MINICOMPUTERS APPLIED TO DIGITAL PHOTOGRAMMETRY

Mark Edward Arbuckle

A Dissertation Submitted to the Faculty of Engineering of the University of the Witwatersrand, Johannesburg for the Degree of Master of Science in Engineering.

Johannesburg 1979

I certify that the work contained in this dissertation is my own and has not been submitted for degree purposes to any other university.

M E ARBUCKLE

Johannesburg
20 July 1979

To my parents

CONTENTS

ACKNOWLEDGEMENTS

Work on this dissertation covered a period of almost four years, the topic of which was suggested in 1975 by Dr H S Williams, who was then a Senior Lecturer in the Department of Surveying at the University of the Witwatersrand, Johannesburg. The writer is sincerely grateful to Dr Williams for this suggestion, for his supervision of the project in its early stages and for providing an introduction to WANG Computers of South Africa who made available, at times, a minicomputer system on which to develop and test the software on which much of the material for this dissertation is based.

The writer wishes to thank the management and all those employees of WANG Computers who in any way provided the writer with assistance in connection with this project.

During the period of study on this dissertation, the writer was awarded a Freda Lawenski Scholarship, for which the Bursaries Committee must be thanked.

The conclusion of this project was made possible owing to the voluntary supervision of Mr D Clegg who so generously gave up many hours of his spare time during the period of the writing of this dissertation. The writer would like to express his special thanks to Mr Clegg for his assistance and valuable suggestions.

SYNOPSIS

Since the appearance of the minicomputers at the beginning of this decade (1970) these small, versatile and inexpensive machines have been applied to almost every field of science previously the domain of the large, expensive computers. In many cases the minicomputer has divested new fields of application where the larger machines could not be used.

Analytical photogrammetry is one application which requires a large amount of high speed data processing capacity and was a practical impossibility before the advent of the electronic digital computer. In just over two decades since the appearance of the first computer, the minicomputer with the processing capabilities of many of the larger first generation computers is now applied to analytical aerial triangulation.

The purpose of this study is to investigate the applicability of a particular minicomputer viz., the WANG 2200, to several phases of aerial triangulation with block adjustment being the most important of these. A system has been developed on the minicomputer to process photographic plate co-ordinates of blocks containing up to two hundred models from relative orientation and model formation to strip and block adjustment. The criteria for the tests are (i) the data storage capacity of the system, (ii) the accuracy of the results obtained from the block adjustments and (iii) the processing times of each phase of the aerial triangulation system.

The software system has been thoroughly tested using data supplied by Dr H S Williams and T J M van Dijk. These data are the Durban and St. Faith's Test Areas, the photographic plates of which were measured trilateratively and processed by Dr H Williams and T van Dijk on the Univeristy of the Witwatersrand IBM 360 computer. The third test consisted of processing two hundred models of the I.T.C. synthetic test block.

This concluded the system tests and demonstrated that the system was capable of processing a block of two hundred models with adequate speed and producing accurate results.

Chapter 1 of this dissertation deals briefly with the history of analytical aerial triangulation and the development of electronic digital computers.

Chater 2 outlines the mathematics used in the various phases of the aerial triangulation system, while Chapter 3 discusses the suite of programs which have been developed on the WANG 2200 minicomputer.

The results of the tests processed using the system are compared where possible with the results obtained by others who have processed the same data. The results are shown and comparisons are made in Chapter 4.

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

SYMBOL	DESCRIPTION
A	Matrix of coefficients of the residual vector
$a-e$	Coefficients of the planimetric correction polynomial
$a_i : i=0,8$	Coefficients of the planimetric correction polynomial
B	Matrix of coefficients of the independent parameters
B_x, B_y, B_z	Model base vector
$b_i : i=0,4$	Coefficients of the height correction polynomial
b_x	Base length of model
Δ	Unknown parameters
$d\lambda$	Scale factor differential
dR	Rotation matrix differential
dX_{shift}	Shift vector differential
e_n	Iterative adjustment precision threshold
f	Camera focal length
I	Identity matrix
$\bar{i}, \bar{j}, \bar{k}$	Rectangular unit vectors
l	Vector of sample values
λ	Scale factor
λ, μ, ν	Rodrigues parameters
$M.S.D.$	Mean standard deviation
N	Normal equation coefficient matrix
N^{-1}	Inverse of the normal equation coefficient matrix
Π	Product of terms
R	Orthogonal rotation matrix
R^T	Transpose of the orthogonal rotation matrix
$\mathbb{R}$	Vector of remainder terms
$r_{ij} : i=1,3 : j=1,3$	Elements of the orthogonal rotation matrix
S	Skew-symmetric matrix
Σ	Sum of terms
σ_{height}	Standard deviation in height
σ_p	Standard deviation in planimetry

SYMBOL	DESCRIPTION
σ_{plan}	Standard deviation in planimetry
σ_{p_y}	Standard deviation of y-parallax
$\sigma_x, \sigma_y, \sigma_z$	Standard deviations in X, Y and Z respectively
$\sigma_{x/y/z}$	Standard deviation of residuals in X, Y or Z
σ_o	Standard deviation of an observation of unit weight
$\sigma_{o_{height}}$	Standard deviation of a single observation of unit weight in height
$\sigma_{o_{plan}}$	Standard deviation of a single observation of unit weight in planimetry
V	Vector of residuals
$V_{p_y(max)}$	Maximum y-parallax
W_h	Matrix of weight coefficients for the height adjustment
W_p	Matrix of weight coefficients for the planimetric adjustment
X, Y, Z	Spatial model co-ordinates or terrain co-ordinates
X_s, Y_s, Z_s	Co-ordinates of a point in the strip
X_t, Y_t, Z_t	Co-ordinates of a point in the terrain

CHAPTER 1

INTRODUCTION

1. INTRODUCTION

1.1 General

In less than three decades since the appearance of the first automatic electronic digital computer, advancements in the fields of computer technology and other allied fields have resulted in a new generation of computer - the minicomputer.

These inexpensive computers are being applied to many fields, originally the domain of the larger mainframe computer. Digital photogrammetry which, prior to the advent of large capacity automatic computers, had little practical importance is now within the realms of application on minicomputers.

The minicomputer, as the name implies, is physically a small computer but is a giant in terms of the processing cabilities, memory and disk storage capacities. For the purpose of this dissertation a minicomputer will be defined as a computer with a memory capacity of 64K word or less. The minicomputer on which the analytical aerial triangulation system for this dissertation was developed has a memory capacity expandability up to a maximum of 4K words, although all the programs in the system were written for a maximum memory capacity of 3K words.

The purpose of this study has been to investigate the applicability of the minicomputer to analytical aerial triangulation with the criteria for success being that the system should be capable of processing the block adjustment, within an adequate time, of at least a two hundred model block which is considered to be a block of adequate practical size. In addition, the results of this study should show that analytical aerial triangulation on the minicomputer produces results which have accuracies comparable with similar solutions on large mainframe computers.

The WANG 2200 minicomputer has been used exclusively in this study and it is hoped that this particular make of minicomputer is representative of minicomputers in general. On this assumption the results of the tests undertaken here will apply to the majority of the available minicomputers.

1.2 Significant Events in the History of Automatic Digital Computers

The appearance of automatic digital computers has been late in the history of calculating and computing and has been the result of developments in science and technology by many people working together and independently in fields related and unrelated to the art of calculating.

Mechanical calculators made their first appearance in the middle of the seventeenth century with the invention in 1642 of a simple digital calculator by the French scientist and writer Blaise Pascal. In 1643 Liebnitz was motivated by the idea of automation in digital calculations. His contribution to the science was a stepped wheel to be used in calculating machines. Regarding automation, he once wrote: 'It is unworthy of excellent men to lose hours like slaves in the labour of calculations which could be safely relegated to anyone else if machines were used'.

The concept of a machine capable of performing numerical computations of a general kind and not requiring the intervention of a human operator at every step in the calculation is attributed to Charles Babbage, an English mathematician. His first inspirations came to him in 1812. In 1822 he demonstrated a prototype of his Difference Engine which was to be capable of evaluating functions from differences. By 1842 the somewhat over-ambitious Babbage had not completed his original project, nor a subsequent machine, the Analytical Engine, which was conceptually the forerunner of the modern digital computer. Although Babbage never completed either of his projects, he contributed largely to the science of calculating and automation in computing. He was responsible for identifying two separate main parts required by an automatic computer, viz. the store and the mill, or in modern terms, the main storage and the central processing unit. In addition it was Babbage who conceived of punched cards for the entry of data into the automatic computer, based on the idea of punched cards used at that time in the control of weaving looms.

Most of what Babbage attempted was impossible because of the underdeveloped or non-existent technologies on which he relied.

A large proportion of Babbage's time was spent in advancing the theories and technologies he required, in developing new concepts in logical design and in improving lathes and gear cutting tools to produce the vast quantity of highly precise cogwheels and levers needed for his Analytical Engine. It was almost seventy years after his death before sufficiently developed technologies existed which enabled scientists to build the first automatic universal digital computer.

This next significant step in the development of automatic digital computers came in 1944 when Professor Howard Aiken of Harvard University (Hartree, D R. 1950) completed the first fully automatic digital computer - the Harvard Mk I, built of electrochemical components. This machine incorporated many of the basic concepts of Babbage's Analytical Engine. The Harvard Mk I, or Automatic Sequence Contolled Calculator (ASCC) was capable of performing two hundred operations per minute, a great advancement for the automatic handling of complex calculations.

Between 1945 and 1947, the successor to the Harvard Mk I, the Mk II, was begun and completed. It was built entirely of specially designed electromechanical relays which resulted in an improved computation speed over the model Mk I.

The first computer to be built consisting entirely of electronic components was the Electronic Numerical Integrator and Calculator (ENIAC) designed and built in 1946 by Professors J W Mauchly and J P Eckert at the University of Pennsylvania (Booth, A D and Booth, K H W. 1956) as a special purpose computer to be used in ballistic research. The vacuum tube, which was first discovered in 1919 by W W Eccles and F W Jordan was the main component of the ENIAC. The machine contained more than 18 000 of these components and all of them had to function simultaneously for an adequate period. The machine's operation was controlled by means of a plugboard which required manual rewiring of each separate sequence of operations to be performed.

Dr John von Neumann who worked on the ENIAC project is considered to be responsible for the next important concept and perhaps one of the most important concepts in the history of the development of computers. In 1945 he proposed storing both the data variables and the computer's operating sequences in the memory of the computer. This concept was incorporated in the Electronic Discrete Variable Automatic Computer (EDVAC) on which work was begun in 1945 but was only completed in 1952 during which period two other projects were initiated, based on the designs of the EDVAC.

The designers of the early automatic computers experimented with various devices to be used as memory storage; the ENIAC used vacuum tubes, the EDVAC and its successor EDSAC (Electronic Delayed Storage Automatic Computer) used memory acoustic delay lines. Each successive device resulted in the improvement in faster computing times. An invention by Dr A Wang, viz. core storage, made while working under H Aiken on the staff of the Harvard Computational Laboratory proved to be far superior to all the earlier storage devices. This device was used extensively as the main storage component in many computers developed during the period 1956 to the mid 1960's and was first used in the Massachusettes Institute of Technology (MIT) Whirlwind I on which work was begun in 1947.

The development of the transistor heralded the next major advancement in computer technology and the beginning of a new generation of computers. Although the transistor had been developed in 1948 it was only in 1954, when Philco Corporation produced the surface barrier transistor, that the transistor became recognised universally as a useful component in high speed electronic computers (Rosen, S. 1969).

The transistorized generation of computers is also recognised by the achievements of computer technologies in the field of super computers. The first of the computer giants was the Naval Ordnance Research Calculator (NORC) built by International Business Machines (IBM). The NORC was originally designed with an electrostatic storage system which was later replaced by a magnetic core storage. Two other giant computers commissioned during this era were the Livermore Atomic Research Computer (LARC) and the Stretch on which design began in 1947 by Remington Rand Univac and IBM respectively. The IBM Stretch computer used over 150 000 of the faster drift transistors which gave it a cycle time of two microseconds. One important innovation which resulted from the Stretch project was the look-ahead unit which enabled the computer to operate on several instructions in advance, thus providing the possibility of controlling of one or more processing units faster than with a sequential system.

The CDC 6600 computer built by Control Data Corporation was designed to be three times more powerful than the Stretch computer. An interesting desgin feature of the CDC 6600 is the ten peripheral processors, each of which is a small computer with an executive control which can direct, monitor and time share the very powerful central processor. The CDC 6600 central processor has the capability of executing over three million operations per second. In 1968 Control Data Corporation began marketing an Extended Core Storage (ECS) to be used as a peripheral memory device on the CDC 6600 and CDC 7000 series which enables block transfer to and from the main memory at a rate of ten million 60 bit words per second. It has been estimated that the CDC 7600 is capable of executing twenty-five million instructions per seconds.

The third generation of computers, most of which were manufactured after 1965 are characterized by the use of integrated circuits as control and storage devices. Some interesting advancements which have been made since 1965 include the multiprogramming and multiprocessing systems which the Atlas Computer, designed by Manchester University in co-operation with Ferranti, is one example of an early time-sharing system. The basic principle of such a system is the communications oriented method of the computer's use whereby two or more users can have simultaneous access to the same computer from different locations by means of on-line terminals. The time-sharing concept was developed in order to reduce the time incompatibility of slow input/output devices and the fast central processor thereby optimizing the use of the expensive central processing unit. To a large extent, time-sharing replaced the original batch processing method for handling a large volume of separate jobs on a single computer installation. Multiprogramming is the common factor between the modern batch processing and the general time-sharing systems, allowing for the simultaneous execution of two or more programs by the same central processing unit. The IBM OS/360 is an example of an operating system which controls a multiprogramming batch system and on-line time-sharing from remote terminals.

1.3 Minicomputers and the WANG 2200 System

The minicomputer is, in general terms, a low cost single task computer with the more specific characteristics of a short word length and a main memory of less than 64K words.

Minicomputers were first used in 1962 in aerospace applications (Kaenel, R A. 1970). The earlier machines were specific purpose computers and it was only in 1969 that manufacturers like Honeywell and Scientific Control Corporation began producing general purpose minicomputers to be sold commercially. The development of the low cost, high speed minicomputer had become possible through the advent of Large Scale Integrated Circuits in the early 1960's. By 1973 a wide range of minicomputers was available all of which had reached a high degree of uniformity in cost, size, speed and internal organisation (Gruenberger, F and Babcock, D. 1973).

The recent rapid increase in the number of minicomputer users may be attributed not only to the lower computing costs involved, but also to the accepted philosophy that certain economies may be achieved through the decentralization of computing facilities, particularly in applications which lend themselves to departmental scope and control.

The power and diversity of minicomputers has led to their application to literally thousands of tasks to the list of which new applications are continually being added. Minicomputers have been used successfully in process control to efficiently direct and monitor automated production lines where sequence, timing and logic are required. An example of this is the use of minicomputers in the manuacture of printed circuit logic boards which are used in computers. The circuit board patterns are stored in the computer memory for the repeated accurate printing of the circuit onto chemically treated boards.

The basic minicomputer configuration comprises the Central Processing Unit (CPU), a teleprinter although more commonly a Cathode Ray Tube (CRT) display unit and an output printer. Most minicomputers can be interfaced with a number of peripheral devices, the more important of which are auxiliary storage devices such as magnetic tapes, drums and disk storage units. Other interfaces include Digital to Analogue linkages in applications where minicomputers are used to control, monitor and simulate fast continuous real time systems.

The Central Processing Unit and the Main Memory of the minicomputer are generally housed in a frame which measures approximately 50cm by 30cm by 55cm. Word lengths ranges from 8 bits to 16 bits, although several minicomputers use combined words for data representation and instruction addressing, which has the disadvantage of reducing the cycle time and the overall performance of the machine. Most of the minicomputers available at the beginning of this decade did not provide for floating point or decimal arithmetic nor bit and byte manipulation. Several did not even offer built-in multiply and divide in which case these operations had to be implemented by software. The present range of minicomputers make extensive use of microprogrammed Read Only Memories (ROM) for hardwired functions such as arithmetic operations, trigonometric functions, matrix algebra and any freqeuntly used subroutines.

The earlier minicomputers used core memory exclusively for Random Access Memory (RAM) which has subsequently been replaced by Large Scale Integrated (LSI) semiconductor memories. Core memory ranged from 1K to 65K capacities with access speeds ranging from 0,5 to 8 microseconds. (Kaenel, R A. 1970).

Minicomputers reached a high level of sophistication in less than a decade from their inception. The first available minicomputers were assembly language machines. By 1974 machines were available which incorporated high level language compilers such as FORTRAN, ALGOL and RPGII. BASIC language interpreters are widely used on the smaller computers and is particularly suited to on-line applications. Several manufacturers provide complex, highly developed software such as real-time disk operating systems and time-sharing executive systems.

Of the auxiliary storage devices available for minicomputers the most reliable fast access mass storage unit is the single or dual platter moving head magnetic disk. Capacities of these units generally range from five megabytes to twenty megabytes.

The flexible diskette provides medium capacity random access storage at a substantially lower cost than the larger rigid disks. Access times and data transfer rates are approximately one order higher for the flexible diskette than their larger rigid counterpart. Other mass data storage devices which can be supported by minicomputers include nine track tape units and the slower and lower capacity tape cassette units.

1.3.1 The WANG 2200 Minicomputer System

The Analytical Aerial triangulation system described in this dissertation was programmed and tested on the WANG 2200T and later the WANG 2200VP minicomputer systems. The hardware configuration comprised a 24K-byte Central Processing Unit, a CRT display and keyboard, a 10 Megabyte disk unit for auxiliary storage and a line printer. Each of these devices will be described below (WANG 1975).

1.3.2 The WANG 2200T Central Processing Unit

The CPU operates on a single user program written in WANG 2200 Extended BASIC. BASIC, an acronym for Beginners All Purpose Symbolic Instruction Code, was originally developed as a high level interpretive language by J G Kerney and T E Kurtz at Dartmouth College, New Hampshire for implementation on time-sharing systems. It was first used in 1965 on the GE 225 computer and has since become one of the more widely used languages on minicomputers (Sanderson, P C. 1973).

The basic interpreter, also known as a translator or the machine's firmware, is stored permanently in 32K bytes of Instruction Read Only Memory (ROM). The interpreter translates and executes one statement of the BASIC source program at a time. The interpreter as opposed to the compiler, has the advantages of requiring less time during compilation and less storage for source and object code but has the disadvantage of increasing the execution time. The microinstruction resulting from the interpretation phase is directed by the firmware through the Arithmetic and Logic Unit (ALU) which is part of the central processing unit responsible for performing both arithmetic and logical functions.

There are three distinct phases in CPU processing inititiated by a keyboard command. The first of these phases, referred to as the Text Entry Phase analyses the syntax of a statement which has been entered via the keyboard and is currently in the Random Access Memory Input/Output buffer. The statement, with its associated line number, is simultaneously included in the program text currently in memory. The second phase is the Line Number Resolution Phase which is entered prior to the Execution Phase. During this phase the variable symbol table is generated, Random Access Memory area is allocated to user variables and program statement line numbers are verified. Each entry in the symbol table, which is generated during the Variable Resolution Phase consists of the symbol prefix and the symbol data. The symbol prefix comprises the name, the atom which flags variables as either scalar, vector or array and numeric or alphanumeric, and the thread to next symbol flag which reduces the search for variable time during execution. On completion of the Variable and Line Number Resolution Phase, the system automatically enteres the Execution Phase.

During execution each statement is interpreted as it is scanned. This phase involves the required BASIC microroutines as they are encountered in the Atom Table information. This phase also activates three pushdown stacks, viz, the Called Subroutine Stack (CSS), the Value Stack (VS) and the Operator Stack (OS), which store subroutine return addresses, the results of expression evaluations and loop and subroutine information.

The read/write memory cycle time of the WANG 2200 Central Processing Unit is rated at 1.6 microseconds. The system operates on full precision numeric variables that is, the equivalent of thirteen significant decimal digits within the dynamic range of 10^{-99} to 10^{+99}. Addition or subtraction of two variables executes in 0,8 msecs, multiplication of two variable executes in 3,8 msecs and division in 7,4 msecs. The slowest rated function is the evaluation of a tangent which has an average execution time of 78,5 msecs.

1.3.3 The WANG 2200 VP Central Processing Unit

The analytical photogrammetry system was developed for this dissertation on the WANG 2200T Central Processing Unit. All initial testing and processing was carried out on this model processor. Towards the end of the project WANG Computers released a faster model, the WANG 2200VP, also a minicomputer expandable up to 32K-bytes of Random Access Memory. The two models of processor are software compatible although the WANG 2200VP has an enhanced BASIC instruction set which is not downward compatible. All the tests processed on the WANG 2200T were reprocessed on the WANG 2200VP in addition to another test viz. the processing of the iterative block adjustment of a block of data comprising two hundred models.

The WANG 2200VP firmware is not hardwired into the system but is loaded by a bootstrap into memory from a disk unit. Additional features offered by the VP firmware are mainly immediate mode insructions none of which could be incorporated into the orginally developed software to increase its power.

The architecture of the machine contains certain improvements which have resulted in a processor which is rated at ten times faster than the WANG 2200T processor.

1.3.4 Auxiliary Data Storage Unit

The WANG 2260 Disk Unit was used in the development of the software for this project. It was, at the time of this development (1975/76), the largest disk unit available for the WANG minicomputer system. This disk unit has sufficient capacity to contain the data of a two hundred model block with approximately thirty points per model. Owing to the limited capacity of the Central Processing Unit Memory, the disk unit is used extensively as auxiliary memory and only certain information is retrieved from the disk as and when it is required to be processed.

The WANG 2260 disk unit has two platters - one fixed and the other removable, each of which contains five megabytes of storage and thus has a total of ten megabytes of storage space.

Each platter is divided into tracks, either one hundred or two hundred tracks per inch (TPI). The individual tracks are divided into twenty four sectors of two hundred and fifty-six bytes per sector, of which two hundred and fifty-three bytes are usable; the remaining three bytes are used as control bytes by the hardware.

The maximum capacity of a ten megabyte disk is approximately 1,1 million full precision numerics (thirteen decimal digits). Since the system allows for the compaction of numeric data, i.e. numeric data can be converted into alphanumeric variables at the rate of one byte per two digits, and with judicious blocking of the data on the disk, the capacity of 1,1 million full precision numbers may be increased if lower precision data is adequate for the current task.

The disk platter has an iron oxide magnetic surface above which the read/write head moves while the disk rotates. Information is stored on the disk in the form of magnetized spots of iron oxide. The sectors are staggered on the concentric tracks in such a way that consecutively numbered sectors in a track are located twelve physical sectors, or one-half track, apart. This arrangement makes it possible to access as many as four consecutively numbered sectors in a single rotation of the platter in certain operations.

The two modes of storage on the disk platters are:

i) Automatic file cataloguing in which the system records both the location and size of each file contained on the disk platter, and

ii) Direct absolute sector addressing of a specific sector on disk which is independent of the automatic file cataloguing.

The four disk specifications which indicate the speed of the disk unit are:

i) The track access time (i.e. the time required to position the disk read/write head at a specific track) of 37 msecs,

ii) the average latency time (i.e. the time required to rotate a track to a particular position) of 12,5 msecs,

iii) the raw transfer rate of data of 312 500 bytes per second, and

iv) the read/write time of 8 msecs.

The disk unit can be multiplexed simultaneously to up to four central processing units each of which can access data from the common data base.

1.4.1 Analytical Photogrammetry Prior to 1950

During the period of 1883 to 1950, analytical photogrammetrists concerned themselves with the development of mathematical solutions of the problems of the space resection in photogrammetry.

In 1883 R Sturn and G Hauck (Doyle, F. 1964) established the relation between projective geometry and photogrammetry. However, it was more than sixteen years later before S Finsterwalder was to establish the mathematics of analytical photogrammetry. He published the first of a series of papers in 1899 which dealt with this subject and over the next thirty years, using vector-terminology, he investigated the photogrammetric single-and-double-point resection in space and the formulation of the relative and absolute orientation.

Concurrent with the work of Finsterwalder, C Pulfrich developed the first stereocomparator in 1901 to be used in the measurement of terrestial photographs and thus started the development towards instrumental photogrammetry. The successors of Pulfrich's instrument are the modern stereocomparator used in analytical photogrammetry.

The first attempt at a practical application of analytical photogrammetry, the mapping of part of the Dutch coastline and several off-shore islands, was undertaken in 1920. Owing to the unsatisfactory results of this new technique, no other analytical photogrammetric projects were begun for almost thirty years.

During this period interest in analytical photogrammetry waned, owing to the poor results achieved in the first projects combined with the fact that there was no instrumentation available that could process the vast amounts of data involved in an analytical mapping project.

However, photogrammetists like Von Gruber and Earl Church continued their investigations into the theory of analytical photogrammetry. Von Gruber is well known for his development of the differential formulae of the projection relation between planes. Ironically, not anticipating the development of high speed computers, he dismissed the practicability of the analytical approach in 1924 and subsequently concentrated his efforts on the development of analogue photogrammetric instruments. Earl Church, an American applied mathematician, revived a limited interest in analytical photogrammetry in a paper published in 1930 which dealt with the single photograph space resection as a two stage problem, viz. the determination first of the station co-ordinates and second of the rotational parameters. Subsequent papers published in 1936, 1940 and 1941 discussed the extension of control using a four point control extension procedure, the determination of scale data from photographs without reference to their absolute positions in space and the rectification of tilted aerial photographs. Church's work, presented in direction-cosine notation has been criticized for its failure to deal with redundant observations and error analysis.

The work of Church was nevertheless a valuable contribution to the development of analytical photogrammetry and had a strong influence on E Merritt who in 1950 and 1951 and later in 1958, in a published book, presented a formal treatment of the analytical solutions for camera calibration, space resection, interior and exterior orientation, relative and absolute orientation of stereo pairs and analytical control extention.

1.4.2 Developments in Analytical Photogrammetry since 1950

The appearance in the 1950's of the high speed electronic digital computer was largely responsible for a renaissance in the field of analytical photogrammetry leading to investigations into practical applications of digital methods of control extension using photogrammetry.

H Schmid (1956/57, 1959) realised the potential computing power of the newly developed automatic electronic computers. In anticipation of the large capacity computer, Schmid developed the principles of modern multistation analytical photogrammetry . His work is further characterised by its generalized treatement of the problem which allows for the simultaneous solution of rigorous least squares adjustments of redundant observations.

The implementation of a rigorous analytical adjustment based on Schmid's theory requires not only fast computing facilities, but also large memory which were not available when Schmid developed his theory. Photogrammetrists realised the need for less rigorous solutions which could be implemented on the current equipment. The result was to apply the computer to the analogue solution of strip formation and the adjustment of strips and blocks based on small sections as the adjustment unit using iterative procedures (Davis, R. 1966).

The development of analytical solutions of the relative and absolute orientations were largely owing to G Schut (1955/56, 1960/61), E Thompson (1959) and C M van den Hout (1961). Schut's approach to the analytical relative orientation was based on the coplanarity condition of homologous pairs of rays in space. This development was furthered by Thompson who used matrix notation for a solution particularly suited to small capacity digital computers. In 1961 van den Hout published a solution to the relative orientation based on the same coplanarity condition but using an alternative algebraic method and the initial assumption of equal elevation of all points in model space.

The same three photogrammetrists, E Thompson (1959), C van den Hout (1960/61) and G Schut (1960/61) were responsible for the theories of analytical solutions to the absolute orientation. The method proposed by Thompson (1958/59) resulted in an exact linear solution of the elements of the orthogonal rotation matrix. Schut (1960/61) devised simpler forms of linear equations using two different approaches viz. matrix algebra with real elements which leads to three equations and quarternion algebra with complex elements which leads to four equations. Also in 1961 van den Hout proposed an alterntive solution to the absolute orientation using a linearized observation equation. The application of triplets of photographs which was first suggested by H Schmid in 1956 and 1957 was further pursued by E Mikhail in 1962 resulting in a method of relative orientation which reduces the number of unknowns from eighteen to eleven.

The early years of the 1960's saw the development and implementation of the Independent Model method of aerial triangulation based on a concept suggested by H Fourcade in 1926. Both the semi-analytical technique which processes models formed on stereoplotters, and the fully analytical technique which processes analytically formed models were considered by V Williams and H Brazier, and G Inghilleri and R Galetto during the period 1964 to 1967 (Williams, V A and Brazier H H. 1964, 1965, 1966 and Inghilleri, G and Galetto R. 1967).

1.4.3 The Development of Analytical Methods of Strip and Block Adjustment

Investigations into analytical adjustments of strips based on least squares were first undertaken by R Roelofs in 1951 and 1952. The adjustment procedure was based on interpolation methods originally developed for hand computations. Several other photogrammetrists, notably A Nowichi and C Born (1960) and A J van der Weele (1953/54) proposed adjustments which were extensions of the procedures developed by Roelofs.

A more rigorous adjustment of strip triangulation was proposed in 1960 by E Gotthardt, a procedure which in the opinion of F Ackermann (1962) was reserved for large scale precision photogrammetry and only suitable for implementation on large capacity computers.

Perhaps the most exhaustive investigations into polynomial strip adjustments were undertaken in the late 1950's by G H Schut at the NRC in Canada (Schut, G H. 1964). The adjustment was programmed as a sequence of conformal transformations in two dimensions as an alterative solution to a three dimensional conformal polynomial transformation.

In an effort to further improve the results of strip adjustment by polynomial adjustment, photogrammetrists investigated the possibility of three dimensional conformal transformations of degree higher than one, but found that they do not exist. Attempts were also made to model the errors in the strip by polynomials of degree higher than three, but subsequently F Ackermann (1961/62) found that the best results would be obtained by adjusting the strip in sections using composed second order polynomials.

The rigorous fully analytical block adjustments first suggested by H Schmid in 1956/57 was not implemented on a computer until several years later in 1966 owing to the requirements for large amounts of computer memory for the solution of the normal equations. The first block adjustment using this technique comprised only twenty photographs. Thus, concurrent with the development of analytical block adjustment during the 1960's, there were several investigations by photogrammetrists and numerical mathematicians into improved algorithms for the solution of the normal equations by both direct and iterative methods.

Alternative methods of analytical block adjustment which required less computer memory and yet achieved a high degree of accuracy were researched in the early 1960's by S Bervoets (1960), G Schut (1964), F Amer (1962) and D Proctor (1962). The methods suggested by Bervoets and Schut consisted in applying sequential strip adjustments using third order polynomials to each strip in the block, treating the tie points from the previous strip as control with a lower weighting in the next overlapping strip.

Amer, at the University College, London, and Proctor of the Ordnance Survey of Great Britain, worked concurrently on the analytical block adjustment using the model or groups of models as the adjustment unit. The approach developed by both Amer and Proctor was a numerical solution of the analogue block adjustment of Jerie for planimetric adjustment which uses two stereomodels as the basic adjustment unit. While this method of block adjustment by applying sequential linear conformal transformations to the sections in the block has a low computer memory requirement, it suffers from a slow rate of convergence, particularly if large blocks are adjusted.

A further extension of the numerical solution of block adjustment based on the Jerie-analogue adjustment, enabling the simultaneous determination of the linear transformation coefficients and tie point co-ordinates was proposed in 1962 by C M van den Hout (1966). The linear property of the normal equations permits this banded and bordered matrix of equations to be solved by a direct method. The symmetric properties of the normal equation coefficient matrix which allow for the treatment of the solution on a collapsed normal equation matrix were recognised by van den Hout. The handling of collapsed matrices greatly reduces the computer memory requirements for a direct solution of the block adjustment coefficients. The same adjustment was implemented in 1963 by D Eckhart (1962/64) and J van Leyden on the ZEBRA Computer in the mathematical department of ITC. The adjustment program, ANBLOCK, was originally developed for planimetric adjustment only but was later revised to handle height adjustment either as a separate adjustment or combined in a three dimensional adjustment.

In 1963 and 1964 American photogrammetrists E Mikhail and normal equations by both direct and iterative methods.

Alternative methods of analytical block adjustment which required less computer memory and yet achieved a high degree of accuracy were researched in the early 1960's by S Bervoets (1960), G Schut (1964), F Amer (1962) and D Proctor (1962). The methods suggested by Bervoets and Schut consisted in applying sequential strip adjustments using third order polynomials to each strip in the block, treating the tie points from the previous strip as control with a lower weighting in the next overlapping strip.

Amer, at the University College, London, and Proctor of the Ordnance Survey of Great Britain, worked concurrently on the analytical block adjustment using the model or groups of models as the adjustment unit. The approach developed by both Amer and Proctor was a numerical solution of the analogue block adjustment of Jerie for planimetric adjustment which uses two stereomodels as the basic adjustment unit. While this method of block adjustment by applying sequential linear conformal transformations to the sections in the block has a low computer memory requirement, it suffers from a slow rate of convergence, particularly if large blocks are adjusted.

A further extension of the numerical solution of block adjustment based on the Jerie-analogue adjustment, enabling the simultaneous determination of the linear transformation coefficients and tie point co-ordinates was proposed in 1962 by C M van den Hout (1966). The linear property of the normal equations permits this banded and bordered matrix of equations to be solved by a direct method. The symmetric properties of the normal equation coefficient matrix which allow for the treatment of the solution on a collapsed normal equation matrix were recognised by van den Hout. The handling of collapsed matrices greatly reduces the computer memory requirements for a direct solution of the block adjustment coefficients. The same adjustment was implemented in 1963 by D Eckhart (1962/64) and J van Leyden on the ZEBRA Computer in the mathematical department of ITC. The adjustment program, ANBLOCK, was originally developed for planimetric adjustment only but was later revised to handle height adjustment either as a separate adjustment or combined in a three dimensional adjustment.

In 1963 and 1964 American photogrammetrists E Mikhail and

J Anderson, respectively, undertook investigations into the practicability of block adjustments using as the basic adjustment unit sub-blocks comprising three overlapping triplet sets. Tests showed that comparable results were obtainable and that such adjustments were indeed feasible for blocks of photography with sixty percent fore and aft overlaps.

The first program developed to adjust blocks of aerial triangulation based on the collinearity condition of image point, perspective centre and object point suggested by H Schmid (1959) became operational in 1966 at the United States National Ocean Survey (USNOS). The direct solution of the normal equations on the hardware available to USNOS limited the size of the block to twenty-five photographs and thus was of little practical use (Keller, M 1967). As a result interest in the practical applications of the non-rigorous adjustments for computational considerations continued to dominate developments in analytical block adjustments.

It was believed however, at that time that the optimal solution lay in the rigorous simultaneous adjustment of the block using Schmid's method. D Brown and Associates under the sponsorship of the Rome Air Development Centre (RADC) began studies in 1963 into the adjustment of large blocks using recently developed techniques in matrix iterative analysis for the solution of the normal equations (Davis, R. 1966). Three iterative solutions were investigated viz. Gauss-Seidel, Gauss-Seidel with Luisternick Acceleration and Gauss-Seidel with Successive Over Relaxation. It was found that the last of the three methods yielded results which compared favourably with non-iterative techniques. The resultant program system was initially written to cater for the adjustment of a block involving a maximum of five hundred unknowns. With the aid of buffering procedures and auxiliary mass storage devices, it was envisaged that with the same amount of main computer memory the program could be extended to handle up to 10 000 unknowns with no significant loss of efficiency.

By the late 1960's it was generally accepted that adjustments of large blocks involving the simultaneous solution of more than 10^4 unknowns was at least possible. An interesting application of such a large block adjustment was theorised by D Brown (1968) for the establishment of a linear control network by photogrammetric means. It was believed that such a task would involve the adjustment of 14 700 photographs if a twelve inch camera were used to photograph the entire lunar surface with fifty-five percent fore and aft and twenty percent side overlaps. The bordered-banded normal equation system would be solved by the method of Recurrent Partitioning. By 1971 such an application had been implemented using a program capable of a simultaneous adjustment of 2 000 photographs involving 10^4 unknowns. The lunar mapping project required the adjustments of sixty-four photographs involving 7 000 point images. The adjustment was processed on the IBM 7094 in less than two hours (Matos, R . 1971).

In the early 1970's attention was again focussed towards the development and implementation of program packages for strip and block adjustments by independent models, this time allowing for greater generality of data in order to produce marketable analytical aerial triangulation systems. The system developed, PAT-M of which there are two versions viz. PATM-43 and PATM-7 was done so under the direction of H Ebner and H Klein at the Photogrammetric Institute of Stuttgart University (Ackermann, F, Ebner, H, Klein, H. 1973). The Cholesky solution, which is particularly suitable for the solution of the positive definitive banded and bordered system of normal equations, allows for up to 10^4 unknowns.

The complete PATM systems are sub-divided into four parts, each of which occupies less than 12K words of main memory.

CHAPTER 2

MATHEMATICS OF ANALYTICAL AERIAL TRIANGULATION

2 MATHEMATICS OF ANALYTICAL AERIAL TRIANGULATION

2.1 Introduction

Subsequent to the photographic stages of photogrammetry there are several steps required to obtain the plate image co-ordinates to be used as input to the analytical aerial triangulation system. The images must be identified on the photographic plates which, depending on the procedure used may require point transfer of artifical points between overlapping photographs viewed under stereo-observation using instruments like the wild PUG or the Zeiss Snap Marker. The dyadic sets of plate image co-ordinates are referred to a plane co-ordinate system with its origin at the principal point of the photograph and the x-axis approximately in the direction of flight.

The plate image co-ordinates may be measured using either stereo- or mono-comparators. Using mono-comparator measuring instruments, each photographic plate is measured separately with the plate co-ordinates being determined in a cartesian reference frame in which the x and y axes are defined generally be mechanical guide rails. Other methods of obtaining mono-comparator plate co-ordinates which do not require a mechanical definition of the axes of the co-ordinate system involve linear measurements and the determination of the co-ordinates of plate images in a co-ordinate system using the trilaterative principle.

The two sets of data used in testing the digital photogrammetric system developed on the WANG 2200 minicomputer viz the Durban and St. Faith's Test Areas, were measured using the Trilateration Microscope developed by H S Williams in 1971 and defined as a linear mono-comparator.

The Analytical Aerial Triangulation procedure developed on the WANG 2200 which is described in this chapter, provides for obtaining final block adjusted co-ordinates using the plate image co-ordinates as input. The steps involved in obtaining the block adjusted co-ordinates include:

a) Relative orientation and model formation,

b) Formation of the strips of the block using the independent models,

c) Transformation of the individual strips to a terrain co-ordinate system and strip adjustment of each strip to reduce systematic errors,

d) Block adjustment using either the models or the strips as the adjustment unit.

2.2 Observed Image Co-ordinate Refinement

Analytical Aerial Triangulation is based on the central projection theory in which the axis of the lens is normal to the plane of the diapositive, intersects it at the principal point and the plane of the photograph is a true plane. However, since these conditions are only theoretical the measured image plate co-ordinates are seldom used in their raw form in analytical photogrammetry but are subjected to several corrections and refinements (ASP 1966).

Comparator calibration corrections are generally insignificant but would be applied to compensate for any errors inherent in the measuring instrument.

The photographic material which may be either glass or film is subject to deformation. Corrections for film deformation may be applied using one of the three following techniques:

1) Linear scale changes in the x and y directions of the photoplane. The corrections are obtained from the calibrated focal plane distances.

2) Linear scale changes in any direction in the plane of the photograph. A minimum of four fiducial marks are required to obtain the eight transformation parameters of a projective transformation.

3) Use of the reseau in the focal plane. The observed points may be referred to the nearest reseau co-ordinate, or transformed by a projective transformation, the coefficients of which are determined from four reseau co-ordinates surrounding the point. A third alternative to this method is to apply a polynomial transformation to each point. The coefficients of the transformation polynomial are determined from all the reseau co-ordinates.

It is often convenient to refer the co-ordinates to the principal point as origin which is defined by the photograph's fiducial axes. This correction constitutes shifts in the x and y directions.

Radial lens distortion, which comprises symmetric and asymmetric radial distortions, is corrected for by applying an appropriate distortion curve polynomial where the coefficients of the polynomial are obtained from the camera calibration data.

The *atmospheric refraction* correction which is radial from the nadir point is obtained from a function relating the nadir angle and the atmospheric constant to the correction to the nadir angle. Empirical equations for the atmospheric constant have been published by several authors.

The plate image co-ordinates processed by the system developed for this dissertation were not subjected to any of the above corrections (with the exception of referring the co-ordinates to the principal point as origin) in order that a direct comparison of results could be obtained with results processed by H S Williams (1974) and T van Dijk (1975) who processed the same unrefined data. However, it should be noted that H Williams (1974) showed the magnitude of these corrections for the data from the Durban and St. Faith's Test Areas to have an insignificant effect on the absolute accuracies of the block adjusted data.

2.3 Analytical Relative Orientation and Model Formation

The restitution of the model in space is obtained from the *coplanarity condition of homologous pairs of rays and the model* base. A minimum of five plate image co-ordinates from the overlapping area of adjacent photographs are required for the solution of the elements of the relative orientation rotation matrix. For a well conditioned solution these points should lie as close as possible to the Von Gruber points. In practice, however, more than the minimum of five points are selected and a least squares solution is applied.

The method of Relative Orientation used in the program developed for this dissertation follows the treatment of the problem outlined by E Thompson (1959).

The condition for coplanarity of homologous pairs of rays and the model base may be expressed as follows:

$$(B_x \underset{\sim}{i} + B_y \underset{\sim}{j} + B_z \underset{\sim}{k}) \cdot (x' \underset{\sim}{i} + y' \underset{\sim}{j} + z' \underset{\sim}{k}) \wedge (x_2' \underset{\sim}{i} + y_2' \underset{\sim}{j} + z_2' \underset{\sim}{k}) = 0$$

(2.3.1)

where $\underline{i}, \underline{j}$ and $\underset{\sim}{k}$ are the unit vectors parallel to the x', y' and z' axes of the model system. The problem is simplified by considering the model system to be coincident with that of the left hand plate co-ordinate system and the model scale to be $1/b_x$ where b_x is the length of the model base. This reduces the number of unknowns from nine to five. The expression for the condition of coplanarity may be expressed in the form:

$$(x_2 \; y_2 \; z_2) R \begin{pmatrix} 0 & -b_Z & b_Y \\ b_Z & 0 & -1 \\ -b_Y & 1 & 0 \end{pmatrix} \begin{pmatrix} x_1 \\ y_1 \\ z_1 \end{pmatrix} = 0$$

(2.3.2)

where: $b_Y = B_Y / b_x$

$b_Y = B_Y / b_x$

$x_1 \; y_1 \; z_1$ are image point co-ordinates in the left hand plate referred to the perspective centre as origin.

$x_2 \; y_2 \; z_2$ are the corresponding image point co-ordinates in the right hand plate referred to the perspective centre as origin.

$z_1 = z_2 = f$ All points are referred to the respective plate perspective centre as origin and therefore all z_1^i and z_2^i equal the common focal length.

R_2^T is the transpose of the orthogonal rotation matrix which can be expressed in terms of three independent parameters without the use of angular functions. E Thompson (1957 uses the Cayley matrix.

$$R = (I - S)(I + S)^{-1}$$

(2.3.3)

where S is a skew symmetric matrix expressed by means of the Rodrigues parameters λ μ and υ thus

$$S = 1/2 \begin{pmatrix} 0 & -\upsilon & \mu \\ \upsilon & 0 & -\lambda \\ -\mu & \lambda & 0 \end{pmatrix}$$

(2.3.4)

Since the focal length of each camera station is constant, $z_1 = z_2 = f$ equation 2.3.2 may be written as

$$(x_2 \;\; y_2 \;\; 1) R_2^T \begin{pmatrix} 0 & -b_z & b_y \\ b_z & 0 & -1 \\ -b_y & 1 & 0 \end{pmatrix} \begin{pmatrix} x_1 \\ y_1 \\ 1 \end{pmatrix} = 0$$

(2.3.5)

where the ordinates x_2, y_2, x_1, y_1 are in the ratio of the measured co-ordinates to f.

Equation 2.3.5 may be expanded and simplified to obtain the following exact condition equation which expresses the y-parallax in terms of parameters of the relative orientation:

$$y_1 - y_2 + (1 + y_1 y_2)\lambda - y_1 x_2 \mu - x_2 \upsilon - (x_1 - x_2) b_y + \\ + (x_1 y_2 - x_2 y_1) b_z + \mathbb{R} = 0$$

(2.3.6)

where $\mathbb{R}$ represents the second and third order terms.

For each image point observed there will be one such condition equation which for n observations may be expressed in matrix notation as:

$$AV + B\Delta + F = 0 \quad : \quad F = \mathbb{R} - l$$

(2.3.7)

where: $A = I$ the identity matrix
B is the matrix of coefficients of the unknown parameters $\lambda, \mu, \upsilon, b_y, b_z$
V is the vector of residuals
Δ is the vector of unknown parameters
l is the vector of y-parallax
$\mathbb{R}$ is the remainder term of second and third order terms.

The least squares solution for the unknowns, Δ, follows an iterative procedure wherein $\mathbb{R}_0 = 0$ (the null matrix) for the first iteration. Thus

$$\Delta_1 = N^{-1}B^TF_1$$

(2.3.8)

where:

$$N = (B^TB)$$

$$F_1 = -l$$

The vector of residuals $V_1 = -B\Delta_1 - (\mathbb{R}_1 - l) = \mathbb{R}_1$ and is evaluated from the original condition equations 2.3.5. In general:

$$\Delta_{n+1} = \Delta_n - N^{-1}B^TV_n$$

and $\mathbb{R}_{n+1} = V_n + V_{n+1}$ (2.3.9)

After convergence of the iterative procedure the right-hand plate co-ordinates are rotated into the co-ordinate system of the left-hand plate by the transformation:

$$(x'_2 \;\; y'_2 \;\; z'_2) = R(x_2 \;\; y_2 \;\; z_2)^T \tag{2.3.10}$$

The spatial model co-ordinates X, Y and Z in the system of the left-hand photograph are calculated from the following equations:

$$\left.\begin{array}{l} X^i_p = Z^i_p \, x^i_1 = 1 - X^i_2 \\ Y^i_1 = Z^i_p \, y^i_1 \\ Y^i_2 = y'^i_2 (Z - b_z)/z'^i_2 + b_y \\ Z^i_p = (y'^i_2 - x'^i_2 b_z)/(x^i_1 z'^i_2 - x'^i_2) \end{array}\right\} Y^i_p = \tfrac{1}{2}(Y^i_1 + Y^i_2) \tag{2.3.11}$$

The standard deviation of the y-parallax for the n points ($n \geq 5$) used in the determination of the elements of the relative orientation at the scale of the photograph is given by:

$$\sigma_{Y_p} = \sqrt{\Sigma y^T y/(n-u)} \tag{2.3.12}$$

where: n equals the number of condition equations

u equals the number of unknowns i.e 5

$y = (Y^i_1 - Y^i_2) \cdot f / Z^i_p$; f is the focal length of the camera.

2.4 Strip Formation from Independent Models

The method of strip formation to be described may be used on models which have been formed either analytically or on analogue plotting instruments.

Strip formation is generally a variation of the absolute orientation applied sequentially throughout the strip to adjacent models.

The method of strip formation used in the programs written for this dissertation is based on the approach to the solution to the absolute orientation of a model developed by Schut (1960) of which the principal aspect is his solution of the orthogonal rotation matrix.

The orthogonal rotation matrix expressed in terms of a skew-symmetric matrix is:

$$R = (dI - S)^{-1}(dI + S) \tag{2.4.1}$$

where:

$$S = \begin{pmatrix} 0 & -c & b \\ c & 0 & -a \\ -b & a & 0 \end{pmatrix} \tag{2.4.2}$$

The rotation matrix is a function of four parameters of which only three are independent which allows any one of the four parameters to be assigned an arbitrary value.

The orientation of each successive model to its predecessor in the strip may be expressed in matrix notation as follows:

$$X' = RX = (dI - S)^{-1}(dI + S)X \tag{2.4.3}$$

2.4 Strip Formation from Independent Models

The method of strip formation to be described may be used on models which have been formed either analytically or on analogue plotting instruments.

Strip formation is generally a variation of the absolute orientation applied sequentially throughout the strip to adjacent models.

The method of strip formation used in the programs written for this dissertation is based on the approach to the solution to the absolute orientation of a model developed by Schut (1960) of which the principal aspect is his solution of the orthogonal rotation matrix.

The orthogonal rotation matrix expressed in terms of a skew-symmetric matrix is:

$$R = (dI - S)^{-1}(dI + S) \tag{2.4.1}$$

where:

$$S = \begin{pmatrix} 0 & -c & b \\ c & 0 & -a \\ -b & a & 0 \end{pmatrix} \tag{2.4.2}$$

The rotation matrix is a function of four parameters of which only three are independent which allows any one of the four parameters to be assigned an arbitrary value.

The orientation of each successive model to its predecessor in the strip may be expressed in matrix notation as follows:

$$X' = RX = (dI - S)^{-1}(dI + S)X \tag{2.4.3}$$

where: X is the vector of co-ordinates prior to rotation
and X' is the vector of co-ordinates subsequent to rotation.

The common perspective centre to the two adjacent models is used to control the longitudinal tilts of the models throughout the strip.

Premultiplying both sides of equation 2.4.3 by $(dI-S)$, expanding and simplifying yields the following three linearly dependent *equations of which only two are linearly independent:*

$$\begin{pmatrix} f_1 \\ f_2 \\ f_3 \end{pmatrix} = \begin{pmatrix} 0 & -(Z'+Z) & (Y'+Y) & (X'-X) \\ (Z'+Z) & 0 & -(X'+X) & (Y'-Y) \\ -(Y'+Y) & (X+X) & 0 & (Z'-Z) \end{pmatrix} \begin{pmatrix} a \\ b \\ c \\ d \end{pmatrix} = 0$$

(2.4.4)

With d set arbitrarily equal to 1 there remain three unknowns to be solved. A least squares adjustment of the observations yields two sets of co-ordinates for each point common to the adjacent models and therefore two linearly independent equations. B Schmutter (1975) has shown that for small variations in the scales of adjacent models the average of the two sets of co-ordinates for each point after transformation common to the adjacent models is an optimum solution.

The rigorous treatment of the least squares solution is to *consider the co-ordinates in both models to be observed.* Linearisation of the observation equations 2.4.4 results in the following set of equations in matrix form for point i :

$$A_i V_i + B_i \Delta + F_i = 0$$

(2.4.5)

Where:

$$A_i = \begin{pmatrix} \frac{\partial f_1}{\partial Z'} & \frac{\partial f_1}{\partial Z} & \frac{\partial f_1}{\partial Y'} & \frac{\partial f_1}{\partial Y} & \frac{\partial f_1}{\partial X'} & \frac{\partial f_1}{\partial X} \\ \frac{\partial f_2}{\partial Z'} & \frac{\partial f_2}{\partial Z} & \frac{\partial f_2}{\partial Y'} & \frac{\partial f_2}{\partial Y} & \frac{\partial f_2}{\partial X'} & \frac{\partial f_2}{\partial X} \end{pmatrix}_i$$

(2.4.6)

Therefore:

$$A_i = \begin{pmatrix} -b^{\circ} & -b^{\circ} & c^{\circ} & c^{\circ} & 1 & -1 \\ a^{\circ} & a^{\circ} & 1 & -1 & -c^{\circ} & -c^{\circ} \end{pmatrix}_i$$

(2.4.7)

where a°, b° and c° are initital approximations to the rotation matrix elements.

$$B_i = \begin{pmatrix} \frac{\partial f_1}{\partial a} & \frac{\partial f_1}{\partial b} & \frac{\partial f_1}{\partial c} \\ \frac{\partial f_1}{\partial a} & \frac{\partial f_1}{\partial b} & \frac{\partial f_1}{\partial c} \end{pmatrix}_i = \begin{pmatrix} 0 & -(Z'+Z) & (Y'+Y) \\ (Z'+Z) & 0 & -(X'+X) \end{pmatrix}_i$$

(2.4.8)

$$V_i = (dZ' \quad dZ \quad dY' \quad dY \quad dX' \quad dX)_i^T$$

(2.4.9)

$$\Delta = (da \quad db \quad dc)^T$$

(2.4.10)

$$F_i = (f_1 \quad f_2)_i^T = ((Y'+Y) \quad (-X'-X))_i^T$$

(2.4.11)

For each of the n points there will be one set of equations of type 2.4.5. Thus

$$A_1V_1 + B_1\Delta + F_1 = 0$$
$$A_2V_2 + B_2\Delta + F_2 = 0$$
$$\vdots$$
$$A_nV_n + B_n\Delta + F_n = 0$$

(2.4.12)

which may be written in general as:

$$AV + B\Delta + F = 0$$

(2.4.13)

On the assumption that there is no correlation between the co-ordinates of different points and that the total cofactor matrix is equal to I , the identity matrix, then the least squares solution to the parameters of the rotation matrix is given by:

$$\Delta = N^{-1}t$$

(2.4.14)

Where: $N = \sum_{i=1}^{n}(B^T(AA^T)^{-1}B)_i$

(2.4.15)

and $t = \sum_{i=1}^{n}(B^T(AA^T)F)_i$

(2.4.16)

The corrections to the observed co-ordinates is given by:

$$V = A^T(AA^T)^{-1}(-BA+F)$$

(2.4.17)

In the system developed here the co-ordinates of the i th model were considered to have infinite weight in the joining of models i and $i+1$ in a strip. A more detailed description of the process of the joining of two models adopted in the programming of the system is given in section 3.3.

2.5 Transformation of the Strip and Strip Adjustment

The triangulated strip co-ordinates subsequent to the formation of the strip are still in the model co-ordinate system referred to the principal point of the first model in the strip as origin. The strip co-ordinates in model space may be used as input to the block adjustment procedures if they are to be block adjusted, otherwise they must be transformed to the terrain co-ordinate system and adjusted accordingly to eliminate systematic errors and reduce random errors. Although the strip co-ordinates in the model system are block adjusted by the system developed here they are nevertheless transformed and strip adjusted using polynomial adjustments prior to block adjustment for the reasons stated. The method of strip transformation and strip adjustment used will be discussed.

2.5.1 Strip Transformation

A projective transformation is used to transform the model units (X Y Z) to the terrain unit (U V W). The projective transformation is thus:

$$X_{terrain} = \lambda R X_{model} + X_{shift} \tag{2.5.1.1}$$

where: $X_{terrain}$ is the vector of terrain co-ordinates $(U\ V\ W)^T$ for a point in the strip.

λ is the scale factor.

R is the orthogonal rotation matrix.

X_{model} is the vector of co-ordinates $(X\ Y\ Z)^T$ in model space of the corresponding point in the strip.

X_{shift} is the vector $(U_o\ V_o\ W_o)^T$ of constant terms to translate the model co-ordinate system to the same origin to which the terrain co-ordinates are referred.

Initial approximations to the unknown elements viz. the nine elements of the rotation matrix R, the scale factor λ and the three shift parameters X_{shift} are obtained from the solution to the equation set 2.5.1.1 using two points which are known in $(U\ V\ W)^T$ and $(X\ Y\ Z)^T$ and a third point known in $(0\ 0\ W)^T$ and $(0\ 0\ Z)^T$.

While in practice these initial approximations may be sufficiently accurate to transform the strip prior to strip adjustment where the data are to be ultimately block adjusted, the method of strip transformation involving a least squares iterative procedure where redundant observations are present which provides improved transformation parameters has been used.

The nine elements of the general orthogonal rotation matrix may be expressed in terms of three of the elements as follows:

$$R = \begin{pmatrix} \sqrt{1 - r_{21}^2 - r_{31}^2} & r_{23} r_{31} - r_{21} r_{33} & r_{21} r_{32} - r_{22} r_{31} \\ r_{21} & \dfrac{r_{11} r_{33} - r_{21} r_{32} r_{31}}{1 - r_{31}^2} & \dfrac{-r_{11} r_{32} - r_{21} r_{31} r_{33}}{1 - r_{31}^2} \\ r_{31} & r_{32} & \sqrt{1 - r_{31}^2 - r_{32}^2} \end{pmatrix}$$

(2.5.1.2)

After the initial approximation all subsequent rotations dR will be small with the elements r_{21}, r_{31} and r_{32} tending to dr_{21}, dr_{31} and dr_{32} respectively. The resulting rotation matrix dR will become:

$$dR = \begin{pmatrix} 1 & -dr_{21} & -dr_{31} \\ dr_{21} & 1 & -dr_{32} \\ dr_{31} & dr_{32} & 1 \end{pmatrix}$$

(2.5.1.3)

if all second and higher order terms are ignored. Similarly after the initial approximation to the transformation parameters the scale λ and the vector of shifts X_{shift}, will tend to the small quantities $d\lambda$ and dX_{shift} respectively.

Hence, after iterating the solution n times

$$X_{terrain} = \lambda_n R_n X_{model} + X_{shift}$$

(2.5.1.4)

where:

$$\lambda_n = \lambda_o + \sum_1^n d\lambda_i$$

(2.5.1.5)

$$R_n = R_o \prod_1^n dR_i$$

(2.5.1.6)

$$X_{n_{shift}} = X_{n_{shift}} + \sum_1^n dX_{i_{shift}}$$

(2.5.1.7)

2.5.2 Strip Adjustment

Polynomials for strip adjustment have been investigated by several photogrammetrists notably G Schut (1960, 1961, 1962, 1964, 1966) F Ackermann (1962/64) E Mikhail (1964) and M Keller and G C Tewinkel (1964). Although the optimum polynomial for adjusting strips has not been found several definite conclusions have been drawn concerning the various polynomials and their uses. Perhaps the most important of these conclusions are that conformal three-dimensional transformations of degree higher than the first do not exist (Schut, G H. 1964 and Mikhail, E. 1964); the accuracy of strip adjustment does not improve with high order polynomials; and composed polynomials of third order produce the most satisfactory results.

Thus most of the polynomial strip adjustments which have been used in practice have been semi-empirical. The Coast and Geodetic Survey (Keller, M. and Tewinkel, G. 1964) use the following formulae which contain terms to cater for the local tilts in the strip:

$$X_{terrain} = X_{model} - \Delta z\,(3hx^2 + 2ix + j) + ax^2 + bx^2 + cx - 2dxy - ey + f$$

$$Y_{terrain} = Y_{model} - \Delta z\,(hx^2 + lx + m) + 3ax^2y + 2bxy + cy + dx^2 + ex + g$$

$$Z_{terrain} = Z_{model} \left(1 + (3hx^2 + 2ix + j)^2 + (kx^2 + im + m)^2\right)^{1/2} + hx^3 + ix^2 + jx + kx^2y + my + n$$

(2.5.2.1)

D Arthur (1959) of the Ordnance Survey of Britain used the formulae:

$$X_{terrain} = X_{model} + a_1 + a_4 x + a_6 z - a_7 y + \tfrac{1}{2} a_8 x^2 + a_{10} xz - a_{11} xy$$

$$Y_{terrain} = Y_{model} + a_2 + a_4 y + a_5 z + a_7 x + a_8 xy + a_9 xz + \tfrac{1}{2} a_{11} x^2$$

$$Z_{terrain} = Z_{model} + a_3 + a_4 z - a_5 y - a_6 x + a_8 xy - \tfrac{1}{2} a_{10} x^2$$

(2.5.2.2)

G Schut (1964) of the NRC in Canada uses conformal polynomial transformations for the adjustments of the planimetric strip co-ordinates, which can be derived from the following complex polynomial:

$$(X_{terrain} + i\,Y_{terrain}) = \sum_{j=1}^{n} (a + ib)(X_{model} + i\,Y_{model})^{j-1}$$

(2.5.2.3)

where: $i = \sqrt{-1}$

The simplest method of polynomial strip adjustment in three dimensions is to treat the planimetric and height adjustments separately. This approach has been adopted in the system developed in this study. The following third order conformal polynomials:

$$X_{terrain} = X_{model} + ax - by + c(x^2 - y^2) - 2dxy + e(x^3 - 3y^3) - f(3x^2y - y^3)$$

$$Y_{terrain} = Y_{model} + bx + ay + d(x^2 - y^2) + 2cxy + e(3x^2y - y^3) + f(x^3 - 3xy^2)$$

and the third order polynomial:

$$Z_{terrain} = Z_{model} + a_1 x + a_2 y + a_3 xy + a_4 x^2 + a_5 x^3$$

(2.5.2.4)

are the polynomial used in the strip adjustment program to adjust the planimetric and height co-ordinates respectively.

The observation equatons 2.5.4.4 may be written in matrix notation for each point i in the strip known in both the model and the terrain as:

$$V_i + B_i \Delta + F_i = 0$$

(2.5.2.5)

where: V_i is the vector of residuals
B_i is the submatrix of coefficients of the unknowns
Δ is the vector of unknowns or the polynomial coefficients which are to be determined
and F_i is the subvector of absolute terms.

Since the planimetric and height adjustments are handled separately there will be two sets of normal equations to be solved for each strip in the block.

2.6 Analytical Block Adjustment

Two approaches to analytical block adjustment have been applied in the system developed on the WANG 2200 minicomputer. The first is that suggested by F Amer (1961) which is a numerical solution to the Jerie analogue block adjustment. This method has the advantage of being implemented on small capacity computers, but because it is an iterative adjustment it suffers from the problem of slow convergence.

The second approach follows that favoured by G Schut (1964, 1967) which uses the strip as the basic adjustment unit. This method is also suitable for small capacity computers, the storage requirements being dependent on the number of strips in the block and the degree of the correction polynomial. This method of block adjustment does not have the slow convergence problem of the iterative block adjustment procedure and produces a result only slightly less accurate than adjustments using the model as the adjustment unit. However, this adjustment method requires substantially more ground control than the previously mentioned block adjustment method.

2.6.1 Block Adjustment Using the Model as the Adjustment Unit

This simple method of block adjustment developed by F Amer (1961) for the planimetric adjustment of blocks consists of a series of linear conformal transformations of each model or section of models in the block in an iterative adjustment. A section may comprise one or more models with the basic assumption that the scale throughout the section is uniform. The iterative adjustment is required to minimize the sums of the squares of the residuals at the section tie points in the block.

The adjustment follows this simple procedure:

i) Each strip in the block is transformed to the terrain and strip adjusted to obtain preliminary block co-ordinates in terrain relatively free from systematic errors.
ii) The arithmetic means of the co-ordinates of the section tie points of each section are calculated.
iii) Each section in turn is transformed to the respective tie points co-ordinate means using a linear conformal transformation. The coefficients of the transformation equations are computed using a minimum variance determination described in 2.6.1.1.
iv) Steps (ii) and (iii) are repeated until the standard error of adjustment converges to within a satisfactory tolerance.

2.6.1.1 The Linear Conformal Transformations

Consider the tie point means of the jth section in strip i in the block to be $(\bar{X}_1\ \bar{Y}_1), (\bar{X}_2\ \bar{Y}_2), \ldots (\bar{X}_n\ \bar{Y}_n)$ and the corresponding tie points to be $(X_1\ Y_1), (X_2\ Y_2), \ldots (X_J\ Y_J)$ then the minimum variance coefficients $\hat{a}, \hat{b}, \hat{c}$ and $\hat{d}$ of the linear conformal transformation observation equations 2.6.1.1.1, of which there will be two for each section tie point,

$$V_1 = \bar{X}_1 - aX_1 - bY_1 + c$$
$$V_2 = \bar{Y}_1 - bX_1 + aY_1 + d$$

(2.6.1.1.1)

are computed from:

$$\hat{a} = \frac{\sum_1^n (X_i\bar{X}_i + Y_i\bar{Y}_i)}{\sum_1^n (X_i^2 + Y_i^2)}$$

$$\hat{b} = \frac{\sum_1^n (X_i\bar{Y}_i - Y_i\bar{X}_i)}{\sum_1^n (X_i^2 + Y_i^2)}$$

$$\hat{c} = \frac{\sum_1^n \bar{X}_i}{n}$$

$$\hat{d} = \frac{\sum_1^n \bar{Y}_i}{n}$$

(2.6.1.1.2)

where X_i and Y_i are referred to the centroid of the model under consideration.

The standard error of adjustment for a single model is computed from:

$$\sigma_0 = \left(\frac{V^TV}{2n-4}\right)^{1/2} = \left(\frac{\sum_1^n\left((\bar{X}_i - \hat{a}X_i + \hat{b}Y_i - \hat{c})^2 + (\bar{Y}_i - \hat{b}X_i - \hat{a}Y_i - \hat{d})^2\right)}{2n-4}\right)^{1/2}$$

(2.6.1.1.3)

where n is the number of tie points in the determination of the transformation coefficients.

The height is adjusted separately after each planimetric model transformation for the purpose of introducing a scale correction into the adjustment. The height adjustment procedure follows that of the planimetric adjustment using a linear transformation,

$$\bar{Z} = Z + Z_0 + aX + bY \tag{2.6.1.1.4}$$

where: $\bar{Z}$ is the transformed height of the point
Z is the height of the point in the strip
Z_0 is a shift in the Z direction
X and Y are the co-ordinates of the point
a and b are the logitudinal and lateral tilt correction parameters respectively.

The adjustment procedure involves the inversion of a three by three matrix for each section in the block in order to solve for the three unknowns viz. Z_0, a and b. The adjustment iterates as with the planimetric adjustment until the standard error of height adjustment for the block has converged to within an acceptable tolerance. The height adjustment generally shows less stability than the planimetric adjustment and therefore converges at a slower rate.

2.6.2 Block Adjustment Using the Strip as the Adjustment Unit

This method of block adjustment is particularly well suited to medium and small scale mapping projects and will produce results within the accuracy required for topographic mapping.

Subsequent to a preliminary transformtion of each strip in the block to the terrain co-ordinate system and strip adjustment of each strip, the block is adjusted using correction polynomials for each strip, taking cognizance of the tie points between strips. The tie points are treated as control points with a lower weighting than the ground control.

The *planimetric* and height adjustments are treated separately for the reason that a combined adjustment would not necessarily produce a better result yet requires a large computer memory for the solution of the normal equation system.

For each planimetric control point in the strip i there will be two planimetric adjustment observation equations of the form:

$$f_1^i = a_0^i + a_2^i X_T - a_3^i Y_T + a_4^i (X_T^2 - Y_T^2) - a_5^i (2X_T Y_T) + a_6^i (X_T^3 - 3X_T Y_T) +$$
$$+ a_7^i (Y_T^3 - 3X_T^2 Y_T) + X_S - X_T = 0$$
$$f_2^i = a_1^i + a_2^i Y_T + a_3^i X_T + 2a_4^i X_T Y_T + a_5^i (X_T^2 - Y_T^2) + a_6^i (3X_T^2 Y_T - Y_T^3) +$$
$$+ a_7^i (X_T^3 - 3X_T Y_T^2) + Y_S - Y_T = 0$$

(2.6.2.1)

and for each height control point there will be a height adjustment observation equation of the form:

$$f_3^i = b_0^i + b_1^i X_T + b_2^i Y_T + b_3^i X_T Y_T + b_4^i (X_T^i)^2 + Z_S - Z_T = 0$$

(2.6.2.2)

where: a_0^i through a_7^i are the planimetric adjustment polynomial coefficients in strip i.

b_0^i through b_4^i are the height adjustment polynomial coefficients in strip i.

X_T, Y_T and Z_T are the control point co-ordinates in the terrain.

X_S, Y_S and Z_S are the corresponding control point co-ordiantes in the strip.

Similar condition equations are applicable to the tie points between strips in both the planimetric and height adjustments. Thus for a tie point between strips i and $i+1$ the respective condition equations are:

Planimetry:

$$f_1^{\,i} = a_0^i + a_2^i X_s^i - a_3^i Y_s^i + a_4^i((X_s^i)^2 - (Y_s^i)^2) - a_5^i(2X_s^i Y_s^i) +$$
$$+ a_6^i((X_s^i)^3 - 3X_s^i Y_s^i) + a_7^i((Y_s^i)^3 - 3(X_s^i)^2(Y_s^i)) + X_s^i - X_T^i = 0$$
$$f_1^{\,i} = a_0^{i+1} + a_2^{i+1} X_s^{i+1} - a_3^{i+1} Y_s^{i+1} + a_4^{i+1}((X_s^{i+1})^2 - (V_1^{i+1})^2) - a_5^{i+1}(2X_s^{i+1} Y_s^{i+1}) +$$
$$+ a_6^{i+1}((X_s^{i+1})^3 - 3X_s^{i+1} Y_s^{i+1}) + a_7^{i+1}((Y_s^{i+1})^3 - 3(X_s^{i+1})^2(Y_s^{i+1})) + X_s^{i+1} - X_T^{i+1} = 0$$
$$f_2^{\,i} = a_1^i + a_2^i Y_s^i + a_3^i X_s^i + 2a_4^i X_s^i Y_s^i + a_5^i((X_s^i)^2 - (Y_s^i)^2) + a_6(3(X_s^i)^2(Y_s^i) +$$
$$-(Y_s^i)^3) + a_7^i((X_s^i)^3 - 3(X_s^i)(Y_s^i)^2) + Y_s^i - Y_T^i = 0$$
$$f_2^{\,i+1} = a_1^{i+1} + a_2^{i+1} Y_s^{i+1} + a_3^{i+1} X_s^{i+1} + 2a_4^{i+1} X_s^{i+1} Y_s^{i+1} + a_5^{i+1}((X_s^{i+1})^2 - (Y_s^{i+1})^2) +$$
$$+ a_6^{i+1}(3(X_s^{i+1})^2(Y_s^{i+1}) - (Y_s^{i+1})^3) + a_7^{i+1}((X_s^{i+1})^3 - 3(X_s^{i+1})(Y_s^{i+1})^2) + Y_s^{i+1} - Y_T^{i+1} = 0$$

Height:

$$f_3^{\,i} = b_0^i + b_1^i X_s^i + b_2^i Y_s^i + b_3^i X_s^i Y_s^i + b_4^i (X_s^i) + Z_s^i - Z_T^i = 0$$
$$f_3^{\,i+1} = b_0^{i+1} + b_1^{i+1} X_s^{i+1} + b_2^{i+1} Y_s^{i+1} + b_3^{i+1} X_s^{i+1} Y_s^{i+1} + b_4^{i+1} (X_s^{i+1})^2 + Z_s^{i+1} - Z_T^{i+1} = 0$$

(2.6.2.3)

where: X_s^i, Y_s^i and Z_s^i are the tie point co-ordinates in strip i
X_s^{i+1}, Y_s^{i+1} and Z_s^{i+1} are the corresponding tie points co-ordinates in strip $i+1$

From the above pairs of equations 2.6.2.3 new condition equations are derived with the added constraints that

$$X_T^i = X_T^{i+1}$$
$$Y_T^i = Y_T^{i+1}$$
and $$Z_T^i = Z_T^{i+1} \qquad (2.6.2.4)$$

Thus, the new planimetric observation equations are:

$$
\begin{aligned}
f_1^{i,i+1} = {} & a_0^i + a_2^i X_s^i - a_3^i Y_s^i + a_4^i((X_s^i)^2 - (Y_s^i)^2) - a_5^i(2 X_s^i Y_s^i) + \\
& + a_6((X_s^i)^3 - 3 X_s^i Y_s^i) + a_7^i((Y_s^i)^3 - 3(X_s^i)^2(Y_s^i)) + \\
& - a_0^{i+1} - a_2^{i+1} X_s^{i+1} + a_3^{i+1} Y_s^{i+1} - a_4^{i+1}((X_s^{i+1})^2 - (Y_s^{i+1})^2) + a_5^{i+1}(2 X_s^{i+1} Y_s^{i+1}) + \\
& - a_6^{i+1}((X_s^{i+1})^3 - 3 X_s^{i+1} Y_s^{i+1}) - a_7^{i+1}((Y_s^{i+1})^3 - 3(X_s^{i+1})^2(Y_s^{i+1})) + X_s^i - X_s^{i+1} = 0 \\
f_2^{i,i+1} = {} & a_1^i + a_2^i Y_s^i + a_3^i X_s^i + 2 a_4^i X_s^i Y_s^i + a_5^i((X_s^i)^2 - (Y_s^i)^2) + \\
& + a_6^i(3(X_s^i)^2(Y_s^i) - (Y_s^i)^3) + a_7^i((X_s^i)^3 - 3(X_s^i)(Y_s^i)^2) + \\
& - a_1^{i+1} - a_2^{i+1} Y_s^{i+1} - a_3^{i+1} X_s^{i+1} - 2 a_4^{i+1} X_s^{i+1} Y_s^{i+1} - a_5^{i+1}((X_s^{i+1})^2 - (Y_s^{i+1})^2) + \\
& - a_6^{i+1}(3(X_s^{i+1})^2(Y_s^{i+1}) - (Y_s^{i+1})^3) - a_7^{i+1}((X_s^{i+1})^3 - 3(X_s^{i+1})(Y_s^{i+1})^2) + Y_s^i - Y_s^{i+1} = 0
\end{aligned}
$$

and the new height observation equation is:

$$
\begin{aligned}
f^{i,i+1} = {} & b_0^i + b_1^i X_s^i + b_2^i Y_s^i + b_3^i X_s^i Y_s^i + b_4^i (X_s^i)^2 + \\
& - b_0^{i+1} - b_1^{i+1} X_s^{i+1} - b_2^{i+1} Y_s^{i+1} - b_3^{i+1} X_s^{i+1} Y_s^{i+1} - b_4^{i+1} (X_s^{i+1})^2 + Z_s - Z_s = 0
\end{aligned}
$$

(2.6.2.5)

The above observation equations 2.6.2.1, 2.6.2.2 and 2.6.2.5 may be expressed in matrix notation as:

$$
\begin{aligned}
V_p + B_p \Delta_p &= F_p \\
V_h + B_h \Delta_h &= F_h
\end{aligned}
$$

(2.6.2.6)

Treating the planimetric and height adjustments separately the above observation equations 2.6.2.6 result in tvo sets of normal equations of the forms:

$$(B_p^T W_p B_p) + \Delta_p + B_p^T W_p F_p = 0$$
$$(B_h^T W_h B_h) + \Delta_h + B_h^T W_h F_h = 0$$

(2.6.2.7)

where: B_p and B_h are the matrices of coefficients of the unknowns $a_j, (j=0,1...7)$ and $b_k, (k=0,.4)$ for planimetry and height respectively

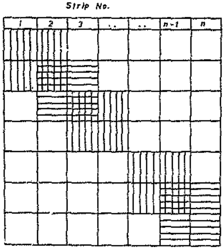
W_p and W_h are the weight coefficient matrices for planimetry and height respectively

Δ_p and Δ_h are the vectors of unknowns $a_j, (j=0,1...7)$ and $b_k, (k=0,.4)$ for planimetry and height respectively.

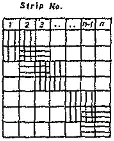
F_p and F_h are the vectors of constant terms for planimetry and height respectively.

Both the planimetric and height adjustment normal equation systems have similar structures in that the coefficient matrices are symmetric banded matrices with band widths of fifteen and nine respectively shown diagrammatically in Figure 2.6.2.1.

Figure 2.6.2.1 : Structure of the normal equation coefficient matrices for the block adjustments using strips. n is the number of strips in the block.



Planimetry : n(8)xn(8)

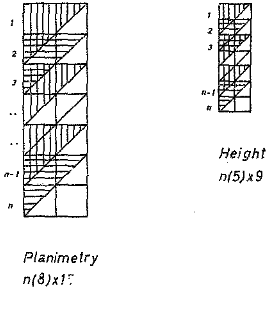


Height: n(5)xn(5)

The sparse structure of the normal equation coefficient matrices can be exploited to reduce both memory space and computation time for the solution of the normal equation system by collapsing the matrix to retain the minimum of zero terms possible and operating on the non-zero terms only. Moreover since the normal equation coefficient matrix is symmetric only the upper or lower diagonal terms need be considered. In the system developed for this dissertation, the coefficient matrices were collapsed to column matrices of the form shown diagrammatically in Figure 2.6.2.2.

The solution of the system of normal equations may be obtained by either an iterative or a direct solution. The direct method using the Cholesky decomposition of symmetric positive-definite matrices into upper triangular matrices has been used in this system.

Figure 2.6.2.2 : Structure of the Collapsed Normal Equation Coefficient Matrices for the Block Adjustment Using Strips.
n is the number of strips in the block.



The standard errors of adjustment of an observation after adjustment are given by:

$$\sigma_{o_{plan}} = \left(\frac{V_p^T W_p V_p}{(2m-8n)}\right)^{1/2}$$

$$\sigma_{o_{height}} = \left(\frac{V_p^T W_p V_p}{(m-5)}\right)^{1/2}$$

(2.6.2.8)

where: n is the number of strips in the block

m is the number of tie and control points in the block.

CHAPTER 3

THE WANG 2200 MINICOMPUTER

ANALYTICAL AERIAL TRIANGULATION SYSTEM

3 THE ANALYTICAL PHOTOGRAMMETRY SYSTEM DEVELOPED FOR THE WANG 2200 MINICOMPUTER

3.1 General Overview

An analytical photogrammetry system was developed for the WANG 2200 minicomputer system with the intention of producing a workable system and not merely a set of unconnected programs to test the applications of a minicomputer to individual phases of analytical aerial triangulation. The complete system comprises thirty-seven subprograms, the core of which consists of the main data processing programs viz. relative orientation and model formation, strip formation using the independent models, strip adjustment and two block adjustment programs. The other subprograms are the data input and output routines and other support routines necessary to the system. The entire system was developed ab initio as no software existed which could be incorporated into it either wholly or partly.

The system has three distinct phases, viz.

1) Input of the plate co-ordinates and the adjustment control data, and amendments thereto,
2) processing of the data, and
3) Output of the final adjusted co-ordinates and statistical analyses.

Being an interactive system, the various subsections of the system are accessed by the operator via menus displayed on the Cathode Ray Tube (CRT) screen. The interactive system has the advantage of allowing the operator to review the input data either on the screen or the printer and amend the data immediately if necessary. Thus the delay between data input and data processing is greatly reduced over the large delays inherent in a batch orientated remote terminal system.

3.1.1 Operation of the System

Processing of the system is initiated by a startup routine which is loaded manually into the computer's memory by the operator.

The startup routine leads to the main menu which displays the various submenus available for entering the three main phases of the system. A diagrammatic representation of the operation of the system is shown in figure 3.1.1.1.

3.1.2 Organisation of the Data Files

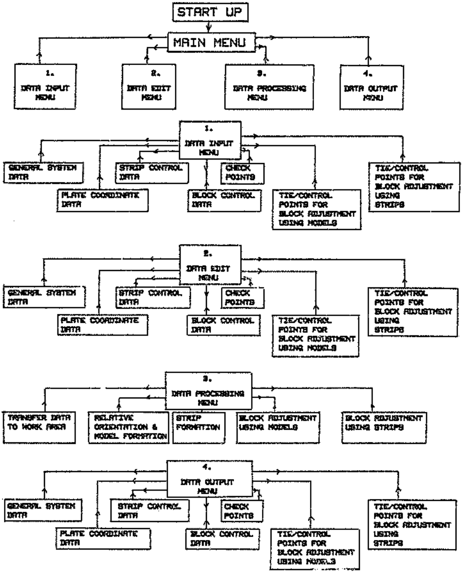
The WANG 2200 minicomputer ten Megabyte disk drive model 2260 has 19 584 directly addressable sectors each 256 bytes in length. A single platter therefore can contain 5 013 504 bytes of information. The user may specify the number of sectors to be allocated for the index and the catalogued files; anything beyond the catalogued file area may be used as a temporary work area.

Data may be accessed from the disk using either catalogued data file procedures or by the direct sector addressing method which is the faster of the two accessing methods.

Logical records on the disk may be of any length, but because each new logical record begins with a new physical record, that is, a logical record is always an integral number of physical records, it is important that the data be blocked in a manner which optimises the use of sectors. Consequently, numeric data is converted to more space economical alphanumeric variables before being written to the disk with sufficient significant figures being retained throughout for the aerial triangulation and adjustment.

The system developed for this dissertation utilizes the direct sector addressing facility of the WANG minicomputer in order to achieve greater processing speeds than would otherwise be achieved using catalogued sequential files. However, the input data are stored in catalogued files and prior to the processing phase the data are transferred from these catalogued files to the uncatalogued work areas and are subsequently accessed by direct sector addressing with the model data being the logical record unit. Each routine in the processing phase produces output to a new area of the disk. Thus no processing routine overwrites the input data which enables any routine to be restarted should an interrupt occur without having to recover from the initial temporary work area setup routine.

Figure 3.1.1.1 Flow Diagram of System Operation



3.1.3 Hardware Configuration and the Software System Capacity

The analytical aerial triangulation software system has been written to operate on the following minimum hardware configuration:

1) A 24K byte Central Processing Unit
2) A 10 Megabyte Disk Drive
3) A 132 Character Line Printer
4) A CRT Screen and Keyboard

A block containing up to two hundred models, each model containing up to twenty-nine model points each with three co-ordinates and a six digit point identifier can be processed using the current software.

3.2 Relative Orientation and Model Formation

One of the requirements of the sysem for its successful operation is that the plate co-ordinate data be entered according to a predefined sequence viz. the model number, the two perspective centre identifiers, well distributed wing points and finally all other points in the model.

A minimum number of six points are used for the relative orientation and model formation using a least squares adjustment of the data in the determination of the elements of the relative orientation. The observation equation coefficient matrix, described in section 2.3 is generated from the first n points in the model where n is determined by the routine from the number of available points in the model. Extensive use is made of the Matrix ROM (Read Only Memory) to form the set of normal equations viz. $(B^TB)\Delta = B^TF$ invert the normal equation coefficient matrix viz. $(B^TB)^{-1} = N^{-1}$ and calculate the first approximations to the five unknown parameters of the relative orientation, that is $\Delta_i = N^{-1}(B^TF)$. The formation and solution of the normal equations is achieved using the following five BASIC matrix statements:

```
10 MAT A1 = TRN(A)        - calculation of B^T
20 MAT A2 = A1*A          - calculation of B^T B=N
30 MAT A3 = INV(A2)       - inversion of N^-1
40 MAT A4 = A3*A1         - calculation of N^-1 B^T
50 MAT X = A4*F           - calculation of Δ=N^-1 B^T F
```

The matrix inversion is performed using Gaussian elimination done in place on the WANG 2200 T and Gaussion elimination with partial pivoting on the WANG 2200 VP. The results of the numerical relative orientation and model formation using either of the models of the machine showed no significant difference.

The orthogonal rotation matrix is generated in the first and subsequent iterations from the solution to the unknowns Δ_i . The residual vector V_i is determined from the relationship:

$$V_i = (x_2 \quad y_2 \quad 1)_i R_i (x_1 \quad y_1 \quad 1)_i^T$$

(3.2.1)

where: $(x_2\, y_2\, 1)_i$ and $(x_1\, y_1\, 1)_i^T$ are the rescaled co-ordinates of the right-hand and left-hand plates respectively after the i th iteration.

R_i is the orthogonal rotation matrix after the i th iteration.

A new approximation to the vector of remainder terms is obtained from the vector of residuals after the ith iteration.

The above procedure involves one inversion of the normal equation coefficient matrix N. The solution to the relative orientation elements is determined in subsequent iterations from the relationship:

$$\Delta_i = \Delta_{i-1} - N^{-1} B^T V_{i-1}$$

(3.2.2)

The solution will iterate until the following convergence criterion has been satisfied:

$$\left| \frac{\sigma_i \quad \sigma_{i-1}}{\sigma_i} \right| \leq e_n$$

(3.2.3)

where e_n is an arbitrarily defined precision threshold, a value for which is chosen a priori based on previous experience.

σ_i and σ_{i-1} are the standard errors of unit weight for iterations i and $i-1$ respectively.

Subsequent to the determination of the elements of the relative orientation the independent model co-ordinates are determined using equation 2.3.11. The results of the model formation of both the Durban and St. Faith's Test Areas given in section 4.2.1.1 and section 4.2.2.1. respectively shows that the method used yields a maximum standard error of y-parallax of less than twenty microns at the scale of the photograph for any model in the strip.

3.3 Strip Formation Using the Independent Models

The right-hand perspective centre of the first model in each strip is adopted, for the sake of convenience, as the origin of the strip co-ordinate system in model space. Each successive model in the strip is translated, scaled and rotated to its predecessor using the method of determination of the elements of the rotation matrix outlined in section 2.4 and the following procedure:

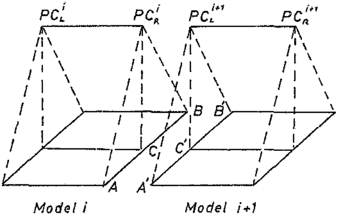
1) Model $(i+1)$ is translated in three primary orthogonal directions so that the right-hand perspective centre of model (i) and the left-hand perspective centre of model $(i+1)$ coincide.
2) Corresponding distances in each model viz. the distances between the two wing points A-B and A'-B', and distances $PC_R^i - C$ and $PC_L^{i+1} - C'$ are compared and the average scale factor $\bar{\lambda}$ is adopted. (Refer Figure 3.3.1). Thus the scale factor $\bar{\lambda}$ is given simply by.

$$\bar{\lambda} = \left(\frac{A-B}{A'-B'} + \frac{PC_R^i - C}{PC_L^{i+1} - C'} \right) \Big/ 2$$

(3.3.1)

3) The elements of the rotation matrix ar determined using a least squares adjustment based on the four points viz. PC_R^i, A, B, C in model (i) and PC_L^{i+1}, A, B, C in model ($i+1$).

Figure 3.3.1 Strip Formation - Junction of Model $i+1$ to Model i



The solution to the system of normal equations viz. $\Delta = N^{-1}B^TF$ requires the inversion of a 3 by 3 coefficient matrix.

4) Model ($i+1$) is rotated using the rotation matrix, the elements of which were determined in step (3).
5) Average transalation parameters are calculated from the four corresponding points used in the adjustment procedure and model ($i+1$) is again translated by these small amounts in order to achieve a mean fit at common points.

Although not entirely rigorous in the determination of all the transformation parameters, the results obtained, using the above procedure for strip formation, show that the method is acceptable. The results of the strip formation of the Durban and St. Faith's Test Areas and the ITC synthetic block data are given in section 4.2.1.2, section 4.2.2.2 and section 4.2.4.1 respectively.

3.4 Transformation of the Strip and Strip Adjustment

The co-ordinates obtained from the strip formation procedure are in model units and unrelated to any terrain co-ordinate system. The strip is transformed to the terrain co-ordinate system by means of a three dimensional linear conformal transformation using a minimum of four control points in X, Y and Z in each step for the least squares determination of the transformation parameters. The control points must have a suitable distribution within the strips in order to avoid the problem of solving an ill-conditioned normal equation system. The three dimensional linear conformal transformation from the model to the terrain system is given as follows:

$$X_{terrain} = \lambda R X_{model} + X_{shift} \tag{3.4.1}$$

where: $X_{terrain}$ is the co-ordinate vector $(x\ y\ z)^T$ of the point in terrain units after transformation,
λ is the scale factor from the model to the terrain units,
X_{model} is the co-ordinate vector $(x\ y\ z)^T$ of the point homologue in the model system.
X_{shift} is the vector of constant terms in terrain units.

Three points known in the terrain in planimetry and height are used to obtain initial approximations to the transformation parameters. Thereafter, the least squares solution is obtained from four points known in planimetry and height. It was found that one iteration of the least squares solution was sufficient to obtain transformation parameters which produced terrain co-ordinates with adequate accuracy for strip adjustment.

The strip adjustment follows immediately after the transformation of each strip to the terrain co-ordinate system. In order to reduce the effects of machine round-off, particularly in this case where the elements of the co-efficient matrix are large, the strip adjustment is performed on rescaled and translated terrain co-ordinates. The approximate centre of the strip is adopted as the origin of the co-ordinate system for the purpose of strip adjustment.

All available control points in the strip are used in the least squares determination of the strip adjustment polynomial coefficients. The current system allows for up to twelve control points in X, Y and Z. Subsequent to the determination of the polynomial coefficients all the points in the strip are corrected using the correction polynomial. The strip adjustment provides a good approximation to the block co-ordinates free from large systematic errors, which are still to be block adjusted and as such reduces the number of iterations required for convergence by the iterative block adjustment procedure. The results obtained from the strip adjustment procedure on the WANG 2200 compared favourably with those obtained by H Williams (1974) and T van Dijk (1975) using the same data on a large computer. The comparison of results is given in section 4.2.1.3 and section 4.2.2.3.

3.5 The Block Adjustment Programs

3.5.1 Block Adjustment Using Strips as the Adjustment Unit

One of the main objectives of this dissertation was to develop a complete analytical photogrammetry system on a minicomputer which would have practical applications and block adjustment is necessarily the most important aspect of this and any other analytical photogrammetric system. Although block adjustments such as ANBLOCK (van den Hout, C M. 1966) or the fully rigorous block adjustment by means of bundles of rays (Schmid, H. 1959) are desirable for the high accuracy that can be achieved they are more readily implemented on large computers because of their large memory requirements. An alternative block adjustment using the strip as the adjustment unit with adjustment polynomials is extremely well suited to minicomputer application, despite the fact that it yields a less accurate result. The suitability of this block adjustment method is owing to two important factors viz. the speed of computation and the low memory requirements even for the adjustment of large blocks.

The block adjustment program consists of five subprograms each of which automatically chains into memory the subsequent subprogram. It was necessary to divide the adjustment into four separate units in order to achieve an adjustment procedure requiring the minimum practical amount of computer memory. As a result, it is possible to adjust a block of data comprising ten strips with less then 24K bytes of memory. Auxiliary storage is used during the phases of the formation of the observation equations and the formation of the normal equations, but this is kept to a minimum by utilizing the maximum amount of available computer memory. The primary function of the disk storage in this adjustment procedure is to pass common data from one subprogram to the next.

The following functions are performed by the different modules:

1) Module 1 : Locates the tie points and control point homologues in the unadjusted block and generates a table containing the block tie point control data.
2) Module 2 : Forms the semi-collapsed observation equations and applies weighting factors to the observation equations; tie and control points are weighted 0,5 and 1,0 respectively.
3) Module 3 : Forms the collapsed set of normal equations from the observation equations and stores the collapsed matrix in a work area.
4) Module 4 : Using a Cholesky (or square root) method of solution this module solves the normal equation set; the polynomial coefficients are passed via common memory to the next module.
5) Module 5 : The entire block is adjusted using the adjustment polynomials with the coefficients which have been determined using the above routines.

Should it be necessary, it is possible to iterate the adjustment using the adjusted block data of the current iteration in the formation of the new observation and normal equations. It was found for blocks with short strips, as were used in testing the system, that the solution converged rapidly and that only one iteration was perhaps necessary for each block of data that was adjusted.

3.5.2 Block Adjustment Using the Model as the Adjustment Unit

An alternative block adjustment procedure to that described above has been provided in the system for those applications which require higher accuracy block adjustments. This adjustment, being iterative, suffers from the problem of slow convergence but does produce results which have accuracies comparable with both the ANBLOCK and rigorous block adjustment procedures (Van Dijk, T J. 1975).

As a general rule of thumb, the number of iterations required for convergence is equal to the number of models in the block. The exact criterion for convergence is somewhat subjective and for this reason the required number of iterations is entered as data in the program developed for this dissertation. The advantage of this approach is to avoid the situation where the result may never converge and in some cases may even diverge. The adjustment program has been written in a manner which enables the operator to periodically review the status of the adjustment and either to accept the results or to continue processing until satisfactory convergence has been achieved. In addition, the program automatically details the residuals at tie and control points after equal iteration intervals during the adjustment procedure.

The adjustment program is a single program which chains into memory the output procedure for printing residuals at tie and control points when required.

The progam has been designed to reduce search and computing time using the following procedure:

1) The block of data is scanned and tables are generated which contain the absolute sector addresses and the element position within the model of control points and tie points common to adjacent models.
2) The location tables are referred to in each iteration to locate the common tie and control points from which the tie point means are calculated and stored as a block of data in the work area on the disk.
3) The transformation parameters are calculated for each model from the control and tie points of each model and the respective tie point means.

4) The tie and control points of each section are transformed using the linear conformal equations whose coefficients were determined in step (3).
5) Up until the last iteration only the tie and control points in each section are transformed to the model tie point means and the control points. After the last iteration the final transformed control points and tie points of each model are referred to the original control points and tie points and a new set of coefficients for the transformation equations is determined for each model in the block.
6) All points in each model, including the original tie and control points are transformed using these new equations.

The above procedure whereby the tie and control points are extracted and the model is treated as though it contained only these points for the purpose of the adjustment is approximately thirty percent faster than a similar adjustment procedure which transforms the entire model after each iteration. The technique described above did not result in any appreciable reduction in the accuracy of the final adjusted block.

CHAPTER 4

DESCRIPTION AND RESULTS OF SYSTEM TESTS

4 DESCRIPTION AND RESULTS OF SYSTEM TESTS

4.1 General

The suite of programs developed for analytical aerial triangulation on the WANG 2200 minicomputer were tested extensively using two test areas and one block of synthetic data. The two test areas used were the Durban and St Faith's test areas and the block of synthetic strips was the ITC block published by the International Training Centre for Aerial Survey (ITC), Delft in the Netherlands (Jerie, H G. 1964).

The Durban and St Faith's test areas were measured by H S Williams of the University of the Witwatersrand and T J M van Dijk, who used the same data as a basis for testing the accuracy of points measured with a Trilateration Microscope (Williams, H S. 1974) and the accuracy of aerial triangulation using points of natural detail (van Dijk, T J M. 1975). The ITC synthetic block was used in the tests primarily because it was the only data available on which to test the specified capacity of the software system of two hundred models. The results obtained from these tests are compared where possible with the results obtained by H F Soehngen (1967) and H F Soehngen, C C Tung and J W Leonard (1967) who processed the ITC test block on strip and block adjustment programs developed at the University of Illinois.

Unless otherwise stated all results tabulated in this section are in microns at the scale of the photograph.

4.1.1 The Durban Test Area

The Durban Test Area, located near Durban, covers an area of approximately 7,5km by 5km at an altitude varying from about sea level to 170m above sea level. At a scale of approximately 1:8 000 the test area photography consists of four strips of thirteen or fourteen photographs each. Only forty-one models of the test area were used in testing the system.

The test area contains eighty pre-marked points located in pairs, each determined in planimetric position by triangulation from the existing trigonometric control in the region of the Durban test area and in height by spirit levelling from the Durban Corporation benchmark system. Unfortunately, there is no available information regarding the accuracy of the positions of the eighty pre-marked points. However, this does not affect the tests processed on the WANG 2200 since the objective in processing the data of the test area was to compare the results with those obtained by others processing the same data on *different software and hardware systems.*

The Durban test area was photographed at a scale of 1:8 000 using a Wild RC8 camera fitted with a 151,86mm focal length Wild Aviogon lens No 150Ag.R11. The photographic plates were measured by H S Williams and T J van Dijk using the Trilateration Microscope developed by H S Williams (1974). The trilaterated points were processed by a least squares adjustment routine on the University of the Witwatersrand IBM 360 computer to obtain image co-ordinates in a rectangular co-ordinate system with the local origin at the principal point of each photograph. The X and Y co-ordinates were positioned to within an accuracy of under three microns.

Two control configurations were used in the two different block adjustments viz. the iterative adjustment using the model as the adjustment unit and the polynomial block adjustment using the strip as the adjustment unit. The distribution of the control in each case is shown in Figure 4.1.1.1 and Figure 4.1.1.2.

In the first case the control configuration is essentially the same as that used by T van Dijk when processing the same data with several block adjustment procedures. The second control configuration is that used by the strip adjustment program for the same data.

With reference to Figure 4.1.1.1 it can be seen that the planimetric control is generally peripheral with a base length of approximately five models. Two additional control points situated within the block were used primarily to control the height adjustment of the block. The total number of control points used was thirteen.

With reference to Figure 4.1.1.2, several more control points were used than in the previous case. A total of twenty-four control points in both planimetry and height were used in the strip and

DURBAN TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT

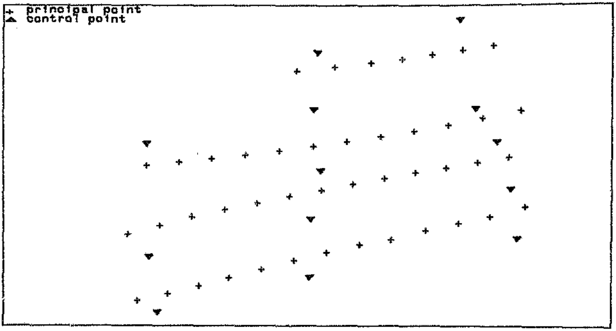


FIGURE 4.1.1.1

DURBAN TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

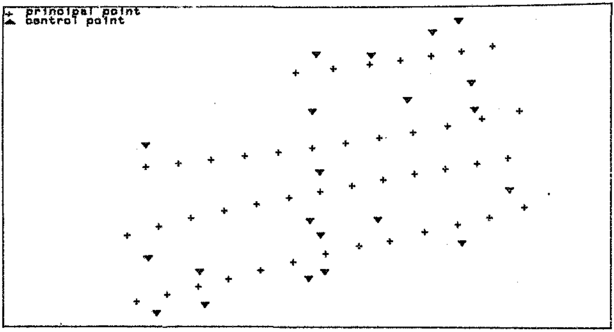


FIGURE 4.1.1.2

block adjustments. In both adjustment procedures, all other known points were used as check points subsequent to the respective block adjustment procedure.

4.1.2 The St. Faith's Test Area

The St. Faith's test area, located in Rhodesia, was originally established for tests involving the application of digital photogrammetry to cadastral surveys in rural area. The test area covers an area of approximately 4,8km by 6,4km with an average altitude of approximately 1 430m above sea level.

This test area comprises two strips of seven photographs each, flown at a scale of 1:15 000. The photography was taken using a Hilger and Watts FX105 camera fitted with a Wild Aviogon wide-angled lens with a fixed focal length of 152,23mm. The aperture setting was 5,6 and the film used was Ilford high resolution film.

A total of one hundred and seventy-three pre-marked points are fixed in planimetry but few of these points are fixed in height and other points for which the heights were determined provide only sufficient information for the levelling of the strips of photographs. Owing to identification problems, several of the height data are probably inaccurate and therefore are of little value. These inaccuracies preclude quoting the results of height adjustments of this block with any confidence.

The pre-marked planimetric ground control was fixed to an accuracy of 1:15 000 and six of the perimeter control were heighted by vertical angle measurements from the secondary triangulation stations (van Dijk, T J. 1965).

As with the Durban Test Area data the St. Faith's Test Area data were obtained from H S Williams and T J van Dijk who measured the photographic plates and used the same data in their experiments. Two different control configurations were used in the two block adjustment procedures developed on the WANG 2200. The control configurations in each case are shown in Figure 4.1.2.1 and Figure 4.1.2.2. In the former case five control points in planimetry only and six control points in planimetry and height were used while in the latter case, ten control points in both height and planimetry

ST. FAITH'S TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT

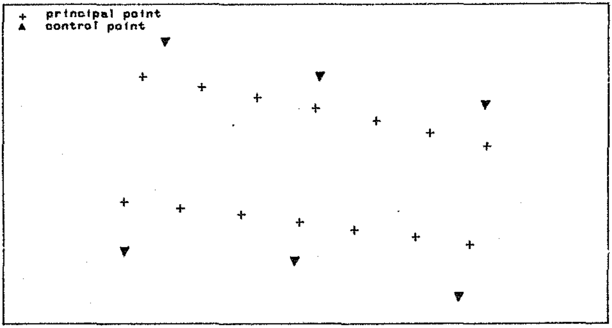


FIGURE 4.1.2.1

ST. FAITH'S TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

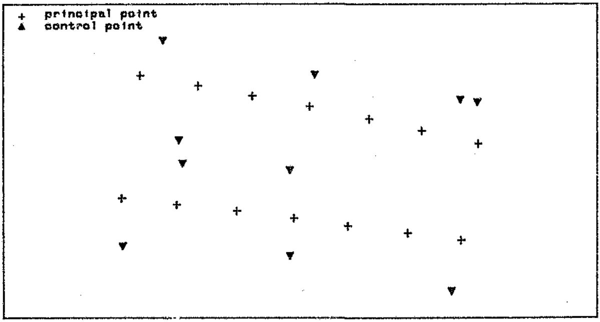


FIGURE 4.1.2.2

were used. All other known points were therefore used as check data with the result that the statistics of the check point data are known with substantially more degrees of freedom than in the tests involving the Durban Test Area.

4.1.3 The ITC Block of Synthetic Strips

The ITC block of synthetic strips consists of a block of data of thirty strips of sixty models each. The data used in this dissertation were part of the ten strips of thirty models each published by ITC in the Netherlands (Jerie, H G. 1964). The data used here consisted of a block of ten strips of twenty models each. In each strip the first twenty models were used. Although only two hundred models were processed in the tests undertaken here this is not the absolute maximum capacity of the system which is estimated to be nearer three hundred models.

The fictitious data were originally generated to provide a block of data to be used in the development of analytical aerial triangulation procedures and a common data base against which various users may compare their adjustment methods. The main advantage of such a block of data is that the absolute value of each co-ordinate is known thus facilitating the separation the errors owing to the adjustment program, the geometry of the figure and the data. Such blocks of data must have inherent weaknesses in modelling the true situation and are therefore of limited value in assessing the absolute accuracy of an adjustment procedure. This factor does not affect the tests undertaken here since the objective is not to determine the absolute accuracy of digital photogrammetry. The data has been of vital importance in testing the capacity and speed of the software developed on the WANG 2200 minicomputer system.

The ITC block of data has a major disadvantage in that relief was not introduced into the original models. The regular format of the data has been noted as another disadvantage (Jerie, H G. 1964) but the writer feels that this need not be so provided no simplifications are made in the software system to accommodate the regular pattern of principal points,tie points and minor control points.

The synthetic data were generated taking into account the following general assumptions:

i)	Principal distance	152,00mm
ii)	Plate format	230mm by 230mm
iii)	Flying height above mean sea level	7 609m
iv)	Flying height above ground	6 609m
v)	Scale of photography	1 in 43 500
vi)	Longitudinal overlap	60%
vii)	Lateral overlap	20%
viii)	Photo base	92mm
ix)	Air base	4 000m

Each model consists of eighteen points; each point has been subjected to random perturbations to introduce the influence owing to:

i) Earth curvature
ii) Refraction
iii) Lens distortion
iv) Unflatness of the negatives
v) Film shrinkage
vi) Errors of stereoscopic point transfer
vii) Observational errors.

The published data consists of models which have been formed from the original plate co-ordinates processed on the Stantec Zebra computer.

In the data used to test the programs developed for this dissertation, the scale transfer points located at the nadir points were translated to assumed perspective centres. This provided data compatible with the programs developed for strip formation and block adjustment. In addition, the effects of block adjustment routines on the hypothetical perspective centres could be analysed having provided better control of the longitudinal tilts of the models in the strip.

The control configuration for the iterative block adjustment using the model as the adjustment unit consisted of thirty-two control points in both planimetry and height selected in a semi-regular arrangement. This control configuration is shown in Figure 4.1.3.1. The block adjustment using the strip as the adjustment unit had a control configuration consisting of sixty planimetric and height control points again selected in a semi-regular arrangement as shown in Figure 4.1.3.2. In both cases all other known points in the block were used as check points. The semi-regular control configuration was selected as a matter of convenience for subsequent comparisons with other test and is in no way a limitation of the system.

In 1967 the ITC synthetic test block was applied in extensive tests to several adjustment procedures at the University of Illinois, Urbana, Illinois (Soenhgen, H F 1967 and Soehngen, H F, Tung, C C, Leonard, J W. 1967) the published results of which have been used as a comparison with the results of the tests undertaken in this study.

4.2.1 Results of the Durban Test Area

4.2.1.1 Relative Orientation and Model Formation

The data from the forty-one models of the Durban Test Area were the mono-measured plate co-ordinates measured by T J M van Dijk. Table 4.2.1.1.1 compares the results of model formation obtained by T van Dijk using the University of Witwatersrand IBM 360 computer and by the writer using the WANG 2200 minicomputer. In both cases the plate co-ordinate data were not subjected to image co-ordinate refinements. It must be noted that T van Dijk used consistently six points* in the relative orientation of each model, whereas the WANG 2200 realtive orientation used a variable number of points ranging from six to twelve points.

---

* Model 81/80 is an exception with seven points used in the relative orientation.

I.T.C. BLOCK

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT

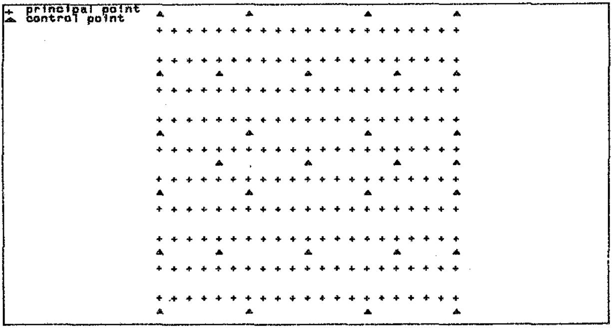


FIGURE 4.1.3.1

I.T.C. BLOCK

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

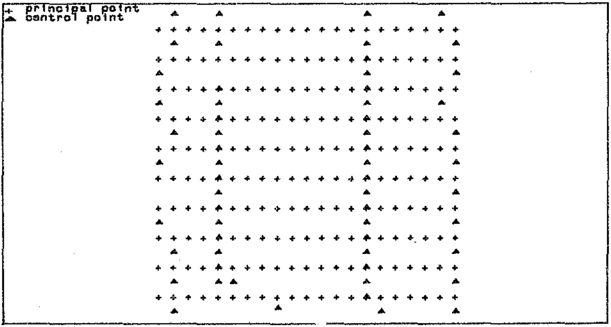


FIGURE 4.1.3.2

Table 4.2.1.1.1 Durban Test Area. Comparison of Results of Relative Orientation and Model Formation Using the Same Plate Co-ordinates on Two Different Systems.

STRIP NO	MODEL NO	δ_{y_p} A	δ_{y_p} B	V_{y_p} (MAX) B
1	12/11	5,7	15,0	32,0
	11/10	3,1	18,0	24,0
	10/9	2,4	16,0	28,0
	9/8	0,4	15,0	26,0
	8/7	3,3	10,0	23,0
	7/6	3,7	18,0	35,0
Means		3,1	15,3	28,0
2	90/89	3,7	6,0	17,0
	89/88	9,5	11,0	22,0
	88/87	5,2	21,0	37,0
	87/86	2,4	18,0	39,0
	86/85	11,9	12,0	27,0
	85/84	5,7	7,0	13,0
	84/83	6,0	5,0	10,0
	83/82	12,1	11,0	27,0
	82/81	5,4	14,0	27,0
	81/80	5,7	8,0	20,0
	80/79	5,6	12,0	29,0
Means		6,7	11,4	24,4
3	63/64	0,4	17,0	36,0
	64/65	3,2	14,0	24,0
	65/66	4,8	11,0	29,0
	66/67	3,9	6,0	12,0
	67/68	3,0	10,0	19,0
	68/69	4,7	9,0	21,0
	69/70	1,0	16,0	34,0
	70/71	6,0	12,0	16,0
	71/72	4,7	12,0	20,0
	72/73	6,9	10,0	13,0
	73/74	4,3	9,0	13,0
	74/75	4,5	9,0	21,0
Means		4,0	11,3	21,5
4	36/37	3,1	13,0	20,0
	37/38	3,4	10,0	21,0
	38/39	3,5	12,0	22,0
	39/40	4,0	11,0	22,0
	40/41	0,8	11,0	17,0
	41/42	3,1	6,0	13,0
	42/43	4,9	8,0	10,0
	43/44	1,0	10,0	17,0
	44/45	2,0	13,0	24,0
	45/46	1,5	10,0	18,0
	46/47	1,2	7,0	11,0
	47/48	5,7	11,0	18,0
Means		2,9	10,2	17,8
Means for the Block		4,2	12,1	22,9

A - Results of relative orientation and model formation obtained by T van Dijk.

B - Results of relative orientation and model formation obtained on the WANG 2200.

σ_{y_p} - Standard deviation in y-parallax after model formation.

$V_{y_p}(max)$ - Maximum residual in y-parallax after model formation.

In the relative orientation performed by T van Dijk only points of natural detail were used for the determination of the elements of the relative orientation, whereas the writer has used combinations of points of natural detail and pre-marked points. The results obtained by the latter are consistent with those obtained by H S Williams (1974)* who used pre-marked and PUG-marked points. Table 4.2.1.1.2 compares the means of the standard deviations of y-parallax for the entire block obtained by H S Williams, T van Dijk and the writer.

Although the standard error of y-parallax for the relative orientation and model formation processed on the Wang 2200 appear to be considerably poorer than those obtained by T van Dijk using the IBM 360 computer, the results for the block adjustment using the iterative adjustment of models do not show any deterioration in accuracy as a result of using these models. The results are shown and compared in Table 4.2.1.1.2.

Table 4.2.1.1.2 Durban Test Area. Means of Standard Deviations of y-Parallax for all the Models in the Block Obtained from Three Different Experiments.

Experiment	σ_{y_p}	$V_{y_p}(max)$
H S Williams	8,9	9,0
T van Dijk	3,3	6,4
WANG 2200	12,1	22,9

*The data quoted were processed by both H S Williams and T J van Dijk on the University of the Witwatersrand IBM 360 using the relative and absolute orientation program code-named REABO.

σ_{y_p} - Standard deviation of y-parallax for the relative orientation over the whole block

$V_{y_p}(max)$ - Average maximum y-parallax residual over the whole block.

4.2.1.2 Strip Formation

Neither H S Williams nor T J van Dijk have published results from their strip formation programs, but for the sake of completeness, the results of the strip formation using the WANG 2200 are given in Table 4.2.1.2.1 without comparison with other experiments.

Table 4.2.1.2.1 Durban Test Area. Standard Deviations of Strip Formation.

STRIP # 1		STRIP # 2		STRIP # 3		STRIP # 4	
MODEL	$\sigma_{x/y/z}$	MODEL	$\sigma_{x/y/z}$	MODEL	$\sigma_{x/y/z}$	MODEL	$\sigma_{x/y/z}$
12/11-11/10	13,0	90/89-89/88	25,0	63/64-64/65	33,0	36/37-37/38	28,0
11/10-10/09	18,0	89/88-88/87	17,0	64/65-65/66	26,0	37/38-38/39	16,0
10/09-09/08	23,0	88/87-87/86	10,0	65/66-66/67	19,0	38/39-39/40	37,0
09/08-08/07	17,0	87/86-86/85	22,0	66/67-67/68	14,0	39/40-40/41	16,0
08/07-07/06	25,0	86/85-85/84	26,0	67/68-68/69	11,0	40/41-41/42	10,0
		85/84-84/83	20,0	68/69-69/70	24,0	41/42-42/43	10,0
		84/83-83/82	11,0	69/70-70/71	14,0	42/43-43/44	9,0
		83/82-82/81	15,0	70/71-71/72	19,0	43/44-44/45	29,0
		82/81-81/80	27,0	71/72-72/73	31,0	44/45-45/46	13,0
		81/80-80/79	14,0	72/73-73/74	12,0	45/46-46/47	15,0
				73/74-74/75	22,0	46/47-47/48	21,0
Means	19,2		18,7		20,5		18,6

$\sigma_{x/y/z}$ - Standard deviation of junction of adjacent models in X, Y or Z.

4.2.1.3 Transformation of the Strip and Strip Adjustment

Subsequent to the formation of the strips each strip in the block was transformed to the terrain co-ordinate system using a three dimensional linear conformal transformation. The individual strips were adjusted using third order conformal polynomials for the planimetric adjustment and a separate third order polynomial for the height adjustment.

The control configuration for each strip is shown in Figure 4.2.1.3.1. The results of the adjustments compared with those obtained by T J van Dijk are shown in Table 4.2.1.3.1. Only strip two had sufficient check points from which to obtain a meaningful estimate of the accuracy at check points after the strip adjustment.

Table 4.2.1.3.1 Durban Test Area. Comparison of Results of the Strip Adjustment Processed on the IBM 360 and the WANG 2200 Minicomputer.

STRIP NO	T VAN DIJK							
	CONTROL				CHECK			
	σ_x	σ_y	σ_z	σ_p	σ_x	σ_y	σ_z	σ_p
1	12,4	13,3	17,4	18,2	-	-	-	-
2	13,1	12,8	19,2	18,3	14,2	16,1	20,1	21,5
3	10,5	15,4	21,7	18,6	11,8	15,3	22,4	19,3
4	11,8	13,2	20,3	17,7	12,1	12,9	21,8	17,7

STRIP NO	WANG 2200							
	CONTROL				CHECK			
	σ_x	σ_y	σ_z	σ_p	σ_x	σ_y	σ_z	σ_p
1	5,3	10,9	7,5	12,1	-	-	-	-
2	5,3	4,1	20,6	6,6	6,1	7,1	28,6	9,4
3	6,5	10,0	16,3	11,9	-	-	-	-
4	10,1	6,3	12,9	12,0	-	-	-	-

$\sigma_x\ \sigma_y\ \sigma_z$ - Standard deviations in X, Y and Z respectively

σ_p - Standard deviation in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).

4.2.1.4 Block Adjustment Using the Strip as the Adjustment Unit

The strip adjusted co-ordinates of the Durban Test Area were block adjusted using a procedure developed by G Schut (1961). The adjustment was iterated and the results showed absolute convergence after one iteration. This can be seen from Table 4.2.1.4.1.

DURBAN TEST AREA

CONTROL CONFIGURATION

STRIP ADJUSTMENT

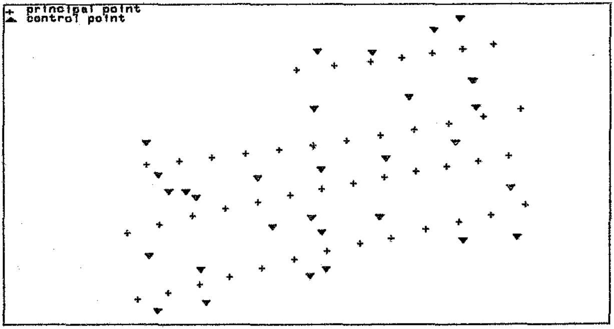


FIGURE 4.2.1.3.1

Table 4.2.1.4.1 Durban Test Area. Results of the Block Adjustment Using Strips.

ITERATION NO	σ PLAN			σ HEIGHT		
	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
1	13,5	20,9	16,6	7,0	35,1	21,6
2	13,5	20,9	16,6	7,0	35,1	21,6

σ_{plan} - Standard deviation in planimetry.

σ_{height} - Standard deviation in height.

The accuracy of the results obtained using this non-rigorous block adjustment procedure compare well with the results obtained from adjusting the same data with the more rigorous procedure using the model as the adjustment unit. This can be explained by two factors. viz:

1) The strips in this particular block are short, and
2) The number of control points used in the former adjustment is substantially more than used in the latter adjustment.

The residual vectors in planimetry and height after adjustment using the strip as the adjustment unit are shown in Figure 4.2.1.4.1 and Figure 4.2.1.4.2 respectively.

A complete comparison of various methods of block adjustment using the Durban Test Area data and processed by T J van Dijk and the writer is given in Table 4.2.3.2.

4.2.1.5. Block Adjustment Using the Model as the Adjustment Unit.

The strip adjusted co-ordinates of the Durban Test Area were processed using a second block adjustment procedure viz. the iterative block adjustment developed by F Amer (1962). The adjustment was iterated one hundred and twenty times but from the results shown in Table 4.2.1.5.1 it appears that convergence took place after the fiftieth iteration.

DURBAN TEST AREA

RESIDUAL VECTORS IN PLANIMETRY

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

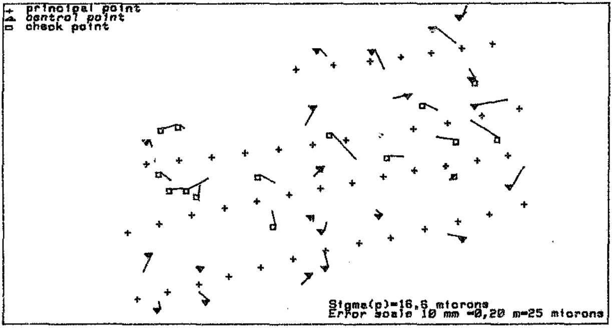


FIGURE 4.2.1.4.1

DURBAN TEST AREA

RESIDUAL VECTORS IN HEIGHT

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

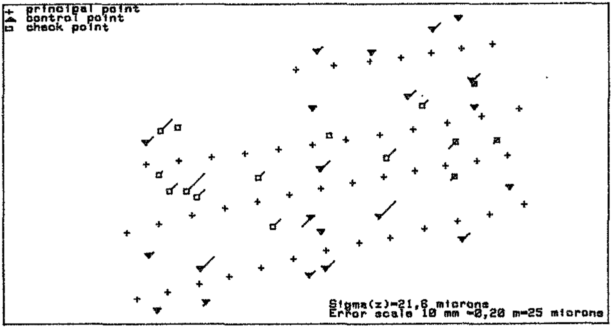


FIGURE 4.2.1.4.2

Table 4.2.1.5.1 Durban Test Area. Bock Adjustment Results After Every Ten Iterations.

ITERATION NO	σ PLAN			σ HEIGHT		
	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
10	10,5	9,0	13,8	9,0	6,0	18,9
20	10,1	8,8	14,9	7,1	5,5	18,5
30	10,1	8,7	15,6	6,5	5,3	18,4
40	10,1	8,7	15,9	6,1	5,1	18,3
50	9,9	8,7	16,3	6,0	5,0	18,3
60	9,9	8,7	16,4	5,9	5,0	18,4
70	9,9	8,7	16,6	5,8	5,0	18,5
80	9,9	8,7	16,6	5,6	4,9	18,6
90	9,9	8,7	16,8	5,6	4,9	18,8
100	9,9	8,7	16,8	5,6	4,9	19,0
110	9,9	8,7	16,8	5,5	4,9	19,1
120	9,9	8,7	16,8	5,5	4,9	19,4

σ_{plan} - Standard deviation in planimetry.

σ_{height} - Standard deviation in height.

The results after ten iterations are compared with those obtained by T J van Dijk in Table 4.2.1.5.2. The residual vectors at control and check points after the tenth iteration for the planimetric and height adjustments are shown in Figure 4.2.1.5.1 and Figure 4.2.1.5.2 respectively.

Table 4.2.1.5.2 Durban Test Area. Comparison of Results from the Block Adjustment Using the Model as the Adjustment Unit After Ten Iterations.

TYPE	σ PLAN			σ HEIGHT		
	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
T van Dijk	10,1	8,3	14,4	4,0	8,3	25,1
WANG 2200	10,5	9,0	13,8	9,0	6,0	18,9

σ_{plan} - Standard deviation in planimetry.

σ_{height} - Standard deviation in height.

DURBAN TEST AREA

RESIDUAL VECTORS IN PLANIMETRY

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT
10 Iterations

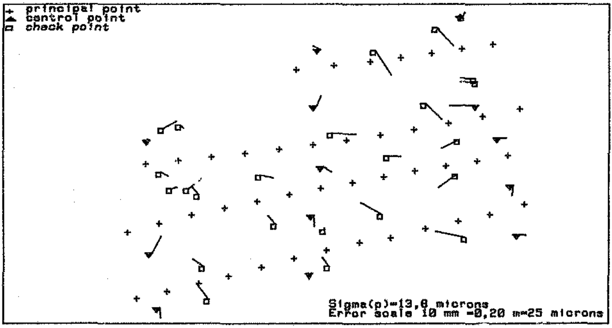


FIGURE 4.2.1.5.1

DURBAN TEST AREA

RESIDUAL VECTORS IN HEIGHT

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT
10 Iterations

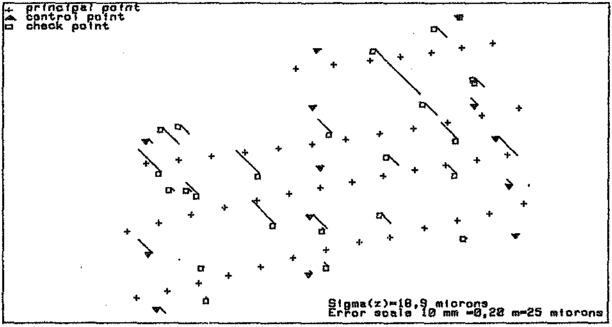


FIGURE 4.2.1.5.2

4.2.2 Results of the St. Faith's Test Area

4.2.2.1 Relative Orientation and Model Formation

The St. Faith's Test Area data were made available from the tests undertaken by H S Williams (1974) and T J van Dijk (1975) who also measured the photographic plates. As with the tests involving the Durban Test Area, the data was processed by the aforementioned on the University of the Witwatersrand IBM 360 computer. Although this set of data is much smaller than that of the *Durban Test Area*, the results from processing it on the WANG 2200 minicomputer provides an indication of the consistency and generality of the software developed on this hardware.

The results of the relative orientation and model formation on the WANG 2200 are compared with those obtained by T van Dijk in Table 4.2.2.1.1.

Table 4.2.2.1.1. St Faith's Test Area. Comparison of Results of Relative Orientation and Model Formation Using the Same Plate Co-ordinates on Two Different Systems.

STRIP NO	MODEL NO	σ_{y_p} A	σ_{y_p} B	V_{y_p} (MAX) B
1	61/62	4,6	13,0	22,0
	62/63	5,1	9,0	20,0
	63/64	3,6	8,0	15,0
	64/65	6,5	10,0	23,0
	65/66	7,6	11,0	21,0
	66/67	6,5	18,0	39,0
Means		5,7	11,5	23,3
2	70/71	6,6	9,0	17,0
	71/72	4,2	5,0	10,0
	72/73	5,0	8,0	16,0
	73/74	4,8	8,0	18,0
	74/75	6,1	11,0	30,0
	75/76	5,6	10,0	17,0
Means		5,4	8,5	18,0
Means for the block		5,6	10,0	20,7

A - Results of the model formation obtained by T van Dijk.

B - Results of the model formation obtained on the WANG 2200.

σ_{y_p} - Standard deviation in y-parallax after model formation.

$V_{y_p}(max)$ - Maximum residual in y-parallax after model formation.

The standard deviations of y-parallax after relative orientation and model formation on the WANG 2200 are significantly poorer than those obtained by T van Dijk. This is contributed to the fact that, as with the Durban Test Area, T van Dijk used points of natural detail only in the relative orientation, whereas a combination of pre-marked points and points of natural detail were used in the test on the WANG 2200; the convergence precision threshold used in the WANG 2200 system was set so that relatively fewer iterations were required for an adequate convergence. The results obtained here are consistent with those obtained previously, using the Durban Test Area (refer Table 4.2.1.1.1). Table 4.2.2.1.2 compares the means of the standard deviations for the entire block obtained by H S Williams (1974), T van Dijk (1975) and the writer using the WANG 2200.

Table 4.2.2.1.2 St Faith's Test Area. Means of Standard Deviations of y-Parallax for all the models in the Block Obtained from Three Different Experiments.

Experiment	σ_{y_p}	$V_{y_p}(max)$
H S Williams	5,8	11,2
T van Dijk	5,5	12,2
WANG 2200	10,0	20,7

σ_{y_p} - Standard deviation of y-parallax for the relative orientation over the whole block

$V_{y_p}(max)$ - Average maximum y-parallax residual over the whole block.

4.2.2.2 Strip Formation

The standard deviations of the residuals at points common to adjacent models in the strip after strip formation are shown in Table 4.2.2.2.1.

Table 4.2.2.2.1 St Faith's Test Area. Standard Deviations of Strip Formation.

STRIP # 1		STRIP # 2	
MODEL	$\sigma_{x/y/z}$	MODEL	$\sigma_{x/y/z}$
61/62-62/63	28,0	70/71-71/72	16,0
62/63-63/64	9,0	71/72-72/73	13,0
63/64-64/65	16,0	72/73-73/74	15,0
64/65-65/66	18,0	73/74-74/75	18,0
65/66-66/67	26,0	74/75-75/76	25,0
Means	19,4		17,4

$\sigma_{x/y/z}$ - Standard deviation of residuals in X, Y or Z.

The mean of the standard deviations obtained in this test is compared with the mean of the standard deviations obtained from the strip formation of the Durban Test Area in Table 4.2.2.2.2. It can be seen from this table that the strip formation produces results of consistent accuracy and sufficiently accurate to be used for strip and block adjustment.

Table 4.2.2.2.2 Comparison of Mean Standard Deviations of Model Formation Over the Whole Block

TEST AREA	$\sigma_{x/y/z}$
Durban	19,1
St. Faith's	18,4

$\sigma_{x/y/z}$- Mean standard deviation in X, Y or Z.

4.2.2.3. Transformation of the Strip and Strip Adjustment

The two strips in this block were adjusted by the same program used to adjust the Durban Test Area in which the planimetry was adjusted by a conformal third order polynomial and the height by a separate third order polynomial.

The control configuration for the strip adjustment is shown in Figure 4.2.2.3.1. The strip adjusted results compare favourably in planimetry with those obtained by T van Dijk as can be seen from Table 4.2.2.3.1. No results are given for the height adjustment at check points owing to insufficient height data. The standard deviation in height at control for the second strip appears to be high but this in fact has not affected the results of the block adjustment which can be seen from Table 4.2.2.4.1 and Table 4.2.2.5.1.

Table 4.2.2.3.1 Comparison of Results of Strip Adjustment of the St. Faith's Test Area Processed on the IBM 360 and the WANG 2200

STRIP NO	T VAN DIJK							
	CONTROL				CHECK			
	σ_x	σ_y	σ_z	σ_p	σ_x	σ_y	σ_z	σ_p
1	9,3	10,5	16,2	14,0	10,8	12,1	-	16,2
2	8,7	7,9	18,5	11,8	11,2	13,4	-	17,5

STRIP NO	WANG 2200							
	CONTROL				CHECK			
	σ_x	σ_y	σ_z	σ_p	σ_x	σ_y	σ_z	σ_p
1	6,3	9,1	14,5	11,1	10,2	9,6	-	14,0
2	5,1	4,1	33,7	6,7	9,2	9,2	-	12,9

$\sigma_x \sigma_y \sigma_z$ - Standard deviations in X, Y and Z respectively.
σ_p - Standard deviation in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).

4.2.2.4 Block Adjustment Using the Strip as the Adjustment Unit

This adjustment was iterated and converged after one iteration to a planimetric accuracy of seventeen microns at the scale of the photograph at the check points as shown in Table 4.2.2.4.1. The small number of height check points and their unknown accuracy and doubtful reliability suggest that the standard deviation of 31,4 microns at the check points in height is not a true indication of the obtainable height accuracy using this method. The residual

ST. FAITH'S TEST AREA

CONTROL CONFIGURATION

STRIP ADJUSTMENT

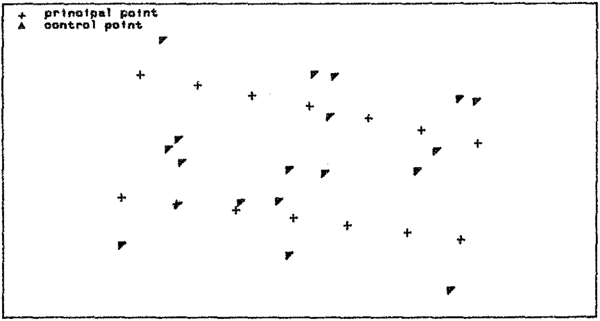


FIGURE 4.2.2.3.1

vectors after the planimetric adjustment at control and check points are shown in Figure 4.2.2.4.1.

Table 4.2.2.4.1 St Faith's Test Area. Results of the Block Adjustment Using Strips.

ITERATION NO	σ PLAN			σ HEIGHT		
	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
1	17,8	21,7	16,9	11,5	24,1	31,4
2	17,8	21,7	16,9	11,5	24,1	31,4

σ_{plan} - Standard deviation in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).
σ_{height} - Standard deviation in height.

It should be noted that the block adjusted results of the Durban and St. Faith's Test Areas obtained using this adjustment program have comparable accuracies as can be seen from Table 4.2.2.4.2.

Table 4.2.2.4.2 Comparison of Block Adjustment Results for Durban and St. Faith's Test Areas.

TEST AREA	σ PLAN			σ HEIGHT		
	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
Durban	13,5	20,9	16,6	7,0	35,1	21,6
St Faith's	17,8	21,7	16,9	11,5	24,1	31,4

σ_{plan} - Standard deviation in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).
σ_{height} - Standard deviation in height.

4.2.2.5 Block Adjustment Using the Model as the Adjustment Unit

The strip adjusted co-ordinates of the St. Faith's Test Area were processed using the iterative block adjustment procedure. The adjustment was iterated one hundred times. Convergence was rapid, the adjustment having converged somewhere between the tenth and twentieth iterations.

Table 4.2.2.5.1 shows the results of the block adjustment of the St. Faith's Test Area after every ten iterations A comparison

ST. FAITH'S TEST AREA

RESIDUAL VECTORS IN PLANIMETRY

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

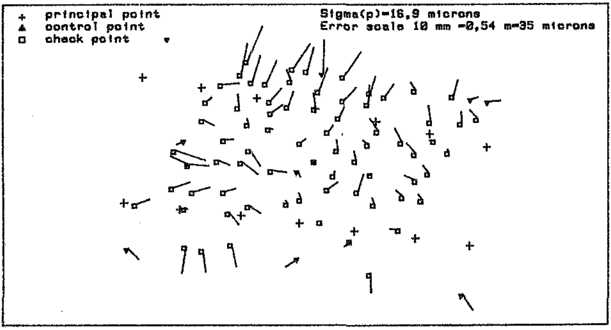


FIGURE 4.2.2.4.1

of these results with the results of the block data after strip adjustment seems to suggest that the block adjustment does not improve the accuracy of the data which may be attributed to the small number of models in the block. Figure 4.2.2.5.1 shows the residual vectors in planimetry at control and check points after the adjustment.

Table 4.2.2.5.1 St. Faith's Test Area. Results of the Block Adjustment Using the Model.

ITERATION NO	σ PLAN			σ HEIGHT		
	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
1	-	-	12,1	-	-	24,9
10	8,3	9,9	14,1	14,4	6,3	24,7
20	8,2	9,8	14,8	13,9	6,4	24,8
30	8,2	9,8	15,0	13,8	6,4	25,0
40	8,2	9,8	15,1	13,7	6,3	25,1
50	8,2	9,8	15,1	13,6	6,3	25,2
60	8,2	9,8	15,1	13,6	6,2	25,4
70	8,2	9,8	15,1	13,6	6,2	25,6
80	8,2	9,8	15,1	13,5	6,2	25,8
90	8,2	9,8	15,1	13,5	6,2	25,9
100	8,2	9,8	15,1	13,5	6,1	26,1

σ_{plan} - Standard deviation in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).
σ_{height} - Standard deviation in height.

4.2.3 Summary of Block Adjustments of the Durban and St Faith's Test Areas

In the tests undertaken for this dissertation two block adjustment procedures were used to process the data of the Durban and St. Faith's Test Areas, both of which had also been processed by block adjustment programs developed by T van Dijk (1975). The block adjustment methods used by T van Dijk were:

ST. FAITH'S TEST AREA

RESIDUAL VECTORS IN PLANIMETRY

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT
10 Iterations

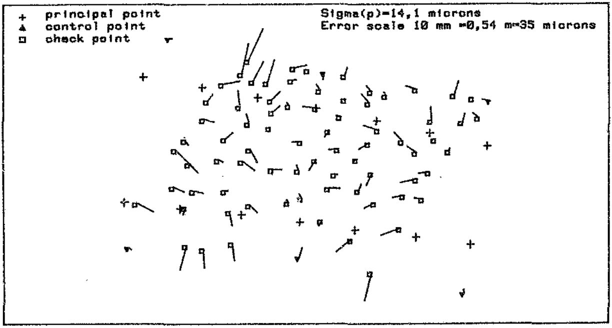


FIGURE 4.2.2.5.1

a) The Bundle adjustment (Schmid, H H. 1959),

b) The ANBLOCK adjustment (van den Hout, C M. 1966), and

c) The Amer adjustment (Amer, F. 1962).

whereas the block adjustment programs developed for this study were:

a) The Amer adjustment, an iterative adjustment using the model as the adjustment unit, and

b) The Schut adjustment (Schut, G H. 1961/1966) which uses the strip as the adjustment unit.

Table 4.2.3.1 summarises the St. Faith's Area block adjustment results of the various methods used by T van Dijk and the writer.

Table 4.2.3.1 St. Faith's Test Area. Comparison of Results of Various Block Adjustments on Different Systems.

SYSTEM	ADJUST-MENT	σ PLAN			σ HEIGHT		
		CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
T van Dijk	Amer	8,7	9,8	15,3	6,8	10,2	20,4
	ANBLOCK	9,2	7,9	16,9	9,8	12,4	24,2
	Bundle	13,4	-	15,7	19,0	-	23,6
WANG 2200	Amer	13,5	20,9	16,6	7,0	35,1	21,6
	Schut	13,8	21,7	16,9	11,5	24,1	31,4

σ_{plan} - Standard deviation in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).

σ_{height} - Standard deviation in height.

Table 4.2.3.2 is a similar summary to that of Table 4.2.3.1 for the Durban Test Area.

Table 4.2.3.2 Durban Test Area. Comparison of Results of Various Block Adjustments on Different Systems.

SYSTEM	ADJUST-MENT	σ PLAN			σ HEIGHT		
		CONTROL	TIE	CHECK	CONTROL	TIE	CHECK
T van Dijk	Amer	10,1	8,3	14,4	4,0	8,3	25,1
	ANBLOCK	10,6	6,3	19,0	8,8	9,7	21,8
	Bundle	9,9	-	16,9	16,6	-	29,8
WANG 2200	Amer	9,9	8,7	16,3	6,0	5,0	18,3
	Schut	13,5	20,9	16,6	7,0	35,1	21,6

σ_{plan} - Standard deviation in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).

σ_{height} - Standard deviation in height.

4.2.4 The ITC Block of Synthetic Strips

4.2.4.1 Strip Formation

The published data of the ITC block consists of models formed from the fictitious plate co-ordinates which were perturbed to simulate the systematic and random errors inherent in actual aerial photography and the measurement of the photographic plates.

Unlike H Soehngen (1967/1967A) who used the same data to test strip and block adjustment procedures and adopted the scale transfer factor of 1,0000 between successive models in each strip, the writer has approached the problem in a slightly different manner. Perspective centres were assumed for each model and each model was rescaled, translated and rotated parallel to its predecessor in the strip using the program developed to form the strips from the models of the Durban and St. Faith's Test Areas.

The results of the strip formations for the two hundred models used in the test are given in Table 4.2.4.1.1.

Table 4.2.4.1.1. ITC Block. Standard Deviations of Strip Formation for Each Model Junction.

	$\sigma_{x/y/z}$									
STRIP NO	1	2	3	4	5	6	7	8	9	10
MODEL NO										
1/2-2/3	53	24	55	35	21	40	41	18	23	36
2/3-3/4	19	07	15	21	19	39	33	17	15	20
3/4-4/5	36	34	30	27	29	38	33	26	29	16
4/5-5/6	42	18	18	10	19	34	36	24	38	34
5/6-6/7	28	46	13	21	15	20	30	30	25	35
6/7-7/8	38	29	13	35	29	27	29	24	33	06
7/8-8/9	12	52	41	17	31	24	41	42	41	63
8/9-9/10	38	88	46	41	11	24	55	28	33	44
9/10-10/11	55	12	30	27	18	42	11	11	52	35
10/11-11/12	11	70	26	07	21	12	44	12	32	14
11/12-12/13	46	20	08	28	39	18	12	20	18	17
12/13-13/14	18	49	11	08	41	23	21	24	05	36
13/14-14/15	09	18	16	13	15	15	19	42	31	31
14/15-15/16	36	27	20	72	14	18	14	32	29	40
15/16-16/17	27	06	17	44	09	12	24	16	33	29
16/17-17/18	12	29	25	21	31	25	58	22	39	11
17/18-18/19	38	13	16	28	51	57	10	42	19	08
18/19-19/20	16	07	12	36	17	17	08	48	10	29
19/20-20/21	31	16	16	39	33	26	23	25	13	25
Means	29,7	29,7	22,5	27,8	24,4	26,9	28,5	26,5	27,3	27,8

$\sigma_{x/y/z}$ - Standard deviations in X, Y or Z ($\sigma_{x/y/z} = \sqrt{(\Sigma v_x^2 + \Sigma v_y^2 + \Sigma v_z^2)/(3n-3)}$ where n is the number of model junctions).

4.2.4.2 Transformation of the Strip and Strip Adjustment

The program used to transform and adjust strips was used without modification to adjust the planimetry and height separately of the ITC block. Each strip was controlled by twelve control points distributed as shown in Figure 4.2.4.2.1. The results of the strip

I.T.C. BLOCK

CONTROL CONFIGURATION

STRIP ADJUSTMENT

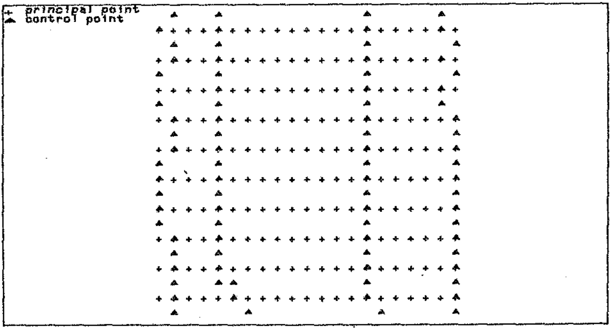


FIGURE 4.2.4.2.1

adjustment are compared in Table 4.2.4.2.1 with those obtained by H Soehngen (1967) who used a third order adjustment polynomial and twelve control points with a similar distribution to that used by the writer.

Table 4.2.4.2.1 *ITC Block. Comparison of Results of Strip Adjustment on Different Systems. All Results are in Metres in the Terrain.*

STRIP NO	H SOEHNGEN							
	CONTROL				CHECK			
	σ_x	σ_y	σ_p	σ_z	σ_x	σ_y	σ_p	σ_z
1	1,31	2,03	2,41	1,00	0,98	2,43	2,64	2,14
2	0,85	1,51	1,73	0,95	0,88	1,13	1,44	1,86
3	0,80	1,67	1,85	0,72	1,68	1,56	2,30	1,93
4	0,98	1,20	1,55	0,83	0,88	1,26	1,55	1,89
5	0,92	0,72	1,17	0,49	1,17	1,16	1,66	2,04
6	1,20	1,40	1,84	0,84	1,48	1,34	2,00	3,22
7	0,48	2,00	2,06	1,00	0,98	1,48	1,79	2,35
8	0,94	1,13	1,47	0,90	1,29	1,49	1,98	1,60
9	0,86	1,50	1,73	0,71	1,39	1,68	2,20	1,47
10	0,65	1,09	1,27	1,12	1,48	1,14	1,88	1,86
Means	0,93	1,48	1,74	0,87	1,25	1,51	1,98	2,08

STRIP NO	WANG 2200							
	CONTROL				CHECK			
	σ_x	σ_y	σ_p	σ_z	σ_x	σ_y	σ_p	σ_z
1	0,95	1,40	1,69	1,24	2,01	2,38	3,11	2,64
2	0,92	0,73	1,18	1,64	1,77	1,00	2,03	2,28
3	1,06	1,51	1,84	0,83	2,26	2,04	3,04	4,45
4	1,13	0,77	1,36	1,78	2,67	1,79	3,2[illegible]	3,24
5	0,74	0,74	1,05	1,91	1,01	1,38	1,71	2,66
6	0,76	0,43	0,88	1,49	2,11	1,24	2,45	1,90
7	1,13	1,21	1,66	1,71	1,15	1,39	1,81	2,66
8	0,92	0,67	1,13	1,29	2,56	1,70	3,08	2,00
9	0,85	1,08	1,37	1,24	1,74	1,72	2,44	1,84
10	0,66	1,01	1,21	1,91	1,93	1,63	2,53	2,95
Means	0,91	0,96	1,34	1,50	1,92	1,63	2,54	2,66

$\sigma_x\ \sigma_y\ \sigma_z$ - Standard deviations in X, Y and Z respectively.

σ_p - Standard deviations in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).

The results of the strip adjustment on the WANG 2200 are not as accurate as those obtained by H Soehngen. The results obtained here are more consistent with those obtained by H Soehngen in a test with the same control configuration and second order adjustment polynomials.

4.2.4.3 Block Adjustment Using the Strip as the Adjustment Unit

The major part of this program consists of the formation and subsequently the solution of the normal equation system. The uncollapsed normal equation coefficient matrix for a block of ten strips using a third order conformal polynomial to adjust the planimetry consists of an 80 by 80 matrix which therefore has 64 000 elements. Owing to the structure of the normal equation matrix it was possible to collapse the matrix into an 80 by 15 matrix and solve for the eighty unknowns simultaneously in a 24K byte memory. Allowance has been made for a solution based on twenty-five planimetric control and tie points per strip or fifty observation equations.

The tests undertaken by H Soehngen (1967) are compared in Table 4.2.4.3.1 with those undertaken here. H Soehngen has used a peripheral control configuration with a few internal control points. The control configuration used here and shown in Figure 4.1.3.2 is more evenly distributed throughout the block.

The block adjustment processed on the WANG 2200 was iterated and convergence was achieved after the fifth iteration. The results after each iteration are shown in Table 4.2.4.3.2. Figure 4.2.4.3.1 and Figure 4.2.4.3.2 show the residual vectors at control and selected check points in planimetry and height respectively after block adjustment.

I.T.C. BLOCK

RESIDUAL VECTORS IN PLANIMETRY AT CHECK POINTS

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

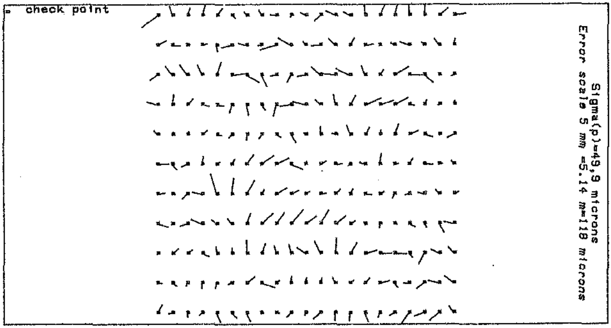


FIGURE 4.2.4.3.1

I.T.C. BLOCK

RESIDUAL VECTORS IN HEIGHT AT CHECK POINTS

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

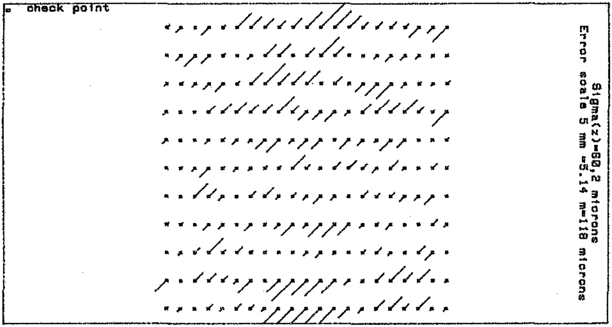


FIGURE 4.2.4.3.2

Table 4.2.4.3.1 ITC Block. Comparison of Block Adjustments Using Strips on Different Systems. All Results are in Metres in the Terrain.

STRIP NO	H SOEHNGEN								
	CONTROL			TIE			CHECK		
	σ_x	σ_y	σ_z	σ_x	σ_y	σ_z	σ_x	σ_y	σ_z
1	0,77	0,90	-	0,64	0,92	-	1,16	0,98	-
2	0,58	0,97	-	0,98	0,91	-	1,00	1,18	-
3	0,89	0,44	-	0,78	0,80	-	1,57	1,64	-
4	0,74	0,46	-	0,66	0,84	-	0,85	1,33	-
5	0,52	0,58	-	0,68	1,02	-	1,29	1,21	-
6	0,63	0,43	-	0,47	1,37	-	1,33	1,36	-
7	1,05	0,36	-	0,69	0,79	-	1,08	1,26	-
8	0,36	0,27	-	0,85	0,83	-	1,39	1,24	-
9	1,14	0,47	-	1,22	1,14	-	1,40	1,28	-
10	0,80	0,91	-	-	-	-	1,20	1,10	-
MSD	0,79	0,63	-	0,80	0,97	-	1,23	1,27	-

STRIP NO	WANG 2200								
	CONTROL			TIE			CHECK		
	σ_x	σ_y	σ_z	σ_x	σ_y	σ_z	σ_x	σ_y	σ_z
1	1,48	1,79	1,65	1,16	2,78	3,27	1,61	2,14	3,11
2	1,37	0,98	1,27	2,66	2,59	2,94	1,88	0,88	2,17
3	2,17	1,20	1,78	2,93	1,90	3,59	2,12	1,63	3,22
4	1,70	1,00	0,58	2,47	1,37	3,76	1,89	1,63	3,00
5	0,97	0,80	1,63	2,10	1,16	0,88	0,96	1,28	2,35
6	1,49	0,75	1,05	1,98	2,31	2,45	1,56	1,19	2,00
7	1,32	1,02	1,30	1,60	2,53	2,75	1,27	1,44	2,50
8	1,93	0,62	1,07	2,38	2,47	2,43	1,74	1,69	1,98
9	1,15	1,45	1,08	2,25	2,12	2,85	1,46	1,66	1,90
10	0,91	1,45	1,90	0,92	1,97	3,74	1,38	1,23	4,01
MSD	1,45	1,11	1,33	2,05	2,12	2,87	1,59	1,48	2,62

$\sigma_x\, \sigma_y\, \sigma_z$ - Standard deviations in X, Y and Z respectively.

MSD - Mean Standard Deviation.

Table 4.2.4.3.2 ITC Block. Block Adjustment Results for Five Iterations. The Results are Given in Metres in the Terrain.

ITERATION NUMBER	σ_o PLAN	σ_o HEIGHT
1	1,587	2,128
2	1,588	2,124
3	1,591	2,121
4	1,592	2,119
5	1,593	2,117
6	1,593	2,117

$\sigma_{o_{plan}}$ - Standard deviation of a single observation of unit weight in planimetry.

$\sigma_{o_{height}}$ - Standard deviation of a single observation of unit weight in height.

4.2.4.4 Block Adjustment Using the Model as the Adjustment Unit

The basic computation in this iterative adjustment procedure is that of the four parameters of the linear conformal transformation for the planimetric adjustment and the three coefficients of the height transformation for each section in the block each iteration. Therefore, for a block comprising two hundred models there are 1 400 unknowns to be solved for each iteration. Since the number of iterations required for convergence is approximately equal to the number of models in the block an equivalent of 280 000 unknowns are solved for during the processing of the block adjustment.

H F Soehngen (1967A) adjusted the ITC Block using section units of two or three models. The method of adjustment used was the simultaneous solution of all the unknowns of the linear conformal equations using both direct and iterative solutions of the normal equation system. The largest normal equation set consisted of one hundred and ninety-six unknowns for a seven strip block comprising forty-nine sections.

The best planimetric adjustment achieved by H Soehngen (1967A) was obtained using a Block Successive Over-Relaxation method for the solution of the normal equation system. The direct solution of the normal equations by the Gaussian elimination method produced comparable results. Table 4.2.4.4.1 compares the results obtained by H Soehngen using twenty-four ground control points with the iterative adjustment processed on the WANG 2200 using the control configuration shown in Figure 4.1.3.1.

Table 4.2.4.4.1 ITC Block. Comparison of Results of Block Adjustments Using Sections as the Adjustment Units. All Results are in Metres in the Terrain.

STRIP NO	H SOEHNGEN CHECK POINTS			WANG 2200 CHECK POINTS		
	σ_x	σ_y	σ_z	σ_x	σ_y	σ_z
1	–	–	–	1,58	1,53	3,28
2	–	–	–	0,90	0,79	2,49
3	–	–	–	0,86	0,95	2,48
4	1,30	1,08	–	0,83	1,00	2,41
5	1,32	1,15	–	0,65	0,93	2,42
6	1,23	1,24	–	0,80	0,85	2,01
7	1,08	1,05	–	0,95	0,75	2,14
8	1,25	1,25	–	0,84	0,68	1,95
9	1,24	1,42	–	1,00	1,15	1,87
10	1,52	1,98	–	1,54	1,64	3,41
MSD	1,28	1,32		1,00	1,03	2,35

$\sigma_x \sigma_y \sigma_z$ - Standard deviations in X, Y and Z respectively.

MSD - Mean Standard Deviation.

Table 4.2.4.4.2 ITC Block. Results of the Iterative Block Adjustment Using Models After Every Twenty-Five Iterations. All Results are in Metres in the Terrain.

ITERATION NO	CONTROL		TIE		CHECK			
	$\sigma_{x/y}$	σ_z	$\sigma_{x/y}$	σ_z	σ_x	σ_y	σ_p	σ_z
1	1,71	2,18	1,96	2,28	1,34	1,23	1,82	2,38
25	0,47	0,31	0,70	0,45	0,93	0,98	1,35	2,24
50	0,47	0,25	0,69	0,41	0,96	1,01	1,39	2,27
75	0,47	0,23	0,69	0,40	1,00	1,04	1,44	2,31
100	0,47	0,21	0,69	0,38	1,02	1,06	1,47	2,38
125	0,47	0,20	0,69	0,38	1,03	1,06	1,48	2,42
150	0,47	0,20	0,69	0,37	1,03	1,07	1,48	2,44
175	0,47	0,19	0,69	0,37	1,03	1,07	1,49	2,47
200	0,47	0,19	0,69	0,37	1,03	1,07	1,49	2,49

$\sigma_{x/y}$ - Standard deviations in X or Y ($\sigma_{x/y} = \sqrt{(\Sigma V_x^2 + \Sigma V_y^2)/(2n-4)}$).

$\sigma_x \sigma_y \sigma_z$ - Standard deviations in X, Y and Z respectively.

σ_p - Standard deviations in planimetry ($\sigma_p = \sqrt{\sigma_x^2 + \sigma_y^2}$).

Table 4.2.4.4.2 gives the results for two hundred iterations of the block adjustment on the WANG 2200. From this table is can be seen that convergence in the planimetric adjustment took place somewhere between iterations 150 and 175, while in the height adjustment convergence occurred between iterations 175 and 200. The residual vectors in height and planimetry at control and selected check points are shown in Figure 4.2.4.4.1 and Figure 4.2.4.4.2 respectively.

4.3 Analysis of Processing Times

One of the critical aspects of large data processing systems on minicomputers is the processing time. The practical application of minicomputers to systems such as the one designed here is determined by this factor. The processing time thus limits the size of the block to be adjusted within the upper limit of the capacity of the minicomputer hardware and determines the type of block adjustment to be used.

At the time of the development of the analytical aerial triangulation system on the minicomputer the WANG 2200 T was available. The Central Processing Unit (CPU) of this model has a read/write memory cycle time of 1,6 micro seconds. As was expected and subsequently proved to be true, iterative block adjustments using the model or sections of models consisting of more than thirty or forty sections are too slow for implementation on minicomputers with memory cycle times of more than 200 nanoseconds.

Towards the end of the development stage of the analytical aerial triangulation system, the WANG 2200 VP was released. The Central Processing Unit of this model is rated at approximately one order faster than that of the WANG 2200 T. Most of the tests processed on the model T were reprocessed on the model VP in order to obtain a comparison of processing times. In addition, it became feasible to process the iterative block adjustment using the two hundred models of the ITC Block which previously had been impossible on the WANG 2200 T owing to the time required to process the block for two hundred iterations in order to test the convergence rate of the adjustment.

I.T.C. BLOCK

RESIDUAL VECTORS IN PLANIMETRY AT CHECK POINTS

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT
200 Iterations

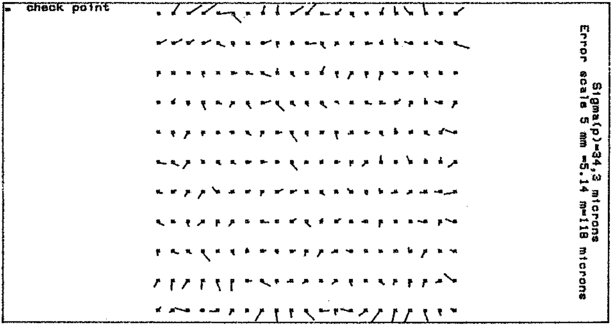


FIGURE 4.2.4.4.1

I.T.C. BLOCK

RESIDUAL VECTORS IN HEIGHT AT CHECK POINTS

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT
200 Iterations

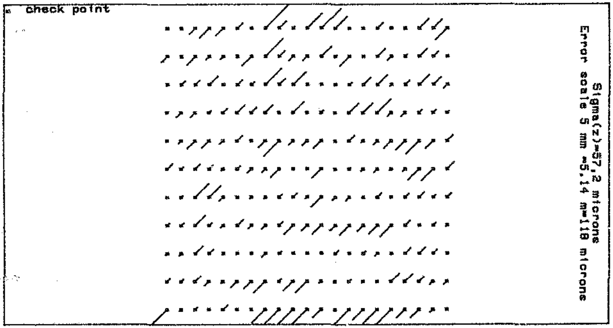


FIGURE 4.2.4.4.2

The processing times on the WANG 2200 T and the WANG 2200 VP for the various intermediate phases of the analytical aerial triangulation system using the three sets of test data viz. St. Faith's and Durban Test Areas and the ITC Block are compared in Table 4.3.1.

Table 4.3.1 Comparison of System Processing Times on the WANG 2200 T and WANG 2200 VP Minicomputers.

TEST DATA	PROGRAM	CPU Processing Times (Secs)	
		WANG 2200 T	WANG 2200 VP
St. Faith's Test Area 12 Models 2 Strips	Model Formation	978	65
	Strip Formation	108	9
	Strip Adjustment	45	6
	Block Adjustment using Strips	540	45
	Block Adjustment using Models	1 350	129
Durban Test Area 41 Models 4 Strips	Model Formation	2 280	190
	Strip Formation	150	14
	Strip Adjustment	45	6
	Block Adjustment using Strips	1 101	92
	Strip Adjustment using Models	6 840	653
ITC Block 200 Models 10 Strips	Strip Formation	3 183	278
	Strip Adjustment	45	6
	Block Adjustment using Strips	6 133	544
	Block Adjustment using Models	25 322	2 678

Strip Adjustment - The times quoted in the table are for the least squares solution of the polynomial coefficients of a single strip. Block Adjustment - The times quoted are for ten iterations of the adjustment.

The ITC Block was processed using the iterative block adjustment of models on the WANG 2200 VP for two hundred iterations which took approximately fifteen hours. The estimated time for a similar adjustment using the WANG 2200 T is approximately one hundred and fifty hours.

Table 4.3.2 details the calculated average processing times based on the results of Table 4.3.1:

a) Per model for the model and strip formation programs and for the block adjustment using the strip as the adjustment unit,
b) Per strip for the strip adjustment program, and
c) Per model per iteration for the block adjustment program using the model as the adjustment unit.

Table 4.3.2 Average Processing Time per Model or Strip Units

PRORGAM	CPU Processing Time (Seconds)	
	WANG 2200 T	WANG 2200 VP
Model Formation	69	5
Strip Formation	10	0,8
Strip Adjustment	45	6
Block Adjustment using Strips	34	3
Block Adjustment using Models	13,5	1,3

The average time of 1,3 seconds per model per iteration for the block adjustment using the model as the adjustment unit is approximately ten times slower than a similar adjustment using a large IBM 360/50 or IBM 370/145. T van Dijk (1975) estimated the average time per iteration per model for a forty-one model block to be in the region of 0,1 to 0,2 seconds, using the IBM 360/50 and the IBM 370/145 respectively. The time taken for this adjustment on the WANG 2200 VP minicomputer is comparable with the processing time estimated by J J Therrien (1963) using the IBM 1620/1 for the iterative solution of the simultaneous adjustment of a one hundred section block. G C Tewinkel (1966) of the Coast and Geodetic Survey estimated the rigorous adjustment of a block of two hundred photographs to take about 6,5 hours (or 117 seconds per photograph) using the IBM 7030 (STRETCH) computer and auxiliary disk storage which compares with the time quoted by M Keller (1967). Based on the assumption that the number of iterations required for convergence is equal to the number of models in the block for the iterative block adjustment using the model, the processing time of 260 seconds per model for a two hundred model block is substantially slower than that of most of the large mainframe computers. However, when equipment and processing costs of mainframe computers and minicomputers are compared, then minicomputers used for iterative block adjustments of blocks of the order of two hundred models become economically competitive.

The alternative block adjustment which uses the strip as the adjustment unit has definite practical application particularly to small scale topographical mapping. The main advantage of this adjustment procedure over the iterative adjustment using the model is the substantially faster processing speed. This adjustment method has in the past been favoured by G Schut (1965, 1967) of the National Research Council in Canada because of its ease of application, the low number of control requirements and the economy of processing particularly on small computers. These factors become particularly important when applying minicomputers to analytical photogrammetry. The above results and processing times substantiate the economic viability and practicability of minicomputers for block adjustment using strips.

CHAPTER 5

CONCLUSIONS

5. CONCLUSIONS

The study of the application of minicomputers to analytical aerial triangulation described in this dissertation and the results obtained from processing the data of two test areas and one block of synthetic data on the system developed on the WANG 2200 minicomputer make it possible to draw the following conclusions:

1) Resitution of the model from measured plate co-ordinates is efficiently processed on the minicomputer particularly on the WANG 2200 VP which required five seconds per model for the solution. However, even using the WANG 2200 T, it is possible to process a block of two hundred models in approximately two hundred minutes. If the system were used solely as a front end procedure to a large computer system for the formation of the independent models, it is possible to accommodate a block consisting of 2 500 models with a WANG 2200 10 Megabyte disk drive.
2) Strip formation is as equally efficently handled on the minicomputer as the relative orientation and model formation process. The results of the strip formation indicate that the semi-rigorous approach is an adequate solution to the problem and provides for quick processing, an important factor to be taken into account when using slower computers.
3) For strips of up to twenty models the polynomials used in the strip transformation and adjustment program has provided adequate correction to the strips which is confirmed by the results obtained from the two block adjustment procedures. It is possible that the system be used up to and including the transformation and strip adjustment programs as a front end procedure to the large computer in order to trap any inconsistencies in the data before processing a large block adjustment on a mainframe computer. Used for this purpose, the minicomputer system would be able to accommodate very long strips particularly if each strip was spooled off the minicomputer disk onto some other medium before processing subsequent strips.
4) Block adjustment on the WANG 2200 T for blocks containing two hundred models or more must be restricted to the method of

adjustment using strips as the adjustment unit. It is however, conceivably economical, even at fifteen hours for the processing of block adjustment using the model as the adjustment unit for blocks of two hundred models, to use the WANG 2200 VP. On either the WANG 2200 T or WANG 2200 VP the method of block adjustment using the strip as the adjustment unit provides a fast method of block adjustment and yields results which are sufficiently accurate for topographical mapping purposes.

5) With reference to Table 4.2.3.1 and Table 4.2.3.2 which compare the results of block adjustment using the model on the IBM 360 and the WANG 2200, the consistency of the results indicate for these two test areas processed that the WANG 2200 operates with sufficient internal accuracy to ignore accumulation of round-off errors.

In conclusion it must be said that for small photogrammetric companies the application of minicomputers to photogrammetry has several economical and practical advantages over batch processing of data on large computers. These advantages may be enumerated as follows:

1) The minicomputer is simple to operate, with the result that the user does not have to face the problem of becoming involved with complex operating systems encountered in batch processing on large computers.
2) A well designed minicomputer system which optimizes the interactive features of the minicomputer can save many costly hours in the data capture, data editing and initial processing stages of the measured data.
3) Reprocessing of individual phases of the aerial triangulation system subsequent to correcting the input data does not suffer from the long delays which are so much a part of batch processing systems.
4) The inexpensive hardware is generally robust and therefore does not require special temperature controlled and dust free conditions under which to operate successfully.
5) Interactive programming and editing facilities provide for rapid and easy development of software systems. It is therefore possible for the user to develop or modify his own system

without the need for costly, highly skilled personnel.

6) The overall low cost of data processing using the minicomputer is perhaps the most important argument in favour of minicomputers applied to analytical aerial triangulation.

BIBLIOGRAPHY

Ackermann, F. 1961/62
On Strip Adjustment with Polynomials of Higher Degree
Photogrammetria, 18(4); 130-139

Ackermann, F. 1962
A Procedure for Analytical Strip Adjustment
ITC Publication, Series A, No 17

Ackermann, F. 1962/64
A Short Discussion of "The Development of Strip and Block Adjustments during 1960-1964"
Photogrammetria, 19(8); 431-436

Ackermann, F. 1962/64A
A Method of Analytical Block Adjustment for Heights
Photogrammetria, 19(8); 457-462

Ackermann, F., Ebner, H. and Klein H. 1973
Block Triangulation with Independent Models
Photogrammetric Engineering, 39(9); 967-981

Amer, F 1962
Digital Block Adjustment
Photogrammetric Record, 4(19); 34-49

Anderson, J.M. & McNair, A.T. 1966
Analytical Aerotriangulation : Triplets and Sub-Blocks
Photogrammetric, 21(6); 197-216

Arthur, D.W.G. 1959
Recent Developments in Analytical Aerial Triangulation at the Ordnance Survey
Photogrammetric Record, 3(14); 112-124

ASP 1966
Manual of Photogrammetry, 3rd ed., 2 vols.,
ASP, Falls Church, Va.

Babbage, C. 1961
Charles Babbage and his Calculating Engines - Selected Writings by Charles Babbage and Others. (Introduction by Morrison, P. and Morrison, E.)
Dover, New York

Baetsle, P.L. 1966
Conformal Transformations in Three Dimensions
Photogrammetric Engineering, 32(5); 816-824

Belling, G.E. 1966
Composed Strip Sections in Digital Block Adjustment
South African Journal of Photogrammetry, 2(4); 262-271

Bervoets, S.G. 1960
Block Adjustment Developments and Experiments
Cartography, 3; 123-128

Boniface, P.R.J. 1967
Analytical Triangulation Using a Stereo-plotter and Reseau Plate Holders
Photogrammetric Record, 5(30); 492-497

Booth, A.D. & Booth, K.H.V. 1956
Automatic Digital Calculators
Butterworths Scientific Publications, London

Bowden, B.V. 1971 — Faster Than Thought (A Symposium on Digital Computing Machines)
Pitman, London

Brandt, R.S. 1955 — Use of Large Capacity Computers in Photogrammetry
Photogrammetric Engineering, 21(5); 695-696

Brown, D. 1968 — A Unified Lunar Control Network
Photogrammetric Engineering, 24(12); 1272-1292

Bull, G.M. and Packham, S.F.G 1971 — Time Sharing Systems
McGraw-Hill, London

Butler, J.L. 1970 — Comparative Criteria for Minicomputers
Instrument Technology, 17; 67-82

Chandor, A. 1970 — A Dictionary of Computers
Penguin Books Ltd., Middlesex

Church, E. 1941 — Analytical Computations in Aerial Photogrammetry
Photogrammetric Engineering, 7(4); 212-252

Coury, F.F. 1972 — A Practical Guide to Minicomputer Applications
IEEE Press, New York, 1972

D'Autume, G. de Masson 1968 — The Perspective Bundle of Rays as the Basic Element in Aerial Triangulation
Photogrammetria, 23(2); 55-56

Davis, R.G. 1966 — Analytical Adjustment of Large Blocks
Photogrammetric Engineering, 32(1); 87-97

Davis, R.G. 1967 — Advanced Techniques for the Rigorous Analytical Adjustment of Large Photogrammetric Nets
Photogrammetria, 22(1); 191-205

Doyle, F.J. 1955 — Photogrammetric Applications of Small Capacity Computers
Photogrammetric Engineering, 21(5); 685-692

Doyle, F.J. 1964 — Historical Developments of Analytical Photogrammetry
Photogrammetric Engineering, 30(2); 259-265

Ebner, H. and Mayer, R. 1967 — Numerical Accuracy of Block Adjustment
Photogrammetria, 32(1); 101-109

Eckhart, D. 1962/64 — The Effect of the Use of Analytical Block Adjustment on the Administrative Side of the Photogrammetric Work, As Experienced at the Ministry of Transport and Water Control
Photogrammetria, 19(8); 538-540

Eden, J.A. 1967 — A New Fast Working Approach to Analytical Photogrammetry
Photogrammetric Record, 5(30); 479-491

Elassal, A.A. 1963 — Analytical Aerotriangulation at the Univerity of Illinois
Photogrammetric Engineering, 29(1); 199-206

Elassal, A.A. 1966 — Simultaneous Multiple Station Analytical Triangulation Program
Photogrammetria, 21(3); 83-94

Faddeeva, V.N. 1959 — Computational Methods of Linear Algebra
Dover, 1959

Forsythe, G. and Moler, C.B. 1967 — Computer Solution of Linear Algebraic Systems
Prentice-Hall, Englewood Cliffs, New Jersey

Frank, A.H.E & Manten, A.A. 1969/70 — W. Schermerhorn and His Role in the Development of Photogrammetry
Photogrammetria, 25(1); 41-60

Gautier, J., O'Donnell, J. and Low, B. 1973 — The Planimetric Adjustment of Very Large Blocks of Models : Its Application to Topographical Mapping in Canada
Canadian Surveyor, 27(2); 99-118

Gracie, G. 1967 — Analytical Block Triangulation with Sequential Independent Models
Photogrammetria, 22(1); 171-180

Gruenberger, F. & Babcock, D. 1973 — Speaking of Minis
Datamation, 19(7); 57-59

Gruenberger, F & Babcock, D. 1973A — Computing with Minicomputers
Melville, 1973

Gschwind, H.W. 1967 — Design of Digital Computers
Springer-Verlag, New York

Hadley, G. 1961 — Linear Algebra
Addison-Wesley Publishing Company Inc., Reading, Massachusettes

Hartree, D.R. 1946 — The ENIAC, an Electronic Computing Machine
Nature, 158(4015); 500-506

Hartree, D.R. 1947 — Calculating Instruments and Machines
Cambridge (Eng) University Press

Hobbs, L.C. & McLoughlin, R.A. 1974 — Minicomputer Survey
Datamation, 20(7); 50-61

Holland, E. 1970 — Minicomputer I/O and Peripherals
IEEE Computer Group News, 3; 10-14

Hollingdale, S.H. 1965 — Electronic Computers
Penguin, 1965

Inghilleri, G. 1964 — Some Experiments on Semi-Analytical Triangulation
Photogrammetria, 19(7); 273-274

Inghilleri, G. & Galetto, R. 1967 — Further Developments of the Method of Aerotriangulation by Independent Models
Photogrammetria, 22(1); 13-28

Jacobs, I.S. 1964 — Practical Analytical Aerial Triangulation
South African Journal of Photogrammetry, 2(2); 118-136

Jaksic, Z. 1967 — Solution of Aerial Triangulation Problems Using the N.R.C. Analytical Plotter
Photogrammetria, 22(1); 59-71

Jerie, H.G. 1964 — A Simplified Method of Block Adjustment of Heights
Photogrammetria, 19(8); 450-456

Jerie, H.G. 1968 — Theoretical Height Accuracy of Strip and Block Triangulation With and Without Use of Auxiliary Data
Photogrammetria, 23(1); 19-44

Kaenel, R.A. 1970 — Minicomputers - A Profile of Tomorrow's Component
IEEE Trans Audio Electroacoust. AU-18; 354-379

Keller, M. & Tewinkel, G.C. 1964 — Aerotriangulation Strip Adjustment
ESSA Technical Report C & GS, No 23

Keller, M. & Tewinkel, G.C. 1965 — Aerotriangulation : Image Co-ordinate Refinement
ESSA Technical Report C & GS, No 25

Keller, M. & Tewinkel, G.C. 1966 — Space Research in Photogrammetry
ESSA Technical Report C & GS, No 32

Keller, M. 1967 — Block Adjustment Operation at Coast and Geodetic Survey
Photogrammetric Engineering, 33(11); 1266-1275

Keller, M. 1967A — Three Photo Solution to Analytical Aerotriangulation
Photogrammetria, 22(1); 117-125

Keller, M. & Tewinkel, G.C. 1967	Block Adjustment Aerotriangulation ESSA Technical Report C & GS, No 35
King, C.W.B. 1967	A Method of Block Adjustment Photogrammetric Record, 5(29); 381-384
Korn, G.A. 1973	Minicomputers for Engineers and Scientists McGraw-HIll, 1973
Kratky, V. 1967	On the Solution of Analyltical Aerotriangulation by Means of an Iterative Procedure Photogrammetria, 22(1); 181-189
Lapidus, G. 1970	Minicomputers Abroad - What's Available Control Engineering, 17(11); 66-75
Light, D.L. 1966	The Orientation Matrix Photogrammetric Engineering, 32(3); 434-438
Mahajan, S.K. & Singh, V. 1972	Comparison of Analytical Relative - Orientation Methods American Society of Civil Engineers - Surveying and Mapping; 73-86
Matos, R.A. 1963	Analytical Triangulation with Small or Large Computers Photogrammetric Engineering, 29(2); 263-270
Matos, R.A. 1971	Multiple-Station Analytical Triangulation Photogrammetric Engineering, 37(2); 173-176
McNair, A.J. 1955	Medium Capapcity Electronic Computers in Photogrammetry Photogrammetric Engineering, 21(5); 692-695
McNair, A.J. 1962/64	Triplets : A Basic Unit for Analytical Aerotriangulation Photogrammetria, 19(7); 367-380
Mikhail, E.M. 1962	Use of Triplets for Analytical Aerotriangulation Photogrammetric Engineering, 28(4); 625-632
Mikhail, E.M. 1964	Simultaneous 3-D Transformations of Higher Degree Photogrammetric Engineering, 30(4); 588-593
Mikhail, E.M. 1976	Observations and Least Squares IEP, New York
Morris, J.J. 1970	What to Expect When You Scale Down to a Minicomputer Control Engineering, 17(9); 65-71
Mosaad Allum, M. 1973	A Program for Analytical Aerial Triangulation Canadian Surveyor, 27(4); 301-307

Nowicki, A.C. & Born, C.J. 1960	Independent Stereotriangulation Adjustments with Electronic Computers. Photogrammetric Engineering, 26(4); 599-604
O'Brien, L.J. 1964	A Method Employed by the Canadian Army for Mapping Arctic Areas with Electronic Computer Assitance Canadian Surveyor, 18(1); 22-33
Proctor, D.W. 1962	The Adjustment of Aerial Triangulation by Electronic Digital Computers Photogrammetric Record, 4(19); 24-33
Ralston, A. 1971	Introduction to Programming and Computer Science McGraw-Hill, New York
Ralston, A. 1965	A First Course in Numerical Analysis McGraw-HIll, New York
Reid, J.K. 1971	Large Sparse Sets of Linear Equations : Proceedings Academic, London
Roelofs, R. 1949/50	Systematic or Accidental Errors Photogrammetria, 6(1); 69-41
Roelofs, R. 1951/52	Adjustment of Aerial Triangulation by the Method of Least Squares Photogrammetria, 8(4), 232-256
Rosen, S. 1969	Electronic Computers : A Historical Survey Computer Surveys, 1(1); 7-36
Sanderson, P.G. 1973	Interactive Computing in BASIC Butterworths, 1973
Saxena, K.C. 1974/75	Independent Model Triangulation Using Different Transformations Photogrammetria, 30(1); 67-74
Schmid, H.H. 1954	An Analytical Treatment of the Orientation of a Photogrammetric Camera Photogrammetric Engineering, 20(4); 765-781
Schmid, H.H. 1956/57	An Analytical Treatment of the Problem of Triangulation by Stereophotogrammetry Photogrammetria, 13(2); 67-77 and 13(3); 91-116
Schmid, H.H. 1959	A General Analytical Solution to the Problem of Photogrammetry International Archives of Photogrammetry, 13(5), 1961
Schut, G.H. 1955/56	Analytical Aerial Triangulation and Comparison Between it and Instrumental Aerial Triangulation Photogrammetria, 12(4); 311-318

Schut, G.H. 1958/59 — Construction of Orthogonal Matrices and their Application in Analytical Photogrammetry. Photogrammetria, 15(4); 149-162

Schut, G.H. 1959/60 — Remarks on the Theory of Analytical Aerial Triangulation. Photogrammetria, 16(.,; 57-66

Schut, G.H. 1960/61 — On Exact Linear Equations for the Computation of the Rotational Elements of Absolute Orientation. Photogrammetria, 17(1), 34-37

Schut, G.H. 1961 — A Method of Block Adjustment for Horizontal Co-ordinates. Canadian Surveyor, 15(7); 376-385

Schut, G.H. 1962 — The Use of Polynomials in Three-Dimensional Adjustment of Triangulated Strips. Canadian Surveyor, 16(3); 132-136

Schut, G,H. 1964 — Development of Programs for Strip and Block Adjustment at the National Research Council of Canada. Photogrammetric Engineering, 30(2); 283-291

Schut, G.H. 1964A — Practical Methods of Analytical Block Adjustment for Strips, Sections and Models. Canadian Surveyor, 18(5); 352-372

Schut, G.H. 1965 — A Method of Block Adjustment for Heights with Results Obtained in the International Test. Photogrammetria, 20(1); 35-51

Schut, G.H. 1966 — Conformal Transformations and Polynomials. Photogrammetric Engineering, 32(5); 826-829

Schut, G.H. 1967 — Block Adjustment by Polynomial Transformations. Photogrammetric Engineering, 33(9); 1042-1053

Schut, G.H. 1967A — Polynomial Transformation of Strips Versus Linear Transformation of Models : A Theory and Experiments. Photogrammetria, 22(1); 241-262

Schut, G.H. 1968 — Review of Strip and Block Adjustment During the Period 1964 - 1967. Photogrammetric Engineering, 34(4); 344-355

Schut, G.H. 1968A — Formation of Strips from Independent Models. Photogrammetic Engineering, 34(7); 690-695

Schwarz, H.R., Rutishauser, H. & Stiefel, E. 1973 — Numerical Analysis of Symmetric Matrices. Prentice-Hall, 1973

Schmutter, B. 1975 — Connecting Adjacent Models. Photogrammetric Engineering, 41(5); 617-619

Smith, A.D.N., Miles, M.J. & Verrall, P. 1966 — Analytical Aerial Triangulation Block Adjustment : The Direct Height Solution Incorporating Tie Strips
Photogrammetric Record, 5(29); 327-348

Soehngen, H.F. 1967 — Strip and Block Adjustment of the ITC Block of Synthetic Aerial Triangulation Strips
Civil Engineering Studies, Photogrammetry Series No 5, University of Illinois

Soehngen, H.F., Tung, C.C. & Leonard, J.W. 1967 — Investigation of Block Adjustments on the ITC Fictitious Block Using Sections and the Iterative and Direct Solutions of the Normal Equation System
Civil Engineering Studies, Photogrammetry Series No 8, University of Illinois

Soucek, B. 1972 — Minicomputers in Data Processing and Simulation
Wiley, 1972

Tewinkel, G.C. 1966 — Block Analytic Aerotriangulation
Photogrammetric Engineering, 32(6); 1056-1061

Thompson, E.H. 1958/59 — An Exact Linear Solution of the Problem of Absolute Orientation
Photogrammetria, 15(4); 163-179

Thompson, E.H. 1959 — A Method for the Construction of Orthogonal Matrices
Photogrammetric Record, 3(13); 55-59

Thompson, E.H. 1959A — A Rational Algebraic Formulation of the Problem of Relative Orientation
Photogrammetric Record, 3(14); 152-159

Thompson, E.H. 1959/60 — Some Observations on Aerial Triangulation
Photogrammetria, 16(2); 186-190

Thompson, E.H. 1965 — Reveiw of Methods of Independent Model Aerial Triangulation
Photogrammetric Record, 5(26); 72-78

Thompson, E.H. 1968 — The Projective Theory of Relative Orientation
Photogrammetria, 23(1); 67-75

Thompson, E.H. 1969 — Introduction to the Algebra of Matrices with Some Applications
Adam Hilger, London

Thompson, E.H. 1956 — A Method of Relative Orientation in Analytical Aerial Triangulation
Photogrammetric Record, 2(8); 145-150

Therrien, J.J. 1963 — A Simultaneous Section Adjustment for Small Computers
Canadian Surveyor, 17(5); 405-417

Tienstra, M. 1969 Calculation of Orthogonal Matrices
ITC Publication, Series A, No 48

Van den Hout, C.M.A. 1961 Analytical Orientation Methods
Boll. di Geod. e Science Affini, 20(3); 418-624

Van den Hout, C.M.A. 1966 The ANBLOCK Method of Planimetric Block Adjustment : Mathematical Foundation and Organisation of its Practical Applications
Photogrammetria, 21(5); 171-178

Van der Weele, A.J. 1953/54 Adjustment of Aerial Triangulation
Photogrammetria, 10(2); 58-67

Van Dijk, T.J.M. 1975 Transfer Points and Absolute Accuracy in Digital Aerial Triangulation
M. Sc. Thesis, University of the Witwatersrand, Johannesburg, 1975

Vincent, L.W. Peripheral Equipment for Minicomputers
A Practical Guide to Minicomputer Applications, IEEE Press; 57-58

Von Gruber, O. 1930 Photogrammetry, Collected Lectures and Essays
Jena 1930 (English Edition - Chapman and Hall, London 1932)

WANG 1975 *Model 2200 Systems Maintenance Manual*
Wang Laboratories Inc, Tewkesbury, Massachusettes

Weightman, J.A. 1961 Analytical Procedures in Photogrammetry
Photogrammetric Record, 3(18); 483-502

Williams, H.S. & Belling, G.E. 1967 Hybrid Conformal Polynomials
Photogrammetric Engineering, 33(6); 627-634

Williams, H.S. 1974 A Controlled Investigation of the Metrical Requirements and Practical Accuracies of Analytical Photogrammetry
Ph. D. Thesis, University of the Witwatersrand, Johannesburg, 1974

Williams, V.A. & Brazier, H.H. 1964 Aerotriangulation by the Observation of Independent Models
Photogrammetria, 19(7); 275-278

Williams, V.A. & Brazier, H.H. 1965 The Method of Adjustment of Independent Models on the Huddersfield Test Strip
Photogrammetric Record, 5(26); 123-130

Williams, V.A. & Brazier, H.H. 1966 Aerotriangulation by Independent Models : A Comparison with Other Methods
Photogrammetria, 21(3); 95-99

Ziegler, J.R. 1967 *Time Sharing Data Processing Systems*
Prentice-Hall, Englewood Cliffs

APPENDIX A

WANG 2200 MINICOMPUTER ANALYTICAL AERIAL TRIANGULATION

PROGRAM LISTINGS

```
   10 REM ---- "START" ----  DATE & PROJECT NAME ENTRY ROUTINE
   20 REM WRITTEN 08/1977          M. ARBUCKLE
   50 DIM N1(10),N9$25,D0$10,Z1$64,Z$64,Z2$64
  100 SELECT #1B10
  190 LOAD DC R"INPUT" 198, 232
 1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
     :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
 1010 PRINT HEX(030A0A);TAB(5);"ANALYTICAL PHOTOGRAMMETRY"
     :PRINT TAB(5);"-------------------------"
     :PRINT HEX(0A0A);TAB(5);"PROJECT ";N9$
     :PRINT TAB(5);"DATE ";D0$
 1020 GOSUB '97(1,1,1,"DO YOU WISH TO CHANGE THE PROJECT NAME (Y/N)",1
     ,0)
     :IF Z$<>"Y" THEN 1040
 1030 GOSUB '97(7,6,1,"PROJECT",25,0)
     :N9$=Z$
 1040 GOSUB '97(1,1,1,"DO YOU WISH TO CHANGE THE DATE (Y/N)",1,0)
     :IF Z$="N" THEN 1060
     :IF Z$<>"Y" THEN 1040
 1050 GOSUI '97(8,6,1,"DATE (DD/MM/19YY)",10,0)
     :D0$=Z$
 1060 DBACKSPACE #1,BEG
     :DATA SAVE DC #1,N,F1,N1(),N9$,D0$
     :LOAD DC R"PHOTO804"
```

```
 10REM                          ---- "PHOTO800" ----  VERSION=  1
 15REM  PHOTOGRAMMETRY SYSTEM        INPUT ROUTINES
 20REM WRITTEN BY= M. ARBUCKLE  DATE= 02/08/77
 30DIM Z$64,R$8,Z1$64,Z2$60,Z3$1,Z4$1,Z5$30,Z6$3,Z7$3,Z8$8,Z0$10,R1$
   64
 70 DATA "NEW PROJECT","PHOTO107","INPUT N,F1,N1(),PROJECT NAME","
   PHOTO100","INPUT PLATE COORDINATES","PHOTO101","INPUT STRIP CONTR
   OL","PHOTO102","INPUT BLOCK CONTROL (AMER)","PHOTO103"
 71 DATA "INPUT CHECK POINTS","PHOTO104","INPUT TIE/CNTRL PT STATU
   S (AMER)","PHOTO105","INPUT TIE/CNTRL PT STATUS (SCHUT)","PHOTO10
   6","RETURN TO MAIN MENU","PHOTO804"
100SELECT DISK B10
190GOTO 1000
199RETURN
202DEFFN'98(Z5,Z6,Z7)
   :IF Z5=0 THEN  203
   :Z5=Z5-1
   :PRINT HEX(010D)
   :IF Z5=0 THEN  203
   :INIT(0A)Z1$
   :PRINT STR(Z1$,1,Z5)
203IF Z7=0 THEN  204
   :FOR Z=1 TO Z7
   :PRINT TAB(63)
   :NEXT Z
   :IF Z7=0 THEN  204
   :INIT(0C)Z1$
   :PRINT STR(Z1$,1,Z7)
204IF Z6=0 THEN  199
   :Z6=Z6-1
   :PRINT HEX(0D)
   :IF Z6=0 THEN  199
   :INIT(09)Z1$
   :PRINT STR(Z1$,1,Z6)
   :RETURN
205DEFFN'30"SCRATCH T ";HEX(22);"PHOTO800";HEX(22)
   :RETURN
206DEFFN'31"SAVE DC T (";HEX(22);"PHOTO800";HEX(22);")";HEX(22);"P
   HOTO800";HEX(22)
   :RETURN
207DEFFN'0"LIST S 1000,9999"
   :RETURN
209DEFFN'97(Z1,Z2,Z3,Z2$,Z4,Z8)
210GOSUB '98(Z1,Z2,Z3)
   :Z1$=Z2$
   :Z5=LEN(Z1$)+1
   :STR(Z1$,Z5,3)=HEX(20205B)
   :INIT(2E)STR(Z1$,LEN(Z1$)+1,Z4)
   :STR(Z1$,LEN(Z1$)+1,1)=HEX(5D)
   :PRINT Z1$;
   :Z3$=HEX(00)
211PRINT HEX(0D);
   :GOSUB '98(0,LEN(Z1$)-Z4-1,Z8,0)
```

```
    :FOR Z=1 TO Z4+1
212KEYIN STR(Z$,Z,1), 213, 220
    :GOTO  212
213ADD(Z3$,01)
    :IF Z3$<HEX(40) THEN  214
    :GOSUB '98(Z1,Z2+Z+3,0)
    :Z3$=HEX(00)
214IF STR(Z$,Z,1)<>HEX(09) THEN  216
    :STR(Z$,Z,1)=HEX(20)
    :IF Z=1 THEN  212
    :Z=Z-2
    :IF Z=0 THEN  215
    :STR(Z$,Z+1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
215STR(Z$,1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
216PRINT STR(Z$,Z,1);
    :IF STR(Z$,Z,1)<>HEX(0D) THEN  217
    :Z=Z4+1
217NEXT Z
    :IF POS(Z$=0D)=0 THEN  221
    :STR(Z$,POS(Z$=0D),1)=HEX(20)
    :IF Z8<>0 THEN  218
    :RETURN
218IF STR(Z$,1,1)<>HEX(20) THEN  219
    :Z$="0"
219IF NUM(Z$)<Z4 THEN  210
    :CONVERT Z$ TO Z
    :IF Z>Z8 THEN  221
    :RETURN
220IF STR(Z$,Z,1)<>HEX(0F) THEN  212
    :IF Z4$<>"1" THEN  212
    :GOSUB '94(0)
    :Z3$=HEX(00)
    :GOSUB '93(0)
    :GOTO 1000
221PRINT HEX(07)
    :KEYIN Z$, 221, 210
    :GOTO  221
227DEFFN'95(R1$)
    :SELECT PRINT 005(64)
    :PRINT HEX(030A0A0A0A)
    :PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * *"
    :PRINT TAB(5);"*";TAB(51);"*"
228PRINT TAB(5);"*                    SYSTEM  LOADING          *"
    :PRINT TAB(5);"*";TAB(30-INT(LEN(R1$)/2));R1$;TAB(51);"*"
    :PRINT TAB(5);"*";TAB(51);"*"
229PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * *"
    :RETURN
1000SELECT PRINT 005(64)
    :PRINT HEX(030A0A);TAB(5);"DIGITAL PHOTOGRAMMETRY
```

```
1010REM N=NO OF OPTIONS AVAILABLE
     :N=9
     :RESTORE
     :FOR I=1  TO N
     :READ R1$,R$
     :PRINT TAB(5);I;" ";R1$
     :NEXT I
1020GOSUB '97(15,6,0."ENTER THE SELECTED NUMBER",2,9)
     :RESTORE 2*Z-1
     :READ R1$,R$
1030PRINT HEX(03);"YOU HAVE SELECTED  **  ";R1$
1040GOSUB '97(2,1,1,"IS THIS CORRECT (Y/N)",1,0)
     :IF Z$="Y" THEN 1050
     :IF Z$<>"N" THEN 1040
     :GOTO 1000
1050GOSUB '95(R1$)
     :LOAD DC TR$
```

```
10REM                          ---- "PHOTO801" ----  VERSION=  1
15REM  PHOTOGRAMMETRY SYSTEM          EDIT ROUTINES
20REM WRITTEN BY= M. ARBUCKLE  DATE= 02/08/77
30DIM Z$64,R$8,Z1$64,Z2$60,Z3$1,Z4$1,Z5$30,Z6$3,Z7$3,Z8$8,Z0$10,R1$
  64
70 DATA "EDIT PROJECT NAME,FOCAL LENGTH ETC.","PHOTO200","EDIT PL
  ATE COORDINATES","PHOTO201","EDIT STRIP CONTROL","PHOTO202","EDIT
   BLOCK CONTROL (AMER)","PHOTO203"
71 DATA "EDIT CHECK POINTS","PHOTO204","EDIT TIE/CNTRL PT STATUS
  (AMER)","PHOTO205","EDIT TIE/CNTRL PT STATUS (SCHUT)","PHOTO206",
  "RETURN TO MAIN MENU","PHOTO804"
100SELECT DISK B10
190GOTO 1000
199RETURN
202DEFFN'98(Z5,Z6,Z7)
   :IF Z5=0 THEN  203
   :Z5=Z5-1
   :PRINT HEX(010D)
   :IF Z5=0 THEN  203
   :INIT(0A)Z1$
   :PRINT STR(Z1$,1,Z5)
203IF Z7=0 THEN  204
   :FOR Z=1 TO Z7
   :PRINT TAB(63)
   :NEXT Z
   :IF Z7=0 THEN  204
   :INIT(0C)Z1$
   :PRINT STR(Z1$,1,Z7)
204IF Z6=0 THEN  199
   :Z6=Z6-1
   :PRINT HEX(0D)
   :IF Z6=0 THEN  199
   :INIT(09)Z1$
   :PRINT STR(Z1$,1,Z6)
   :RETURN
205DEFFN'30"SCRATCH T ";HEX(22);"PHOTO801";HEX(22)
   :RETURN
206DEFFN'31"SAVE DC T (";HEX(22);"PHOTO801";HEX(22);")";HEX(22);"P
   HOTO801";HEX(22)
   :RETURN
207DEFFN'0"LIST S 1000,9999"
   :RETURN
209DEFFN'97(Z1,Z2,Z3,Z2$,Z4,Z8)
210GOSUB '98(Z1,Z2,Z3)
   :Z1$=Z2$
   :Z5=LEN(Z1$)+1
   :STR(Z1$,Z5,3)=HEX(20205B)
   :INIT(2E)STR(Z1$,LEN(Z1$)+1,Z4)
   :STR(Z1$,LEN(Z1$)+1,1)=HEX(5D)
   :PRINT Z1$;
   :Z3$=HEX(00)
211PRINT HEX(0D);
   :GOSUB '98(0,LEN(Z1$)-Z4-1+Z2,0)
```

```
    :FOR Z=1 TO Z4+1
 212KEYIN STR(Z$,Z,1), 213, 220
    :GOTO  212
 213ADD(Z3$,01)
    :IF Z3$<HEX(40) THEN  214
    :GOSUB '98(Z1,Z2+Z+3,0)
    :Z3$=HEX(00)
 214IF STR(Z$,Z,1)<>HEX(08) THEN  216
    :STR(Z$,Z,1)=HEX(20)
    :IF Z=1 THEN  212
    :Z=Z-2
    :IF Z=0 THEN  215
    :STR(Z$,Z+1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
 215STR(Z$,1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
 216PRINT STR(Z$,Z,1);
    :IF STR(Z$,Z,1)<>HEX(0D) THEN  217
    :Z=Z4+1
 217NEXT Z
    :IF POS(Z$=0D)=0 THEN  221
    :STR(Z$,POS(Z$=0D),1)=HEX(20)
    :IF Z8<>0 THEN  218
    :RETURN
 218IF STR(Z$,1,1)<>HEX(20) THEN  219
    :Z$="0"
 219IF NUM(Z$)<Z4 THEN  210
    :CONVERT Z$ TO Z
    :IF Z>Z8 THEN  221
    :RETURN
 220IF STR(Z$,Z,1)<>HEX(0F) THEN  212
    :IF Z4$<>"1" THEN  212
    :GOSUB '94(0)
    :Z3$=HEX(00)
    :GOSUB '93(0)
    :GOTO 1000
 221PRINT HEX(07)
    :KEYIN Z$, 221, 210
    :GOTO  221
 227DEFFN'95(R1$)
    :SELECT PRINT 005(64)
    :PRINT HEX(030A0A0A0A0A)
    :PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * * * *"
    :PRINT TAB(5);"*";TAB(51);"*"
 228PRINT TAB(5);"*                   SYSTEM  LOADING               *"
    :PRINT TAB(5);"*";TAB(30-INT(LEN(R1$)/2));R1$;TAB(51);"*"
    :PRINT TAB(5);"*";TAB(51);"*"
 229PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * * * *"
    :RETURN
1000SELECT PRINT 005(64)
    :PRINT HEX(020A0A);TAB(5);"DIGITAL PHOTOGRAMMETRY EDIT ROUTINES"
```

```
1010REM N=NO OF OPTIONS AVAILABLE
     :N=8
     :RESTORE
     :FOR I=1  TO N
     :READ R1$,R$
     :PRINT TAB(5);I;" ";R1$
     :NEXT I
1020GOSUB '97(15,6,0,"ENTER THE SELECTED NUMBER",2,8)
     :RESTORE 2*Z-1
     :READ R1$,R$
1030PRINT HEX(03);"YOU HAVE SELECTED  **  ";R1$
1040GOSUB '97(2,1,1,"IS THIS CORRECT (Y/N)",1,0)
     :IF Z$="Y" THEN 1050
     :IF Z$<>"N" THEN 1040
     :GOTO 1000
1050GOSUB '95(R1$)
     :LOAD DC TR$
```

```
10REM                          ---- "PHOTO802" ----  VERSION= 1
15REM  PHOTOGRAMMETRY SYSTEM          OUTPUT ROUTINES
20REM WRITTEN BY= M. ARBUCKLE  DATE= 02/08/77
30DIM Z$64,R$8,Z1$64,Z2$60,Z3$1,Z4$1,Z5$30,Z6$3,Z7$3,Z8$8,Z0$10,R1$
   64
70 DATA "PRINT N,F1","PHOTO300","PRINT PLATE COORDINATES","PHOTO3
   01","PRINT STRIP CONTROL","PHOTO302","PRINT BLOCK CONTROL (AMER)"
   ,"PHOTO303"
71DATA "PRINT CHECK POINTS","PHOTO304","PRINT TIE/CNTRL PT STATUS
    (AMER)","PHOTO305","PRINT TIE/CNTRL PT STATUS (SCHUT)","PHOTO306
   "
73 DATA "PRINT RESIDUALS AT CHECK POINTS","PHOTO307","PRINT FINAL
    BLOCK COORDINATES","PHOTO308","RETURN TO MAIN MENU","PHOTO804"
100SELECT DISK B10
190GOTO 1000
199RETURN
202DEFFN'98(Z5,Z6,Z7)
   :IF Z5=0 THEN  203
   :Z5=Z5-1
   :PRINT HEX(010D)
   :IF Z5=0 THEN  203
   :INIT(0A)Z1$
   :PRINT STR(Z1$,1,Z5)
203IF Z7=0 THEN  204
   :FOR Z=1 TO Z7
   :PRINT TAB(63)
   :NEXT Z
   :IF Z7=0 THEN  204
   :INIT(0C)Z1$
   :PRINT STR(Z1$,1,Z7)
204IF Z6=0 THEN  199
   :Z6=Z6-1
   :PRINT HEX(0D)
   :IF Z6=0 THEN  199
   :INIT(09)Z1$
   :PRINT STR(Z1$,1,Z6)
   :RETURN
205DEFFN'30"SCRATCH T ";HEX(22);"PHOTO802";HEX(22)
   :RETURN
206DEFFN'31"SAVE DC T (";HEX(22);"PHOTO802";HEX(22);")";HEX(22);"PHO
   TO802";HEX(22)
   :RETURN
207DEFFN'0"LIST S 1000,3999"
   :RETURN
209DEFFN'97(Z1,Z2,Z3,Z2$,Z4,Z8)
210GOSUB '98(Z1,Z2,Z3)
   :Z1$=Z2$
   :Z5=LEN(Z1$)+1
   :STR(Z1$,Z5,3)=HEX(20205B)
   :INIT(2E)STR(Z1$,LEN(Z1$)+1,Z4)
   :STR(Z1$,LEN(Z1$)+1,1)=HEX(5D)
   :PRINT Z1$;
   :Z3$=HEX(00)
```

```
    :GOSUB '98(0,LEN(Z1$)-Z4-1+Z2,0)
    :Z$=" "
    :FOR Z=1 TO Z4+1
 212KEYIN STR(Z$,Z,1), 213, 220
    :GOTO  212
 213ADD(Z3$,01)
    :IF Z3$<HEX(40) THEN  214
    :GOSUB '98(Z1,Z2+Z+3,0)
    :Z3$=HEX(00)
 214IF STR(Z$,Z,1)<>HEX(08) THEN  216
    :STR(Z$,Z,1)=HEX(20)
    :IF Z=1 THEN  212
    :Z=Z-2
    :IF Z=0 THEN  215
    :STR(Z$,Z+1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
 215STR(Z$,1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
 216PRINT STR(Z$,Z,1);
    :IF STR(Z$,Z,1)<>HEX(0D) THEN  217
    :Z=Z4+1
 217NEXT Z
    :IF POS(Z$=0D)=0 THEN  221
    :STR(Z$,POS(Z$=0D),1)=HEX(20)
    :IF Z8<>0 THEN  218
    :RETURN
 218IF STR(Z$,1,1)<>HEX(20) THEN  219
    :Z$="0"
 219IF NUM(Z$)<Z4 THEN  210
    :CONVERT Z$ TO Z
    :IF Z>Z8 THEN  221
    :RETURN
 220IF STR(Z$,Z,1)<>HEX(0F) THEN  212
    :IF Z4$<>"1" THEN  212
    :GOSUB '94(0)
    :Z3$=HEX(00)
    :GOSUB '93(0)
    :GOTO 1000
 221PRINT HEX(07)
    :KEYIN Z$, 221, 210
    :GOTO  221
 227DEFFN'95(R1$)
    :SELECT PRINT 005(64)
    :PRINT HEX(030A0A0A0A0A)
    :PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * **"
    :PRINT TAB(5);"*";TAB(51);"*"
 228PRINT TAB(5);"*                    SYSTEM  LOADING         *"
    :PRINT TAB(5);"*";TAB(30-INT(LEN(R1$)/2));R1$;TAB(51);"*"
    :PRINT TAB(5);"*";TAB(51);"*"
 229PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * **"
    :RETURN
1000SELECT PRINT 005(64)
```

```
     :PRINT HEX(030A);TAB(5);"DIGITAL PHOTOGRAMMETRY OUTPUT ROUTINES"
     :PRINT
1010REM N=NO OF OPTIONS AVAILABLE
     :N=10
     :RESTORE
     :FOR I=1  TO N
     :READ R1$,R$
     :PRINT TAB(5);I:" ";R1$
     :NEXT I
1020GOSUB '97(15,6,0,"ENTER THE SELECTED NUMBER",2,10)
     :RESTORE 2*Z-1
     :READ R1$,R$
1030PRINT HEX(03);"YOU HAVE SELECTED  **  ";R1$
1040GOSUB '97(2,1,1,"IS THIS CORRECT (Y/N)",1,0)
     :IF Z$="Y" THEN 1050
     :IF Z$<>"N" THEN 1040
     :GOTO 1000
1050GOSUB '95(R1$)
     :LOAD DC TR$
```

```
 10REM                    ---- "PHOTO803" ----  VERSION=  1
 15REM  PHOTOGRAMMETRY SYSTEM        PROCESSING ROUTINES
 20REM WRITTEN BY= M. ARBUCKLE  DATE= 02/08/77
 30DIM Z$64,R$8,Z1$64,Z2$60,Z3$1,Z4$1,Z5$30,Z6$3,Z7$3,Z8$8,Z0$10,R1$
   64
 70 DATA "TRANSFER DATA TO WORK AREAS","PHOTO001","PLATE COORDINAT
   E REFINEMENT","PHOTO405"
 71 DATA "MODEL FORMATION","PHOTO400","STRIP FORMATION","PHOTO401"
   ,"STRIP ADJUSTMENT","PHOTO402","BLOCK ADJUSTMENT (AMER)","PHOTO40
   4","BLOCK ADJUSTMENT (SCHUT)","PHOTO403"
 72 DATA "RETURN TO MAIN MENU","PHOTO804"
100SELECT DISK B10
190GOTO 1000
199RETURN
202DEFFN'98(Z5,Z6,Z7)
    :IF Z5=0 THEN  203
    :Z5=Z5-1
    :PRINT HEX(010D)
    :IF Z5=0 THEN  203
    :INIT(0A)Z1$
    :PRINT STR(Z1$,1,Z5)
203IF Z7=0 THEN  204
    :FOR Z=1 TO Z7
    :PRINT TAB(63)
    :NEXT Z
    :IF Z7=0 THEN  204
    :INIT(0C)Z1$
    :PRINT STR(Z1$,1,Z7)
204IF Z6=0 THEN  199
    :Z6=Z6-1
    :PRINT HEX(0D)
    :IF Z6=0 THEN  199
    :INIT(09)Z1$
    :PRINT STR(Z1$,1,Z6)
    :RETURN
205DEFFN'30"SCRATCH T ";HEX(22);"PHOTO803";HEX(22)
    :RETURN
206DEFFN'31"SAVE DC T (";HEX(22);"PHOTO803";HEX(22);")";HEX(22);"P
    HOTO803";HEX(22)
    :RETURN
207DEFFN'0"LIST S 1000,9999"
    :RETURN
209DEFFN'97(Z1,Z2,Z3,Z2$,Z4,Z8)
210GOSUB '98(Z1,Z2,Z3)
    :Z1$=Z2$
    :Z5=LEN(Z1$)+1
    :STR(Z1$,Z5,3)=HEX(20205B)
    :INIT(2E)STR(Z1$,LEN(Z1$)+1,Z4)
    :STR(Z1$,LEN(Z1$)+1,1)=HEX(5D)
    :PRINT Z1$;
    :Z3$=HEX(0G)
211PRINT HEX(0D);
    :GOSUB '98(0,LEN(Z1$)-Z4-1+Z2,0)
    :Z$=" "
```

```
    :FOR Z=1 TO Z4+1
 212KEYIN STR(Z$,Z,1), 213, 220
    :GOTO  212
 213ADD(Z3$,01)
    :IF Z3$<HEX(40) THEN  214
    :GOSUB '98(Z1,Z2+Z+3,0)
    :Z3$=HEX(00)
 214IF STR(Z$,Z,1)<>HEX(08) THEN  216
    :STR(Z$,Z,1)=HEX(20)
    :IF Z=1 THEN  212
    :Z=Z-2
    :IF Z=0 THEN  215
    :STR(Z$,Z+1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
 215STR(Z$,1,1)=HEX(20)
    :PRINT HEX(082E08);
    :GOTO  217
 216PRINT STR(Z$,Z,1);
    :IF STR(Z$,Z,1)<>HEX(0D) THEN  217
    :Z=Z4+1
 217NEXT Z
    :IF POS(Z$=0D)=0 THEN  221
    :STR(Z$,POS(Z$=0D),1)=HEX(20)
    :IF Z8<>0 THEN  218
    :RETURN
 218IF STR(Z$,1,1)<>HEX(20) THEN  219
    :Z$="0"
 219IF NUM(Z$)<Z4 THEN  210
    :CONVERT Z$ TO Z
    :IF Z>Z8 THEN  221
    :RETURN
 220IF STR(Z$,Z,1)<>HEX(0F) THEN  212
    :IF Z4$<>"1" THEN  212
    :GOSUB '94(0)
    :Z3$=HEX(00)
    :GOSUB '93(0)
    :GOTO 1000
 221PRINT HEX(07)
    :KEYIN Z$, 221, 210
    :GOTO  221
 227DEFFN'95(R1$)
    :SELECT PRINT 005(64)
    :PRINT HEX(030A0A0A0A0A)
    :PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * * *"
    :PRINT TAB(5);"*";TAB(51);"*"
 228PRINT TAB(5);"*                    SYSTEM  LOADING              *"
    :PRINT TAB(5);"*";TAB(30-INT(LEN(R1$)/2));R1$;TAB(51);"*"
    :PRINT TAB(5);"*";TAB(51);"*"
 229PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * * *"
    :RETURN
1000SELECT PRINT 005(64)
    :PRINT HEX(030A0A);TAB(5);"DIGITAL PHOTOGRAMMETRY PROCESSING ROUT
    INES"
```

```
     :PRINT
 1010REM N=NO OF OPTIONS AVAILABLE
     :N=8
     :RESTORE
     :FOR I=1  TO N
     :READ R1$,R$
     :PRINT TAB(5);I;" ";R1$
     :NEXT I
 1020GOSUB '97(15,6,0,"ENTER THE SELECTED NUMBER",2,8)
     :RESTORE 2*Z-1
     :READ R1$,R$
 1030PRINT HEX(03);"YOU HAVE SELECTED  **  ";R1$
 1040GOSUB '97(2,1,1,"IS THIS CORRECT (Y/N)",1,0)
     :IF Z$="Y" THEN 1050
     :IF Z$<>"N" THEN 1040
     :GOTO 1000
 1050GOSUB '95(R1$)
     :LOAD DC TR$
```

```
 10REM                          ---- "PHOTO804" ----  VERSION=  1
 15REM  PHOTOGRAMMETRY SYSTEM          MAIN MENU
 20REM WRITTEN BY= M. ARBUCKLE  DATE= 02/08/77
 30DIM Z$64,R$8,Z1$64,Z2$60,Z3$1,Z4$1,Z5$30,Z6$3,Z7$3,Z8$8,Z0$10,R1$
   64
 70 DATA "INPUT ROUTINES","PHOTO800","EDIT ROUTINES","PHOTO801","O
   UTPUT ROUTINES","PHOTO802","PROCESSING ROUTINES","PHOTO803"
100SELECT DISK B10
190GOTO 1000
199RETURN
202DEFFN'98(Z5,Z6,Z7)
   :IF Z5=0 THEN  203
   :Z5=Z5-1
   :PRINT HEX(010D)
   :IF Z5=0 THEN  203
   :INIT(0A)Z1$
   :PRINT STR(Z1$,1,Z5)
203IF Z7=0 THEN  204
   :FOR Z=1 TO Z7
   :PRINT TAB(63)
   :NEXT Z
   :IF Z7=0 THEN  204
   :INIT(0C)Z1$
   :PRINT STR(Z1$,1,Z7)
204IF Z6=0 THEN  199
   :Z6=Z6-1
   :PRINT HEX(0D)
   :IF Z6=0 THEN  199
   :INIT(09)Z1$
   :PRINT STR(Z1$,1,Z6)
   :RETURN
205DEFFN'30"SCRATCH T ";HEX(22);"PHOTO804";HEX(22)
   :RETURN
206DEFFN'31"SAVE DC T (";HEX(22);"PHOTO804";HEX(22);")";HEX(22);"PHO
   TO804";HEX(22)
   :RETURN
207DEFFN'0"LIST S 1000,9999"
   :RETURN
209DEFFN'97(Z1,Z2,Z3,Z2$,Z4,Z8)
210GOSUB '98(Z1,Z2,Z3)
   :Z1$=Z2$
   :Z5=LEN(Z1$)+1
   :STR(Z1$,Z5,3)=HEX(20205B)
   :INIT(2E)STR(Z1$,LEN(Z1$)+1,Z4)
   :STR(Z1$,LEN(Z1$)+1,1)=HEX(5D)
   :PRINT Z1$;
   :Z3$=HEX(00)
211PRINT HEX(0D);
   :GOSUB '98(0,LEN(Z1$)-Z4-1+Z2,0)
   :Z$=" "
   :FOR Z=1 TO Z4+1
212KEYIN STR(Z$,Z,1), 213, 220
   :GOTO  212
213ADD(Z3$,01)
```

```
     :IF Z3$<HEX(40) THEN  214
     :GOSUB '98(Z1,Z2+Z+3,0)
     :Z3$=HEX(00)
  214IF STR(Z$,Z,1)<>HEX(08) THEN  216
     :STR(Z$,Z,1)=HEX(20)
     :IF Z=1 THEN  212
     :Z=Z-2
     :IF Z=0 THEN  215
     :STR(Z$,Z+1,1)=HEX(20)
     :PRINT HEX(082E08);
     :GOTO  217
  215STR(Z$,1,1)=HEX(20)
     :PRINT HEX(082E08);
     :GOTO  217
  216PRINT STR(Z$,Z,1);
     :IF STR(Z$,Z,1)<>HEX(0D) THEN  217
     :Z=Z4+1
  217NEXT Z
     :IF POS(Z$=0D)=0 THEN  221
     :STR(Z$,POS(Z$=0D),1)=HEX(20)
     :IF Z8<>0 THEN  218
     :RETURN
  218IF STR(Z$,1,1)<>HEX(20) THEN  219
     :Z$="0"
  219IF NUM(Z$)<Z4 THEN  210
     :CONVERT Z$ TO Z
     :IF Z>Z8 THEN  221
     :RETURN
  220IF STR(Z$,Z,1)<>HEX(0F) THEN  212
     :IF Z4$<>"1" THEN  212
     :GOSUB '94(0)
     :Z3$=HEX(00)
     :GOSUB '93(0)
     :GOTO 1000
  221PRINT HEX(07)
     :KEYIN Z$, 221, 210
     :GOTO  221
  227DEFFN'95(R1$)
     :SELECT PRINT 005(64)
     :PRINT HEX(030A0A0A0A)
     :PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * *"
     :PRINT TAB(5);"*";TAB(51);"*"
  228PRINT TAB(5);"*                    SYSTEM  LOADING           *"
     :PRINT TAB(5);"*";TAB(30-INT(LEN(R1$)/2));R1$;TAB(51);"*"
     :PRINT TAB(5);"*";TAB(51);"*"
  229PRINT TAB(5);"* * * * * * * * * * * * * * * * * * * * * * * *"
     :RETURN
 1000SELECT PRINT 005(64)
     :PRINT HEX(030A0A);TAB(5);"DIGITAL PHOTOGRAMMETRY MAIN MENU"
     :PRINT
 1010REM N=NO OF OPTIONS AVAILABLE
     :N=4
     :RESTORE
     :FOR I=1  TO N
```

```
     :READ R1$,R$
     :PRINT TAB(5);I;" ";R1$
     :NEXT I
1020GOSUB '97(15,6,0,"ENTER THE SELECTED NUMBER",2,4)
     :RESTORE 2*Z-1
     :READ R1$,R$
1030PRINT HEX(03);"YOU HAVE SELECTED  **  ";R1$
1040GOSUB '97(2,1,1,"IS THIS CORRECT (Y/N)",1,0)
     :IF Z$="Y" THEN 1050
     :IF Z$<>"N" THEN 1040
     :GOTO 1000
1050GOSUB '95(R1$)
     :LOAD DC TR$
```

```
   10 REM ---- "PHOTO000" ----  PROGRAM TO INITIALIZE DATA FILES
   20 REM WRITTEN 08/1977     M. ARBUCKLE
   50 DIM Z$64,Z1$64,N1(10),D0$10,N9$25
  190 GOTO 1000
  205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO000";HEX(22)
  206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO000";HEX(22);")";HEX(22);"P
     HOTO000";HEX(22)
 1000 PRINT HEX(030A0A);TAB(5);"SETTING UP FILE AREAS"
 1001 DATA SAVE DC OPEN R 3,"PHOTOD01"
      :DATA SAVE DC 0,0,N1(),N9$,D0$
 1010 DATA SAVE DC END
      :DATA SAVE DC OPEN R 1000,"PHOTOD02"
      :DATA SAVE DC END
      :DATA SAVE DC OPEN R 300,"PHOTOD03"
      :DATA SAVE DC END
      :DATA SAVE DC OPEN R 10,"PHOTOD04"
      :DATA SAVE DC END
      :DATA SAVE DC OPEN R 10,"PHOTOD05"
      :DATA SAVE DC END
 1020 DATA SAVE DC OPEN R450,"PHOTOD06"
      :DATA SAVE DC END
      :DATA SAVE DC OPEN R15,"PHOTOD07"
      :DATA SAVE DC END
 1030 LOAD DC R"PHOTO804"
```

PHOTO001   01/10/77   1

```
  10 REM ---- "PHOTO001" ----  PROGRAM TO TRANSFER DATA TO WORK ARE
     AS
  20 REM WRITTEN 09/1977      M. ARBUCKLE
  50 DIM Z$64,Z1$64,N1(10),D0$10,N9$25,X$(30)23,A1$(15)24,A2$(30)24,A
     3$(30)24,A4$(12)41,A5$(40)4
 190 GOTO 1000
 205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO001";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO001";HEX(22);")";HEX(22);"PHO
     TO001";HEX(22)
1000 PRINT HEX(030A0A);TAB(5);"TRANSFERRING DATA TO WORK AREAS"
1001 DATA LOAD DC OPEN R"PHOTOD01"
     :DATA LOAD DC N,F1,N1(),N9$,D0$
     :DATA SAVE DA R(4001,L)N,F1,N1(),N9$,D0$
1010DATA LOAD DC OPEN R"PHOTOD02"
     :L=5000
1020 DATA LOAD DC X$()
     :IF END  THEN 1030
     :DATA SAVE DA R(L,L)X$()
     :GOTO 1020
1030 DATA SAVE DA R(L,L)END
     :DATA LOAD DC OPEN R"PHOTOD03"
     :L=4002
1040 DATA LOAD DC A1$()
     :IF END  THEN 1050
     :DATA SAVE DA R(L,L)A1$()
     :GOTO 1040
1050 DATA SAVE DA R(L,L)END
     :DATA LOAD DC OPEN R"PHOTOD04"
     :DATA LOAD DC A2$()
     :DATA SAVE DA R(4711,L)A2$()
     :DATA SAVE DC END
1060 DATA LOAD DC OPEN R"PHOTOD05"
     :DATA LOAD DC A3$()
     :DATA SAVE DA R(4721,L)A3$()
     :DATA SAVE DC END
1070 DATA LOAD DC OPEN R"PHOTOD06"
     :L=4201
1080 DATA LOAD DC A4$()
     :IF END  THEN 1090
     :DATA SAVE DA R(L,L)A4$()
     :GOTO 1080
1090 DATA SAVE DA R(L,L)END
     :DATA LOAD DC OPEN R"PHOTOD07"
     :L=4052
1100 DATA LOAD DC A5$()
     :IF END  THEN 1110
     :DATA SAVE DA R(L,L)A5$()
     :GOTO 1100
1110 DATA SAVE DA R(L,L)END
     :LOAD DC R"PHOTOB03"
```

```
  10 REM ---- "PHOTO100" ----    PROGRAM TO INPUT NO OF STRIPS, FOC
     AL LENGTH, MODELS PER STRIP, PROJECT NAME
  20 REM WRITTEN     08/08/77          M. ARBUCKLE
  50 DIM N1(10),D0$10,Z3$1,Z1$64,Z$64,N9$25,Z2$64
 190 LOAD DC R"INPUT" 198, 230
 205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO100";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO100";HEX(22);")";HEX(22);"PHO
     TO100";HEX(22)
1000 PRINT HEX(030A0A);TAB(5);"DATA INPUT"
     :J=0
     :DATA LOAD DC OPEN R"PHOTOD01"
     :DATA LOAD DC N,F1,N1(),N9$,D0$
1010 GOSUB '97(5,6,0,"1. ENTER THE PROJECT NAME",25,0)
     :N9$=Z$
     :IF J=1 THEN 1040
1020 GOSUB '97(6,6,0,"2. NUMBER OF STRIPS IN BLOCK",2,10)
     :N=Z
     :IF J=1  THEN 1040
1030 GOSUB '97(7,6,0,"3. FOCAL LENGTH............",6,200)
     :F1=Z
1040J=1
     :GOSUB '97(15,6,1,"ENTER THE NUMBER TO BE CHANGED (0=NO CHANGE",1
     ,3)
     :IF Z=0 THEN 1050
     :P1=Z
     :ON ZGOTO 1010,1020,1030
1050 PRINT HEX(030A);TAB(5);"DATA INPUT   -   ENTER NUMBER OF MODEL
     S PER STRIP"
     :PRINT
     :PRINT TAB(5);"STRIP NO"
1060FOR I=1  TO N
     :CONVERT I TO Z2$,(##)
1061GOSUB '97(I+4,9,0,Z2$,2,99)
     :IF Z<=0 THEN 1061
     :N1(I)=Z
     :NEXT I
1070 GOSUB '97(15,6,1,"ENTER THE NUMBER TO BE CHANGED (0=NO CHANGE",2
     ,10)
     :P1=Z
     :IF Z=0 THEN 1090
1080 CONVERT P1 TO Z2$,(##)
     :GOSUB '97(P1+4,9,0,Z2$,2,99)
     :IF Z<=0 THEN 1080
     :N1(P1)=Z
     :GOTO 1070
1090T=0
     :FOR I=1  TO N
     :T=T+N1(I)
     :NEXT I
     :IF T>200 THEN 2000
     :DATA LOAD DC OPEN R"PHOTOD01"
     :DATA SAVE DC N,F1,N1(),N9$,D0$
1100 LOAD DC R"PHOTOB00"
2000 PRINT HEX(030A0A);TAB(5);"NO OF MODELS EXCEEDS 200 - RE-ENTER DA
```

```
TA"
:FOR I=1  TO 250
:NEXT I
:GOTO 1050
```

```
    10 REM ---- "PHOTO101" ----  INPUT PLATE COORDINATES
    12 REM WRITTEN 08/1977                M. ARBUCKLE
    15 SELECT PRINT 005(64)
    20 DIM A1$(30)23,A2$(60)13,A3$(60)13,A4$(60)13,A5$3,L0$(1)2,J1$2,J2
      $2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
    80% ######     -####.####     -####.####          -####.####     -
      ####.####
    81% ########       ######
    82% PT. NO.        X1             Y1                   X1
       Y1
   100SELECT #1810
   190LOAD DC R"INPUT" 198, 232
   205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO101";HEX(22)
   206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO101";HEX(22);")";HEX(22);"PHO
      TO101";HEX(22)
  1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
      :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
      :DATA LOAD DC OPEN R "PHOTOD02"
      : DSKIP END
  1001 PRINT HEX(0301);"SWITCH ON PRINTER"
      :SELECT PRINT 215(132)
      :PRINT HEX(0C0A0A)
      :J9=INT((66-LEN(N9$))/2)
      :PRINT HEX(0E);TAB(J9);N9$
      :PRINT
      :PRINT HEX(0E);TAB(24);"PLATE COORDINATES"
      :PRINT
      :PRINT TAB(56);D0$
      :PRINT
  1002 SELECT PRINT 005(64)
  1010 J=0
      :J1$="0001"
      :J2$="0005"
  1020 PRINT HEX(030A0A);TAB(5);"PLATE COORDINATE INPUT"
  1030GOSUB '97(6,6,1,"END OF BLOCK (Y/N)",1,0)
      :IF Z$="Y" THEN 1430
      :IF Z$<>"N" THEN 1030
  1040 I=3
      :J=J+1
  1050 GOSUB '97(6,6,1,"PLATE NO.",6,999999)
      :P=Z
  1060 PACK(######)A2$(1)FROM P
      :PACK(+####.####)STR(A2$(1),4,10)FROM 0,0
  1070 GOSUB '97(7,6,1,"P.C. NO.",6,999999)
      :P1=Z
  1080 PACK(######)A2$(2)FROM P1
      :PACK(+####.####)STR(A2$(2),4,10)FROM 0,0
  1081PRINT HEX(01);TAB(5);"SPACE FOR ";29-I;" POINTS"
      :IF I<>3 THEN 1100
  1090PRINT HEX(030A0A);TAB(5);"MODEL COORDINATES INPUT"
  1100 GOSUB '97(6,6,3,"PT NO.",6,999999)
      :P=Z
  1110GOSUB '97(7,6,1,"X1",10,9999.9999)
      :X1=Z
```

```
1120GOSUB '97(8,6,1,"V1",10,9999.9999)
     :Y1=Z
1130 PACK(######)A2$(I)FROM P
1140 PACK(+####.####)STR(A2$(I),4,10)FROM X1,Y1
1150 I=I+1
     :IF P=1  THEN 1160
     :IF P=5  THEN 1160
     :IF I=29 THEN 1151
     :GOTO 1081
1151PRINT HEX(01);TAB(5);"NO MORE SPACE - END MODEL/BLOCK"
     :GOTO 1100
1160 IF J=2  THEN 1170
     :IF P=5  THEN 1170
     :MAT COPY A2$() TO A3$()
     :GOTO 1020
1170 MAT COPY A2$() TO A4$()
     :MAT COPY A3$() TO A2$()
     :MAT COPY A4$() TO A3$()
1180 PRINT HEX(030A0A);TAB(5);"SEARCHING AND SORTING"
1190 I=3
     :K=4
1200 UNPACK(######)A2$(1) TO P
1210 UNPACK(######)A2$(2) TO P1
1220 UNPACK(######)A3$(2) TO P2
1230 PACK(######)A1$(1)FROM P
     :PACK(######)A1$(2)FROM P1
     :PACK(+####.####)STR(A1$(1),4,20)FROM 0,0,0,0
1240 PACK(######)A1$(3)FROM P2
1250 PACK(+####.####)STR(A1$(2),4,20)FROM 0,0,0,0
1260 PACK(+####.####)STR(A1$(3),4,20)FROM 1,0,0,0
1270 INIT(00)L0$()
     :UNPACK(######)STR(A2$(I),1,3) TO P
     :IF P=1  THEN 1370
     :IF P=5  THEN 1370
1280 MAT SEARCH A3$(),=STR(A2$(I),1,3) TO L0$() STEP 13
     :IF L0$(1)=HEX(0000) THEN 1330
1290 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
1300 J=(K1-1)/13+1
1310 UNPACK(+####.####)STR(A2$(I),4,10) TO X1,Y1
1320 UNPACK(+####.####)STR(A3$(J),4,10) TO X2,Y2
1330 I=I+1
1340 PACK(######)A1$(K)FROM P
1350 PACK(+####.####)STR(A1$(K),4,20)FROM X1,Y1,X2,Y2
1360 K=K+1
     :GOTO 1270
1370 GOSUB 1510
1380 PACK(+####.####)STR(A1$(K),4,20)FROM 0,0,0,0
1390 PACK(######)A1$(K)FROM P2
1400 DATA SAVE DC A1$()
     :DATA SAVE DC END
     :DBACKSPACE 16
1410 GOSUB 1440
1420 J=1
     :IF P2=1  THEN 1040
```

```
     :IF P2= 5  THEN 1010
1430 DATA SAVE DC END
     :LOAD DC R"PHOTO800"
1440 I=2
     :SELECT PRINT 215(132)
     :PRINT
     :PRINT
     :UNPACK(######)A1$(1) TO P
     :PRINT TAB(30);
     :PRINTUSING   81,"MODEL NO",P
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   82
     :PRINT
1450 UNPACK(######)A1$(I) TO A
1460 UNPACK(+####.####)STR(A1$(I),4,20) TO B,C,D,E
1470PRINT TAB(30);
     :PRINTUSING   80,A,B,C,D,E
1480 IF A=1  THEN 1500
     :IF A=5  THEN 1500
1490 I=I+1
     :GOTO 1450
1500 SELECT PRINT 005(64)
     :RETURN
1510 J=3
1520 UNPACK(######)A3$(J) TO P2
1530 IF P2=1  THEN 1540
     :IF P2=5  THEN 1540
     :J=J+1
     :GOTO 1520
1540 RETURN
```

```
  10 REM ---- "PHOTO102" ----  INPUT STRIP CONTROL
  12 REM WRITTEN 08/1977                M. ARBUCKLE
  15 SELECT PRINT 005(64)
  20 DIM A1$(15)24,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
  80% ######   -######.###    -######.###     -######.###     ######
  81%  ########     ######
  82% PT. NO.       X1                V1                 Z1            MODEL N
    O
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO102";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO102";HEX(22);")";HEX(22);"PHO
    TO102";HEX(22)
1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :DATA LOAD DC OPEN R "PHOTOD03"
1010 PRINT HEX(0301);"SWITCH ON PRINTER"
    :SELECT PRINT 215(132)
    :PRINT HEX(0C0A0A)
    :J9=INT((66-LEN(N9$))/2)
    :PRINT HEX(0E);TAB(J9);N9$
    :PRINT
    :PRINT HEX(0E);TAB(27);"STRIP CONTROL"
    :PRINT
    :PRINT TAB(56);D0$
    :PRINT
1020 SELECT PRINT 005(64)
1030 DATA LOAD DC A1$()
    :IF END  THEN 1040
    :J1=J1+1
    :GOTO 1030
1040 J,I1=0
    :J1$="0001"
    :J2$="0005"
1050 PRINT HEX(030A0A);TAB(5);"STRIP CONTROL INPUT"
    :PRINT
    :PRINT TAB(5);"INPUT CONTROL FOR STRIP NO ";J1+1
1060GOSUB '97(6,6,1,"END OF STRIP (Y/N)",1,0)
    :IF Z$="Y" THEN 1220
    :IF Z$<>"N" THEN 1060
1070 I=1
    :GOSUB '98(6,6,1)
1080PRINT HEX(01);TAB(5);"SPACE FOR ";15-I;" POINTS"
1090 GOSUB '97(7,6,5,"PT NO.",6,999999)
    :P=Z
1100GOSUB '97(8,6,1,"X1",11,999999.999)
    :X9=Z
1110GOSUB '97(9,6,1,"Y1",11,999999.999)
    :Y9=Z
1120 GOSUB '97(10,6,1,"Z1",11,999999.999)
    :Z9=Z
1130 GOSUB '97(11,6,1,"MODEL NO",6,999999)
    :M=Z
1140 PACK(######)A1$(I)FROM P
```

```
1150 PACK(+######.###)STR(A1$(I),4,18)FROM X9,Y9,Z9
     :PACK(######)STR(A1$(I),22,3)FROM M
1160 I=I+1
     :IF P=1  THEN 1180
     :IF P=5  THEN 1180
     :IF I=14 THEN 1170
     :GOTO 1080
1170PRINT HEX(01);TAB(5);"NO MORE SPACE - END STRIP"
     :GOTO 1090
1180 DATA SAVE DC A1$()
     :DATA SAVE DC END
     :DBACKSPACE 1S
     :J1=J1+1
1200 GOSUB 1230
1210GOTO 1050
1220 DATA SAVE DC END
     :LOAD DC R"PHOTO800"
1230 I=1
     :I1=I1+1
     :SELECT PRINT 215(132)
     :PRINT
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   B1,"STRIP NO ";I1
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   B2
     :PRINT
1240 UNPACK(######)A1$(I) TO A
1250 UNPACK(+######.###)STR(A1$(I),4,18) TO B,C,D
     :UNPACK(######)STR(A1$(I),22,3) TO M
1260PRINT TAB(30);
     :PRINTUSING   B0,A,B,C,D,M
1270 IF A=1  THEN 1290
     :IF A=5  THEN 1290
1280 I=I+1
     :GOTO 1240
1290 SELECT PRINT 005(64)
     :RETURN
```

```
   10 REM ----- "PHOTO103" ----  INPUT BLOCK CONTROL (AMER ADJUSTMENT
     *
   12 REM WRITTEN 09/1977                 M. ARBUCKLE
   15 SELECT PRINT 005(64)
   20 DIM A1$(30)24,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
   80% ######   -######.#####      -######.#####      -######.#####
   82% PT. NO.        X1                  Y1                  Z1
  100SELECT #1B10
  190LOAD DC R"INPUT" 198, 232
  205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO103";HEX(22)
  206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO103";HEX(22);")";HEX(22);"P
     HOTO103";HEX(22)
 1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
     :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
     :DATA LOAD DC OPEN R "PHOTOD04"
 1010 PRINT HEX(0301);"SWITCH ON PRINTER"
     :SELECT PRINT 215(132)
     :PRINT HEX(0C0A0A)
     :J9=INT((66-LEN(N9$))/2)
     :PRINT HEX(0E);TAB(J9);N9$
     :PRINT
     :PRINT HEX(0E);TAB(23);"BLOCK CONTROL (AMER)"
     :PRINT
     :PRINT TAB(56);D0$
     :PRINT
 1020 SELECT PRINT 005(64)
 1040 J,I1=0
     :J1$="0001"
     :J2$="0005"
 1050 PRINT HEX(030A0A);TAB(5);"BLOCK CONTROL INPUT"
 1070 I=1
 1080PRINT HEX(01);TAB(5);"SPACE FOR ";30-I;" POINTS"
 1090 GOSUB '97(7,6,5,"PT NO.",6,999999)
     :P=Z
 1100GOSUB '97(8,6,1,"X1",11,999999.999)
     :X9=Z
 1110GOSUB '97(9,6,1,"Y1",11,999999.999)
     :Y9=Z
 1120 GOSUB '97(10,6,1,"Z1",11,999999.999)
     :Z9=Z
 1140 PACK(######)A1$(I)FROM P
 1150 PACK(+######.#####)STR(A1$(I),4,21)FROM X9,Y9,Z9
 1160 I=I+1
     :IF P=1  THEN 1180
     :IF P=5  THEN 1180
     :IF I=30 THEN 1170
     :GOTO 1080
 1170PRINT HEX(01);TAB(5);"NO MORE SPACE - END INPUT"
     :GOTO 1090
 1180 DATA SAVE DC A1$()
     :DATA SAVE DC END
 1200 GOSUB 1230
 1220LOAD DC R"PHOTO800"
 1230 I=1
```

```
      :I1=I1+1
      :SELECT PRINT 215(132)
      :PRINT
      :PRINT
      :PRINT TAB(30);
      :PRINTUSING   B2
      :PRINT
 1240 UNPACK(######)A1$(I) TO A
 1250 UNPACK(+#######.#####)STR(A1$(I),4,21) TO B,C,D
 1260PRINT TAB(30);
      :PRINTUSING   B0,A,B,C,D
 1270 IF A=1  THEN 1290
      :IF A=5  THEN 1290
 1280 I=I+1
      :GOTO 1240
 1290 SELECT PRINT 005(64)
      :RETURN
```

```
  10 REM ---- "PHOTO105" ----  INPUT BLOCK TIE/CNTRL PT STATUS (AME
    R)
  12 REM WRITTEN 09/1977                  M. ARBUCKLE
  15 SELECT PRINT 005(64)
  20 DIM A1$(12)41,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
  80% ######       ##
  81% ########   ######
  82% PT. NO.      STATUS
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO105";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO105";HEX(22);")";HEX(22);"PHO
    TO105";HEX(22)
1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :DATA LOAD DC OPEN R "PHOTOD06"
1010 PRINT HEX(0301);"SWITCH ON PRINTER"
    :SELECT PRINT 215(132)
    :PRINT HEX(0C0A0A)
    :J9=INT((66-LEN(N9$))/2)
    :PRINT HEX(0E);TAB(J9);N9$
    :PRINT
    :PRINT HEX(0E);TAB(21);"TIE/CONTROL POINT STATUS"
    :PRINT
    :PRINT TAB(55);D0$
    :PRINT
1020 SELECT PRINT 005(64)
1030 DSKIP END
    :DBACKSPACE 1
    :DATA LOAD DC A1$()
    :IF END  THEN 1031
    :GOTO 1040
1031 J1=0
    :GOTO 1050
1040UNPACK(######)A1$(1) TO J1
1050 PRINT HEX(030A0A);TAB(5);"TIE/CNTRL PT STATUS"
    :PRINT
    :PRINT TAB(5);"LAST MODEL INPUT ";J1
    :INIT(00)A1$()
1060GOSUB '97(6,6,1,"END OF INPUT (Y/N)",1,0)
    :IF Z$="Y" THEN 1220
    :IF Z$<>"N" THEN 1050
1070 I=1
    :GOSUB '98(6,6,1)
1080PRINT HEX(01);TAB(5);"SPACE FOR ";12-I;" POINTS"
1090 GOSUB '97(7,6,5,"PT NO.",6,999999)
    :P=Z
1100GOSUB '97(8,6,1,"STATUS",1,4)
    :X9=Z
1140 PACK(######)A1$(I)FROM P
1150 PACK(##)STR(A1$(I),4,1)FROM X9
1160 I=I+1
    :IF P=1  THEN 1180
    :IF P=5  THEN 1180
```

```
     :IF I=11 THEN 1170
     :GOTO 1080
1170PRIN" HEX(01);TAB(5);"NO MORE SPACE - END MODEL"
     :GOTO 1090
1180 DATA SAVE DC A1$()
     :DATA SAVE DC END
     :DBACKSPACE 1S
     :UNPACK(######)A1$(1) TO J1
1200 GOSUB 1230
1210GOTO 1050
1220 DATA SAVE DC END
     :LOAD DC R"PHOTO800"
1230 I=2
     :UNPACK(######)A1$(1) TO J1
     :SELECT PRINT 215(132)
     :PRINT
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   81,"MODEL NO ";J1
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   82
     :PRINT
1240 UNPACK(######)A1$(I) TO A
1250 UNPACK(##)STR(A1$(I),4,1) TO B
1260PRINT TAB(30);
     :PRINTUSING   80,A,B
1270 IF A=1  THEN 1290
     :IF A=5  THEN 1290
1280 I=I+1
     :GOTO 1240
1290 SELECT PRINT 005(64)
     :RETURN
```

```
 10 REM ---- "PHOTO104" ----  INPUT CHECK POINTS
 12 REM WRITTEN 09/1977                M. ARBUCKLE
 15 SELECT PRINT 005(64)
 20 DIM A1$(30)24,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
 80% ######    -######.#####       -######.#####        -######.#####
 82% PT. NO.         X1                 Y1                   Z1
100SELECT #1B10
190LOAD DC R"INPUT" 198, 232
205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO104";HEX(22)
206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO104";HEX(22);")";HEX(22);"PHO
    TO104";HEX(22)
1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :DATA LOAD DC OPEN R "PHOTOD05"
1010 PRINT HEX(0301);"SWITCH ON PRINTER"
    :SELECT PRINT 215(132)
    :PRINT HEX(0C0A0A)
    :J9=INT((66-LEN(N9$))/2)
    :PRINT HEX(0E);TAB(J9);N9$
    :PRINT
    :PRINT HEX(0E);TAB(27);"CHECK POINTS"
    :PRINT
    :PRINT TAB(56);D0$
    :PRINT
1020 SELECT PRINT 005(64)
1040 J,I1=0
    :J1$="0001"
    :J2$="0005"
1050 PRINT HEX(030A0A);TAB(5);"CHECK POINTS INPUT"
1070 I=1
1080PRINT HEX(01);TAB(5);"SPACE FOR ";30-I;" POINTS"
1090 GOSUB '97(7,6,5,"PT NO.",6,999999)
    :P=Z
1100GOSUB '97(8,6,1,"X1",11,999999.999)
    :X9=Z
1110GOSUB '97(9,6,1,"Y1",11,999999.999)
    :Y9=Z
1120 GOSUB '97(10,6,1,"Z1",11,999999.999)
    :Z9=Z
1140 PACK(######)A1$(I)FROM P
1150 PACK(+######.#####)STR(A1$(I),4,21)FROM X9,Y9,Z9
1160 I=I+1
    :IF P=1  THEN 1180
    :IF P=5  THEN 1180
    :IF I=29 THEN 1170
    :GOTO 1080
1170PRINT HEX(01);TAB(5);"NO MORE SPACE - EHD INPUT"
    :GOTO 1090
1180 DATA SAVE DC A1$()
    :DATA SAVE DC END
1200 GOSUB 1230
1220LOAD DC R"PHOTO800"
1230 I=1
    :I1=I1+1
```

```
     :SELECT PRINT 215(132)
     :PRINT
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   82
     :PRINT
1240 UNPACK(######)A1$(I) TO A
1250 UNPACK(+######.#####)STR(A1$(I),4,21) TO B,C,D
1260PRINT TAB(30);
     :PRINTUSING   80,A,B,C,D
1270 IF A=1  THEN 1290
     :IF A=5  THEN 1290
1280 I=I+1
     :GOTO 1240
1290 SELECT PRINT 005(64)
     :RETURN
```

```
  10 REM ---- "PHOTO106" ----  INPUT BLOCK TIE/CNTRL PT STATUS (SCH
     UT)
  12 REM WRITTEN 08/1977              M. ARBUCKLE
  15 SELECT PRINT 005(64)
  20 DIM A1$(40)4,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
  80% ######          ##
  81% ########    ##
  82% PT. NO.         STATUS
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO106";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO106";HEX(22);")";HEX(22);"PHO
     TO106";HEX(22)
1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
     :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
     :DATA LOAD DC OPEN R "PHOTOD07"
1010 PRINT HEX(0301);"SWITCH ON PRINTER"
     :SELECT PRINT 215(132)
     :PRINT HEX(0C0A0A)
     :J9=INT((66-LEN(N9$))/2)
     :PRINT HEX(0E);TAB(J9);N9$
     :PRINT
     :PRINT HEX(0E);TAB(21);"TIE/CONTROL POINT STATUS"
     :PRINT
     :PRINT TAB(56);D0$
     :PRINT
1020 SELECT PRINT 005(64)
1030 DATA LOAD DC A1$()
     :IF END  THEN 1040
     :J1=J1+1
     :GOTO 1030
1040 J,I1=0
     :J1$="0001"
     :J2$="0005"
1050 PRINT HEX(030A0A);TAB(5);"TIE/CNTRL PT STATUS"
     :PRINT
     :PRINT TAB(5);"INPUT FOR STRIP NO ";J1+1
1060GOSUB '97(6,6,1,"END OF STRIP (Y/N)",1,0)
     :IF Z$="Y" THEN 1220
     :IF Z$<>"N" THEN 1060
1070 I=1
     :GOSUB '98(6,6,1)
1080PRINT HEX(01);TAB(5);"SPACE FOR ";40-I;" POINTS"
1090 GOSUB '97(7,6,5,"PT NO.",6,999999)
     :P=Z
1100GOSUB '97(8,6,1,"X1",1,3)
     :X9=Z
1140 PACK(######)A1$(I)FROM P
1150 PACK(##)STR(A1$(I),4,1)FROM X9
1160 I=I+1
     :IF P=1  THEN 1180
     :IF P=5  THEN 1180
     :IF I=39 THEN 1170
     :GOTO 1080
```

```
1170PRINT HEX(01);TAB(5);"NO MORE SPACE - END STRIP"
     :GOTO 1090
1180 DATA SAVE DC A1$()
     :DATA SAVE DC END
     :DBACKSPACE 16
     :J1=J1+1
1200 GOSUB 1230
1210GOTO 1050
1220 DATA SAVE DC END
     :LOAD DC R"PHOTO800"
1230 I=1
     :I1=I1+1
     :SELECT PRINT 215(132)
     :PRINT
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   81,"STRIP NO ";I1
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   82
     :PRINT
1240 UNPACK(######)A1$(I) TO A
1250 UNPACK(##)STR(A1$(I),4,1) TO B
1260PRINT TAB(30);
     :PRINTUSING   80,A,B
1270 IF A=1  THEN 1290
     :IF A=9  THEN 1290
1280 I=I+1
     :GOTO 1240
1290 SELECT PRINT 005(64)
     :RETURN
```

```
  10 REM ---- "PHOTO107" ----  PROGRAM TO CLEAR FILES FOR NEW PROJE
     CT
  20 REM WRITTEN 08/1977      M. ARBUCKLE
  50 DIM Z$64,Z1$64,N1(10),D0$10,N9$25
 190 GOTO 1000
 205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO107";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO107";HEX(22);")";HEX(22);"P
     HOTO107";HEX(22)
1000 PRINT HEX(030A0A);TAB(5);"CLEARING OLD FILES"
1001 DATA LOAD DC OPEN R "PHOTOD01"
     :DATA SAVE DC 0,0,N1(),N9$,D0$
1010 DATA SAVE DC END
     :DATA LOAD DC OPEN R "PHOTOD02"
     :DATA SAVE DC END
     :DATA LOAD DC OPEN R "PHOTOD03"
     :DATA SAVE DC END
     :DATA LOAD DC OPEN R "PHOTOD04"
     :DATA SAVE DC END
     :DATA LOAD DC OPEN R "PHOTOD05"
     :DATA SAVE DC END
1020 DATA LOAD DC OPEN R"PHOTOD06"
     :DATA SAVE DC END
     :DATA LOAD DC OPEN R"PHOTOD07"
     :DATA SAVE DC END
1030 LOAD DC R"PHOTO800"
```

```
 10 REM ---- "PHOTO200" ----    PROGRAM TO EDIT NO OF STRIPS, FOCA
   L LENGTH, MODELS PER STRIP, PROJECT NAME
 20 REM WRITTEN      08/08/77          M. ARBUCKLE
 50 DIM N1(10),D0$10,Z3$1,Z1$64,Z$64,N9$25,Z2$64
 80DATA "1. PROJECT NAME","2. NUMBER OF STRIPS","3. FOCAL LENGTH"
190 LOAD DC R"INPUT" 198, 230
205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO200";HEX(22)
206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO200";HEX(22);")";HEX(22);"PHO
   TO200";HEX(22)
1000 PRINT HEX(030A0A);TAB(5);"DATA EDIT"
     :J=0
     :DATA LOAD DC OPEN R"PHOTOD01"
     :DATA LOAD DC N,F1,N1(),N9$,D0$
1001 PRINT
     :READ R$
     :PRINT TAB(5);R$;TAB(30);N9$
     :READ R$
     :PRINT TAB(5);R$;TAB(30);N
     :READ R$
     :PRINT TAB(5);R$;TAB(30);F1
     :GOTO 1040
1010GOSUB '97(5,6,1,R$,25,0)
     :N9$=Z$
     :GOTO 1040
1020GOSUB '97(6,6,1,R$,2,99)
     :N=Z
     :GOTO 1040
1030GOSUB '97(7,6,1,R$,6,999.99)
     :F1=Z
1040RESTORE
     :J=1
     :GOSUB '97(15,6,1,"ENTER THE NUMBER TO BE CHANGED (0=NO CHANGE",1
     ,3)
     :IF Z=0 THEN 1050
     :P1=Z
     :RESTORE Z
     :READ R$
     :ON ZGOTO 1010,1020,1030
1050 PRINT HEX(030A);TAB(5);"DATA EDIT"
     :PRINT
     :PRINT TAB(5);"STRIP NO/MODELS PER STRIP"
1060FOR I=1  TO N
     :CONVERT I TO Z2$,(##)
     :PRINT TAB(5);Z2$;"  ";N1(I)
     :NEXT I
1070 GOSUB '97(15,6,1,"ENTER THE NUMBER TO BE CHANGED (0=NO CHANGE"
     ,2,10)
     :P1=Z
     :IF Z=0 THEN 1090
1080 CONVERT P1 TO Z2$,(##)
     :GOSUB '97(P1+4,6,0,Z2$,2,99)
     :IF Z<=0 THEN 1080
     :N1(P1)=Z
     :GOTO 1070
```

```
1090T=0
    :FOR I=1  TO N
    :T=T+N1(I)
    :NEXT I
    :IF T>200 THEN 2000
    :DATA LOAD DC OPEN R"PHOTO01"
    :DATA SAVE DC N,F1,N1(),N9$,D0$
1100 LOAD DC R"PHOTO801"
2000 PRINT HEX(030A0A);TAB(5);"NO OF MODELS EXCEEDS 200 - RE-ENTER
    DATA"
    :FOR I=1  TO 250
    :NEXT I
    :GOTO 1050
```

```
 10 REM ---- "PHOTO201" ----  UPDATE PLATE COORDINATES
 20REM WRITTEN 08/1977          M. ARBUCKLE
 50 DIM A$(30)23,P$3,L0$(1)2,B$1,B1$(30)23,Z2$64,Z$64,Z1$64
100SELECT #1B10
190LOAD DC R"INPUT" 198, 232
205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO201";HEX(22)
206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO201";HEX(22);")";HEX(22);"P
    HOTO201";HEX(22)
300DEFFN'200
    :PRINT HEX(030A0A);TAB(5);"MODEL ";P1;" NOT IN BLOCK RE-ENTER"
    :PRINT HEX(070707)
    :FOR I=1  TO 2500
    :A=I↑2
    :NEXT I
    :RETURN
1000PRINT HEX(030A0A);TAB(5);"EDIT PLATE COORDINATES"
    :PRINT
    :PRINT TAB(5);"1. CHANGE A MODEL NO"
    :PRINT TAB(5);"2. DELETE A POINT"
    :PRINT TAB(5);"3. INSERT A POINT"
    :PRINT TAB(5);"4. CHANGE A POINT"
    :PRINT TAB(5);"5. RETURN TO EDIT MENU"
1010GOSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,5)
    :ON ZGOTO 1260,1310,1440,1050,1580
1050 DATA LOAD DC OPEN F#1,"PHOTOD02"
1070 PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1080GOSUB '97(5,6,1,"MODEL NO. (0 TO END)",6,999999)
    :P1=Z
    :IF Z=0 THEN 1000
1090 PACK(######)P$FROM P1
1100 DATA LOAD  DC #1,A$()
    :IF END   THEN 1101
    :GOTO 1110
1101GOSUB '200
    :GOTO 1000
1110 IF STR(A$(1),1,3)<>P$ THEN 1100
1129GOSUB '97(6,6,1,"POINT NO",6,999999)
    :P2=Z
1130 PACK(######)P$FROM P2
1140 INIT(00)L0$()
1150 MAT SEARCH A$(),=P$ TO L0$() STEP 23
    :IF L0$(1)=HEX(0000) THEN 1160
    :GOTO 1170
1160PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS MODEL"
    :PRINT HEX(070707)
    :FOR I=1 TO 2500
    :A=I↑2
    :NEXT I
    :GOTO 1129
1170 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I=(I-1)/23+1
1180 UNPACK(+####.####)STR(A$(I),4,20) TO X1,Y1,X2,Y2
1190 PRINT "X1 = ";X1,"Y1 = ";Y1,"X2 = ";X2,"Y2 = ";Y2
1191GOSUB '97(8,6,1,"POINT NO",6,999999)
```

```
      :P2=Z
  1195GOSUB '97(9,6,1,"X1",10,9999.9999)
      :X1=Z
  1196GOSUB '97(10,6,1,"Y1",10,9999.9999)
      :Y1=Z
  1197GOSUB '97(11,6,1,"X2",10,9999.9999)
      :X2=Z
      :GOSUB '97(12,6,1,"Y2",10,9999.9999)
      :Y2=Z
  1200PACK(+####.####)STR(A$(I),4,20)FROM X1,Y1,X2,Y2
  1210 PACK(######)A$(I)FROM P2
  1220GOSUB '97(15,6,1,"ANY MORE CORRECTIONS TO THIS MODEL (Y/N)",1,0
      )
  1230 IF Z$="N"  THEN 1250
  1240 PRINT HEX(030A0A0A)
      :GOTO 1129
  1250 DBACKSPACE #1,1
      :DATA SAVE DC #1,A$()
      :GOTO 1000
  1260 DATA LOAD DC OPEN T#1,"PHOTOD02"
  1261PRINT HEX(030A0A);TAB(5);"DATA EDIT"
  1270GOSUB '97(5,6,1,"PRESENT MODEL NO. (0 TO END)",6,999999)
      :P1=Z
      :IF Z=0 THEN 1000
      :PACK(######)P$FROM P1
  1271GOSUB '97(6,6,1,"MODEL'S POSITION IN THE BLOCK ",3,200)
      :P9=Z
      :DSKIP #1,(P9-1)
  1280 DATA LOAD DC #1,A$()
      :IF END   THEN 1281
      :GOTO 1290
  1281GOSUB '200
      :GOTO 1000
  1290 IF STR(A$(1),1,3)<>P$  THEN 1280
  1300GOSUB '97(7,6,1,"NEW MODEL NO.",6,999999)
      :P=Z
      :PACK(######)A$(1)FROM P
      :DBACKSPACE #1,1
      :DATA SAVE DC #1,A$()
      :GOTO 1000
  1310DATA LOAD DC OPEN T#1,"PHOTOD02"
  1311PRINT HEX(030A0A);TAB(5);"DATA EDIT"
  1320GOSUB '97(5,6,1,"MODEL NO. (0 TO END)",6,999999)
      :P1=Z
      :IF Z=0 THEN 1000
      :PACK(######)P$FROM P1
  1330 DATA LOAD DC #1,A$()
      :IF END   THEN 1331
      :GOTO 1340
  1331GOSUB '200
      :GOTO 1000
  1340 IF STR(A$(1),1,3)<>P$ THEN 1330
  1350GOSUB '97(7,6,1,"POINT NO",6,999999)
      :P2=Z
```

```
1351PACK(######)P$FROM P2
1360 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 23
     :IF L0$(1)=HEX(0000) THEN 1361
     :GOTO 1370
1361PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS MODEL"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1350
1370 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/23+1
1380 UNPACK(+####.####)STR(A$(I),4,20) TO X1,Y1,X2,Y2
1390 PRINT "X1 = ";X1,"Y1 = ";Y1,"X2 = ";X2,"Y2 = ";Y2
1400 PACK(######)A$(I)FROM 0
     :INIT(00)B1$()
     :I2=0
1410 FOR I1=1  TO 30
     :IF STR(A$(I1),1,3)=HEX(000000) THEN 1420
     :I2=I2+1
     :B1$(I2)=A$(I1)
1420 NEXT I1
1430 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
1440DATA LOAD DC OPEN T#1,"PHOTOD02"
1441PRINT HEX(030A0A);TAB(5);"EDIT DATA"
1450 GOSUB '97(5,5,1,"MODEL NO. (0 TO END)",6,999999)
     :P1=Z
     :IF Z=0  THEN 1000
     :PACK(######)P$FROM P1
1460 DATA LOAD DC #1,A$()
     :IF END   THEN 1461
     :GOTO 1470
1461GOSUB '200
     :GOTO 1000
1470 IF STR(A$(1),1,3)<>P$ THEN 1460
1480 GOSUB '97(6,6,1,"AFTER PT. NO. ",6,999999)
     :P2=Z
     :PACK(######)P$FROM P2
1490 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 23
     :IF L0$(1)=HEX(0000) THEN 1491
     :GOTO 1500
1491PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS MODEL"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1480
1500 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/23+1
1510 UNPACK(+####.####)STR(A$(I),4,20) TO X1,Y1,X2,Y2
```

```
1520 PRINT "X1 = ";X1,"Y1 = ";Y1,"X2 = ";X2,"Y2 = ";Y2
1530 INIT(00)B1$()
1540 FOR I1=1 TO I
     :B1$(I1)=A$(I1)
     :NEXT I1
     :I2=I1+1
     :I=I+1
1550GOSUB '97(9,6,1,"X1",10,9999.9999)
     :X1=Z
1551GOSUB '97(10,6,1,"Y1",10,9999.9999)
     :Y1=Z
1552GOSUB '97(11,6,1,"X2",10,9999.9999)
     :X2=Z
     :GOSUB '97(12,6,1,"Y2",10,9999.9999)
     :Y2=Z
1559PACK(######)B1$(I2)FROM P
     :PACK(+####.####)STR(B1$(I2),4,20)FROM X1,Y1,X2,Y2
     :I2=I2+1
1560 FOR I1=I TO 29
     :B1$(I2)=A$(I1)
     :I2=I2+1
     :NEXT I1
1570 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
1580 LOAD DC R"PHOTO801"
```

```
  10 REM ---- "PHOTO202" ----  UPDATE STRIP CONTROL
  20REM WRITTEN 08/1977           M. ARBUCKLE
  50 DIM A$(15)24,P$3,L0$(1)2,B$1,B1$(15)24,Z2$64,Z$64,Z1$64
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R";HEX(22);"PHOTO202";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO202";HEX(22);")";HEX(22);"P
    HOTO202";HEX(22)
 300DEFFN'200
    :PRINT HEX(030A0A);TAB(5);"STRIP ";P1;" NOT IN BLOCK RE-ENTER"
    :PRINT HEX(070707)
    :FOR I=1  TO 2500
    :A=I↑2
    :NEXT I
    :RETURN
1000PRINT HEX(030A0A);TAB(5);"EDIT STRIP CONTROL"
    :PRINT
    :PRINT TAB(5);"1. DELETE A POINT"
    :PRINT TAB(5);"2. INSERT A POINT"
    :PRINT TAB(5);"3. CHANGE A POINT"
    :PRINT TAB(5);"4. RETURN TO EDIT MENU"
1010GOSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4)
    :ON ZGOTO 1310,1440,1050,1580
1050 DATA LOAD DC OPEN T#1,"PHOTOD03"
1070 PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1080GOSUB '97(5,6,1,"STRIP NO. (0 TO END)",2,99)
    :P1=Z
    :IF Z=0 THEN 1000
1100FOR I=1  TO P1
    :DATA LOAD  DC #1,A$()
    :IF END   THEN 1101
    :NEXT I
    :GOTO 1129
1101I=P1
    :NEXT I
    :GOSUB '200
    :GOTO 1000
1129GOSUB '97(6,6,1,"POINT NO",6,999999)
    :P2=Z
1130 PACK(######)P$FROM P2
1140 INIT(00)L0$()
1150 MAT SEARCH A$(),=P$ TO L0$() STEP 24
    :IF L0$(1)=HEX(0000) THEN 1160
    :GOTO 1170
1160PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS STRIP"
    :PRINT HEX(070707)
    :FOR I=1 TO 2500
    :A=I↑2
    :NEXT I
    :GOTO 1129
1170 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I=(I-1)/24+1
1180 UNPACK(+######.###)STR(A$(I),4,18) TO X,Y,Z
    :UNPACK(######)STR(A$(I),22,3) TO M
```

```
1190 PRINT "X = ";X,"Y = ";Y,"Z = ";Z,"M = ";M
     :GOSUB '97(9,6,1,"POINT NO",6,999999)
     :P=Z
1195GOSUB '97(10,6,1,"X",10,999999.999)
     :X=Z
1196GOSUB '97(11,6,1,"Y",10,999999.999)
     :Y=Z
1197GOSUB '97(12,6,1,"Z",10,999999.999)
1200PACK(######)A$(I)FROM P
     :PACK(+######.###)STR(A$(I),4,18)FROM X,Y,Z
1201GOSUB '97(13,6,1,"MODEL NO",6,999999)
     :M=Z
     :PACK(######)STR(A$(I),22,3)FROM M
1220GOSUB '97(15,6,1,"ANY MORE CORRECTIONS TO THIS STRIP (Y/N)",1,0)
1230 IF Z$="N"  THEN 1250
1240 PRINT HEX(030A0A0A)
     :GOTO 1129
1250 DBACKSPACE #1,1
     :DATA SAVE DC #1,A$()
     :GOTO 1000
1310DATA LOAD DC OPEN T#1,"PHOTOD03"
1311PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1320GOSUB '97(5,6,1,"STRIP NO. (0 TO END)",2,99)
     :P1=Z
     :IF Z=0 THEN 1000
1330 FOR I=1  TO P1
     :DATA LOAD DC #1,A$()
     :IF END   THEN 1331
     :NEXT I
     :GOTO 1350
1331I=P1
     :NEXT I
     :GOSUB '200
     :GOTO 1000
1350GOSUB '97(7,6,1,"POINT NO",6,999999)
     :P2=Z
1351PACK(######)P$FROM P2
1360 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 24
     :IF L0$(1)<>HEX(0000) THEN 1370
1361PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS STRIP"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1350
1370 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/24+1
1380 UNPACK(+######.###)STR(A$(I),4,18) TO X,Y,Z
     :UNPACK(######)STR(A$(I),22,3) TO M
1390 PRINT "X = ";X,"Y = ";Y,"Z = ";Z,"M = ";M
1391GOSUB '97(15,6,1,"IS THIS THE CORRECT POINT (Y/N)",1,0)
     :IF Z$="Y" THEN 1400
     :IF Z$<>"N" THEN 1391
```

```
      :GOTO 1350
 1400GOSUB '98(15,1,1)
      :PACK(######)A$(I)FROM 0
      :INIT(00)B1$()
      :I2=0
 1410 FOR I1=1  TO 15
      :IF STR(A$(I1),1,3)=HEX(000000) THEN 1420
      :I2=I2+1
      :B1$(I2)=A$(I1)
 1420 NEXT I1
 1430 DBACKSPACE #1,1
      :DATA SAVE DC #1,B1$()
      :GOTO 1000
 1440DATA LOAD DC OPEN T#1,"PHOTOD03"
 1441PRINT HEX(030A0A);TAB(5);"EDIT DATA"
 1450 GOSUB '97(5,6,1,"STRIP NO. (0 TO END)",2,99)
      :P1=Z
      :IF Z=0  THEN 1000
 1460FOR I=1  TO P1
      : DATA LOAD DC #1,A$()
      :IF END   THEN 1461
      :NEXT I
      :GOTO 1480
 1461I=P1
      :NEXT I
      :GOSUB '200
      :GOTO 1000
 1480 GOSUB '97(6,6,1,"AFTER PT. NO. ",6,999999)
      :P2=Z
      :PACK(######)P$FROM P2
 1490 INIT(00)L0$()
      :MAT SEARCH A$(),=P$ TO L0$() STEP 24
      :IF L0$(1)<>HEX(0000) THEN 1500
 1491PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS STRIP"
      :PRINT HEX(070707)
      :FOR I=1 TO 2500
      :A=I↑2
      :NEXT I
      :GOTO 1480
 1500 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
      :I=(I-1)/24+1
 1510 UNPACK(+######.###)STR(A$(I),4,18) TO X,Y,Z
      :UNPACK(######)STR(A$(I),22,3) TO M
 1520 PRINT "X = ";X,"Y = ";Y,"Z = ";Z,"M = ";M
 1530 INIT(00)B1$()
 1540 FOR I1=1 TO I
      :B1$(I1)=A$(I1)
      :NEXT I1
      :I2=I1+1
      :I=I+1
 1550GOSUB '97(9,6,1,"POINT NO",6,999999)
      :P=Z
      :GOSUB '97(10,6,1,"X = ",10,999999.999)
      :X=Z
```

```
1551GOSUB '97(11,6,1,"Y = ",10,999999.999)
     :Y=Z
1552GOSUB '97(12,6,1,"Z = ",10,999999.999)
1559PACK(######)B1$(I2)FROM P
     :PACK(+######.###)STR(B1$(I2),4,18)FROM X,Y,Z
     :GOSUB '97(13,6,1,"MODEL NO",6,999999)
     :M=Z
     :PACK(######)STR(B1$(I2),22,3)FROM M
     :I2=I2+1
1560 FOR I1=I TO 14
     :B1$(I2)=A$(I1)
     :I2=I2+1
     :NEXT I1
1570 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
1580 LOAD DC R"PHOTO801"
```

```
  10 REM ---- "PHOTO203" ----  UPDATE BLOCK CONTROL (AMER)
  20REM WRITTEN 09/1977           M. ARBUCKLE
  50 DIM A$(30)24,P$3,L0$(1)2,B$1,B1$(30)24,Z2$64,Z$64,Z1$64
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R";HEX(22);"PHOTO203";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO203";HEX(22);")";HEX(22);"P
    HOTO203";HEX(22)
1000PRINT HEX(030A0A);TAB(5);"EDIT BLOCK CONTROL"
    :PRINT
    :PRINT TAB(5);"1. DELETE A POINT"
    :PRINT TAB(5);"2. INSERT A POINT"
    :PRINT TAB(5);"3. CHANGE A POINT"
    :PRINT TAB(5);"4. RETURN TO EDIT MENU"
1010GOSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4)
    :ON ZGOTO 1310,1440,1050,1580
1050 DATA LOAD DC OPEN T#1,"PHOTOD04"
    :DATA LOAD DC #1,A$()
1070 PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1129GOSUB '97(6,6,1,"POINT NO",6,999999)
    :P2=Z
1130 PACK(######)P$FROM P2
1140 INIT(00)L0$()
1150 MAT SEARCH A$(),=P$ TO L0$() STEP 24
    :IF L0$(1)=HEX(0000) THEN 1160
    :GOTO 1170
1160PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN BLOCK"
    :PRINT HEX(070707)
    :FOR I=1 TO 2500
    :A=I+2
    :NEXT I
    :GOTO 1129
1170 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I=(I-1)/24+1
1180 UNPACK(+######.#####)STR(A$(I),4,21) TO X,Y,Z
1190 PRINT TAB(5);"X = ";X,"Y = ";Y,"Z = ";Z
    :GOSUB '97(9,6,1,"POINT NO",6,999999)
    :P=Z
1195GOSUB '97(10,6,1,"X",10,999999.999)
    :X=Z
1196GOSUB '97(11,6,1,"Y",10,999999.999)
    :Y=Z
1197GOSUB '97(12,6,1,"Z",10,999999.999)
1200PACK(######)A$(I)FROM P
    :PACK(+######.#####)STR(A$(I),4,21)FROM X,Y,Z
1210 PACK(######)A$(I)FROM P2
1250 DBACKSPACE #1,1
    :DATA SAVE DC #1,A$()
    :GOTO 1000
1310DATA LOAD DC OPEN T#1,"PHOTOD04"
    :DATA LOAD DC #1,A$()
1311PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1350GOSUB '97(7,6,1,"POINT NO",6,999999)
    :P2=Z
```

```
1351PACK(######)P$FROM P2
1360 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 24
     :IF L0$(1)<>HEX(0000) THEN 1370
1361PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN BLOCK"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1350
1370 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/24+1
1380 UNPACK(+######.#####)STR(A$(I),4,21) TO X,Y,Z
1390 PRINT TAB(5);"X = ";X,"Y = ";Y,"Z = ";Z
1391GOSUB '97(15,6,1,"IS THIS THE CORRECT POINT (Y/N)",1,0)
     :IF Z$="Y" THEN 1400
     :IF Z$<>"N" THEN 1391
     :GOTO 1350
1400GOSUB '98(15,1,1)
     :PACK(######)A$(I)FROM 0
     :INIT(00)B1$()
     :I2=0
1410 FOR I1=1  TO 30
     :IF STR(A$(I1),1,3)=HEX(000000) THEN 1420
     :I2=I2+1
     :B1$(I2)=A$(I1)
1420 NEXT I1
1430 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
1440DATA LOAD DC OPEN T#1,"PHOTOD04"
     :DATA LOAD DC #1,A$()
1441PRINT HEX(030A0A);TAB(5);"EDIT DATA"
1480 GOSUB '97(6,6,1,"AFTER PT. NO. ",6,999999)
     :P2=Z
     :PACK(######)P$FROM P2
1490 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 24
     :IF L0$(1)<>HEX(0000) THEN 1500
1491PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN BLOCK"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1480
1500 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/24+1
1510 UNPACK(+######.#####)STR(A$(I),4,21) TO X,Y,Z
1520 PRINT TAB(5);"X = ";X,"Y = ";Y,"Z = ";Z
1530 INIT(00)B1$()
1540 FOR I1=1 TO I
     :B1$(I1)=A$(I1)
     :NEXT I1
     :I2=I1+1
```

```
     :I=I+1
 1550GOSUB '97(9,6,1,"POINT NO",6,999999)
     :P=Z
     :GOSUB '97(10,6,1,"X = ",10,999999.999)
     :X=Z
 1551GOSUB '97(11,6,1,"Y = ",10,999999.999)
     :Y=Z
 1552GOSUB '97(12,6,1,"Z = ",10,999999.999)
 1559PACK(######)B1$(I2)FROM P
     :PACK(+######.#####)STR(B1$(I2),4,21)FROM X,Y,Z
     :I2=I2+1
 1560 FOR I1=I TO 29
     :B1$(I2)=A$(I1)
     :I2=I2+1
     :NEXT I1
 1570 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
 1580 LOAD DC R"PHOTO801"
```

```
  10 REM ---- "PHOTO204" ----  UPDATE CHECK POINTS
  20REM WRITTEN 09/1977          M. ARBUCKLE
  50 DIM A$(30)24,P$3,L0$(1)2,9$1,B1$(30)24,Z2$64,Z$64,Z1$64
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R";HEX(22);"PHOTO204";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO204";HEX(22);")";HEX(22);"P
    HOTO204";HEX(22)
1000PRINT HEX(030A0A);TAB(5);"EDIT CHECK POINTS"
    :PRINT
    :PRINT TAB(5);"1. DELETE A POINT"
    :PRINT TAB(5);"2. INSERT A POINT"
    :PRINT TAB(5);"3. CHANGE A POINT"
    :PRINT TAB(5);"4. RETURN TO EDIT MENU"
1010GOSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4)
    :ON ZGOTO 1310,1440,1050,1580
1050 DATA LOAD DC OPEN T#1,"PHOTOD05"
    :DATA LOAD DC #1,A$()
1070 PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1129GOSUB '97(6,6,1,"POINT NO",6,999999)
    :P2=Z
1130 PACK(######)P$FROM P2
1140 INIT(00)L0$()
1150 MAT SEARCH A$(),=P$ TO L0$() STEP 24
    :IF L0$(1)=HEX(0000) THEN 1160
    :GOTO 1170
1160PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN BLOCK"
    :PRINT HEX(070707)
    :FOR I=1 TO 2500
    :A=I+2
    :NEXT I
    :GOTO 1129
1170 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I=(I-1)/24+1
1180 UNPACK(+######.#####)STR(A$(I),4,21) TO X,Y,Z
1190 PRINT "X = ";X,"Y = ";Y,"Z = ";Z
    :GOSUB '97(9,6,1,"POINT NO",6,999999)
    :P=Z
1195GOSUB '97(10,6,1,"X",10,999999.999)
    :X=Z
1196GOSUB '97(11,6,1,"Y",10,999999.999)
    :Y=Z
1197GOSUB '97(12,6,1,"Z",10,999999.999)
1200PACK(######)A$(I)FROM P
    :PACK(+######.#####)STR(A$(I),4,21)FROM X,Y,Z
1210 PACK(######)A$(I)FROM P2
1250 DBACKSPACE #1,1
    :DATA SAVE DC #1,A$()
    :GOTO 1000
1310DATA LOAD DC OPEN T#1,"PHOTOD05"
    :DATA LOAD DC #1,A$()
1311PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1350GOSUB '97(7,6,1,"POINT NO",6,999999)
    :P2=Z
```

```
1351PACK(######)P$FROM P2
1360 INIT(00)LO$()
     :MAT SEARCH A$(),=P$ TO LO$() STEP 24
     :IF LO$(1)<>HEX(0000) THEN 1370
1361PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN BLOCK"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1350
1370 I=256*VAL(STR(LO$(1),1,1))+VAL(STR(LO$(1),2))
     :I=(I-1)/24+1
1380 UNPACK(+######.#####)STR(A$(I),4,21) TO X,Y,Z
1390 PRINT "X = ";X,"Y = ";Y,"Z = ";Z
1391GOSUB '97(15,6,1,"IS THIS THE CORRECT POINT (Y/N)",1,0)
     :IF Z$="Y" THEN 1400
     :IF Z$<>"N" THEN 1391
     :GOTO 1350
1400GOSUB '98(15,1,1)
     :PACK(######)A$(I)FROM 0
     :INIT(00)B1$()
     :I2=0
1410 FOR I1=1  TO 30
     :IF STR(A$(I1),1,3)=HEX(000000) THEN 1420
     :I2=I2+1
     :B1$(I2)=A$(I1)
1420 NEXT I1
1430 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
1440DATA LOAD DC OPEN T#1,"PHOTOD05"
     :DATA LOAD DC #1,A$()
1441PRINT HEX(030A0A);TAB(5);"EDIT DATA"
1480 GOSUB '97(6,6,1,"AFTER PT. NO. ",6,999999)
     :P2=Z
     :PACK(######)P$FROM P2
1490 INIT(00)LO$()
     :MAT SEARCH A$(),=P$ TO LO$() STEP 24
     :IF LO$(1)<>HEX(0000) THEN 1500
1491PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN BLOCK"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1490
1500 I=256*VAL(STR(LO$(1),1,1))+VAL(STR(LO$(1),2))
     :I=(I-1)/24+1
1510 UNPACK(+######.#####)STR(A$(I),4,21) TO X,Y,Z
1520 PRINT "X = ";X,"Y = ";Y,"Z = ";Z
1530 INIT(00)B1$()
1540 FOR I1=1 TO I
     :B1$(I1)=A$(I1)
     :NEXT I1
     :I2=I1+1
```

```
     :I=I+1
1550GOSUB '97(9,6,1,"POINT NO",6,999999)
     :P=Z
     :GOSUB '97(10,6,1,"X = ",10,999999.999)
     :X=Z
1551GOSUB '97(11,6,1,"Y = ",10,999999.999)
     :Y=Z
1552GOSUB '97(12,6,1,"Z = ",10,999999.999)
1559PACK(######)B1$(I2)FROM P
     :PACK(+######.#####)STR(B1$(I2),4,21)FROM X,Y,Z
     :I2=I2+1
1560 FOR I1=I TO 29
     :B1$(I2)=A$(I1)
     :I2=I2+1
     :NEXT I1
1570 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
1580 LOAD DC R"PHOTO801"
```

```
  10 REM ---- "PHOTO205" ----  UPDATE TIE/CNTRL PT STATUS (AMER)
  20REM WRITTEN 08/1977          M. ARBUCKLE
  50 DIM A$(12)41,P$3,L0$(1)2,B$1,B1$(12)41,Z2$64,Z$64,Z1$64
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R";HEX(22);"PHOTO205";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO205";HEX(22);")";HEX(22);"P
    HOTO205";HEX(22)
 300DEFFN'200
    :PRINT HEX(030A0A);TAB(5);"MODEL ";P1;" NOT IN BLOCK RE-ENTER"
    :PRINT HEX(070707)
    :FOR I=1  TO 2500
    :A=I↑2
    :NEXT I
    :RETURN
1000PRINT HEX(030A0A);TAB(5);"EDIT TIE/CNTRL PT STATUS"
    :PRINT
    :PRINT TAB(5);"1. DELETE A POINT"
    :PRINT TAB(5);"2. INSERT A POINT"
    :PRINT TAB(5);"3. CHANGE A POINT"
    :PRINT TAB(5);"4. RETURN TO EDIT MENU"
1010GOSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4)
    :ON ZGOTO 1310,1440,1050,1580
1050 DATA LOAD DC OPEN T#1,"PHOTO006"
1070 PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1080GOSUB '97(5,6,1,"MODEL NO. (0 TO END)",6,999999)
    :P1=Z
    :IF Z=0 THEN 1000
1100DATA LOAD  DC #1,A$()
    :IF END   THEN 1101
    :UNPACK(######)A$(1) TO P2
    :IF P1<>P2  THEN 1100
    :GOTO 1129
1101GOSUB '200
    :GOTO 1000
1129GOSUB '97(6,5,1,"POINT NO",6,999999)
    :P2=Z
1130 PACK(######)P$FROM P2
1140 INIT(00)L0$()
1150 MAT SEARCH A$(),=P$ TO L0$() STEP 41
    :IF L0$(1)=HEX(0000) THEN 1160
    :GOTO 1170
1160PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS MODEL"
    :PRINT HEX(070707)
    :FOR I=1 TO 2500
    :A=I↑2
    :NEXT I
    :GOTO 1129
1170 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I=(I-1)/41+1
1180 UNPACK(##)STR(A$(I),4,1) TO X
1190 PRINT TAB(5);"STATUS = ";X
    :GOSUB '97(9,6,1,"POINT NO",6,999999)
    :P=Z
```

```
1195GOSUB '97(10,6,1,"STATUS",1,4)
     :X=Z
1200PACK(######)A$(I)FROM P
     :PACK(##)STR(A$(I),4,1)FROM X
1220GOSUB '97(15,6,1,"ANY MORE CORRECTIONS TO THIS MODF. (Y/N)",1,0)
1230 IF Z$="N"  THEN 1250
1240 PRINT HEX(030A0A0A)
     :GOTO 1129
1250 DBACKSPACE #1,1
     :DATA SAVE DC #1,A$()
     :GOTO 1000
1310DATA LOAD DC OPEN T#1,"PHOTOD06"
1311PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1320GOSUB '97(5,6,1,"MODEL NO. (0 TO END)",6,999999)
     :P1=Z
     :IF Z=0 THEN 1000
1330DATA LOAD DC #1,A$()
     :IF END   THEN 1331
     :UNPACK(######)A$(1) TO P2
     :IF P1<>P2 THEN 1330
     :GOTO 1350
1331GOSUB '200
     :GOTO 1000
1350GOSUB '97(7,6,1,"POINT NO",6,999999)
     :P2=Z
1351PACK(######)P$FROM P2
1360 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 41
     :IF L0$(1)<>HEX(0000) THEN 1370
1361PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS MODEL"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1350
1370 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/41+1
1380 UNPACK(##)STR(A$(I),4,1) TO X
1390 PRINT TAB(5);"STATUS = ";X
1391GOSUB '97(15,6,1,"IS THIS THE CORRECT POINT (Y/N)",1,0)
     :IF Z$="Y" THEN 1400
     :IF Z$<>"N" THEN 1391
     :GOTO 1350
1400GOSUB '98(15,1,1)
     :PACK(######)A$(I)FROM 0
     :INIT(00)B1$()
     :I2=0
1410 FOR I1=1  TO 12
     :IF STR(A$(I1),1,3)=HEX(000000) THEN 1420
     :I2=I2+1
     :B1$(I2)=A$(I1)
1420 NEXT I1
1430 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
```

```
     :GOTO 1000
1440DATA LOAD DC OPEN T#1,"PHOTOD06"
1441PRINT HEX(030A0A);TAB(5);"EDIT DATA"
1450 GOSUB '97(5,6,1,"MODEL NO. (0 TO END)",6,999999)
     :P1=Z
     :IF Z=0  THEN 1000
1460 DATA LOAD DC #1,A$()
     :IF END   THEN 1461
     :UNPACK(######)A$(1) TO P2
     :IF P1<>P2 THEN 1460
     :GOTO 1480
1461GOSUB '200
     :GOTO 1000
1480 GOSUB '97(6,6,1,"AFTER PT. NO. ",6,999999)
     :P2=Z
     :PACK(######)P$FROM P2
1490 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 41
     :IF L0$(1)<>HEX(0000) THEN 1500
1491PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS STRIP"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1480
1500 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/41+1
1510 UNPACK(##)STR(A$(I),4,1) TO X
1520 PRINT TAB(5);"STATUS = ";X
1530 INIT(00)B1$()
1540 FOR I1=1 TO I
     :B1$(I1)=A$(I1)
     :NEXT I1
     :I2=I1+1
     :I=I+1
1550GOSUB '97(9,6,1,"POINT NO",6,999999)
     :P=Z
     :GOSUB '97(10,6,1,"STATUS",1,4)
     :X=Z
1559PACK(######)B1$(I2)FROM P
     :PACK(##)STR(B1$(I2),4,1)FROM X
     :I2=I2+1
1560 FOR I1=I TO 11
     :B1$(I2)=A$(I1)
     :I2=I2+1
     :NEXT I1
1570 DBACKSPACE #1,1
     :DATA SAVE DC #1,B1$()
     :GOTO 1000
1580 LOAD DC R"PHOTO801"
```

```
  10 REM ---- "PHOTO206" ---- UPDATE TIE/CNTRL PT STATUS (SCHUT)"
  20REM WRITTEN 08/1977          M. ARBUCKLE
  50 DIM A$(40)4,P$3,LO$(1)2,B$1,B1$(40)4,Z2$64,Z$64,Z1$64
 100SELECT #1B10
 190LOAD DC R"INPUT" 198, 232
 205DEFFN'30"SCRATCH R";HEX(22);"PHOTO206";HEX(22)
 206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO206";HEX(22);")";HEX(22);"P
    HOTO206";HEX(22)
 300DEFFN'200
    :PRINT HEX(030A0A);TAB(5);"STRIP ";P1;" NOT IN BLOCK RE-ENTER"
    :PRINT HEX(070707)
    :FOR I=1  TO 2500
    :A=I↑2
    :NEXT I
    :RETURN
1000PRINT HEX(030A0A);TAB(5);"EDIT TIE/CNTRL PT STATUS"
    :PRINT
    :PRINT TAB(5);"1. DELETE A POINT"
    :PRINT TAB(5);"2. INSERT A POINT"
    :PRINT TAB(5);"3. CHANGE A POINT"
    :PRINT TAB(5);"4. RETURN TO EDIT MENU"
1010GOSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4)
    :ON ZGOTO 1310,1440,1050,1580
1050 DATA LOAD DC OPEN T#1,"PHOTO007"
1070 PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1080GOSUB '97(5,6,1,"STRIP NO. (0 TO END)",2,99)
    :P1=Z
    :IF Z=0 THEN 1000
1100FOR I=1  TO P1
    :DATA LOAD  DC #1,A$()
    :IF END   THEN 1101
    :NEXT I
    :GOTO 1129
1101I=P1
    :NEXT I
    :GOSUB '200
    :GOTO 1000
1129GOSUB '97(6,6,1,"POINT NO",6,999999)
    :P2=Z
1130 PACK(######)P$FROM P2
1140 INIT(00)LO$()
1150 MAT SEARCH A$(),=P$ TO LO$() STEP 4
    :IF LO$(1)=HEX(0000) THEN 1160
    :GOTO 1170
1160PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS STRIP"
    :PRINT HEX(070707)
    :FOR I=1 TO 2500
    :A=I↑2
    :NEXT I
    :GOTO 1129
1170 I=256*VAL(STR(LO$(1),1,1))+VAL(STR(LO$(1),2))
    :I=(I-1)/4+1
1180 UNPACK(##)STR(A$(I),4,1) TO X
1190 PRINT  TAB(5);"STATUS = ";X
```

```
     :GOSUB '97(9,6,1,"POINT NO",6,999999)
     :P=Z
1195GOSUB '97(10,6,1,"STATUS",1,3)
     :X=Z
1200PACK(######)A$(I)FROM P
     :PACK(##)STR(A$(I),4,1)FROM X
1220GOSUB '97(15,6,1,"ANY MORE CORRECTIONS TO THIS STRIP (Y/N)",1,0)
1230 IF Z$="N"  THEN 1250
1240 PRINT HEX(030A0A0A)
     :GOTO 1129
1250 DBACKSPACE #1,1
     :DATA SAVE DC #1,A$()
     :GOTO 1000
1310DATA LOAD DC OPEN T#1,"PHOTOD07"
1311PRINT HEX(030A0A);TAB(5);"DATA EDIT"
1320GOSUB '97(5,6,1,"STRIP NO. (0 TO END)",2,99)
     :P1=Z
     :IF Z=0 THEN 1000
1330 FOR I=1  TO P1
     :DATA LOAD DC #1,A$()
     :IF END   THEN 1331
     :NEXT I
     :GOTO 1350
1331I=P1
     :NEXT I
     :GOSUB '200
     :GOTO 1000
1350GOSUB '97(7,6,1,"POINT NO",6,999999)
     :P2=Z
1351PACK(######)P$FROM P2
1360 INIT(00)L0$()
     :MAT SEARCH A$(),=P$ TO L0$() STEP 4
     :IF L0$(1)<>HEX(0000) THEN 1370
1361PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS STRIP"
     :PRINT HEX(070707)
     :FOR I=1 TO 2500
     :A=I↑2
     :NEXT I
     :GOTO 1350
1370 I=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I=(I-1)/4+1
1380 UNPACK(##)STR(A$(I),4,1) TO X
1390 PRINT TAB(5);"STATUS = ";X
1391GOSUB '97(15,6,1,"IS THIS THE CORRECT POINT (Y/N)",1,0)
     :IF Z$="Y" THEN 1400
     :IF Z$<>"N" THEN 1391
     :GOTO 1350
1400GOSUB '98(15,1,1)
     :PACK(######)A$(I)FROM 0
     :INIT(00)B1$()
     :I2=0
1410 FOR I1=1  TO 40
     :IF STR(A$(I1),1,3)=HEX(000000) THEN 1420
     :I2=I2+1
```

```
      :B1$(I2)=A$(I1)
1420 NEXT I1
1430 D...CKBPACE #1,1
      :DATA SAVE DC #1,B1$()
      :GOTO 1000
1440DATA LOAD DC OPEN T#1,"PHOTOD07"
1441PRINT HEX(030A0A);TAB(5);"EDIT DATA"
1450 GOSUB '97(5,6,1,"STRIP NO. (0 TO END)",2,99)
      :P1=Z
      :IF Z=0  THEN 1000
1460FOR I=1  TO P1
      : DATA LOAD DC #1,A$()
      :IF END   THEN 1461
      :NEXT I
      :GOTO 1480
1461I=P1
      :NEXT I
      :GOSUB '200
      :GOTO 1000
1480 GOSUB '97(6,6,1,"AFTER PT. NO. ",6,999999)
      :P2=Z
      :PACK(######)P$FROM P2
1490 INIT(00)LO$()
      :MAT SEARCH A$(),=P$ TO LO$() STEP 4
      :IF LO$(1)<>HEX(0000) THEN 1500
1491PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS STRIP"
      :PRINT HEX(070707)
      :FOR I=1 TO 2500
      :A=I+2
      :NEXT I
      :GOTO 1480
1500 I=256*VAL(STR(LO$(1),1,1))+VAL(STR(LO$(1),2))
      :I=(I-1)/4+1
1510 UNPACK(##)STR(A$(I),4,1) TO X
1520 PRINT TAB(5);"STATUS = ";X
1530 INIT(00)B1$()
1540 FOR I1=1 TO I
      :B1$(I1)=A$(I1)
      :NEXT I1
      :I2=I1+1
      :I=I+1
1550GOSUB '97(9,6,1,"POINT NO",6,999999)
      :P=Z
      :GOSUB '97(10,6,1,"STATUS",1,3)
      :X=Z
1559PACK(######)B1$(I2)FROM P
      :PACK(##)STR(B1$(I2),4,1)FROM X
      :I2=I2+1
1560 FOR I1=I TO 39
      :B1$(I2)=A$(I1)
      :I2=I2+1
      :NEXT I1
1570 DBACKSPACE #1,1
      :DATA SAVE DC #1,B1$()
```

```
     :GOTO 1000
 1580 LOAD DC R"PHOTO801"
```

```
   10 REM ---- "PHOTO300" ----    OUTPUT NO OF STRIPS, FOCAL LENGTH,
      MODELS PER STRIP, PROJECT NAME
   20 REM WRITTEN     08/08/77        M. ARBUCKLE
   50 DIM N1(10),D0$10,Z3$1,Z1$64,Z$64,N9$25,Z2$64
   80%                                                    NO OF STRI
     PS                   ##
   81%                                                    FOCAL LENGTH
                  ###.##
   82%                                                    MODELS PER
      STRIP
   83%                                                    STRIP NO
               NO OF MODELS
   84%                                                    ##
                          ###
  100SELECT #1810
  190GOTO 1000
  205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO300";HEX(22)
  206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO300";HEX(22);")";HEX(22);"PHO
      TO300";HEX(22)
 1000PRINT HEX(030A0A);"PRINTING THE PROJECT NAME, NO OF STRIPS ETC"
 1010PRINT HEX(01);"SWITCH ON THE PRINTER"
      :SELECT PRINT 215(132)
      :PRINT HEX(0C0A0A)
      :SELECT PRINT 005(64)
      :PRINT HEX(01);TAB(64)
      :SELECT PRINT 215(132)
 1020DATA LOAD DC OPEN T#1,"PHOTOD01"
      :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
      :J9=INT(66-LEN(N9$))/2
 1030PRINT HEX(0E);TAB(J9);N9$
      :PRINT
      :PRINT TAB(59);D0$
      :PRINT
      :PRINTUSING   80,N
      :PRINT
      :PRINTUSING   81,F1
      :PRINT
      :PRINTUSING   82
      :PRINTUSING   83
      :PRINT
 1040FOR I=1  TO N
      :PRINTUSING   84,I,N1(I)
      :NEXT I
 1050SELECT PRINT 005(64)
      :LOAD DC R"PHOTO802"
```

```
10 REM ---- "PHOTO301" ---- OUTPUT OF PLATE COORDINATES
12 REM WRITTEN 08/1977                M. ARBUCKLE
15 SELECT PRINT 005(64)
20 DIM A1$(30)23,A2$(60)13,A3$(60)13,A4$(60)13,A5$3,L0$(1)2,J1$2,J2
  $2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
80% ######    -####.####     -####.####          -####.####     -
  ####.####
81% ###########    ######
82% PT. NO.       X1              Y1                X2
  Y2
100SELECT #1B10,#2B10
190GOTO 1000
205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO301";HEX(22)
206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO301";HEX(22);")";HEX(22);"P
  HOTO301";HEX(22)
1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :DATA LOAD DC OPEN T#2,"PHOTOD02"
1001 PRINT HEX(0301);"SWITCH ON PRINTER"
    :SELECT PRINT 215(132)
    :PRINT HEX(0C0A0A)
    :J9=INT(66-LEN(N9$))/2
    :PRINT HEX(0E);TAB(J9);N9$
    :PRINT
    :PRINT HEX(0E);TAB(24);"PLATE COORDINATES"
    :PRINT
    :PRINT TAB(56);D0$
    :PRINT
1002 SELECT PRINT 005(64)
1010 J=0
1020 PRINT HEX(030A0A);TAB(5);"PLATE COORDINATE OUTPUT"
    :SELECT PRINT 215(132)
1440 I=2
    :DATA LOAD DC #2,A1$()
    :IF END   THEN 1500
    :PRINT
    :PRINT
    :UNPACK(######)A1$(1) TO P
    :PRINT TAB(50);
    :PRINTUSING   81,"MODEL NO",P
    :PRINT
    :PRINT TAB(30);
    :PRINTUSING   82
    :PRINT
1450 UNPACK(######)A1$(I) TO A
1460 UNPACK(+####.####)STR(A1$(I),4,20) TO B,C,D,E
1470PRINT TAB(30);
    :PRINTUSING   80,A,B,C,D,E
1480 IF A=1  THEN 1440
    :IF A=5  THEN 1440
1490 I=I+1
    :GOTO 1450
1500 SELECT PRINT 005(64)
    :LOAD DC R"PHOTO802"
```

```
   10 REM ---- "PHOTO302" ----  OUTPUT STRIP CONTROL
   12 REM WRITTEN 08/1977              M. ARBUCKLE
   15 SELECT PRINT 005(64)
   20 DIM A1$(15)24,A5$3,J1$2,J2$[illegible]$64,Z$64,Z2$64,N1(10),D0$10,N9$25
   80% ######    -######.###     -#[illegible].###     -######.###     ######
   81%  ########      ######
   82% PT. NO.        X1               Y1               Z1           MODEL N
     O
  100SELECT #1B10
  190GOTO 1000
  205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO302";HEX(22)
  206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO302";HEX(22);")";HEX(22);"PHO
     TO302";HEX(22)
 1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
     :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
     :DATA LOAD DC OPEN R "PHOTOD03"
 1010 PRINT HEX(0301);"SWITCH ON PRINTER"
     :SELECT PRI[illegible] 215(132)
     :PRINT HEX(0C0A0A)
     :J9=INT((66-LEN(N9$))/2)
     :PRINT HEX(0E);TAB(J9);N9$
     :PRINT
     :PRINT HEX(0E);TAB(27);"STRIP CONTROL"
     :PRINT
     :PRINT TAB(56);D0$
     :PRINT
 1011SELECT PRINT 005(64)
     :PRINT HEX(030A0A);TAB(5);"PRINTING STRIP CONTROL"
     :SELECT PRINT 215(132)
 1020DATA LOAD DC A1$()
     :IF END   THEN 1090
 1030 I=1
     :I1=I1+1
     :PRINT
     :PRINT TAB(50);
     :PRINTUSING   81,"STRIP NO";I1
     :PRINT
     :PRINT TAB(30);
     :PRINTUSING   82
     :PRINT
 1040 UNPACK(######)A1$(I) TO A
 1050 UNPACK(+######.###)STR(A1$(I),4,18) TO B,C,D
     :UNPACK(######)STR(A1$(I),22,3) TO M
 1060PRINT TAB(30);
     :PRINTUSING   80,A,B,C,D,M
 1070 IF A=1  THEN 1020
 1080 I=I+1
     :GOTO 1040
 1090SELECT PRINT 005(64)
     :LOAD DC R"PHOTO802"
```

```
10 REM ---- "PHOTO305" ----  OUTPUT TIE/CNTRL PT STATUS (AMER)
12 REM WRITTEN 08/1977                    M. ARBUCKLE
15 SELECT PRINT 005(64)
20 DIM A1$(12)41,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
80% ######         TO
81% #########    ######
82% PT. NO.        STATUS
100SELECT #1B10
190GOTO 1000
205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO305";HEX(22)
206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO305";HEX(22);")";HEX(22);"PHO
   TO305";HEX(22)
1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :DATA LOAD DC OPEN R "PHOTOD06"
1010 PRINT HEX(0301);"SWITCH ON PRINTER"
    :SELECT PRINT 215(132)
    :PRINT HEX(0C0A0A)
    :J9=INT((66-LEN(N9$))/2)
    :PRINT HEX(0E);TAB(J9);N9$
    :PRINT
    :PRINT HEX(0E);TAB(21);"TIE/CONTROL POINT STATUS"
    :PRINT
    :PRINT TAB(56);D0$
    :PRINT
1011SELECT PRINT 005(64)
    :PRINT HEX(030A0A);TAB(5);"PRINTING TIE/CNTRL PT STATUS"
    :SELECT PRINT 215(132)
1020DATA LOAD DC A1$()
    :IF END   THEN 1090
1030 I=2
    :UNPACK(######)A1$(1) TO I1
    :PRINT
    :PRINT TAB(50);
    :PRINTUSING   81,"MODEL NO ";I1
    :PRINT
    :PRINT TAB(50);
    :PRINTUSING   82
    :PRINT
1040 UNPACK(######)A1$(I) TO A
1050 UNPACK(##)STR(A1$(I),4,1) TO B
1060PRINT TAB(50);
    :PRINTUSING   80,A,B
1070 IF A=1  THEN 1020
    :IF A=5  THEN 1020
    1040 UNPACK(######)A1$(I) TO A
1080 1050 UNPACK(##)STR(A1$(I),4,1) TO B
    1060PRINT TAB(50);
1090     :PRINTUSING   80,A,B
    1070 IF A=1  THEN 1020
        :IF A=5  THEN 1020
    1080 I=I+1
        :GOTO 1040
    1090SELECT PRINT 005(64)
        :LOAD DC R"PHOTO802"
```

PHOTO303   01/10/77   1

```
   10 REM ---- "PHOTO303" ----  OUTPUT BLOCK CONTROL
   12 REM WRITTEN 08/1977              M. ARBUCKLE
   15 SELECT PRINT 005(64)
   20 DIM A1$(30)24,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
   80% ######    -######.###     -######.###     -######.###
   81%  ########      ######
   82% PT. .O.       X1              V1              Z1
  100SELECT #1810
  190GOTO 1000
  205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO303";HEX(22)
  206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO303";HEX(22);")";HEX(22);"PHO
     TO303";HEX(22)
 1000 DATA LOAD DC OPEN T#1,"PHOTO001"
     :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
     :DATA LOAD DC OPEN R "PHOTO004"
 1010 PRINT HEX(0301);"SWITCH ON PRINTER"
     :SELECT PRINT 215(132)
     :PRINT HEX(0C0A0A)
     :J9=INT((66-LEN(N9$))/2)
     :PRINT HEX(0E);TAB(J9);N9$
     :PRINT
     :PRINT HEX(0E);TAB(23);"BLOCK CONTROL (AMER)"
     :PRINT
     :PRINT TAB(56);D0$
     :PRINT
 1011SELECT PRINT 005(64)
     :PRINT HEX(030A0A);TAB(5);"PRINTING BLOCK CONTROL"
     :SELECT PRINT 215(132)
 1020 DATA LOAD DC A1$()
     :IF END  THEN 1090
 1030 I=1
     :PRINT TAB(30);
     :PRINTUSING   82
     :PRINT
 1040 UNPACK(######)A1$(I) TO A
 1050 UNPACK(+######.#####)STR(A1$(I),4,21) TO B,C,D
 1060PRINT TAB(30);
     :PRINTUSING   80,A,B,C,D
 1070 IF A=1  THEN 1020
 1080 I=I+1
     :GOTO 1040
 1090SELECT PRINT 005(64)
     :LOAD DC R"PHOTO802"
```

```
   10 REM ---- "PHOTO304" ----  OUTPUT CHECK POINTS
   12 REM WRITTEN 09/1977                 M. ARBUCKLE
   15 SELECT PRINT 005(64)
   20 DIM A1$(30)24,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
   80% ######   -######.#####       -######.#####        -######.#####
   81%  $#######      ######
   82% PT. NO.        X1                       Y1                    Z1
  100SELECT #1B10
  190GOTO 1000
  205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO304";HEX(22)
  206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO304";HEX(22);")";HEX(22);"PHO
     TO304";HEX(22)
 1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
     :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
     :DATA LOAD DC OPEN R "PHOTOD0S"
 1010 PRINT HEX(0301);"SWITCH ON PRINTER"
     :SELECT PRINT 215(132)
     :PRINT HEX(0C0A0A)
     :J9=INT((66-LEN(N9$))/2)
     :PRINT HEX(0E);TAB(J9);N9$
     :PRINT
     :PRINT HEX(0E);TAB(27);"CHECK POINTS"
     :PRINT
     :PRINT TAB(56);D0$
     :PRINT
 1011SELECT PRINT 005(64)
     :PRINT HEX(030A0A);TAB(5);"PRINTING CHECK POINTS"
     :SELECT PRINT 215(132)
 1020 DATA LOAD DC A1$()
     :IF END  THEN 1090
 1030 I=1
     :PRINT TAB(30);
     :PRINTUSING   82
     :PRINT
 1040 UNPACK(######)A1$(I) TO A
 1050 UNPACK(+######.#####)STR(A1$(I),4,21) TO B,C,D
 1060PRINT TAB(2?);
     :PRINTUSING   80,A,B,C,D
 1070 IF A=1  THEN 1020
     :IF A=5 THEN 1020
 1080 I=I+1
     :GOTO 1040
 1090SELECT PRINT 005(64)
     :LOAD DC R"PHOTO802"
```

PHOTO306   01/10/77   1

```
 10 REM ---- "PHOTO306" ----  OUTPUT TIE/CNTRL PT STATUS (SCHUT)
 12 REM WRITTEN 08/1977              M. ARBUCKLE
 15 SELECT PRINT 005(64)
 20 DIM A1$(40)4,A5$3,J1$2,J2$2,Z1$64,Z$64,Z2$64,N1(10),D0$10,N9$25
 80% ######        ##
 81% ########   ##
 82% PT. NO.        STATUS
100SELECT #1B10
190GOTO 1000
205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO306";HEX(22)
206DEFFN'31"SAVE DC R (";HEX(22);"PHOTO306";HEX(22);")";HEX(22);"PHO
    TO306";HEX(22)
1000 DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :DATA LOAD DC OPEN R "PHOTOD07"
1010 PRINT HEX(0301);"SWITCH ON PRINTER"
    :SELECT PRINT 215(132)
    :PRINT HEX(0C0A0A)
    :J9=INT((66-LEN(N9$))/2)
    :PRINT HEX(0E);TAB(J9);N9$
    :PRINT
    :PRINT HEX(0E);TAB(21);"TIE/CONTROL POINT STATUS"
    :PRINT
    :PRINT TAB(56);D0$
    :PRINT
1011SELECT PRINT 005(64)
    :PRINT HEX(030A0A);TAB(5);"PRINTING TIE/CNTRL PT STATUS"
    :SELECT PRINT 215(132)
1020DATA LOAD DC A1$()
    :IF END   THEN 1090
1030 I=1
    :I1=I1+1
    :PRINT
    :PRINT TAB(50);
    :PRINTUSING   81,"STRIP NO ";I1
    :PRINT
    :PRINT TAB(50);
    :PRINTUSING   82
    :PRINT
1040 UNPACK(######)A1$(I) TO A
1050 UNPACK(##)STR(A1$(I),4,1) TO B
1060PRINT TAB(50);
    :PRINTUSING   80,A,B
1070 IF A=1  THEN 1020
1080 I=I+1
    :GOTO 1040
1090SELECT PRINT 005(64)
    :LOAD DC R"PHOTO802"
```

```
10REM ---- "PHOTO307" ----     RESIDUALS AT CHECK POINTS
20REM WRITTEN  07/76                      M. ARBUCKLE
50 DIM A4$(30)24,C1$(30)24,S2(10),L0$(1)2,S1(10),C2$(30)24,Z$64,Z1$
  64,Z2$64,Z3$64,Z4$64,N1(10),N9$25,D0$10
80%  PT. NO.      X              Y             Z             X
  Y             Z          VX        VY       VZ
81%                     MODEL COORINATES                        TERRAIN COORD
  INATES                    RESIDUALS
82% ###### -######.### -######.### -######.### -######.### -#####
  #.### -######.###  -#.###  -#.###  -#.###
83%                 SIGMA X/Y = -#.###          SIGMA Z = -#.###
100 SELECT #1B10
190 LOAD DC R"INPUT" 198, 232
1000 PRINT HEX(030A0A);TAB(5);"RESIDUALS AT CHECK POINTS"
    :PRINT
    :PRINT TAB(5);"1. AMER ADJUSTMENT"
    :PRINT TAB(5);"2. SCHUT ADJUSTMENT"
1001 GOSUB '97(8,6,1,"ENTER THE REQUIRED NO",1,2)
    :IF Z=0 THEN 1001
    :ON ZGOTO 1002,1003
1002L=9000
    :M=12000
    :GOTO 1004
1003L=17000
    :M=12000
1004 DATA LOAD DA R(L,L)C1$()
    :IF END  THEN 1005
    :DATA SAVE DA R(M,M)C1$()
    :GOTO 1004
1005 DATA SAVE DA R(M,M)END
    :PRINT HEX(030A0A);TAB(5);"RESIDUALS AT CHECK POINTS"
    :DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
1010 SELECT PRINT 215(132)
    :J2=INT(66-LEN(N9$))/2
    :PRINT HEX(0C0E);TAB(J2);N9$
    :PRINT
    :PRINT HEX(0E);TAB(20);"RESIDUALS AT CHECK POINTS"
    :PRINT
    :PRINT TAB(59);D0$
    :PRINT
1030 PRINTUSING  81
    :PRINT HEX(0A)
    :PRINTUSING  80
    :PRINT HEX(0A)
1060 DATA LOAD DA R(4721,L)A4$()
    :IF END  THEN 1340
1070 M=12000
    :S=0
    :DATA LOAD DA R(4051,L)S2()
    :DATA LOAD DA R(4001,L)N1,F1,S1()
1080 S=S+1
    :N2=S1(S)
    :IF S=N1+1  THEN 1090
```

```
     :N3=N2+S1(S+1)
     :GOTO 1100
1090 S=N1
     :N3=S1(S)
1100 DATA LOAD DA R(M,M)C1$()
     :IF END  THEN 1310
     :I=2
1110 UNPACK(######)C1$(I) TO A
     :IF A=0  THEN 1300
     :IF A=1  THEN 1100
     :IF A=5  THEN 1080
     :I5=0
1120 INIT(00)L0$()
     :MAT SEARCH A4$(),=STR(C1$(I),1,3) TO L0$() STEP 24
1130 IF L0$(1)=HEX(0000) THEN 1300
     :K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :K2=(K1-1)/24+1
1140 UNPACK(+######.#####)STR(A4$(K2),4,21) TO X1,Y1,Z1
     :X6,Y6,Z6=0
1150 N4=S2(S)+4000
     :FOR J=1  TO N3
1160 DATA LOAD DA R(N4,NS)C2$()
1170 INIT(00)L0$()
     :MAT SEARCH C2$(),=STR(C1$(I),1,3) TO L0$() STEP 24
1180 IF L0$(1)=HEX(0000) THEN 1240
1190 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :K2=(K1-1)/24+1
1200 UNPACK(+######.#####)STR(C2$(K2),4,21) TO X2,Y2,Z2
1210 PACK(######)C2$(K2)FROM 0
1220 DATA SAVE DA R(N4,NS)C2$()
1230 X6=X6+X2
     :Y6=Y6+Y2
     :Z6=Z6+Z2
     :I5=I5+1
1240 N4=NS
     :NEXT J
1250 X=X6/I5
     :Y=Y6/I5
     :Z=Z6/I5
1260 V1=X-X1
     :V2=Y-Y1
     :V3=Z-Z1
     :V4=V4+V1↑2
     :V5=V5+V2↑2
     :V6=V6+V3↑2
     :I7=I7+1
1270 PACK(######)C1$(I)FROM 0
1280 PRINTUSING    82,A,X,Y,Z,X1,Y1,Z1,V1,V2,V3
     :GOTO 1300
1290 PRINTUSING    82,A,X,Y,Z
1300 I=I+1
     :GOTO 1110
1310 V7=SQR((V4+V5)/(2*I7-2))
     :V8=SQR(V6/(I7-1))
```

```
1320 PRINT HEX(0A0A0A)
     :PRINTUSING   83,V7,V8
1340 LOAD DC R"PHOTO802"
```

```
  10REM ---- "PHOTO308" ----     FINAL COORDINATE LIST
  20REM WRITTEN  07/76                      M. ARBUCKLE
  50 DIM A4$(30)24,C1$(30)24,S2(10),L0$(1)2,S1(10),C2$(30)24,Z$64,Z1$
    64,Z2$64,Z3$64,Z4$64,N1(10),N9$25,D0$10
  80%                                                PT. NO.        X
                Y                  Z
  82%                                                            MODEL
    NO ######
  83%                                                ######    -######.
    ###    -######.###    -######.###
 100 SELECT #1B10
 190 LOAD DC R"INPUT" 198, 232
1000 PRINT HEX(030A0A);TAB(5);"FINAL BLOCK COORDINATE LIST"
    :PRINT
    :PRINT TAB(5);"1. AMER ADJUSTMENT"
    :PRINT TAB(5);"2. SCHUT ADJUSTMENT"
1010 GOSUB '97(8,6,1,"ENTER THE REQUIRED NO",1,2)
    :IF Z=0 THEN 1010
    :ON ZGOTO 1020,1030
1020L=9000
    :M=12000
    :GOTO 1040
1030L=17000
    :M=12000
1040 DATA LOAD DA R(L,L)C1$()
    :IF END  THEN 1050
    :DATA SAVE DA R(M,M)C1$()
    :GOTO 1040
1050 DATA SAVE DA R(M,M)END
    :PRINT HEX(030A0A);TAB(5);"FINAL COORDINATE LIST"
1060 SELECT PRINT 215(132)
1070 DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :J2=INT(66-LEN(N9$))/2
    :PRINT HEX(0C0E);TAB(J2);N9$
    :PRINT
1080 PRINT HEX(0E);TAB(22);HEX(0E);"FINAL COORDINATE LIST"
    :PRINT
    :PRINT TAB(59);D0$
    :PRINT
1090 M=12000
1100 DATA LOAD DA R(M,M)C1$()
    :IF END  THEN 1150
    :I=2
    :UNPACK(######)C1$(1) TO A
    :PRINT
    :PRINTUSING   82,A
    :PRINT
    :PRINTUSING   80
    :PRINT
1110 UNPACK(######)C1$(I) TO A
    :IF A=1  THEN 1100
    :IF A=5  THEN 1100
1120 UNPACK(+######.#####)STR(C1$(I),4,21) TO X2,Y2,Z2
```

```
1130 PRINTUSING   83,A,X2,Y2,Z2
     :GOTO 1140
1140 I=I+1
     :GOTO 1110
1150 LOAD DC R"PHOTO802"
```

```
10 REM MODEL FORMATION          ----"PHOTO400"-----
11 REM WRITTEN 10/1975          M. ARBUCKLE
12 PRINT HEX(0C)
20 DIM A(20,5),A1(5,20),A2(5,5),R3(3,1),D2(3,1),X$(30)23,N1(10)
30 DIM V(20,1),A3(5,5),A4(5,20),F(20,1)
40 DIM X(5,1),I1(3,3),S(3,3),S1(3,3),S2(3,3),R2(3,1),X3(5,1),V1(1
  0,1)
50 DIM R(3,3),R1(3,3),C(3,3),D(3,3),L1(1,3),L2(3,1),N9$25,D0$10
51 SELECT #1B10
52 DATA LOAD DC OPEN T#1,"PHOTOD01"
  :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
53 SELECT PRINT 005(64)
54 PRINT HEX(030A0A0A0A0A0A0A);TAB(10);"M O D E L    F O R M A
  T I O N"
55 SELECT PRINT 215(132)
60 N2=5000
  :N4=6000
110 E=1
  :I9=1
  :S5=0.0000001
  :MAT A=ZER
  :MAT F=ZER
  :MAT A4=ZER
  :MAT A3=ZER
  :MAT A2=ZER
  :MAT A1=ZER
  :MAT V=ZER
120 DATA LOAD DA R(N2,N3)X$()
  :IF END  THEN  930
121 I=4
  :J=0
122 UNPACK(######)X$(I) TO P
  :IF P=1  THEN  124
  :IF P=5  THEN  124
123 J=J+1
  :I=I+1
  :GOTO  122
124 N1=J-6
  :N1=N1+3
130 FOR I=4  TO N1
131 J1=I-3
140 UNPACK(+####.####)STR(X$(I),4,20) TO X1,Y1,X2,Y2
150 X1=X1/F1
160 Y1=Y1/F1
170 X2=X2/F1
180 Y2=Y2/F1
190 A(J1,1)=1+Y1*Y2
200 A(J1,2)=-X2*Y1
210 A(J1,3)=-X2
220 A(J1,4)=-(X1-X2)
230 A(J1,5)=X1*Y2-X2*Y1
240 F(J1,1)=Y2-Y1
250 NEXT I
260 MAT A1=TRN(A)
```

```
270 MAT A2=A1*A
280 MAT A3=INV(A2)
290 MAT A4=A3*A1
300 MAT X=A4*F
310 MAT I1=IDN
320 D1=1.+.25*(X(1,1)↑2+X(2,1)↑2+X(3,1)↑2)
330 S(1,1)=0
340 S(1,2)=0.5*X(3,1)
350 S(1,3)=-0.5*X(2,1)
360 S(2,1)=-0.5*X(3,1)
370 S(2,2)=0
380 S(2,3)=0.5*X(1,1)
390 S(3,1)=0.5*X(2,1)
400 S(3,2)=-0.5*X(1,1)
410 S(3,3)=0
420 MAT S1=I1-S
430 MAT S2=S*S1
440 T=2/D1
450 MAT S2=(T)*S2
460 MAT R=I1-S2
470 MAT R1=TRN(R)
480 C(1,1)=0
490 C(1,2)=-X(5,1)
500 C(1,3)=X(4,1)
510 C(2,1)=X(5,1)
520 C(2,2)=0
530 C(2,3)=-1
540 C(3,1)=-X(4,1)
550 C(3,2)=1
560 C(3,3)=0
570 MAT D=R1*C
580 FOR I=4  TO N1
581 J1=I-3
590 UNPACK(+####.####)STR(X$(I),4,20) TO X1,Y1,X2,Y2
600 X1=X1/F1
610 Y1=Y1/F1
620 X2=X2/F1
630 Y2=Y2/F1
640 L1(1,1)=X2
650 L1(1,2)=Y2
660 L1(1,3)=1
670 L2(1,1)=X1
680 L2(2,1)=Y1
690 L2(3,1)=1
700 FOR J=1  TO 3
710 T=0
720 FOR K=1  TO 3
730 T=T+D(J,K)*L2(K,1)
740 NEXT K
750 D2(J,1)=T
760 NEXT J
770 T=0
780 FOR M=1  TO 3
790 T=T+L1(1,M)*D2(M,1)
```

```
800 NEXT M
810 V(J1,1)=T
820 NEXT I
830 I9=I9+1
840 MAT X3=A4*V
850 MAT X=X-X3
860 GOSUB 1400
870 IF ABS(E)<=0.0001  THEN  890
880 GOTO  320
890 GOSUB 1030
900 DATA SAVE DA R(N4,N5)X$()
910 N2=N3
    :N4=N5
920 GOTO  110
930 DATA SAVE DA R(N4,N5)END
940 N4=6000
941J=INT((66-LEN(N9$))/2)
    :PRINT HEX(0C0E);TAB(J);N9$
    :PRINT
    :PRINT HEX(0E);TAB(25);"MODEL FORMATION"
    :PRINT
    :PRINT TAB(59);D0$
    :PRINT
942I=2
    :T=0
    :DATA LOAD DA R(N4,N5)X$()
    :IF END  THEN 1010
943 UNPACK(######)X$(1) TO P
949 PRINT
    :PRINTUSING 1301,P
    :PRINT
    :PRINTUSING 1302
    :PRINT
950 DATA LOAD DA R(N4,N5)X$()
    :IF END  THEN 1010
960 UNPACK(######)X$(I) TO P
    :UNPACK(+#.#######)STR(X$(I),4,20)  TO X4,Y6,Z,Y7
    :IF P=1  THEN  990
    :IF P=5  THEN  990
971 PRINTUSING 1300,P,X4,Y6,Z,Y7
980 T=T+Y7↑2
    :I=I+1
    :GOTO  960
990 S4=SQR(T/(I-9))
    :PRINT
    :PRINTUSING 1310,S4
1000 N4=N5
    :GOTO  942
1010 SELECT PRINT 005(64)
    :LOAD DC R"PHOTO803"
1030 I=4
    :T=0
1050 PACK(+#.#######)STR(X$(3),4,20) FROM 1,X(4,1),X(5,1)
1060 UNPACK(+####.####)STR(X$(I),4,20) TO X1,Y1,X2,Y2
```

```
1070 UNPACK(######)X$(I) TO P
1080 IF P=1  THEN 1290
    :IF P=5  THEN 1290
1090 R3(1,1)=X2/F1
1100 R3(2,1)=Y2/F1
1110 R3(3,1)=1
1120 MAT R2=R*R3
1130 X1=X1/F1
1140 Y1=Y1/F1
1150 Z=(R2(3,1)-R2(1,1)*X(5,1))/(X1*R2(3,1)-R2(1,1))
1160 X4=X1*Z
1170 Y4=Y1*Z
1180 Y5=R2(2,1)*(Z-X(5,1))/R2(3,1)+X(4,1)
1190 Y6=.5*(Y4+Y5)
1200 Y7=F1*(Y4-Y5)/Z
1201 T=T+Y7↑2
1230 PACK(+#.#######)STR(X$(I),4,20)FROM X4,Y6,Z,Y7
1250 I=I+1
    :GOTO 1060
1290 S9=SQR(T/(I-9))
1291 RETURN
1300%                  ######                    -#.#######          -#.####
    ###          -#.#######          -#.###
1301%                                                                MODEL NO
     ######
1302%                  PT NO                     X                   Y
                    Z                   Y PARALLAX
1310%                                            Y PARALLAX STD ERR =
    #.### MM AT PHOTO SCALE
1400 T=0
1405 FOR I=4  TO N1
1410 UNPACK(+####.####)STR(X$(I),4,20) TO X1,Y1,X2,Y2
1420 R3(1,1)=X2/F1
1430 R3(2,1)=Y2/F1
1440 R3(3,1)=1
1450 MAT R2=R*R3
1460 X1=X1/F1
    :Y1=Y1/F1
1470 Z=(R2(3,1)-R2(1,1)*X(5,1))/(X1*R2(3,1)-R2(1,1))
1480 X4=X1*Z
    :Y4=Y1*Z
1490 Y5=R2(2,1)*(Z-X(5,1))/R2(3,1)+X(4,1)
1500 Y7=(Y4-Y5)/Z
    :T=T+Y7↑2
    :NEXT I
1501 T=T*F1
1510 S4=SQR(T/(N1-4))
1520 E=(S4-S5)/S4
1530 S5=S4
    :RETURN
```

```
  10 REM ---- "PHOTO401"  ----   JUNCTION OF ADJACENT MODELS
  11 REM WRITTEN 11/1975        M. ARBUCKLE
  20 DATA LOAD DA R(4001,L3)N,F1
  30 DIM X1$(30)23,X2$(30)23,X1(10),Y1(10),Z1(10),X2(10),Y2(10),Z2(10
    ),A$(30)23,X3(10),Y3(10),Z3(10),L0$(1)2,D0$10,N9$25,N1(10)
  40 DIM A(20,3),F(20,1),A1(3,20),A2(3,3),A3(3,1),X(3,1),R(3,3),R1(
    3,1),R2(3,1),A4(3,3)
  71 SELECT PRINT 005(64)
    :PRINT HEX(030A0A);TAB(5);"STRIP FORMATION"
  72 SELECT #1B10
    :DATA LOAD DC OPEN T#1,"PHOTOD01"
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
    :J2=INT(66-LEN(N9$))/2
  73 SELECT PRINT 215(132)
    :PRINT HEX(0C0E);TAB(J2);N9$
    :PRINT
    :PRINT HEX(0E);TAB(25);"STRIP FORMATION"
    :PRINT
    :PRINT TAB(59);D0$
    :PRINT
  80 L=6000
    :M=7000
  90 INIT(00)X1$()
    :DATA LOAD DA R(L,L)A$()
    :IF END  THEN  150
 100 I=1
 110 UNPACK(######)A$(I) TO P
    :UNPACK(+#.#######)STR(A$(I),4,20) TO X,Y,Z
 120 PACK(######)X1$(I)FROM P
    :PACK(+###.#######)STR(X1$(I),4,18)FROM X,Y,Z
 130 IF P=5  THEN  140
    :IF P=1  THEN  140
    :I=I+1
    :GOTO  110
 140 DATA SAVE DA R(M,M)X1$()
    :GOTO   90
 150 DATA SAVE DA R(M,M)END
 160 M,L=7000
 170 L=M
 180 INIT(00)X1$(),X2$()
    :L1=0
    :DATA LOAD DA R(L,M)X1$()
    :I9=0
 190 DATA LOAD DA R(M,M2)X2$()
    :IF END  THEN 1340
    :MAT A=ZER
    :MAT F=ZER
    :MAT A1=ZER
    :MAT A2=ZER
    :MAT A3=ZER
    :MAT A4=ZER
 200 V4,V5,V6=0
 210 I1=2
    :I=4
```

```
220 UNPACK(+###.#######)STR(X1$(3),4,18) TO X1(1),Y1(1),Z1(1)
230 UNPACK(+###.#######)STR(X2$(2),4,18) TO X2(1),Y2(1),Z2(1)
240 UNPACK(######)X1$(I) TO P1
    :IF P1=1  THEN  331
    :IF P1=5  THEN  331
251 INIT(00)L0$()
    :MAT SEARCH X2$(),=STR(X1$(I),1,3) TO L0$() STEP 23
    :IF L0$(1)=HEX(0000)  THEN  320
252 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
253 I2=(K1-1)/23+1
280 UNPACK(+###.#######)STR(X1$(I),4,18) TO X1(I1),Y1(I1),Z1(I1)
290 UNPACK(+###.#######)STR(X2$(I2),4,18) TO X2(I1),Y2(I1),Z2(I1)
300 IF I1=4  THEN  331
310 I1=I1+1
    :I=I+1
    :GOTO  240
320 I=I+1
    :GOTO  240
330 I1=I1-1
331 I=4
350 H1=X1(3)
    :H2=Y1(3)
360 H3=Z1(3)
    :H4=X2(3)
    :H5=Y2(3)
    :H6=Z2(3)
370 FOR I=1  TO I1
380 X2(I)=X2(I)-H4
390 Y2(I)=Y2(I)-H5
400 Z2(I)=Z2(I)-H6
410 X1(I)=X1(I)-H1
    :Y1(I)=Y1(I)-H2
    :Z1(I)=Z1(I)-H3
420 NEXT I
440 FOR I=1  TO 2
    :I9=I+2
450 T1=(X1(I)-X1(I9))*(X1(I)-X1(I9))+(Y1(I)-Y1(I9))*(Y1(I)-Y1(I9))+(
    Z1(I)-Z1(I9))*(Z1(I)-Z1(I9))
460 T2=(X2(I)-X2(I9))*(X2(I)-X2(I9))+(Y2(I)-Y2(I9))*(Y2(I)-Y2(I9))
    +(Z2(I)-Z2(I9))*(Z2(I)-Z2(I9))
470 L1=SQR(T1/T2)+L1
480 NEXT I
490 L1=L1/2
510 FOR I=1  TO I1
520 X2(I)=X2(I)*L1
530 Y2(I)=Y2(I)*L1
540 Z2(I)=Z2(I)*L1
550 NEXT I
560 FOR I=1  TO I1
570 J=2*I-1
580 K=2*I
590 A(J,1)=0
600 A(J,2)=-(Z1(I)+Z2(I))
610 A(J,3)=X1(I)-X2(I)
```

```
620 A(K,1)=Z1(I)+Z2(I)
630 A(K,2)=0
640 A(K,3)=Y1(I)-Y2(I)
650 F(J,1)=-(Y1(I)+Y2(I))
660 F(K,1)=X1(I)+X2(I)
670 NEXT I
680 MAT A1=TRN(A)
690 MAT A2=A1*A
700 MAT A3=A1*F
710 MAT A4=INV(A2)
720 MAT X=A4*A3
730 MAT X=(-1)*X
740 R(1,1)=X(3,1)*X(3,1)+X(1,1)*X(1,1)-X(2,1)*X(2  )-1
750 R(2,1)=2*(X(1,1)*X(2,1)-X(3,1))
760 R(3,1)=-2*(X(1,1)+X(2,1)*X(3,1))
770 R(1,2)=2*(X(1,1)*X(2,1)+X(3,1))
780 R(2,2)=X(3,1)*X(3,1)-X(1,1)*X(1,1)+X(2,1)*X(2,1)-1
790 R(3,2)=-2*(X(2,1)-X(1,1)*X(3,1))
800 R(1,3)=-2*(X(1,1)-X(2,1)*X(3,1))
810 R(2,3)=-2*(X(2,1)+X(1,1)*X(3,1))
820 R(3,3)=X(3,1)*X(3,1)-X(1,1)*X(1,1)-X(2,1)*X(2,1)+1
830 T1=1/(X(3,1)*X(3,1)+X(1,1)*X(1,1)+X(2,1)*X(2,1)+1)
840 MAT R=(T1)*R
850 T1,T2,T3=0
860 FOR I=1  TO I1
870 R1(1,1)=X2(I)
880 R1(2,1)=Y2(I)
890 R1(3,1)=Z2(I)
900 MAT R2=R*R1
910 T1=T1-R2(1,1)+X1(I)
920 T2=T2-R2(2,1)+Y1(I)
930 T3=T3-R2(3,1)+Z1(I)
940 NEXT I
950 T1=T1/I1
    :T2=T2/I'
    :T3=T3/I1
970 F=F1/H3
    :H1=H1+T1
    :H2=H2+T2
    :H3=H3+T3
980 UNPACK(######)X1$(1) TO B1
    :UNPACK(######)X2$(1) TO B2
990 PRINT "                      JUNCTION OF MODELS ";B1;"-";B2
    :PRINT
    :PRINTUSING 1321
    :PRINT
1000 I=2
    :I2=0
1010 UNPACK(######)X2$(I) TO P1
1020 IF P1=1  THEN 1250
1030 IF P1=5  THEN 1250
1040 UNPACK(+###.#######)STR(X2$(I),4,18) TO X3,Y3,Z3
1050 X3=X3-H4
    :Y3=Y3-H5
```

```
    :Z3=Z3-H6
1060 R1(1,1)=X3*L1
1070 R1(2,1)=Y3*L1
1080 R1(3,1)=Z3*L1
1090 MAT R2=R*R1
1100 X3=R2(1,1)+H1
    :Y3=R2(2,1)+H2
    :Z3=R2(3,1)+H3
    :INIT(00) L0$()
1110 MAT SEARCH X1$(),=STR(X2$(I),1,3) TO L0$() STEP 23
    :IF L0$(1)=HEX(0000) THEN 1220
1120 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
1130 I1=(K1-1)/23+1
1140 UNPACK(+###.#######)STR(X1$(I1),4,18) TO X2,Y2,Z2
1150 V1=X3-X2
    :V2=Y3-Y2
    :V3=Z3-Z2
1160 PRINTUSING 1320,P1,X3,Y3,Z3,X2,Y2,Z2,V1,V2,V3
1170 X3=(X3+X2)*0.5
    :Y3=(Y3+Y2)*0.5
    :Z3=(Z3+Z2)*0.5
1180 V4=V4+V1↑2
    :V5=V5+V2↑2
    :V6=V6+V3↑2
    :I2=I2+1
1190 PACK(+###.#######)STR(X1$(I1),4,18)FROM X3,Y3,Z3
1200 PACK(+###.#######)STR(X2$(I),4,18)FROM X3,Y3,Z3
1210 GOTO 1240
1220 PRINTUSING 1320,P1,X3,Y3,Z3
1230 PACK(+###.#######)STR(X2$(I),4,18)FROM X3,Y3,Z3
1240 I=I+1
    :GOTO 1010
1250 G4=SQR((V4+V5+V6)/(3*I2-3))*F
1260 DATA SAVE DA R(L,M)X1$()
    :DATA SAVE DA R(M,M2)X2$()
    :PRINT
    :PRINT
    :PRINTUSING 1330,G4
    :PRINT
    :PRINT
1270 IF P1=5  THEN 1290
1280 GOTO  170
1290 L=M2
1300 GOTO  180
1320%    ######  +##.#######  +##.#######  +##.#######  +##.#######
    +##.#######  +##.#######  +.###↑↑↑↑  +.###↑↑↑↑  +.###↑↑↑↑
1321%    PT NO.         X2          Y2          Z2          X1
           Y1          Z1          VX          VY          VZ
1330%     SIGMA X/Y/Z  =  #.### MM AT PHOTO SCALE
1340 SELECT PRINT 005(64)
    :PRINT HEX(03)
    :LOAD DC R"PHOTO803"
```

```
10 REM %  ---- "PHOTO402" ----   ABSOLUTE ORIENTATION OF A STRIP
  & STRIP ADJUSTMENT
11REM % WRITTEN 02/1976         M. ARBUCKLE
15 SELECT PRINT 005(64)
  :PRINT HEX(030A0A);TAB(5);"STRIP ADJUSTMENT"
16 SELECT PRINT 215(132),#1B10
  :DATA LOAD DC OPEN T#1,"PHOTOD01"
30 DIM R(3;3),U0(3,1),C2$(30)24
40 DIM A(7,14),F(28,1),V(3,1),U(3,1),A5(8,28),X9(7,1),R4(3,3),N0(
  14),N2(14),L0$(1)2
50 DIM R3(3,3),X3(3,1),N1(10),C1(14),C2(14),C3(14),S1(14),S2(14),S3
  (14),S(10),X1$(30)23,X9(7,1)
51 DIM B3(14,6),B6(6,1),F2(14,1),X8(6,1),C1$(15)24,X(8,1),A3(28,8
  ),A2(8,8),A6(8,1),A4(8,8),N1(10),D0$10,N9$25
58DATA LOAD DC #1,N,F1,N1(),N9$,D0$
59 J9=0
60 R2=+1
61J=INT((66-LEN(N9$))/2)
  :PRINT HEX(0C0E);TAB(J);N9$
  :PRINT
  :PRINT HEX(0E);TAB(25);"STRIP ADJUSTMENT"
  :PRINT
  :PRINT TAB(59);D0$
  :PRINT
62 L=7000
  :L3=4002
  :S4=8000
63 S=L
  :I3=I3+1
  :IF I3=N+1  THEN 2151
  :S(I3)=L
  :U4,V4,W4=0
  :N2(I3)=S4
  :Z9=0
64 I7=N1(I3)
  :MAT A=ZER
  :MAT F=ZER
  :MAT A3=ZER
  :MAT X=ZER
65 I8=0
  :DATA LOAD DA R(L3,L3)C1$()
  :FOR I2=1  TO 4
66 I8=I8+1
  :UNPACK(######)C1$(I2) TO A
  :N0(I8)=A
67 UNPACK(+#######.###)STR(C1$(I2),4,18) TO C1(I8),C2(I8),C3(I8)
68 UNPACK(######)STR(C1$(I2),22,3) TO M
  :S2=S
69 S1=S2
  :DATA LOAD DA R(S1,S2)X1$()
70 UNPACK(######)X1$(1) TO B
71 IF B=M  THEN   73
72 GOTO   69
73 INIT(00)L0$()
```

```
      :MAT SEARCH X1$(),=STR(C1$(I2),1,3) TO L0$() STEP 23
      :IF L0$(1)=HEX(0000) THEN   79
  74 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
      :I6=(K1-1)/23+1
      :UNPACK(######)X1$(I6) TO B
      :UNPACK(+###.#######)STR(X1$(I6),4,18) TO X,Y,Z
  77 S1(I8)=X
      :S2(I8)=Y
      :S3(I8)=Z
  79 NEXT I2
  80 MAT REDIM A(3,3),F(3,1),X(3,1),A3(3,3)
      :L=3*I7+L
  81 X1=S1(1)
      :Y1=S2(1)
      :Z1=S3(1)
  82 X2=S1(2)
      :Y2=S2(2)
      :Z2=S3(2)
  83 X3=S1(3)
      :Y3=S2(3)
      :Z3=S3(3)
  84 U1=C1(1)
      :V1=C2(1)
      :W1=C3(1)
  85 U2=C1(2)
      :V2=C2(2)
      :W2=C3(2)
  86 U3=C1(3)
      :V3=C2(3)
      :W3=C3(3)
 110 G1=U1-U2
      :G2=V1-V2
      :G3=W1-W2
 120 G4=X1-X2
      :G5=Y1-Y2
      :G6=Z1-Z2
 130 G7=Y1-Y3
      :G8=W1-W3
      :H1=Z1-Z3
      :H2=X1-X3
 140 L1=(G1↑2+G2↑2+G3↑2)/(G4↑2+G5↑2+G6↑2)
 150 L1=SQR(L1)
 151 L2=1/L1
 160 A1=(G3*G7-G5*G8)*L2
 170 A2=G6*G7-G5*H1
 180 B1=(G4*G8-G3*H2)*L2
 190 B2=G4*H1-G6*H2
 200 C=G4*G7-G5*H2
 201 C1=1/C
 210 D1=A2↑2+B2↑2+C↑2
 220 D2=-2*(A2*A1+B2*B1)
 230 D3=A1↑2+B1↑2-C↑2
 240 R(3,3)=(-D2-SQR(D2↑2-4*D1*D3))/(2*D1)
 250 R(3,1)=(A1-A2*R(3,3))*C1
```

```
260 R(3,2)=(B1-B2*R(3,3))*C1
270 E1=R2*(R(3,2)*(Z1-Z2)-R(3,3)*(Y1-Y2))
280 E2=R2*(R(3,3)*(X1-X2)-R(3,1)*(Z1-Z2))
290 E3=R2*(R(3,1)*(Y1-Y2)-R(3,2)*(X1-X2))
300 A(1,1)=X1-X2
310 A(1,2)=Y1-Y2
320 A(1,3)=Z1-Z2
330 A(2,1)=R(3,1)
340 A(2,2)=R(3,2)
350 A(2,3)=R(3,3)
360 A(3,1)=E1
370 A(3,2)=E2
380 A(3,3)=E3
390 F(1,1)=(V1-V2)*L2
400 F(2,1)=0
410 F(3,1)=(U1-U2)*L2
420 MAT A3=INV(A)
430 MAT X=A3*F
440 FOR I=1  TO 3
450 R(2,I)=X(I,1)
460 NEXT I
470 R(1,1)=R2*(R(2,2)*R(3,3)-R(2,3)*R(3,2))
480 R(1,2)=R2*(R(2,3)*R(3,1)-R(2,1)*R(3,3))
490 R(1,3)=R2*(R(2,1)*R(3,2)-R(2,2)*R(3,1))
500 U0(1,1)=U1-L1*(R(1,1)*X1+R(1,2)*Y1+R(1,3)*Z1)
510 U0(2,1)=V1-L1*(R(2,1)*X1+R(2,2)*Y1+R(2,3)*Z1)
520 U0(3,1)=W1-L1*(R(3,1)*X1+R(3,2)*Y1+R(3,3)*Z1)
530 MAT R4=R
    :MAT A5=ZER
    :MAT F=ZER
    :MAT A2=ZER
    :MAT A6=ZER
    :MAT A4=ZER
    :MAT X9=ZER
    :MAT A=ZER
    :MAT REDIM F(14,1),A(7,14),A5(14,7),A2(7,7),A4(7,7),A6(7,1)
570 FOR I1=1  TO 4
    :K=3*I1
    :I=K-2
    :J=K-1
580 X3(1,1)=S1(I1)
    :X3(2,1)=S2(I1)
    :X3(3,1)=S3(I1)
581 U7=C1(I1)
    :V7=C2(I1)
    :W7=C3(I1)
590 MAT V=R*X3
610 A5(I,1)=-L1*V(2,1)
620 A5(I,2)=-L1*V(3,1)
630 A5(I,4)=V(1,1)
640 A5(I,5)=1
650 A5(J,1)=L1*V(1,1)
660 A5(J,3)=-L1*V(3,1)
670 A5(J,4)=V(2,1)
```

```
 680 A5(J,6)=1
 690 A5(K,2)=L1*V(1,1)
 700 A5(K,3)=L1*V(2,1)
 710 A5(K,4)=V(3,1)
 720 A5(K,7)=1
 730 F(I,1)=U0(1,1)+L1*V(1,1)-U7+U4
 740 F(J,1)=U0(2,1)+L1*V(2,1)-V7+V4
 750 F(K,1)=U0(3,1)+L1*V(3,1)-W7+W4
     :NEXT I1
 760 MAT A=TRN(A5)
     :MAT A2=A*A5
     :MAT A6=A*F
     :MAT A4=INV(A2)
 850 MAT X9=A4*A6
 860 MAT X9=(-1)*X9
 870 R3(1,1)=1
 880 R3(1,2)=-X9(1,1)
 890 R3(1,3)=-X9(2,1)
 900 R3(2,1)=X9(1,1)
 910 R3(2,2)=1
 920 R3(2,3)=-X9(3,1)
 930 R3(3,1)=X9(2,1)
 940 R3(3,2)=X9(3,1)
 950 R3(3,3)=1
 960 MAT R=R3*R4
 970 L1=L1+X9(4,1)
     :L2=1/L1
 980 U4=U4+X9(5,1)
 990 V4=V4+X9(6,1)
1000 W4=W4+X9(7,1)
1010 REM STRIP ADJUSTMENT BEGINS AT LINE 1030
1030 MAT REDIM X(8,1),A3(28,8),A2(8,8),A6(8,1),A4(8,8),F(28,1),A5(8,2
     8)
1040 MAT A4=ZER
     :MAT A2=ZER
     :MAT A3=ZER
     :MAT B3=ZER
     :MAT F2=ZER
     :MAT A6=ZER
     :MAT B2=ZER
     :MAT B6=ZER
     :MAT X=ZER
     :MAT X8=ZER
     :MAT A5=ZER
     :MAT F=ZER
1050 U0(1,1)=U0(1,1)+U4
1060 U0(2,1)=U0(2,1)+V4
1070 U0(3,1)=U0(3,1)+W4
1080 I=4
1100 S=S(I3)
     :I=I+1
     :UNPACK(######)C1$(I) TO A
1110 IF A=1  THEN 1240
1120 UNPACK(+######.###)STR(C1$(I),4,18) TO U1,V1,W1
```

```
1130 I8=I8+1
     :UNPACK(######)STR(C1$(I),22,3) TO M
1140 C1(I8)=U1
     :C2(I8)=V1
     :C3(I8)=W1
     :N0(I8)=A
1160 DATA LOAD DA R(6,5)X1$()
1170 UNPACK(######)X1$(1) TO B
1180 IF B=M  THEN 1190
     :GOTO 1160
1190 INIT(00)L0$()
     :MAT SEARCH X1$(),=STR(C1$(I),1,3) TO L0$() STEP 23
     :IF L0$(1)=HEX(0000) THEN 1100
1191 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
     :I6=(K1-1)/23+1
1201 UNPACK(+###.#######)STR(X1$(I6),4,18) TO X,Y,Z
1230 S1(I8)=X
     :S2(I8)=Y
     :S3(I8)=Z
     :GOTO 1100
1240G1,G2=0
     :FOR J1=1  TO I8
     :G1=G1+C1(J1)
     :G2=G2+C2(J1)
     :NEXT J1
     :G1=G1/I8
     :G2=G2/I8
1247 FOR I=1  TO I8
     :N3=2*I
     :N2=N3-1
1248 X1=S1(I)
     :Y1=S2(I)
     :Z1=S3(I)
1249 U1=C1(I)
     :V1=C2(I)
     :W1=C3(I)
     :U1=(U1-G1)/1000
     :V1=(V1-G2)/1000
1250 GOSUB 2160
1260 A3(N2,1)=1
1270 A3(N2,3)=X5
1280 A3(N2,4)=-Y5
1290 A3(N2,5)=X5*X5-Y5*Y5
1300 A3(N2,6)=-2*X5*Y5
1310 A3(N2,7)=X5*X5*X5-3*X5*Y5*Y5
1320 A3(N2,8)=Y5*Y5*Y5-3*X5*X5*Y5
1330 A3(N3,2)=1
1340 A3(N3,3)=Y5
1350 A3(N3,4)=X5
1360 A3(N3,5)=-A3(N2,6)
1370 A3(N3,6)=A3(N2,5)
1380 A3(N3,7)=-A3(N2,8)
1390 A3(N3,8)=A3(N2,7)
1400 F(N2,1)=X5-U1
```

```
1410 F(N3,1)=Y5-V1
1420 B3(I,1)=1
1430 B3(I,2)=X5
1440 B3(I,3)=Y5
1450 B3(I,4)=X5*Y5
1460 B3(I,5)=X5*X5
1470 B3(I,6)=X5*X5*X5
1480 F2(I,1)=Z5-W1
1481 NEXT I
1490 MAT A5=TRN(A3)
     :MAT A2=A5*A3
     :MAT A4=INV(A2)
     :MAT A6=A5*F
     :MAT X=A4*A6
1500 MAT REDIM A5(6,12),A2(6,6),A4(6,6)
1510 MAT A5=TRN(B3)
     :MAT A2=A5*B3
     :MAT B6=A5*F2
     :MAT A4=INV(A2)
     :MAT X8=A4*B6
1790 PRINT TAB(51);"PLANIMETRIC AND HEIGHT CONTROL"
     :PRINT
1810 PRINT TAB(6);"PT NO.";TAB(19);"X";TAB(33);"Y";TAB(47);"Z";TAB(
     61);"X";TAB(74);"Y";TAB(88);"Z";TAB(97);"VX";TAB(106);"VY";TAB(11
     5);"VZ"
1820 PRINT
1822 V2,V5,V6=0
1830 FOR I1=1  TO I8
1840 X1=S1(I1)
     :Y1=S2(I1)
     :Z1=S3(I1)
1850 U1=C1(I1)
     :V1=C2(I1)
     :W1=C3(I1)
1860 GOSUB 2160
1870 GOSUB 2280
1880 PRINTUSING 2250,N0(I1);U1;V1;W1;X2;Y2;Z2;X2-U1;Y2-V1;Z2-W1
1890 V5=(X2-U1)↑2+V5
1900 V2=(Y2-V1)↑2+V2
1910 V6=(Z2-W1)↑2+V6
1920 NEXT I1
1930 V3=SQR((V5+V2)/(2*I8-8))
1940 V5=SQR(V5/(2*I8-8))
1950 V2=SQR(V2/(2*I8-8))
1960 V6=SQR(V6/(I8-6))
1970 V7=SQR(V6↑2+V2↑2+V5↑2)
1990PRINT
     :PRINTUSING 2240,V5,V2,V6
2000 PRINTUSING 2260,V3,V7
     :PRINT
2020 PRINT TAB(20);"ADJUSTED COORDINATES"
     :PRINT
2040 PRINT TAB(6);"PT NO";TAB(19);"X";TAB(33);"Y";TAB(47);"Z"
     :PRINT
```

```
2050 S=S(I3)
     :J3=0
2060 I1=2
     :DATA LOAD DA R(S,S)X1$()
2061 UNPACK(######)X1$(1) TO A
     :PRINT HEX(0A0A)
     :PACK(######)C2$(1)FROM A
2063 PRINT TAB(5);"SECTION NO. ";A
     :PRINT HEX(0A0A)
2065 UNPACK(######)X1$(I1) TO A
     :IF A=1  THEN 2142
     :IF A=5  THEN 2141
2080 UNPACK(+###.#######)STR(X1$(I1),4,18) TO X1,Y1,Z1
2110 GOSUB 2160
2120 GOSUB 2280
2130 PRINTUSING 2270,A,X2,Y2,Z2
2131 PACK(######)C2$(I1)FROM A
     :PACK(+######.#####)STR(C2$(I1),4,21)FROM X2,Y2,Z2
2140 I1=I1+1
     :GOTO 2065
2141 J9=J9+1
     :PACK(######)C2$(I1)FROM A
     :PACK(+######.#####)STR(C2$(I1),4,21)FROM 0,0,J9
     :GOTO 2146
2142 PACK(######)C2$(I1)FROM A
     :PACK(+######.#####)STR(C2$(I1),4,21)FROM 0,0,0
2146 DATA SAVE DA R(S4,S4)C2$()
     :IF S>=L  THEN 2150
     :GOTO 2060
2150 PRINT HEX(0C)
     :GOTO   63
2151 DATA SAVE DA R(4051,L)N2()
     :DATA SAVE DA R(S4,S4)END
     :LOAD DC R"PHOTO803"
2160 X3(1,1)=X1
2170 X3(2,1)=Y1
2180 X3(3,1)=Z1
2190 MAT U=R*X3
2200 X5=L1*U(1,1)+U0(1,1)
2210 Y5=L1*U(2,1)+U0(2,1)
2220 Z5=L1*U(3,1)+U0(3,1)
2221 X5=(X5-G1)/1000
     :Y5=(Y5-G2)/1000
2230 RETURN
2240% STD ERR IN X=-#.###   STD ERR IN Y=-#.###   STD ERR IN Z=-#.#
    ##
2250%   ######   -######.###   -######.###   -######.###   -######.##
    #   -######.###   -######.###   -#.###   -#.###   -#.###
2260% STD ERR IN PLANIMETRY=-#.###  STD ERR OF ADJUSTMENT=-#.###
2270%   ######   -######.###   -######.###   -######.###
2280 X2=X5-X(1,1)-X(3,1)*X5+X(4,1)*Y5-X(5,1)*(X5*X5-Y5*Y5)+X(6,1)*2*X
    5*Y5
2290 X2=X2-X(7,1)*(X5*X5*X5-3*X5*Y5*Y5)+X(8,1)*(3*X5*X5*Y5-Y5*Y5*Y5
    )
```

```
2300 Y2=Y5-X(2,1)-X(4,1)*X5-X(3,1)*Y5-X(6,1)*(X5*X5-Y5*Y5)-X(5,1)*2*X
     5*Y5
2310 Y2=Y2-X(8,1)*(X5*X5*X5-3*X5*Y5*Y5)-X(7,1)*(3*X5*X5*Y5-Y5*Y5*Y5)
2320 Z2=Z5-X8(1,1)-X8(2,1)*X5-X8(3,1)*Y5-X8(4,1)*X5*Y5-X8(5,1)*X5*X
     5-X8(6,1)*X5*X5*X5
2321 X2=X2*1000+G1
     :Y2=Y2*1000+G2
2330 RETURN
```

```
 5 REM ---- "PHOTO403" ----   BLOCK ADJUSTMENT BY SCHUT'S METHOD
     MODULE 1
 6 REM  WRITTEN 04/1976            M. ARBUCKLE
11 COM X1(80),X2(80),Q1,Q2
12PRINT HEX(030A0A);TAB(5);"BLOCK ADJUETMENT"
  :PRINT
  :IF Q1<>0 THEN   15
  :PRINT TAB(5);
  :INPUT "ENTER THE NO OF ITERATIONS REQUIRED",Q2
  :IF Q2<=0 THEN   13
  :IF Q2>10 THEN   13
  :GOTO   14
13PRINT
  :PRINT TAB(5);"MIN = 1 ; MAX = 10"
  :FOR I=1  TO 250
  :NEXT I
  :GOTO   12
14SELECT PRINT 005(64)
  :PRINT HEX(030A0A);TAB(5);"BLOCK ADJUSTMENT"
15PRINT
  :PRINT TAB(5);"ITERATION NO ";Q1+1
20 DIM C1$(40)24,A1$(40)4,C$(30)24,N1(10),L0$(1)2
30 DATA LOAD DA R(4051,L)N1()
  :J=0
  :L2=4076
  :L=4052
35 J=J+1
40 I=0
  :DATA LOAD DA R(L,L)A1$()
  :IF END  THEN  170
50 I=I+1
  :L1=N1(J)
  :UNPACK(######)A1$(I) TO P
  :IF P=1  THEN  150
60 DATA LOAD DA R(L1,L1)C$()
  :INIT(00)L0$(1)
80 MAT SEARCH C$(),=STR(A1$(I),1,3) TO L0$() STEP 24
90 IF L0$(1)=HEX(0000)  THEN   60
100 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
  :K2=(K1-1)/24+1
110 UNPACK(+######.#####)STR(C$(K2),4,21) TO X,Y,Z
120 PACK(######)C1$(I)FROM P
130 PACK(+######.#####)STR(C1$(I),4,21)FROM X,Y,Z
140 GOTO   50
150 PACK(######)C1$(I)FROM I
160 DATA SAVE DA R(L2,L2)C1$()
  :GOTO   35
170 DATA SAVE DA R(L2,L2)END
  :LOAD DC R"PHOTO413"
```

```
 10 REM ---- "PHOTO413" ----    BLOCK ADJUSTMENT BY SCHUT'S METHOD
       MODULE 2
 11REM FORMATION OF THE NORMAL EQUATIONS
 12 REM WRITTEN 04/1976         M. ARBUCKLE
 20 SELECT PRINT 005(64)
 30PRINT HEX(030A0A);TAB(5);"FORMATION OF THE NORMAL EQUATIONS"
   :SELECT PRINT 005(64)
 40 DIM A5(50,10),A6(25,10),Z$3,S2(10)
 50 DIM A1$(40)4,C1$(40)24,C2$(40)24,C4$(15)24,F5(50,1),F6(25,1),L0$
   (1)2
 60 DATA LOAD DA R(4051,L9)S2()
 70 DATA LOAD DA R(4001,L9)N,F1
 80 L=4052
   :L0=4002
   :L4=13000
   :L5=13500
 90 L1=4076
100 I=I+1
   :IF I=N+1  THEN  350
   :DATA LOAD DA R(L0,L0)C4$()
   :MAT A5=ZER
   :MAT A6=ZER
   :MAT F5=ZER
   :MAT F6=ZER
110 I6,I1,I2,I3,I4,I7=1
   :H1=0
120 DATA LOAD DA R(L1,L2)C1$()
   :DATA LOAD DA R(L,M)A1$()
   :DATA LOAD DA R(L2,L1)Z$
   :IF END  THEN  140
   :DATA LOAD DA R(L2,L1)C2$()
   :L1=L2
   :L=M
130 GOTO  150
140 Z$="END"
150 UNPACK(######)A1$(I1) TO P1
   :IF P1=1  THEN  340
160 UNPACK(##)STR(A1$(I1),4,1) TO P2
   :I1=I1+1
   :IF Z$="END"  THEN  170
   :GOTO  180
170 IF P2=1  THEN  150
180 INIT(00)L0$(1)
190 MAT SEARCH C1$(),=STR(A1$(I1-1),1,3) TO L0$() STEP 24
200 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
   :I2=(K1-1)/24+1
   :UNPACK(+######.#####)STR(C1$(I2),4,21) TO X1,Y1,Z1
210 ON P2 GOTO  220, 280, 280
220 INIT(00)L0$(1)
230 MAT SEARCH C2$(),=STR(A1$(I1-1),1,3) TO L0$() STEP 24
   :IF L0$(1)=HEX(0000) THEN  150
240 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
   :I3=(K1-1)/24+1
   :UNPACK(+######.#####)STR(C2$(I3),4,21) TO X2,Y2,Z2
```

```
250 W=0.5
    :H1=H1+1
260 GOSUB  370
270 GOTO  150
280 INIT(00)L0$(1)
290 MAT SEARCH C4$(),=STR(A1$(I1-1),1,3) TO L0$() STEP 24
300 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I4=(K1-1)/24+1
    :UNPACK(+######.###)STR(C4$(I4),4,18) TO X3,Y3,Z3
310 W=1
    :H1=H1+1
320 GOSUB  830
330 GOTO  150
340 DATA SAVE DA R(L4,L4)H1,A5(),F5()
    :DATA SAVE DA R(L5,L5)H1,A6(),F6()
    :GOTO  100
350 DATA SAVE DA R(L4,L4)END
    :DATA SAVE DA R(L5,L5)END
360LOAD DC R"PHOTO423"
370 H2=2*H1
    :H3=H2-1
    :W1=SQR(W)
380 A5(H3,1)=1
390 A5(H3,3)=X1
400 A5(H3,4)=-Y1
410 A5(H3,5)=X1↑2-Y1↑2
420 A5(H3,6)=-2*X1*Y1
430 A5(H3,7)=X1↑3-3*X1*Y1↑2
440 A5(H3,8)=Y1↑3-3*X1↑2*Y1
450 A5(H3,9)=-1
460 A5(H3,11)=-X2
470 A5(H3,12)=Y2
480 A5(H3,13)=Y2↑2-X2↑2
490 A5(H3,14)=2*X2*Y2
500 A5(H3,15)=3*X2*Y2↑2-X2↑3
510 A5(H3,16)=3*X2↑2*Y2-Y2↑3
520 A5(H2,2)=1
530 A5(H2,3)=Y1
540 A5(H2,4)=X1
550 A5(H2,5)=2*X1*Y1
560 A5(H2,6)=X1↑2-Y1↑2
570 A5(H2,7)=3*X1↑2*Y1-Y1↑3
580 A5(H2,8)=X1↑3-3*X1*Y1↑2
590 A5(H2,10)=-1
600 A5(H2,11)=-Y2
610 A5(H2,12)=-X2
620 A5(H2,13)=-2*X2*Y2
630 A5(H2,14)=Y2↑2-X2↑2
640 A5(H2,15)=Y2↑3-3*X2↑2*Y2
650 A5(H2,16)=3*X2*Y2↑2-X2↑3
660 F5(H3,1)=X1-X2
670 F5(H2,1)=Y1-Y2
680 A6(H1,1)=1
690 A6(H1,2)=X1
```

```
 700 A6(H1,3)=Y1
 710 A6(H1,4)=X1*Y1
 720 A6(H1,5)=X1↑2
 730 A6(H1,6)=-1
 740 A6(H1,7)=-X2
 750 A6(H1,8)=-Y2
 760 A6(H1,9)=-X2*Y2
 770 A6(H1,10)=-X2↑2
 780 F6(H1,1)=Z1-Z2
 790 FOR J4=1  TO 16
     :A5(H3,J4,=A5(H3,J4)*W1
     :A5(H2,J4)=A5(H2,J4)*W1
     :NEXT J4
 800 FOR J4=1  TO 10
     :A6(H1,J4)=A6(H1,J4)*W1
     :NEXT J4
 810 F5(H3,1)=F5(H3,1)*W1
     :F5(H2,1)=F5(H2,1)*W1
     :F6(H1,1)=F6(H1,1)*W1
 820 RETURN
 830 H2=2*H1
     :H3=H2-1
     :W1=SQR(W)
 840 A5(H3,1)=1
 850 A5(H3,3)=X3
 860 A5(H3,4)=-Y3
 870 A5(H3,5)=X3↑2-Y3↑2
 880 A5(H3,6)=-2*X3*Y3
 890 A5(H3,7)=X3↑3-3*X3*Y3↑2
 900 A5(H3,8)=Y3↑3-3*X3↑2*Y3
 910 A5(H2,2)=1
 920 A5(H2,3)=Y3
 930 A5(H2,4)=X3
 940 A5(H2,5)=2*X3*Y3
 950 A5(H2,6)=X3↑2-Y3↑2
 960 A5(H2,7)=3*X3↑2*Y3-Y3↑3
 970 A5(H2,8)=X3↑3-3*X3*Y3↑2
 980 F5(H3,1)=X1-X3
 990 F5(H2,1)=Y1-Y3
1000 A6(H1,1)=1
1010 A6(H1,2)=X3
1020 A6(H1,3)=Y3
1030 A6(H1,4)=X3*Y3
1040 A6(H1,5)=X3↑2
1050 F6(H1,1)=Z1-Z3
1060 FOR J4=1  TO 8
     :A5(H3,J4)=A5(H3,J4)*W1
     :A5(H2,J4)=A5(H2,J4)*W1
     :NEXT J4
1070 F5(H3,1)=F5(H3,1)*W1
     :F5(H2,1)=F5(H2,1)*W1
1080 FOR J4=1  TO 5
     :A6(H1,J4)=A6(H1,J4)*W1
     :NEXT J4
```

```
     :F6(H1,1)=F6(H1,1)*W1
  1090 RETURN
```

```
 10 REM ---- "PHOTO423" ----   BLOCK ADJUSTMENT BY SCHUT'S METHOD
           MODULE 3
 11 REM FORMATION OF NORMAL EQUATIONS
 20 DIM A5(50,16),F5(50,1),A6(16,50),A7(16,16),F6(16,1),A8(16,16),F8
    (16,1)
 25 L1=13000
    :L2=13500
    :L3=14000
    :L4=14500
 30 DATA LOAD DA R(L1,L1)H1,A5(),F5()
    :H2=2*H1
 40 MAT REDIM A5(H2,16),F5(H2,1),A6(16,H2)
 50 MAT A6=TRN(A5)
    :MAT F6=A6*F5
 60 MAT A7=A6*A5
 70 MAT A8=A7
    :MAT F8=F6
    :DATA SAVE DA R(L3,L3)A7(),F6()
 80 MAT REDIM A5(50,16),F5(50,1)
    :DATA LOAD DA R(L1,L1)H1,A5(),F5()
    :IF END  THEN  170
    :H2=2*H1
 90 MAT REDIM A5(H2,16),F5(H2,1),A6(16,H2)
100 MAT A7=ZER
    :MAT F6=ZER
110 MAT A6=TRN(A5)
    :MAT F6=A6*F5
120 MAT A7=A6*A5
130 FOR I=9  TO 16
    :FOR J=9  TO 16
140 K1=I-8
    :K2=J-8
150 A7(K1,K2)=A7(K1,K2)+A8(I,J)
    :NEXT J
    :F6(K1,1)=F6(K1,1)+F8(I,1)
    :NEXT I
160 DATA SAVE DA R(L3,L3)A7(),F6()
    :MAT A8=A7
    :MAT F8=F6
    :GOTO   80
170 MAT REDIM A5(25,10),F5(25,1),A6(10,25),A7(10,10),F6(10,1),A8(10,
    10),F8(10,1)
180 DATA LOAD DA R(L2,L2)H1,A5(),F5()
190 MAT REDIM A5(H1,10),F5(H1,1),A6(10,H1)
200 MAT A7=ZER
    :MAT F6=ZER
210 MAT A6=TRN(A5)
    :MAT F6=A6*F5
    :MAT A7=A6*A5
    :MAT A8=A7
    :MAT F8=F6
    :DATA SAVE DA R(L4,L4)A7(),F6()
220 MAT REDIM A5(25,10),F5(25,1)
    :DATA LOAD DA R(L2,L2)H1,A5(),F5()
```

```
    :IF END  THEN  300
230 MAT REDIM A5(H1,10),F5(H1,1),A6(10,H1)
240 MAT A7=ZER
    :MAT F6=ZER
250 MAT A6=TRN(A5)
    :MAT F6=A6*F5
    :MAT A7=A6*A5
260 FOR I=6  TO 10
    :FOR J=6  TO 10
270 K1=I-5
    :K2=J-5
280 A7(K1,K2)=A7(K1,K2)+A8(I,J)
    :NEXT J
    :F6(K1,1)=F6(K1,1)+F8(I,1)
    :NEXT I
290 DATA SAVE DA R(L4,L4)A7(),F6()
    :MAT A8=A7
    :MAT F8=F6
    :GOTO  220
300 DATA SAVE DA R(L3,L3)END
    :DATA SAVE DA R(L4,L4)END
310 LOAD DC R"PHOTO433"
```

```
  4 REM ---- "PHOTO433" ----  BLOCK ADJUSTMENT BY SCHUT'S METHOD
         MODULE 4
  5 REM SOLUTION OF THE NORMAL EQUATIONS
 11 DIM A(80,16),F(80),Y(80),F5(16,1),A5(16,16)
   :L1=15000
 15 DATA LOAD DA R(4001,L)N,F1
   :N3=N*8
   :MAT REDIM A(N3,16),F(N3),X1(N3),X2(N3),Y(N3)
 20 L=14000
   :N1=0
   :I2=8
   :I3=16
   :I4=0
   :MAT A=ZER
 30 DATA LOAD DA R(L,L)A5(),F5()
   :IF END  THEN   80
 35 N2=N1*I2
 40 FOR I=1  TO I2
   :K=N2+I
   :K1=0
   :FOR J=I  TO I3
   :K1=K1+1
 50 A(K,K1)=A5(I,J)
   :NEXT J
   :F(K)=F5(I,1)
   :NEXT I
 60 N1=N1+1
   :GOTO   30
 80 M=I3-1
   :M1=I3
 90 FOR I=1  TO N3
100 A(I,1)=SQR(A(I,1))
110 FOR J=2  TO M1
120 A(I,J)=A(I,J)/A(I,1)
   :NEXT J
130 IF N3<I+M  THEN  150
131 IF N3=I+M  THEN  150
140 M2=I+M
   :GOTO  160
150 M2=N3
155 IF M2-I-1<0  THEN  230
160 FOR M3=I+1 TO M2
190 FOR J=1  TO M+I-M3+1
220 A(M3,J)=A(M3,J)-A(I,M3-I+1)*A(I,M3-I+J)
   :NEXT J
   :NEXT M3
230 NEXT I
240 FOR K=1  TO N3
250 S=F(K)
260 IF (K-1)=0  THEN  320
270 IF (K-M1)<0  THEN  280
   :GOTO  290
280 M2=K
   :GOTO  300
```

```
290 M2=M1
300 FOR I=2  TO M2
305 J=K-I+1
310 S=S+A(J,I)*Y(J)
    :NEXT I
320 Y(K)=-S/A(K,1)
    :NEXT K
325 M2=2
330 FOR K=N3 TO 1 STEP -1
335 S=Y(K)
340 IF (N3-K)=0 THEN  400
350 IF (M1-K+1)<=0  THEN  360
    :GOTO  365
360 IF M2=I3+1 THEN  365
    :GOTO  370
365 M2=I3
370 FOR I=2  TO M2
390 S=S-A(K,I)*X2(K+I-1)
    :NEXT I
400 X2(K)=S/A(K,1)
    :IF K=N3 THEN  401
    :M2=M2+1
401NEXT K
700 I4=I4+1
    :IF I4=2  THEN  740
710 L=14500
    :N1=0
    :N3=N*5
    :I3=10
    :MAT X1=X2
    :I2=5
720 MAT REDIM A(N3,10),F(N3),X2(N3),F5(10,1),Y(N3),A5(10,10)
    :MAT A=ZER
    :MAT F=ZER
730 GOTO  30
740 LOAD DC R"PHOTO443"
```

```
   4 REM ---- "PHOTO443" ---- BLOCK ADJUSTMENT BY SCHUT'S METHOD
     MODULE 5
   5 REM TRANSFORMATION OF THE BLOCK
   6 SELECT PRINT 215(132),#1B10
    :DATA LOAD DC OPEN T#1,"PHOTOD01"
  11 DIM A$(30)24,B$(30)24,X3(8),X4(5),C1$(40)24,A1$(40)4,C4$(15)24
    ,C2$(40)24,Z$3,L0$(1)2,X5(8),X6(5),N1(10),N9$25,D0$10
  12 E1,E2,E3,E4,E5,E6,I2,I3,I4,W1=0
    :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
  13J2=INT(66-LEN(N9$))/2
    :PRINT HEX(0C0E);TAB(J2);N9$
    :PRINT
    :PRINT HEX(0E);TAB(25);"BLOCK ADJUSTMENT"
    :PRINT
    :PRINT TAB(50);"RESIDUALS AT TIE AND CONTROL POINTS"
    :PRINT
    :PRINT TAB(59);D0$
    :PRINT
  14PRINT TAB(58);"ITERATION NO";G1+1
    :PRINT
    :PRINTUSING 315
    :PRINT
 141 L1,L2=4076
    :L0=4002
    :L=4052
    :I1=0
 142 IF I1=N  THEN  300
    :N1=I1*8+1
    :N2=I1*5+1
    :N3=N1+7
    :N4=N2+4
    :K=0
    :FOR I=N1  TO N3
    :K=K+1
    :X3(K)=X1(I)
    :NEXT I
    :K=0
    :FOR I=N2  TO N4
    :K=K+1
    :X4(K)=X2(I)
    :NEXT I
    :I1=I1+1
 143 IF I1=N  THEN  149
 144 N1=I1*8+1
    :N2=I1*5+1
    :N3=N1+7
    :N4=N2+4
    :K=0
    :FOR I=N1  TO N3
    :K=K+1
    :X5(K)=X1(I)
    :NEXT I
    :K=0
    :FOR I=N2  TO N4
```

```
    :K=K+1
    :X6(K)=X2(I)
    :NEXT I
149 DATA LOAD DA R(L,L)A1$()
150 L1=L2
    :I2=I2+1
    :IF I2=N+1  THEN  300
    :DATA LOAD DA R(L1,L2)C1$()
    :DATA LOAD DA R(L0,L0)C4$()
    :DATA LOAD DA R(L2,L3)C2$()
    :IF END  THEN  151
    :GOTO  160
151 Z$="END"
160 J=1
170 UNPACK(######)A1$(J) TO P
    :IF P=1  THEN  142
180 UNPACK(##)STR(A1$(J),4,1) TO M
    :IF Z$="END"  THEN  181
    :GOTO  200
181 IF M=1  THEN  230
200 IF M=3  THEN  207
    :W=0.5
    :GOTO  209
207 W=1
209 INIT(00)L0$()
210 MAT SEARCH C1$(),=STR(A1$(J),1,3) TO L0$() STEP 24
220 IF L0$(1)=HEX(0000)  THEN  230
221 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :K2=(K1-1)/24+1
222 UNPACK(+######.#####)STR(C1$(K2),4,21)  TO X1,Y1,Z1
    :GOSUB  770
    :X2=X
    :Y2=Y
    :Z2=Z
223 ON M GOTO  224, 224, 240
224 INIT(00)L0$()
225 MAT SEARCH C2$(),=STR(A1$(J),1,3) TO L0$() STEP 24
226 IF L0$(1)=HEX(0000) THEN  230
227 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :K2=(K1-1)/24+1
228 UNPACK(+######.#####)STR(C2$(K2),4,21) TO X1,Y1,Z1
229 GOSUB  870
    :E1=E1+(X2-X)↑2*W
    :E2=E2+(Y2-Y)↑2*W
    :E3=E3+(Z2-Z)↑2*W
    :I3=I3+1
    :PRINTUSING  313,P,X2,Y2,Z2,X,Y,Z,X2-X,Y2-Y,Z2-Z
230 J=J+1
    :GOTO  170
240 INIT(00)L0$()
250 MAT SEARCH C4$(),=STR(A1$(J),1,3) TO L0$()  STEP 24
260 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :K2=(K1-1)/24+1
270 UNPACK(+######.###)STR(C4$(K2),4,18) TO X,Y,Z
```

```
280 E1=E1+(X2-X)↑2*W
    :E2=E2+(Y2-Y)↑2*W
    :E3=E3+(Z2-Z)↑2*W
    :I3=I3+1
281 PRINTUSING  314,P,X2,Y2,Z2,X,Y,Z,X2-X,Y2-Y,Z2-Z
290 J=J+1
    :GOTO  170
300 S1=SQR((E1+E2)/(2*I3-N*8))
    :S2=SQR(E3/(I3-N*5))
    :S4=SQR(S1↑2+S2↑2)
310 PRINT HEX(0A0A)
    :PRINTUSING  311,S1,S2
311%     SIGMA 0 PLAN = -###.###   SIGMA 0 HEIGHT = -###.###
312 PRINT
    :PRINT
    :PRINT TAB(7);"(* CONTROL POINT)"
313%  ######  -######.###   -######.###   -######.###   -######.##
   #   -######.###   -######.###  -##.###  -##.###  -##.###
314%* ######  -######.###   -######.###   -######.###   -######.###
     -######.###   -######.###  -##.###  -##.###  -##.###
315%  PT. NO        X1            Y1             Z1            X2
           Y2              Z2       VX       VY       VZ
421 L=8000
    :M=16000
    :I1=0
430 IF I1=N  THEN  467
    :N1=I1*8+1
    :N2=I1*5+1
    :N3=N1+7
    :N4=N2+4
    :K=0
    :FOR I=N1  TO N3
    :K=K+1
    :X3(K)=X1(I)
    :NEXT I
    :K=0
    :FOR I=N2  TO N4
    :K=K+1
    :X4(K)=X2(I)
    :NEXT I
    :I1=I1+1
440 J1=2
    :DATA LOAD DA R(L,L)A$()
    :UNPACK(######)A$(1) TO P
    :PACK(######)B$(1)FROM P
    :IF END  THEN  467
450 UNPACK(######)A$(J1) TO P
    :IF P=1  THEN  464
    :IF P=5  THEN  464
460 UNPACK(+######.#####)BTR(A$(J1),4,21) TO X1,Y1,Z1
461 GOSUB  770
462 PACK(######)B$(J1)FROM P
463 PACK(+######.#####)STR(B$(J1),4,21)FROM X,Y,Z
    :J1=J1+1
```

```
    :GOTO  450
464 .     .######)B$(J1)FROM P
465 B$(1)=A$(1)
    :DATA SAVE DA R(M,M)B$()
466 IF P=1  THEN  440
    :IF P=5  THEN  430
467 DATA SAVE DA R(M,M)END
    :SELECT PRINT 005(64)
    :Q1=Q1+1
468M=16000
    :L=8000
    :IF Q1<>Q2 THEN  470
    :L=17000
470 DATA LOAD DA R(M,M)A$()
    :IF END  THEN  471
    :DATA SAVE DA R(L,L)A$()
    :GOTO  470
471 DATA SAVE DA R(L,L)END
    :IF Q1<>Q2 THEN  490
    :COM CLEAR
    :LOAD DC R"PHOTO803"
490MAT REDIM X1(80),X2(80)
    :LOAD DC R"PHOTO403"
770 C1=X3(1)+X1*X3(3)-Y1*X3(4)+(X1↑2-Y1↑2)*X3(5)-2*X1*Y1*X3(6)+(X1
    ↑3-3*X1*Y1↑2)*X3(7)+(Y1↑3-3*X1↑2*Y1)*X3(8)
771 X=X1+C1
780 C2=X3(2)+Y1*X3(3)+X1*X3(4)+2*X1*Y1*X3(5)+(X1↑2-Y1↑2)*X3(6)+(3*X1
    ↑2*Y1-Y1↑3)*X3(7)+(X1↑3-3*X1*Y1↑2)*X3(8)
781 Y=Y1+C2
790 C3=X4(1)+X1*X4(2)+Y1*X4(3)+X1*Y1*X4(4)+X1↑2*X4(5)
791 Z=Z1+C3
792 RETURN
870 C1=X5(1)+X1*X5(3)-Y1*X5(4)+(X1↑2-Y1↑2)*X5(5)-2*X1*Y1*X5(6)+(X1↑3
    -3*X1*Y1↑2)*X5(7)+(Y1↑3-3*X1↑2*Y1)*X5(8)
871 X=X1+C1
880 C2=X5(2)+Y1*X5(3)+X1*X5(4)+2*X1*Y1*X5(5)+(X1↑2-Y1↑2)*X5(6)+(3*
    X1↑2*Y1-Y1↑3)*X5(7)+(X1↑3-3*X1*Y1↑2)*X5(8)
881 Y=Y1+C2
890 C3=X6(1)+X1*X6(2)+Y1*XG(3)+X1*Y1*X6(4)+X1↑2*X6(5)
891 Z=Z1+C3
892 RETURN
```

```
10SELECT PRINT 005(64)
20 REM ---- "PHOTO404" ----     BLOCK ADJUSTMENT BY AMER'S ITERATIVE
     METHOD
30 REM WRITTEN 06/1976              M. ARBUCKLE
40 REM ** WRITTEN JUNE 1976                                   **
41COM O0,O1
50 DIM A$(12)41,C$(30)24,X8(10),Y8(10),Z8(10),X9(10),Y9(10),Z9(10
   ),M9(5),N3(10),C2$(30)24,L0$(1)2,A1(20,4),A2(4,20),A3(4,4),F1(20,
   1),F2(4,1),R3(3,3),Z$1
60 DIM X(4,1),A1$(12)41,M0(5),A0(10,3),R1(3,10),R2(3,3),F0(10,1),
   R4(3,1),R5(3,1),X6(10),Y6(10),Z6(10),X7(10),Y7(10),Z7(10),N1(10),
   N9$25,D0$10
62PRINT HEX(030A0A);TAB(5);"BLOCK ADJUSTMENT"
70 DATA LOAD DA R(4711,L)C2$()
   :DATA LOAD DA R(4001,L)N,F,N1()
   :Z$="X"
   :IF O0=1 THEN   90
71PRINT
   :PRINT TAB(5);
   :INPUT "DO YOU WISH TO RESTART (Y/N)",Z$
   :IF Z$="Y" THEN   80
   :IF Z$="N" THEN   80
   :PRINT HEX(0C);TAB(64)
   :PRINT HEX(0C0C)
   :GOTO   71
80PRINT
   :PRINT TAB(5);
   :INPUT "ENTER THE NO OF ITERATIONS",O1
   :IF O1-INT(O1/10)*10=0 THEN   90
   :PRINT
   :PRINT TAB(5);"MUST BE A MULTIPLE OF 10"
   :FOR I=1  TO 7500
   :NEXT I
   :GOTO   62
90 Z9=0
   :O0=O0+1
100IF Z$="N" THEN  430
   :IF O0=O1/10+1 THEN  110
   :IF O0=1 THEN  120
   :GOTO  430
110COM CLEAR
   :LOAD DC R"PHOTO802"
120L=8000
   :M=9000
130 DATA LOAD DA R(L,L)C$()
   :IF END  THEN  150
140 DATA SAVE DA R(M,M)C$()
   :GOTO  130
150 DATA SAVE DA R(M,M)END
160 I=4201
   :J=9000
   :I3=-1
170I2=2
   :DATA LOAD DA R(I,P)A$()
```

```
    :IF END  THEN  250
    :I3=I3+1
180 UNPACK(######)A$(I2) TO Y1
    :UNPACK(##)STR(A$(I2),4,1) TO X1
190 IF Y1=1  THEN  240
    :IF Y1=5  THEN  240
200 DATA LOAD DA R(J+3*I3,L)C$()
210 INIT(00)L0$()
    :MAT SEARCHC$()<25,696>,=STR(A$(I2),1,3) TO L0$() STEP 24
    :IF L0$(1)=HEX(0000) THEN  211
    :K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I6=(K1-1)/24+2
    :GOTO  220
211UNPACK(######)A$(1) TO M0
    :PRINT HEX(030A0A);TAB(5);"ERROR IN MODEL NO ";M0
    :STOP
220 UNPACK(+######.#####)STR(C$(I6),4,21) TO X,Y,Z
    :GOTO  230
230 PACK(+######.#####)STR(A$(I2),6,21)FROM X,Y,Z
    :I2=I2+1
    :GOTO  180
240 DATA SAVE DA R(I,P)A$()
    :I=P
    :GOTO  170
250 N3(1)=4201
    :S=0
    :A5=1
    :I=4201
260 S3=0
    :FOR I2=1  TO N-1
    :S2=N1(I2)
    :S3=S3+S2
    :N3(I2+1)=4201+2*S3
    :NEXT I2
270 N2=0
    :IF S=0  THEN  280
    :IF S=N-1  THEN  290
    :IF S=N  THEN  430
    :A5=S+2
    :S1=S
    :GOTO  300
280 A5=S+2
    :S1=S+1
    :GOTO  300
290 A5=S+1
    :S1=S
300 FOR I2=S1  TO A5
    :N2=N2+N1(I2)
    :NEXT I2
310 I2=2
    :DATA LOAD DA R(I,P)A$()
    :IF END  THEN  430
320 I7=0
    :UNPACK(######)A$(I2) TO A4
```

```
    :IF A4=1  THEN  410
    :IF A4=5  THEN  420
330 L1=N3(S1)
    :FOR I3=1  TO N2
340 INIT(00)L0$()
    :DATA LOAD DA R(L1,L2)A1$()
350 MAT SEARCH A1$()<42,451>,=STR(A$(I2),1,3) TO L0$() STEP 41
    :IF L0$(1)=HEX(0000) THEN  370
360 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I6=(K1-1)/41+2
    :I7=I7+1
    :M9(I7)=L1
    :M0(I7)=I6
370 L1=L2
    :NEXT I3
380 PACK(####)STR(A$(I2),27,10)FROM M9()
390 PACK(##)STR(A$(I2),37,5)FROM M0()
400 PACK(##)STR(A$(I2),5,1)FROM I7
    :I2=I2+1
    :GOTO  320
410 DATA SAVE DA R(I,P)A$()
    :I=P
    :GOTO  310
420 DATA SAVE DA R(I,P)A$()
    :I=P
    :S=S+1
    :GOTO  270
430IF O1<>0 THEN  431
    :GOTO  930
431 IF Z9=10 THEN  930
    :PRINT Z9
    :PRINT HEX(0C)
440 I=4201
    :L2=10500
450 I2=2
    :DATA LOAD DA R(I,I)A$()
    :IF END  THEN  640
    :I8=0
    :M3=0
460 UNPACK(######)A$(I2) TO A4
    :IF A4=1  THEN  630
    :IF A4=5  THEN  630
    :UNPACK(##)STR(A$(I2),4,2) TO X1,Z1
470 UNPACK(##)STR(A$(I2),37,5) TO M0()
    :I4=0
480 UNPACK(####)STR(A$(I2),27,10) TO M9()
490 UNPACK(+######.#####)STR(A$(I2),6,21) TO X,Y,Z
    :ON X1 GOTO  500, 510, 500, 510
500 I8=I8+1
    :X9(I8)=X
    :Y9(I8)=Y
    :Z9(I8)=Z
    :GOTO  520
510 M3=M3+1
```

```
    :X7(M3)=X
    :Y7(M3)=Y
    :Z7(M3)=Z
520 X,Y,Z=0
    :FOR I3=1  TO Z1
    :DATA LOAD DA R(M9(I3),L3)A1$()
    :UNPACK(+######.#####)STR(A1$(M0(I3)),6,21) TO X2,Y2,Z2
530 I4=I4+1
    :X=X+X2
    :Y=Y+Y2
    :Z=Z+Z2
    :NEXT I3
540 X=X/I4
    :Y=Y/I4
    :Z=Z/I4
550 ON X1 GOTO  590, 560, 570, 600
560 X6(M3)=X
    :Y6(M3)=Y
    :Z6(M3)=Z
    :I2=I2+1
    :GOTO  460
570 INIT(00)L0$()
    :MAT SEARCH C2$(),=STR(A$(I2),1,3) TO L0$() STEP 24
    :K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I6=(K1-1)/24+1
580 UNPACK(+######.#####)STR(C2$(I6),4,21) TO X,Y,Z
590 X8(I8)=X
    :Y8(I8)=Y
    :Z8(I8)=Z
    :I2=I2+1
    :GOTO  460
600 INIT(00)L0$()
    :MAT SEARCH C2$(),=STR(A$(I2),1,3) TO L0$() STEP 24
    :K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2,1))
    :I6=(K1-1)/24+1
610 UNPACK(+######.#####)STR(C2$(I6),18,7) TO Z
620 X6(M3)=X
    :Y6(M3)=Y
    :Z6(M3)=Z
    :I2=I2+1
    :GOTO  460
630 DATA SAVE DA R(L2,L2)X6(),Y6(),Z6(),X7(),Y7(),Z7(),X8(),Y8(),Z
   8(),X9(),Y9(),Z9(),I8,M3
    :GOTO  450
640 DATA SAVE DA R(L2,L2)END
650 L1=10500
    :I=4201
660 DATA LOAD DA R(L1,L1)X6(),Y6(),Z6(),X7(),Y7(),Z7(),X8(),Y8(),Z8(
   ),X9(),Y9(),Z9(),I8,M3
    :IF END  THEN  920
670 DATA LOAD DA R(I,P)A$()
680 FOR I4=1  TO M3
    :M2=I8+I4
690 X8(M2)=X6(I4)
```

```
    :Y8(M2)=Y6(I4)
    :Z8(M2)=Z6(I4)
    :X9(M2)=X7(I4)
    :Y9(M2)=Y7(I4)
    :Z9(M2)=Z7(I4)
    :NEXT I4
700 S1,S2,S3,S4,S5,S6,S7=0
710 FOR I4=1  TO I8
720 S1=S1+X9(I4)
    :S2=S2+Y9(I4)
    :S3=S3+X8(I4)
    :S4=S4+Y8(I4)
    :NEXT I4
730 S1=S1/I8
    :S2=S2/I8
    :S3=S3/I8
    :S4=S4/I8
740 FOR I4=1  TO I8
750 T1=X9(I4)-S1
    :T2=Y9(I4)-S2
    :T3=X8(I4)-S3
    :T4=Y8(I4)-S4
760 S5=S5+T1*T1+T2*T2
    :S6=S6+T1*T3+T2*T4
    :S7=S7+T2*T3-T1*T4
    :NEXT I4
770 H1=S6/S5
    :H2=S7/S5
    :H3=S3-H1*S1-H2*S2
    :H4=S4+H2*S1-H1*S2
780 S1=SQR(H1*H1+H2*H2)
    :MAT R1=ZER
    :MAT R2=ZER
    :MAT R3=ZER
    :MAT R4=ZER
    :MAT R5=ZER
    :MAT F0=ZER
    :MAT A0=ZER
790 FOR J1=1  TO M2
800 X5=H1*X9(J1)+H2*Y9(J1)+H3
    :Y5=-H2*X9(J1)+H1*Y9(J1)+H4
810 A0(J1,1)=1
    :A0(J1,2)=X5
    :A0(J1,3)=Y5
    :F0(J1,1)=Z9(J1)*S1-Z8(J1)
    :NEXT J1
820 MAT R1=TRN(A0)
    :MAT R2=R1*A0
    :MAT R3=INV(R2)
830 MAT R4=R1*F0
    :MAT R5=R3*R4
    :MAT R5=(-1)*R5
    :Z0=R5(1,1)
    :C=R5(2,1)
```

```
    :D=R5(3,1)
840 I2=2
850 UNPACK(######)A$(I2) TO A4
    :IF A4=1  THEN  910
    :IF A4=5  THEN  910
860 UNPACK(##)STR(A$(I2),4,1) TO X1
870 UNPACK(+######.#####)STR(A$(I2),6,21) TO X,Y,Z
880 X5=X*H1+Y*H2+H3
    :Y5=-X*H2+Y*H1+H4
    :Z5=Z*S1+Z0+X5*C+Y5*D
890 PACK(+######.#####)STR(A$(I2),6,21)FROM X5,Y5,Z5
900 I2=I2+1
    :GOTO  850
910 DATA SAVE DA R(I,P)A$()
    :I=P
    :GOTO  660
920 Z9=Z9+1
    :GOTO  430
930 I2=9000
    :L1=4201
    :L3=10500
940 I1=2
    :I4=0
    :DATA LOAD DA R(L1,L1)A$()
    :IF END  THEN 1220
    :DATA LOAD DA R(L3,L3)X6(),Y6(),Z6(),X7(),Y7(),Z7(),X8(),Y8(),Z8(
    ),X9(),Y9(),Z9(),I8,M3
    :FOR I5=1  TO M3
    :M2=I8+I5
    :X8(M2)=X6(I5)
    :Y8(M2)=Y6(I5)
    :Z8(M2)=Z6(I5)
    :NEXT I5
    :I5=0
950 DATA LOAD DA R(I2,I3)C$()
960 UNPACK(######)A$(I1) TO P
    :IF P=1  THEN 1040
    :IF P=5  THEN 1040
    :UNPACK(##)STR(A$(I1),4,1) TO Q
970 INIT(00)L0$()
980 MAT SEARCH C$()<25,696>,=STR(A$(I1),1,3) TO L0$() STEP 24
990 K1=256*VAL(STR(L0$(1),1,1))+VAL(STR(L0$(1),2))
    :I6=(K1-1)/24+2
1000 UNPACK(+######.#####)STR(C$(I6),4,21) TO X,Y,Z
    :ON Q GOTO 1010,1020,1010,1020
1010 I4=I4+1
    :X9(I4)=X
    :Y9(I4)=Y
    :Z9(I4)=Z
    :GOTO 1030
1020 I5=I5+1
    :X7(I5)=X
    :Y7(I5)=Y
    :Z7(I5)=Z
```

```
1030 I1=I1+1
     :GOTO  960
1040 S1,S2,S3,S4,S5,S6,S7=0
1050 FOR I4=1  TO I8
1060 S1=S1+X9(I4)
     :S2=S2+Y9(I4)
     :S3=S3+X8(I4)
     :S4=S4+Y8(I4)
     :NEXT I4
1070 S1=S1/I8
     :S2=S2/I8
     :S3=S3/I8
     :S4=S4/I8
1080 FOR I4=1  TO I8
1090 T1=X9(I4)-S1
     :T2=Y9(I4)-S2
     :T3=X8(I4)-S3
     :T4=Y8(I4)-S4
1100 S5=S5+T1*T1+T2*T2
     :S6=S6+T1*T3+T2*T4
     :S7=S7+T2*T3-T1*T4
     :NEXT I4
1110 H1=S6/S5
     :H2=S7/S5
     :H3=S3-H1*S1-H2*S2
     :H4=S4+H2*S1-H1*S2
1120 MAT R1=ZER
     :MAT R2=ZER
     :MAT R3=ZER
     :MAT R4=ZER
     :MAT R5=ZER
     :MAT A0=ZER
     :MAT F0=ZER
1130 S1=SQR(H1*H1+H2*H2)
     :FOR I5=1  TO M3
     :M2=I8+I5
     :X9(M2)=X7(I5)
     :Y9(M2)=Y7(I5)
     :Z9(M2)=Z7(I5)
     :NEXT I5
1140 FOR I5=1  TO M2
     :A0(I5,1)=1
     :A0(I5,2)=H1*X9(I5)+H2*Y9(I5)+H3
     :A0(I5,3)=-H2*X9(I5)+H1*Y9(I5)+H4
     :F0(I5,1)=Z9(I5)*S1-Z8(I5)
     :NEXT I5
1150 MAT R1=TRN(A0)
     :MAT R2=R1*A0
     :MAT R3=INV(R2)
     :MAT R4=R1*F0
     :MAT R5=R3*R4
     :MAT R5=(-1)*R5
     :Z0=R5(1,1)
     :C=R5(2,1)
```

```
     :D=R5(3,1)
1160 I4=2
1170 UNPACK(######)C$(I4) TO P
     :IF P=1  THEN 1210
     :IF P=5  THEN 1210
1180 UNPACK(+######.#####)STR(C$(I4),4,21) TO X5,Y5,Z5
1190 X=H1*X5+H2*Y5+H3
     :Y=-H2*X5+H1*Y5+H4
     :Z=Z5*S1+Z0+C*X+D*Y
1200 PACK(+######.#####)STR(C$(I4),4,21)FROM X,Y,Z
     :I4=I4+1
     :GOTO 1170
1210 DATA SAVE DA R(I2,I3)C$()
     :I2=I3
     :GOTO  940
1220LOAD DC R"PHOTO414"
```

```
10REM ---- "PHOTO414" ---- RESIDUALS AT TIE AND CHECK POINTS
15REM WRITTEN 06/76                    M. ARBUCKLE
16DIM N1(10),N9$25,D0$10
17DIM A$(10)41,X6(10),Y6(10),Z6(10),X7(10),Y7(10),Z7(10),X8(10),Y8(
  10),Z8(10),X9(10),Y9(10),Z9(10)
20SELECT #1B10
  :DATA LOAD DC OPEN T#1,"PHOTOD01"
  :DATA LOAD DC #1,N,F1,N1(),N9$,D0$
  :J2=INT(66-LEN(N9$))/2
21PRINT HEX(030A0A);TAB(5);"RESIDUALS AT TIE/CHECK POINTS"
50SELECT PRINT 215(132)
60PRINT HEX(0C0E);TAB(J2);N9$
  :PRINT
  :PRINT HEX(0E);TAB(16);"RESIDUALS AT TIE AND CHECK POINTS"
  :PRINT
  :PRINT TAB(59);D0$
  :PRINT
  :PRINT TAB(59);"ITERATION NO ";D0*10
70 PRINT
  :PRINT
  :PRINT TAB(25);"SECTION  CORNERS";TAB(62);"SECTION  CORNER  MEANS
  ";TAB(103);"RESIDUALS"
80 PRINT
  :PRINT
90 PRINT TAB(6);"PT NO.";TAB(19);"X";TAB(33);"Y";TAB(47);"Z";TAB(61
  );"X";TAB(74);"Y";TAB(88);"Z";TAB(97);"VX";TAB(106);"VY";TAB(115)
  ;"VZ"
100 PRINT
  :PRINT
120 I=4201
  :G1=10500
  :M4=0
130 DATA LOAD DA R(I,I)A$()
  :IF END  THEN  400
  :M4=M4+1
140 DATA LOAD DA R(G1,G1)X6(),Y6(),Z6(),X7(),Y7(),Z7(),X8(),Y8(),Z8(
  ),X9(),Y9(),Z9(),I8
150 I2=2
  :I3=1
160 UNPACK(######)A$(I3) TO A4
  :I3=I3+1
170 PRINT
180 PRINT TAB(59);"SECTION NO ";A4
190 PRINT
200 M3=1
  :M2=1
210 UNPACK(##)STR(A$(I3),4,2) TO X1,Z1
220 UNPACK(######)A$(I3) TO A4
  :I3=I3+1
230 IF A4=5  THEN  130
  :IF A4=1  THEN  130
240 IF X1=2  THEN  310
250 V1=X8(M3)-X9(M3)
  :V2=Y8(M3)-Y9(M3)
```

```
    :V3=Z8(M3)-Z9(M3)
260 IF X1=1  THEN  290
    :IF X1=3  THEN  270
270 V4=V4+V1↑2
    :V5=V5+V2↑2
    :V6=V6+V3↑2
    :J1=J1+1
280 GOTO  340
290 W4=W4+V1↑2
    :W5=W5+V2↑2
    :W6=W6+V3↑2
    :J2=J2+1
    :J3=J3+1
300 GOTO  340
310 V3=Z6(M2)-Z7(M2)
320 U6=U6+V3↑2
    :J3=J3+1
330 GOTO  360
340 PRINTUSING  370,A4,X9(M3),Y9(M3),Z9(M3),X8(M3),Y8(M3),Z8(M3),V1,
    V2,V3
    :M3=M3+1
350 GOTO  210
360 PRINTUSING  380,A4,X7(M2),Y7(M2),Z7(M2),Z6(M2),V3
    :M2=M2+1
370%   ######   -######.###   -######.###   -######.###   -######.##
    #   -######.###   -######.###   -#.###   -#.###   -#.###
380%   ######   -######.###   -######.###   -######.###
                     -######.###                    -#.###
390 GOTO  210
400 S1=SQR((V4+V5)/(2*J1-2))
410 S2=SQR((W4+W5)/(2*J2-4*M4))
420 S3=SQR(V6/(J1-1))
430 S4=SQR((U6+W6)/(J3-3*M4))
    :SELECT PRINT 215(132)
    :PRINT
    :PRINT
440 PRINT
    :PRINT
    :PRINTUSING  450,S2,S4,S1,S3
    :PRINT HEX(0A0A)
    :SELECT PRINT 005(64)
450%        SIGMA X/Y TIE = -##.###       SIGMA Z TIE = -##.###      SI
    GMA X/Y CONTROL = -##.###     SIGMA Z CONTROL = -##.###
460 LOAD DC R"PHOTO404"
```

APPENDIX B

OUTPUT FROM THE ST. FAITH'S TEST AREA

MODEL FORMATION

MODEL NO 6061

PT NO	X	Y	Z	Y PARALLAX
6061	0.0000000	0.0000000	0.0000000	0.000
6062	1.0000000	-0.0204915	0.0113328	0.000
614	0.0003291	0.9861612	1.6163602	-0.002
616	0.0541558	-0.0609784	1.6508440	-0.001
618	0.0730867	-1.0683199	1.6826477	0.000
624	0.9807056	0.9594191	1.6610459	0.009
626	1.1358843	-0.1824813	1.7084469	0.004
628	0.8336740	-1.0316533	1.7065988	-0.000
1024	0.2614617	0.7086956	1.6293194	0.007
621	0.9712572	0.9602013	1.6609654	-0. 05
907	0.6438904	0.5258603	1.6481086	-0.017
612	0.0530430	0.0208593	1.6434807	0.012
13	1.2542772	0.0954141	1.7076374	0.001
909	0.1859921	-0.2314714	1.6611854	-0.009
908	0.6287462	-0.1717736	1.6790464	0.000
15	1.0477313	-0.2241131	1.7072597	0.021
16	1.0360469	-0.5373858	1.7074122	0.022
17	0.7922759	-0.9252795	1.7080431	0.017
19	0.6564148	-1.1087280	1.7102391	0.009
613	0.0726668	-1.0724039	1.6823820	0.003
911	0.0091213	-0.9763046	1.6741511	0.022

Y PARALLAX STD ERR = 0.013 MM AT PHOTO SCALE

MODEL NO 6062

PT NO	X	Y	Z	Y PARALLAX
6062	0.0000000	0.0000000	0.0000000	0.000
6063	1.0000000	-0.0179730	0.0102224	0.000
624	-0.0303983	1.0270954	1.7580485	-0.014
626	0.1444901	-0.1837084	1.8010099	-0.008
628	-0.1689068	-1.0885093	1.7928494	0.018
621	-0.0404582	1.0284559	1.7591005	0.009
621	-0.0404582	1.0284559	1.7591005	0.009
13	0.2676895	0.1123857	1.8020533	-0.001
15	0.0512616	-0.2288384	1.7995905	-0.005
16	0.0416434	-0.5616800	1.7974366	-0.002
17	-0.2138289	-0.9759183	1.7951844	-0.000
634	0.9163839	1.0746633	1.8028643	-0.002
636	1.1662504	-0.0408035	1.7710687	0.010
638	1.0234632	-1.2642728	1.7692628	0.005
38	0.7898277	0.2507443	1.7919863	-0.006
37	0.6333015	-0.2315655	1.7890810	0.006
196	0.8463453	-0.4980655	1.7696761	0.004
33	0.4217653	-1.2231448	1.7873543	-0.020
54	0.9436510	-0.9467008	1.7800633	0.003
55	0.8447012	-1.1781238	1.7738817	-0.004
42	1.1652593	-0.0304577	1.7714102	-0.004
194	1.2222043	-0.2313466	1.7708099	0.008
11	0.6466171	0.5977877	1.8016885	0.004
198	1.0427544	0.2671657	1.7883731	0.000
35	0.4798737	-0.8404724	1.7725535	-0.006

49	1.2298105	-0.5128954	1.7680100	0.009
12	0.5756098	0.3504251	1.7953972	0.003

Y PARALLAX STD ERR = 0.009 MM AT PHOTO SCALE

MODEL NO 6063

PT NO	X	Y	Z	Y PARALLAX
6063	0.0000000	0.0000000	0.0000000	0.000
6064	1.0000000	-0.0078219	0.0099340	0.000
634	-0.0881630	1.0428104	1.6923343	-0.008
636	0.157[illegible]360	-0.0117655	1.6675094	-0.005
638	0.0318787	-1.1714170	1.6717438	0.000
38	-0.2014810	0.2615233	1.6863290	0.002
54	-0.0462288	-0.8712524	1.6804559	-0.008
55	-0.1380868	-1.0913021	1.6757644	0.010
42	0.1562980	-0.0019557	1.6676071	0.006
194	0.2118431	-0.1917134	1.6682471	-0.010
49	0.2213115	-0.4583256	1.6671326	-0.009
644	0.9640219	0.9503279	1.6539171	-0.005
646	0.9304082	-0.0563923	1.6658340	0.015
648	1.0819685	-0.8459167	1.6738744	-0.002
631	0.0050905	0.9128204	1.6905252	0.010
39	0.4461850	0.5998351	1.6675485	0.003
83	0.6830948	0.6017891	1.6651780	0.002
82	0.9550920	0.6026781	1.6639448	-0.002
41	0.4422287	0.3885929	1.6759770	0.005
81	0.9354864	0.3030164	1.6763498	-0.004
44	0.4713981	-0.0380307	1.6635782	-0.005
78	0.[illegible]275809	0.0065632	1.6676093	0.005
74	0.3808093	-1.1435277	1.6722421	-0.008
76	0.7849904	-0.5969433	1.671056[illegible]	-0.002
107	0.8214080	-1.0829518	1.6731466	-0.011
206	1.0764296	-0.8571515	1.6737541	0.001

Y PARALLAX STD ERR = 0.008 MM AT PHOTO SCALE

MODEL NO 6064

PT NO	X	Y	Z	Y PARALLAX
6064	0.0000000	0.0000000	0.0000000	0.000
6065	1.0000000	-0.0417131	0.0035811	0.000
644	-0.0104142	0.9238411	1.5779422	-0.003
646	-0.0558450	-0.0431837	1.5924793	-0.010
648	0.0795569	-0.8040414	1.6006240	-0.023
82	-0.0234861	0.5900577	1.5893708	0.004
81	-0.0461766	0.3022950	1.6020118	0.005
78	-0.0577324	0.0174068	1.5943351	-0.006
107	-0.1739976	-1.0283807	1.6016823	0.020
206	0.0740865	-0.8149413	1.6006290	-0.000
654	1.0838281	0.7904908	1.5799014	-0.004
656	0.9781576	0.0664861	1.5829096	0.004
658	1.0965622	-1.0875596	1.5887411	0.000
102	0.4028435	-0.5842985	1.5971391	0.011
129	0.7754164	0.4202979	1.5899086	-0.006
105	0.4128638	-0.9958393	1.5957107	-0.011
219	1.0039813	-0.8783088	1.5898151	0.001
88	0.3446028	-0.0651032	1.5923849	0.003
201	0.7691563	0.2334404	1.5863158	0.003
121	0.7224903	-0.6983501	1.5931107	0.002

84	0.3130038	0.5998590	1.5907728	0.009
87	0.3759007	0.2194890	1.5946899	0.010
101	0.2094628	-0.3158086	1.5965056	-0.005
131	1.0203804	0.3948097	1.5359594	-0.007
128	0.9967526	-0.1746866	1.5837918	-0.002
124	0.8783191	-0.4116622	1.5875958	0.016
218	0.8342289	-1.1850674	1.5915575	0.016

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 6065

PT NO	X	Y	Z	Y PARALLAX
6065	0.0000000	0.0000000	0.0000000	0.000
6066	1.0000000	-0.0115603	0.0129142	0.000
654	0.0352390	0.9230210	1.7829773	-0.002
656	-0.0418286	0.1033171	1.7779567	-0.012
658	0.1577324	-1.1873499	1.7743143	-0.014
129	-0.2900732	0.4891401	1.7879192	-0.001
219	0.0415614	-0.9572044	1.7763715	0.006
201	-0.2863327	0.2787849	1.7819712	0.002
121	-0.2851554	-0.7710649	1.7795400	0.007
131	-0.0133125	0.4745186	1.7847397	0.004
128	-0.0070522	-0.1667193	1.7768389	0.005
124	-0.1265196	-0.4399199	1.7775966	-0.004
664	1.0962686	0.9904231	1.7653453	0.004
666	1.2045643	-0.1783293	1.7793025	-0.021
668	0.8582020	-0.9316951	1.7946333	-0.001
186	0.7475571	-0.4238046	1.7731200	0.010
159	1.0422014	-1.2224551	1.7847485	-0.001
155	1.0538168	-0.7218964	1.7948008	0.018
162	0.6929077	-1.2346378	1.7925102	-0.016
141	0.8903071	0.2007669	1.7660316	0.011
143	0.4641460	-0.2760341	1.7694407	0.007
187	1.0353135	-0.1239502	1.7705133	0.014
136	0.5032484	0.6985808	1.7828602	-0.004
139	1.2025188	0.7383676	1.7631963	-0.014

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

MODEL NO 6066

PT NO	X	Y	Z	Y PARALLAX
6066	0.0000000	0.0000000	0.0000000	0.000
6067	1.0000000	-0.0059099	0.0033242	0.000
664	0.0950592	0.9328907	1.6336136	-0.002
666	0.2048295	-0.1555175	1.6448905	0.002
668	-0.1123730	-0.8609071	1.6620568	-0.025
159	0.0613359	-1.1307003	1.6508442	0.011
155	0.0684992	-0.6637374	1.6603728	-0.002
141	-0.0910137	0.1953391	1.6351008	0.001
187	0.0465984	-0.1062412	1.6379989	-0.004
139	0.1959282	0.6987399	1.6304413	0.010
674	1.0276124	0.8789038	1.6204103	0.004
676	0.7441948	-0.1631639	1.6496820	0.009
678	0.8719999	-1.0289641	1.6421321	0.003
928	0.9949908	-0.9479645	1.6383397	-0.008
144	0.5099564	0.7120714	1.6348115	-0.006
145	0.8043429	0.7315435	1.6258338	-0.008
156	-0.1082989	-0.8279075	1.6606747	0.014

930	0.8871095	-0.1133504	1.6449344	0.003
147	0.6807607	0.4116920	1.6354106	-0.013
149	0.3221422	-0.2464404	1.6541765	-0.000
146	0.4285173	0.2830914	1.6446575	0.008
671	1.0333385	0.8815753	1.6202191	0.039
672	1.0074349	-0.0322721	1.6400562	.0.049

Y PARALLAX STD ERR = 0.018 MM AT PHOTO SCALE

MODEL NO 6070

PT NO	X	Y	Z	Y PARALLAX
6070	0.0000000	0.0000000	0.0000000	0.000
6071	1.0000000	0.0415691	-0.0018588	0.000
618	0.0812688	1.0847649	1.8061713	-0.001
706	0.0695165	0.0440423	1.8125377	-0.001
708	-0.0564888	-0.8215499	1.8134318	-0.003
628	0.8895852	1.1230222	1.8205688	0.008
716	1.0291586	0.0699438	1.7932654	0.004
718	1.1469854	-0.8992840	1.7902151	-0.012
19	0.7012160	1.0410360	1.8255562	0.001
29	1.0303234	0.0615691	1.7932281	-0.004
25	0.1614667	-0.0029517	1.8230699	-0.004
6024	0.1433037	-0.8092392	1.8194280	0.004
189	1.1503774	-0.6080517	1.7980313	0.017
21	0.9750848	0.8335421	1.8073197	-0.011
31	1.1300324	0.3717145	1.8041125	-0.001
901	-0.2895037	-0.7649347	1.8018010	0.000
902	-0.2797947	0.0828605	1.7959370	0.004
904	0.1019319	0.1490884	1.8112851	-0.016
903	0.1143649	-0.1201780	1.8108592	-0.001
905	0.1790204	0.9674324	1.8082361	0.013
23	0.7671453	0.3856889	1.8161203	0.003
911	0.0133706	1.1825087	1.7991860	-0.007
613	0.0808357	1.0809378	1.8066229	-0.002

Y PARALLAX STD ERR = 0.009 MM AT PHOTO SCALE

MODEL NO 6071

PT NO	X	Y	Z	Y PARALLAX
6071	0.0000000	0.0000000	0.0000000	0.000
6072	1.0000000	0.0221375	0.0040520	0.000
628	-0.0686462	1.0182121	1.6599985	-0.002
716	0.0265439	0.0471677	1.6487598	-0.000
718	0.1044140	-0.8463855	1.6580206	0.005
19	-0.2441619	. 0.9492547	1.6658871	-0.003
29	0.0273550	0.0394683	1.6489489	0.004
189	0.1166223	-0.5790313	1.6615113	-0.010
21	0.0007802	0.7500228	1.6519945	0.007
31	0.1285731	0.3211363	1.6547618	0.004
23	-0.2041676	0.3455412	1.6656008	-0.002
638	1.0177601	0.8088531	1.6244832	0.002
726	1.0481550	-0.0478117	1.6314126	-0.003
728	0.9588183	-0.7235593	1.6439224	0.002
55	0.8572947	0.8950442	1.6307193	-0.001
192	0.6358593	0.3842188	1.6412369	-0.002
62	0.8553989	-0.4502365	1.6493275	0.000
59	1.0592064	0.2040237	1.6247832	-0.009
33	0.4675636	0.8708830	1.6485786	-0.010

65	0.7515253	0.0562098	1.6310838	0.000
54	0.9574400	1.1032614	1.6335304	0.002
64	0.3963877	-0.6026369	1.6550267	0.001

Y PARALLAX STD ERR = 0.005 MM AT PHOTO SCALE

MODEL NO 6072

PT NO	X	Y	Z	Y PARALLAX
6072	0.0000000	0.0000000	0.0000000	0.000
6073	1.0000000	0.0183421	-0.0022119	0.000
638	0.0025182	0.7781646	1.7037854	0.001
726	0.0564191	-0.1114375	1.6899209	0.005
728	-0.0184428	-0.8318336	1.6860123	-0.009
55	-0.1664726	0.8632199	1.7123988	0.006
62	-0.1334014	-0.5349901	1.6985930	0.003
59	0.0613251	0.1507648	1.6888943	0.000
54	-0.0678113	1.0823057	1.7204578	-0.009
648	1.0696101	1.0778140	1.6957304	0.003
736	1.0625890	0.0826966	1.6695627	-0.005
738	0.8946006	-0.8567911	1.6752352	0.012
71	0.7023584	0.2852038	1.6819999	-0.001
108	0.9179814	0.3912927	1.6751573	-0.004
5000	1.0294803	-0.9127531	1.6712447	-0.005
206	1.0638677	1.0663703	1.6950097	0.002
915	0.7170662	-0.2177676	1.6733244	-0.006
107	0.8006552	0.8457378	1.6937402	-0.004
5024	1.0209075	-0.6110787	1.6676333	0.006
916	1.0371475	-0.1554252	1.6640455	0.009
74	0.3549610	0.7967810	1.6987558	-0.001
914	0.6924323	-0.8240298	1.6838522	0.016

Y PARALLAX STD ERR = 0.008 MM AT PHOTO SCALE

MODEL NO 6073

PT NO	X	Y	Z	Y PARALLAX
6073	0.0000000	0.0000000	0.0000000	0.000
6074	1.0000000	0.0306653	0.0009333	0.000
648	0.0426740	1.1522144	1.7958910	-0.002
736	0.0590804	0.0915889	1.7808845	0.000
738	-0.0974299	-0.9131150	1.7980070	0.000
71	-0.3296081	0.2988396	1.7902889	0.000
108	-0.1023868	0.4169781	1.7823161	-0.004
5000	0.0475877	-0.9695455	1.7950049	0.013
206	0.0368370	1.1400055	1.7955003	0.003
915	-0.3018952	-0.2367706	1.7876803	0.004
5024	0.0312588	-0.6484431	1.7871742	-0.002
916	0.0376834	-0.1627941	1.7777287	-0.008
914	-0.3135532	-0.8828386	1.8059247	-0.008
658	1.1823592	0.8459224	1.7718360	-0.005
746	0.8949331	-0.1315949	1.7931904	-0.000
748	1.0334355	-0.9672934	1.7764415	-0.005
215	0.3510855	0.6816007	1.7785255	0.004
219	1.0766464	1.0784849	1.7759413	0.001
175	0.9101203	-0.1646431	1.7882942	0.008
183	1.2178110	0.5570042	1.7729339	-0.012
211	0.3209541	0.0811917	1.7731714	-0.002
121	0.7603624	1.2769669	1.7844226	0.018
105	0.4173976	0.9413915	1.7852953	0.006

218	0.8901645	0.7339842	1.7751515	-0.013
743	1.0814468	-0.9566322	1.7726842	-0.003

Y PARALLAX STD ERR = 0.008 MM AT PHOTO SCALE

MODEL NO 6074

PT NO	X	Y	Z	Y PARALLAX
6074	0.0000000	0.0000000	0.0000000	0.000
6075	1.0000000	0.0468447	-0.0046201	0.000
658	0.1755669	0.7607074	1.5789583	0.001
746	-0.0879993	-0.1166063	1.6148232	-0.003
748	0.0321441	-0.8693673	1.6129289	0.011
219	0.0817204	0.9706701	1.5796209	-0.004
175	-0.0745496	-0.1465615	1.6113670	-0.004
183	0.2059208	0.5006177	1.5842065	0.005
218	-0.0878393	0.6615912	1.5847660	0.006
743	0.0754013	-0.8603321	1.6097316	-0.001
668	0.8117202	0.9588387	1.5835149	-0.002
756	0.9446329	-0.0556271	1.5876070	0.009
758	1.0213158	-0.8005542	1.5787076	-0.001
168	0.6794450	0.1641625	1.5970071	-0.005
177	0.3316137	-0.6246081	1.5942485	-0.011
156	0.8172594	0.9901531	1.5819305	-0.001
155	0.9949824	1.1375204	1.5775639	0.008
753	1.0806308	-0.8480839	1.5774066	-0.030
162	0.6512388	0.6955543	1.5881279	-0.001
752	1.0050415	-0.0827965	1.5867156	-0.015
159	0.9632244	0.6914093	1.5760524	-0.014

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

MODEL NO 6075

PT NO	X	Y	Z	Y PARALLAX
6075	0.0000000	0.0000000	0.0000000	0.000
6076	1.0000000	0.0021943	-0.0081418	0.000
668	-0.1801077	1.0090844	1.7955578	0.008
756	-0.0601302	-0.1335858	1.7865956	-0.009
758	0.0044325	-0.9714400	1.7664137	-0.005
156	-0.1729977	1.0441850	1.7942249	0.000
155	0.0307779	1.2048020	1.7909611	-0.005
753	0.0696426	-1.0267064	1.7647144	0.009
752	0.0068953	-0.1657734	1.7854725	0.003
159	-0.0177521	0.7046846	1.7831838	-0.001
678	0.8598041	0.7429595	1.7619184	-0.003
766	1.1093680	-0.1064324	1.7638996	0.007
768	0.9507949	-0.8985210	1.7519487	-0.005
4000	1.0138336	-1.0123000	1.7472232	0.014
4024	0.9570174	-0.8998703	1.7515312	0.016
923	0.6593713	-1.0359375	1.7536987	-0.003
762	1.0813645	-0.0818893	1.7643269	0.015
928	0.9984203	0.8189285	1.7552659	0.000
929	0.5328141	0.8311990	1.7663085	-0.017

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

STRIP FORMATION

JUNCTION OF MODELS 6061 - 6062

6062	+1.0000048	-0.0202276	+0.0114249	+1.0000000	-0.0204915	+0.0113328	+.489E-05	+.263E-03	+.921E-04
6063	+1.9415853	-0.0450806	+0.0205158						
624	+0.9808428	+0.9590807	+1.6601128	+0.9807056	+0.9594191	+1.6610459	+.137E-03	-.338E-03	-.933E-03
626	+1.1358921	0.1822333	+1.7085289	+1.1358843	-0.1824813	+1.7084469	+.784E-05	+.247E-03	+.182E-03
628	+0.8335239	-1.0318267	+1.7072575	+0.8336740	-1.0316533	+1.7065988	-.150E-03	-.173E-03	+.658E-03
621	+0.9713809	+0.9604495	+1.6611010	+0.9712572	+0.9602013	+1.6609654	+.123E-03	+.248E-03	+.135E-03
621	+0.9713809	+0.9604495	+1.6611010	+0.9713190	+0.9603254	+1.6610332	+.619E-04	+.124E-03	+.678E-04
13	+1.2542782	+0.0956181	+1.7075319	+1.2542772	+0.0954141	+1.7076374	+.102E-05	+.204E-03	-.105E-03
15	+1.0477356	-0.2239960	+1.7076582	+1.0477313	-0.2241131	+1.7072597	+.430E-05	+.117E-03	+.398E-03
16	+1.0360163	-0.5373681	+1.7078828	+1.0360469	-0.5373858	+1.7074122	-.305E-04	+.176E-04	+.470E-03
17	+0.7921215	-0.9254256	+1.7087259	+0.7922759	-0.9252795	+1.7080431	-.154E-03	-.146E-03	+.682E-03
634	+1.8728557	+0.9966060	+1.7013738						
636	+2.0992217	-0.0560337	+1.6787964						
638	+1.9549773	-1.2070364	+1.6854482						
38	+1.7470831	+0.2216660	+1.6967745						
37	+1.5958230	-0.2312895	+1.6973970						
196	+1.7943062	-0.4840852	+1.6807818						
33	+1.3886899	-1.1639727	+1.7026033						
54	+1.8823625	-0.9072700	+1.6935281						
55	+1.7873259	-1.1244498	+1.6893339						
42	+2.0983713	-0.0462809	+1.6790488						
194	+2.1503914	-0.2359160	+1.6798021						
11	+1.6149998	+0.5496850	+1.7036628						
198	+1.9853971	+0.2350829	+1.6930948						
36	+1.4464593	-0.8035773	+1.6860437						
49	+2.1553021	-0.5011282	+1.6790609						
12	+1.5461496	+0.3172708	+1.6994545						

SIGMA X/Y/Z = 0.028 MM AT PHOTO SCALE

JUNCTION OF MODELS 6062 - 6063

6063	+1.9415819	-0.0451222	+0.0205307	+1.9415853	-0.0450806	+0.0205158	-.339E-05	-.416E-04	+.149E-04
6064	+2.9357973	-0.0696781	+0.0296274						
634	+1.8728433	+0.9967005	+1.7014587	+1.8728557	+0.9966060	+1.7013738	-.123E-04	+.945E-04	+.849E-04
636	+2.0992183	-0.0560774	+1.6787311	+2.0992217	-0.0560337	+1.6787964	-.337E-05	-.437E-04	-.652E-04
638	+1.9549964	-1.2070455	+1.6854135	+1.9549773	-1.2070364	+1.6854482	+.191E-04	-.915E-05	-.346E-04
38	+1.7470387	+0.2217294	+1.6971745	+1.7470831	+0.2216660	+1.6967745	-.443E-04	+.634E-04	+.400E-03
54	+1.8823801	-0.9072510	+1.6935261	+1.8823625	-0.9072700	+1.6935281	+.176E-04	+.189E-04	-.196E-05
55	+1.7873421	-1.1245210	+1.6893838	+1.7873259	-1.1244498	+1.6893339	+.162E-04	-.712E-04	+.499E-04
42	+2.0983510	-0.0463056	+1.6788091	+2.0983713	-0.0462809	+1.6790488	-.202E-04	-.247E-04	-.239E-03
194	+2.1503949	-0.2359204	+1.6797892	+2.1503914	-0.2359160	+1.6798021	+.350E-05	-.443E-05	-.128E-04
49	+2.1553305	-0.5011840	+1.6792184	+2.1553021	-0.5011282	+1.6790609	+.284E-04	-.558E-04	+.157E-03
644	+2.9174854	+0.0869874	+1.6620059						
646	+2.8671626	-0.1134413	+1.6765390						
648	+3.0046103	-0.9010241	+1.6860283						
631	+1.9633839	+0.8658765	+1.6998509						
39	+2.3967049	+0.5472073	+1.6772888						
83	+2.6323043	+0.5451657	+1.6747383						
82	+2.9027755	+0.5414780	+1.6732929						
41	+2.3892299	+0.3372450	+1.6861059						
[illegible]	[illegible]	[illegible]	[illegible]						

STRIP FORMATION

JUNCTION OF MODELS 6061 - 6062

6062	+1.0000048	-0.0202276	+0.0114249	+1.0000000	-0.0204915	+0.0113328	+.483E-05	+.263E-03	+.921E-04
6063	+1.9415853	-0.0450806	+0.0205158						
624	+0.9808428	+0.9590807	+1.6601128	+[illegible].9807056	+0.9594191	+1.6610459	+.137E-03	-.339E-03	-.933E-03
626	+1.1358921	-0.1822333	+1.7086289	+1.1358843	-0.1824813	+1.7084469	+.784E-05	+.247E-03	+.182E-03
628	+0.8335239	-1.0318267	+1.7072575	+0.8336740	-1.0316533	+1.7065938	-.150E-03	-.173E-03	+.658E-03
621	+0.9713809	+0.9604495	+1.6611010	+0.9712572	+0.9602013	+1.6609654	+.123E-03	+.248E-03	+.135E-03
621	+0.9713809	+0.9604495	+1.6611010	+0.9713190	+0.9603254	+1.6610332	+.619E-04	+.124E-03	+.678E-04
13	+1.2542782	+0.0956181	+1.7075319	+1.2542772	+0.0954141	+1.7076374	+.102E-05	+.204E-03	-.105E-03
15	+1.0477356	-0.2239960	+1.7076582	+1.0477313	-0.2241131	+1.7072597	+.430E-05	+.117E-03	+.398E-03
16	+1.0360163	-0.5373681	+1.7078828	+1.0360469	-0.5373858	+1.7074122	-.305E-04	+.176E-04	+.470E-03
17	+0.7921215	-0.9254256	+1.7087259	+0.7922759	-0.9252795	+1.7080431	-.154E-03	-.146E-03	+.682E-03
634	+1.8728557	+0.9956060	+1.7013738						
636	+2.0992217	-0.0560337	+1.6787964						
638	+1.9549773	-1.2070364	+1.6854482						
38	+1.7470831	+0.2216660	+1.6967745						
37	+1.5958230	-0.2312895	+1.6973970						
196	+1.7943062	-0.4840852	+1.6807818						
33	+1.3886899	-1.1633727	+1.7026033						
54	+1.8823625	-0.9072700	+1.6935281						
55	+1.7873259	-1.1244498	+1.6893339						
42	+2.0983713	-0.0462809	+1.6790488						
194	+2.1503914	-0.2359160	+1.6798021						
11	+1.6149998	+0.5496850	+1.7036628						
198	+1.9853971	+0.2350829	+1.6930948						
36	+1.4464593	-0.8035773	+1.6860437						
49	+2.1553021	-0.5011282	+1.6790609						
12	+1.5461496	+0.3172708	+1.6994545						

SIGMA X/Y/Z = 0.028 MM AT PHOTO SCALE

JUNCTION OF MODELS 6062 - 6063

6063	+1.9415819	-0.0451222	+0.0205307	+1.9415853	-0.0450806	+0.0205158	-.339E-05	-.416E-04	+.149E-04
6064	+2.9357973	-0.0696781	+0.0296274						
634	+1.8728433	+0.9967005	+1.7014587	+1.8728557	+0.9956060	+1.7013738	-.123E-04	+.945E-04	+.849E-04
636	+2.0992183	-0.0560774	+1.6787311	+2.0992217	-0.0560337	+1.6787964	-.337E-05	-.437E-04	-.652E-04
638	+1.9549964	-1.2070455	+1.6854135	+1.9549773	-1.2070364	+1.6854482	+.191E-04	-.915E-05	-.346E-04
38	+1.7470387	+0.2217294	+1.6971745	+1.7470831	+0.2216660	+1.6967745	-.443E-04	+.634E-04	+.400E-03
54	+1.8823801	-0.9072510	+1.6935261	+1.8823625	-0.9072700	+1.6935281	+.176E-04	+.189E-04	-.196E-05
55	+1.7873421	-1.1245210	+1.6893838	+1.7873259	-1.1244498	+1.6893339	+.162E-04	-.712E-04	+.499E-04
42	+2.0983510	-0.0463056	+1.6788091	+2.0983713	-0.0462809	+1.6790488	-.202E-04	-.247E-04	-.239E-03
194	+2.1503949	-0.2359204	+1.6797892	+2.1503914	-0.2359160	+1.6798021	+.350E-05	-.443E-05	-.128E-04
49	+2.1553305	-0.5011840	+1.6792184	+2.1553021	-0.5011282	+1.6790609	+.284E-04	-.558E-04	+.157E-03
644	+2.9174854	+0.8869874	+1.6620059						
646	+2.8671628	-0.1134413	+1.6765390						
648	+3.0046103	-0.9010241	+1.6860283						
631	+1.9633839	+0.8658765	+1.6998509						
39	+2.3967049	+0.5472073	+1.6772888						
83	+2.6323043	+0.5451657	+1.6747383						
82	+2.9027765	+0.5414780	+1.6732929						
41	+2.3892299	+0.3372450	+1.6851059						
81	+2.8782579	+0.2438679	+1.6862518						
44	+2.4110579	-0.0874776	+1.6746246						
78	+2.8654104	-0.0507913	+1.6781780						

[illegible]	[illegible]	[illegible]	+1.6835734
76	+2.7134931	-0.6484777	+1.6829540
107	+2.7415429	-1.1323413	+1.6859973
206	+2.9989139	-0.9121025	+1.6859361

SIGMA X/Y/Z = 0.009 MM AT PHOTO SCALE

JUNCTION OF MODELS 6063 - 6064

6064	+2.9357885	-0.0696342	+0.0296166	+2.9357973	-0.0696781	+0.0296274	-.875E-05	+.438E-04	-.107E-04
6065	+3.9701256	-0.1161387	+0.0400713						
644	+2.9174948	+0.8868513	+1.6615390	+2.9174854	+0.8869874	+1.6620059	+.942E-05	-.136E-03	-.466E-03
646	+2.8671535	-0.1133990	+1.6766895	+2.8671628	-0.1134413	+1.6765390	-.922E-05	+.422E-04	+.150E-03
648	+3.0046188	-0.9009741	+1.6863553	+3.0046103	-0.9010241	+1.6860233	+.854E-05	+.499E-04	+.327E-03
82	+2.9027748	+0.5415937	+1.6734181	+2.9027755	+0.5414780	+1.6732929	-.617E-06	+.115E-03	+.125E-03
81	+2.8782507	+0.2439784	+1.6864668	+2.8782579	+0.2437679	+1.6862513	-.713E-05	+.110E-03	+.215E-03
78	+2.8653918	-0.0507096	+1.6785705	+2.8654104	-0.0507913	+1.6781780	-.185E-04	+.816E-04	+.392E-03
107	+2.7415564	-1.1322076	+1.6858401	+2.7415429	-1.1323413	+1.6859973	+.135E-04	+.133E-03	-.157E-03
206	+2.9989231	-0.9122319	+1.6863284	+2.9989139	-0.9121025	+1.6859361	+.920E-05	-.129E-03	+.392E-03
654	+4.0490290	+0.7452293	+1.6709899						
656	+3.9372629	-0.0034144	+1.6737031						
658	+4.0558405	-1.1976956	+1.6810314						
102	+3.3398200	-0.6747306	+1.6848317						
129	+3.7286671	+0.3632949	+1.6794260						
105	+3.3488146	-1.1005132	+1.6835992						
219	+3.9607604	-0.9809099	+1.6814288						
88	+3.2813443	-0.1374180	+1.6792971						
201	+3.7215881	+0.1700059	+1.6757478						
121	+3.6701394	-0.7937932	+1.6828654						
84	+3.2508975	+0.5506058	+1.6771295						
87	+3.3146616	+0.1568952	+1.6817695						
101	+3.1406728	-0.3963235	+1.6827585						
131	+3.9820237	+0.3361036	+1.6770006						
128	+3.9556841	-0.2529751	+1.6748451						
124	+3.8323437	-0.4977329	+1.6780854						
218	+3.7841102	-1.2976888	+1.6822210						

SIGMA X/Y/Z = 0.016 MM AT PHOTO SCALE

JUNCTION OF MODELS 6064 - 6065

6065	+3.9701224	-0.1160247	+0.0400219	+3.9701256	-0.1161387	+0.0400713	-.311E-05	+.113E-03	-.493E-04
6066	+4.8874415	-0.1765462	+0.0522754						
654	+4.0490072	+0.7452548	+1.6707682	+4.0490290	+0.7452293	+1.6709899	-.217E-04	+.255E-04	-.221E-03
656	+3.9372597	-0.0033010	+1.6734149	+3.9372629	-0.0034144	+1.6737031	-.316E-05	+.113E-03	-.288E-03
658	+4.0558685	-1.1979484	+1.6815905	+4.0558405	-1.1976956	+1.6810314	+.280E-04	-.252E-03	+.559E-03
129	+3.7287005	+0.3633343	+1.6790750	+3.7286671	+0.3632949	+1.6794260	+.334E-04	+.394E-04	-.350E-03
219	+3.9607489	-0.9808883	+1.6814042	+3.9607604	-0.9809099	+1.6814288	-.114E-04	+.215E-04	-.245E-04
201	+3.7216094	+0.1700195	+1.6754776	+3.7215881	+0.1700059	+1.6757478	+.213E-04	+.136E-04	-.270E-03
121	+3.6701698	-0.7936674	+1.6825714	+3.6701394	-0.7937932	+1.6828654	+.304E-04	+.125E-03	-.293E-03
131	+3.9820056	+0.3360406	+1.6763597	+3.9820237	+0.3361036	+1.6770006	-.180E-04	-.629E-04	-.640E-03
128	+3.9556717	-0.2529041	+1.6747965	+3.9556841	-0.2529751	+1.6748451	-.123E-04	+.709E-04	-.485E-04
124	+3.8323462	-0.4976785	+1.6778870	+3.8323437	-0.4977329	+1.6780854	+.254E-05	+.543E-04	-.198E-03
664	+5.0262889	+0.7538845	+1.6542586						
666	+5.0672278	-0.3241504	+1.6775033						
668	+4.7116189	-0.9381652	+1.6981925						
186	+4.6354619	-0.5266531	+1.6738735						
159	+4.8659634	-1.2743323	+1.6917413						
155	+4.9016681	-0.8153954	+1.6965371						
162	+4.5447407	-1.2679716	+1.6958864						

141	[illegible]	[illegible]	+1.6618482
143	+4.3827119	-0.3768766	+1.6690991
187	+4.9145920	-0.2658496	+1.6688936
136	+4.4673627	+0.5158384	+1.6727857
139	+5.1112057	+0.5172006	+1.6545525

SIGMA X/Y/Z = 0.018 MM AT PHOTO SCALE

JUNCTION OF MODELS 6065 - 6066

6066	+4.8874575	-0.1763557	+0.0521605	+4.8874415	-0.1765462	+0.0522754	+.160E-04	+.190E-03	-.114E-03
6067	+5.8711620	-0.2436766	+0.0635863						
664	+5.0263804	+0.7537373	+1.6538269	+5.0262889	+0.7538845	+1.6542586	+.915E-04	-.147E-03	-.431E-03
666	+5.0672468	-0.3239593	+1.6772435	+5.0672278	-0.3241504	+1.6775033	+.190E-04	+.191E-03	-.259E-03
668	+4.7114922	-0.9983994	+1.6989987	+4.7116189	-0.9981652	+1.6981925	-.126E-03	-.234E-03	+.806E-03
159	+4.8658949	-1.2747069	+1.6921766	+4.8659634	-1.2743323	+1.6917413	-.684E-04	-.374E-03	+.435E-03
155	+4.9016506	-0.8155212	+1.6967339	+4.9016681	-0.8153854	+1.6965371	-.174E-04	-.135E-03	+.196E-03
141	+4.7978039	+0.0394057	+1.6615207	+4.7977347	+0.0394066	+1.6618482	+.692E-04	-.801E-06	-.327E-03
187	+4.9146204	-0.2658060	+1.6686525	+4.9145920	-0.2658496	+1.6638936	+.284E-04	+.435E-04	-.241E-03
139	+5.1112387	+0.5170751	+1.6539695	+5.1112057	+0.5172006	+1.6545525	+.330E-04	-.125E-03	-.582E-03
674	+5.9408708	+0.6430750	+1.6489159						
676	+5.5975258	-0.3646247	+1.6864094						
678	+5.6699982	-1.2245770	+1.6890756						
928	+5.7960525	-1.1524787	+1.6854819						
144	+5.4210609	+0.5109163	+1.6606780						
145	+5.7120313	+0.5118627	+1.6540027						
156	+4.7175434	-0.9661916	+1.6973230						
930	+5.7412723	-0.3244523	+1.6823619						
147	+5.5706327	+0.2048183	+1.6657989						
149	+5.1770213	-0.4205512	+1.6883009						
146	+5.3144079	+0.0938918	+1.6742244						
671	+5.9466718	+0.6453494	+1.6487457						
672	+5.8647164	-0.2521244	+1.6776752						

SIGMA X/Y/Z = 0.026 MM AT PHOTO SCALE

JUNCTION OF MODELS 6070 - 6071

6071	+0.9999860	+0.0416890	-0.0018481	+1.0000000	+0.0415691	-0.0018583	-.138E-04	+.119E-03	+.106E-04
6072	+2.0871581	+0.1027759	+0.0021499						
628	+0.8896158	+1.1227657	+1.8199518	+0.8895852	+1.1230[illegible]	+1.8205688	+.306E-04	-.256E-03	-.616E-03
716	+1.0291442	+0.0700664	+1.7935283	+1.02915[illegible]	+0.[illegible]	+1.7932654	-.143E-04	+.122E-03	+.262E-03
718	+1.1469829	-0.8992701	+1.7905584	+1.1469854	-0.[illegible]2840	+1.7902151	-.240E-05	+.138E-04	+.343E-03
19	+0.7012190	+1.0411571	+1.8254878	+0.7012160	+1.0410360	+1.8255562	+.305E-05	+.121E-03	-.683E-04
29	+1.0303122	+0.0617176	+1.7936216	+1.0303234	+0.0615691	+1.7932281	-.111E-04	+.148E-03	+.393E-03
189	+1.1503644	-0.6080161	+1.7982368	+1.1503774	-0.6080517	+1.7980313	-.129E-04	+.355E-04	+.205E-03
21	+0.9750772	+0.8336949	+1.8072885	+0.9750848	+0.8335421	+1.8073197	-.749E-05	+.152E-03	-.311E-04
31	+1.1300077	+0.3718087	+1.8039705	+1.1300324	+0.3717145	+1.8041125	-.246E-04	+.942E-04	-.141E-03
23	+0.7670992	+0.3858691	+1.8163682	+0.7671453	+0.3856[illegible]	+1.8161203	-.460E-04	+.180E-03	+.247E-03
638	+2.0753250	+0.9357862	+1.7774504						
726	+2.1441418	+0.0048544	+1.7725141						
728	+2.0725518	-0.7500960	+1.7761527						
55	+1.9015551	+1.0235150	+1.7856097						
192	+1.6795749	+0.4594331	+1.7897930						
62	+1.9493572	-0.4403437	+1.7863047						
59	+2.1468270	+0.2793296	+1.7689517						
33	+1.4784497	+0.9225267	+1.8049848						
65	+1.8175581	+0.1070293	+1.7738866						
54	+2.0028010	+1.2537034	+1.7916238						
64	+1.4556122	-0.6232335	+1.7906295						

SIGMA X/Y/Z = 0.016 MM AT PHOTO SCALE

JUNCTION OF MODELS 6071 - 6072

6072	+2.0871591	+0.1027644	+0.0021370	+2.0871581	+0.1027759	+0.0021499	+.108E-05	-.114E-04	-.128E-04
6073	+3.1338860	+0.1313653	+0.0013783						
638	+2.0793219	+0.9357571	+1.7774084	+2.07932[illegible]	+0.9357862	+1.7774504	-.309E-05	-.290E-04	-.419E-04
726	+2.1441428	+0.0048434	+1.7725862	+2.14414[illegible]	+0.0048544	+1.7725141	+.103E-05	-.109E-04	+.721E-04
728	+2.0725527	-0.7500445	+1.7761352	+2.0725518	-0.7500960	+1.7761527	+.978E-06	+.514E-04	-.174E-04
55	+1.9015903	+1.0232968	+1.7852115	+1.9015551	+1.0235150	+1.7856097	+.352E-04	-.218E-03	-.398E-03
62	+1.9493880	-0.4402442	+1.78590[illegible]	+1.9493572	-0.4403437	+1.7863047	+.308E-04	+.994E-04	-.403E-03
59	+2.1468148	+0.2793628	+1.7686[illegible]	+2.1468270	+0.2793296	+1.7689517	-.121E-04	+.332E-04	-.260E-03
54	+2.0028029	+1.2536614	+1.791457[illegible]	[illegible]2.0028010	+1.2537034	+1.7916238	+.198E-05	-.419E-04	-.165E-03
648	+3.1936521	+1.2594114	+1.7676155						
736	+3.1957092	+0.2173334	+1.7509448						
738	+3.0286682	-0.7676830	+1.7667243						
71	+2.8166579	+0.4260656	+1.7611481						
108	+3.0414075	+0.5390821	+1.7532185						
5000	+3.1704069	-0.8250383	+1.7633872						
206	+3.1877493	+1.2473698	+1.7569744						
915	+2.8368019	-0.1004204	+1.7575181						
107	+2.9142708	+1.0139085	+1.7675638						
5024	+3.1586015	-0.5093528	+1.7563367						
916	+3.1713243	-0.0322415	+1.7476333						
74	+2.4481268	+0.9585126	+1.7725607						
914	+2.8166951	-0.7351995	+1.7750371						

SIGMA X/Y/Z = 0.013 MM AT [illegible]OTO SCALE

JUNCTION OF MODELS 6072 - 6073

6073	+3.1338803	+0.1313404	+0.0014440	+3.13388[illegible]	+0.1313653	+0.0013733	-.561E-05	-.249E-04	+.657E-04
6074	+4.1166215	+0.1482264	+0.0009462						
648	+3.1936495	+1.2593852	+1.7677649	+3.1936521	+1.2594114	+1.7676155	-.250E-05	-.261E-04	+.149E-03
736	+3.1957034	+0.2173074	+1.7511001	+3.1957092	+0.2173334	+1.7509448	-.576E-05	-.259E-04	+.155E-03
738	+3.0286920	-0.7676060	+1.7[illegible]53537	+3.0286682	[illegible]0.7676830	+1.7667243	+.138E-04	+.769E-04	-.370E-03
71	+2.8166308	+0.4260243	+1.7512813	+2.8166579	+0.4260656	+1.7611481	-.190E-04	-.412E-04	+.139E-03
108	+3.0413984	+0.5390226	+1.7523261	+3.0414075	+0.5390821	+1.7[illegible]32185	-.909E-05	+.595E-06	+.107E-03
5000	+3.1703863	-0.8249536	+1.7[illegible]0903	+3.1704069	-0.8250383	+1.7[illegible]3872	-.205E-04	+.846E-04	-.296E-03
206	+3.1877535	+1.2474700	+1.7673678	+3.1877493	+1.2473698	+1.7669744	+.422E-05	+.100E-03	+.393E-03
915	+2.8367677	-0.1004854	+1.7577193	+2.8368019	-0.1004204	+1.7575181	-.341E-04	-.650E-04	+.201E-03
5024	+3.1585855	-0.5092937	+1.7559959	+3.1586015	-0.5093528	+1.7563367	-.159E-04	+.590E-04	-.340E-03
916	+3.1713122	-0.0322924	+1.7475760	+3.1713243	-0.0322415	+1.7476933	-.120E-04	-.509E-04	-.117E-03
914	+2.8167890	-0.7350183	+1.77450[illegible]	+2.8166951	-0.7351995	+1.7750371	+.939E-04	+.181E-03	-.533E-03
658	+4.2091113	+0.9434633	+1.7419098						
746	+4.0138500	-0.0130138	+1.7515620						
748	+4.1238210	-0.8357561	+1.7434086						
215	+3.4303573	+0.7930350	+1.7494093						
219	+4.2033508	+1.1733039	+1.7465145						
175	+4.0283275	-0.0456755	+1.7567687						
183	+4.3401136	+0.6591731	+1.7424193						
211	+3.4528020	+0.2036418	[illegible].7431192						
121	+3.9002941	+1.3724559	[illegible].7556567						
105	+3.5589470	+1.0473463	+1.7564275						
218	+4.0206015	+0.8373041	+1.7453061						
743	+4.1861199	-0.8259120	+1.7396[illegible]						

SIGMA X/Y/Z = 0.015 MM AT P[illegible]OTO [illegible]ALE

JUNCTION OF MODELS 6073 - 6074

6074	+4.1166247	+0.1482623	+0.0009369	+4.1166215	+0.1482264	+0.0009462	+.322E-05	+.359E-04	-.927E-05
6075	+5.2091223	+0.1911447	+0.0002631						
658	+4.3091015	+0.9435103	+1.7419602	+4.3091113	+0.9434633	+1.7419098	-.970E-05	+.470E-04	+.504E-04
746	+4.0138562	-0.0129818	+1.7613883	+4.0138530	-0.0130188	+1.7615620	+.328E-05	+.263E-04	-.173E-03
748	+4.1388241	-0.8358760	+1.7435410	+4.1388210	-0.8357561	+1.7434086	+.319E-05	-.119E-03	+.132E-03
219	+4.2083524	+1.1735367	+1.7468800	+4.2083508	+1.1733089	+1.7465145	+.169E-05	+.227E-03	+.365E-03
175	+4.0283082	-0.0457277	+1.7570094	+4.0283275	-0.0456755	+1.7567687	-.192E-04	-.522E-04	+.240E-03
183	+4.3400740	+0.6591552	+1.7422037	+4.3401136	+0.6591781	+1.7424193	-.395E-04	-.228E-04	-.215E-03
218	+4.0205946	+0.8373656	+1.7452856	+4.0206015	+0.8373641	+1.7453961	-.683E-05	+.154E-05	-.110E-03
743	+4.1861513	-0.8263038	+1.7403895	+4.1861199	-0.8259120	+1.7396658	+.314E-04	-.391E-03	+.723E-03
668	+5.0054679	+1.1544274	+1.7533336						
756	+5.1421883	+0.0455458	+1.7364486						
758	+5.2197830	-0.7682807	+1.7109810						
168	+4.8543692	+0.2875480	+1.7505437						
177	+4.4679596	-0.5707310	+1.7294109						
156	+5.0117827	+1.1886069	+1.7522952						
155	+5.2071109	+1.3481222	+1.7512920						
753	+5.2841706	-0.8206460	+1.7087386						
162	+4.8280063	+0.8681942	+1.7521728						
752	+5.2079377	+0.0153937	+1.7350946						
159	+5.1687317	+0.8613175	+1.7399480						

SIGMA X/Y/Z = 0.018 MM AT PHOTO SCALE

JUNCTION OF MODELS 6074 - 6075

6075	+5.2091314	+0.1910172	+0.0002580	+5.2091223	+0.1911447	+0.0002631	+.914E-05	-.127E-03	-.507E-05
6076	+6.1816588	+0.2106770	-0.0014543						
668	+5.0054543	+1.1545011	+1.7537289	+5.0054679	+1.1544274	+1.7533336	-.135E-04	+.737E-04	+.395E-03
756	+5.1421971	+0.0454204	+1.7365202	+5.1421883	+0.0455458	+1.7364486	+.886E-05	-.125E-03	+.716E-04
758	+5.2197785	-0.7681017	+1.7105190	+5.2197830	-0.7682807	+1.7109810	-.448E-05	+.178E-03	-.461E-03
156	+5.0117624	+1.1887716	+1.7527602	+5.0117827	+1.1886069	+1.7522952	-.202E-04	+.164E-03	+.465E-03
155	+5.2071448	+1.3485564	+1.7521448	+5.2071109	+1.3481222	+1.7512920	+.339E-04	+.434E-03	+.852E-03
753	+5.2841744	-0.8206959	+1.7088232	+5.2841706	-0.8206460	+1.7087386	+.381E-05	-.499E-04	+.846E-04
752	+5.2079509	+0.0152973	+1.7355825	+5.2079377	+0.0153937	+1.7350946	+.132E-04	-.963E-04	+.487E-03
159	+5.1687528	+0.8614077	+1.7402383	+5.1687317	+0.8613175	+1.7399480	+.211E-04	+.902E-04	+.290E-03
678	+6.0216490	+0.9141257	+1.7252952						
766	+6.2792152	+0.0924315	+1.7219025						
768	+6.1389422	-0.6805466	+1.7028961						
4000	+6.2022692	-0.7900576	+1.6977705						
4024	+6.1450198	-0.6817468	+1.7025176						
923	+5.8579235	-0.8192868	+1.7016841						
762	+6.2515490	+0.1158073	+1.7223431						
928	+6.1551655	+0.9904803	+1.7202965						
929	+5.7020742	+0.9341939	+1.7282546						

SIGMA X/Y/Z = 0.025 MM AT PHOTO SCALE

APPENDIX C

OUTPUT FROM THE DURBAN TEST AREA

* DURBAN TEST AREA *

MODEL FORMATION

01/01/1973

MODEL NO 1211

PT NO	X	Y	Z	Y PARALLAX
4912	0.0000000	0.0000000	0.0000000	0.000
4911	1.0000000	0.0109704	0.0218327	0.000
9124	0.0078468	0.7464059	1.5764331	0.000
9126	0.0196005	-0.0530044	1.5852059	-0.004
9128	0.3055050	-1.0887256	1.5446485	0.010
9114	0.8923830	0.8784048	1.5156245	-0.003
9116	0.9670248	0.1004815	1.5705434	-0.000
9118	1.0787379	-0.3919027	1.5712517	-0.000
503	0.3535171	-1.0298275	1.5391196	-0.010
101	0.5885777	0.4536885	1.5024360	0.007
9123	-0.0170260	-0.9901313	1.5322814	0.032
9113	0.9508984	-1.0557593	1.5601183	0.009
9122	-0.0026037	0.0733400	1.5892694	0.022
9112	0.9072080	0.0227993	1.5721571	0.009
9111	0.9702933	0.8398115	1.5339532	0.010
9121	-0.0193583	0.8639432	1.5581454	0.000

Y PARALLAX STD ERR = 0.015 MM AT PHOTO SCALE

MODEL NO 1110

PT NO	X	Y	Z	Y PARALLAX
4911	0.0000000	0.0000000	0.0000000	0.000
4910	1.0000000	0.0192422	0.0047820	0.000
9114	-0.0741218	0.9136531	1.5361323	0.000
9116	0.0057047	0.1088759	1.6026714	-0.001
9118	0.1120009	-1.0284464	1.6169111	0.000
9104	0.9472693	0.8999410	1.5438336	0.000
9106	0.9336054	0.0421725	1.5749029	0.006
9108	0.9357190	-0.9683103	1.6118261	-0.001
301	1.1021833	0.3141183	1.5582253	-0.005
9101	0.9247146	0.9431539	1.5448362	0.024
9103	0.9767621	-0.9582731	1.6129503	0.021
9113	-0.0061196	-1.0885404	1.6039421	0.020
9111	0.0069879	0.9298462	1.5534901	0.022
9112	-0.0580128	0.0281637	1.6073080	0.002
9102	0.8983350	0.0640679	1.5714810	0.023

Y PARALLAX STD ERR = 0.018 MM AT PHOTO SCALE

MODEL NO 1009

PT NO	X	Y	Z	Y PARALLAX
4910	0.0000000	0.0000000	0.0000000	0.000
4909	1.0000000	0.0342031	0.0028579	0.000
9104	-0.0501708	1.0038707	1.8465490	-0.001
9106	-0.0724523	-0.0120508	1.8611900	-0.002

9108	-0.0665412	-1.2118509	1.8795032	-0.000
9094	1.0438309	1.0075469	1.8280533	0.000
9096	1.0194589	0.1401908	1.8351428	-0.002
9098	1.1615377	-1.2275646	1.8051350	0.000
301	0.1263718	0.3098193	1.8477062	0.005
9091	0.9656491	1.1988319	1.8432876	0.026
9093	1.0806664	-1.1911452	1.8065413	-0.006
9102	-0.1143037	0.0122462	1.8582969	0.026
9103	-0.0173203	-1.2002104	1.8812230	0.004
9101	-0.0860318	1.0545630	1.8437830	0.028
9092	1.0778958	0.0738021	1.8767740	0.001

Y PARALLAX STD ERR = 0.016 MM AT PHOTO SCALE

MODEL NO 908

PT NO	X	Y	Z	Y PARALLAX
4909	0.0000000	0.0000000	0.0000000	0.000
4908	1.0000000	0.0058326	-0.0069075	0.000
9094	0.0803873	1.0020875	1.8250835	0.000
9096	0.0155564	0.1308440	1.8438946	-0.000
9098	0.0951428	-1.2524107	1.8332730	0.000
9084	0.9279922	0.9832901	1.8298443	0.000
9086	1.0634575	0.0316879	1.8607963	0.000
9088	1.2187496	-1.1149419	1.8634938	-0.000
302	1.1918247	0.8039058	1.8113132	-0.000
9081	0.9936739	1.0982183	1.8785850	0.021
9083	0.9769085	-1.2072908	1.8085716	-0.023
9092	0.0712629	0.0613998	1.8468106	0.006
9091	0.0105390	1.1382061	1.8376996	0.026
9082	0.9909033	0.0448420	1.8573934	0.003
9093	0.0154545	-1.2124710	1.8343915	0.016

Y PARALLAX STD ERR = 0.015 MM AT PHOTO SCALE

MODEL NO 907

PT NO	X	Y	Z	Y PARALLAX
4908	0.0000000	0.0000000	0.0000000	0.000
4907	1.0000000	0.0004684	-0.0020729	0.000
9084	-0.0632670	0.9944900	1.8340026	0.000
9086	0.0675968	0.0306351	1.8728461	-0.000
9088	0.2171440	-1.1105062	1.8829479	0.000
9074	1.1003966	1.1878865	1.8089006	0.004
9076	1.0867520	0.0482787	1.9137802	0.002
9078	1.2662724	-1.1106178	1.8037062	0.002
302	0.2000331	0.8129395	1.8170147	-0.000
103	1.0976951	1.0043892	1.8474973	-0.008
102	1.0892582	1.0511914	1.8472943	0.002
304	1.2218694	-1.0039758	1.8954336	-0.003
9071	1.0538140	1.0037939	1.8471205	0.003
9073	0.9488424	-1.2418276	1.8746571	0.003
9082	-0.0051063	0.0590507	1.8690118	0.016
9081	0.0031653	1.1091045	1.8376008	0.023
9072	0.9754049	0.0725321	1.9040914	0.013
9083	-0.0258056	-1.2023214	1.8594112	0.000

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 706

PT NO	X	Y	Z	Y PARALLAX
4907	0.0000000	0.0000000	0.0000000	0.000
4906	1.0000000	0.0294383	-0.0020798	0.000
9074	0.0884034	1.1262109	1.8495402	0.004
9076	0.1000183	0.0109148	1.8746358	-0.000
9078	0.3009700	-1.1180145	1.8301535	-0.006
9064	1.0128331	1.1973119	1.9955711	-0.000
9066	1.0290426	-0.0022659	1.9497628	0.000
9068	1.0540712	-0.9372265	1.8082101	0.000
102	0.0797735	0.9923200	1.8264410	-0.004
103	0.0977476	1.0061338	1.8270684	-0.000
504	0.2552884	-1.0150608	1.8383008	0.007
9061	0.9795169	1.2230127	1.9963527	0.030
9063	1.0032715	-1.1479303	1.8044358	0.002
9072	-0.0083380	-0.0167682	1.8661550	0.018
9071	0.0440277	1.0394260	1.8271312	0.013
9062	1.0032997	0.0094138	1.9500764	0.021
9073	-0.0067316	-1.2540745	1.8167119	0.035

Y PARALLAX STD ERR = 0.018 MM AT PHOTO SCALE

MODEL NO 9089

PT NO	X	Y	Z	Y PARALLAX
4890	0.0000000	0.0000000	0.0000000	0.000
4889	1.0000000	0.0078964	0.0038747	0.000
8904	-0.1764545	1.0813563	1.8275955	-0.001
8906	0.0760930	0.0958652	1.8678254	0.004
8908	-0.1218050	-1.1347389	1.8657397	0.001
8894	1.0413214	0.9674871	1.8728609	0.003
8896	1.0050700	0.0854212	1.8121734	0.000
8898	1.0774730	-0.8368778	1.7807100	0.004
303	0.0944147	0.7138708	1.8343733	0.004
501	0.5393234	1.0261484	1.8729199	-0.005
502	1.0727583	1.0686565	1.8662629	-0.000
505	0.6153504	-0.8183457	1.7904387	-0.004
506	1.1281325	-0.8771078	1.7800931	-0.001
307	0.3483740	-0.2894578	1.8046753	-0.006
8901	-0.1093071	1.0740749	1.8501730	0.002
8891	1.0235950	1.0513643	1.8670458	-0.001
8903	-0.1203248	-1.1165599	1.8664480	-0.009
8893	0.9524045	-1.0818572	1.8039918	-0.017
8902	0.0011219	-0.0126996	1.8681749	-0.001
8892	0.9873215	0.0733971	1.8089740	-0.000

Y PARALLAX STD ERR = 0.006 MM AT PHOTO SCALE

MODEL NO 8988

PT NO	X	Y	Z	Y PARALLAX
4889	0.0000000	0.0000000	0.0000000	0.000
4888	1.0000000	0.0108662	0.0031198	0.000
8894	0.0562540	0.9657193	1.8656736	0.000
8896	0.0244331	0.0851049	1.8086422	0.000

8808	0.1026421	-0.8008676	1.7803410	-0.002
8834	1.0273224	0.9444587	1.8434832	-0.000
8886	1.0145190	0.0407084	1.7949906	0.001
8888	1.0077233	-0.9704091	1.7864398	-0.002
506	0.1482831	-0.8795134	1.7786956	-0.001
308	0.4366191	-1.0876050	1.7641203	0.006
502	0.0870425	1.0726995	1.8587449	-0.000
8893	-0.0214453	-1.0864900	1.8049634	0.005
8891	0.0378075	1.0546838	1.8595202	0.003
8881	1.0276787	1.2414334	1.8500819	-0.022
8892	0.0066682	0.0732445	1.8050728	-0.022
8882	0.9430803	0.1166071	1.7861721	-0.008
8883	1.0519829	-1.0148109	1.7830481	0.010

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

MODEL NO 8887

PT NO	X	Y	Z	Y PARALLAX
4888	0.0000000	0.0000000	0.0000000	0.000
4887	1.0000000	0.0073556	-0.0018324	0.000
8884	0.0245829	0.9000372	1.7868050	0.002
8886	0.0042852	0.0304202	1.7339770	-0.005
8888	-0.0113647	-0.9512775	1.7322642	0.002
8874	1.0627420	0.7983055	1.7366696	-0.002
8876	0.9903358	-0.0976431	1.6495423	0.007
8878	1.0400316	-0.6796608	1.7198992	-0.004
8871	1.0331764	1.0685795	1.7640861	0.037
8881	0.0275703	1.1966550	1.7932?28	0.021
8872	1.0252679	-0.0165821	1.6717688	-0.005
8882	-0.0643456	0.1048106	1.7309442	-0.003
8883	0.0311935	-0.9948398	1.7352456	-0.007
8873	1.0072027	-1.1002707	1.7488009	-0.031

Y PARALLAX STD ERR = 0.021 MM AT PHOTO SCALE

MODEL NO 8786

PT NO	X	Y	Z	Y PARALLAX
4887,	0.0000000	0.0000000	0.0000000	0.000
4886	1.0000000	0.0256874	0.0001673	0.000
8874	0.0439001	0.7326638	1.7293565	-0.000
8876	-0.0174571	-0.1004099	1.6442639	0.000
8878	0.0382028	-0.6789970	1.7157983	0.003
8864	0.9482748	0.9515621	1.7473899	0.000
8866	1.0576640	-0.1046647	1.7092091	-0.000
8868	1.1757449	-0.6893697	1.7265354	0.001
507	0.3112150	-0.6720473	1.6948517	-0.005
8861	0.0233007	1.0791477	1.7260040	0.003
8863	1.1113449	-1.0150734	1.7538106	-0.030
8872	0.0162679	-0.0192740	1.6664108	-0.000
8873	0.0102622	-1.0981040	1.7459426	0.008
8862	1.0588306	0.0995099	1.7088640	0.005
8871	0.0112199	1.0612941	1.7554718	-0.039

Y PARALLAX STD ERR = 0.018 MM AT PHOTO SCALE

MODEL NO 8685

PT NO	X	Y	Z	Y PARALLAX
4886	0.0000000	0.0000000	0.0000000	0.000
4885	1.0000000	0.0407209	0.0013417	0.000
503	1.1326975	1.1440295	1.7145867	0.009
503	1.1974012	-0.6331942	1.7325331	0.002
8856	0.9262831	0.0550160	1.6307060	0.001
8858	1.1761226	-0.6438873	1.7317890	-0.002
8864	-0.0504291	0.8976331	1.7448154	0.002
8866	0.0679220	-0.1488084	1.6942439	-0.000
8868	0.1907985	-0.7283766	1.7043017	-0.000
9128	1.0796518	1.0785724	1.7218499	0.000
8851	0.9646335	1.0525170	1.7302139	-0.012
8852	1.0131319	0.0706659	1.6331237	-0.004
8853	1.0583780	-0.8774373	1.7404990	-0.006
8861	-0.0765264	1.0241349	1.7249361	-0.003
8862	0.0671673	0.0537621	1.6966124	-0.002
8863	0.1301249	-1.0535501	1.7279305	0.027
9123	0.7207492	1.1870225	1.7143547	0.017

Y PARALLAX STD ERR = 0.012 MM AT PHOTO SCALE

MODEL NO 8584

PT NO	X	Y	Z	Y PARALLAX
4885	0.0000000	0.0000000	0.0000000	0.000
4884	1.0000000	-0.0445762	0.0083075	0.000
304	0.5485868	0.2385784	1.6101042	-0.000
503	0.2508968	1.1071205	1.7227416	0.006
508	0.1209232	-0.6909320	1.7529939	-0.002
8846	1.0490033	-0.1157042	1.6888831	0.003
8848	0.9654527	-0.7305181	1.7595820	-0.002
8856	-0.0707946	0.0339493	1.6453249	-0.001
8858	0.1069878	-0.6934815	1.7524351	0.004
9118	1.0657028	1.0688366	1.7425824	-0.002
9128	0.1907213	1.0469558	1.7304531	-0.005
8841	1.1225127	0.0636077	1.7456044	0.001
8842	1.0354137	-0.0007531	1.6865611	-0.006
8843	0.9207475	-0.9931811	1.7810048	0.011
8851	0.0724536	1.0331479	1.7394384	0.005
8852	0.0180908	0.0406995	1.6536886	-0.003
8853	-0.0352433	-0.9156692	1.7629229	0.008
9113	0.9245078	1.0104221	1.7339766	0.013

Y PARALLAX STD ERR = 0.007 MM AT PHOTO SCALE

MODEL NO 8483

PT NO	X	Y	Z	Y PARALLAX
4884	0.0000000	0.0000000	0.0000000	0.000
4883	1.0000000	0.0147833	0.0007510	0.000
9118	-0.0002823	1.0876311	1.7289455	0.000
8846	0.0462065	-0.0043599	1.6636724	-0.001
8848	-0.0031326	-0.6974532	1.7274166	0.001
9108	0.8789192	1.1066918	1.7311406	-0.000
8836	1.0471642	-0.0027417	1.6934743	0.001
8838	1.1132300	-0.6350768	1.7182353	0.004

509	1.0996043	-0.6387039	1.7186958	-0.005
8831	1.0101791	0.8167799	1.6867604	-0.004
8833	1.0001100	-0.9069558	1.7539487	-0.010
8842	0.0277027	0.0197207	1.6628203	0.004
8841	0.0615515	0.9867340	1.7316083	0.004
8832	1.0863789	0.0782890	1.7034255	0.004
8843	-0.0333429	-0.9598678	1.7459597	-0.003

Y PARALLAX STD ERR = 0.005 MM AT PHOTO SCALE

MODEL NO 8382

PT NO	X	Y	Z	Y PARALLAX
4883	0.0000000	0.0000000	0.0000000	0.000
4882	1.0000000	0.0574260	0.0036114	0.000
9108	-0.1549835	1.1335567	1.7284138	-0.000
8836	0.0525339	0.0175036	1.7172438	0.000
8838	0.1407718	-0.6187969	1.7488513	-0.000
9098	0.9698321	1.1018556	1.6711244	0.006
8826	1.0403701	-0.0110903	1.7201292	0.002
8828	0.8702065	-0.6121376	1.7418559	-0.001
509	0.1271064	-0.6228202	1.7491809	0.000
8821	1.0332149	0.9720081	1.6506361	-0.007
8823	1.0468452	-0.8472781	1.8018735	0.003
8822	1.0338245	0.1173275	1.7181494	-0.012
8832	0.0310666	0.0501858	1.7209429	0.009
8831	-0.0126137	0.8439999	1.6885782	0.008
9093	0.8962545	1.1359681	1.6709518	0.027
8833	0.0991043	-0.9755270	1.7921983	0.006

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

MODEL NO 8281

PT NO	X	Y	Z	Y PARALLAX
4882	0.0000000	0.0000000	0.0000000	0.000
4881	1.0000000	-0.0113023	0.0061508	0.000
9078	0.0622690	0.9806406	1.6366336	-0.008
8876	0.0462631	-0.0953318	1.6680154	0.000
8878	-0.1620275	-0.6647151	1.6822546	-0.004
9088	1.0674666	1.0601121	1.6574423	0.005
8816	1.1619171	0.1543013	1.6053223	-0.006
8818	0.8571312	-0.5632744	1.7006004	0.013
305	0.4093791	0.6711192	1.5879639	0.014
510	1.1558739	-0.5362345	1.6909760	-0.006
8811	1.0604038	0.7984572	1.6043098	-0.007
8813	1.0647454	-0.9728444	1.7464457	-0.027
8821	0.1194748	0.8528482	1.6141281	0.002
8823	-0.0154782	-0.9071508	1.7352162	-0.017
8812	1.1194385	0.0161389	1.6308002	0.011
8872	0.0504444	0.0256730	1.6677536	0.016
9083	0.8490678	0.8891050	1.6098133	-0.001

Y PARALLAX STD ERR = 0.014 MM AT PHOTO SCALE

MODEL NO 9180

PT NO	X	Y	Z	Y PARALLAX

4881	0.0000000	0.0000000	0.0000000	0.000
4880	1.0000000	0.0402171	-0.0144470	0.000
9088	0.0423169	1.1016104	1.6074494	-0.002
8316	0.1563816	0.2066517	1.5780428	0.005
8818	-0.1281582	-0.5001050	1.6907401	-0.00-
9078	0.9580265	1.0800811	1.6099077	0.003
8806	1.0994204	0.1332358	1.5921989	-0.002
8808	1.1346971	-0.6784393	1.7045172	0.000
8744	0.5915938	-0.3158691	1.6603142	0.001
306	0.3868126	0.4037767	1.5375847	-0.002
510	0.1669297	-0.4746818	1.6804821	0.002
8801	1.0778932	0.7784846	1.5867627	-0.002
8803	1.0527591	-0.7891634	1.7179214	-0.001
8812	0.1180038	0.0695662	1.6067339	0.002
8811	0.0413379	0.8415089	1.5616047	0.01[illegible]
9073	0.6776690	0.9717540	1.6007631	0.020
8802	1.0903346	0.1538831	1.5976115	-0.002
8813	0.0868727	-0.9074865	1.7463101	0.010

Y PARALLAX STD ERR = 0.008 MM AT PHOTO SCALE

MODEL NO 8079

PT NO	X	Y	Z	Y PARALLAX
4880	0.0000000	0.0000000	0.0000000	0.000
4879	1.0000000	-0.0342011	0.0113135	0.000
9078	-0.0126721	0.9079671	1.5338639	-0.000
8806	0.0622021	0.0247160	1.4862503	0.001
8808	0.0446812	-0.7279467	1.5613468	-0.000
9068	0.6203931	0.9835602	1.5309463	0.002
8790	0.7364533	0.2309124	1.5236778	-0.004
8798	0.5100769	-0.3667695	1.5299526	0.003
504	-0.0408474	0.9329380	1.5393439	-0.000
511	0.2410802	-0.6757707	1.5583886	-0.001
8791	1.0643072	0.0285259	1.5704582	0.006
8793	0.9765162	-0.8461662	1.5864451	0.029
8802	0.0550305	0.0440835	1.4919900	-0.000
8801	0.0804850	0.6200070	1.5039697	-0.000
9063	0.5601051	0.8188939	1.5265504	0.013
8792	1.0331280	-0.0793222	1.5096724	0.016

Y PARALLAX STD ERR = 0.012 MM AT PHOTO SCALE

MODEL NO 6364

PT NO	X	Y	Z	Y PARALLAX
4863	0.0000000	0.0000000	0.0000000	0.000
4864	1.0000000	0.0384690	0.0116004	0.000
8634	-0.1912601	0.9138391	1.7700134	-0.000
8636	0.0854557	-0.0834779	1.7851725	0.001
8632	-0.1914446	-0.8748316	1.7644468	0.012
8908	0.7666934	0.7450590	1.7847755	0.001
8646	1.0509172	0.0724236	1.7327033	-0.002
8648	0.8202186	-1.0350986	1.7385109	0.001
309	0.5141216	-0.7924402	1.7497100	0.002
8633	-0.0548850	-0.8870106	1.7759778	-0.015
8913	-0.0541562	0.9965930	1.7522466	-0.006

8641	1.1500416	1.1038411	1.7504797	0.036
8643	1.0310152	-1.0250342	1.7595433	-0.014
8632	-0.0962075	0.0759898	1.7473867	-0.019
8642	0.9695162	0.1489851	1.7165622	-0.001
8903	0.7725272	0.7624271	1.7856449	-0.018

Y PARALLAX STD ERR = 0.017 MM AT PHOTO SCALE

MODEL NO 6465

PT NO	X	Y	Z	Y PARALLAX
4864	0.0000000	0.0000000	0.0000000	0.000
4865	1.0000000	0.0241995	-0.0092625	0.000
8308	-0.2095726	0.6841127	1.7692646	0.002
8646	0.0690849	0.0167306	1.7078083	-0.004
8648	-0.1612399	-1.0826266	1.7047895	0.001
8898	0.9923101	0.7624516	1.6679439	-0.000
8656	1.0424316	-0.1266122	1.6899117	0.005
8658	0.7901044	-1.0817068	1.7292349	-0.002
505	0.5509631	0.8986533	1.6881499	-0.000
506	1.0394668	0.7760086	1.6667732	-0.006
8651	1.0742875	0.9312539	1.6811446	0.004
8653	0.9621475	-1.0961315	1.7261707	-0.024
8642	-0.0117736	0.0023954	1.6934491	-0.018
8641	0.1750776	1.0405099	1.7355083	-0.010
8893	0.8463127	0.5076347	1.6886823	-0.022
8652	1.0649960	0.0597852	1.6767415	-0.009
8643	0.0481473	-1.0721023	1.7230671	-0.018

Y PARALLAX STD ERR = 0.014 MM AT PHOTO SCALE

MODEL NO 6566

PT NO	X	Y	Z	Y PARALLAX
4865	0.0000000	0.0000000	0.0000000	0.000
4866	1.0000000	0.0379647	-0.0227483	0.000
8898	-0.0206880	0.7398025	1.6406834	-0.005
8656	0.0704055	-0.1239165	1.6694433	-0.007
8658	-0.1132977	-1.0793830	1.7206252	0.002
8888	0.8359260	0.6010383	1.6278093	-0.003
8666	1.0507806	0.0316086	1.6420607	0.004
8668	0.8662659	-0.9625555	1.6833605	-0.002
506	0.0157594	0.7556620	1.6386358	0.004
108	0.2766833	0.5331561	1.6157331	0.008
561	1.0340005	0.9004522	1.6014732	-0.001
8 3	0.9926020	-1.0356895	1.6863419	-0.029
8662	1.0078996	0.0832502	1.6407304	0.003
8652	0.0817672	0.0550210	1.6550027	0.005
8651	0.0412035	0.9037137	1.6504233	-0.006
8883	0.8752666	0.5548465	1.6289468	-0.009
8653	0.0434258	-1.0155612	1.7150794	0.006

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

MODEL NO 6667

PT NO	X	Y	Z	Y PARALLAX

4866	0.0000000	0.0000000	0.0000000	0.000
4867	1.0000000	0.0036167	-0.0079491	0.000
8888	-0.1820544	0.5728330	1.7043589	0.002
8666	0.0381292	-0.0134464	1.7203854	-0.003
8668	-0.1209461	-1.0270441	1.7622994	0.000
8878	0.0187596	0.7608482	1.6840174	-0.012
8675	0.3570108	-0.0189443	1.6950501	0.003
8678	0.8417507	-1.0078669	1.7378454	-0.001
507	1.1988709	0.7403584	1.6570662	0.000
8671	1.0179876	0.8317735	1.6703060	0.008
8673	0.8900624	-1.0134661	1.7370609	0.006
8662	-0.0143032	0.0408629	1.7181550	-0.002
8661	0.0283056	0.8842843	1.6808275	0.000
8672	1.0078233	0.0390321	1.6892581	-0.003
8663	-0.0517628	-1.1144267	1.7612671	-0.006
8873	0.8464854	0.3326237	1.7049479	0.006

Y PARALLAX STD ERR = 0.006 MM AT PHOTO SCALE

MODEL NO 6768

PT NO	X	Y	Z	Y PARALLAX
4867	0.0000000	0.0000000	0.0000000	0.000
4868	1.0000000	0.0201005	-0.0021010	0.000
8878	-0.0749320	0.7656794	1.6722886	-0.004
8676	-0.0276375	-0.0074463	1.6903711	0.006
8678	-0.1305668	-0.9891447	1.7426203	-0.001
8868	1.0842145	0.6511104	1.6516198	-0.002
8686	1.0573351	-0.0015084	1.6936884	-0.002
8688	0.8133261	-0.9429825	1.7414508	0.004
311	0.3333171	-0.7876227	1.7401942	-0.004
507	0.2033784	0.7482178	1.6434612	0.001
8681	1.0441837	0.9763336	1.5992301	0.003
8683	1.0257407	-0.8800331	1.7334298	-0.019
8673	-0.0825036	-0.9048233	1.7418836	0.012
8671	0.0230182	0.8369729	1.6574470	0.008
8682	1.1017570	0.0637777	1.6937016	0.001
8672	0.0815345	0.0513276	1.6828163	0.011
8863	0.3894258	0.3229174	1.6784915	-0.018

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 6869

PT NO	X	Y	Z	Y PARALLAX
4868	0.0000000	0.0000000	0.0000000	0.000
4869	1.0000000	0.0354252	-0.0084887	0.000
8868	0.0413456	0.6700265	1.7130731	-0.000
8686	0.0247680	-0.0077337	1.7619275	-0.000
8688	-0.1096035	-0.9008828	1.8144038	-0.001
8958	1.1006658	0.6826506	1.7379146	0.005
8696	0.9714764	0.0182768	1.7788202	-0.004
8698	0.7415458	-0.9424416	1.8221691	-0.005
508	1.1240882	0.6860220	1.7386951	-0.004
312	0.5826254	-0.7537774	1.7850657	0.010
8691	0.9753685	1.1302197	1.6966816	0.000
8693	1.0445404	-0.9781614	1.8205106	-0.003
8692	0.0740301	0.0664010	1.7619099	-0.007

8691	-0.0077663	1.0061336	1.6552924	-0.008
8853	0.3575783	0.4422572	1.7488196	-0.021
8692	0.9930023	0.1433254	1.7725393	0.008
8693	0.0176045	-0.9198879	1.8155008	0.005

Y PARALLAX STD ERR = 0.009 MM AT PHOTO SCALE

MODEL NO 6970

PT NO	X	Y	Z	Y PARALLAX
4869	0.0000000	0.0000000	0.0000000	0.000
4870	1.0000000	-0.0375087	-0.0025946	0.000
8858	0.1433977	0.6213383	1.7252442	-0.003
8690	-0.0216034	-0.0256743	1.7623029	0.004
8698	-0.3025327	-0.9590052	1.8018661	0.002
8848	1.0403486	0.5581097	1.7252705	0.003
8706	0.8883021	-0.0677824	1.7580788	-0.003
8708	0.7255742	-1.0209389	1.7837338	-0.018
508	0.1664414	0.6233056	1.7257585	0.000
8701	1.1078650	0.9089143	1.6795267	-0.000
8703	0.9554836	-1.0678338	1.7873726	0.015
8353	-0.0112860	0.3929589	1.7352503	-0.012
8691	0.0451287	1.0691383	1.6871195	-0.020
8843	0.9862045	0.2842180	1.7451436	-0.007
8702	1.0756802	-0.0476417	1.7540675	0.018
8692	0.0086711	0.0961097	1.7573082	0.034
8693	-0.0061857	-1.0112973	1.7985091	0.004

Y PARALLAX STD ERR = 0.016 MM AT PHOTO SCALE

MODEL NO 7071

PT NO	X	Y	Z	Y PARALLAX
4870	0.0000000	0.0000000	0.0000000	0.000
4871	1.0000000	-0.0457407	0.0025021	0.000
8248	0.0318088	0.6361970	1.7531007	0.004
8706	-0.1331830	0.0007002	1.7956393	-0.003
8708	-0.3138986	-0.9636009	1.8355832	0.005
8838	1.2350330	0.5872060	1.7425077	-0.001
8716	1.0679131	-0.0531473	1.8028352	0.007
8718	0.8005309	-0.8595593	1.8312078	0.006
313	0.5964060	-1.1534054	1.7976239	-0.009
509	1.2208626	0.5847308	1.7429614	-0.005
8711	1.1008272	1.0129063	1.7239686	0.001
8713	0.9435008	-1.0171722	1.8416930	0.021
8702	0.0583352	0.0180730	1.7923862	0.013
8701	0.1065124	0.9923340	1.7013749	0.012
8843	-0.0277318	0.3580542	1.7774470	0.000
8712	0.9875595	0.1028727	1.7957863	0.016
8703	-0.0801164	-1.0204163	1.8382530	-0.014

Y PARALLAX STD ERR = 0.012 MM AT PHOTO SCALE

MODEL NO 7172

PT NO	X	Y	Z	Y PARALLAX
4871	0.0000000	0.0000000	0.0000000	0.000

4872	1.0000000	0.0191992	-0.0141618	0.000
8838	0.2107850	0.6126876	1.7569467	-0.002
8716	0.0355780	-0.0408171	1.8112218	-0.007
8718	-0.1224742	-0.8661587	1.8190198	0.001
8828	0.9364985	0.5701798	1.7441688	-0.005
8726	1.0970092	-0.1651170	1.8315145	0.003
8728	0.8987840	-0.6840920	1.8340115	-0.015
509	0.1957979	0.6092713	1.7577574	0.005
8721	1.0324925	1.0022987	1.7340034	0.001
8723	1.0134808	-0.9505298	1.8318208	-0.003
8712	-0.0053297	0.1101243	1.8026090	0.019
8833	0.1421644	0.2338660	1.7949328	-0.003
8711	0.0470502	1.0301895	1.7485617	-0.019
8722	1.0396558	0.1540341	1.8185770	0.006
8713	0.0252546	-1.0153018	1.8250562	0.020

Y PARALLAX STD ERR = 0.012 MM AT PHOTO SCALE

MODEL NO 7273

PT NO	X	Y	Z	Y PARALLAX
4872	0.0000000	0.0000000	0.0000[illegible]0	0.000
4873	1.0000000	-0.0075055	0.0000[illegible]7	0.000
8828	-0.0065632	0.5250953	1.7973[illegible]2	0.003
8726	0.0962774	-0.2236473	1.8722[illegible]4	0.014
8728	-0.1051930	-0.7516081	1.8647[illegible]3	0.003
8818	1.1300009	0.6626392	1.8271[illegible]	-0.003
8736	0.9238534	-0.0406215	1.8758[illegible]4	0.003
8738	0.9336464	-1.0723712	1.8450[illegible]78	0.005
314	1.2454583	-0.3360147	1.8740[illegible]	0.007
8731	0.9412610	0.8939783	1.7920[illegible]5	0.005
8733	0.9876304	-1.0750084	1.8530[illegible]3	-0.000
8722	0.0376455	0.1007723	1.8651[illegible]5	0.003
8823	0.1620678	0.2562250	1.8504[illegible]1	0.009
8721	0.0295458	0.9641352	1.795[illegible]	0.002
8732	1.0056011	0.0276010	1.875[illegible]	0.013
8723	0.0122335	-1.0726034	1.857[illegible]	0.003

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 7374

PT NO	X	Y	Z	Y PARALLAX
4873	0.0000000	0.0000000	0.00[illegible]	0.000
4874	1.0000000	-0.0259042	-0.011[illegible]	0.000
8818	0.1826802	0.0984214	1.75[illegible]	0.006
8736	-0.0261919	0.0706728	1.8[illegible]	-0.007
8738	-0.0457237	-0.9830580	1.[illegible]	0.002
8744	0.3776850	0.8911295	1.711[illegible]	-0.007
8746	1.2191253	-0.0487740	1.77[illegible]	0.003
8748	1.0455130	-0.9189442	1.[illegible]	-0.002
510	0.5074615	0.7274828	1.[illegible]	-0.002
314	0.2730511	-0.3222853	1.[illegible]	0.003
8741	0.9324600	0.9158258	1.71[illegible]	0.005
8743	1.0511514	-0.9169695	1.20[illegible]	0.012
8732	0.0490044	0.0851057	1.[illegible]	0.010
8731	0.0030712	0.9262885	1.[illegible]	0.013
8813	0.4092451	0.2526251	1.800[illegible]	-0.003

8733	0.0060104	-0.0868479	1.8320843	-0.003
8742	1.1008762	0.0185303	1.7812471	0.011

Y PARALLAX STD ERR = 0.003 MM AT PHOTO SCALE

MODEL NO 7475

PT NO	X	Y	Z	Y PARALLAX
4874	0.0000000	0.0000000	0.0000000	0.000
4875	1.0000000	-0.0542042	-0.0023764	0.000
8744	-0.0295376	0.9581783	1.7611732	-0.000
8746	0.1779807	-0.0155862	1.8446485	0.007
8748	-0.0363516	-0.9014582	1.8727258	-0.003
8792	1.1241101	0.9509598	1.7526172	0.007
8756	1.0821623	0.0045362	1.8352857	-0.001
8758	0.9039635	-1.0792326	1.8766512	0.000
8808	0.5555790	0.5100321	1.8027958	0.002
511	0.7958503	0.5738976	1.8006125	-0.009
315	0.8766117	-0.9970544	1.8746524	0.001
8751	1.0172594	0.9622762	1.7821416	-0.003
8753	0.9483668	-0.9716369	1.8778888	0.021
8803	0.4557491	0.3909587	1.8212842	0.008
8752	0.9673488	0.0014319	1.8349717	0.006
8743	-0.0305793	-0.8930378	1.8730953	0.003
8742	0.0575466	0.0573313	1.8438036	0.011
8741	-0.0133323	0.9838093	1.7614782	-0.002

Y PARALLAX STD ERR = 0.009 MM AT PHOTO SCALE

MODEL NO 3637

PT NO	X	Y	Z	Y PARALLAX
4836	0.0000000	0.0000000	0.0000000	0.000
4837	1.0000000	0.0911519	0.0008325	0.000
8638	-0.0921879	1.2107473	1.8114561	-0.012
8366	0.2493568	0.0682146	1.8070008	-0.007
8368	0.4065670	-0.3142286	1.7992378	0.008
8648	0.9903846	1.1502603	1.7579477	-0.001
8376	1.0470475	-0.0443826	1.7852823	-0.000
8378	1.0460519	-0.6504527	1.7797928	-0.000
104	0.6746066	-0.4026596	1.7915798	-0.001
8363	0.0268413	-0.9858118	1.8023190	-0.000
8361	0.0271219	1.1102840	1.8211594	0.016
8371	0.9811352	1.0630220	1.7820985	0.020
8373	1.0464127	-0.8875184	1.7787605	0.010
8362	0.0303038	0.0612260	1.8113023	0.002
8633	0.0535752	1.2127404	1.8202823	-0.016
8643	1.2120382	1.1845050	1.7748098	0.003
8372	1.0048301	0.0941048	1.7878769	0.020

Y PARALLAX STD ERR = 0.013 MM AT PHOTO SCALE

MODEL NO 3738

PT NO	X	Y	Z	Y PARALLAX
4837	0.0000000	0.0000000	0.0000000	0.000
4838	1.0000000	0.1176817	-0.0206280	0.000

8648	-0.0057763	1.0591363	1.7003849	-0.002
8376	0.0462893	-0.1073283	1.7448128	0.002
8378	0.0436645	-0.6995728	1.7486077	-0.002
8658	0.9907761	1.1612831	1.7110087	-0.003
8386	0.9549088	0.2299990	1.7206248	0.005
8388	1.1874713	-0.4471066	1.7193002	0.001
316	1.2119373	-0.3987264	1.7133046	-0.000
310	1.1851730	0.6414430	1.7122821	-0.011
8381	0.9938384	1.0750955	1.7125716	0.010
8383	1.1114990	-0.8055873	1.7238897	-0.003
8372	0.0054365	0.0278845	1.7454421	0.018
8371	-0.0150365	0.9739006	1.7253107	-0.001
8641	0.2107741	1.0021256	1.7167248	-0.021
8382	1.020[illegible]	0.1305913	1.7199593	0.008
8373	0.043[illegible]	[illegible]0.9913311	1.7509961	0.003

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 3839

PT NO	X	Y	Z	Y PARALLAX
4838	0.0000000	0.0000000	0.0000000	0.000
4839	1.0000000	0.0859615	-0.0036193	0.000
8658	-0.0221123	1.0491504	1.8075982	-0.002
8386	-0.0817622	0.0876842	1.8006035	-0.004
8388	0.1331975	-0.6189233	1.7937956	-0.002
8662	1.0512951	1.1917803	1.7962890	0.000
8396	1.0936879	0.0098811	1.[illegible]31818	-0.003
8398	1.0335720	-0.4679711	[illegible].915277	0.001
310	0.1633614	0.5063034	[illegible].8048924	0.007
316	0.1602698	-0.5695456	1.7889524	0.003
83	0.9773285	0.9490118	1.8075555	-0.000
8391	1.0307250	-0.9372730	1.7868397	-0.022
8382	-0.0222525	-0.0169574	1.7996898	0.012
8381	-0.0215370	0.9598185	1.8078670	0.021
8653	0.1488100	1.1215176	1.8050904	-0.009
8383	0.0442091	-0.9873189	1.7900075	-0.012
8392	1.04355[illegible]	0.0124285	1.7978399	0.008

Y PARALLAX STD ERR = 0.012 MM AT PHOTO SCALE

MODEL NO 3940

PT NO	X	Y	Z	Y PARALLAX
4839	0.0000000	0.0000000	0.0000000	0.000
4840	1.0000000	0.0572865	-0.0043557	0.000
8668	0.1093703	1.0734000	1.6442676	-0.001
8396	0.1027393	0.0287844	1.6757789	0.006
8398	0.0247364	-0.4688401	1.6855786	-0.003
8678	1.1206275	1.0890086	1.6187007	0.000
8406	0.9511902	0.3658857	1.6605537	-0.007
8408	1.0307388	-0.2476855	1.6707975	0.003
8401	0.3739089	1.0537348	1.6282209	0.003
8403	1.1380476	-0.3991843	1.6724285	-0.001
8392	0.0538034	-0.0225162	1.6782226	0.020
8391	0.0307344	0.8509078	1.6616821	0.022
8663	0.2359048	0.9949635	1.6462941	-0.001
8393	0.0027781	-0.9054140	1.6943647	-0.001

8402	1.0422328	0.1695576	1.6637704	-0.001

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

MODEL NO 4041

PT NO	X	Y	Z	Y PARALLAX
4840	0.0000000	0.0000000	0.0000000	0.000
4841	1.0000000	0.0652335	-0.0016049	0.000
8678	0.0974354	1.0034005	1.6077606	-0.002
8406	-0.0624624	0.2892442	1.6412676	0.002
8408	0.0218944	-0.3140685	1.6465548	-0.001
8683	1.0238572	1.0367942	1.6200581	-0.010
8416	0.9673369	0.3159912	1.6327546	-0.004
8418	1.0181905	-0.5514582	1.6452081	0.001
8411	0.9841483	0.3494954	1.6244855	0.015
8413	1.0313157	-0.5551188	1.6454002	0.007
8402	0.0290381	0.0968342	1.6433641	-0.001
8401	-0.0467321	0.9668210	1.6152445	-0.012
8673	0.1446713	0.9373851	1.6075718	-0.010
8412	1.0173421	0.2397472	1.6385789	-0.006
8403	0.1290651	-0.4623259	1.6486222	0.017

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

MODEL NO 4142

PT NO	X	Y	Z	Y PARALLAX
4841	0.0000000	0.0000000	0.0000000	0.000
4842	1.0000000	-0.0865543	-0.0015972	0.000
8688	0.1597743	0.9615382	1.6369759	-0.001
8416	0.0068231	0.2491031	1.6478379	0.002
8418	-0.0586493	-0.6239667	1.6571926	-0.004
8698	1.0510421	0.3541177	1.6400680	-0.000
8426	0.93[illegible]3338	0.0015961	1.6434117	-0.006
8428	0.8301318	-0.5552580	1.6477208	0.000
312	0.9322566	1.0504387	1.6039282	-0.002
512	1.0078593	0.5410120	1.6429325	0.001
513	0.8615112	-0.5383919	1.6500116	0.000
105	0.3382927	-0.5689655	1.6540606	0.006
8421	1.0668616	0.8514343	1.6402738	0.004
8423	0.9179890	-0.5574382	1.6499193	0.006
8412	0.0465114	0.1662351	1.6533380	0.006
8411	0.0784500	0.0835562	1.6414423	-0.005
8683	0.3761613	0.9927825	1.6367819	-0.013
8422	1.0421906	0.1669427	1.6451450	0.011
8413	-0.0460473	-0.6235813	1.6577574	-0.000

Y PARALLAX STD ERR = 0.006 MM AT PHOTO SCALE

MODEL NO 4243

PT NO	X	Y	Z	Y PARALLAX
4842	0.0000000	0.0000000	0.0000000	0.000
4843	1.0000000	-0.0303751	-0.0104492	0.000
8698	-0.0009655	0.9404010	1.5990520	-0.006
8426	-0.0575386	0.0989581	1.6114306	0.006

8428	-0.1213207	-0.4522089	1.6219065	-0.003
8708	0.9677675	0.8374325	1.5744874	0.005
8436	1.0556048	-0.0616057	1.5853530	-0.008
8438	0.9975654	-0.6128639	1.6102283	0.005
512	0.0660461	0.6373821	1.6043271	0.004
513	-0.0917832	-0.4337219	1.6239693	-0.001
8431	1.0040355	0.7993196	1.5732515	-0.001
8433	0.9952090	-0.6354026	1.6111077	0.006
8422	0.0370013	0.2678267	1.6107271	0.010
8421	0.0145867	0.9387393	1.5991418	0.009
8693	0.2768359	0.8782214	1.5940600	-0.005
8432	1.0484859	0.1636274	1.5982610	0.009
8423	-0.0352793	-0.4486748	1.6236373	0.009

Y PARALLAX STD ERR = 0.008 MM AT PHOTO SCALE

MODEL NO 4344

PT NO	X	Y	Z	Y PARALLAX
4843	0.0000000	0.0000000	0.0000000	0.000
4844	1.0000000	-0.0259435	0.0073442	0.000
8708	-0.0810769	0.8574832	1.6141612	0.001
8436	0.0374667	-0.0492818	1.6156100	0.001
8438	-0.0034116	-0.6092293	1.6333470	-0.000
8718	0.9705631	0.9628167	1.6025743	-0.006
8446	0.3676750	0.2008759	1.6204085	-0.000
8448	0.8612558	-0.7409560	1.6202242	0.000
313	0.7738333	0.6864673	1.5710736	-0.006
8713	1.0996187	0.8152727	1.6102160	0.010
8443	0.9699604	-0.7057283	1.6284699	0.006
8432	0.0225726	0.1780285	1.6309265	0.005
8431	0.0479518	0.8230934	1.6141609	0.017
8703	0.1309569	0.8097857	1.6144138	0.011
8442	0.9834736	0.0728494	1.6205634	0.010
8433	-0.0050503	-0.6320027	1.6339782	-0.011

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 4445

PT NO	X	Y	Z	Y PARALLAX
4844	0.0000000	0.0000000	0.0000000	0.000
4845	1.0000000	0.0164452	0.0024433	0.000
8718	-0.0535416	1.0106793	1.6272190	0.001
8446	-0.0353405	0.2330099	1.6463130	-0.003
8448	-0.1176014	-0.7307694	1.6472009	0.001
8728	0.9266725	1.1492079	1.6374203	-0.001
8456	1.0273979	0.0724237	1.5989901	0.003
8458	0.9825096	-0.5723188	1.6185225	-0.001
8723	1.0276392	0.8910405	1.6400033	-0.010
8453	1.0190970	-0.7308124	1.6502021	0.017
8442	-0.0156577	0.1026749	1.6467821	0.013
8713	0.0822186	0.8630555	1.6354988	-0.003
8443	-0.0077669	-0.6920153	1.6558877	0.024
8452	1.0082475	0.0851848	1.6414034	0.007

Y PARALLAX STD ERR = 0.013 MM AT PHOTO SCALE

MODEL NO 4546

PT NO	X	Y	Z	Y PARALLAX
4845	0.0000000	0.0000000	0.0000000	0.000
4846	1.0000000	0.0703098	-0.0194316	0.000
8728	-0.1139784	1.0823962	1.6347228	0.000
8456	0.0469940	-0.0108854	1.5744161	-0.002
8458	0.0400093	-0.5702350	1.5838588	0.001
8738	0.8549023	0.8067310	1.6054905	0.004
8466	1.0104346	0.0030862	1.6010062	0.000
8468	1.0201278	-0.5483073	1.5963724	-0.003
317	1.1288649	-0.4469038	1.5966722	0.002
8461	0.9760050	0.9708468	1.6124434	-0.003
8463	1.1429075	-0.7519731	1.5919273	0.015
8452	0.0206138	0.0393287	1.6177597	0.009
8723	0.0008216	0.8340835	1.6309646	0.014
8733	0.9053045	0.8061464	1.6119996	-0.018
8462	1.0733047	0.1916000	1.6026070	0.004
8453	0.0883992	-0.7636903	1.6111802	0.005

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 4647

PT NO	X	Y	Z	Y PARALLAX
4846	0.0000000	0.0000000	0.0000000	0.000
4847	1.0000000	0.0231070	0.0035383	0.000
8738	-0.1664858	0.7655838	1.6769173	-0.000
8466	-0.0462764	-0.0728560	1.6777765	0.000
8468	-0.0640503	-0.6448995	1.6731780	0.001
8748	0.9103647	0.8270994	1.6954292	-0.004
8476	0.9732286	-0.0164644	1.6931434	0.001
8478	1.0688558	-0.8221613	1.6898740	-0.000
317	0.0535821	-0.5449984	1.6773710	-0.002
8471	0.9405296	0.9468050	1.6964858	0.009
8473	1.0059587	-0.0383059	1.6827151	0.008
8462	-0.0229922	0.1208502	1.6799161	-0.003
8461	-0.0 [illegible]3122	0.9892553	1.6880093	-0.006
8743	0.9162528	0.8291144	1.6952967	-0.011
8472	0.9694446	0.0513294	1.6952884	0.010
8463	0.0537653	-0.8615352	1.6731288	0.007

Y PARALLAX STD ERR = 0.007 MM AT PHOTO SCALE

MODEL NO 4748

PT NO	X	Y	Z	Y PARALLAX
4847	0.0000000	0.0000000	0.0000000	0.000
4848	1.0000000	-0.0224336	-0.0028816	0.000
8748	-0.0280166	0.8332608	1.7044047	-0.001
8476	-0.0062816	-0.0227397	1.7104704	0.009
8478	0.0505079	-0.8417304	1.7148178	-0.000
8758	0.8843831	0.6504818	1.7064531	-0.016
8486	1.0081424	-0.0555722	1.7137732	0.000
8488	0.7156759	-0.8310163	1.7122616	-0.003
315	0.8588644	0.7304889	1.7055271	0.009
106	0.6966680	-0.8125283	1.7125247	0.000

8753	0.9206882	0.7545930	1.7078208	0.006
8483	1.0133377	-0.8864368	1.7072984	0.002
8472	-0.0067429	0.0462066	1.7117663	0.015
8749	-0.0222287	0.8352368	1.7045047	-0.004
8471	0.0021144	0.9528315	1.7041369	0.005
8473	-0.0137072	-0.2549307	1.7143641	0.018
107	0.3176386	-1.0809745	1.7076096	-0.016
8482	1.0341814	-0.0122212	1.7164676	0.015

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

* DURBAN TEST AREA *

STRIP FORMATION

01/01/1978

JUNCTION OF MODELS 1211 - 1110

NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4911	+0.9999303	+0.0170488	+0.0218423	+1.0000000	+0.0169704	+0.0218327	-.903E-05	+.784E-04	+.102E-04
4910	+1.9652478	+0.0365187	+0.0493948						
9114	+0.8923725	+0.8783413	+1.5153973	+0.8921830	+0.8784048	+1.5156245	-.104E-04	-.634E-04	-.227E-03
9116	+0.9699158	+0.1004556	+1.5705181	+0.9699248	+0.1003815	+1.5705434	-.896E-05	+.741E-04	-.252E-04
9118	+1.0787653	-0.9919918	+1.5714939	+1.0787373	-0.9919027	+1.5712517	+.284E-04	-.891E-04	+.242E-03
9104	+1.8782563	+0.8659726	+1.5458076						
9106	+1.8654510	+0.0373104	+1.5638824						
9108	+1.8679400	-0.9388710	+1.5850005						
301	+2.0282260	+0.3002783	+1.5550954						
9101	+1.8564033	+0.9076622	+1.5468473						
9103	+1.9075234	-0.9291555	+1.5880545						
9113	+0.9589174	-1.0558203	+1.5600787	+0.9588984	-1.0557593	+1.5601183	+.190E-04	-.610E-04	-.395E-04
9111	+0.9702613	+0.8930196	+1.5341577	+0.9702933	+0.8938115	+1.5339592	-.319E-04	+.815E-05	+.198E-03
9112	+0.9072412	+0.0220974	+1.5724830	+0.9072680	+0.0283933	+1.5721571	-.267E-04	+.413E-05	+.326E-03
9102	+1.8314405	+0.0584645	+1.5600748						

SIGMA X/Y/Z = 0.012 MM AT PHOTO SCALE

JUNCTION OF MODELS 1110 - 1009

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4910	+1.9652556	+0.0365424	+0.0493627	+1.9652478	+0.0365187	+0.0493948	+.782E-05	+.897E-04	-.324E-04
4909	+2.7737170	+0.0629719	+0.0733915						
9104	+1.8782550	+0.8660299	+1.5457097	+1.8782563	+0.8659726	+1.5458076	-.129E-05	+.573E-04	-.378E-04
9106	+1.8654610	+0.0373417	+1.5636965	+1.8654510	+0.0373104	+1.5638824	+.100E-04	+.313E-04	-.185E-03
9108	+1.8679234	-0.9389894	+1.5861566	+1.8679400	-0.9388710	+1.5859005	-.165E-04	-.118E-03	+.256E-03
9094	+2.7770260	+0.8672934	+1.5548527						
9096	+2.7556026	+0.1607091	+1.5654594						
9098	+2.8697579	-0.9540493	+1.5525950						
301	+2.0282134	+0.3002951	+1.5550717	+2.0282260	+0.3002783	+1.5550954	-.847E-05	+.168E-04	-.823E-03
9091	+2.7133271	+1.0833549	+1.5643635						
9093	+2.8030193	-0.9842501	+1.5517430						
9102	+1.8314794	+0.0582682	+1.5609645	+1.8314995	+0.0584645	+1.5600748	-.200E-04	-.196E-03	+.189E-03
9103	+1.9075047	-0.9295657	+1.5880555	+1.9075234	-0.9291555	+1.5880545	-.186E-04	-.410E-03	+.501E-03
9101	+1.8564111	+0.9073840	+1.5466862	+1.8564033	+0.9076622	+1.5468473	+.728E-05	-.278E-03	-.161E-03
9092	+2.8030593	+0.1066177	+1.5604787						

SIGMA X/Y/Z = 0.018 MM AT PHOTO SCALE

JUNCTION OF MODELS 1009 - 908

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4909	+2.7797127	+0.0630461	+0.0733277	+2.7737170	+0.0629719	+0.0733915	-.429E-05	+.743E-04	-.377E-05
4908	+3.5875730	+0.1036150	+0.0853540						

* DURBAN TEST AREA *

STRIP FORMATION

01/01/1978

JUNCTION OF MODELS 1211 - 1110

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4911	+0.9999909	+0.0170488	+0.0218429	+1.0000000	+0.0169704	+0.0218327	-.903E-05	+.784E-04	+.102E-04
4910	+1.9652478	+0.0365187	+0.0493948						
9114	+0.8928725	+0.8783413	+1.5153973	+0.8923840	+0.8784048	+1.5156245	-.104E-04	-.634E-04	-.227E-03
9116	+0.9699158	+0.1004556	+1.5705181	+0.9694948	+0.1003815	+1.5705434	-.896E-05	+.741E-04	-.252E-04
9118	+1.0787663	-0.9019918	+1.5714939	+1.0787379	-0.9019027	+1.5712517	+.284E-04	-.891E-04	+.242E-03
9104	+1.8782563	+0.8659726	+1.5458076						
9106	+1.8654510	+0.0373104	+1.5638824						
9108	+1.8679400	-0.9388710	+1.5859005						
301	+2.0282869	+0.3002783	+1.5552954						
9101	+1.8564039	+0.9076622	+1.5468473						
9103	+1.9075234	-0.9291555	+1.5880545						
9113	+0.9589174	-1.0558203	+1.5600787	+0.9588984	-1.0557593	+1.5601183	+.190E-04	-.610E-04	-.395E-04
9111	+0.9702613	+0.8938196	+1.5341577	+0.9702913	+0.8938115	+1.5339592	-.319E-04	+.815E-05	+.198E-03
9112	+0.9072412	+0.0823974	+1.5724839	+0.9072680	+0.0823933	+1.5721571	-.267E-04	+.413E-05	+.326E-03
9102	+1.8314905	+0.0584645	+1.5600748						

SIGMA X/Y/Z = 0.012 MM AT PHOTO SCALE

JUNCTION OF MODELS 1110 - 1009

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4910	+1.9652556	+0.0365404	+0.0493629	+1.9652478	+0.0365187	+0.0493948	+.783E-05	+.297E-04	-.324E-04
4909	+2.7797170	+0.0629719	+0.0733915						
9104	+1.8782550	+0.8660293	+1.5457697	+1.8782563	+0.8659726	+1.5458076	-.129E-05	+.573E-04	-.378E-04
9106	+1.8654610	+0.0373417	+1.5636965	+1.8654510	+0.0373104	+1.5638824	+.100E-04	+.313E-04	-.185E-03
9108	+1.8679234	-0.9389804	+1.5861560	+1.8679400	-0.9388710	+1.5859005	-.165E-04	-.118E-03	+.256E-03
9094	+2.7770260	+0.8672084	+1.5548528						
9096	+2.7656086	+0.1607091	+1.5654594						
9098	+2.8607570	-0.9540497	+1.5525960						
301	+2.0782184	+0.3002951	+1.5550717	+2.0282869	+0.3002783	+1.5552954	-.847E-05	+.168E-04	-.223E-03
9091	+2.7133271	+1.0833549	+1.5643535						
9093	+2.8039193	-0.9342501	+1.5517430						
9102	+1.8314704	+0.0582682	+1.5602645	+1.8314905	+0.0584645	+1.5600748	-.200E-04	-.196E-03	+.189E-03
9103	+1.9075047	-0.9295657	+1.5885555	+1.9075234	-0.9291555	+1.5880545	-.186E-04	-.410E-03	+.501E-03
9101	+1.8564111	+0.9073840	+1.5466862	+1.8564039	+0.9076672	+1.5468473	+.728E-05	-.278E-03	-.161E-03
9092	+2.8030599	+0.1066177	+1.5634787						

SIGMA X/Y/Z = 0.018 MM AT PHOTO SCALE

JUNCTION OF MODELS 1009 - 908

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4909	+2.7797127	+0.0630461	+0.0733877	+2.7797170	+0.0629719	+0.0733915	-.429E-05	+.743E-04	-.377E-05
4908	+3.5875730	+0.1036150	+0.0853540						

9034	+2.7770206	+0.8672683	+1.5546821	+2.7770260	+0.8672384	+1.5548528	-.529E-05	-.320E-04	-.170E-03
9036	+2.7556051	+0.1607812	+1.5653870	+2.7556086	+0.1607091	+1.5654504	-.345E-05	+.721E-04	-.714E-04
9038	+2.8697710	-0.9541635	+1.5628418	+2.8697579	-0.9540493	+1.5625960	+.131E-04	-.114E-03	+.245E-03
9084	+3.4624755	+0.8824176	+1.5733189						
9086	+3.6055249	+0.1181114	+1.5970439						
9088	+3.7721278	-0.8029602	+1.5975107						
302	+3.6821206	+0.7469790	+1.5622581						
9081	+3.5113568	+0.9776516	+1.5738358						
9083	+3.5809993	-0.8859499	+1.5484972						
9032	+2.8030565	+0.1066435	+1.5684613	+2.8030599	+0.1066177	+1.5684787	-.330E-05	+.258E-04	-.173E-04
9031	+2.7133842	+1.0231942	+1.5644135	+2.7133871	+1.0233549	+1.5643635	-.285E-05	-.160E-03	+.560E-04
9082	+3.5464913	+0.1261583	+1.5930708						
9033	+2.8039330	-0.9247471	+1.5525032	+2.8039193	-0.9242501	+1.5517439	+.137E-04	-.497E-03	+.759E-03

SIGMA X/Y/Z = 0.022 MM AT PHOTO SCALE

JUNCTION OF MODELS 008 - 807

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4908	+3.5875961	+0.1035110	+0.0853861	+3.5875720	+0.1036150	+0.0853543	+.231E-04	-.103E-03	+.312E-04
4907	+4.3928272	+0.1487488	+0.1024357						
9084	+3.4624268	+0.8824090	+1.5735510	+3.4624355	+0.8824176	+1.5733189	-.860E-05	-.856E-05	+.232E-03
9086	+3.6056453	+0.1180069	+1.5972841	+3.6055249	+0.1181114	+1.5970439	+.204E-04	-.104E-03	+.240E-03
9088	+3.7720927	-0.8027432	+1.5970070	+3.7721278	-0.8029602	+1.5975107	-.350E-04	+.216E-03	-.503E-03
9074	+4.3917554	+1.0844103	+1.6252360						
9076	+4.4253054	+0.1652947	+1.6498508						
9078	+4.6169791	-0.7608702	+1.6225444						
302	+3.6821360	+0.7469246	+1.5623873	+3.6821206	+0.7469790	+1.5622581	+.154E-04	-.543E-04	+.129E-03
103	+4.3944684	+0.9849801	+1.6066216						
102	+4.3882064	+0.9740533	+1.6061414						
504	+4.5768172	-0.6767973	+1.6273590						
9071	+4.3577061	+1.0117911	+1.6058270						
9073	+4.3666580	-0.8791072	+1.6030438						
9082	+3.5465183	+0.1259477	+1.5920318	+3.5464913	+0.1261583	+1.5930708	+.275E-04	-.210E-03	-.138E-03
9081	+3.5113651	+0.9774340	+1.5740015	+3.5113568	+0.9776516	+1.5738358	+.833E-05	-.227E-03	+.195E-03
9072	+4.3368263	+0.1401968	+1.6401775						
9083	+3.5810271	-0.8857823	+1.5482877	+3.5809993	-0.8859499	+1.5484972	+.278E-04	+.167E-03	-.209E-03

SIGMA X/Y/Z = 0.017 MM AT PHOTO SCALE

JUNCTION OF MODELS 807 - 706

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4907	+4.3928281	+0.1487953	+0.1024425	+4.3928272	+0.1487488	+0.1024357	+.975E-06	+.475E-04	+.687E-05
4906	+5.2160510	+0.1262517	+0.1270383						
9074	+4.3917599	+1.0842784	+1.6250079	+4.3917554	+1.0844103	+1.6252360	+.453E-05	-.131E-03	-.228E-03
9076	+4.4253033	+0.1653398	+1.6500009	+4.4253054	+0.1652947	+1.6498508	-.140E-05	+.451E-04	+.149E-03
9078	+4.6169749	-0.7608310	+1.6226159	+4.6169791	-0.7608702	+1.6225444	-.410E-05	+.391E-04	+.715E-04
9064	+5.1478313	+1.1638170	+1.7605110						
9066	+5.1821524	+0.1753108	+1.7364666						
9068	+5.2339806	-0.5951646	+1.6237777						
102	+4.3882078	+0.9741573	+1.6062098	+4.3882064	+0.9740533	+1.6061414	+.143E-05	+.104E-03	+.684E-04
103	+4.3944684	+0.9852280	+1.6068005	+4.3944684	+0.9849801	+1.6066216	+.698E-07	+.247E-03	+.268E-03
504	+4.5768512	-0.6769637	+1.6277520	+4.5768172	-0.6767973	+1.6273590	+.340E-04	-.166E-03	+.393E-03

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
9061	+5.1198463	+1.1842533	+1.7691164						
9063	+5.1967980	-0.7666758	+1.[illegible]						
9072	+4.3368266	+0.1400916	+1.6401063	+4.3368263	+0.1401068	+1.6401775	+.354E-06	-.105E-03	+.128E-04
9071	+4.3577123	+1.0116086	+1.6057187	+4.3577051	+1.0117911	+1.6058279	+.728E-05	-.324E-04	-.109E-03
9062	+5.1715982	+0.1844700	+1.7361192						
9073	+4.3068473	-0.8798449	+1.6038832	+4.3068420	-0.8791072	+1.6036638	-.206E-04	-.737E-03	+.845E-03

SIGMA X/Y/Z = 0.023 MM AT PHOTO SCALE

JUNCTION OF MODELS 9089 - 8882

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4883	+0.9999992	+0.0070870	+0.0088612	+1.0000000	+0.0070364	+0.0088747	-.714E-06	-.935E-05	-.134E-04
4888	+1.9967004	+0.0127225	+0.0220345						
8894	+1.0413828	+0.9625163	+1.8728463	+1.0413814	+0.9624871	+1.8728609	+.143E-05	+.292E-04	+.854E-04
8896	+1.0050694	+0.0852106	+1.8121176	+1.0050700	+0.0852212	+1.8121734	-.562E-06	-.105E-04	-.557E-04
8898	+1.0774736	0.8968871	+1.7806938	+1.0774738	-0.8968778	+1.7807100	-.157E-06	-.937E-05	-.162E-04
8884	+2.0093349	+0.9356064	+1.8613448						
8886	+1.9317395	+0.0350321	+1.8091385						
8888	+1.9730557	-0.9726955	+1.7963631						
506	+1.1231015	-0.8768650	+1.7796103	+1.1231305	-0.8771078	+1.7800931	-.309E-04	+.242E-03	-.456E-03
308	+1.4034016	-1.0859402	+1.7677078						
502	+1.0727798	+1.0689809	+1.8668180	+1.0727583	+1.0686565	+1.8662629	+.215E-04	+.333E-03	+.556E-03
8893	+0.9524277	-1.0812573	+1.8031124	+0.9524045	-1.0818572	+1.8033918	+.232E-04	+.599E-03	-.279E-03
8891	+1.0235033	+1.0513246	+1.8669795	+1.0235050	+1.0513648	+1.8670458	-.169E-05	-.401E-04	-.663E-04
8881	+2.0113811	+1.2315788	+1.8691527						
8892	+0.9873263	+0.0735099	+1.8083170	+0.9873215	+0.0733071	+1.8089740	+.484E-05	+.112E-03	-.656E-03
8882	+1.9210897	+0.1112950	+1.7998833						
8883	+2.0228761	-1.0171674	+1.7992628						

SIGMA X/Y/Z = 0.025 MM AT PHOTO SCALE

JUNCTION OF MODELS 8888 - 8287

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4888	+1.9956987	+0.0126608	+0.0229164	+1.9967004	+0.0127225	+0.0229345	-.163E-05	-.616E-04	-.180E-04
4887	+3.0211288	+0.0236036	+0.0264031						
8884	+2.0093310	+0.9356840	+1.8617073	+2.0093349	+0.9356064	+1.8613448	-.384E-05	+.776E-04	+.362E-03
8886	+1.9917380	+0.0350172	+1.8090730	+1.9917395	+0.0350321	+1.8091385	-.143E-05	-.648E-04	-.654E-04
8888	+1.9730626	-0.9726464	+1.7960840	+1.9730557	-0.9726955	+1.7963631	+.690E-05	+.488E-04	-.279E-03
8874	+3.0756895	+0.8868133	+1.8157285						
8876	+3.0047828	-0.0326256	+1.7[illegible]						
8878	+3.0574031	-0.6002264	+1.7[illegible]						
8871	+3.0441706	+1.1040003	+1.8440256						
8881	+2.0113791	+1.2319181	+1.8697876	+2.0113811	+1.7315788	+1.8691527	-.192E-05	+.333E-03	+.634E-03
8872	+3.0400441	-0.0034150	+1.7442708						
8882	+1.9210864	+0.1112737	+1.7998136	+1.9210857	+0.1112950	+1.7998833	+.750E-06	-.212E-04	-.698E-04
8883	+2.0228780	-1.0172302	+1.7991500	+2.0228761	-1.0171674	+1.7992628	+.285E-05	-.648E-04	-.112E-03
2273	+3.0240865	-1.1222184	+1.8177160						

SIGMA X/Y/Z = 0.017 MM AT PHOTO SCALE

244

JUNCTION OF MODELS 8887 - 8786

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4887	+3.0231277	+0.0235275	+0.0264265	+3.0231249	+0.0236036	+0.0264091	-.104E-05	-.760E-04	+.174E-04
4886	+4.0543204	+0.0415673	+0.0264309						
8874	+3.0756060	+0.8269058	+1.8155045	+3.0755865	+0.8268183	+1.8152285	+.205E-04	+.875E-04	+.276E-03
8875	+3.0047812	-0.0327186	+1.7208567	+3.0047828	-0.0326256	+1.7208583	-.154E-05	-.930E-04	-.156E-05
8878	+3.0573851	-0.6901448	+1.7900908	+3.0574031	-0.6902264	+1.7903878	-.179E-04	+.815E-04	-.291E-03
8864	+4.0033415	+0.9829477	+1.8349991						
8866	+4.1131896	-0.1065927	+1.7874791						
8868	+4.2299766	-0.7105229	+1.8006617						
507	+3.3388239	-0.6851209	+1.7684483						
8861	+3.9846645	+1.1148587	+1.8139514						
8863	+4.1608525	-1.0469023	+1.8262673						
8872	+3.0402434	-0.0094359	+1.7443086	+3.0402441	-0.0094160	+1.7442708	-.647E-06	-.199E-04	+.378E-04
8873	+3.0249671	-1.1222196	+1.8179220	+3.0249865	-1.1222184	+1.8177360	-.193E-04	-.120E-05	+.186E-03
8862	+4.1161254	+0.1038938	+1.7886169						
8871	+3.0441896	+1.1039221	+1.8445287	+3.0441706	+1.1040003	+1.8445856	+.190E-04	-.781E-04	-.569E-04

SIGMA X/Y/Z = 0.010 MM AT PHOTO SCALE

JUNCTION OF MODELS 8786 - 8685

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4886	+4.0543053	+0.0416612	+0.0263952	+4.0543204	+0.0415673	+0.0264309	-.150E-04	+.933E-04	-.356E-04
4885	+5.0937054	+0.0654791	+0.0329554						
503	+5.2429253	+1.2167867	+1.8084792						
508	+5.2771282	-0.6364876	+1.8354193						
8856	+5.0088205	+0.0091081	+1.7250948						
8858	+5.2548507	-0.6409711	+1.8345530						
8864	+4.0093475	+0.9828709	+1.8346523	+4.0093415	+0.9829477	+1.8349991	+.602E-05	-.767E-04	-.346E-03
8866	+4.1131737	-0.1064920	+1.7874170	+4.1131896	-0.1065927	+1.7874791	-.158E-04	+.997E-04	-.620E-04
8868	+4.2300215	-0.7106391	+1.8011061	+4.2299966	-0.7105229	+1.8006617	+.249E-04	-.116E-03	+.444E-03
9128	+5.1865786	+1.1497608	+1.8160327						
8851	+5.0665891	+1.1243141	+1.8242221						
8852	+5.0992716	+0.1037960	+1.7342339						
8853	+5.1287061	-0.8813422	+1.8440153						
8861	+3.9846869	+1.1146550	+1.8133602	+3.9846645	+1.1148587	+1.8139514	+.224E-04	-.203E-03	-.591E-03
8862	+4.1161264	+0.1039850	+1.7829700	+4.1161254	+0.1038938	+1.7836169	+.108E-05	+.912E-04	+.353E-03
8863	+4.1608601	-1.0471537	+1.8268036	+4.1608525	-1.0469023	+1.8262673	+.764E-05	-.251E-03	+.572E-03
9123	+4.8158506	+1.2690548	+1.8058434						

SIGMA X/Y/Z = 0.022 MM AT PHOTO SCALE

JUNCTION OF MODELS 8685 - 8584

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4885	+5.0936931	+0.0655174	+0.0329383	+5.0937054	+0.0654791	+0.0329554	-.122E-04	+.383E-04	+.429E-04
4884	+6.1222676	+0.1084168	+0.0473209						
804	+5.6255670	+0.3536183	+1.6328305						
503	+5.2429272	+1.2160759	+1.8091700	+5.2429253	+1.2167867	+1.8084792	+.191E-05	+.802E-04	+.690E-03
508	+5.2771194	-0.6364587	+1.8349091	+5.2771282	-0.6364876	+1.8354193	-.871E-05	+.288E-04	-.510E-03
8846	+6.1602859	+0.0746867	+1.7758894						

8848	+6.1377517	-0.6029245	+1.8465178						
8856	+5.0088395	+0.0809516	+1.7248710	+5.0088405	+0.0801081	+1.7250948	+.190E-04	-.156E-03	-.223E-03
8858	+5.2548658	-0.6410134	+1.8341984	+5.2548507	-0.6409711	+1.8345590	+.151E-04	-.423E-04	-.354E-03
9118	+6.0811158	+1.2497793	+1.8342842						
9128	+5.1865551	+1.1498706	+1.8162204	+5.1865786	+1.1497608	+1.8160387	-.234E-04	+.109E-03	+.557E-03
8841	+6.1486348	+1.1469768	+1.8375476						
8842	+6.1459788	+0.1420556	+1.7736954						
8843	+6.1150991	-0.8760980	+1.8676071						
8851	+5.0665425	+1.1252154	+1.8250987	+5.0665891	+1.1249141	+1.8242221	-.465E-04	+.301E-03	+.876E-03
8852	+5.0992723	+0.1037180	+1.7340149	+5.0992716	+0.1037960	+1.7342339	+.726E-06	-.779E-04	-.218E-03
8853	+5.1287563	-0.8813199	+1.8435706	+5.1287061	-0.8813472	+1.8440153	+.502E-04	+.220E-04	-.444E-03
9113	+5.9416626	+1.1774393	+1.8244489						

SIGMA X/Y/Z = 0.026 MM AT PHOTO SCALE

JUNCTION OF MODELS 8584 - 8483

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4884	+6.1222601	+0.1084348	+0.0474020	+6.1222676	+0.1084168	+0.0473269	+.151E-05	+.180E-04	+.751E-04
4883	+7.1596467	+0.1571851	+0.0504696						
9118	+6.0811142	+1.2498448	+1.8346835	+6.0811158	+1.2497793	+1.8342842	-.158E-05	+.655E-04	+.399E-03
8846	+6.1692841	+0.0345301	+1.7756681	+6.1692859	+0.0346067	+1.7758894	-.171E-05	-.965E-04	-.221E-03
8848	+6.1377534	-0.6029116	+1.8462645	+6.1377517	-0.6029245	+1.8465178	+.178E-05	+.128E-04	-.253E-03
9108	+6.9929717	+1.2930100	+1.8389204						
8836	+7.2047095	+0.1529728	+1.8146395						
8838	+7.2943363	-0.5009007	+1.8389458						
509	+7.2803161	-0.5051687	+1.8394185						
8831	+7.1390001	+1.0021853	+1.7953002						
8833	+7.2508563	-0.8676636	+1.8725003						
8842	+6.1459844	+0.1419658	+1.7739693	+6.1459788	+0.1420556	+1.7736954	+.566E-05	-.897E-04	+.273E-03
8841	+6.1486512	+1.1472136	+1.8383414	+6.1486348	+1.1469768	+1.8375476	+.164E-04	+.236E-03	+.793E-03
8832	+7.2447091	+0.1865149	+1.8180072						
8843	+6.1151105	-0.8761271	+1.8678338	+6.1150991	-0.8760980	+1.8676071	+.114E-04	-.291E-04	+.223E-03

SIGMA X/Y/Z = 0.020 MM AT PHOTO SCALE

JUNCTION OF MODELS 8483 - 8382

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	V2
4883	+7.1596448	+0.1571577	+0.0504291	+7.1596467	+0.1571851	+0.0504696	-.188E-05	-.273E-04	-.404E-04
4882	+8.1806737	+0.2147370	+0.0600437						
9108	+6.9929638	+1.2931637	+1.8391315	+6.9929717	+1.2930100	+1.8389204	-.782E-05	+.153E-03	+.203E-03
8836	+7.2047080	+0.1529462	+1.8143541	+7.2047095	+0.1529728	+1.8146395	-.143E-05	-.265E-04	-.285E-03
8832	+7.2943474	-0.5010005	+1.8390693	+7.2943363	0.5009007	+1.8389458	+.111E-04	-.998E-04	+.123E-03
9098	+8.1483772	+1.2658349	+1.7857100						
8826	+8.2191387	+0.1222169	+1.8220579						
8828	+8.0406647	-0.4090613	+1.8357754						
509	+7.2803065	-0.5051179	+1.8395593	+7.2803161	-0.5051687	+1.8394185	-.952E-05	+.507E-04	-.133E-03
8821	+8.2134097	+1.1306716	+1.7633260						
8823	+8.2242948	-0.7375011	+1.8359500						
8822	+8.2125912	+0.2561249	+1.8716457						
8832	+7.2443048	+0.1864175	+1.8182693	+7.2443091	+0.1865149	+1.8180072	-.420E-05	-.101E-03	-.264E-03
8831	+7.1390100	+1.0021375	+1.7953300	+7.1389990	+1.0021853	+1.7953002	+.119E-04	-.477E-04	-.701E-04
9093	+8.0728594	+1.3000658	+1.7858024						

8833	+7.2505743	-0.8676311	+1.8787702	+7.2508664	-0.8676636	+1.8785003	+.807E-05	-.167E-03	+.269E-03

SIGMA X/Y/Z = 0.011 MM AT PHOTO SCALE

JUNCTION OF MODELS 8382 - 8281

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4882	+8.1866793	+0.2147707	+0.0600652	+8.1866707	+0.2147370	+0.0600497	+.561E-05	+.337E-04	-.244E-04
4881	+9.2397003	+0.2904966	+0.0810501						
9098	+8.1483846	+1.2657886	+1.7854983	+8.1483772	+1.2658343	+1.7857106	+.743E-05	-.457E-04	-.212E-03
8826	+8.2191444	+0.1222495	+1.8220479	+8.2191387	+0.1222160	+1.8220579	+.573E-05	+.326E-04	-.139E-04
8878	+8.0496478	-0.4950818	+1.8360260	+8.0496647	-0.4950613	+1.8357754	-.188E-04	-.205E-04	+.250E-03
9088	+9.1925540	+1.4274693	+1.8216241						
8816	+9.3715914	+0.4824793	+1.7711484						
8818	+9.1127723	-0.2930198	+1.8698077						
306	+8.5352508	+0.9603554	+1.7401421						
510	+9.4248715	-0.2444809	+1.8638811						
8811	+9.2068171	+1.1514123	+1.7663903						
8813	+9.3663969	-0.7116866	+1.9226310						
8821	+8.2134124	+1.1325491	+1.7628174	+8.2134097	+1.1326716	+1.7633260	+.274E-05	-.122E-03	-.408E-03
8823	+8.2242828	-0.7372203	+1.8949007	+8.2242948	-0.7375311	+1.8952599	-.119E-04	+.310E-03	-.359E-03
8812	+9.3390501	+0.3334718	+1.7973866						
8822	+8.2126014	+0.2541477	+1.8213464	+8.2125917	+0.2541243	+1.8216457	+.102E-04	+.234E-04	-.249E-03
9083	+8.9696308	+1.3335139	+1.7684809						

SIGMA X/Y/Z = 0.015 MM AT PHOTO SCALE

JUNCTION OF MODELS 8281 - 8180

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4881	+9.2396092	+0.2905775	+0.0803898	+9.2397003	+0.2904966	+0.0810501	-.109E-05	+.809E-04	-.602E-04
4880	+10.2021094	+0.3372638	+0.0815043						
9088	+9.1926058	+1.4274138	+1.8213831	+9.1925540	+1.4274693	+1.8216841	+.518E-04	-.544E-04	-.300E-03
8816	+9.3715973	+0.4825794	+1.7709860	+9.3715914	+0.4824793	+1.7711484	+.156E-05	+.100E-03	-.162E-03
8818	+9.1127199	-0.2931469	+1.8703312	+9.1127723	-0.2930198	+1.8698077	-.523E-04	-.126E-03	+.523E-03
9078	+10.1603775	+1.4626070	+1.8372350						
8806	+10.3202179	+0.4639842	+1.7985149						
8808	+10.4680720	-0.4605976	+1.9000023						
8744	+9.8672294	-0.0480461	+1.8531297						
306	+10.1369242	+0.7462014	+1.7434085						
510	+9.4249300	-0.2445707	+1.8645478	+9.4248715	-0.2444809	+1.8638811	+.585E-04	-.898E-04	+.676E-03
8801	+10.3161774	+1.1496894	+1.8078562						
8803	+10.3377125	-0.5240028	+1.9105014						
8812	+9.3390700	+0.3335084	+1.7978290	+9.3390501	+0.3334718	+1.7973866	+.408E-04	+.366E-04	+.442E-03
8811	+9.2088502	+1.1515431	+1.7664528	+9.2068171	+1.1514123	+1.7663903	+.331E-04	+.136E-03	+.625E-04
9073	+9.8774977	+1.3706869	+1.8207091						
8802	+10.3691519	+0.4852584	+1.8046256						
8813	+9.3664227	-0.7120101	+1.9235549	+9.3663969	-0.7116866	+1.9226310	+.258E-04	-.323E-03	+.924E-03

SIGMA X/Y/Z = 0.027 MM AT PHOTO SCALE

JUNCTION OF MODELS 8180 - 8079

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4880	+10.3021240	+0.3971770	+0.0815031	+10.3021004	+0.3972638	+0.0815043	+.146E-04	-.867E-04	-.113E-05
4873	+11.4543358	+0.5008962	+0.0659211						
9078	+10.1683468	+1.4627286	+1.8370575	+10.1683775	+1.4626030	+1.8372350	-.306E-04	+.125E-03	+.422E-03
5806	+10.3802946	+0.4638817	+1.7984783	+10.3802179	+0.4639842	+1.7985149	+.167E-04	-.102E-03	-.365E-04
8808	+10.4680713	-0.4005340	+1.8000173	+10.4680720	-0.4005976	+1.9000023	-.683E-06	+.635E-04	-.384E-03
9068	+10.8038397	+1.0443284	+1.8263348						
8796	+11.1158812	+0.8662941	+1.8304073						
8798	+10.9501829	+0.0705798	+1.8582263						
504	+10.1279983	+1.5604857	+1.8425840						
511	+10.6859157	-0.3127094	+1.8934002						
8791	+11.4158706	+1.5303392	+1.8714227						
8791	+11.55417	-0.4026503	+1.9222415						
8802	+10.36017	+0.4851827	+1.8048155	+10.3691519	+0.4852524	+1.8046296	+.234E-04	-.756E-04	+.185E-03
8801	+10.3161835	+1.1498970	+1.8075862	+10.3161774	+1.1496894	+1.8073562	+.615E-05	+.764E-05	+.210E-03
9063	+10.8301687	+1.4467453	+1.8255106						
8792	+11.5102179	+0.5703072	+1.8177690						

SIGMA X/Y/Z = 0.014 MM AT PHOTO SCALE

JUNCTION OF MODELS 6364 - 6465

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4864	+1.0000003	+0.0384323	+0.0115932	+1.0000000	+0.0384690	+0.0116004	+.342E-06	-.366E-04	-.116E-05
4865	+2.0076125	+0.0640661	+0.0129439						
8708	+0.7686627	+0.7450454	+1.7850106	+0.7686934	+0.7450530	+1.7547755	-.306E-04	-.135E-04	+.235E-03
8646	+1.0509180	+0.0727864	+1.7327906	+1.0509172	+0.0724236	+1.7327039	+.892E-06	-.371E-04	+.807E-04
8648	+0.8202479	-1.0356112	+1.7381961	+0.8202186	-1.0356986	+1.7385109	+.293E-04	+.873E-04	-.314E-03
8898	+1.9806194	+0.8245821	+1.6952717						
8656	+2.0319774	-0.0709087	+1.7268161						
8658	+1.7875558	-1.0331506	+1.7733004						
505	+1.5355551	+0.3614207	+1.7034525						
506	+2.0281277	+0.8382932	+1.6944719						
8651	+2.0028521	+0.3049006	+1.7077833						
8653	+1.9518032	-0.9770174	+1.7714237						
8642	+0.9695125	+0.1489756	+1.7166806	+0.9695162	+0.1489261	+1.7165622	-.364E-05	+.495E-04	+.118E-03
8641	+1.1561421	+1.1043145	+1.7516474	+1.1560416	+1.1038411	+1.7504797	+.100E-03	+.473E-03	+.116E-02
8803	+1.8334080	+0.6585310	+1.7162149						
8652	+2.0540265	+0.1167952	+1.7119350						
8643	+1.03.0013	-1.0245441	+1.7587918	+1.0310152	-1.0250942	+1.7595433	-.138E-04	+.550E-03	-.751E-03

SIGMA X/Y/Z = 0.033 MM AT PHOTO SCALE

JUNCTION OF MODELS 6465 - 6566

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4865	+2.0076240	+0.0641751	+0.0129175	+2.0076125	+0.0640661	+0.0129439	+.115E-04	+.103E-03	-.263E-04
4866	+3.0741702	+0.0449635	+0.0137095						
8898	+1.9806645	+0.8246388	+1.6951257	+1.9806194	+0.8245821	+1.6952717	+.451E-04	+.567E-04	-.145E-03
8656	+2.0319959	-0.0707891	+1.7264784	+2.0319774	-0.0709087	+1.7268161	+.185E-04	+.119E-03	-.377E-03
8658	+1.7874905	-1.0334360	+1.7738503	+1.7875658	-1.0331506	+1.7733004	-.752E-04	-.286E-03	+.549E-03
8888	+2.8591269	+0.6322546	+1.7026852						

8666	+3.0540258	+0.0361280	+1.7226117						
8668	+2.7379230	-0.9707057	+1.7644451						
506	+2.0281636	+0.8382304	+1.6941318	+2.0281277	+0.8382932	+1.6944719	+.359E-04	-.537E-04	-.340E-03
308	+2.2829756	+0.5952075	+1.6767817						
8661	+3.0799361	+0.9273560	+1.6806549						
8663	+2.9230668	-1.0529389	+1.7653692						
8662	+3.0048035	+0.0920213	+1.7197265						
8652	+2.0546559	+0.1169072	+1.7121215	+2.0546265	+0.1167952	+1.7119250	+.294E-04	+.112E-03	+.186E-03
8651	+2.0624818	+0.9945302	+1.7060370	+2.0621621	+0.9949006	+1.7077832	+.197E-04	-.370E-03	-.846E-03
8889	+2.8066975	+0.5826666	+1.7047681						
8653	+1.9517630	-0.9771830	+1.7719820	+1.9518032	-0.9770174	+1.7714397	-.201E-04	-.165E-03	+.543E-03

SIGMA X/Y/Z = 0.026 MM AT PHOTO SCALE

JUNCTION OF MODELS 6666 - 6667

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4866	+3.0341775	+0.0450502	+0.0137057	+3.0341702	+0.0449635	+0.0137095	+.736E-05	+.867E-04	-.377E-05
4867	+4.0265871	+0.0103419	+0.0156110						
8888	+2.8591717	+0.6322741	+1.7024313	+2.8591259	+0.6322545	+1.7026852	+.458E-04	+.196E-04	+.253E-03
8666	+3.0548399	+0.0362207	+1.7227335	+3.0540258	+0.0361280	+1.7226117	+.107E-04	+.927E-04	-.273E-03
8668	+2.7378592	-0.9703048	+1.7649753	+2.7379230	-0.9707057	+1.7644451	-.640E-04	-.199E-03	+.530E-03
8878	+3.9581050	+0.7706957	+1.6924647						
8676	+3.9665795	-0.0044880	+1.7062220						
8678	+3.8130989	-0.9808754	+1.7506350						
507	+4.2360021	+0.7305326	+1.6685202						
8671	+4.0598032	+0.8372064	+1.6796090						
8673	+3.8616552	-0.9885804	+1.7503483						
8662	+3.0042292	+0.0921105	+1.7194406	+3.0048035	+0.0920213	+1.7197265	+.197E-04	+.892E-04	-.285E-03
8661	+3.0790459	+0.9272170	+1.6801853	+3.0799361	+0.9273560	+1.6806549	+.984E-05	-.138E-03	-.468E-03
8672	+4.0787060	+0.0488375	+1.7013695						
8663	+2.9230781	-1.0526876	+1.7654572	+2.9230668	-1.0529389	+1.7653692	+.113E-04	+.249E-03	+.880E-04
8873	+3.8702267	+0.3486152	+1.7138646						

SIGMA X/Y/Z = 0.019 MM AT PHOTO SCALE

JUNCTION OF MODELS 6667 - 6768

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4867	+4.0265733	+0.0103364	+0.0156[illegible]	+4.0265871	+0.0103419	+0.0156110	-.775E-05	.114E-04	+.735E-04
4868	+5.0260185	0.0194206	+0.0373311						
8878	+3.9581106	+0.7706520	+1.6921401	+3.9581050	+0.7706957	+1.6924647	+.567E-05	.371E-04	-.324E-03
8676	+3.9665704	0.0045020	+1.7061701	+3.9665795	-0.0044880	+1.7062220	-.904E-05	-.140E-04	+.157E-03
8678	+3.8130500	-0.9808123	+1.7507237	+3.8130989	-0.9808754	+1.7506350	+.111E-04	+.631E-04	+.937E-04
8868	+5.1111967	+0.5084605	+1.6923500						
8686	+5.0510757	-0.0526748	+1.7259434						
8688	+4.7505003	-0.9817297	+1.7674219						
311	+4.3375447	-0.8050046	+1.7591057						
507	+4.2350627	+0.7334782	+1.6683665	+4.2360021	+0.7305326	+1.6685202	-.393E-04	-.843E-04	-.154E-03
8681	+5.0883620	+0.9257845	+1.6411786						
8683	+4.9744362	-0.9293512	+1.7007329						
8673	+3.8616710	-0.9888755	+1.7508564	+3.8616552	-0.9885804	+1.7503483	-.341E-04	-.205E-03	+.508E-03
8671	+4.0598791	+0.8371040	+1.6795528	+4.0598032	+0.8372064	+1.6796090	-.205E-04	-.102E-03	-.561E-04
8682	+5.0383627	+0.0158586	+1.7312149						

8672	+4.0787045	+0.0488344	+1.7012153	+4.0788060	+0.0488375	+1.7013695	-.134E-04	-.303E-05	-.154E-03
8863	+4.9995773	+0.2750502	+1.7134506						

SIGMA X/Y/Z = 0.014 MM AT PHOTO SCALE

JUNCTION OF MODELS 6768 - 6869

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4868	+5.0260106	-0.0194442	+0.0323812	+5.0260185	-0.0194208	+0.0323311	-.784E-05	-.234E-04	+.501E-04
4869	+5.9905256	-0.0574330	+0.0258800						
8868	+5.1111914	+0.5984096	+1.6923744	+5.1111967	+0.5984696	+1.6923500	-.152E-04	-.599E-04	-.255E-04
8686	+5.0510664	-0.0527040	+1.7301933	+5.0510757	-0.0526748	+1.7299439	-.928E-05	-.292E-04	+.249E-03
8688	+4.7595326	-0.9816103	+1.7671479	+4.7595003	-0.9817237	+1.7674219	+.323E-04	+.112E-03	-.273E-03
8858	+6.1302797	+0.5337681	+1.7177038						
8696	+5.9579256	-0.0958755	+1.7479533						
8098	+5.6675693	-1.0030704	+1.7764160						
508	+6.1526388	+0.5353220	+1.7185295						
812	+5.5785288	0.8098100	+1.7430307						
8691	+6.0420418	+0.9734670	+1.6838912						
8693	+5.9561958	-1.0592391	+1.7746363						
8682	+5.0909808	+0.0153424	+1.7312352	+5.0909927	+0.0153506	+1.7312149	-.118E-04	-.161E-04	+.203E-04
8681	+5.0083509	+0.9257108	+1.6411454	+5.0083629	+0.9257845	+1.6411786	-.119E-04	-.736E-04	-.331E-04
8853	+5.9752131	+0.3129534	+1.7247791						
8692	+5.9276453	+0.0228202	+1.7436010						
8683	+4.9744344	-0.9291477	+1.7694293	+4.9744362	-0.9293612	+1.7697323	-.171E-05	+.213E-03	-.302E-03

SIGMA X/Y/Z = 0.011 MM AT PHOTO SCALE

JUNCTION OF MODELS 6869 - 6970

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4869	+5.9905628	-0.0573261	+0.0258384	+5.9905256	-0.0574330	+0.0258800	+.372E-04	+.106E-03	-.415E-04
4870	+6.9544034	-0.1108737	+0.0201444						
8858	+6.1302935	+0.5338005	+1.7174922	+6.1302797	+0.5337681	+1.7177023	+.138E-04	+.325E-04	-.211E-03
8696	+5.9579660	-0.0957617	+1.7475519	+5.9579256	-0.0958755	+1.7479533	+.404E-04	+.113E-03	-.401E-03
8698	+5.6674777	-1.0033235	+1.7770704	+5.6675693	-1.0030704	+1.7764160	-.915E-04	-.253E-03	+.654E-03
8848	+7.0059014	+0.4568918	+1.7225223						
8706	+6.8403013	-0.1523174	+1.7486752						
8708	+6.6711152	-1.0310385	+1.7651725						
508	+6.1526381	+0.5353999	+1.7181519	+6.1526388	+0.5353220	+1.7185295	-.638E-06	+.795E-05	-.377E-03
8701	+7.0777457	+0.7188580	+1.6810249						
8703	+6.8949642	-1.1307245	+1.7668819						
8853	+5.9752563	+0.3131976	+1.7245057	+5.9752131	+0.3129534	+1.7247791	+.432E-04	+.244E-03	-.273E-03
8691	+6.0420517	+0.9732726	+1.6831927	+6.0420418	+0.9734670	+1.6838918	+.999E-05	-.194E-03	-.699E-03
8843	+6.9479779	+0.1900479	+1.7374386						
8702	+7.0297421	-0.1357600	+1.7400600						
8692	+5.9276696	+0.0220113	+1.7437318	+5.9276453	+0.0228202	+1.7436010	+.243E-04	-.189E-03	+.130E-03
8693	+5.9562212	-1.0594475	+1.7751333	+5.9561958	-1.0592391	+1.7746363	+.254E-04	-.214E-03	+.497E-03

SIGMA X/Y/Z = 0.024 MM AT PHOTO SCALE

JUNCTION OF MODELS 6970 - 7071

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4870	+6.0669776	-0.1108197	0.0201[illegible]	+6.066[illegible]	-0.1108[illegible]	+0.0201444	-.1[illegible]E-04	+.[illegible]E-05	.161E-04
4871	+7.9246238	-0.1568688	+0.0266661						
8848	+7.0056931	+0.4567846	+1.7[illegible]540	+7.00[illegible]016	+0.4568018	+1.72[illegible]	+.673E-05	.[illegible]E-03	+.[illegible]E-04
8706	+6.3462257	-0.1523201	+1.[illegible]	+6.[illegible]	-0.1523174	+1.74[illegible]	-.1[illegible]E-04	-.27[illegible]E-05	+.[illegible]E-03
8708	+6.6711397	-1.0809374	+1.76[illegible]	+6.6711[illegible]	-1.0810385	+1.76[illegible]	+.245E-04	+.100E-03	-.24[illegible]E-03
8838	+8.1587806	+0.4074849	+1.706[illegible]						
8716	+7.9965524	-0.2068854	+1.7556[illegible]						
8718	+7.7444545	-0.9788864	+1.7583[illegible]						
313	+7.5424078	-1.2580754	+1.7206893						
509	+8.1440476	+0.4051375	+1.7070201						
8711	+8.0301927	+0.8158101	+1.6994166						
8713	+7.8753153	-1.1303420	+1.7647588						
8702	+7.0297404	-0.1360132	+1.7460285	+7.0[illegible]	-0.1357[illegible]	+1.7460050	-.167E-05	[illegible]E-03	-.373E-04
8701	+7.0777627	+0.7988298	+1.6811581	+7.077[illegible]	+0.7988[illegible]	+1.6810249	+.170E-04	.[illegible]E-04	+.133E-03
8843	+6.9479817	+0.1900298	+1.7395705	+6.9479[illegible]	+0.1900479	+1.7394[illegible]	+.387E-05	-.1[illegible]E-04	+.173E-04
8712	+7.9193018	-0.0569580	+1.7471112						
8703	+6.8949341	-1.1311108	+1.7653566	+6.894[illegible]	-1.1307245	+1.7648813	.336E-04	-.395E-03	+.475E-03

SIGMA X/Y/Z = 0.014 MM AT PHOTO SCALE

JUNCTION OF MODELS 7071 - 7172

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4871	+7.9246456	-0.1567916	+0.0266053	+7.92462[illegible]	-0.1568688	+0.0265661	+.217E-04	+.771E-04	+.392E-04
4872	+8.8781358	-0.2039478	+0.0167363						
8838	+8.1587837	+0.4074710	+1.7062430	+8.1587808	+0.4074849	+1.7065854	+.291E-05	-.13[illegible]E-04	-.342E-03
8716	+7.9965741	-0.2067499	+1.7554497	+7.9965524	-0.2068854	+1.7556053	+.217E-0[illegible]	+.754E-04	-.155E-03
8718	+7.7444080	-0.9790252	+1.7594355	+7.7444545	-0.9788864	+1.7583705	-.464E-04	-.130E-03	+.453E-03
88[illegible]	+8.9041897	+0.3155859	+1.6067241						
87[illegible]	+8.9514835	-0.3913962	+1.7780342						
87[illegible]	+8.7[illegible]2156	-0.8725495	+1.7780006						
509	+8.1442066	+0.4051970	+1.7069518	+8.1440[illegible]	+0.40[illegible]	+1.7070201	+.3[illegible]E-04	+.595E-04	-.682E-04
8721	+8.[illegible]	+0.7747134	+1.6892002						
87[illegible]	+8.[illegible]6688	-1.1337032	+1.7754476						
8712	+7.9[illegible]	-0.0570475	+1.747[illegible]	+7.9193018	-0.0569[illegible]	[illegible].7471112	+.[illegible]E-04	-.805E-04	+.287E-03
88[illegible]	+8.0[illegible]4	+0.0511423	+1.7410077						
8711	+8.03[illegible]442	+0.8157554	+1.6990245	+8.0301927	+0.8158101	+[illegible]4166	.[illegible]E-04	-.54[illegible]E-04	-.392E-03
8722	+8.9177561	-0.0837117	+1.7665289						
8713	+7.8752853	1.1307281	+1.7652364	+7.8753153	-1.1303420	+1.764[illegible]	.29[illegible]E-0[illegible]	-.386E-03	+.477E-03

SIGMA X/Y/Z = 0.013 MM AT PHOTO SCALE

JUNCTION OF MODELS 7172 - 7273

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4872	+8.8781407	-0.2038431	+0.0168[illegible]	+8.8781358	-0.2039478	+0.01673[illegible]	+.490E-05	+.104E-03	+.734E-04
4873	+9.8142552	-0.2763400	+0.0191788						
88[illegible]	+8.9042826	+0.3154884	+1.6062417	[illegible]7	+0.3155853	+1.6067241	.423E-04	-.974E-04	-.482E-03
8725	+8.9514899	-0.3913010	+1.7779835	+8.[illegible]	-0.3913962	+1.7780342	.[illegible]8E-05	+.951E-04	-.506E-04
8727	+8.7281611	-0.8726519	+1.7784601	+8.72821[illegible]	-0.8725[illegible]	+1.7780006	.[illegible]E-04	-.102E-03	+.459E-03
8810	+9.9770119	+0.3703870	+1.7240671						

8736	+9.7441453	-0.2744175	+1.7805357						
8738	+9.6801198	-1.2419104	+1.7672743						
314	+10.0171232	-0.6185640	+1.7846696						
8731	+9.8167040	+0.5987838	+1.6887102						
8733	+9.7305381	-1.2472265	+1.7752493						
8722	+8.9177716	-0.0837545	+1.7663268	+8.9177561	-0.0837117	+1.7665239	+.155E-04	-.428E-04	-.202E-03
8823	+9.0452546	+0.0534042	+1.7504150						
8721	+8.9668148	+0.7242478	+1.6884146	+8.9667865	+0.7247134	+1.6892002	+.263E-04	-.465E-03	-.785E-03
8732	+9.8196446	-0.2155048	+1.7789473						
8727	+8.8204026	-1.1342252	+1.7763840	+8.8204638	-1.1337832	+1.7754476	-.661E-04	-.443E-03	+.936E-03

SIGMA X/Y/Z = 0.031 MM AT PHOTO SCALE

JUNCTION OF MODELS 7273 - 7374

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4873	+9.8142640	-0.2762853	+0.0191633	+9.8142552	-0.2763400	+0.0191788	+.885E-05	+.546E-04	-.154E-04
4874	+10.7773278	-0.3464439	+0.0320439						
8818	+9.9778029	+0.3703991	+1.7245703	+9.9778119	+0.3703870	+1.7246671	-.891E-05	+.121E-04	-.961E-04
8736	+9.7441554	-0.2743641	+1.7803695	+9.7441453	-0.2744175	+1.7805357	+.101E-04	+.533E-04	-.166E-03
8738	+9.6801097	-1.2420305	+1.7675519	+9.6801198	-1.2419104	+1.7672743	-.100E-04	-.120E-03	+.277E-03
8744	+10.7538786	+0.5206270	+1.7053490						
8746	+10.9425977	-0.3972675	+1.7652992						
8748	+10.7354690	-1.2286581	+1.7737057						
510	+10.2325917	+0.3838751	+1.7170255						
314	+10.0171358	0.6186123	+1.7847408	+10.0171232	-0.6185640	+1.7846696	+.126E-04	-.483E-04	+.712E-04
8741	+10.7692724	+0.5447309	+1.7052545						
8743	+10.7400851	-1.2270132	+1.7741325						
8732	+9.8196399	-0.2156047	+1.7791686	+9.8196446	-0.2155048	+1.7789473	-.469E-05	-.999E-04	+.221E-03
8731	+9.8166942	+0.5985794	+1.6884483	+9.8167040	+0.5987838	+1.6887102	-.979E-05	-.204E-03	-.261E-03
8813	+10.1740517	-0.0701907	+1.7699648						
8733	+9.7305334	-1.2473730	+1.7756378	+9.7305381	-1.2472265	+1.7752493	-.467E-05	-.146E-03	+.388E-03
8742	+10.8302646	-0.7373976	+1.7653916						

SIGMA X/Y/Z = 0.013 MM AT PHOTO SCALE

JUNCTION OF MODELS 7374 - 7475

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4874	+10.7773212	0.3464077	+0.0320385	+10.7773278	-0.3464439	+0.0320499	-.654E-05	+.361E-04	-.113E-04
4875	+11.7167645	-0.4057420	+0.0256723						
8744	+10.7539021	+0.5206355	+1.7050465	+10.7538786	+0.5206270	+1.7053490	+.235E-04	+.858E-05	-.302E-03
8746	+10.9425324	0.3972301	+1.7651074	+10.9425977	-0.3972675	+1.7652992	-.526E-05	+.373E-04	-.131E-03
8748	+10.7354578	-1.2287401	+1.7741512	+10.7354690	-1.2286581	+1.7737057	-.117E-04	-.820E-04	+.445E-03
8798	+11.2380440	+0.5065973	+1.6979042						
8755	+11.7924703	-0.3839595	+1.7575628						
8758	+11.6180109	-1.4019050	+1.7758810						
8808	+11.3008621	+0.0948019	+1.7418040						
511	+11.5270033	+0.1535102	+1.7355430						
315	+11.5928340	-1.3244768	+1.7753336						
8751	+11.7376608	+0.5173566	+1.7257650						
8753	+11.6608986	-1.3011770	+1.7789271						
8803	+11.2057063	-0.0165810	+1.7511062						
8752	+11.0845504	-0.3861320	+1.7571059						

8743	+10.7408015	-1.2273630	+1.7740083	+10.7400851	-1.2270132	+1.7741925	-.935E-04	-.350E-03	+.715E-03
8742	+10.8392790	-0.3274272	+1.7656713	+10.8392646	-0.3273976	+1.7653916	+.153E-04	-.296E-04	+.279E-03
8741	+10.7692303	+0.5446084	+1.7058345	+10.7692724	+0.5447309	+1.7062545	+.185E-04	-.122E-03	-.419E-03

SIGMA X/Y/Z = 0.022 MM AT PHOTO SCALE

JUNCTION OF MODELS 3637 - 3738

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4837	+0.9999960	+0.0012482	+0.0007888	+1.0000000	+0.0311519	+0.0008325	-.394E-05	+.963E-04	-.436E-04
4838	+2.0233541	+0.2149018	-0.0181685						
8648	+0.9903775	+1.1501834	+1.7575622	+0.9903846	+1.1502603	+1.7579477	-.700E-05	-.768E-04	-.365E-03
8376	+1.0470305	-0.0442834	+1.7851908	+1.0470435	-0.0443826	+1.7852873	-.398E-05	+.931E-04	-.914E-04
8378	+1.0460668	-0.6505654	+1.7803133	+1.0460519	-0.6504527	+1.7797928	+.149E-04	-.112E-03	+.520E-03
8658	+2.0102399	+1.2574723	+1.7697483						
8386	+1.9813351	+0.3039929	+1.7658024						
8388	+2.2160465	-0.3884137	+1.7551394						
316	+2.2411540	-0.3387236	+1.7491141						
310	+2.2107478	+0.7259153	+1.7634430						
8381	+2.0138238	+1.1692378	+1.7700744						
8383	+2.1395160	-0.7556271	+1.7538886						
8372	+1.0048269	+0.0939848	+1.7878180	+1.0048301	+0.0941048	+1.7878769	-.318E-05	-.119E-03	-.588E-04
8371	+0.9811358	+1.0625508	+1.7811971	+0.9811352	+1.0630220	+1.7820985	+.629E-06	-.471E-03	-.901E-03
8643	+1.2119568	+1.1843440	+1.7742515	+1.2120382	+1.1845050	+1.7748998	-.813E-04	-.160E-03	-.648E-03
8382	+2.0434778	+0.2024252	+1.7636759						
8373	+1.0464301	-0.8878258	+1.7793297	+1.0464127	-0.8875184	+1.7787685	+.174E-04	-.307E-03	+.561E-03

SIGMA X/Y/Z = 0.028 MM AT PHOTO SCALE

JUNCTION OF MODELS 3738 - 3839

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4838	+2.0233436	+0.2149606	-0.0181926	+2.0233541	+0.2149018	-0.0181685	-.104E-04	+.588E-04	-.241E-04
4839	+3.0098746	+0.3314505	-0.0451408						
8658	+2.0102250	+1.2574024	+1.7694379	+2.0102399	+1.2574723	+1.7697483	-.148E-04	-.698E-04	-.310E-03
8385	+1.9813251	+0.3040516	+1.7656011	+1.9813351	+0.3039929	+1.7658024	-.994E-05	+.587E-04	-.121E-05
8388	+2.2160816	-0.3884614	+1.7554791	+2.2160465	-0.3884137	+1.7551394	+.351E-04	-.477E-04	+.330E-03
8668	+3.0674173	+1.4322574	+1.7330682						
8396	+3.1447339	+0.3231774	+1.7361746						
8398	+3.1020358	-0.2107852	+1.7320469						
310	+2.2107488	+0.7260294	+1.7635320	+2.2107478	+0.7259153	+1.7634430	+.102E-05	+.114E-03	+.890E-04
316	+2.2411842	-0.3387615	+1.7493617	+2.2411540	-0.3387236	+1.7491141	+.302E-04	-.379E-04	+.247E-03
8391	+3.0021454	+1.1807218	+1.7464113						
8393	+3.1138822	-0.6753037	+1.7284016						
8382	+2.0434732	+0.2023674	+1.7637235	+2.0434778	+0.2024252	+1.7636759	-.459E-05	-.577E-04	+.476E-04
8381	+2.0136133	+1.1690193	+1.7698674	+2.0136238	+1.1692378	+1.7700744	-.104E-04	-.218E-03	-.206E-03
8653	+2.1769354	+1.3343831	+1.7628477						
8383	+2.1395560	-0.7558733	+1.7545180	+2.1395160	-0.7556271	+1.7538886	+.400E-04	-.202E-03	+.630E-03
8392	+3.0909331	+0.8649641	+1.7371123						

SIGMA X/Y/Z = 0.016 MM AT PHOTO SCALE

JUNCTION OF MODELS 3839 - 3940

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4839	+3.0038587	+0.3315183	-0.0452810	+3.0038746	+0.3314505	-0.0451408	-.188E-04	+.678E-04	-.140E-03
4840	+4.0657722	+0.4730179	-0.0628919						
8668	+3.0674277	+1.4322786	+1.7328041	+3.0674173	+1.4322574	+1.7330632	+.104E-04	+.312E-04	-.259E-03
8396	+3.1447135	+0.3232481	+1.7358157	+3.1447030	+0.3231774	+1.7361746	-.203E-04	+.707E-04	-.359E-03
8398	+3.1020644	-0.2109550	+1.7327056	+3.1020358	-0.2107852	+1.7320469	+.286E-04	-.169E-03	+.758E-03
8672	+4.1382646	+1.5310997	+1.6912552						
8406	+4.0172724	+0.7495243	+1.7170628						
8408	+4.1510275	+0.1050789	+1.7088208						
8401	+3.9856508	+1.4816005	+1.7024950						
8403	+4.2770120	-0.0468926	+1.7045474						
8392	+3.0969680	+0.2648338	+1.7376284	+3.0969331	+0.2649441	+1.7371123	+.357E-04	-.105E-03	+.516E-03
8391	+3.0021653	+1.1895469	+1.7459571	+3.0021454	+1.1897218	+1.7464113	+.209E-04	-.174E-03	-.454E-03
8669	+3.2079533	+1.3502664	+1.7308072						
8393	+3.1139413	-0.6758779	+1.7296847	+3.1138882	-0.6753037	+1.7284016	+.531E-04	-.574E-03	+.128E-02
8402	+4.1296325	+0.5486058	+1.7133992						

SIGMA X/Y/Z = 0.037 MM AT PHOTO SCALE

JUNCTION OF MODELS 3940 - 4041

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4840	+4.0657750	+0.4729482	-0.0628363	+4.0657722	+0.4730179	-0.0628919	+.281E-05	-.696E-04	+.556E-04
4841	+5.1389212	+0.6144545	-0.0858940						
8672	+4.1382803	+1.5312379	+1.6916402	+4.1382646	+1.5310997	+1.6912552	+.247E-04	+.138E-03	+.385E-03
8406	+4.0172736	+0.7494598	+1.7169469	+4.0172724	+0.7495243	+1.7170628	+.121E-05	-.644E-04	-.115E-03
8408	+4.1509987	+0.1050686	+1.7084960	+4.1510275	+0.1050789	+1.7088208	-.287E-04	-.420E-05	-.324E-03
8682	+5.1347183	+1.6329277	+1.6846273						
8416	+5.1251593	+0.8517370	+1.6849710						
8418	+5.2415668	-0.0798830	+1.6796562						
8411	+5.0658674	+1.5307870	+1.6892041						
8413	+5.2559767	-0.0828983	+1.6794921						
8402	+4.1296188	+0.5485424	+1.7132304	+4.1296325	+0.5486058	+1.7133992	-.136E-04	-.633E-04	-.168E-03
8401	+3.9856729	+1.4814100	+1.7022450	+3.9856508	+1.4816005	+1.7024950	+.217E-04	-.190E-03	-.249E-03
8673	+4.1806818	+1.5281191	+1.6902443						
8412	+5.1845295	+0.7729962	+1.6885815						
8403	+4.2770369	-0.0471388	+1.7048530	+4.2770120	-0.0468926	+1.7045474	+.229E-04	-.246E-03	+.311E-03

SIGMA X/Y/Z = 0.016 MM AT PHOTO SCALE

JUNCTION OF MODELS 4041 - 4142

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4841	+5.1389290	+0.6144007	-0.0858352	+5.1389212	+0.6144545	-0.0858940	+.786E-05	-.537E-04	+.587E-04
4842	+6.2080587	+0.7356586	-0.1050489						
8682	+5.1347203	+1.6329500	+1.6847441	+5.1347183	+1.6329277	+1.6846273	+.206E-05	+.223E-04	+.116E-03
8416	+5.1251677	+0.8516828	+1.6850961	+5.1251593	+0.8517370	+1.6849710	+.847E-05	-.541E-04	+.125E-03
8418	+5.2415483	-0.0797972	+1.6793554	+5.2415668	-0.0798830	+1.6796562	-.184E-04	+.856E-04	-.300E-03
[illegible]	+6.0941035	+1.7091359	+1.6718708						
[illegible]	+6.1518596	+0.785[illegible]078	+1.6609048						
[illegible]	+6.1607558	+0.1811391	+1.6564509						

312	+5.9257117	+1.8071033	+1.6389154						
512	+6.2097018	+1.3900067	+1.6681793						
513	+6.1902003	+0.2054846	+1.6587340						
105	.6469485	+0.0622799	+1.6707711						
8421	+6.1112995	+1.7096696	+1.6717953						
8423	+6.2535929	+0.1974031	+1.6573731						
8412	+5.1845387	+0.7729980	+1.6887679	+5.1845195	+0.7729962	+1.6885815	+.152E-04	-.581E-04	+.186E-03
8411	+5.0658729	+1.5336756	+1.6893183	+5.0658674	+1.5337870	+1.6892041	+.555E-05	-.108E-03	+.114E-03
8683	+5.3554792	+1.7116094	+1.6817109						
8422	+6.2305100	+0.9850790	+1.6642324						
8413	+5.2559920	-0.0830321	+1.6795531	+5.2559767	-0.0828983	+1.6794921	+.153E-04	-.133E-03	+.161E-03

SIGMA X/Y/Z = 0.010 MM AT PHOTO SCALE

JUNCTION OF MODELS 4142 - 4243

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4842	+6.2080638	+0.7355876	-0.1050340	+6.2080487	+0.7356586	-0.1050483	+.515E-05	-.709E-04	+.148E-04
4843	+7.2970787	+0.8446428	-0.1260907						
8698	+6.0940949	+1.7092583	+1.6721614	+6.0941035	+1.7091359	+1.6718768	-.853E-05	+.122E-03	+.284E-03
8426	+6.1518639	+0.7883385	+1.6607926	+6.1518595	+0.7884078	+1.6609048	+.442E-05	-.692E-04	-.112E-03
8428	+6.1607547	+0.1811568	+1.6562635	+6.1607558	+0.1811391	+1.6564503	-.104E-05	+.177E-04	-.187E-03
8708	+7.1592775	+1.7355619	+1.6337491						
8436	+7.3319224	+0.7726972	+1.6177284						
8438	+7.3971359	+0.1659054	+1.6207934						
512	+6.2097165	+1.3899118	+1.6681981	+6.2097018	+1.3900067	+1.6681793	+.147E-04	-.948E-04	+.188E-04
513	+6.1901963	+0.2054321	+1.6587245	+6.1902003	+0.2054846	+1.6587340	-.397E-05	-.524E-04	-.942E-05
8431	+7.3016334	+1.7121557	+1.6301470						
8432	+7.3977786	+0.1411019	+1.6291013						
8422	+6.2305373	+0.9848931	+1.6642970	+6.2305100	+0.9850790	+1.6642324	+.273E-04	-.186E-03	+.646E-04
8421	+6.1113113	+1.7096715	+1.6720731	+6.1112995	+1.7096696	+1.6717953	+.118E-04	+.191E-05	+.277E-03
8693	+6.4041979	+1.6813315	+1.6624049						
8433	+7.3424240	+1.0155712	+1.6337067						
8423	+6.2536048	+0.1972516	+1.6574178	+6.2535929	+0.1974031	+1.6573731	+.119E-04	-.171E-03	+.447E-04

SIGMA X/Y/Z = 0.010 MM AT PHOTO SCALE

JUNCTION OF MODELS 4243 - 4344

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4843	+7.2970766	+0.8446563	-0.1260821	+7.2970787	+0.8446428	-0.1260907	-.152E-05	+.135E-04	+.837E-05
4844	+8.3753762	+0.9210830	-0.1414588						
8708	+7.1592963	+1.7355334	+1.6338490	+7.1592775	+1.7355619	+1.6337491	+.780E-05	-.284E-04	+.100E-03
8436	+7.3319212	+0.7727108	+1.6177704	+7.3319224	+0.7726972	+1.6177284	-.116E-05	+.136E-04	+.420E-04
8438	+7.3971307	+0.1659066	+1.6286485	+7.3971359	+0.1659054	+1.6207934	-.511E-05	+.125E-05	-.150E-03
8718	+8.2788063	+1.9596510	+1.5089995						
8446	+8.3561422	+1.1395805	+1.6057871						
8448	+8.3404898	+0.1156003	+1.5925142						
313	+8.0055452	+1.6421671	+1.5640170						
8713	+8.4333365	+1.8144379	+1.6018728						
8443	+8.4538979	+0.1646178	+1.5905154						
8433	+7.3424929	+1.0154079	+1.6384024	+7.3424240	+1.0155712	+1.6337067	+.813E-05	-.161E-03	-.304E-03
8431	+7.3016507	+1.7171173	+1.6303301	+7.3016334	+1.7121557	+1.6301470	+.173E-04	-.383E-04	+.183E-03
8703	+7.4009196	+1.7073774	+1.6283017						

8442	+8.38[illegible]	+1.0035511	+1.[illegible]34847						
8473	+7.3477704	+0.1411442	+1.[illegible]	+7.[illegible]77786	+0.1411019	+1.6291013	-.815E-05	+.423E-04	-.100E-03

SIGMA X/Y/Z = 0.00[illegible] MM AT PHOTO SCALE

JUNCTION OF MODELS 4344 - 4445

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4844	+8.3754709	+0.9217867	-0.1414061	+8.37537[illegible]	+0.9218830	-0.1414508	+.765E-06	-.962E-04	+.520E-04
4845	+9.4302206	+1.0134128	-0.1588466						
8718	+8.2788807	+1.9597205	+1.5993466	+8.2788[illegible]	+1.9596510	+1.5989995	-.605E-05	+.605E-04	+.347E-03
8446	+8.3561433	+1.1394949	+1.6058859	+8.3561422	+1.1395895	+1.6057871	+.118E-05	-.945E-04	+.988E-04
8448	+8.3404933	+0.1155275	+1.5920155	+8.3404[illegible]	+0.1154063	+1.5925142	+.410E-05	+.121E-03	-.498E-03
8728	+9.3040715	+2.1786934	+1.5926055						
8456	+9.4880020	+1.0070592	+1.5308643						
8458	+9.4871581	+0.4066715	+1.5426990						
8723	+9.4298460	+1.9135072	+1.5888739						
8453	+9.5410182	+0.1998948	+1.5721056						
8442	+8.3865799	+1.0033048	+1.6037537	+8.3866655	+1.0035511	+1.6034847	+.144E-04	-.246E-03	+.269E-03
8713	+8.4333814	+1.8147319	+1.6028423	+8.4333365	+1.8144323	+1.6018728	+.449E-04	+.299E-03	+.969E-03
8443	+8.4539028	+0.1642752	+1.5996373	+8.4538979	+0.1646178	+1.5995154	+.109E-04	-.342E-03	+.121E-03
8452	+9.4690103	+1.0609905	+1.5769743						

SIGMA X/Y/Z = 0.029 MM AT PHOTO SCALE

JUNCTION OF MODELS 4445 - 4546

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4845	+9.4302258	+1.0133595	-0.1588482	+9.4302206	+1.0134128	-0.1588466	+.525E-05	-.537E-04	-.165E-05
4846	+10.5025432	+1.1056840	-0.1845580						
8728	+9.3040483	+2.1788198	+1.5928823	+9.3040715	+2.1786934	+1.5926055	-.231E-04	+.126E-03	+.276E-03
8456	+9.4880080	+1.0069384	+1.5307171	+9.4880020	+1.0070592	+1.5308643	+.603E-05	-.607E-04	-.147E-03
8458	+9.4871639	+0.4066589	+1.5425703	+9.4871581	+0.4066715	+1.5426990	+.118E-04	-.125E-04	-.128E-03
8738	+10.3467103	+1.8930444	+1.5578609						
8466	+10.5219492	+1.0379523	+1.5547559						
8468	+10.5381332	+0.4398500	+1.5514076						
317	+10.6537610	+0.5504718	+1.5509183						
8461	+10.4748351	+2.0704662	+1.5642076						
8463	+10.6720132	+0.2232000	+1.5466827						
8452	+9.4690272	+1.0608395	+1.5771630	+9.4690103	+1.0609905	+1.5769743	+.169E-04	-.150E-03	+.168E-03
8723	+9.4298427	+1.9135197	+1.5890683	+9.4298460	+1.9135072	+1.5888739	-.328E-05	+.125E-04	+.194E-03
8733	+10.4007472	+1.8923646	+1.5646159						
8462	+10.5344445	+1.2746402	+1.5558438						
8453	+9.5410546	+0.1996303	+1.5722554	+9.5410182	+0.1998948	+1.5721056	+.364E-04	-.264E-03	+.149E-03

SIGMA X/Y/Z = 0.013 MM AT PHOTO SCALE

JUNCTION OF MODELS 4546 - 4647

PT NO	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4846	+10.5025391	+1.1056015	-0.1845439	+10.5025432	+1.1056840	-0.1845580	-.409E-05	+.759E-05	+.140E-04

4847	+11.5351770	+1.1902466	-0.2184722						
8738	+10.3467259	+1.2023772	+1.5577232	+10.3467163	+1.2030444	+1.5578609	+.967E-05	-.671E-04	-.137E-03
8466	+10.5219476	+1.0328302	+1.5549126	+10.5219493	+1.0328223	+1.5547559	-.152E-05	+.796E-05	+.156E-03
8468	+10.5381231	+0.4399106	+1.5513744	+10.5381332	+0.4398590	+1.5514076	-.404E-05	+.516E-04	-.331E-04
8748	+11.4572559	+2.0219888	+1.5363707						
8476	+11.5731741	+1.1530422	+1.5324699						
8478	+11.7208374	+0.3252678	+1.5262751						
317	+10.6537799	+0.5504096	+1.5512026	+10.6537610	+0.5504718	+1.5509183	+.189E-04	-.621E-04	+.284E-03
8471	+11.4810087	+2.1476549	+1.5362227						
8473	+11.6567444	+0.3047473	+1.5274536						
8462	+10.5344438	+1.2346703	+1.5560615	+10.5344445	+1.2346402	+1.5558438	-.617E-06	+.307E-04	+.217E-03
8461	+10.4748937	+2.0704199	+1.5640490	+10.4748961	+2.0704662	+1.5642676	-.237E-05	-.462E-04	-.218E-03
8743	+11.4630095	+2.0244180	+1.5360178						
8472	+11.5652261	+1.2229581	+1.5347676						
8463	+10.6720564	+0.2228657	+1.5471455	+10.6720132	+0.2232000	+1.5466827	+.432E-04	-.334E-03	+.462E-03

SIGMA X/Y/Z = 0.015 MM AT PHOTO SCALE

JUNCTION OF MODELS 4647 - 4748

PT NO.	X2	Y2	Z2	X1	Y1	Z1	VX	VY	VZ
4847	+11.5351584	+1.1903557	-0.2184622	+11.5351770	+1.1902466	-0.2184722	-.185E-04	+.109E-03	+.991E-05
4848	+12.5554047	+1.2771233	-0.2451114						
8748	+11.4572595	+2.0219013	+1.5358337	+11.4572559	+2.0219888	+1.5363707	+.368E-05	-.874E-04	-.536E-03
8476	+11.5731550	+1.1531512	+1.5324376	+11.5731741	+1.1530422	+1.5324699	-.190E-04	+.109E-03	-.322E-04
8478	+11.7208713	+0.3251370	+1.5268344	+11.7208374	+0.3252678	+1.5262751	+.339E-04	-.130E-03	+.559E-03
8758	+12.4060474	+1.9357875	+1.5145313						
8486	+12.6094142	+1.2304558	+1.5116039						
8488	+12.3965585	+0.4083261	+1.5086884						
315	+12.3713000	+2.0144540	+1.5150237						
106	+12.3751299	+0.4256745	+1.5006077						
8753	+12.4407073	+2.0467262	+1.5153684						
8483	+12.7054106	+0.3851744	+1.4960234						
8472	+11.5652141	+1.2229384	+1.5345042	+11.5652261	+1.2229581	+1.5347676	-.119E-04	-.196E-04	-.263E-03
8743	+11.4629930	+2.0245525	+1.5358196	+11.4630095	+2.0244180	+1.5360178	-.164E-04	+.134E-03	-.198E-03
8471	+11.4810034	+2.1476035	+1.5359792	+11.4810087	+2.1476549	+1.5362227	-.524E-05	-.513E-04	.243E-03
8473	+11.6567550	+0.3045825	+1.5277491	+11.6567444	+0.3047473	+1.5274536	+.106E-04	-.164E-03	+.295E-03
107	+12.6506269	+0.1630523	+1.4959572						
8482	+12.6314469	+1.2774452	+1.5142056						

SIGMA X/Y/Z = 0.021 MM AT PHOTO SCALE

* DURBAN TEST AREA *

STRIP ADJUSTMENT

01/01/1978

PLANIMETRIC AND HEIGHT CONTROL

PT NO.	X	Y	Z	X	Y	Z	VX	VY	VZ
101	2637.370	2680.050	137.900	2637.367	2680.041	137.877	-0.002	-0.008	-0.022
102	-30.250	1011.820	126.090	-30.266	1011.835	126.097	-0.016	0.015	0.007
504	717.610	-127.860	90.940	717.562	-127.779	90.949	-0.047	0.080	0.009
503	3563.930	1869.250	84.950	3563.952	1869.243	84.956	0.022	-0.006	0.006
301	1810.650	1827.020	117.430	1810.662	1826.938	117.481	0.012	-0.081	0.051
302	534.710	1239.710	140.480	534.673	1239.544	140.444	-0.036	-0.165	-0.035
103	-30.950	1015.440	125.870	-30.997	1015.478	125.874	-0.047	0.038	0.004
9038	1939.669	594.684	118.316	1939.784	594.811	118.294	0.115	0.127	-0.021

STD ERR IN X= 0.050   STD ERR IN Y= 0.085   STD ERR IN Z= 0.050
STD ERR IN PLANIMETRY= 0.099   STD ERR OF ADJUSTMENT= 0.111

ADJUSTED COORDINATES

PT NO	X	Y	Z
SECTION NO. 1211			
4912	3270.657	2705.937	1354.073
4911	2639.759	2191.122	1353.400
9124	2847.452	3169.471	71.010
9126	3253.969	2659.900	53.960
9128	3625.002	1857.364	78.848
9114	2222.773	2787.747	137.663
9116	2581.466	2257.005	84.110
9118	3086.759	1511.986	71.393
503	3563.952	1869.243	84.956
101	2637.367	2680.041	137.877
9123	3776.561	2088.?72	84.779
9113	3375.986	1534.764	77.703
9122	3307.521	2751.180	51.850
9113	2661.860	2240.801	80.584
9111	2165.238	2756.507	123.382
9121	2803.195	2757.799	87.024
SECTION NO. 1110			
4911	2639.759	2191.122	1353.400
4910	2021.307	1696.211	1347.713
9114	2222.773	2787.747	137.663
9116	2581.466	2257.005	84.110
9118	3086.759	1511.986	71.393
9104	1608.165'	2261.951	120.680
9106	2051.044	1746.843	104.279
9108	2561.783	1130.708	73.674

301	1810.662	1826.938	117.481
9101	1600.000	2239.569	124.018
9103	2531.790	1115.934	72.617
9113	3195.986	1534.764	77.763
9111	2165.238	2756.507	123.982
9112	2061.860	240.891	80.584
9102	2061.453	1777.943	106.923

SECTION NO. 1003

4910	2021.307	1096.211	1347.713
4909	1494.153	1284.971	1342.597
9104	1608.165	2261.951	123.680
9106	2091.044	1746.843	104.270
9108	2561.783	1130.708	73.674
9094	1041.561	1790.681	138.066
9096	1425.817	1356.932	120.052
9098	1939.784	594.811	118.294
301	1810.662	1826.938	117.481
9091	999.554	1922.357	131.008
9093	1965.693	648.054	118.003
9102	2061.453	1777.343	106.923
9103	2531.790	1115.934	72.617
9101	1600.000	2239.569	124.018
9092	1424.296	1297.918	117.705

SECTION NO. 908

4909	1494.153	1284.971	1342.597
4908	963.920	886.101	1347.596
9094	1041.561	1790.681	138.066
9096	1425.817	1356.932	120.052
9098	1939.784	594.811	118.294
9084	601.669	1440.239	135.112
9086	912.385	883.517	108.551
9088	1231.220	215.841	99.705
302	534.673	1239.544	146.444
9081	520.908	1474.408	136.725
9083	1456.219	264.048	115.302
9092	1424.296	1297.918	117.705
9091	999.554	1922.357	131.008
9082	945.451	919.569	111.012
9093	1965.693	648.054	118.003

SECTION NO. 807

4908	963.920	886.101	1347.596
4907	416.636	491.530	1348.630
9084	601.669	1440.239	135.112
9086	912.385	883.517	108.551
9088	1231.220	215.841	99.705
9074	-30.773	1079.419	112.022
9076	370.092	437.558	80.633
9078	786.508	-201.786	94.677

[illegible]	534.073	1239.544	146.444
[illegible]	[illegible]	1015.478	125.874
[illegible]	-80.266	1011.835	126.097
[illegible]	717.562	-127.779	90.940
[illegible]	-30.202	1051.571	126.349
[illegible]	956.798	-145.029	104.303
[illegible]	945.451	913.569	111.012
[illegible]	[illegible]	1474.468	136.725
[illegible]	479.261	513.193	86.695
[illegible]	1456.219	264.048	135.302

SECTION NO. 706

[illegible]	437.636	431.530	1340.639
[illegible]	-111.010	80.767	1344.073
[illegible]	-30.778	1073.419	112.022
[illegible]	370.002	482.558	80.633
[illegible]	736.503	-201.786	94.677
[illegible]	612.081	737.312	8.498
[illegible]	113.200	87.505	23.739
[illegible]	260.691	-421.716	107.068
[illegible]	-80.266	1011.835	126.097
[illegible]	-49.997	1015.478	125.874
[illegible]	717.562	-127.779	90.940
[illegible]	605.135	759.934	8.509
[illegible]	374.346	-510.271	107.226
[illegible]	479.261	513.192	86.695
[illegible]	-30.202	1051.571	126.349
[illegible]	-112.071	102.408	23.823
[illegible]	956.798	-145.029	104.303

PLANIMETRIC AND HEIGHT CONTROL

PT NO.	X	Y	Z	X	Y	Z	VX	VY	VZ
303	6627.770	3897.470	44.550	6627.861	3897.484	44.438	0.091	0.014	-0.111
307	6936.920	3230.680	65.620	6936.966	3230.649	65.701	0.046	-0.070	0.081
507	5466.460	1673.320	102.310	5466.362	1673.313	102.550	-0.097	-0.006	0.240
503	3563.930	1869.250	84.950	3564.147	1869.087	85.087	0.217	-0.162	0.137
508	4375.430	831.550	64.710	4375.463	831.569	64.576	0.033	0.019	-0.133
509	3211.850	6.530	73.200	3211.698	6.476	72.888	-0.151	-0.053	-0.311
510	1911.660	-810.780	68.720	1911.745	-810.548	68.921	0.085	0.231	0.201
306	1075.810	-582.560	160.430	1075.649	-582.704	160.515	-0.160	-0.144	0.085
504	717.610	-127.860	90.940	717.661	-127.885	90.813	0.051	-0.025	-0.126
308	6709.540	2316.640	95.070	6709.509	2316.789	95.133	-0.030	0.149	0.063
506	6773.710	2560.170	85.580	6773.624	2560.177	85.453	-0.085	0.007	-0.126

STD ERR IN X= 0.098   STD ERR IN Y= 0.095   STD ERR IN Z= 0.242
STD ERR IN PLANIMETRY= 0.137   STD ERR OF ADJUSTMENT= 0.278

ADJUSTED COORDINATES

PT NO	X	Y	Z
SECTION NO. 9089			
4890	7006.731	3549.498	1346.585
4889	6452.154	3106.015	1343.600
8904	6612.646	4221.274	48.591
8906	6914.664	3564.903	20.242
8908	7574.607	2975.663	20.296
8894	5934.475	3610.469	20.484
8895	6407.577	3143.290	62.886
8898	6807.687	2569.658	84.682
303	6627.861	3897.484	44.438
501	6242.703	3870.337	18.729
502	5929.594	3655.034	25.189
505	7027.303	2819.596	76.278
506	6773.624	2560.177	85.453
307	6936.966	3230.649	65.701
8901	6578.812	4187.165	32.764
8891	5964.524	3667.416	24.662
8903	7565.736	2985.014	19.810
8893	6950.742	2523.870	67.867
8902	7004.452	3538.316	19.602
8892	6432.630	3144.760	65.300
SECTION NO. 8408			
4889	6452.154	3106.015	1343.600
4888	5900.583	2662.232	1307.351
8894	5934.475	3610.469	20.484
8896	6407.577	3143.290	62.886
8898	6807.687	2569.658	84.682
8884	5472.964	3162.247	32.279
8886	5886.213	2673.742	68.709

8888	6344.680	2123.956	76.384
506	6773.624	2560.177	85.453
308	6709.503	2816.709	95.133
502	5929.594	3655.034	25.183
8893	6959.248	2523.870	67.667
8891	5964.524	3667.416	24.662
8881	5339.207	3324.562	26.865
8892	6422.639	3144.760	65.300
8887	5891.055	2747.422	75.070
8883	6340.466	2079.775	74.891

SECTION NO. 8887

4888	5300.583	2662.232	1337.351
4887	5329.840	2203.447	1339.158
8884	5472.464	3162.247	32.273
8886	5886.213	2673.742	68.709
8888	6344.680	2123.956	76.884
8874	4933.997	2624.813	69.519
8876	5385.302	2149.692	135.487
8878	5623.706	1796.573	85.835
8871	4827.095	2791.625	48.878
8881	5339.207	3324.562	75.865
8872	5328.366	2179.664	119.080
8887	5891.055	2747.422	75.070
8883	6340.466	2079.775	74.891
8873	5835.041	1572.861	65.634

SECTION NO. 8786

4887	5329.840	2203.447	1339.159
4886	4753.177	1756.455	1343.902
8874	4933.997	2624.813	69.519
8876	5385.302	2149.692	135.487
8878	5623.706	1796.573	85.835
8864	4349.133	2232.597	60.174
8866	4780.101	1645.302	93.255
8868	4986.254	1259.327	83.603
507	5466.362	1673.313	102.550
8861	4303.770	2376.392	75.203
8863	5175.037	1105.341	64.648
8872	5328.366	2179.664	119.080
8873	5835.041	1572.861	65.634
8862	4684.177	1700.130	92.534
8871	4827.095	2791.625	48.878

SECTION NO. 8685

4886	4753.177	1756.459	1343.902
4885	4169.267	1303.969	1344.434
503	3564.147	1269.087	85.087
508	4375.463	831.563	64.576
8856	4198.814	1352.087	142.281
8858	4383.770	839.054	65.015

8864	4349.179	2292.597	60.174
8866	4770.101	1645.382	93.255
8868	4986.254	1259.927	83.603
9128	3625.220	1857.359	73.411
8851	3702.458	1897.447	72.831
8852	4142.302	1319.675	136.270
8853	4566.981	763.001	57.382
8861	4303.770	2376.392	75.209
8862	4684.177	1760.130	38.534
8863	5175.037	1105.341	64.648
9123	3776.307	2039.193	85.031

SECTION NO. 8584

4885	4169.267	1303.969	1344.434
4884	3582.687	866.810	1339.762
304	3740.264	1221.771	168.644
503	3564.147	1869.087	85.087
508	4375.463	831.509	64.576
8846	3582.952	802.102	112.341
8848	3885.713	464.446	61.249
8856	4198.814	1362.087	142.281
8858	4389.770	839.054	65.015
9118	3086.967	1511.765	71.429
9128	3625.220	1857.359	73.411
8841	3095.720	1424.852	69.249
8842	3547.709	871.770	113.717
8843	4020.530	323.869	45.788
8851	3702.458	1897.447	72.831
8852	4142.302	1319.675	136.270
8853	4566.981	763.001	57.382
9113	3196.344	1534.332	77.717

SECTION NO. 2483

4884	3582.687	866.810	1339.762
4883	2988.631	428.038	1343.539
9118	3086.967	1511.765	71.429
8846	3582.952	802.102	112.341
8848	3885.713	464.446	61.249
9108	2561.910	1130.461	73.438
8836	2958.658	403.421	90.897
8838	3302.081	2.503	73.221
509	3211.698	6.476	72.888
8831	2614.544	301.327	105.088
8833	3390.244	-180.429	44.340
8842	3547.709	871.770	113.717
8841	3095.720	1424.852	69.249
8832	2321.789	404.156	88.337
8843	4020.530	323.869	45.788

SECTION NO. 8382

4883	2988.631	428.038	1343.539

4882	2396.255	0.583	1342.988
9108	2561.910	1130.461	73.438
8830	2950.658	403.421	90.897
8838	3202.081	2.503	73.221
9038	1939.687	594.612	118.294
8826	2412.799	-68.001	91.627
8828	2782.793	-332.643	79.983
509	3211.698	6.476	72.888
8821	1963.573	492.041	134.536
8823	2794.773	-544.657	38.710
8822	2357.322	7.697	92.116
8832	2321.789	404.156	88.337
8831	2614.544	901.377	105.088
9093	1365.593	647.835	117.870
8833	3390.244	-180.429	44.340

SECTION NO. 8281

4882	2396.255	0.583	1342.988
4881	1781.316	-429.362	1334.849
9038	1939.687	594.612	118.294
8826	2412.799	-68.001	91.627
8828	2782.793	-332.643	79.983
9068	1291.133	215.954	99.524
8816	1615.845	-385.402	135.585
8818	2108.374	-700.827	62.667
305	1863.291	252.885	152.694
510	1911.745	-810.548	68.921
8811	1405.999	56.544	138.515
8813	2153.120	-1042.277	26.120
8821	1963.573	492.041	134.536
8823	2794.773	-544.657	38.710
8812	1700.441	-453.101	116.356
8822	2357.322	7.697	92.116
9083	1456.369	264.031	135.685

SECTION NO. 8180

4881	1781.316	-429.362	1334.847
4880	1147.425	-846.387	1341.672
9082	1291.133	215.964	99.524
8816	1615.845	-385.402	135.585
8818	2108.374	-700.827	62.667
9078	736.697	-201.976	34.680
8806	1067.639	-847.491	122.801
8808	1405.975	-1363.956	50.433
8744	1579.740	-900.263	79.962
306	1075.649	-582.704	160.515
510	1911.745	-810.548	68.921
8801	795.784	-440.513	116.600
8803	1505.555	-1396.086	42.133
8812	1700.441	-453.101	116.356
8811	1405.999	56.544	138.515
9073	957.102	-144.754	104.463
8802	1064.182	-830.803	118.327
8813	2153.120	-1042.277	26.120

SECTION NO. 8079

4880	1147.425	-846.387	1341.672
4879	465.336	-1305.278	1346.568
9078	736.693	-201.976	94.680
8806	1067.639	-847.491	122.801
8808	1405.975	-1363.356	50.433
9068	261.038	-421.938	107.144
8796	481.478	-955.057	105.540
8798	925.137	-1314.296	88.130
504	717.661	-127.835	90.813
511	1246.463	-1413.040	56.591
8791	18.439	-722.898	79.141
8793	807.593	-1851.560	42.080
8802	1064.182	-830.803	118.327
8801	795.784	-440.513	116.680
9063	374.725	-510.472	107.683
8792	414.464	-1316.985	117.043

PLANIMETRIC AND HEIGHT CONTROL

PT NO.	X	Y	Z	X	Y	Z	VX	VY	VZ
309	8304.990	2134.800	27.310	8305.050	2134.819	27.293	0.060	0.019	-0.016
315	1759.470	-2337.510	11.270	1759.444	-2337.482	11.262	-0.025	0.027	-0.007
505	7027.350	2819.630	76.470	7027.304	2819.587	76.559	-0.045	-0.042	0.089
506	6773.610	2560.170	85.530	6773.601	2560.128	85.568	-0.008	-0.041	-0.011
308	6709.540	2316.640	95.070	6709.567	2316.649	95.050	0.027	0.009	-0.019
507	5466.460	1673.320	102.310	5466.502	1673.239	102.167	0.042	-0.080	-0.142
311	5982.360	695.670	19.180	5982.355	695.766	19.108	-0.004	0.096	-0.071
508	4375.430	831.550	64.710	4375.472	831.552	64.728	0.042	0.002	0.018
312	5759.160	246.580	30.770	5759.144	246.663	30.973	-0.015	0.083	0.203
509	3211.850	6.530	73.200	3211.738	6.324	73.236	-0.111	-0.205	0.036
313	4201.270	-781.390	43.460	4201.308	-781.259	43.381	0.038	0.130	-0.078

STD ERR IN X= 0.042 STD ERR IN Y= 0.078 STD ERR IN Z= 0.129
STD ERR IN PLANIMETRY= 0.089 STD ERR OF ADJUSTMENT= 0.157

ADJUSTED COORDINATES

PT NO	X	Y	Z

SECTION NO. 6364

4863	8357.702	2793.539	1288.044
4864	7709.620	2442.832	1279.272
8634	8095.859	3437.266	34.471
8636	8300.415	2736.365	11.139
8638	8764.138	2348.887	16.330
8908	7574.605	2975.541	20.737
8646	7654.821	2460.061	49.609
8648	8209.858	1872.140	32.135
309	8305.050	2134.819	27.293
8633	8686.526	2290.475	7.859
8913	7921.573	3436.182	48.004
8641	7204.668	3048.801	48.842
8643	8077.394	1800.022	17.244
8632	8351.555	2891.637	40.304
8642	7675.831	2536.966	62.134
8903	7565.757	2984.083	20.405

SECTION NO. 6465

4864	7709.620	2442.832	1279.272
4865	7086.665	2081.327	1277.931
8908	7574.605	2975.541	20.737
8646	7654.821	2460.061	49.609
8648	8209.858	1872.140	32.135
8898	6807.626	2569.603	84.796
8656	7111.292	2005.608	51.578
8658	7620.038	1511.781	6.394
505	7027.304	2819.587	76.559
506	6773.601	2560.128	85.568
8651	6603.828	2642.486	78.066

8653	7499.033	1484.464	8.342
8642	7675.891	2506.966	62.134
8641	7204.668	3048.801	48.843
8897	6959.220	2523.771	67.899
8652	7027.344	2111.243	64.263
8643	8077.394	1800.022	17.244

SECTION NO. 6566

4865	7086.665	2081.327	1277.931
4866	6468.881	1685.397	1276.716
8898	6807.626	2569.603	84.796
8656	7111.292	2005.608	51.578
8658	7620.038	1511.781	6.394
8888	6344.721	2123.741	76.797
8666	6448.586	1687.798	55.415
8668	6981.701	1171.439	13.131
506	6773.601	2560.128	85.568
308	6709.567	2310.649	95.050
8661	6100.009	2220.488	36.009
8663	6936.197	1074.656	11.601
8662	6458.129	1740.518	58.163
8652	7027.344	2111.243	64.263
8551	6693.828	2642.486	78.066
8883	6340.413	2079.514	74.617
8653	7499.033	1484.464	8.342

SECTION NO. 6667

4866	6468.881	1685.397	1276.716
4867	5877.652	1292.730	1274.787
8888	6344.721	2123.741	76.797
8666	6448.586	1687.798	55.415
8668	6981.701	1171.439	13.131
8878	5623.870	1796.477	85.491
8676	5908.831	1321.519	66.365
8678	6367.018	784.731	22.945
507	5466.502	1673.239	102.167
8671	5537.092	1798.725	95.350
8673	6340.936	762.070	22.909
8662	6458.129	1740.518	58.163
8661	6100.009	2220.488	36.009
8672	5820.570	1311.918	70.577
8663	6936.197	1074.656	11.601
8873	5835.708	1572.606	65.134

SECTION NO. 6768

4867	5877.652	1292.730	1274.787
4868	5779.638	900.165	1262.660
8878	5623.870	1796.477	85.491
8676	5908.831	1321.519	66.365
8678	6367.018	784.731	22.945
8868	4986.262	1259.842	83.574

8686	5766.426	886.285	48.983
8688	5791.547	430.268	11.251
311	5982.355	695.766	19.108
507	5466.502	1673.233	102.167
8681	4877.942	1467.203	123.928
8683	5641.057	381.707	10.315
8673	6340.335	762.070	22.909
8671	5537.092	1798.725	95.350
8682	5711.786	909.785	48.972
8672	5820.570	1311.918	70.577
8867	5175.109	1104.908	64.081

SECTION NO. 6869

4868	5279.638	300.165	1262.660
4869	4707.162	516.119	1267.308
8868	4986.262	1250.842	83.574
8686	5766.426	886.285	48.983
8688	5791.547	430.268	11.251
8858	4389.786	839.053	65.227
8696	4730.291	520.558	36.263
8698	5746.716	77.181	4.657
508	4375.472	831.552	64.728
312	5259.144	246.663	30.373
8691	4279.126	1139.427	94.562
8693	5091.984	-65.135	5.461
8682	5711.786	909.785	48.972
8681	4877.942	1467.203	123.928
8853	4566.798	762.814	57.549
8692	4667.825	581.583	40.578
8683	5641.057	381.707	10.315

SECTION NO. 6970

4869	4707.162	516.119	1267.308
4870	4132.620	117.905	1865.101
8858	4389.786	839.053	65.227
8696	4730.291	520.558	36.263
8698	5746.716	77.181	4.657
8848	3885.600	464.418	61.471
8706	4210.547	153.457	35.534
8708	4664.865	-346.166	12.852
508	4375.472	831.552	64.728
8701	3713.851	645.236	95.066
8703	4547.286	460.308	12.428
8853	4566.798	762.814	57.549
8691	4279.126	1139.427	94.562
8843	4020.485	323.719	46.244
8702	4092.717	94.723	37.853
8692	4667.825	581.583	40.578
8693	5091.984	-65.135	5.461

SECTION NO. 7071

4870	4132.630	117.305	1265.101
4871	3566.779	-268.809	1267.438
8848	3885.600	464.418	51.471
8706	4210.547	153.457	45.534
8708	4664.865	-346.166	12.852
8838	3202.039	2.289	73.690
8716	3530.533	-310.468	31.337
8718	3973.190	-666.097	19.402
313	4201.308	-781.255	43.331
509	3211.738	6.324	73.236
8711	3127.449	298.956	83.307
8713	3950.234	-827.342	13.650
8702	4032.717	94.723	37.853
8701	3713.851	645.236	95.066
8843	4020.485	323.719	46.244
8712	3521.161	-190.646	38.879
8703	4547.286	-460.338	12.428

SECTION NO. 7172

4871	3566.779	-268.809	1267.438
4872	3003.921	-654.682	1275.250
8838	3202.039	2.289	73.690
8716	3530.533	-310.468	31.337
8718	3973.190	-666.097	19.402
8828	2782.679	-332.982	80.800
8726	3018.130	-780.260	14.526
8728	3334.265	-989.626	8.442
509	3211.738	6.324	73.236
8721	2591.463	-107.540	91.010
8723	3376.003	-1183.335	7.196
8712	3521.161	-190.646	38.879
8833	3390.234	-180.516	44.775
8711	3127.449	298.956	83.307
8722	2923.502	-580.489	26.280
8713	3950.234	-827.342	13.650

SECTION NO. 7273

4872	3003.921	-654.682	1275.250
4873	2461.088	-1043.356	1274.351
8828	2782.679	-332.982	80.800
8726	3018.130	-780.260	14.526
8728	3334.265	-989.626	8.442
8818	2108.329	-701.460	63.181
8736	2431.684	-1005.941	15.510
8738	2893.071	-1571.098	13.541
314	2454.354	-1317.666	9.057
8731	2123.147	-502.476	31.203
8733	2864.317	-1593.152	7.838
8722	2923.502	-580.489	26.280
8823	2794.627	-544.300	39.445
8721	2591.463	-107.540	91.010
8732	2423.700	-998.411	17.332
8723	3376.003	-1183.335	7.196

SECTION NO. 7374

4873	2461.088	-1043.356	1274.361
4874	1900.957	-1492.601	1266.360
8818	2178.329	-701.460	63.181
8736	2431.684	-1005.941	15.510
8738	2833.071	-1571.098	13.541
8744	1579.736	-900.873	80.353
8746	1808.192	-1529.698	27.507
8748	2245.544	-1958.164	11.270
510	1911.694	-811.227	69.385
314	2454.354	-1317.656	9.057
8741	1561.359	-831.399	80.051
8743	2241.641	-1959.289	10.855
8732	2423.700	-998.411	17.372
8731	2121.147	-502.476	91.203
8813	2153.011	-1043.081	26.175
8733	2864.717	-1593.152	7.838
8742	1844.937	-1448.493	27.851

SECTION NO. 7475

4874	1900.957	-1492.601	1266.360
4875	1350.556	-1839.300	1209.693
8744	1579.736	-900.873	80.353
8746	1808.192	-1529.698	27.507
8748	2245.544	-1958.164	11.270
8798	925.109	-1315.543	88.017
8756	1285.974	-1833.979	30.249
8752	1773.101	-2394.035	10.189
8808	1405.773	-1364.537	50.676
511	1246.361	-1413.634	56.368
315	1759.444	-2337.482	11.262
8751	981.936	-1271.149	67.966
8753	1709.264	-2348.751	9.146
8803	1506.522	-1396.692	42.484
8758	1352.431	-1800.853	35.368
8743	2241.641	-1959.289	10.855
8742	1844.937	-1448.493	27.851
8741	1561.359	-831.399	80.051

PLANIMETRIC AND HEIGHT CONTROL

PT NO.	X	Y	Z	X	Y	Z	VX	VY	VZ
310	7730.480	1144.610	3.870	7730.557	1144.615	3.767	0.077	0.005	-0.102
317	3279.860	-2415.880	4.920	3279.934	-2415.845	4.887	0.074	0.034	-0.032
104	9016.230	1170.130	5.350	9016.181	1170.154	5.362	-0.048	-0.025	0.012
316	8150.770	561.670	6.390	8150.806	561.742	6.440	0.036	0.072	0.050
312	5259.160	246.580	30.770	5259.197	246.527	30.902	0.037	-0.052	0.132
512	5315.640	-141.180	3.330	5315.605	-141.192	3.370	-0.034	-0.012	0.040
513	5812.190	-767.690	2.940	5812.165	-767.644	2.907	-0.024	0.045	-0.032
313	4201.270	-781.390	43.460	4201.270	-781.415	43.346	0.000	-0.025	-0.113
315	1759.470	-2337.510	11.270	1759.429	-2337.528	11.257	-0.040	-0.018	-0.012
105	6161.990	-621.250	3.050	6161.924	-621.291	3.052	-0.065	-0.041	0.002
106	2409.510	-3189.430	5.060	2409.495	-3189.412	5.113	-0.014	0.017	0.053

STD ERR IN X= 0.041 STD ERR IN Y= 0.032 STD ERR IN Z= 0.100
STD ERR IN PLANIMETRY= 0.053 STD ERR OF ADJUSTMENT= 0.113

ADJUSTED COORDINATES

PT NO	X	Y	Z
SECTION NO. 3637			
4836	9193.902	1636.917	1228.179
4837	8621.089	1276.052	1210.205
8638	8765.679	2748.659	15.363
8366	9051.002	1596.745	5.430
8368	9123.513	1327.434	5.550
8648	8210.109	1871.954	31.777
8376	8669.808	1209.330	5.124
8378	8918.813	885.073	4.983
104	9016.181	1170.154	5.362
8363	9502.104	1123.473	6.280
8367	8739.361	2250.929	6.127
8371	8251.154	1829.243	15.318
8373	9015.249	757.990	4.215
8362	9170.931	1682.595	6.443
8633	8686.881	2230.143	6.789
8643	8077.961	1799.695	10.685
8372	8635.702	1300.771	4.947
SECTION NO. 3738			
4837	8621.089	1276.052	1210.205
4838	8022.133	922.627	1205.588
8648	8210.109	1871.954	31.777
8376	8669.808	1209.330	5.124
8378	8918.813	885.073	4.983
8658	7620.036	1511.570	6.338
8386	8026.489	1012.701	3.726
8388	8184.692	545.508	2.488
316	8150.806	561.742	6.440
310	7730.557	1144.615	3.767

8381	7654.444	1462.083	5.501
8383	8376.294	380.195	2.350
8372	8695.702	1300.771	4.947
8371	8251.154	1870.243	15.313
8643	8077.161	1799.005	16.685
8382	8034.860	932.772	3.437
8373	9015.949	757.930	4.215

SECTION NO. 3839

4838	8082.193	932.627	1205.582
4839	7445.854	580.228	1207.222
8658	7620.036	1511.570	6.338
8386	8026.489	1012.701	3.726
8388	8184.692	545.598	2.488
8668	6981.717	1171.283	13.583
8396	7395.337	545.606	3.547
8398	7637.251	277.037	3.468
310	7730.557	1144.615	3.767
316	8150.806	561.742	6.440
8391	7116.351	1068.260	4.343
8393	7821.508	23.277	2.712
8382	8034.860	932.772	3.437
8381	7654.444	1462.083	5.501
8643	7499.036	1484.336	8.406
8383	8376.294	380.135	2.350
8392	7444.858	533.960	3.100

SECTION NO. 3940

4839	7445.854	580.228	1207.222
4840	6822.202	822.764	1201.700
8668	6981.717	1171.283	13.583
8396	7395.337	545.606	3.547
8398	7637.251	277.037	3.468
8678	6367.184	784.519	23.642
8406	6753.004	415.832	3.816
8408	6945.727	15.745	3.253
8401	6469.411	870.665	18.603
8403	6940.521	-117.434	2.830
8392	7444.858	533.980	3.100
8391	7116.351	1068.260	4.343
8663	6935.381	1074.522	12.142
8393	7821.508	23.277	2.712
8402	6775.244	262.047	3.162

SECTION NO. 4041

4840	6822.202	822.764	1201.700
4841	6180.279	-141.973	1199.732
8678	6367.184	784.519	23.642
8406	6753.006	415.832	3.816
8408	6945.727	15.745	3.253
8688	5791.693	430.203	11.806

8416	6117.459	15.713	7.055
8418	6437.394	-530.977	3.156
8411	5860.336	405.375	9.207
8413	6430.953	-538.568	2.847
8402	6775.244	262.097	3.162
8401	6469.411	820.665	18.603
8673	6340.924	761.810	23.554
8412	6118.024	-50.758	3.117
8403	6840.621	-117.434	2.830

SECTION NO. 4142

4841	6189.279	-141.973	1193.732
4842	5566.867	-515.935	1195.378
8688	5791.699	430.203	11.806
8416	6117.459	15.713	7.055
8418	6437.394	-530.977	3.156
8698	5246.503	77.266	4.633
8426	5593.448	-439.732	5.664
8428	5837.884	-768.616	4.852
312	5859.197	246.527	30.902
512	5315.605	-141.192	3.370
513	5812.165	-767.644	2.907
105	6161.924	-621.231	3.052
8421	5237.094	70.459	4.405
8423	5781.548	-798.032	2.695
8412	6118.024	-50.758	3.117
8411	5860.336	405.375	9.207
8683	5641.117	381.781	10.543
8422	5470.658	-366.665	3.231
8413	6430.953	-538.568	2.847

SECTION NO. 4243

4842	5566.867	-515.935	1195.378
4843	4978.815	-904.659	1192.125
8698	5246.503	77.266	4.633
8426	5593.448	-439.732	5.664
8428	5837.884	-768.616	4.852
8708	4664.921	-346.232	12.839
8436	4940.838	-953.408	14.176
8438	5181.903	-1284.412	2.817
512	5315.605	-141.192	3.370
513	5812.165	-767.644	2.907
8431	4598.272	-417.237	12.749
8433	5191.736	-1297.941	2.437
8422	5470.658	-366.665	3.231
8421	5237.094	70.459	4.405
8693	5091.789	-65.028	5.765
8432	4862.526	-806.904	2.260
8423	5781.548	-798.032	2.695

SECTION NO. 4344

4843	4978.815	-904.659	1192.125
4844	4329.677	-1305.999	1185.260
8708	4664.921	-346.232	12.839
8436	4940.838	-353.408	14.176
8438	5181.903	-1284.412	2.817
8718	3973.094	-686.155	19.157
8446	4268.539	-1156.903	8.460
8448	4697.196	-1698.987	11.609
313	4201.270	-781.415	43.346
8713	3950.006	-827.200	13.623
8443	4616.450	-1719.192	5.130
8432	4862.526	-806.904	2.269
8431	4598.272	-417.237	12.749
8703	4547.050	-460.552	12.389
8442	4308.108	-1242.300	8.633
8433	5191.736	-1297.941	2.437

SECTION NO. 4445

4844	4329.677	-1305.999	1185.260
4845	3727.232	-1690.076	1180.497
8718	3973.094	-686.155	19.157
8446	4268.539	-1156.903	8.460
8448	4697.196	-1698.987	11.609
8728	3334.256	-989.698	8.207
8456	3716.263	-1693.366	39.953
8458	3963.308	-2014.268	28.300
8723	3375.803	-1183.379	7.138
8453	4019.711	-2146.724	6.231
8442	4308.108	-1242.300	8.633
8713	3950.006	-827.200	13.623
8443	4616.450	-1719.192	5.130
8452	3704.778	-1656.074	9.381

SECTION NO. 4546

4845	3727.232	-1690.076	1180.497
4846	3115.110	-2081.042	1181.283
8728	3334.256	-989.698	8.207
8456	3716.263	-1693.366	39.953
8458	3963.308	-2014.268	28.300
8738	2793.140	-1571.083	13.402
8466	3152.495	-2103.483	7.392
8468	3387.215	-2427.576	5.815
317	3279.934	-2415.845	4.887
8461	2751.748	-1522.620	8.144
8463	3404.516	-2598.660	5.371
8452	3704.778	-1656.074	9.381
8723	3375.803	-1183.379	7.138
8733	2864.313	-1693.184	7.942
8462	3062.958	-2000.557	7.672
8453	4019.711	-2146.724	6.231

SECTION NO. 4647

4846	3115.110	-2081.042	1181.283
4847	2527.385	-2459.939	1188.418
8738	2893.140	-1571.083	13.402
8466	3152.495	-2103.483	7.392
8462	3387.215	-2427.576	5.815
8748	2245.652	-1958.132	11.305
8476	2540.299	-2470.757	6.669
8478	2801.039	-2974.547	3.238
317	3279.934	-2415.845	4.887
8471	2181.338	-1900.613	11.693
8473	2843.786	-2959.226	3.406
8462	3062.958	-2000.557	7.972
8461	2751.748	-1528.620	8.144
8743	2241.533	-1959.133	11.354
8472	2515.897	-2430.081	5.749
8463	3404.516	-2598.600	5.371

SECTION NO. 4748

4847	2527.385	-2459.939	1188.418
4848	1945.545	-2832.438	1191.072
8748	2245.652	-1958.132	11.305
8476	2540.299	-2470.757	6.669
8478	2801.039	-2974.547	3.238
8758	1773.129	-2393.888	10.576
8486	1953.834	-2854.806	5.109
8488	2405.139	-3207.500	5.234
315	1753.429	-2337.528	11.257
106	24[illegible].495	-3189.412	5.113
8753	1705.054	-2348.726	9.743
8483	2249.241	-3346.759	8.919
8472	2515.897	-2430.081	5.749
8743	2241.533	-1959.133	11.354
8471	2181.338	-1900.613	11.693
8473	2843.786	-2959.226	3.406
107	2367.005	-3433.633	3.472
8482	1932.784	-2838.663	3.302

* DURBAN TEST AREA *

RESIDUALS AT TIE AND CONTROL POINTS

01/01/1978

ITERATION NO 10

BLOCK ADJUSTMENT USING MODELS

	SECTION CORNERS			SECTION CORNER MEANS			RESIDUALS		
PT NO.	X	Y	Z	X	Y	Z	VX	VY	VZ
				SECTION NO 1211					
4912	3278.625	2706.009	1354.014			1354.014			0.000
4911	2633.760	2191.001	1353.406			1353.430			0.024
101	2637.351	2679.995	137.905	2637.370	2680.050	137.900	0.018	0.054	-0.005
503	3564.005	1869.219	84.948	3563.930	1869.250	84.950	-0.075	0.030	0.001
9114	2222.784	2787.676	137.730	2222.791	2787.657	137.721	0.006	-0.019	-0.008
9118	3086.767	1511.934	71.424	3086.815	1511.867	71.412	0.047	-0.067	-0.012
				SECTION NO 1110					
4911	2633.810	2191.029	1353.454			1353.430			-0.024
9114	2222.797	2787.638	137.712	2222.791	2787.657	137.721	-0.006	0.019	0.008
9118	3086.856	1511.843	71.393	3086.815	1511.867	71.412	-0.041	0.023	0.018
4910	2021.338	1636.099	1347.657			1347.663			0.006
9104	1608.206	2261.854	129.626	1608.223	2261.855	129.608	0.016	0.001	-0.018
9108	2561.818	1130.551	73.575	2561.833	1130.506	73.556	0.014	-0.045	-0.019
301	1810.692	1826.834	117.389	1810.701	1826.829	117.399	0.009	-0.005	0.010
				SECTION NO 1009					
4910	2021.364	1696.078	1347.670			1347.663			-0.006
9104	1608.240	2261.856	129.590	1608.223	2261.855	129.608	-0.016	-0.001	0.018
9108	2561.819	1130.502	73.571	2561.833	1130.506	73.556	0.013	0.003	-0.015
301	1810.711	1826.823	117.410	1810.701	1826.829	117.399	-0.009	0.005	-0.010
4909	1494.150	1284.862	1342.710			1342.689			-0.020
9094	1041.586	1790.628	138.158	1041.613	1790.621	138.161	0.027	-0.007	0.003
9098	1939.734	594.642	118.374	1939.715	594.632	118.414	-0.019	-0.010	0.040
				SECTION NO 908					
4909	1494.173	1284.880	1342.669			1342.689			0.020
9094	1041.640	1790.614	138.164	1041.613	1790.621	138.161	-0.027	0.007	-0.003
9098	1939.727	594.721	118.409	1939.715	594.632	118.414	-0.012	-0.088	0.005
4908	963.932	886.070	1347.490			1347.500			0.010
9084	601.727	1440.221	135.066	601.715	1440.228	135.064	-0.012	0.006	-0.002
9088	1291.176	215.829	99.608	1231.230	215.898	99.607	0.054	0.069	-0.001
				SECTION NO 807					
4908	963.970	886.097	1347.511			1347.500			-0.010
9084	601.702	1440.234	135.061	601.715	1440.228	135.064	0.012	-0.006	0.002
9088	1291.287	215.863	99.599	1231.230	215.898	99.607	-0.056	0.035	0.008
4907	432.704	491.405	1348.589			1348.613			0.023

3078	736.634	-201.776	94.597	736.675	-201.832	94.587	0.041	-0.056	-0.009
102	-30.254	1011.794	126.039	-30.250	1011.820	126.030	0.004	0.025	-0.009

SECTION NO 706

4907	432.728	491.492	1348.636			1348.613			-0.023
3078	736.661	-201.818	94.562	736.675	-201.832	94.587	0.014	-0.014	0.025
102	-30.243	1011.823	126.083	-30.250	1011.820	126.090	-0.006	-0.003	0.006
3068	260.876	-421.802	106.916	260.868	-421.783	106.880	-0.007	0.018	-0.036
4906	-110.918	88.146	1344.023			1344.023			0.000

SECTION NO 9089

4890	7006.715	3547.473	1346.758			1346.758			0.000
4889	6452.084	3105.972	1343.685			1343.688			0.003
303	6627.766	3897.452	44.583	6627.770	3897.470	44.550	0.003	0.017	-0.033
8994	5994.389	3610.411	20.533	5994.395	3610.398	20.555	0.006	-0.013	0.022
8898	6807.627	2569.622	84.786	6807.626	2569.621	84.759	-0.000	-0.001	-0.026
8908	7574.640	2975.637	20.501	7574.635	2975.636	20.523	-0.005	-0.001	0.021

SECTION NO 8988

4889	6452.107	3105.944	1343.691			1343.688			-0.003
8994	5994.402	3610.385	20.577	5994.395	3610.398	20.555	-0.006	0.013	-0.022
8898	6807.659	2569.583	84.741	6807.626	2569.621	84.759	-0.032	0.031	0.018
4888	5900.547	2662.140	1337.470			1337.472			0.001
8884	5472.910	3162.138	32.392	5472.944	3162.145	32.399	0.033	0.007	0.006
8888	6344.659	2123.875	76.972	6344.672	2123.828	76.960	0.012	-0.047	-0.011

SECTION NO 8887

4888	5900.506	2662.136	1337.473			1337.472			-0.001
8884	5472.977	3162.152	32.406	5472.944	3162.145	32.399	-0.033	-0.007	-0.006
8888	6344.687	2123.853	76.956	6344.672	2123.828	76.960	-0.015	-0.025	0.004
4887	5379.850	2208.357	1339.177			1339.202			0.024
8874	4934.013	2624.722	69.528	4934.027	2624.767	69.503	0.013	0.044	-0.025
8878	5623.709	1796.481	85.812	5623.753	1796.478	85.808	0.043	-0.003	-0.004

SECTION NO 8786

4887	5379.881	2208.395	1339.226			1339.202			-0.024
8874	4934.040	2624.812	69.477	4934.027	2624.767	69.503	-0.013	-0.044	0.025
8878	5623.738	1796.474	85.811	5623.753	1796.478	85.808	0.015	0.004	-0.003
4886	4753.192	1756.414	1344.135			1344.170			0.035
8864	4349.129	2292.614	60.273	4349.117	2292.664	60.230	-0.011	0.049	-0.042
8868	4986.208	1259.840	83.772	4986.222	1259.842	83.780	0.013	0.001	0.007

SECTION NO 8685

4886	4753.164	1756.485	1344.205			1344.170			-0.035
8864	4349.106	2292.713	60.187	4349.117	2292.664	60.230	0.011	-0.049	0.042
8868	4986.243	1259.882	83.785	4986.222	1259.842	83.780	-0.021	-0.040	-0.004
4885	4169.156	1303.976	1344.657			1344.646			-0.011
503	3563.998	1869.290	84.974	3563.930	1869.250	84.950	-0.068	0.049	-0.024
508	4375.350	831.506	64.672	4375.430	831.550	64.710	0.079	0.044	0.037

SECTION NO 8584

4885	4169.205	1304.065	1344.635			1344.646			0.011
503	3563.935	1869.228	84.972	3563.930	1869.290	84.950	-0.005	0.021	-0.022

4884	3582.568	866.833	1340.060			1340.036			-0.024
9118	3086.771	1511.852	71.384	3086.815	1511.867	71.412	0.043	0.014	0.028
8848	3885.645	464.428	61.457	3885.679	464.458	61.457	0.034	0.029	0.000
508	4375.443	831.615	64.690	4375.430	831.550	64.710	-0.013	-0.065	0.010

SECTION NO 8483

4884	3582.654	866.869	1340.011			1340.036			0.024
9118	3086.863	1511.897	71.446	3086.815	1511.867	71.412	-0.048	0.029	-0.034
8848	3885.727	464.496	61.451	3885.679	464.458	61.457	-0.047	-0.037	0.006
4883	2388.579	428.929	1343.880			1343.875			-0.005
9108	2561.793	1130.482	73.530	2561.833	1130.506	73.556	0.039	0.023	0.025
8838	3202.072	2.473	73.526	3202.125	2.458	73.509	0.053	-0.014	-0.017

SECTION NO 8382

4883	2388.659	428.936	1343.870			1343.875			0.005
9108	2561.900	1130.488	73.547	2561.833	1130.506	73.556	-0.067	0.017	0.008
8838	3202.136	2.482	73.534	3202.125	2.458	73.509	-0.010	-0.023	-0.025
4882	2396.254	0.540	1343.318			1343.302			-0.015
9098	1939.649	594.604	118.408	1939.715	594.632	118.414	0.065	0.028	0.006
8828	2782.829	-332.701	80.303	2782.842	-332.725	80.334	0.013	-0.023	0.031

SECTION NO 8281

4882	2396.329	0.504	1343.286			1343.302			0.015
9098	1939.748	594.561	118.467	1939.715	594.632	118.414	-0.033	0.070	-0.052
8828	2782.887	-332.736	80.285	2782.842	-332.725	80.334	-0.044	0.010	0.049
4881	1781.353	-423.460	1335.005			1334.998			-0.007
9088	1231.157	215.913	99.541	1231.230	215.898	99.607	0.073	-0.014	0.065
8818	2108.432	-700.944	62.823	2108.440	-701.015	62.759	0.008	-0.071	-0.063

SECTION NO 8180

4881	1781.411	-423.465	1334.990			1334.998			0.007
9088	1231.301	215.988	99.678	1231.230	215.898	99.607	-0.070	-0.089	-0.071
8818	2108.455	-701.000	62.719	2108.440	-701.015	62.759	-0.015	-0.015	0.039
4880	1147.397	-846.425	1341.528			1341.539			0.011
9078	736.743	-201.880	94.560	736.675	-201.832	94.587	-0.068	0.047	0.026
8808	1405.892	-1364.083	50.111	1405.893	-1364.154	50.038	0.000	-0.065	-0.072
306	1075.659	-582.703	160.365	1075.810	-582.560	160.430	0.150	0.143	0.064
8744	1579.746	-900.376	79.831	1579.752	-900.404	79.805	0.006	-0.028	-0.026

SECTION NO 8079

4880	1147.357	-846.476	1341.551			1341.539			-0.011
9078	736.663	-201.856	94.630	736.675	-201.832	94.587	0.012	0.025	-0.042
8808	1405.877	-1364.201	49.841	1405.893	-1364.154	50.038	0.016	0.046	0.197
8798	924.937	-1315.050	87.460	924.933	-1315.076	87.404	-0.004	-0.026	-0.055
4879	465.029	-1305.305	1346.005			1346.005			0.000
9068	260.860	-421.764	106.844	260.868	-421.783	106.880	0.007	-0.018	0.035
511	1246.321	-1413.271	55.933	1246.290	-1413.300	55.750	-0.031	-0.028	-0.183

SECTION NO 6364

4863	8332.813	2793.593	1287.087			1287.087			0.000
4864	7709.631	2442.861	1279.240			1279.213			-0.027
309	8305.122	2134.760	27.175	8304.990	2134.800	27.310	-0.132	0.039	0.134
8638	8765.313	2348.806	16.044	8765.371	2348.824	16.010	0.057	0.017	-0.033
8648	8209.889	1872.059	32.146	8209.931	1872.021	32.086	0.042	-0.037	-0.059

278

8908	7574.605	2975.655	20.523	7574.635	2975.636	20.523	0.030	-0.018	-0.000
				SECTION NO 6465					
4864	7709.670	2442.821	1279.186			1279.213			0.027
8908	7574.660	2975.616	20.544	7574.635	2975.636	20.523	-0.024	0.020	-0.021
8648	8709.927	1872.012	32.084	8709.931	1872.021	32.086	0.004	0.008	0.002
4865	7086.643	2081.304	1277.969			1277.969			0.000
8848	6807.585	2569.623	84.755	6807.626	2569.621	84.759	0.041	-0.002	0.003
8658	7620.017	1511.685	6.464	7619.996	1511.662	6.463	-0.021	-0.022	-0.001
				SECTION NO 6566					
4865	7086.669	2081.320	1277.970			1277.969			-0.000
8890	6807.635	2569.649	84.755	6807.626	2569.621	84.759	-0.008	-0.027	0.004
8658	7620.014	1511.680	6.453	7619.996	1511.662	6.463	-0.018	-0.017	0.009
4866	6468.829	1685.417	1276.987			1277.015			0.028
8888	6344.689	2123.779	76.969	6344.672	2122.828	76.960	-0.016	0.048	-0.009
8668	6981.613	1171.403	13.414	6981.657	1171.408	13.407	0.044	0.004	-0.007
				SECTION NO 6667					
4866	6468.843	1685.419	1277.043			1277.015			-0.028
8888	6344.653	2123.804	76.944	6344.672	2123.828	76.960	0.019	0.023	0.016
8668	6981.714	1171.412	13.387	6981.657	1171.408	13.407	-0.057	-0.004	0.019
4867	5877.577	1292.706	1275.251			1275.239			-0.012
8878	5623.761	1796.473	85.782	5623.753	1796.478	85.808	-0.008	0.004	0.025
8678	6366.979	784.679	23.343	6367.027	784.666	23.348	0.047	-0.013	0.005
				SECTION NO 6768					
4867	5877.625	1292.723	1275.226			1275.239			0.012
8878	5623.804	1796.484	85.825	5623.753	1796.478	85.808	-0.050	-0.006	-0.017
8678	6367.030	784.706	23.327	6367.027	784.666	23.348	-0.002	-0.039	0.021
4868	5279.598	900.123	1262.956			1262.951			-0.004
8868	4986.203	1259.798	83.747	4986.222	1259.842	83.780	0.018	0.043	0.032
8688	5791.536	430.219	11.499	5791.572	430.230	11.473	0.036	0.011	-0.026
				SECTION NO 6869					
4868	5279.614	900.160	1262.946			1262.951			0.004
8868	4986.233	1259.847	83.816	4986.222	1259.842	83.780	-0.010	-0.005	-0.035
8688	5791.533	430.237	11.397	5791.572	430.230	11.473	0.038	-0.006	0.075
4869	4707.119	516.116	1267.293			1267.271			-0.021
8698	5246.674	77.151	4.523	5246.599	77.237	4.569	-0.074	0.085	0.046
508	4375.434	831.560	64.637	4375.430	831.550	64.710	-0.004	-0.010	0.072
312	5259.106	246.639	30.908	5259.160	246.580	30.770	0.053	-0.059	-0.138
				SECTION NO 6970					
4869	4707.132	516.135	1267.249			1267.271			0.021
8698	5246.657	77.247	4.597	5246.599	77.237	4.569	-0.058	-0.010	-0.027
4870	4132.647	117.945	1265.089			1265.106			0.016
8848	3885.649	464.424	61.487	3885.679	464.458	61.457	0.030	0.034	-0.029
8708	4664.857	-346.084	12.844	4664.920	-346.127	12.847	0.062	-0.042	0.002
508	4375.462	831.578	64.704	4375.430	831.550	64.710	-0.032	0.021	0.005
				SECTION NO 7071					
4870	4132.681	117.967	1265.172			1265.106			-0.016

8248	3885.836	464.485	61.474	3885.879	464.458	61.457	-0.016	-0.026	0.032
8708	4664.888	-346.132	12.859	4664.920	-346.127	12.847	0.031	0.004	-0.012
4871	3566.820	-268.689	1267.340			1267.314			-0.025
8838	3202.121	2.443	73.508	3202.125	2.458	73.509	0.003	0.015	0.000
8718	3973.190	-686.014	19.276	3973.175	-686.002	19.302	-0.015	0.011	0.025

SECTION NO 7172

4871	3566.850	-268.682	1267.288			1267.314			0.025
8838	3202.172	2.435	73.467	3202.125	2.458	73.509	-0.046	0.023	0.041
8718	3973.198	-685.983	19.358	3973.175	-686.002	19.302	-0.023	-0.018	-0.056
4872	3003.980	-654.460	1274.905			1274.929			0.024
8828	2782.802	-332.748	80.419	2782.842	-332.725	80.334	0.040	0.022	-0.084
8728	3334.267	-989.434	8.178	3334.304	-989.456	8.210	0.037	-0.022	0.032

SECTION NO 7273

4872	3004.044	-654.443	1274.953			1274.929			-0.024
8828	2782.852	-332.715	80.330	2782.842	-332.725	80.334	-0.009	-0.010	0.004
8728	3334.349	-989.433	8.209	3334.304	-989.456	8.210	-0.045	-0.022	0.001
4873	2461.138	-1049.035	1274.138			1274.177			0.039
8818	2108.445	-701.062	62.788	2108.440	-701.015	62.759	-0.004	0.046	-0.028
8738	2893.059	-1570.876	13.472	2893.130	-1570.887	13.458	0.071	-0.011	-0.013

SECTION NO 7374

4873	2461.195	-1049.026	1274.216			1274.177			-0.039
8818	2108.429	-701.055	62.706	2108.440	-701.015	62.759	0.011	0.039	0.052
8738	2893.216	-1570.876	13.465	2893.130	-1570.887	13.458	-0.085	-0.011	-0.007
4874	1900.914	-1452.273	1266.265			1266.288			0.023
8744	1579.750	-900.414	79.862	1579.752	-900.404	79.805	0.001	0.009	-0.056
8748	2245.533	-1957.979	11.214	2245.617	-1958.020	11.225	0.083	-0.040	0.010

SECTION NO 7475

4874	1901.018	-1452.305	1266.311			1266.288			-0.023
8744	1579.759	-900.423	79.722	1579.752	-900.404	79.805	-0.007	0.018	0.082
8748	2245.691	-1958.027	11.228	2245.617	-1958.020	11.225	-0.073	0.007	-0.002
315	1759.412	-2337.462	11.217	1759.470	-2337.510	11.270	0.057	-0.047	0.052
4875	1350.429	-1839.073	1269.626			1269.626			0.000
8798	924.928	-1315.103	87.349	924.933	-1315.076	87.404	0.004	0.026	0.055
8808	1405.909	-1364.173	50.162	1405.893	-1364.154	50.038	-0.016	0.018	-0.124
511	1246.249	-1413.269	55.826	1246.290	-1413.300	55.750	0.040	-0.030	-0.076

SECTION NO [illegible]

4836	9193.864	1637.090	1228.574			1228.574			0.000
4837	8621.029	1276.083	1210.304			1210.296			-0.008
104	9016.184	1170.234	5.407	9016.230	1170.180	5.350	0.045	-0.054	-0.057
8378	8918.844	885.104	4.873	8918.823	885.126	4.932	-0.021	0.022	0.058
8638	8765.428	2348.842	15.977	8765.371	2348.824	16.010	-0.057	-0.017	0.033
8648	8709.902	1871.969	32.092	8709.931	1872.021	32.086	0.029	0.051	-0.005

SECTION NO 3738

4837	8621.045	1276.141	1210.288			1210.296			0.008
8648	8710.007	1872.043	32.022	8709.931	1872.021	32.086	-0.075	-0.022	0.063
8378	8918.801	885.148	4.991	8918.823	885.126	4.932	0.021	-0.022	-0.058
4838	8022.141	972.670	1205.619			1205.645			0.026
8658	7619.951	1511.610	6.531	7619.996	1511.662	6.463	0.045	0.052	-0.068

8388	8184.663	545.556	2.450	8184.686	545.553	2.488	0.002	-0.002	0.038

SECTION NO 3839

4838	8082.160	922.608	1205.671			1205.645			-0.026
8678	7620.001	1511.676	6.403	7620.00[illegible]	1511.662	6.463	-0.005	-0.017	0.059
8388	8184.693	545.551	2.526	8184.686	545.553	2.488	-0.002	0.002	-0.038
4839	7445.791	520.307	1207.125			1207.151			0.026
8668	6981.663	1171.389	13.458	6981.657	1171.408	13.407	-0.006	0.019	-0.051
8398	7637.178	277.098	3.3	7637.187	277.101	3.366	0.008	0.002	0.022

SECTION NO 3940

4839	7445.795	520.324	1207.177			1207.151			-0.026
8668	6981.638	1171.426	13.368	6981.657	1171.408	13.407	0.019	-0.018	0.038
8398	7637.196	277.103	3.389	7637.187	277.101	3.366	-0.008	-0.002	-0.022
4840	6822.092	222.858	1201.605			1201.610			0.004
8678	6367.068	784.654	23.383	6367.027	784.666	23.348	-0.041	0.012	-0.034
8408	6945.615	15.823	3.109	6945.644	15.847	3.126	0.028	0.024	0.016

SECTION NO 4041

4840	6822.1[illegible]	222.889	1201.615			1201.610			-0.004
8678	6367.030	784.626	23.341	6367.027	784.666	23.348	-0.002	0.040	0.007
8408	6945.672	15.871	3.142	6945.644	15.847	3.126	-0.028	-0.024	-0.016
4841	6183.205	-141.918	1199.611			1199.592			-0.018
8688	5791.561	430.[illegible]	11.477	5791.572	430.230	11.473	0.010	-0.011	-0.003
8418	6437.361	-530.317	3.052	6437.383	-530.311	3.057	0.021	0.006	0.005

SECTION NO 4142

4841	6183.263	-141.918	1199.573			1199.592			0.018
8688	5791.658	430.223	11.518	5791.572	430.230	11.473	-0.085	0.006	-0.045
8418	6437.405	-530.304	3.063	6437.383	-530.311	3.057	-0.021	-0.006	-0.005
4842	5566.888	-515.912	1195.434			1195.414			-0.020
8698	5246.404	77.259	4.542	5246.509	77.237	4.569	0.104	-0.022	0.026
513	5812.197	-767.603	2.986	5812.175	-767.621	2.964	-0.022	-0.017	-0.022
105	6161.943	-621.233	3.030	6161.990	-621.250	3.050	0.046	-0.016	0.019
312	5959.179	246.518	0.758	5959.160	246.580	30.770	-0.019	0.061	0.011

SECTION NO 4243

4842	5566.860	515.916	1195.393			1195.414			0.020
8698	5246.571	77.289	4.613	5246.509	77.237	4.569	0.038	-0.052	-0.045
513	5812.153	-767.638	2.941	5812.175	-767.621	2.964	0.022	0.017	0.022
4843	4[illegible]8.816	-904.573	1192.1[illegible]			1192.123			-0.005
8708	4[illegible]4.976	-346.149	12.815	4664.920	-346.127	12.847	-0.054	0.021	0.031
8438	51[illegible]1.069	1284.344	2.843	5181.075	-1284.327	2.822	0.006	0.017	-0.021

SECTION NO 4344

4843	4918.812	[illegible]04.552	11[illegible].118			1192.123			0.005
8708	4664.959	[illegible].143	12.868	4664.920	-346.127	12.84	-0.039	0.015	-0.021
8438	5121.881	-12[illegible].310	[illegible].801	5181.875	-1284.327	2.822	-0.006	0.017	0.021
4844	4329.683	-1[illegible].756	1185.343			1185.343			0.000
8718	3973.137	[illegible]	15.288	3973.175	-686.002	15.302	0.037	0.017	0.013
8448	4697.178	-10[illegible]	11.[illegible]	4697.189	-1698.860	11.664	0.010	-0.006	-0.001

SECTION NO 4445

4544	4323.700	-1305.859	1185.344			1185.343			-0.000
8718	3973.174	-685.991	19.285	3973.175	-686.002	19.302	0.000	-0.011	0.017
8448	4697.190	-1698.867	11.663	4697.180	-1698.860	11.664	-0.010	0.006	0.001
4845	3727.235	-1680.898	1180.476			1180.491			0.015
8728	3334.307	-989.480	8.240	3334.304	-989.456	8.210	-0.002	0.023	-0.029
8458	3963.295	-2014.106	28.244	3963.316	-2014.111	28.241	0.020	-0.004	-0.003

SECTION NO 4546

4845	3727.258	-1680.904	1180.506			1180.491			-0.015
8728	3334.293	-989.478	8.215	3334.304	-989.456	8.210	0.010	0.021	-0.004
8458	3963.336	-2014.115	28.238	3963.316	-2014.111	28.241	-0.020	0.004	0.003
4846	3115.092	-2080.878	1181.344			1181.332			-0.012
8738	2893.121	-1570.876	13.445	2893.130	-1570.887	13.458	0.008	-0.011	0.012
8468	3387.211	-2427.438	5.800	3387.228	-2427.440	5.811	0.017	-0.001	0.011

SECTION NO 4647

4846	3115.115	-2080.302	1181.319			1181.332			0.012
8738	2893.124	-1570.920	13.449	2893.130	-1570.887	13.458	0.006	0.033	0.008
8468	3387.245	-2427.441	5.822	3387.228	-2427.440	5.811	-0.017	0.001	-0.011
4847	2527.364	-2459.845	1188.331			1188.308			-0.022
8748	2245.593	-1958.002	11.221	2245.617	-1958.020	11.225	0.024	-0.017	0.004
8478	2801.069	-2974.478	3.099	2801.073	-2974.489	3.113	0.003	-0.011	0.014

SECTION NO 4748

4847	2527.396	-2459.890	1188.286			1188.308			0.022
8748	2245.650	-1958.070	11.237	2245.617	-1958.020	11.225	-0.033	0.050	-0.011
8478	2801.076	-2974.500	3.127	2801.073	-2974.489	3.113	-0.003	0.011	-0.014
106	2409.535	-3189.394	5.061	2409.510	-3189.430	5.060	-0.025	-0.035	-0.001
315	1759.400	-2337.484	11.267	1759.470	-2337.510	11.270	0.069	-0.025	0.002
4848	1945.540	-2832.425	1191.029			1191.029			0.000

SIGMA X/Y TIE = 0.041 SIGMA Z TIE = 0.045 SIGMA X/Y CONTROL = 0.056 SIGMA Z CONTROL = 0.057

BLOCK ADJUSTMENT USING MODELS

* DURBAN TEST AREA *

RESIDUALS AT CHECK POINTS

01/01/1978

PT. NO.	MODEL COORDINATES X	Y	Z	TERRAIN COORDINATES X	Y	Z	RESIDUALS VX	VY	VZ
301	1810.700	1826.927	117.396	1810.650	1827.020	117.830	0.050	-0.192	-0.433
302	534.713	1239.532	146.373	534.710	1239.700	146.480	0.003	-0.167	-0.106
307B	736.675	-201.833	94.588	736.590	-201.920	94.560	0.085	0.086	0.028
103	-39.980	1015.452	125.868	-39.950	1015.440	125.870	-0.030	0.012	-0.001
504	717.677	-127.779	30.838	717.610	-127.860	30.940	0.067	0.080	-0.101
501	6242.6C	3870.289	13.822	6242.720	3870.320	13.960	-0.112	-0.030	-0.137
502	5929.514	3654.959	25.252	5929.530	3654.990	25.300	-0.015	-0.030	-0.047
505	7027.307	2819.601	76.436	7027.350	2819.630	76.470	-0.042	-0.028	-0.033
506	6773.582	2560.144	85.535	6773.710	2560.170	85.580	-0.127	-0.025	-0.044
307	6936.897	3270.619	65.850	6936.920	3270.680	65.620	-0.022	-0.060	0.230
303	6703.524	2316.700	95.152	6703.540	2316.640	95.070	-0.015	0.060	0.082
507	5466.402	1673.225	102.519	5466.460	1673.320	102.310	-0.057	-0.094	0.209
508	4375.422	831.552	64.679	4375.430	831.550	64.710	-0.007	0.002	-0.030
304	3740.153	1221.843	168.691	3740.270	1221.970	168.559	-0.116	-0.126	0.132
509	3211.784	6.462	73.116	3211.850	6.530	73.200	-0.065	-0.067	-0.083
305	1863.344	252.821	152.846	1863.350	252.980	153.010	-0.005	-0.158	-0.163
510	1911.782	-810.729	68.940	1911.660	-810.780	68.720	0.122	0.050	0.220
511	1246.285	-1413.271	55.873	1246.290	-1413.300	55.750	-0.004	0.028	0.123
311	5982.348	695.734	19.413	5982.360	695.670	19.180	-0.011	0.064	0.233
312	5259.143	246.579	30.831	5259.160	246.580	30.770	-0.016	-0.000	0.061
313	4201.303	-781.239	43.366	4201.270	-781.390	43.460	0.033	0.150	-0.093
314	2454.400	-1317.365	8.850	2454.260	-1317.390	8.750	0.140	0.024	0.100
316	8150.767	561.791	6.437	8150.770	561.670	6.390	-0.002	0.121	0.047
310	7730.506	1144.684	3.841	7730.480	1144.610	3.870	0.026	0.074	-0.028
512	5315.632	-141.178	3.348	5315.640	-141.180	3.330	-0.007	0.001	0.018
513	5812.176	-767.620	2.966	5812.190	-767.690	2.940	-0.013	0.069	0.026
317	3279.946	-2415.708	4.884	3279.860	-2415.880	4.920	0.086	0.171	-0.035

SIGMA X/Y = 0.081 SIGMA Z = 0.143

APPENDIX D

OUTPUT FROM THE ITC BLOCK OF SYNTHETIC STRIPS

** ITC TEST BLOCK **

BLOCK ADJUSTMENT *USING STRIPS*

RESIDUALS AT TIE AND CONTROL POINTS   ITERATION 05

*	11021	3999.441	79998.656	1001.684	4000.000	80000.000	1000.000	-0.558	-1.343	1.684
*	1221	3999.507	72001.426	1001.228	4000.000	72000.000	1000.000	-0.492	1.426	1.228
*	12211	80001.528	72000.598	1001.256	80000.000	72000.000	1000.000	1.528	0.598	1.256
*	201	75999.275	79997.922	1002.128	76000.000	80000.000	1000.000	-0.724	-2.077	2.128
*	11051	15998.988	79997.575	998.873	16000.000	80000.000	1000.000	-1.011	-2.424	-1.126
*	1251	16000.330	71998.703	997.871	16000.000	72000.000	1000.000	0.330	-1.296	-2.128
*	151	55999.139	79997.672	997.308	56000.000	80000.000	1000.000	-0.860	-2.327	-2.691
*	12151	55998.236	72000.471	998.943	56000.000	72000.000	1000.000	-1.764	0.471	-1.056
	1212	-0.664	72003.304	999.896	-2.382	72000.668	1000.839	1.718	2.636	-0.942
	1222	3999.089	72002.111	1002.052	3999.231	72000.388	1001.726	-0.141	1.723	0.326
	1232	7998.415	71999.668	1001.352	7999.924	71999.997	1003.929	-1.509	-0.328	-2.576
	1242	11998.429	71998.615	1000.554	12000.028	71999.281	1003.328	-1.598	-0.666	-2.773
	1262	20001.744	71997.878	998.002	20002.529	71999.674	1000.247	-0.784	-1.796	-2.245
	1272	24002.077	71999.365	1002.087	24001.563	71998.719	1001.372	0.514	0.645	0.715
	1282	28002.052	71998.290	1001.771	28000.671	71998.811	995.476	1.[illegible]81	-0.521	6.294
	12102	36004.814	72000.218	1000.786	36001.635	71997.357	999.242	3.179	2.860	1.544
	12112	40001.983	72003.642	1004.088	39998.919	71997.902	996.108	3.064	5.740	7.980
	12132	48001.828	72002.601	999.883	47999.530	71997.741	996.912	2.298	4.859	2.970
	12152	55998.213	72000.742	999.554	55997.723	72000.318	999.685	0.490	0.423	-0.130
	12162	59998.195	71998.274	997.566	60000.357	72000.260	1000.980	-2.162	-1.986	-3.413
	12182	68000.626	71995.949	995.514	68002.295	71999.432	1002.012	-1.669	-3.482	-6.498
	12202	76001.408	71999.160	999.605	76001.271	71997.657	1000.643	0.136	1.503	-1.037
	12212	80001.870	72000.817	1000.899	79999.683	71998.481	999.705	2.186	2.336	1.194
*	1221	3998.745	72000.527	1001.760	4000.000	72000.000	1000.000	-1.254	0.527	1.760
*	2311	-0.209	64000.279	997.826	0.000	64000.000	1000.000	-0.209	0.279	-2.173
*	12211	79999.592	71997.529	1000.062	80000.000	72000.000	1000.000	-0.407	-2.470	0.062
*	23211	80001.227	64001.142	998.350	80000.000	64000.000	1000.000	1.227	1.142	-1.649
*	1251	16000.192	72000.805	999.033	16000.000	72000.000	1000.000	0.192	0.805	-0.966
*	12151	55997.499	72000.473	999.359	56000.000	72000.000	1000.000	-2.500	0.473	-0.640
*	22151	55999.157	67999.908	1000.973	56000.000	68000.000	1000.000	-0.842	-0.091	0.973
*	23151	56000.310	63999.825	1000.977	56000.000	64000.000	1000.000	0.310	-0.174	0.977
	2312	-0.292	64000.349	998.407	-0.544	64000.244	1001.518	0.252	0.105	-3.111
	2322	4000.330	64000.434	1000.562	4001.241	64000.232	998.639	-0.911	0.201	1.923
	2342	12001.609	64000.178	1000.278	12002.316	63997.943	1001.605	-0.707	2.234	-1.326
	2362	20001.669	64001.024	1000.761	19997.232	63997.507	999.141	4.437	3.517	1.619
	2382	28002.081	63999.473	999.695	27999.102	64000.824	992.364	2.978	-1.351	7.231
	23102	36002.521	63999.137	995.397	35999.381	63999.994	994.867	3.139	-0.856	0.530
	23122	44001.250	64000.102	1000.331	44001.469	63997.403	999.045	-0.218	2.699	1.285
	23142	51998.593	64000.201	998.348	52002.970	63997.602	1000.545	-4.376	2.599	-2.197
	23162	60001.681	64001.017	1003.492	59999.112	63998.185	1004.509	2.568	2.831	-1.017
	23182	68002.745	64001.574	1001.466	67995.657	64001.271	1000.471	7.088	0.303	0.995
	23202	76001.279	64001.024	999.336	76000.743	64001.065	999.939	0.536	-0.040	-0.603
	23212	80000.616	64000.991	998.494	80001.331	64000.274	999.105	-0.714	0.716	-0.611
*	2311	-0.318	64001.006	1000.447	0.000	64000.000	1000.000	-0.318	1.006	0.447
*	3411	-1.273	55999.080	997.527	0.000	56000.000	1000.000	-1.273	-0.919	-2.472
*	23211	80000.983	64000.076	998.602	80000.000	64000.000	1000.000	0.983	0.076	-1.397
*	34201	76000.362	55999.314	1000.285	76000.000	56000.000	1000.000	0.362	-0.685	0.285
*	3351	16000.509	60000.023	1002.077	16000.000	60000.000	1000.000	0.509	0.023	2.077
*	3451	16000.491	56001.512	999.842	16000.000	56000.000	1000.000	0.491	1.512	-0.157

*	33151	56002.005	60000.164	1003.199	56000.000	60000.000	1000.000	2.005	0.164	3.199
*	34151	56003.340	56001.315	1000.878	56000.000	56000.000	1000.000	3.340	1.315	0.878
	23182	67995.657	64001.271	1000.471	68002.694	64001.600	1001.128	-7.037	-0.329	-0.656
	23202	76000.743	64001.065	999.939	76001.233	64001.030	998.957	-0.490	-0.025	0.982
	23212	80001.331	64000.274	999.105	80000.577	64001.081	998.095	0.753	-0.806	1.010
	3422	4002.191	55999.445	1000.222	3999.977	55999.314	999.633	2.213	0.131	0.589
	3442	12001.425	56002.340	1003.187	11998.303	55999.547	997.783	3.122	2.792	5.404
	3462	19999.036	56001.455	998.123	19999.991	56001.095	996.699	-0.954	0.360	1.424
	3482	28000.116	56000.694	995.360	27998.849	56001.200	997.286	1.267	-0.505	-1.925
	34102	35999.224	56000.557	995.749	36002.874	56000.103	997.474	-3.649	0.454	-1.725
	34122	44001.259	55999.505	997.336	44003.558	55998.074	1002.635	-2.298	1.430	-5.299
	34142	52003.524	55998.125	995.788	51999.266	55997.038	1001.641	4.258	1.087	-5.852
	34162	60000.470	56000.805	1000.839	59996.944	55998.084	995.376	3.526	2.721	5.462
	34182	67997.216	56001.389	1002.836	67997.691	55999.288	995.985	-0.475	2.100	6.850
	34202	76000.162	55999.075	1000.067	76000.233	56000.104	999.296	-0.071	-1.029	0.771
	34212	80001.798	55998.860	997.256	80000.095	55999.272	1005.296	1.702	-0.411	-8.040
*	3411	0.967	55999.281	1000.717	0.000	56000.000	1000.000	0.967	-0.718	0.717
*	4521	3999.680	48000.170	999.719	4000.000	48000.000	1000.000	-0.319	0.170	-0.280
*	34201	75999.795	56000.314	996.978	76000.000	56000.000	1000.000	-0.204	0.314	-1.021
*	4521	3999.680	48000.170	999.719	4000.000	48000.000	1000.000	-0.319	0.170	-0.280
*	4451	15999.389	51999.839	1000.613	16000.000	52000.000	1000.000	-0.610	-0.100	0.613
*	4551	16000.022	48000.427	1000.370	16000.000	48000.000	1000.000	0.022	0.427	0.370
*	44151	55997.323	51998.649	1000.327	56000.000	52000.000	1000.000	-2.676	-1.350	0.327
*	45151	55999.272	48000.551	1000.435	56000.000	48000.000	1000.000	-0.727	0.551	0.435
	4522	3999.655	48000.425	999.684	3999.598	47999.464	999.844	0.056	0.960	-0.159
	4532	8000.456	48001.856	1001.573	8000.089	47998.565	1000.269	0.366	3.290	1.304
	4552	15999.743	48000.042	1000.259	15999.095	48000.587	998.279	0.647	-0.545	1.980
	4572	24001.767	48002.384	1000.394	24000.513	48001.589	1001.083	1.254	0.795	-0.689
	4592	32000.480	47999.715	1000.924	31999.233	48001.315	1004.324	1.246	-1.599	-3.399
	45112	40004.634	48000.112	1004.040	40001.524	47999.629	1003.331	3.109	0.483	0.708
	45132	48002.370	48000.763	1001.982	48001.168	47999.324	999.320	1.201	1.438	2.661
	45152	55999.621	48000.662	1000.363	55999.484	47998.171	1002.123	0.136	2.490	-1.759
	45172	63997.050	47998.986	996.210	63999.751	47997.319	1003.678	-2.700	1.666	-7.468
	45192	72001.232	48001.181	1001.295	71997.681	48000.424	999.390	3.550	0.756	1.905
	45212	80002.162	47999.553	1001.698	80001.425	48000.249	999.549	0.736	-0.695	2.148
*	4521	3999.689	47999.275	999.669	4000.000	48000.000	1000.000	-0.310	-0.724	-0.330
*	5611	-1.281	40001.568	1001.045	0.000	40000.000	1000.000	-1.281	1.568	1.045
*	45211	80001.559	48000.490	998.831	80000.000	48000.000	1000.000	1.559	0.490	-1.168
*	56211	79998.629	39999.748	1002.804	80000.000	40000.000	1000.000	-1.370	-0.251	2.804
*	5551	16000.534	44000.247	1000.458	16000.000	44000.000	1000.000	0.534	0.247	0.458
*	5651	16001.383	39999.683	999.878	16000.000	40000.000	1000.000	1.383	-0.316	-0.121
*	55151	55999.610	43999.587	999.770	56000.000	44000.000	1000.000	-0.389	-0.412	-0.229
*	56151	56000.128	39999.845	996.978	56000.000	40000.000	1000.000	0.128	-0.154	-3.021
	5622	3998.353	40000.422	1000.109	3999.310	39998.431	999.644	-0.957	1.991	0.465
	5632	7998.723	39997.571	996.801	7999.060	39999.042	1001.048	-0.336	-1.470	-4.247
	5652	16001.904	39999.793	999.589	15997.817	40000.195	998.914	4.087	-0.402	0.674
	5672	24000.131	40002.106	1003.390	23999.590	39999.844	1000.002	0.541	2.262	3.388
	5692	31999.317	40002.884	999.976	31998.567	39999.216	999.044	0.750	3.668	0.931
	56112	40000.538	40000.804	998.355	40002.089	40000.552	997.863	-1.550	0.252	0.491
	56132	48002.292	39998.644	998.141	47999.530	39999.750	997.798	2.761	-1.105	0.343
	56152	56000.473	40000.583	997.081	56001.069	39998.865	997.840	-0.596	1.718	-0.758
	56172	64000.282	40000.052	996.094	63998.308	39999.137	996.624	1.974	0.914	-0.530
	56192	72000.083	39999.020	995.361	71997.452	39999.184	1000.542	2.631	-0.163	-5.180
	56212	79999.102	39999.558	1002.158	79999.306	39999.072	999.377	-0.203	0.485	2.781
*	5611	-1.379	39998.892	999.450	0.000	40000.000	1000.000	-1.379	-1.107	-0.549

*	6711	-0.031	32001.566	1000.742	0.000	32000.000	1000.000	-0.031	1.566	0.742
*	56211	79999.998	39999.224	999.233	80000.000	40000.000	1000.000	-0.001	-0.775	-0.766
*	67211	80000.635	32000.003	1000.797	80000.000	32000.000	1000.000	0.635	0.003	0.797
*	6651	15999.491	35999.040	1000.846	16000.000	36000.000	1000.000	-0.508	-0.959	0.846
*	6751	16001.291	31998.755	997.706	16000.000	32000.000	1000.000	1.291	-1.244	-2.293
*	66151	56000.577	35999.017	1000.143	56000.000	36000.000	1000.000	0.577	-0.982	0.143
*	67151	56000.230	31999.563	999.433	56000.000	32000.000	1000.000	0.230	-0.436	-0.566
	6722	3998.697	32000.452	997.931	3997.985	31998.847	999.203	0.712	1.605	-1.272
	6742	12000.757	32000.346	998.544	12001.800	31998.677	997.493	-1.043	1.669	1.051
	6762	20001.364	32001.368	1000.891	19999.204	31997.156	999.821	2.160	4.212	1.070
	6782	27999.413	32001.250	999.954	27999.426	31999.694	996.196	-0.012	1.556	3.757
	67102	36001.068	31998.978	994.910	35998.533	32000.206	998.081	2.535	-1.228	-3.170
	67122	44000.676	32002.939	1002.008	43999.231	32000.557	1002.535	1.445	2.381	-0.526
	67142	51999.439	32000.443	999.902	52000.267	31998.459	999.550	-0.827	1.983	0.352
	67162	60000.525	32001.006	1001.583	59998.601	31998.707	998.464	1.923	2.298	3.118
	67182	67998.288	32000.954	1002.460	67999.801	31999.156	1001.424	-1.512	1.798	1.035
	67202	75999.963	31999.048	998.630	76000.294	31999.354	1002.689	-0.330	-0.306	-4.059
	67212	80000.988	32000.025	1000.369	79998.563	31999.974	1000.075	2.424	0.050	0.294
*	6711	-1.430	31999.109	1000.225	0.000	32000.000	1000.000	-1.430	-0.890	0.225
*	7811	0.459	24002.111	1000.689	0.000	24000.000	1000.000	0.459	2.111	0.689
*	67211	79998.475	32000.194	999.715	80000.000	32000.000	1000.000	-1.524	0.194	-0.284
*	78211	80002.181	23999.720	997.767	80000.000	24000.000	1000.000	2.181	-0.279	-2.232
*	7751	16000.378	27999.002	1001.646	16000.000	28000.000	1000.000	0.378	-0.997	1.646
*	7851	15999.933	24000.106	999.256	16000.000	24000.000	1000.000	-0.066	0.106	-0.743
*	77151	56000.105	28000.498	1000.121	56000.000	28000.000	1000.000	0.105	0.498	0.121
*	78151	56000.566	24000.472	1002.206	56000.000	24000.000	1000.000	0.566	0.472	2.206
	7822	3999.344	24002.408	1000.751	4000.311	23999.782	999.119	-0.967	2.625	1.631
	7842	12001.603	24000.608	999.689	12002.551	23999.626	1001.735	-0.947	0.982	-2.045
	7862	20001.334	23999.320	997.398	20000.830	23998.655	999.940	0.503	0.664	-2.542
	7882	27999.832	23999.638	997.215	27996.710	23999.729	999.607	3.122	-0.091	-2.391
	78102	35999.999	24002.276	1004.761	35996.709	23998.063	1004.477	3.290	4.212	0.284
	78122	43999.135	24002.024	1003.113	43998.409	23998.497	1004.601	0.726	3.527	-1.488
	78142	52000.269	24000.684	1003.308	51999.878	23998.932	1004.509	0.391	1.751	-1.200
	78162	59999.387	24002.254	1005.956	60000.971	24000.064	999.824	-1.583	2.189	6.131
	78202	76000.469	23999.742	1001.969	75998.819	24001.932	998.222	1.650	-2.190	3.747
	78212	80001.745	23999.392	996.915	80001.796	23999.480	1000.642	-0.051	-0.087	-3.727
*	7811	-3.113	23999.982	998.635	0.000	24000.000	1000.000	-3.113	-0.017	-1.364
*	8921	4000.491	15999.089	1000.819	4000.000	16000.000	1000.000	0.491	-0.910	0.819
*	78211	80002.318	23999.522	1000.357	80000.000	24000.000	1000.000	2.318	-0.477	0.357
*	89211	79998.257	15999.629	1000.698	80000.000	16000.000	1000.000	-1.742	-0.370	0.698
*	8851	16002.082	19999.906	999.481	16000.000	20000.000	1000.000	2.082	-0.093	-0.518
*	8951	16002.111	16000.728	998.057	16000.000	16000.000	1000.000	2.111	0.728	-1.942
*	88151	56001.675	19999.327	1000.930	56000.000	20000.000	1000.000	1.675	-0.672	0.930
*	89151	56001.944	15999.766	999.173	56000.000	16000.000	1000.000	1.944	-0.233	-0.826
	8922	4000.907	15999.175	1000.639	4004.648	15998.630	1000.867	-3.741	0.544	-0.228
	8932	8002.159	16000.132	999.655	7999.639	15993.286	997.870	2.520	6.845	1.784
	8952	16002.567	16000.859	997.843	15998.016	15999.086	998.064	4.551	1.773	-0.220
	8972	23998.648	16002.820	999.741	23999.324	16001.855	998.575	-0.675	0.965	1.166
	8992	31996.845	16001.353	1001.979	32001.091	16001.635	999.462	-4.245	-0.282	2.516
	89112	39997.997	15998.549	998.751	40003.941	15999.632	1001.045	-5.944	-1.082	-2.294
	89132	48000.721	16000.540	1000.768	48001.022	15998.020	1000.609	-0.300	2.519	0.159
	89152	56001.855	15999.821	999.143	55997.968	15998.869	998.933	3.886	0.951	0.150
	89172	64000.534	16003.181	998.587	63997.946	15998.047	1000.820	2.587	5.134	-2.233
	89192	71996.922	16001.448	998.230	72000.961	16001.139	996.943	-4.038	0.309	1.287
*	8921	4003.570	15998.431	1000.401	4000.000	16000.000	1000.000	3.570	-1.568	0.401

* 91021	3995.046	8002.090	999.337	4000.000	8000.000	1000.000	-4.953	2.090	-0.662
* 59211	79999.695	15998.389	999.569	80000.000	16000.000	1000.000	-0.304	-1.610	-0.430
* 910211	80001.661	8001.354	998.049	80000.000	8000.000	1000.000	1.661	1.354	-1.950
* 9951	15999.797	12000.326	1001.551	16000.000	12000.000	1000.000	-0.202	0.326	1.551
* 91051	16001.552	8001.748	1000.803	16000.000	8000.000	1000.000	1.552	1.748	0.803
* 59151	55998.302	12000.045	1000.596	56000.000	12000.000	1000.000	-1.697	0.045	0.596
* 910151	55998.885	8001.564	1000.696	56000.000	8000.000	1000.000	-1.114	1.564	0.696
91022	3994.630	8001.645	999.342	3998.055	8000.100	999.895	-3.364	1.545	-0.552
91032	7998.532	7995.662	999.902	7999.297	7999.971	997.137	-0.764	-4.309	2.765
91052	16001.552	8002.022	1000.913	15999.634	8000.867	998.580	1.918	1.154	2.333
91072	23998.909	8004.449	1002.440	23998.184	7999.695	1004.519	0.725	4.754	-2.079
91092	31999.182	8001.106	998.513	32000.797	8000.208	1005.104	-1.614	0.898	-6.590
910112	40001.193	8002.152	1003.479	40001.234	8000.461	1005.628	-0.101	1.691	-2.148
910132	48000.310	8001.213	1001.340	48000.789	7999.611	1004.392	-0.478	1.602	-3.05[illegible]
910152	55999.297	8001.280	1000.404	55998.221	7999.023	1000.385	1.075	2.256	0.019
910172	64000.250	8001.336	1001.303	63999.473	8001.928	992.931	0.777	-0.591	8.371
910192	72002.182	7997.981	997.664	72003.311	8000.908	994.394	-1.129	-2.926	3.270
910212	80002.270	8001.234	998.334	80001.738	7997.533	1000.598	0.531	3.701	-2.264
* 91021	3997.815	8000.155	999.820	4000.000	8000.000	1000.000	-2.184	0.155	-0.179
* 101121	4001.187	-1.144	1000.768	4000.000	0.000	1000.000	1.187	-1.144	0.768
* 910211	80001.477	7997.533	1000.596	80000.000	8000.000	1000.000	1.477	-2.466	0.596
* 11215	80000.680	3.281	1002.318	80000.000	0.000	1000.000	0.680	3.281	2.318
* 91051	15999.617	8001.703	997.900	16000.000	8000.000	1000.000	-0.382	1.703	-2.099
* 10155	55998.060	4000.887	1001.661	56000.000	4000.000	1000.000	-1.939	0.887	1.661
* 11165	59999.626	0.848	996.080	60000.000	0.000	1000.000	-0.373	0.848	-3.919
* 91061	20000.322	8001.623	1000.890	20000.000	8000.000	1000.000	0.322	1.623	0.890

SIGMA O PLAN = 1.656 SIGMA O HEIGHT = 2.203

(* CONTROL POINT)

** ITC TEST BLOCK **

BLOCK ADJUSTMENT USING STRIPS

RESIDUALS AT CHECK POINTS

MODEL NO 10102

PT NO	X	Y	Z	X1	Y1	Z1	VX	VY	VZ
11011	1.105	80000.823	998.900	0.000	80000.000	1000.000	-1.105	-0.823	1.099
1111	0.855	76003.071	1000.292	0.000	76000.000	1000.000	-0.855	-3.071	-0.292
1211	-0.571	72003.874	999.386	0.000	72000.000	1000.000	0.571	-3.874	0.613
11021	3999.441	79998.656	1001.684	4000.000	80000.000	1000.000	0.558	1.343	-1.684
1121	3999.318	76000.840	1002.065	4000.000	76000.000	1000.000	0.681	-0.840	-2.065
1221	3999.507	72001.426	1001.228	4000.000	72000.000	1000.000	0.492	-1.426	-1.228

STD ERRS FOR THE MODEL SIG X = 0.812 M SIG Y = 2.436 M SIG Z = 1.434 SIG PLAN = 2.568 SIG POS = 2.941

MODEL NO 10203

PT NO	X	Y	Z	X1	Y1	Z1	VX	VY	VZ
11021	3999.441	79998.656	1001.684	4000.000	80000.000	1000.000	0.558	1.343	-1.684
1121	3999.318	76000.840	1002.065	4000.000	76000.000	1000.000	0.681	-0.840	-2.065
1221	3999.507	72001.426	1001.228	4000.000	72000.000	1000.000	0.492	-1.426	-1.228
11031	7999.900	79998.193	999.770	8000.000	80000.000	1000.000	0.099	1.806	0.229
1131	7999.203	75999.141	1001.562	8000.000	76000.000	1000.000	0.796	0.858	-1.562
1231	7998.197	71999.568	1000.922	8000.000	72000.000	1000.000	1.802	0.431	-0.922

STD ERRS FOR THE MODEL SIG X = 0.991 M SIG Y = 1.321 M SIG Z = 1.546 SIG PLAN = 1.652 SIG POS = 2.262

MODEL NO 10304

PT NO	X	Y	Z	X1	Y1	Z1	VX	VY	VZ
11031	7999.900	79998.193	999.770	8000.000	80000.000	1000.000	0.099	1.806	0.229
1131	7999.203	75999.141	1001.562	8000.000	76000.000	1000.000	0.796	0.858	-1.562
1231	7998.197	71999.568	1000.922	8000.000	72000.000	1000.000	1.802	0.431	-0.922
11041	11999.153	79996.562	1002.610	12000.000	80000.000	1000.000	0.846	3.437	-2.610
1141	11998.771	75998.924	1001.189	12000.000	76000.000	1000.000	1.228	1.075	-1.189
1241	11998.121	71998.920	1000.299	12000.000	72000.000	1000.000	1.878	1.079	-0.299

STD ERRS FOR THE MODEL SIG X = 1.389 M SIG Y = 1.914 M SIG Z = 1.527 SIG PLAN = 2.365 SIG POS = 2.815

MODEL NO 10405

PT NO	X	Y	Z	X1	Y1	Z1	VX	VY	VZ
11041	11999.153	79996.562	1002.610	12000.000	80000.000	1000.000	0.846	3.437	-2.610
1141	11998.771	75998.924	1001.189	12000.000	76000.000	1000.000	1.228	1.075	-1.189
1241	11998.121	71998.920	1000.299	12000.000	72000.000	1000.000	1.878	1.079	-0.299
11051	15998.988	79997.575	998.873	16000.000	80000.000	1000.000	1.011	2.424	1.126
1151	15999.176	75999.080	999.928	16000.000	76000.000	1000.000	0.823	0.919	0.071
1251	16000.330	71998.703	997.871	16000.000	72000.000	1000.000	-0.330	1.296	2.128

STD ERRS FOR THE MODEL SIG X = 1.230 M SIG Y = 2.1[illegible] M SIG Z = 1.680 SIG PLAN = 2.453 SIG POS = 2.974

MODEL NO 10506

11051	15998.988	79997.575	998.873	16000.000	80000.000	1000.000	1.011	2.424	1.126
1151	15999.176	75999.080	999.928	16000.000	76000.000	1000.000	0.823	0.919	0:071
1251	16000.330	71998.703	997.871	16000.000	72000.000	1000.000	-0.330	1.296	2.128
11061	19999.232	79999.462	993.881	20000.000	80000.000	1000.000	0.767	0.537	6.118
1161	20000.412	75998.505	996.447	20000.000	76000.000	1000.000	-0.412	1.494	3.552
1261	20001.745	71997.592	997.747	20000.000	72000.000	1000.000	-1.745	2.407	2.252

STD ERRS FOR THE MODEL SIG X = 1.059 M SIG Y = 1.828 M SIG Z = 3.490 SIG PLAN = 2.113 SIG POS = 4.080

MODEL NO 10607

11061	19999.232	79999.462	993.881	20000.000	80000.000	1000.000	0.767	0.537	6.118
1161	20000.412	75998.505	996.447	20000.000	76000.000	1000.000	-0.412	1.494	3.552
1261	20001.745	71997.592	997.747	20000.000	72000.000	1000.000	-1.745	2.407	2.252
11071	24000.681	79997.604	995.233	24000.000	80000.000	1000.000	-0.681	2.396	4.766
1171	24001.601	75998.254	999.576	24000.000	76000.000	1000.000	-1.601	1.745	0.423
1271	24001.968	71998.534	1001.621	24000.000	72000.000	1000.000	-1.968	1.465	-1.621

STD ERRS FOR THE MODEL SIG X = 1.463 M SIG Y = 1.962 M SIG Z = 4.016 SIG PLAN = 2.448 SIG POS = 4.703

MODEL NO 10708

11071	24000.681	79997.604	995.233	24000.000	80000.000	1000.000	-0.681	2.396	4.766
1171	24001.601	75998.254	999.576	24000.000	76000.000	1000.000	-1.601	1.745	0.423
1271	24001.968	71998.534	1001.621	24000.000	72000.000	1000.000	-1.968	1.465	-1.621
11081	28000.461	79997.060	995.865	28000.000	80000.000	1000.000	-0.461	2.939	4.134
1181	28001.542	75998.251	999.376	28000.000	76000.000	1000.000	-1.542	1.748	0.623
1281	28002.356	71998.474	1002.132	28000.000	72000.000	1000.000	-2.356	1.525	-2.132

STD ERRS FOR THE MODEL SIG X = 1.734 M SIG Y = 2.234 M SIG Z = 3.083 SIG PLAN = 2.828 SIG POS = 4.184

MODEL NO 10809

11081	28000.461	79997.060	995.865	28000.000	80000.000	1000.000	-0.461	2.939	4.134
1181	28001.542	75998.251	999.376	28000.000	76000.000	1000.000	-1.542	1.748	0.623
1281	28002.356	71998.474	1002.132	28000.000	72000.000	1000.000	-2.356	1.525	-2.132
11091	32001.253	79998.683	996.936	32000.000	80000.000	1000.000	-1.253	1.316	3.063
1191	32001.239	76000.305	1000.365	32000.000	76000.000	1000.000	-1.239	-0.305	-0.365
1291	32002.255	71999.838	1000.317	32000.000	72000.000	1000.000	-2.255	0.161	-0.317

STD ERRS FOR THE MODEL SIG X = 1.807 M SIG Y = 1.781 M SIG Z = 2.515 SIG PLAN = 2.533 SIG POS = 3.573

MODEL NO 10910

11091	32001.253	79998.683	996.936	32000.000	80000.000	1000.000	-1.253	1.316	3.063
1191	32001.239	76000.305	1000.365	32000.000	76000.000	1000.000	-1.233	-0.305	-0.365
1291	32002.255	71999.838	1000.317	32000.000	72000.000	1000.000	-2.255	0.161	-0.317
101	36000.014	79999.419	996.206	36000.000	80000.000	1000.000	-0.014	0.580	3.793
11101	36002.933	76000.139	999.771	36000.000	76000.000	1000.000	-2.933	-0.139	0.228
12101	36004.420	72000.423	1000.820	36000.000	72000.000	1000.000	-4.420	-0.423	-0.820

STD ERRS FOR THE MODEL SIG X = 2.695 M SIG Y = 0.691 M SIG Z = 2.223 SIG PLAN = 2.783 SIG POS = 3.562

MODEL NO 11011

101	36000.014	79999.419	996.206	36000.000	80000.000	1000.000	-0.014	0.580	3.793
11101	36002.933	76000.139	999.771	36000.000	76000.000	1000.000	-2.933	-0.139	0.228
12101	36004.420	72000.423	1000.820	36000.000	72000.000	1000.000	-4.420	-0.423	-0.820
111	40000.923	79998.213	993.804	40000.000	80000.000	1000.000	-0.923	1.787	6.195
11111	40001.430	76000.264	1001.134	40000.000	76000.000	1000.000	-1.430	-0.264	-1.134
12111	40001.788	72003.738	1004.087	40000.000	72000.000	1000.000	-1.788	-3.738	-4.087

STD ERRS FOR THE MODEL SIG X = 2.616 M SIG Y = 1.885 M SIG Z = 3.781 SIG PLAN = 3.225 SIG POS = 4.970

MODEL NO 11112

111	40000.923	79998.213	993.804	40000.000	80000.000	1000.000	-0.923	1.787	6.195
11111	40001.430	76000.264	1001.134	40000.000	76000.000	1000.000	-1.430	-0.264	-1.134
12111	40001.788	72003.738	1004.087	40000.000	72000.000	1000.000	-1.788	-3.738	-4.087
121	44000.898	80000.733	990.188	44000.000	80000.000	1000.000	-0.898	-0.733	9.811
11121	44002.505	76001.115	992.147	44000.000	76000.000	1000.000	-2.505	-1.115	7.852
12121	44001.190	72001.928	996.589	44000.000	72000.000	1000.000	-1.190	-1.928	3.410

STD ERRS FOR THE MODEL SIG X = 1.708 M SIG Y = 2.132 M SIG Z = 6.722 SIG PLAN = 2.732 SIG POS = 7.256

MODEL NO 11213

121	44000.898	80000.733	990.188	44000.000	80000.000	1000.000	-0.898	-0.733	9.811
11121	44002.505	76001.115	992.147	44000.000	76000.000	1000.000	-2.505	-1.115	7.852
12121	44001.190	72001.928	996.589	44000.000	72000.000	1000.000	-1.190	-1.928	3.410
131	48001.312	79998.296	993.370	48000.000	80000.000	1000.000	-1.312	1.703	6.629
11131	48001.574	76000.574	997.310	48000.000	76000.000	1000.000	-1.574	-0.574	2.683
12131	48001.284	72002.816	999.665	48000.000	72000.000	1000.000	-1.284	-2.816	0.334

STD ERRS FOR THE MODEL SIG X = 1.694 M SIG Y = 1.825 M SIG Z = 6.645 SIG PLAN = 2.490 SIG POS = 7.097

MODEL NO 11314

131	48001.312	79998.296	993.370	48000.000	80000.000	1000.000	-1.312	1.703	6.629
11131	48001.574	76000.574	997.310	48000.000	76000.000	1000.000	-1.574	-0.574	2.689
12131	48001.284	72002.816	999.665	48000.000	72000.000	1000.000	-1.284	-2.816	0.334
241	52000.556	79998.861	994.842	52000.000	80000.000	1000.000	-0.556	1.138	5.157
11141	52000.422	75999.948	998.320	52000.000	76000.000	1000.000	-0.422	0.051	1.679
12141	51999.931	72002.302	1000.075	52000.000	72000.000	1000.000	0.068	-2.302	-0.075

STD ERRS FOR THE MODEL SIG X = 1.126 M SIG Y = 1.885 M SIG Z = 4.017 SIG PLAN = 2.196 SIG POS = 4.578

MODEL NO 11415

141	52000.556	79998.861	994.842	52000.000	80000.000	1000.000	-0.556	1.138	5.157
11141	52000.422	75999.948	998.320	52000.000	76000.000	1000.000	-0.422	0.051	1.679
12141	51999.931	72002.302	1000.075	52000.000	72000.000	1000.000	0.068	-2.302	-0.075
151	55999.139	79997.672	997.308	56000.000	80000.000	1000.000	0.860	2.327	2.691
11151	55998.514	75998.912	999.634	56000.000	76000.000	1000.000	1.485	1.087	0.365
12151	55998.235	72000.471	998.943	56000.000	72000.000	1000.000	1.764	-0.471	1.056

STD ERRS FOR THE MODEL SIG X = 1.144 M SIG Y = 1.638 M SIG Z = 2.753 SIG PLAN = 1.998 SIG POS = 3.402

MODEL NO 11516

151	55999.139	79997.672	997.308	56000.000	80000.000	1000.000	0.860	2.327	2.691
11151	55998.514	75998.912	999.634	56000.000	76000.000	1000.000	1.485	1.087	0.365
12151	55998.235	72000.471	998.943	56000.000	72000.000	1000.000	1.764	-0.471	1.056
161	59998.069	79997.027	997.105	60000.000	80000.000	1000.000	1.930	2.972	2.894
11161	59998.653	75997.903	997.928	60000.000	76000.000	1000.000	1.346	2.096	2.071
12161	59997.890	71998.445	997.500	60000.000	72000.000	1000.000	2.103	1.554	2.499

STD ERRS FOR THE MODEL SIG X = 1.791 M SIG Y = 2.119 M SIG Z = 2.341 SIG PLAN = 2.775 SIG POS = 3.631

MODEL NO 11617

161	59998.069	79997.027	997.105	60000.000	80000.000	1000.000	1.930	2.972	2.894
11161	59998.653	75997.903	997.928	60000.000	76000.000	1000.000	1.346	2.096	2.071
12161	59997.890	71998.445	997.500	60000.000	72000.000	1000.000	2.109	1.554	2.499
171	63998.812	79996.707	997.041	64000.000	80000.000	1000.000	1.187	3.292	2.958
11171	63998.904	75997.520	998.183	64000.000	76000.000	1000.000	1.095	2.479	1.816
12171	63998.982	71997.486	998.357	64000.000	72000.000	1000.000	1.017	2.513	1.642

STD ERRS FOR THE MODEL SIG X = 1.651 M SIG Y = 2.791 M SIG Z = 2.594 SIG PLAN = 3.243 SIG POS = 4.153

MODEL NO 11718

171	63998.812	79996.707	997.041	64000.000	80000.000	1000.000	1.187	3.292	2.958
11171	63998.904	75997.520	998.183	64000.000	76000.000	1000.000	1.095	2.479	1.816
12171	63998.982	71997.486	998.357	64000.000	72000.000	1000.000	1.017	2.513	1.642
181	68000.536	79997.214	997.941	68000.000	80000.000	1000.000	-0.536	2.785	2.058
11181	68000.559	75997.266	998.473	68000.000	76000.000	1000.000	-0.559	2.733	1.526
12181	68000.340	71996.329	995.623	68000.000	72000.000	1000.000	-0.340	3.670	4.376

STD ERRS FOR THE MODEL SIG X = 0.934 M SIG Y = 3.225 M SIG Z = 2.845 SIG PLAN = 3.357 SIG POS = 4.400

MODEL NO 11819

181	68000.536	79997.214	997.941	68000.000	80000.000	1000.000	-0.536	2.785	2.058
11181	68000.559	75997.266	998.473	68000.000	76000.000	1000.000	-0.559	2.733	1.526
12181	68000.340	71996.329	995.623	68000.000	72000.000	1000.000	-0.340	3.670	4.376
191	72000.424	79994.277	1003.338	72000.000	80000.000	1000.000	-0.424	5.722	-3.338
11191	72000.718	75997.522	1002.831	72000.000	76000.000	1000.000	-0.718	2.477	-2.831
12191	72002.030	71998.984	1001.201	72000.000	72000.000	1000.000	-2.030	1.015	-1.201

STD ERRS FOR THE MODEL SIG X = 1.052 M SIG Y = 3.704 M SIG Z = 3.044 SIG PLAN = 3.851 SIG POS = 4.909

MODEL NO 11920

191	72000.424	79994.277	1003.338	72000.000	80000.000	1000.000	-0.424	5.722	-3.338
11191	72000.718	75997.522	1002.831	72000.000	76000.000	1000.000	-0.718	2.477	-2.831
12191	72002.030	71998.984	1001.201	72000.000	72000.000	1000.000	-2.030	1.015	-1.201
201	75999.275	79997.922	1002.128	76000.000	80000.000	1000.000	0.724	2.077	-2.128
11201	76000.901	75998.515	1002.612	76000.000	76000.000	1000.000	-0.901	1.484	-2.612
12201	76000.907	71998.986	999.862	76000.000	72000.000	1000.000	-0.907	1.013	0.137

STD ERRS FOR THE MODEL SIG X = 1.181 M SIG Y = 3.081 M SIG Z = 2.529 SIG PLAN = 3.300 SIG POS = 4.157

MODEL NO 12021

201	75999.275	79997.922	1002.128	76000.000	80000.000	1000.000	0.724	2.077	-2.128
11201	76000.901	75998.515	1002.612	76000.000	76000.000	1000.000	-0.901	1.484	-2.612
12201	76000.907	71998.986	999.862	76000.000	72000.000	1000.000	-0.907	1.013	0.137
211	79998.063	79998.001	1006.122	80000.000	80000.000	1000.000	1.936	1.998	-6.122
11211	79999.263	76000.974	1004.086	80000.000	76000.000	1000.000	0.716	-0.974	-4.086
12211	80001.528	72000.598	1001.256	80000.000	72000.000	1000.000	-1.528	-0.598	-1.256

STD ERRS FOR THE MODEL SIG X = 1.323 M SIG Y = 1.603 M SIG Z = 3.664 SIG PLAN = 2.079 SIG POS = 4.213

STD ERRS FOR THE STRIP SIG X = 1.422 M SIG Y = 2.027 M SIG Z = 3.145 SIG PLAN = 2.476 SIG POS = 4.003

MODEL NO 20102

1211	-2.079	72000.298	1000.328	0.000	72000.000	1000.000	2.079	-0.298	-0.328
2211	-1.384	67999.045	998.511	0.000	68000.000	1000.000	1.384	0.954	1.488
2311	-0.209	64000.279	997.826	0.000	64000.000	1000.000	0.209	-0.279	2.173
1221	3998.745	72000.527	1001.760	4000.000	72000.000	1000.000	1.254	-0.527	-1.760
2221	4000.284	67999.816	1001.987	4000.000	68000.000	1000.000	-0.284	0.183	-1.987
2321	4000.380	64000.974	1000.563	4000.000	64000.000	1000.000	-0.380	-0.974	-0.563

STD ERRS FOR THE MODEL SIG X = 1.271 M SIG Y = 0.684 M SIG Z = 1.697 SIG PLAN = 1.444 SIG POS = 2.228

MODEL NO 20203

1221	3998.745	72000.527	1001.760	4000.000	72000.000	1000.000	1.254	-0.527	-1.760
2221	4000.284	67999.816	1001.987	4000.000	68000.000	1000.000	-0.284	0.183	-1.987
2321	4000.380	64000.974	1000.563	4000.000	64000.000	1000.000	-0.380	-0.974	-0.563
1231	7999.905	72000.137	1003.789	8000.000	72000.000	1000.000	0.094	-0.137	-3.789
2231	8000.762	68000.263	1002.912	8000.000	68000.000	1000.000	-0.762	-0.263	-2.912
2331	8000.536	64000.144	999.953	8000.000	64000.000	1000.000	-0.536	-0.144	0.046

STD ERRS FOR THE MODEL SIG X = 0.731 M SIG Y = 0.523 M SIG Z = 2.458 SIG PLAN = 0.899 SIG POS = 2.617

MODEL NO 20304

1231	7999.905	72000.137	1003.789	8000.000	72000.000	1000.000	0.094	-0.137	-3.789
2231	8000.762	68000.263	1002.912	8000.000	68000.000	1000.000	-0.762	-0.263	-2.912
2331	8000.536	64000.144	999.953	8000.000	64000.000	1000.000	-0.536	-0.144	0.046
1241	11999.812	71999.311	1002.682	12000.000	72000.000	1000.000	0.187	0.688	-2.682
2241	12001.567	67999.948	1002.417	12000.000	68000.000	1000.000	-1.567	0.051	-2.417
2341	12000.908	63999.867	1000.387	12000.000	64000.000	1000.000	-0.908	0.132	-0.387

STD ERRS FOR THE MODEL SIG X = 0.916 M SIG Y = 0.347 M SIG Z = 2.684 SIG PLAN = 0.979 SIG POS = 2.857

MODEL NO 20405

1241	11999.812	71999.311	1002.682	12000.000	72000.000	1000.000	0.187	0.688	-2.682
2241	12001.567	67999.948	1002.417	12000.000	68000.000	1000.000	-1.567	0.051	-2.417
2341	12000.908	63999.867	1000.387	12000.000	64000.000	1000.000	-0.908	0.132	-0.387
1251	16000.192	72000.805	999.033	16000.000	72000.000	1000.000	-0.192	-0.805	0.966
2251	16001.955	67999.968	1001.024	16000.000	68000.000	1000.000	-1.955	0.031	-1.024
2351	16002.068	64000.171	1000.939	16000.000	64000.000	1000.000	-2.068	-0.171	-0.939

STD ERRS FOR THE MODEL SIG X = 1.513 M SIG Y = 0.484 M SIG Z = 1.791 SIG PLAN = 1.589 SIG POS = 2.395

MODEL NO 20506

1251	16000.192	72000.805	999.033	16000.000	72000.000	1000.000	-0.192	-0.805	0.966
2251	16001.955	67999.968	1001.024	16000.000	68000.000	1000.000	-1.955	0.031	-1.024
2351	16002.068	64000.171	1000.939	16000.000	64000.000	1000.000	-2.068	-0.171	-0.939
1261	20002.549	71999.834	1000.102	20000.000	72000.000	1000.000	-2.549	0.165	-0.102
2261	20001.737	67999.649	1000.862	20000.000	68000.000	1000.000	-1.737	0.350	-0.862
2361	20001.845	64000.989	1000.722	20000.000	64000.000	1000.000	-1.845	-0.989	-0.722

STD ERRS FOR THE MODEL SIG X = 2.052 M SIG Y = 0.601 M SIG Z = 0.910 SIG PLAN = 2.138 SIG POS = 2.324

MODEL NO 20607

1261	20002.549	71999.834	1000.102	20000.000	72000.000	1000.000	-2.549	0.165	-0.102
2261	20001.737	67999.649	1000.862	20000.000	68000.000	1000.000	-1.737	0.350	-0.862
2361	20001.845	64000.989	1000.722	20000.000	64000.000	1000.000	-1.845	-0.989	-0.722
1271	24001.669	71998.729	1001.087	24000.000	72000.000	1000.000	-1.669	1.270	-1.087
2271	24001.540	68000.246	1001.377	24000.000	68000.000	1000.000	-1.540	-0.246	-1.377
2371	24001.830	64000.256	999.331	24000.000	64000.000	1000.000	-1.830	-0.256	0.668

STD ERRS FOR THE MODEL SIG X = 2.070 M SIG Y = 0.757 M SIG Z = 0.980 SIG PLAN = 2.204 SIG POS = 2.412

MODEL NO 20708

1271	24001.669	71998.729	1001.087	24000.000	72000.000	1000.000	-1.669	1.270	-1.087
2271	24001.540	68000.246	1001.377	24000.000	68000.000	1000.000	-1.540	-0.246	-1.377
2371	24001.830	64000.256	999.331	24000.000	64000.000	1000.000	-1.830	-0.256	0.668
1281	28000.347	71998.786	995.185	28000.000	72000.000	1000.000	-0.347	1.213	4.814
2281	28001.704	67998.692	999.507	28000.000	68000.000	1000.000	-1.704	1.307	0.492
2381	28001.777	63999.788	1000.129	28000.000	64000.000	1000.000	-1.777	0.211	-0.129

STD ERRS FOR THE MODEL SIG X = 1.714 M SIG Y = 0.996 M SIG Z = 2.322 SIG PLAN = 1.983 SIG POS = 3.053

MODEL NO 20809

1281	28000.347	71998.786	995.185	28000.000	72000.000	1000.000	-0.347	1.213	4.814
2281	28001.704	67998.692	999.507	28000.000	68000.000	1000.000	-1.704	1.307	0.492
2381	28001.777	63999.788	1000.129	28000.000	64000.000	1000.000	-1.777	0.211	-0.129
1291	32003.043	71999.669	995.077	32000.000	72000.000	1000.000	-3.043	0.330	4.923
2291	32002.404	67998.446	998.582	32000.000	68000.000	[illegible]0.000	-2.404	1.553	1.417
2391	32001.028	63999.215	998.774	32000.000	64000.000	[illegible].000.000	-1.028	0.784	1.225

STD ERRS FOR THE MODEL SIG X = 2.111 M SIG Y = 1.128 M SIG Z = 3.199 SIG PLAN = 2.393 SIG POS = 3.996

MODEL NO 20910

1291	32003.043	71999.669	995.077	32000.000	72000.000	1000.000	-3.043	0.330	4.923
2291	32002.404	67998.446	998.582	32000.000	68000.000	1[illegible]0.000	-2.404	1.553	1.417
2391	32001.028	63999.215	998.774	32000.000	64000.000	[illegible]0.000	-1.028	0.784	1.225
12101	36001.813	71997.032	999.817	36000.000	72000.000	[illegible]0.000	-1.813	2.967	0.182
22101	36001.990	67999.381	999.579	36000.000	68000.000	[illegible]0.000	-1.990	0.618	0.420
23101	36002.167	63999.301	996.010	36000.000	64000.000	[illegible]0.000	-2.167	0.698	3.989

STD ERRS FOR THE MODEL SIG X = 2.368 M SIG Y = 1.600 M SIG Z = [illegible] SIG PLAN = 2.858 SIG POS = 4.116

MODEL NO 21011

12101	36001.813	71997.032	999.817	36000.000	72000.000	1000.000	-1.813	2.967	0.182
22101	36001.990	67599.381	999.579	36000.000	68000.000	1000.000	-1.990	0.618	0.420
23101	36002.167	63999.301	996.010	36000.000	64000.000	1000.000	-2.167	0.698	3.989
12111	39999.051	71997.782	996.719	40000.000	72000.000	1000.000	0.948	2.217	3.280
22111	40000.853	67998 170	998.498	40000.000	68000.000	1000.000	-0.853	1.829	1.501
23111	40002.399	63999.574	998.451	40000.000	64000.000	1000.000	-2.399	0.425	1.548

STD ERRS FOR THE MODEL SIG X = 1.966 M SIG Y = 1.903 M SIG Z = 2.511 SIG PLAN = 2.737 SIG POS = 3.714

MODEL NO 21112

12111	39999.051	71997.782	996.719	40000.000	72000.000	1000.000	0.948	2.217	3.280
22111	40000.853	67998.170	998.498	40000.000	68000.000	1000.000	-0.853	1.829	1.501
23111	40002.399	63999.574	998.451	40000.000	64000.000	1000.000	-2.399	0.425	1.548
12121	44000.584	71998.864	992.357	44000.000	72000.000	1000.000	-0.584	1.135	7.642
22121	44000.965	67998.196	998.571	44000.000	68000.000	1000.000	-0.965	1.803	1.428
23121	44001.905	63998.942	999.787	44000.000	64000.000	1000.000	-1.905	1.057	0.212

STD ERRS FOR THE MODEL SIG X = 1.567 M SIG Y = 1.679 M SIG Z = 3.896 SIG PLAN = 2.297 SIG POS = 4.523

MODEL NO 21213

12121	44000.584	71998.864	992.357	44000.000	72000.000	1000.000	-0.584	1.135	7.642
22121	44000.965	67998.196	998.571	44000.000	68000.000	1000.000	-0.965	1.803	1.428
23121	44001.905	63998.942	999.787	44000.000	64000.000	1000.000	-1.905	1.057	0.212
12131	47999.357	71997.661	996.440	48000.000	72000.000	1000.000	0.642	2.338	3.559
22131	47998.952	67999.110	999.877	48000.000	68000.000	1000.000	1.047	0.889	0.122
23131	47999.307	64001.369	999.974	48000.000	64000.000	1000.000	0.692	-1.369	0.025

STD ERRS FOR THE MODEL SIG X = 1.174 M SIG Y = 1.661 M SIG Z = 3.825 SIG PLAN = 2.034 SIG POS = 4.332

MODEL NO 21314

12131	47999.357	71997.661	996.440	48000.000	72000.000	1000.000	0.642	2.338	3.559
22131	47998.952	67999.110	999.877	48000.000	68000.000	1000.000	1.047	0.889	0.122
23131	47999.307	64001.369	999.974	48000.000	64000.000	1000.000	0.692	-1.369	0.025
12141	51997.430	71998.739	999.165	52000.000	72000.000	1000.000	2.569	1.260	0.835
22141	51997.925	67999.948	999.558	52000.000	68000.000	1000.000	2.074	0.051	0.441
23141	51998.967	63999.845	998.089	52000.000	64000.000	1000.000	1.033	0.154	1.910

STD ERRS FOR THE MODEL SIG X = 1.670 M SIG Y = 1.396 M SIG Z = 1.856 SIG PLAN = 2.177 SIG POS = 2.861

MODEL NO 21415

12141	51997.430	71998.739	999.165	52000.000	72000.000	1000.000	2.569	1.260	0.835
22141	51997.925	67999.948	999.558	52000.000	68000.000	1000.000	2.074	0.051	0.441
23141	51998.967	63999.845	998.089	52000.000	64000.000	1000.000	1.033	0.154	1.910
12151	55997.499	72000.473	999.360	56000.000	72000.000	1000.000	2.500	-0.473	0.640
22151	55999.157	67999.908	1000.973	56000.000	68000.000	1000.000	0.842	0.091	-0.973
23151	56000.310	63999.825	1000.977	56000.000	64000.000	1000.000	-0.310	0.174	-0.977

STD ERRS FOR THE MODEL SIG X = 1.950 M SIG Y = 0.612 M SIG Z = 1.170 SIG PLAN = 2.044 SIG POS = 2.356

MODEL NO 21516

12151	55937.493	72000.473	999.359	56000.000	72000.000	1000.000	2.500	-0.473	0.640
22151	55999.157	67999.908	1000.973	56000.000	68000.000	1000.000	0.842	0.091	-0.973
23151	56000.310	63999.825	1000.977	56000.000	64000.000	1000.000	-0.310	0.174	-0.977
12161	60000.579	72000.141	1000.731	60000.000	72000.000	1000.000	-0.579	-0.141	-0.731
22161	60000.730	68000.155	1003.903	60000.000	68000.000	1000.000	-0.730	-0.155	-3.903
23161	60001.529	64000.646	1003.711	60000.000	64000.000	1000.000	-1.529	-0.646	-3.711

STD ERRS FOR THE MODEL SIG X = 1.432 M SIG Y = 0.380 M SIG Z = 2.524 SIG PLAN = 1.482 SIG POS = 2.927

MODEL NO 21617

12161	60000.579	72000.141	1000.731	60000.000	72000.000	1000.000	-0.579	-0.141	-0.731
22161	60000.730	68000.155	1003.903	60000.000	68000.000	1000.000	-0.730	-0.155	-3.903
23161	60001.529	64000.646	1003.711	60000.000	64000.000	1000.000	-1.529	-0.646	-3.711
12171	64002.214	71999.536	1002.416	64000.000	72000.000	1000.000	-2.214	0.463	-2.416
22171	64002.340	67999.896	1004.313	64000.000	68000.000	1000.000	-2.340	0.103	-4.313
23171	64001.719	64000.747	1003.517	64000.000	64000.000	1000.000	-1.719	-0.747	-3.517

STD ERRS FOR THE MODEL SIG X = 1.819 M SIG Y = 0.499 M SIG Z = 3.643 SIG PLAN = 1.886 SIG POS = 4.102

MODEL NO 21718

12171	64002.214	71999.536	1002.416	64000.000	72000.000	1000.000	-2.214	0.463	-2.416
22171	64002.340	67999.896	1004.313	64000.000	68000.000	1000.000	-2.340	0.103	-4.313
23171	64001.719	64000.747	1003.517	64000.000	64000.000	1000.000	-1.719	-0.747	-3.517
12181	68003.447	71999.172	1002.006	68000.000	72000.000	1000.000	-3.447	0.827	-2.006
22181	68002.438	68000.444	1002.260	68000.000	68000.000	1000.000	-2.438	-0.444	-2.260
23181	68002.550	64001.574	1001.610	68000.000	64000.000	1000.000	-2.550	-1.574	-1.610

STD ERRS FOR THE MODEL SIG X = 2.744 M SIG Y = 0.310 M SIG Z = 3.116 SIG PLAN = 2.891 SIG POS = 4.251

MODEL NO 21819

12181	68003.447	71999.172	1002.006	68000.000	72000.000	1000.000	-3.447	0.827	-2.006
22181	68002.438	68000.444	1002.260	68000.000	68000.000	1000.000	-2.438	-0.444	-2.260
23181	68002.550	64001.574	1001.610	68000.000	64000. 0	1000.000	-2.550	-1.574	-1.610
12191	72001.686	71999.129	1001.354	72000.000	720[illegible].00	1000.000	-1.686	0.870	-1.354
22191	72002.072	68000.370	1001.710	72000.000	680[illegible].000	1000.000	-2.072	-0.370	-1.710
23191	72002.523	64001.300	1001.024	72000.000	64000.000	1000.000	-2.523	-1.300	-1.024

STD ER[illegible] FOR THE MODEL SIG X = 2.751 M SIG Y = 1.090 M SIG Z = 1.872 SIG PLAN = 2.959 SIG POS = 3.501

MODEL NO 21920

12191	72001.686	71999.129	1001.354	72000.000	72000.000	1000.000	-1.686	0.870	-1.354
22191	72002.072	68000.370	1001.710	72000.000	68000.000	1000.000	-2.072	-0.370	-1.710
23191	72002.523	64001.300	1001.024	72000.000	64000.000	1000.000	-2.523	-1.300	-1.024
12201	76001.788	71997.817	1000.463	76000.000	72000.000	1000.000	-1.788	2.182	-0.463
22201	76000.933	67999.337	1001.479	76000.000	68000.000	1000.000	-0.933	0.662	-1.479
23201	76001.415	64001.155	999.193	76000.000	64000.000	1000.000	-1.415	-1.155	0.80[illegible]

STD ERRS FOR THE MODEL SIG X = 1.978 M SIG Y = 1.350 M SIG Z = 1.331 SIG PLAN = 2.395 SIG POS = 2.741

MODEL NO 22021

12201	76001.788	71997.817	1000.463	76000.000	72000.000	1000.000	-1.788	2.182	-0.463
22201	76000.933	67999.337	1001.479	76000.000	68000.000	1000.000	-0.933	0.662	-1.479
2322:	76001.415	64001.155	999.193	76000.000	64000.000	1000.000	-1.415	-1.155	0.806
12211	79999.592	71997.529	1000.062	80000.000	72000.000	1000.000	0.407	2.470	-0.062
22211	79999.859	67999.438	1000.929	80000.000	68000.000	1000.000	0.140	0.561	-0.929
23211	80001.227	64001.142	998.350	80000.000	64000.000	1000.000	-1.227	-1.142	1.649

STD ERRS FOR THE MODEL SIG X = 1.246 M SIG Y = 1.688 M SIG Z = 1.152 SIG PLAN = 2.098 SIG POS = 2.394

STD ERRS FOR THE STRIP SIG X = 1.678 M SIG Y = 1.034 M SIG Z = 2.268 SIG PLAN = 1.971 SIG POS = 3.005

MODEL NO 30102

2311	-0.318	64001.006	1000.447	0.000	64000.000	1000.000	0.318	-1.006	-0.447
3311	-1.433	60000.984	1000.632	0.000	60000.000	1000.000	1.433	-0.984	-0.632
3411	-1.273	55999.080	997.527	0.000	56000.000	1000.000	1.273	0.919	2.472
2321	4001.197	64000.132	998.704	4000.000	64000.000	1000.000	-1.197	-0.132	1.295
3321	4001.449	59999.923	999.683	4000.000	60000.000	1000.000	-1.449	0.076	0.316
3421	4001.886	55998.955	1000.182	4000.000	56000.000	1000.000	-1.886	1.044	-0.182

STD ERRS FOR THE MODEL SIG X = 1.474 M SIG Y = 0.888 M SIG Z = 1.305 SIG PLAN = 1.721 SIG POS = 2.160

MODEL NO 30203

2321	4001.197	64000.132	998.704	4000.000	64000.000	1000.000	-1.197	-0.132	1.295
3321	4001.449	59999.923	999.683	4000.000	60000.000	1000.000	-1.449	0.076	0.316
3421	4001.886	55998.955	1000.182	4000.000	56000.000	1000.000	-1.886	1.044	-0.182
2331	8003.337	63998.480	1000.351	8000.000	64000.000	1000.000	-3.337	1.519	-0.351
3331	8002.882	59999.894	1002.838	8000.000	60000.000	1000.000	-2.882	0.105	-2.838
3431	8002.700	56000.252	1002.990	8000.000	56000.000	1000.000	-2.700	-0.252	-2.990

STD ERRS FOR THE MODEL SIG X = 2.601 M SIG Y = 0.836 M SIG Z = 1.946 SIG PLAN = 2.732 SIG POS = 3.354

MODEL NO 30304

2331	8003.337	63998.480	1000.351	8000.000	64000.000	1000.000	-3.337	1.519	-0.351
3331	8002.882	59999.894	1002.838	8000.000	60000.000	1000.000	-2.882	0.105	-2.838
3431	8002.700	56000.252	1002.990	8000.000	56000.000	1000.000	-2.700	-0.252	-2.990
2341	12002.341	63997.673	1001.710	12000.000	64000.000	1000.000	-2.341	2.326	-1.710
3341	12001.552	60000.067	1003.633	12000.000	60000.000	1000.000	-1.552	-0.067	-3.633
3441	12001.639	56002.169	1003.402	12000.000	56000.000	1000.000	-1.639	-2.169	-3.402

STD ERRS FOR THE MODEL SIG X = 2.732 M SIG Y = 1.581 M SIG Z = 2.994 SIG PLAN = 3.156 SIG POS = 4.351

MODEL NO 30405

2341	12002.341	63997.673	1001.710	12000.000	64000.000	1000.000	-2.341	2.326	-1.710
3341	12001.552	60000.067	1003.633	12000.000	60000.000	1000.000	-1.552	-0.067	-3.633
3441	12001.6[illegible]	56002.169	1003.402	12000.000	56000.000	1000.000	-1.639	-2.169	-3.402
2351	16000.080	63995.862	1002.844	16000.000	64000.000	1000.000	-0.080	4.137	-2.844
3351	16000.509	60000.023	1002.077	16000.000	60000.000	1000.000	-0.509	-0.023	-2.077
3451	16000.491	56001.512	999.842	16000.000	56000.000	1000.000	-0.491	-1.512	0.157

STD ERRS FOR THE MODEL SIG X = 1.489 M SIG Y = 2.430 M SIG Z = 2.893 SIG PLAN = 2.850 SIG POS = 4.018

MODEL NO 30506

2351	16000.080	63995.862	1002.844	16000.000	64000.000	1000.000	-0.080	4.137	-2.844
3351	16000.509	60000.023	1002.077	16000.000	60000.000	1000.000	-0.509	-0.023	-2.077
3451	16000.491	56001.512	999.842	16000.000	56000.000	1000.000	-0.491	-1.512	0.157
2361	19996.747	63997.996	999.034	20000.000	64000.000	1000.000	3.252	2.003	0.965
3361	19997.810	59999.834	[illegible]	20000.000	60000.000	1000.000	2.189	0.165	0.059
3461	19998.815	56001.460	[illegible]	20000.000	56000.000	1000.000	1.184	-1.460	1.691

STD ERRS FOR THE MODEL SIG X = 1.859 M SIG Y = 2.262 M SIG Z = 1.801 SIG PLAN = 2.928 SIG POS = 3.437

MODEL NO 30607

2361	19996.747	63997.996	999.034	20000.000	64000.000	1000.000	3.252	2.003	0.965
3361	19997.810	59999.834	999.940	20000.000	60000.000	1000.000	2.189	0.165	0.059
3461	19998.815	56001.460	998.308	20000.000	56000.000	1000.000	1.184	-1.460	1.691
2371	23996.876	64000.301	995.539	24000.000	64000.000	1000.000	3.123	-0.301	4.460
3371	23997.699	60000.140	997.188	24000.000	60000.000	1000.000	2.300	-0.140	2.811
3471	23998.750	56000.204	995.023	24000.000	56000.000	1000.000	1.249	-0.204	4.976

STD ERRS FOR THE MODEL SIG X = 2.583 M SIG Y = 1.124 M SIG Z = 3.357 SIG PLAN = 2.818 SIG POS = 4.383

MODEL NO 30708

2371	23996.876	64000.301	995.539	24000.000	64000.000	1000.000	3.123	-0.301	4.460
3371	23997.699	60000.140	997.188	24000.000	60000.000	1000.000	2.300	-0.140	2.811
3471	23998.750	56000.204	995.023	24000.000	56000.000	1000.000	1.249	-0.204	4.976
2381	27998.299	64000.825	992.006	28000.000	64000.000	1000.000	1.700	-0.825	7.993
3381	28000.014	59999.874	994.604	28000.000	60000.000	1000.000	-0.014	0.125	5.395
3481	28000.161	56000.504	995.470	28000.000	56000.000	1000.000	-0.161	-0.504	4.529

STD ERRS FOR THE MODEL SIG X = 1.976 M SIG Y = 0.469 M SIG Z = 5.763 SIG PLAN = 2.031 SIG POS = 6.110

MODEL NO 30809

2381	27998.299	64000.825	992.006	28000.000	64000.000	1000.000	1.700	-0.825	7.993
3381	28000.014	59999.874	994.604	28000.000	60000.000	1000.000	-0.014	0.125	[illegible]
3481	28000.161	56000.504	995.470	28000.000	56000.000	1000.000	-0.161	-0.504	[illegible]
2391	32000.381	63998.412	996.028	32000.000	64000.000	1000.000	-0.381	1.587	[illegible]
3391	31999.377	60000.224	997.671	32000.000	60000.000	1000.000	0.622	-0.224	[illegible]
3491	31998.704	56002.017	938.455	32000.000	56000.000	1000.000	1.295	-2.017	1.544

STD ERRS FOR THE MODEL SIG X = 1.012 M SIG Y = 1.232 M SIG Z = 5.236 SIG PLAN = 1.594 SIG POS = 5.473

MODEL NO 30910

2391	32000.381	63998.412	996.028	32000.000	64000.000	1000.000	-0.381	1.587	3.971
3391	31999.377	60000.224	997.671	32000.000	60000.000	1000.000	0.622	-0.224	2.328
3491	31998.704	56002.017	998.455	32000.000	56000.000	1000.000	1.295	-2.017	1.544
23101	35999.944	64000.397	995.335	36000.000	64000.000	1000.000	0.055	-0.397	4.664
33101	35999.098	60000.606	996.655	36000.000	60000.000	1000.000	0.901	-0.606	3.344
34101	35999.485	56000.012	995.674	36000.000	56000.000	1000.000	0.514	-0.012	4.325

STD ERRS FOR THE MODEL SIG X = 0.811 M SIG Y = 1.197 M SIG Z = 3.878 SIG PLAN = 1.446 SIG POS = 4.139

MODEL NO 31011

23101	35999.944	64000.397	995.335	36000.000	64000.000	1000.000	0.055	-0.397	4.664
33101	35999.098	60000.606	996.655	36000.000	60000.000	1000.000	0.901	-0.606	3.344
34101	35999.485	56000.012	995.674	36000.000	56000.000	1000.000	0.514	-0.012	4.325
23111	40000.906	63999.133	994.990	40000.000	64000.000	1000.000	-0.906	0.866	5.009
33111	40000.979	59999.189	996.190	40000.000	60000.000	1000.000	-0.979	0.810	3.809
34111	40000.391	55998.602	994.730	40000.000	56000.000	1000.000	-0.391	1.397	5.269

STD ERRS FOR THE MODEL SIG X = 0.776 M SIG Y = 0.881 M SIG Z = 4.875 SIG PLAN = 1.174 SIG POS = 5.018

MODEL NO 31112

23111	40000.906	63999.133	994.990	40000.000	64000.000	1000.000	-0.906	0.866	5.009
33111	40000.979	59999.189	996.190	40000.000	60000.000	1000.000	-0.979	0.810	3.809
34111	40000.391	55998.602	994.730	40000.000	56000.000	1000.000	-0.391	1.397	5.269
23121	44001.227	63996.976	999.334	44000.000	64000.000	1000.000	-1.227	3.023	0.665
33121	44001.424	59998.699	998.353	44000.000	60000.000	1000.000	-1.424	1.300	1.646
34121	44000.739	55999.711	997.373	44000.000	56000.000	1000.000	-0.739	0.288	2.626

STD ERRS FOR THE MODEL SIG X = 1.097 M SIG Y = 1.689 M SIG Z = 3.935 SIG PLAN = 2.014 SIG POS = 4.421

MODEL NO 31213

23121	44001.227	63996.976	999.334	44000.000	64000.000	1000.000	-1.227	3.023	0.665
33121	44001.424	59998.699	998.353	44000.000	60000.000	1000.000	-1.424	1.300	1.646
34121	44000.739	55999.711	997.373	44000.000	56000.000	1000.000	-0.739	0.288	2.626
23131	48002.713	63999.016	997.158	48000.000	64000.000	1000.000	-2.713	0.983	2.841
33131	48002.550	59998.702	997.668	48000.000	60000.000	1000.000	-2.550	1.297	2.331
34131	48002.201	55998.426	996.021	48000.000	56000.000	1000.000	-2.201	1.573	3.978

STD ERRS FOR THE MODEL SIG X = 2.135 M SIG Y = 1.791 M SIG Z = 2.806 SIG PLAN = 2.787 SIG POS = 3.955

MODEL NO 31314

23131	48002.713	63999.016	997.158	48000.000	64000.000	1000.000	-2.713	0.983	2.841
33131	48002.550	59998.702	997.668	48000.000	60000.000	1000.000	-2.550	1.297	2.331
34131	48002.201	55998.426	996.021	48000.000	56000.000	1000.000	-2.201	1.573	3.978
23141	52003.167	63997.962	1000.402	52000.000	64000.000	1000.000	-3.167	2.037	-0.402
33141	52002.868	59999.221	999.174	52000.000	60000.000	1000.000	-2.868	0.778	0.825
34141	52004.259	55998.155	995.899	52000.000	56000.000	1000.000	-4.259	1.844	4.100

STD ERRS FOR THE MODEL SIG X = 3.320 M SIG Y = 1.629 M SIG Z = 3.066 SIG PLAN = 3.698 SIG POS = 4.804

MODEL NO 31415

23141	52003.167	63997.962	1000.402	52000.000	64000.000	1000.000	-3.167	2.037	-0.402
33141	52002.868	59999.221	999.174	52000.000	60000.000	1000.000	-2.868	0.778	0.825
34141	52004.259	55998.155	995.899	52000.000	56000.000	1000.000	-4.259	1.844	4.100
23151	56000.628	63997.468	1003.081	56000.000	64000.000	1000.000	-0.628	2.531	-3.081
33151	56002.005	60000.164	1003.199	56000.000	60000.000	1000.000	-2.005	-0.164	-3.199
34151	56003.340	56001.315	1000.878	56000.000	56000.000	1000.000	-3.340	-1.315	-0.878

STD ERRS FOR THE M[illegible]L SIG X = 3.224 M SIG Y = 1.806 M SIG Z = 2.762 SIG PLAN = 3.695 SIG POS = 4.614

MODEL NO 3.516

23151	56000.628	63997.468	1003.081	56000.000	64000.000	1000.000	-0.628	2.531	-3.081
33151	56002.005	60000.164	1003.199	56000.000	60000.000	1000.000	-2.005	-0.164	-3.199
34151	56003.340	56001.315	1000.878	56000.000	56000.000	1000.000	-3.340	-1.315	-0.878
23161	59998.488	63998.927	1004.475	60000.000	64000.000	1000.000	1.511	1.072	-4.475
33161	59999.685	60000.040	1003.999	60000.000	60000.000	1000.000	0.314	-0.040	-3.999
34161	60000.428	56001.210	1001.340	60000.000	56000.000	1000.000	-0.428	-1.210	-1.340

STD ERRS FOR THE MODEL SIG X = 1.904 M SIG Y = 1.468 M SIG Z = 3.415 SIG PLAN = 2.405 SIG POS = 4.177

MODEL NO 31617

23161	59998.488	63998.927	1004.475	60000.000	64000.000	1000.000	1.511	1.072	-4.475
33161	59999.685	60000.040	1003.999	60000.000	60000.000	1000.000	0.314	-0.040	-3.999
34161	60000.428	56001.210	1001.340	60000.000	56000.000	1000.000	-0.428	-1.210	-1.340
23171	63996.062	63998.505	1005.[illegible]3	64000.000	64000.000	1000.000	3.937	1.494	-5.683
33171	63998.445	60000.947	1005.528	64000.000	60000.000	1000.000	1.554	-0.947	-5.528
34171	63998.421	56002.718	1004.291	64000.000	56000.000	1000.000	1.578	-2.718	-4.291

STD ERRS FOR THE MODEL SIG X = 2.143 M SIG Y = 1.620 M SIG Z = 4.880 SIG PLAN = 2.687 SIG POS = 5.571

MODEL NO 31718

23171	63996.062	63998.505	1005.683	64000.000	64000.000	1000.000	3.937	1.494	-5.683
33171	63998.445	60000.947	1005.528	64000.000	60000.000	1000.000	1.554	-0.947	-5.528
34171	63998.421	56002.718	1004.291	64000.000	56000.000	1000.000	1.578	-2.718	-4.291
23181	67995.402	64000.674	1001.188	68000.000	64000.000	1000.000	4.597	-0.674	-1.188
33181	67996.880	60001.057	1003.001	58000.000	60000.000	1000.000	3.119	-1.057	-3.001
34181	67997.611	56001.833	1003.089	68000.000	56000.000	1000.000	2.388	-1.833	-3.089

STD ERRS FOR THE MODEL SIG X = 3.375 M SIG Y = 1.758 M SIG Z = 4.499 SIG PLAN = 3.806 SIG POS = 5.893

MODEL NO 31819

23181	67995.402	64000.674	1001.188	68000.000	64000.000	1000.000	4.597	-0.674	-1.188
33181	67996.880	60001.057	1003.001	68000.000	60000.000	1000.000	3.119	-1.057	-3.001
34181	67997.611	56001.833	1003.089	68000.000	56000.000	1000.000	2.388	-1.833	-3.089
23191	71997.670	64002.924	998.763	72000.000	64000.000	1000.000	2.329	-2.924	1.236
33191	71997.894	60000.715	1000.405	72000.000	60000.000	1000.000	2.105	-0.715	-0.405
34191	71998.630	55999.551	1000.468	72000.000	56000.000	1000.000	1.369	0.448	-0.468

STD ERRS FOR THE MODEL SIG X = 3.108 M SIG Y = 1.685 M SIG Z = 2.092 SIG PLAN = 3.535 SIG POS = 4.108

MODEL NO 31920

23191	71997.670	64002.924	998.763	72000.000	64000.000	1000.000	2.329	-2.924	1.236
33191	71997.894	60000.715	1000.405	72000.000	60000.000	1000.000	2.105	-0.715	-0.405
34191	71998.630	55999.551	1000.468	72000.000	56000.000	1000.000	1.369	0.448	-0.468
23201	76000.440	64000.684	1000.225	76000.000	64000.000	1000.000	-0.440	-0.684	-0.225
33201	76001.275	60000.310	1000.973	76000.000	60000.000	1000.000	-1.275	-0.310	-0.973
34201	76000.362	55999.314	1000.285	76000.000	56000.000	1000.000	-0.362	0.685	-0.285

STD ERRS FOR THE MODEL SIG X = 1.654 M SIG Y = 1.435 M SIG Z = 0.773 SIG PLAN = 2.190 SIG POS = 2.323

MODEL NO 32021

23201	76000.440	64000.684	1000.225	76000.000	64000.000	1000.000	-0.440	-0.684	-0.225
33201	76001.275	60000.310	1000.973	76000.000	60000.000	1000.000	-1.275	-0.310	-0.973
34201	76000.362	55999.314	1000.285	76000.000	56000.000	1000.000	-0.362	0.685	-0.285
23211	80000.983	64000.076	998.602	80000.000	64000.000	1000.000	-0.983	-0.076	1.397
33211	80002.148	60000.276	999.802	80000.000	60000.000	1000.000	-2.148	-0.276	0.197
34211	80001.886	55998.470	997.546	80000.000	56000.000	1000.000	-1.886	1.529	2.453

STD ERRS FOR THE MODEL SIG X = 1.489 M SIG Y = 0.831 M SIG Z = 1.348 SIG PLAN = 1.705 SIG POS = 2.174

STD ERRS FOR THE STRIP SIG X = 2.012 M SIG Y = 1.385 M SIG Z = 3.171 SIG PLAN = 2.443 SIG POS = 4.003

MODEL NO 40102

3411	0.967	55999.281	1000.717	0.000	56000.000	1000.000	-0.967	0.718	-0.717
4411	-0.303	52001.007	1001.531	0.000	52000.000	1000.000	0.303	-1.007	-1.531
4511	-0.765	48001.362	1002.272	0.000	48000.000	1000.000	0.765	-1.362	-2.272
3421	3999.741	55998.774	999.732	4000.000	56000.000	1000.000	0.258	1.225	0.267
4421	3999.609	52000.291	1000.536	4000.000	52000.000	1000.000	0.390	-0.291	-0.536
4521	3999.680	48000.170	999.719	4000.000	48000.000	1000.000	0.319	-0.170	0.280

STD ERRS FOR THE MODEL SIG X = 0.622 M SIG Y = 1.000 M SIG Z = 1.300 SIG PLAN = 1.178 SIG POS = 1.755

MODEL NO 40203

3421	3999.741	55998.774	999.732	4000.000	56000.000	1000.000	0.258	1.225	0.267
4421	3999.609	52000.291	1000.536	4000.000	52000.000	1000.000	0.390	-0.291	-0.536
4521	3999.680	48000.170	999.719	4000.000	48000.000	1000.000	0.319	-0.170	0.280
3431	7999.646	55998.313	999.916	8000.000	56000.000	1000.000	0.353	1.686	0.083
4431	8000.571	52000.159	1001.820	8000.000	52000.000	1000.000	-0.571	-0.159	-1.820
4531	8000.457	48001.996	1001.468	8000.000	48000.000	1000.000	-0.457	-1.996	-1.468

STD ERRS FOR THE MODEL SIG X = 0.443 M SIG Y = 1.301 M SIG Z = 1.087 SIG PLAN = 1.375 SIG POS = 1.753

MODEL NO 40304

3431	7999.646	55998.313	999.916	8000.000	56000.000	1000.000	0.35[illegible]	1.686	0.083
4431	8000.571	52000.159	1001.820	8000.000	52000.000	1000.000	-0.571	-0.159	-1.820
4531	8000.457	48001.996	1001.468	8000.000	48000.000	1000.000	-0.457	-1.996	-1.468
3441	11998.303	55999.861	997.713	12000.000	56000.000	1000.000	1.696	0.138	2.286
4441	11998.911	51999.690	1001.006	12000.000	52000.000	1000.000	1.088	0.309	-1.006
4541	12000.193	48001.705	1002.141	12000.000	48000.000	1000.000	-0.193	-1.705	-2.141

STD ERRS FOR THE MODEL SIG X = 0.975 M SIG Y = 1.405 M SIG Z = 1.805 SIG PLAN = 1.711 SIG POS = 2.487

MODEL NO 40405

3441	11998.303	55999.861	997.713	12000.000	56000.000	1000.000	1.696	0.138	2.286
4441	11998.911	51999.690	1001.006	12000.000	52000.000	1000.000	1.088	0.309	-1.006
4541	12000.193	48001.705	1002.141	12000.000	48000.000	1000.000	-0.193	-1.705	-2.141
3451	15998.335	55999.509	996.622	16000.000	56000.000	1000.000	1.664	0.490	3.377
4451	15999.389	51999.899	1000.613	16000.000	52000.000	1000.000	0.610	0.100	-0.613

4551	16000.022	48000.427	1000.370	16000.000	48000.000	1000.000	-0.022	-0.427	-0.370

STD ERRS FOR THE MODEL SIG X = 1.203 M SIG Y = 0.831 M SIG Z = 2.133 SIG PLAN = 1.462 SIG POS = 2.586

MODEL NO 40506

3451	15998.335	55999.509	996.622	16000.000	56000.000	1000.000	1.664	0.490	3.377
4451	15999.389	51999.899	1000.613	16000.000	52000.000	1000.000	0.610	0.100	-0.613
4551	16000.022	48000.427	1000.370	16000.000	48000.000	1000.000	-0.022	-0.427	-0.370
3461	20000.492	56001.066	996.485	20000.000	56000.000	1000.000	-0.492	-1.066	3.514
4461	20000.177	52001.194	998.350	20000.000	52000.000	1000.000	-0.177	-1.194	1.649
4561	20000.788	48000.204	998.168	20000.000	48000.000	1000.000	-0.788	-0.204	1.831

STD ERRS FOR THE MODEL SIG X = 0.898 M SIG Y = 0.779 M SIG Z = 2.463 SIG PLAN = 1.189 SIG POS = 2.735

MODEL NO 40607

3461	20000.492	56001.066	996.485	20000.000	56000.000	1000.000	-0.492	-1.066	3.514
4461	20000.177	52001.194	998.350	20000.000	52000.000	1000.000	-0.177	-1.194	1.649
4561	20000.788	48000.204	998.168	20000.000	48000.000	1000.000	-0.788	-0.204	1.831
3471	23999.060	56001.728	997.305	24000.000	56000.000	1000.000	0.939	-1.728	2.694
4471	24000.794	52001.755	1000.320	24000.000	52000.000	1000.000	-0.794	-1.755	-0.320
4571	24001.416	48002.039	1000.497	24000.000	48000.000	1000.000	-1.416	-2.039	-0.497

STD ERRS FOR THE MODEL SIG X = 0.939 M SIG Y = 1.602 M SIG Z = 2.281 SIG PLAN = 1.857 SIG POS = 2.942

MODEL NO 40708

3471	23999.060	56001.728	997.305	24000.000	56000.000	1000.000	0.939	-1.728	2.694
4471	24000.794	52001.755	1000.320	24000.000	52000.000	1000.000	-0.794	-1.755	-0.320
4571	24001.416	48002.039	1000.497	24000.000	48000.000	1000.000	-1.416	-2.039	-0.497
3481	27998.349	56000.296	997.352	28000.000	56000.000	1000.000	1.650	-0.296	2.647
4481	27999.628	52002.027	1001.810	28000.000	52000.000	1000.000	0.371	-2.027	-1.810
4581	27999.658	48003.725	1004.729	28000.000	48000.000	1000.000	0.341	-3.725	-4.729

STD ERRS FOR THE MODEL SIG X = 1.140 M SIG Y = 2.379 M SIG Z = 2.837 SIG PLAN = 2.638 SIG POS = 3.874

MODEL NO 40809

3481	27998.349	56000.296	997.352	28000.000	56000.000	1000.000	1.650	-0.296	2.647
4481	27999.628	52002.027	1001.810	28000.000	52000.000	1000.000	0.371	-2.027	-1.810
4581	27999.658	48003.725	1004.729	28000.000	48000.000	1000.000	0.341	-3.725	-4.729
3491	31999.877	56002.519	993.670	32000.000	56000.000	1000.000	0.122	-2.519	6.329
4491	32000.056	52000.444	998.729	32000.000	52000.000	1000.000	-0.056	-0.444	1.270
4591	32000.503	47998.802	1000.459	32000.000	48000.000	1000.000	-0.503	1.197	-0.459

STD ERRS FOR THE MODEL SIG X = 0.806 M SIG Y = 2.282 M SIG Z = 3.861 SIG PLAN = 2.421 SIG POS = 4.557

MODEL NO 40910

3491	31999.877	56002.519	993.670	32000.000	56000.000	1000.000	0.122	-2.519	6.329
4491	32000.056	52000.444	998.729	32000.000	52000.000	1000.000	-0.056	-0.444	1.270
4591	32000.503	47998.802	1000.459	32000.000	48000.000	1000.000	-0.503	1.197	-0.459
34101	36002.936	56000.154	997.073	36000.000	56000.000	1000.000	-2.936	-0.154	2.926
44101	36002.344	51999.411	1002.140	36000.000	52000.000	1000.000	-2.344	0.588	-2.140

45101	36002.325	47999.762	1003.338	36000.000	48000.000	1000.000	-2.325	0.237	-3.338

STD ERRS FOR THE MODEL SIG X = 1.989 M SIG Y = 1.296 M SIG Z = 3.638 SIG PLAN = 2.375 SIG POS = 4.344

MODEL NO 41011

34101	36002.936	56000.154	997.073	36000.000	56000.000	1000.000	-2.936	-0.154	2.926
44101	36002.344	51999.411	1002.140	36000.000	52000.000	1000.000	-2.344	0.588	-2.140
45101	36002.325	47999.762	1003.338	36000.000	48000.000	1000.000	-2.325	0.237	-3.338
34111	40003.971	55998.692	1002.604	40000.000	56000.000	1000.000	-3.971	1.307	-2.604
44111	40004.240	51999.921	1005.150	40000.000	52000.000	1000.000	-4.240	0.078	-5.150
45111	40005.160	47999.744	1003.818	40000.000	48000.000	1000.000	-5.160	0.255	-3.818

STD ERRS FOR THE MODEL SIG X = 3.997 M SIG Y = 0.664 M SIG Z = 3.799 SIG PLAN = 4.052 SIG POS = 5.555

MODEL NO 41112

34111	40003.971	55998.692	1002.604	40000.000	56000.000	1000.000	-3.971	1.307	-2.604
44111	40004.240	51999.921	1005.150	40000.000	52000.000	1000.000	-4.240	0.078	-5.150
45111	40005.160	47999.744	1003.818	40000.000	48000.000	1000.000	-5.160	0.255	-3.818
34121	44002.449	55997.939	1002.743	44000.000	56000.000	1000.000	-2.449	2.060	-2.743
44121	44004.198	51999.733	1005.559	44000.000	52000.000	1000.000	-4.198	0.266	-5.559
45121	44003.293	48000.908	1005.401	44000.000	48000.000	1000.000	-3.293	-0.908	-5.401

STD ERRS FOR THE MODEL SIG X = 4.355 M SIG Y = 1.176 M SIG Z = 4.806 SIG PLAN = 4.511 SIG POS = 6.592

MODEL NO 41213

34121	44002.449	55997.939	1002.743	44000.000	56000.000	1000.000	-2.449	2.060	-2.743
44121	44004.198	51999.733	1005.559	44000.000	52000.000	1000.000	-4.198	0.266	-5.559
45121	44003.293	48000.908	1005.401	44000.000	48000.000	1000.000	-3.293	-0.908	-5.401
34131	48001.065	55996.574	1003.651	48000.000	56000.000	1000.000	-1.065	3.425	-3.651
44131	48001.860	51999.538	1003.855	48000.000	52000.000	1000.000	-1.860	0.461	-3.855
45131	48002.504	48000.403	1002.162	48000.000	48000.000	1000.000	-2.504	-0.403	-2.162

STD ERRS FOR THE MODEL SIG X = 3.011 M SIG Y = 1.857 M SIG Z = 4.483 SIG PLAN = 3.537 SIG POS = 5.710

MODEL NO 41314

34131	48001.065	55996.574	1003.651	48000.000	56000.000	1000.000	-1.065	3.425	-3.651
44131	48001.860	51999.538	1003.855	48000.000	52000.000	1000.000	-1.860	0.461	-3.855
45131	48002.504	48000.403	1002.162	48000.000	48000.000	1000.000	-2.504	-0.403	-2.162
34141	51998.898	55996.873	1001.283	52000.000	56000.000	1000.000	1.101	3.126	-1.283
44141	52000.256	51999.573	1003.679	52000.000	52000.000	1000.000	-0.256	0.426	-3.679
45141	52000.532	48001.894	1001.676	52000.000	48000.000	1000.000	-0.532	-1.894	-1.676

STD ERRS FOR THE MODEL SIG X = 1.576 M SIG Y = 2.264 M SIG Z = 3.189 SIG PLAN = 2.759 SIG POS = 4.217

MODEL NO 41415

34141	51998.898	55996.873	1001.283	52000.000	56000.000	1000.000	1.101	3.126	-1.283
44141	52000.256	51999.573	1003.679	52000.000	52000.000	1000.000	-0.256	0.426	-3.679
45141	52000.532	48001.894	1001.676	52000.000	48000.000	1000.000	-0.532	-1.894	-1.676
34151	55995.553	55997.942	996.847	56000.000	56000.000	1000.000	4.446	2.057	3.152
44151	55997.323	51998.649	1000.327	56000.000	52000.000	1000.000	2.676	1.350	-0.327

45151	55999.272	48000.551	1000.435	56000.000	48000.000	1000.000	0.727	-0.551	-0.435

STD ERRS FOR THE MODEL SIG X = 2.409 M SIG Y = 1.995 M SIG Z = 2.376 SIG PLAN = 3.128 SIG POS = 3.928

MODEL NO 41516

34151	55995.553	55997.942	996.847	56000.000	56000.000	1000.000	4.446	2.057	3.152
44151	55997.323	51998.649	1000.327	56000.000	52000.000	1000.000	2.676	1.350	-0.327
45151	55999.272	48000.551	1000.435	56000.000	48000.000	1000.000	0.727	-0.551	-0.435
34161	59996.375	55998.638	994.978	60000.000	56000.000	1000.000	3.624	1.361	5.021
44161	59997.430	51997.992	998.607	60000.000	52000.000	1000.000	2.569	2.007	1.392
45161	59996.751	48000.863	1000.758	60000.000	48000.000	1000.000	3.248	-0.863	-0.758

STD ERRS FOR THE MODEL SIG X = 3.398 M SIG Y = 1.611 M SIG Z = 2.755 SIG PLAN = 3.761 SIG POS = 4.662

MODEL NO 41617

34161	59996.375	55998.638	994.978	60000.000	56000.000	1000.000	3.624	1.361	5.021
44161	59997.430	51997.992	998.607	60000.000	52000.000	1000.000	2.569	2.007	1.392
45161	59996.751	48000.863	1000.758	60000.000	48000.000	1000.000	3.248	-0.863	-0.758
34171	63996.180	55997.440	996.624	64000.000	56000.000	1000.000	3.819	2.559	3.375
44171	63997.087	51998.617	997.383	64000.000	52000.000	1000.000	2.912	1.382	2.616
45171	63997.029	47998.781	995.704	64000.000	48000.000	1000.000	2.970	1.218	4.295

STD ERRS FOR THE MODEL SIG X = 3.526 M SIG Y = 1.820 M SIG Z = 3.589 SIG PLAN = 3.969 SIG POS = 5.351

MODEL NO 41718

34171	63996.180	55997.440	996.624	64000.000	56000.000	1000.000	3.819	2.559	3.375
44171	63997.087	51998.617	997.383	64000.000	52000.000	1000.000	2.912	1.382	2.616
45171	63997.029	47998.781	995.704	64000.000	48000.000	1000.000	2.970	1.218	4.295
34181	67997.454	55999.723	995.300	68000.000	56000.000	1000.000	2.545	0.276	4.699
44181	67997.689	51999.258	995.475	68000.000	52000.000	1000.000	2.310	0.741	4.524
45181	67999.742	47997.373	994.614	68000.000	48000.000	1000.000	0.257	2.626	5.385

STD ERRS FOR THE MODEL SIG X = 2.959 M SIG Y = 1.869 M SIG Z = 4.652 SIG PLAN = 3.500 SIG POS = 5.822

MODEL NO 41819

34181	67997.454	55999.723	995.300	68000.000	56000.000	1000.000	2.545	0.276	4.699
44181	67997.689	51999.258	995.475	68000.000	52000.000	1000.000	2.310	0.741	4.524
45181	67999.742	47997.373	994.614	68000.000	48000.000	1000.000	0.257	2.626	5.385
34191	71998.527	55998.734	997.755	72000.000	56000.000	1000.000	1.472	1.265	2.244
44191	72000.179	51999.409	999.782	72000.000	52000.000	1000.000	-0.179	0.590	0.217
45191	72001.229	48001.796	1001.547	72000.000	48000.000	1000.000	-1.229	-1.796	-1.547

STD ERRS FOR THE MODEL SIG X = 1.766 M SIG Y = 1.593 M SIG Z = 3.975 SIG PLAN = 2.379 SIG POS = 4.633

MODEL NO 41920

34191	71998.527	55998.734	997.755	72000.000	56000.000	1000.000	1.472	1.265	2.244
44191	72000.179	51999.409	999.782	72000.000	52000.000	1000.000	-0.179	0.590	0.217
45191	72001.229	48001.796	1001.547	72000.000	48000.000	1000.000	-1.229	-1.796	-1.547
34201	75999.795	56000.314	998.978	76000.000	56000.000	1000.000	0.204	-0.314	1.021
44201	76000.166	51999.890	1000.838	76000.000	52000.000	1000.000	-0.166	0.109	-0.838

45201	76000.337	48000.231	1001.089	76000.000	48000.000	1000.000	-0.337	-0.231	-1.089

STD ERRS FOR THE MODEL SIG X = 0.882 M SIG Y = 1.033 M SIG Z = 1.443 SIG PLAN = 1.359 SIG POS = 1.982

MODEL NO 42021

34201	75999.795	56000.314	998.978	76000.000	56000.000	1000.000	0.204	-0.314	1.021
44201	76000.166	51999.890	1000.838	76000.000	52000.000	1000.000	-0.166	0.109	-0.838
45201	76000.337	48000.231	1001.089	76000.000	48000.000	1000.000	-0.337	-0.231	-1.089
34211	80000.185	55999.442	1005.298	80000.000	56000.000	1000.000	-0.185	0.557	-5.298
44211	80001.030	52000.496	1004.327	80000.000	52000.000	1000.000	-1.030	-0.496	-4.327
45211	80002.251	48000.484	1001.702	80000.000	48000.000	1000.000	-2.251	-0.484	-1.702

STD ERRS FOR THE MODEL SIG X = 1.126 M SIG Y = 0.437 M SIG Z = 3.244 SIG PLAN = 1.208 SIG POS = 3.462

STD ERRS FOR THE STRIP SIG X = 2.058 M SIG Y = 1.430 M SIG Z = 2.914 SIG PLAN = 2.506 SIG POS = 3.843

MODEL NO 50102

4511	0.468	47999.251	1001.237	0.000	48000.000	1000.000	-0.468	0.748	-1.237
5511	-0.570	44001.237	1001.930	0.000	44000.000	1000.000	0.570	-1.237	-1.930
5611	-1.281	40001.568	1001.045	0.000	40000.000	1000.000	1.281	-1.568	-1.045
4521	3999.689	47999.275	999.669	4000.000	48000.000	1000.000	0.310	0.724	0.330
5521	3998.706	44000.337	1001.053	4000.000	44000.000	1000.000	1.293	-0.337	-1.053
5621	3998.592	40000.527	1000.184	4000.000	40000.000	1000.000	1.407	-0.527	-0.184

STD ERRS FOR THE MODEL SIG X = 1.089 M SIG Y = 1.045 M SIG Z = 1.233 SIG PLAN = 1.510 SIG POS = 1.949

MODEL NO 50203

4521	3999.689	47999.275	999.669	4000.000	48000.000	1000.000	0.310	0.724	0.330
5521	3998.706	44000.337	1001.053	4000.000	44000.000	1000.000	1.293	-0.337	-1.053
5621	3998.592	40000.527	1000.184	4000.000	40000.000	1000.000	1.407	-0.527	-0.184
4531	7999.696	47998.956	1000.014	8000.000	48000.000	1000.000	0.303	1.043	-0.014
5531	7999.333	43999.495	999.662	8000.000	44000.000	1000.000	0.666	0.504	0.337
5631	7998.461	39998.711	997.340	8000.000	40000.000	1000.000	1.538	1.288	2.659

STD ERRS FOR THE MODEL SIG X = 1.153 M SIG Y = 0.885 M SIG Z = 1.299 SIG PLAN = 1.454 SIG POS = 1.949

MODEL NO 50304

4531	7999.696	47998.956	1000.014	8000.000	48000.000	1000.000	0.303	1.043	-0.014
5531	7999.333	43999.495	999.662	8000.000	44000.000	1000.000	0.666	0.504	0.337
5631	7998.461	39998.711	997.340	8000.000	40000.000	1000.000	1.538	1.288	2.659
4541	11998.497	47998.475	1000.776	12000.000	48000.000	1000.000	1.502	1.524	-0.776
5541	11999.660	43999.635	1001.159	12000.000	44000.000	1000.000	0.339	0.364	-1.159
5641	12001.400	39997.943	998.662	12000.000	40000.000	1000.000	-1.400	2.056	1.337

STD ERRS FOR THE MODEL SIG X = 1.203 M SIG Y = 1.392 M SIG Z = 1.477 SIG PLAN = 1.840 SIG POS = 2.360

MODEL NO 50405

4541	11998.497	47998.475	1000.776	12000.000	48000.000	1000.000	1.502	1.524	-0.776
5541	11999.660	43999.635	1001.159	12000.000	44000.000	1000.000	0.339	0.364	-1.159
5641	12001.400	39997.943	998.662	12000.000	40000.000	1000.000	-1.400	2.056	1.337

4551	15998.618	47999.992	998.597	16000.000	48000.000	1000.000	1.381	0.007	1.402
5551	16000.534	44000.247	1000.458	16000.000	44000.000	1000.000	-0.534	-0.247	-0.458
5651	16001.383	39999.683	999.878	16000.000	40000.000	1000.000	-1.383	0.316	0.121

STD ERRS FOR THE MODEL SIG X = 1.299 M SIG Y = 1.170 M SIG Z = 1.038 SIG PLAN = 1.748 SIG POS = 2.059

MODEL NO 50506

4551	15998.618	47999.992	998.597	16000.000	48000.000	1000.000	1.381	0.007	1.402
5551	16000.534	44000.247	1000.458	16000.000	44000.000	1000.000	-0.534	-0.247	-0.458
5651	16001.383	39999.683	999.878	16000.000	40000.000	1000.000	-1.383	0.316	0.121
4561	20000.472	48000.703	1001.110	20000.000	48000.000	1000.000	-0.472	-0.703	-1.110
5561	20000.426	44000.782	1003.567	20000.000	44000.000	1000.000	-0.426	-0.782	-3.567
5661	20001.345	40002.058	1003.863	20000.000	40000.000	1000.000	-1.345	-2.058	-3.863

STD ERRS FOR THE MODEL SIG X = 1.124 M SIG Y = 1.049 M SIG Z = 2.492 SIG PLAN = 1.538 SIG POS = 2.929

MODEL NO 50607

4561	20000.472	48000.703	1001.110	20000.000	48000.000	1000.000	-0.472	-0.703	-1.110
5561	20000.426	44000.782	1003.567	20000.000	44000.000	1000.000	-0.426	-0.782	-3.567
5661	20001.345	40002.058	1003.863	20000.000	40000.000	1000.000	-1.345	-2.058	-3.863
4571	24000.102	48001.715	1000.222	24000.000	48000.000	1000.000	-0.102	-1.715	-0.222
5571	24000.004	44001.229	1002.760	24000.000	44000.000	1000.000	-0.004	-1.229	-2.760
5671	23999.828	40002.422	1003.065	24000.000	40000.000	1000.000	0.171	-2.422	-3.065

STD ERRS FOR THE MODEL SIG X = 0.671 M SIG Y = 1.769 M SIG Z = 3.031 SIG PLAN = 1.893 SIG POS = 3.573

MODEL NO 50708

4571	24000.102	48001.715	1000.222	24000.000	48000.000	1000.000	-0.102	-1.715	-0.222
5571	24000.004	44001.229	1002.760	24000.000	44000.000	1000.000	-0.004	-1.229	-2.760
5671	23999.828	40002.422	1003.065	24000.000	40000.000	1000.000	0.171	-2.422	-3.065
4581	28000.863	48001.460	1003.161	28000.000	48000.000	1000.000	-0.863	-1.460	-3.161
5581	27999.860	44002.142	1003.328	28000.000	44000.000	1000.000	0.139	-2.142	-3.328
5681	27999.767	40002.426	1001.587	28000.000	40000.000	1000.000	0.232	-2.426	-1.587

STD ERRS FOR THE MODEL SIG X = 0.414 M SIG Y = 2.141 M SIG Z = 2.851 SIG PLAN = 2.181 SIG POS = 3.590

MODEL NO 50809

4581	28000.863	48001.460	1003.161	28000.000	48000.000	1000.000	-0.863	-1.460	-3.161
5581	27999.860	44002.142	1003.328	28000.000	44000.000	1000.000	0.139	-2.142	-3.328
5681	27999.767	40002.426	1001.587	28000.000	40000.000	1000.000	0.232	-2.426	-1.587
4591	31999.148	48001.335	1004.464	32000.000	48000.000	1000.000	0.851	-1.335	-4.464
5591	31999.174	44002.664	1003.335	32000.000	44000.000	1000.000	0.825	-2.664	-3.335
5691	31998.972	40003.224	1000.155	32000.000	40000.000	1000.000	1.027	-3.224	-0.155

STD ERRS FOR THE MODEL SIG X = 0.810 M SIG Y = 2.525 M SIG Z = 3.306 SIG PLAN = 2.652 SIG POS = 4.239

MODEL NO 50910

4591	31999.148	48001.335	1004.464	32000.000	48000.000	1000.000	0.851	-1.335	-4.464
5591	31999.174	44002.664	1003.335	32000.000	44000.000	1000.000	0.825	-2.664	-3.335
5691	31998.972	40003.224	1000.155	32000.000	40000.000	1000.000	1.027	-3.224	-0.155

45101	35999.710	48002.618	1000.840	36000.000	48000.000	1000.000	0.289	-2.618	-0.840
55101	36000.222	44002.143	999.975	36000.000	44000.000	1000.000	-0.222	-2.143	0.024
56101	36000.104	40001.093	996.912	36000.000	40000.000	1000.000	-0.104	-1.093	3.087

STD ERRS FOR THE MODEL SIG X = 0.722 M SIG Y = 2.526 M SIG Z = 2.874 SIG PLAN = 2.628 SIG POS = 3.894

MODEL NO 51011

45101	35999.710	48002.618	1000.840	36000.000	48000.000	1000.000	0.289	-2.618	-0.840
55101	36000.222	44002.143	999.975	36000.000	44000.000	1000.000	-0.222	-2.143	0.024
56101	36000.104	40001.093	996.912	36000.000	40000.000	1000.000	-0.104	-1.093	3.087
45111	40001.695	47999.444	1003.112	40000.000	48000.000	1000.000	-1.695	0.555	-3.112
55111	40001.122	44000.987	1001.997	40000.000	44000.000	1000.000	-1.122	-0.987	-1.997
56111	40000.903	40000.544	998.356	40000.000	40000.000	1000.000	-0.903	-0.544	1.643

STD ERRS FOR THE MODEL SIG X = 1.009 M SIG Y = 1.686 M SIG Z = 2.307 SIG PLAN = 1.965 SIG POS = 3.031

MODEL NO 51112

45111	40001.695	47999.444	1003.112	40000.000	48000.000	1000.000	-1.695	0.555	-3.112
55111	40001.122	44000.987	1001.997	40000.000	44000.000	1000.000	-1.122	-0.987	-1.997
56111	40000.903	40000.544	998.356	40000.000	40000.000	1000.000	-0.903	-0.544	1.643
45121	44000.478	47997.458	1003.331	44000.000	48000.000	1000.000	-0.478	2.541	-3.331
55121	44000.945	43999.589	1001.835	44000.000	44000.000	1000.000	-0.945	0.410	-1.835
56121	44001.487	39999.306	999.870	44000.000	40000.000	1000.000	-1.487	0.693	0.129

STD ERRS FOR THE MODEL SIG X = 1.287 M SIG Y = 1.318 M SIG Z = 2.484 SIG PLAN = 1.842 SIG POS = 3.093

MODEL NO 51213

45121	44000.478	47997.458	1003.331	44000.000	48000.000	1000.000	-0.478	2.541	-3.331
55121	44000.945	43999.589	1001.835	44000.000	44000.000	1000.000	-0.945	0.410	-1.835
56121	44001.487	39999.306	999.870	44000.000	40000.000	1000.000	-1.487	0.693	0.129
45131	48000.973	47999.454	999.354	48000.000	48000.000	1000.000	-0.973	0.545	0.645
55131	48001.684	43998.890	1000.165	48000.000	44000.000	1000.000	-1.684	1.109	-0.165
56131	48001.794	39999.031	993.897	48000.000	40000.000	1000.000	-1.794	0.968	6.102

STD ERRS FOR THE MODEL SIG X = 1.438 M SIG Y = 1.383 M SIG Z = 3.230 SIG PLAN = 1.995 SIG POS = 3.797

MODEL NO 51314

45131	48000.973	47999.454	999.354	48000.000	48000.000	1000.000	-0.973	0.545	0.645
55131	48001.684	43998.890	1000.165	48000.000	44000.000	1000.000	-1.684	1.109	-0.165
56131	48001.794	39999.031	993.897	48000.000	40000.000	1000.000	-1.794	0.968	6.102
45141	52000.824	47997.631	1003.135	52000.000	48000.000	1000.000	-0.824	2.368	-3.135
55141	52001.146	44000.066	1001.786	52000.000	44000.000	1000.000	-1.146	-0.066	-1.786
56141	52001.862	40001.378	999.394	52000.000	40000.000	1000.000	-1.862	-1.378	[illegible]

STD ERRS FOR THE MODEL SIG X = 1.579 M SIG Y = 1.412 M SIG Z = 3.196 SIG PLAN = 2.119 SIG POS = 3.834

MODEL NO 51415

45141	52000.824	47997.631	1003.135	52000.000	48000.000	1000.000	-0.824	2.368	-3.135
55141	52001.146	44000.066	1001.786	52000.000	44000.000	1000.000	-1.146	-0.066	-1.786
56141	52001.862	40001.378	999.394	52000.000	40000.000	1000.000	-1.862	-1.378	0.605

45151	55999.022	47998.372	1001.550	56000.000	48000.000	1000.000	0.977	1.627	-1.550
55151	55999.610	43999.587	999.770	56000.000	44000.000	1000.000	0.389	0.412	0.229
56151	56000.128	39999.845	996.978	56000.000	40000.000	1000.000	-0.128	0.154	3.021

STD ERRS FOR THE MODEL SIG X = 1.147 M SIG Y = 1.439 M SIG Z = 2.235 SIG PLAN = 1.841 SIG POS = 2.895

MODEL NO 51516

45151	55999.022	47998.372	1001.550	56000.000	48000.000	1000.000	0.977	1.627	-1.550
55151	55999.610	43999.587	999.770	56000.000	44000.000	1000.000	0.389	0.412	0.229
56151	56000.128	39999.845	996.978	56000.000	40000.000	1000.000	-0.128	0.154	3.021
45161	60000.237	47998.905	1000.354	60000.000	48000.000	1000.000	-0.237	1.094	-0.354
55161	60000.647	43999.597	998.615	60000.000	44000.000	1000.000	-0.647	0.402	1.384
56161	60000.768	39998.963	995.090	60000.000	40000.000	1000.000	-0.768	1.036	4.909

STD ERRS FOR THE MODEL SIG X = 0.661 M SIG Y = 1.027 M SIG Z = 2.747 SIG PLAN = 1.222 SIG POS = 3.006

MODEL NO 51

45161	60000.237	47998.905	1000.354	60000.000	48000.000	1000.000	-0.237	1.094	-0.354
55161	60000.647	43999.597	998.615	60000.000	44000.000	1000.000	-0.647	0.402	1.384
56161	60000.768	39998.963	995.090	60000.000	40000.000	1000.000	-0.768	1.036	4.909
45171	63999.599	47996.854	1004.111	64000.000	48000.000	1000.000	0.400	3.145	-4.111
55171	63999.973	43999.621	1000.678	64000.000	44000.000	1000.000	0.026	0.378	-0.678
56171	64000.985	40000.345	996.520	64000.000	40000.000	1000.000	-0.985	-0.345	3.479

STD ERRS FOR THE MODEL SIG X = 0.663 M SIG Y = 1.586 M SIG Z = 3.335 SIG PLAN = 1.719 SIG POS = 3.752

MODEL NO 51718

45171	63999.599	47996.854	1004.111	64000.000	48000.000	1000.000	0.400	3.145	-4.111
55171	63999.973	43999.621	1000.678	64000.000	44000.000	1000.000	0.026	0.378	-0.678
56171	64000.985	40000.345	996.520	64000.000	40000.000	1000.000	-0.985	-0.345	3.479
45181	67997.724	47998.330	1003.228	68000.000	48000.000	1000.000	2.275	1.669	-3.228
55181	67998.656	44000.473	1000.199	68000.000	44000.000	1000.000	1.343	-0.473	-0.199
56181	67999.634	40000.030	996.053	68000.000	40000.000	1000.000	0.365	-0.030	3.946

STD ERRS FOR THE MODEL SIG X = 1.284 M SIG Y = 1.622 M SIG Z = 3.332 SIG PLAN = 2.06[illegible] SIG POS = 3.922

MODEL NO 51819

45181	67997.724	47998.330	1003.228	68000.000	48000.000	1000.000	2.275	1.669	-3.228
55181	67998.656	44000.473	1000.199	68000.000	44000.000	1000.000	1.343	-0.473	-0.199
56181	67999.634	40000.030	996.053	68000.000	40000.000	1000.000	0.365	-0.030	3.946
45191	71997.529	48000.439	999.748	72000.000	48000.000	1000.000	2.470	-0.439	0.251
55191	71998.847	43999.734	998.309	72000.000	44000.000	1000.000	1.152	0.265	1.690
56191	72000.303	39999.390	995.579	72000.000	40000.000	1000.000	-0.303	0.609	4.420

STD ERRS FOR THE MODEL SIG X = 1.711 M SIG Y = 0.854 M SIG Z = 3.114 SIG PLAN = 1.912 SIG POS = 3.654

MODEL NO 51920

45191	71997.529	48000.439	999.748	72000.000	48000.000	1000.000	2.470	-0.439	0.251
55191	71998.847	43999.734	998.309	72000.000	44000.000	1000.000	1.152	0.265	1.690
56191	72000.303	39999.390	995.579	72000.000	40000.000	1000.000	-0.303	0.609	4.420

45201	75999.643	47999.738	1000.271	76000.000	48000.000	1000.000	0.356	0.261	-0.271
55201	76000.267	43999.006	1001.045	76000.000	44000.000	1000.000	-0.267	0.993	-1.045
56201	76000.531	39999.697	999.736	76000.000	40000.000	1000.000	-0.531	0.302	0.263

STD ERRS FOR THE MODEL SIG X = 1.265 M SIG Y = 0.596 M SIG Z = 2.177 SIG PLAN = 1.399 SIG POS = 2.587

MODEL NO 52021

45201	75999.643	47999.738	1000.271	76000.000	48000.000	1000.000	0.356	0.261	-0.271
55201	76000.267	43999.006	1001.045	76000.000	44000.000	1000.000	-0.267	0.993	-1.045
56201	76000.531	39999.697	999.736	76000.000	40000.000	1000.000	-0.531	0.302	0.263
45211	80001.559	48000.490	998.831	80000.000	48000.000	1000.000	-1.559	-0.490	1.168
55211	80000.368	43998.260	1002.219	80000.000	44000.000	1000.000	-0.368	1.739	-2.219
56211	79998.629	39999.748	1002.804	80000.000	40000.000	1000.000	1.370	0.251	-2.804

STD ERRS FOR THE MODEL SIG X = 0.992 M SIG Y = 0.945 M SIG Z = 1.754 SIG PLAN = 1.371 SIG POS = 2.226

STD ERRS FOR THE STRIP SIG X = 1.031 M SIG Y = 1.383 M SIG Z = 2.370 SIG PLAN = 1.725 SIG POS = 2.931

MODEL NO 60102

5611	-1.379	39998.892	999.450	0.000	40000.000	1000.000	1.379	1.107	0.549
6611	-0.799	35999.249	1000.497	0.000	36000.000	1000.000	0.799	0.750	-0.497
6711	-0.031	32001.566	1000.742	0.000	32000.000	1000.000	0.031	-1.566	-0.742
5621	3998.487	39999.061	999.394	4000.000	40000.000	1000.000	1.512	0.938	0.605
6621	3999.177	35999.541	999.142	4000.000	36000.000	1000.000	0.822	0.458	0.857
6721	3998.409	32001.086	998.506	4000.000	32000.000	1000.000	1.590	-1.086	1.493

STD ERRS FOR THE MODEL SIG X = 1.267 M SIG Y = 1.141 M SIG Z = 0.941 SIG PLAN = 1.706 SIG POS = 1.948

MODEL NO 60203

5621	3998.487	39999.061	999.394	4000.000	40000.000	1000.000	1.512	0.938	0.605
6621	3999.177	35999.541	999.142	4000.000	36000.000	1000.000	0.822	0.458	0.857
6721	3998.409	32001.086	998.506	4000.000	32000.000	1000.000	1.590	-1.086	1.493
5631	7999.085	39999.696	1001.054	8000.000	40000.000	1000.000	0.914	0.303	-1.054
6631	7999.097	35999.851	999.314	8000.000	36000.000	1000.000	0.902	0.148	0.685
6731	7999.788	31999.518	995.563	8000.000	32000.000	1000.000	0.211	0.481	4.436

STD ERRS FOR THE MODEL SIG X = 1.199 M SIG Y = 0.723 M SIG Z = 2.217 SIG PLAN = 1.400 SIG POS = 2.623

MODEL NO 60304

5631	7999.085	39999.695	1001.054	8000.000	40000.000	1000.000	0.914	0.303	-1.054
6631	7999.097	35999.851	999.314	8000.000	36000.000	1000.000	0.902	0.148	0.685
6731	7999.788	31999.518	995.563	8000.000	32000.000	1000.000	0.211	0.481	4.436
5641	11997.550	39998.398	1003.206	12000.000	40000.000	1000.000	2.449	1.601	-3.206
6641	11999.111	35999.795	1003.282	12000.000	36000.000	1000.000	0.888	0.204	-3.282
6741	12000.822	32000.411	998.508	12000.000	32000.000	1000.000	-0.822	-0.411	1.491

STD ERRS FOR THE MODEL SIG X = 1.353 M SIG Y = 0.790 M SIG Z = 2.984 SIG PLAN = 1.567 SIG POS = 3.371

MODEL NO 60405

5641	11997.550	39998.398	1003.206	12000.000	40000.000	1000.000	2.449	1.601	-3.206

6641	11999.111	35999.795	1003.282	12000.000	36000.000	1000.000	0.888	0.204	-3.282
6741	12000.822	32000.411	998.508	12000.000	32000.000	1000.000	-0.822	-0.411	1.491
5651	15997.992	40000.531	998.769	16000.000	40000.000	1000.000	2.007	-0.531	1.230
6651	15999.491	35999.040	1000.846	16000.000	36000.000	1000.000	0.508	0.959	-0.846
6751	16001.291	31998.755	997.706	16000.000	32000.005	1000.000	-1.291	1.244	2.293

STD ERRS FOR THE MODEL SIG X = 1.638 M SIG Y = 1.051 M SIG Z = 2.480 SIG PLAN = 1.946 SIG POS = 3.153

MODEL NO 60506

5651	15997.992	40000.531	998.769	16000.000	40000.000	1000.000	2.007	-0.531	1.230
6651	15999.491	35999.040	1000.846	16000.000	36000.000	1000.000	0.508	0.959	-0.846
6751	16001.291	31998.755	997.706	16000.000	32000.000	1000.000	-1.291	1.244	2.293
5661	19999.113	40000.249	1000.527	20000.000	40000.000	1000.000	0.886	-0.249	-0.527
6661	20000.372	36000.119	1000.784	20000.000	36000.000	1000.000	-0.372	-0.119	-0.784
6761	20001.337	32001.473	1001.211	20000.000	32000.000	1000.000	-1.337	-1.473	-1.211

STD ERRS FOR THE MODEL SIG X = 1.316 M SIG Y = 0.999 M SIG Z = 1.403 SIG PLAN = 1.653 SIG POS = 2.168

MODEL NO 60607

5661	19999.113	40000.249	1000.527	20000.000	40000.000	1000.000	0.886	-0.249	-0.527
6661	20000.372	36000.119	1000.784	20000.000	36000.000	1000.000	-0.372	-0.119	-0.784
6761	20001.337	32001.473	1001.211	20000.000	32000.000	1000.000	-1.337	-1.473	-1.211
5671	23999.263	39999.353	1000.221	24000.000	40000.000	1000.000	0.736	0.646	-0.221
6671	24000.456	35999.564	999.999	24000.000	36000.000	1000.000	-0.456	0.435	0.000
6771	24000.699	32001.076	999.846	24000.000	32000.000	1000.000	-0.699	-1.076	0.153

STD ERRS FOR THE MODEL SIG X = 0.889 M SIG Y = 0.895 M SIG Z = 0.697 SIG PLAN = 1.262 SIG POS = 1.442

MODEL NO 60708

5671	23999.263	39999.353	1000.221	24000.000	40000.000	1000.000	0.736	0.646	-0.221
6671	24000.456	35999.564	999.999	24000.000	36000.000	1000.000	-0.456	0.435	0.000
6771	24000.699	32001.076	999.846	24000.000	32000.000	1000.000	-0.699	-1.076	0.153
5681	27998.965	39999.091	998.838	28000.000	40000.000	1000.000	1.034	0.909	1.161
6681	28000.192	35999.375	999.976	28000.000	36000.000	1000.000	-0.192	0.624	0.023
6781	27999.805	32001.475	999.670	28000.000	32000.000	1000.000	0.194	-1.475	0.329

STD ERRS FOR THE MODEL SIG X = 0.690 M SIG Y = 1.015 M SIG Z = 0.553 SIG PLAN = 1.228 SIG POS = 1.347

MODEL NO 60809

5681	27998.965	39999.091	998.838	28000.000	40000.000	1000.000	1.034	0.909	1.161
6681	28000.192	35999.375	999.976	28000.000	36000.000	1000.000	-0.192	0.624	0.023
6781	27999.805	32001.475	999.670	28000.000	32000.000	1000.000	0.194	-1.475	0.329
5691	31998.851	39999.371	999.076	32000.000	40000.000	1000.000	1.148	0.628	0.923
6691	31998.272	35999.765	998.893	32000.000	36000.000	1000.000	1.727	0.234	1.106
6791	31998.192	31999.583	996.049	32000.000	32000.000	1000.000	1.807	0.410	3.950

STD ERRS FOR THE MODEL SIG X = 1.320 M SIG Y = 0.895 M SIG Z = 1.956 SIG PLAN = 1.595 SIG POS = 2.524

MODEL NO 60910

5691	31998.851	39999.371	999.076	32000.000	40000.000	1000.000	1.148	[illegible]	0.923

6691	31998.272	35999.765	998.893	32000.000	36000.000	1000.000	1.727	0.234	1.106
6791	31998.192	31999.589	996.049	32000.000	32000.000	1000.000	1.807	0.410	3.950
56101	35999.043	40002.277	994.627	36000.000	40000.000	1000.000	0.956	-2.277	5.372
66101	36000.359	36000.528	995.759	36000.000	36000.000	1000.000	-0.359	-0.528	4.240
67101	36001.007	31998.332	994.333	36000.000	32000.000	1000.000	-1.007	1.667	5.666

STD ERRS FOR THE MODEL SIG X = 1.387 M SIG Y = 1.331 M SIG Z = 4.356 SIG PLAN = 1.923 SIG POS = 4.798

MODEL NO 61011

56101	35999.043	40002.277	994.627	36000.000	40000.000	1000.000	0.956	-2.277	5.372
66101	36000.359	36000.528	995.759	36000.000	36000.000	1000.000	-0.359	-0.528	4.240
67101	36001.007	31998.332	994.333	36000.000	32000.000	1000.000	-1.007	1.667	5.666
56111	40001.763	40000.116	998.122	40000.000	40000.000	1000.000	-1.763	-0.116	1.877
66111	40001.752	36000.382	1000.436	40000.000	36000.000	1000.000	-1.752	-0.382	-0.436
67111	40001.756	32001.984	1000.824	40000.000	32000.000	1000.000	-1.756	-1.984	-0.824

STD ERRS FOR THE MODEL SIG X = 1.505 M SIG Y = 1.571 M SIG Z = 4.083 SIG PLAN = 2.175 SIG POS = 4.626

MODEL NO 61112

56111	40001.763	40000.116	998.122	40000.000	40000.000	1000.000	-1.763	-0.116	1.877
66111	40001.752	36000.382	1000.436	40000.000	36000.000	1000.000	-1.752	-0.382	-0.436
67111	40001.756	32001.984	1000.824	40000.000	32000.000	1000.000	-1.756	-1.984	-0.824
56121	44000.502	39999.445	1000.377	44000.000	40000.000	1000.000	-0.502	0.554	-0.377
66121	44000.875	36001.084	1001.048	44000.000	36000.000	1000.000	-0.875	-1.084	-1.048
67121	44000.351	32003.164	1001.867	44000.000	32000.000	1000.000	-0.351	-3.164	-1.867

STD ERRS FOR THE MODEL SIG X = 1.442 M SIG Y = 1.766 M SIG Z = 1.350 SIG PLAN = 2.280 SIG POS = 2.650

MODEL NO 61213

56121	44000.502	39999.445	1000.377	44000.000	40000.000	1000.000	-0.502	0.554	-0.377
66121	44000.875	36001.084	1001.048	44000.000	36000.000	1000.000	-0.875	-1.084	-1.048
67121	44000.351	32003.164	1001.867	44000.000	32000.000	1000.000	-0.351	-3.164	-1.867
56131	47999.352	39999.259	997.616	48000.000	40000.000	1000.000	0.647	0.740	2.383
66131	47999.905	35999.973	999.617	48000.000	36000.000	1000.000	0.094	0.026	0.382
67131	47999.679	32001.516	999.787	48000.000	32000.000	1000.000	0.320	-1.516	0.212

STD ERRS FOR THE MODEL SIG X = 0.578 M SIG Y = 1.693 M SIG Z = 1.456 SIG PLAN = 1.789 SIG POS = 2.307

MODEL NO 61314

56131	47999.352	39999.259	997.616	48000.000	40000.000	1000.000	0.647	0.740	2.383
66131	47999.905	35999.973	999.617	48000.000	36000.000	1000.000	0.094	0.026	0.382
67131	47999.679	32001.516	999.787	48000.000	32000.000	1000.000	0.320	-1.516	0.212
56141	52000.421	39999.798	996.659	52000.000	40000.000	1000.000	-0.421	0.201	3.340
66141	51999.208	35999.676	999.537	52000.000	36000.000	1000.000	0.791	0.323	0.462
67141	51999.769	32000.043	999.939	52000.000	32000.000	1000.000	0.230	-0.043	0.060

STD ERRS FOR THE MODEL SIG X = 0.526 M SIG Y = 0.773 M SIG Z = 1.857 SIG PLAN = 0.936 SIG POS = 2.080

MODEL NO 61415

56141	52000.421	39999.798	996.659	52000.000	40000.000	1000.000	-0.421	0.201	3.340

66141	51999.208	35999.676	999.537	52000.000	36000.000	1000.000	0.791	0.323	0.462
67141	51999.769	32000.043	999.939	52000.000	32000.000	1000.000	0.230	-0.043	0.060
56151	56000.919	39999.040	997.620	56000.000	40000.000	1000.000	-0.919	0.959	2.380
66151	56000.577	35999.017	1000.143	56000.000	36000.000	1000.000	-0.577	0.982	-0.143
67151	56000.230	31999.563	999.433	56000.000	32000.000	1000.000	-0.230	0.436	0.566

STD ERRS FOR THE MODEL SIG X = 0.646 M SIG Y = 0.666 M SIG Z = 1.864 SIG PLAN = 0.928 SIG POS = 2.083

MODEL NO 61516

56151	56000.919	39999.040	997.620	56000.000	40000.000	1000.000	-0.919	0.959	2.380
66151	56000.577	35999.017	1000.143	56000.000	36000.000	1000.000	-0.577	0.982	-0.143
67151	56000.230	31999.563	999.433	56000.000	32000.000	1000.000	-0.230	0.436	0.566
56161	59999.108	39996.786	1000.954	60000.000	40000.000	1000.000	0.891	3.213	-0.954
66161	60000.021	35999.484	1002.376	60000.000	36000.000	1000.000	-0.021	0.515	-2.376
67161	60000.175	32000.875	1001.440	60000.000	32000.000	1000.000	-0.175	-0.875	-1.440

STD ERRS FOR THE MODEL SIG X = 0.641 M SIG Y = 1.639 M SIG Z = 1.711 SIG PLAN = 1.760 SIG POS = 2.454

MODEL NO 61617

56161	59999.108	39996.786	1000.954	60000.000	40000.000	1000.000	0.891	3.213	-0.954
66161	60000.021	35999.484	1002.376	60000.000	36000.000	1000.000	-0.021	0.515	-2.376
67161	60000.175	32000.875	1001.440	60000.000	32000.000	1000.000	-0.175	-0.875	-1.440
56171	63998.570	39999.404	996.262	64000.000	40000.000	1000.000	1.429	0.595	3.737
66171	63999.466	35998.767	1000.309	64000.000	36000.000	1000.000	0.533	1.232	-0.309
67171	64000.283	31999.723	1000.232	64000.000	32000.000	1000.000	-0.283	0.276	-0.232

STD ERRS FOR THE MODEL SIG X = 0.804 M SIG Y = 1.631 M SIG Z = 2.133 SIG PLAN = 1.818 SIG POS = 2.803

MODEL NO 61718

56171	63998.570	39999.404	996.262	64000.000	40000.000	1000.000	1.429	0.595	3.737
66171	63999.466	35998.767	1000.309	64000.000	36000.000	1000.000	0.533	1.232	-0.309
67171	64000.283	31999.723	1000.232	64000.000	32000.000	1000.000	-0.283	0.276	-0.232
56181	67998.895	39997.923	1000.063	68000.000	40000.000	1000.000	1.104	2.076	-0.063
66181	67999.142	35998.647	1002.127	68000.000	36000.000	1000.000	0.857	1.352	-2.127
67181	67998.372	32001.185	1002.496	68000.000	32000.000	1000.000	1.627	-1.185	-2.496

STD ERRS FOR THE MODEL SIG X = 1.184 M SIG Y = 1.378 M SIG Z = 2.230 SIG PLAN = 1.817 SIG POS = 2.877

MODEL NO 61819

56181	67998.895	39997.923	1000.063	68000.000	40000.000	1000.000	1.104	2.076	-0.063
66181	67999.142	35998.647	1002.127	68000.000	36000.000	1000.000	0.857	1.352	-2.127
67181	67998.372	32001.185	1002.496	68000.000	32000.000	1000.000	1.627	-1.185	-2.496
56191	71997.518	39999.499	1000.218	72000.000	40000.000	1000.000	2.481	0.500	-0.218
66191	71997.922	35999.853	1000.236	72000.000	36000.000	1000.000	2.077	0.146	-0.236
67191	71999.021	31999.502	999.142	72000.000	32000.000	1000.000	0.978	0.407	0.857

STD ERRS FOR THE MODEL SIG X = 1.790 M SIG Y = 1.263 M SIG Z = 1.523 SIG PLAN = 2.191 SIG POS = 2.669

MODEL NO 61920

56191	71997.518	39999.499	1000.218	72000.000	40000.00	1000.000	2.481	0.500	-0.218

66191	71997.922	35999.853	1000.236	72000.000	36000.000	1000.000	2.077	0.146	-0.236
67191	71999.021	31999.592	999.142	72000.000	32000.000	1000.000	0.978	0.407	0.857
56201	75998.697	39999.433	997.981	76000.000	40000.000	1000.000	1.302	0.566	2.018
66201	75999.518	35999.556	999.778	76000.000	36000.000	1000.000	0.481	0.443	0.221
67201	76000.002	31999.408	998.811	76000.000	32000.000	1000.000	-0.002	0.591	1.188

STD ERRS FOR THE MODEL SIG X = 1.634 M SIG Y = 0.511 M SIG Z = 1.129 SIG PLAN = 1.712 SIG POS = 2.051

MODEL NO 62021

56201	75998.697	39999.433	997.981	76000.000	40000.000	1000.000	1.302	0.566	2.018
66201	75999.518	35999.556	999.778	76000.000	36000.000	1000.000	0.481	0.443	0.221
67201	76000.002	31999.408	998.811	76000.000	32000.000	1000.000	-0.002	0.591	1.188
56211	79999.998	39999.224	999.233	80000.000	40000.000	1000.000	0.001	0.775	0.766
66211	80000.195	35999.770	1002.776	80000.000	36000.000	1000.000	-0.195	0.229	-2.776
67211	80000.635	32000.003	1000.797	80000.000	32000.000	1000.000	-0.635	-0.003	-0.797

STD ERRS FOR THE MODEL SIG X = 0.688 M SIG Y = 0.551 M SIG Z = 1.701 SIG PLAN = 0.882 SIG POS = 1.916

STD ERRS FOR THE STRIP SIG X = 1.092 M SIG Y = 1.082 M SIG Z = 1.979 SIG PLAN = 1.538 SIG POS = 2.506

MODEL NO 70102

6711	-1.430	31999.109	1000.225	0.000	32000.000	1000.000	1.430	0.890	-0.225
7711	-0.945	28000.574	1001.891	0.000	28000.000	1000.000	0.945	-0.574	-1.891
7811	0.459	24002.111	1000.689	0.000	24000.000	1000.000	-0.459	-2.111	-0.689
6721	3999.093	31998.707	999.529	4000.000	32000.000	1000.000	0.906	1.292	0.470
7721	3998.474	28000.461	1000.137	4000.000	28000.000	1000.000	1.525	-0.461	-0.137
7821	3999.040	24002.438	1000.640	4000.000	24000.000	1000.000	0.959	-2.438	-0.640

STD ERRS FOR THE MODEL SIG X = 1.201 M SIG Y = 1.637 M SIG Z = 0.975 SIG PLAN = 2.031 SIG POS = 2.253

MODEL NO 70203

6721	3999.093	31998.707	999.529	4000.000	32000.000	1000.000	0.906	1.292	0.470
7721	3998.474	28000.461	1000.137	4000.000	28000.000	1000.000	1.525	-0.461	-0.137
7821	3999.040	24002.438	1000.640	4000.000	24000.000	1000.000	0.959	-2.438	-0.640
6731	8000.270	32000.683	994.525	8000.000	32000.000	1000.000	-0.270	-0.683	5.474
7731	8000.085	27999.972	996.507	8000.000	28000.000	1000.000	-0.085	0.027	3.492
7831	7998.741	23999.257	996.902	8000.000	24000.000	1000.000	1.258	0.742	3.097

STD ERRS FOR THE MODEL SIG X = 1.071 M SIG Y = 1.330 M SIG Z = 3.237 SIG PLAN = 1.707 SIG POS = 3.660

MODEL NO 70304

6731	8000.270	32000.683	994.525	8000.000	32000.000	1000.000	-0.270	-0.683	5.474
7731	8000.085	27999.972	996.507	8000.000	28000.000	1000.000	-0.085	0.027	3.492
7831	7998.741	23999.257	996.902	8000.000	24000.000	1000.000	1.258	0.742	3.097
6741	12001.668	31999.637	996.848	12000.000	32000.000	1000.000	-1.668	0.362	3.151
7741	12001.286	27999.827	1000.296	12000.000	28000.000	1000.000	-1.286	0.172	-0.296
7841	12001.407	24000.708	1000.077	12000.000	24000.000	1000.000	-1.407	-0.708	-0.077

STD ERRS FOR THE MODEL SIG X = 1.271 M SIG Y = 0.580 M SIG Z = 3.515 SIG PLAN = 1.397 SIG POS = 3.783

MODEL NO 70405

6741	12001.668	31999.637	996.848	12000.000	32000.000	1000.000	-1.668	0.362	3.151
7741	12001.286	27999.827	1000.296	12000.000	28000.000	1000.000	-1.286	0.172	-0.296
7841	12001.407	24000.708	1000.077	12000.000	24000.000	1000.000	-1.407	-0.708	-0.077
6751	16001.009	31995.425	1001.202	16000.000	32000.000	1000.000	-1.009	4.574	-1.202
7751	16000.378	27999.002	1001.646	16000.000	28000.000	1000.000	-0.378	0.997	-1.646
7851	15999.933	24000.106	999.256	16000.000	24000.000	1000.000	0.066	-0.106	0.743

STD ERRS FOR THE MODEL SIG X = 1.231 M SIG Y = 2.125 M SIG Z = 1.716 SIG PLAN = 2.457 SIG POS = 2.997

MODEL NO 70506

6751	16001.009	31995.425	1001.202	16000.000	32000.000	1000.000	-1.009	4.574	-1.202
7751	16000.378	27999.002	1001.646	16000.000	28000.000	1000.000	-0.378	0.997	-1.646
7851	15999.933	24000.106	999.256	16000.000	24000.000	1000.000	0.066	-0.106	0.743
6761	19999.230	31996.936	999.751	20000.000	32000.000	1000.000	0.769	3.063	0.248
7761	20000.478	27999.087	999.833	20000.000	28000.000	1000.000	-0.478	0.912	0.166
7861	20000.943	23998.766	996.717	20000.000	24000.000	1000.000	-0.943	1.233	3.282

STD ERRS FOR THE MODEL SIG X = 0.758 M SIG Y = 2.595 M SIG Z = 1.764 SIG PLAN = 2.703 SIG POS = 3.228

MODEL NO 70607

6761	19999.230	31996.936	999.751	20000.000	32000.000	1000.000	0.769	3.063	0.248
7761	20000.478	27999.087	999.833	20000.000	28000.000	1000.000	-0.478	0.912	0.166
7861	20000.943	23998.766	996.717	20000.000	24000.000	1000.000	-0.943	1.233	3.282
6771	23998.220	31997.584	997.636	24000.000	32000.000	1000.000	1.779	2.415	2.363
7771	23999.582	27999.035	999.401	24000.000	28000.000	1000.000	0.417	0.964	0.598
7871	24001.046	23999.816	998.399	24000.000	24000.000	1000.000	-1.046	0.183	1.600

STD ERRS FOR THE MODEL SIG X = 1.108 M SIG Y = 1.925 M SIG Z = 1.968 SIG PLAN = 2.222 SIG POS = 2.968

MODEL NO 70708

6771	23998.220	31997.584	997.636	24000.000	32000.000	1000.000	1.779	2.415	2.363
7771	23999.582	27999.035	999.401	24000.000	28000.000	1000.000	0.417	0.964	0.598
7871	24001.046	23999.816	998.399	24000.000	24000.000	1000.000	-1.046	0.183	1.600
6781	27999.881	32000.068	996.159	28000.000	32000.000	1000.000	0.118	-0.068	3.840
7781	27999.522	27999.688	998.005	23000.000	28000.000	1000.000	0.477	0.311	1.994
7881	27999.201	23999.717	997.757	28000.000	24000.000	1000.000	0.798	0.282	2.242

STD ERRS FOR THE MODEL SIG X = 1.031 M SIG Y = 1.181 M SIG Z = 2.540 SIG PLAN = 1.568 SIG POS = 2.985

MODEL NO 70809

6781	27999.881	32000.068	996.159	28000.000	32000.000	1000.000	0.118	-0.068	3.840
7781	27999.522	27999.688	998.005	28000.000	28000.000	1000.000	0.477	0.311	1.994
7881	27999.201	23999.717	997.757	28000.000	24000.000	1000.000	0.798	0.282	2.242
6791	31998.222	31999.421	1000.355	32000.000	32000.000	1000.000	1.777	0.578	-0.355
7791	32000.142	28000.337	1002.064	32000.000	28000.000	1000.000	-0.142	-0.337	-2.064
7891	32001.310	24001.469	1001.068	32000.000	24000.000	1000.000	-1.310	-1.469	-1.068

STD ERRS FOR THE MODEL SIG X = 1.074 M SIG Y = 0.747 M SIG Z = 2.420 SIG PLAN = 1.309 SIG POS = 2.751

MODEL NO 70910

6791	31998.222	31999.421	1000.355	32000.000	32000.000	1000.000	1.777	0.578	-0.355
7791	32000.142	28000.337	1002.064	32000.000	28000.000	1000.000	-0.142	-0.337	-2.064
7891	32001.310	24001.469	1001.068	32000.000	24000.000	1000.000	-1.310	-1.469	-1.068
67101	35998.818	31999.752	998.047	36000.000	32000.000	1000.000	1.181	0.247	1.952
77101	35999.696	28000.139	1002.747	36000.000	28000.000	1000.000	0.303	-0.139	-2.747
78101	36000.612	24001.602	1004.908	36000.000	24000.000	1000.000	-0.612	-1.602	-4.908

STD ERRS FOR THE MODEL SIG X = 1.162 M SIG Y = 1.025 M SIG Z = 2.863 SIG PLAN = 1.550 SIG POS = 3.255

MODEL NO 71011

67101	35998.818	31999.752	998.047	36000.000	32000.000	1000.000	1.181	0.247	1.952
77101	35999.696	28000.139	1002.747	36000.000	28000.000	1000.000	0.303	-0.139	-2.747
78101	36000.612	24001.602	1004.908	36000.000	24000.000	1000.000	-0.612	-1.602	-4.908
67111	39999.669	32000.201	1000.680	40000.000	32000.000	1000.000	0.330	-0.201	-0.680
77111	39998.864	28001.410	1004.273	40000.000	28000.000	1000.000	1.135	-1.410	-4.273
78111	39998.843	24002.971	1004.379	40000.000	24000.000	1000.000	1.156	-2.971	-4.379

STD ERRS FOR THE MODEL SIG X = 0.959 M SIG Y = 1.643 M SIG Z = 3.830 SIG PLAN = 1.903 SIG POS = 4.277

MODEL NO 71112

67111	39999.669	32000.201	1000.680	40000.000	32000.000	1000.000	0.330	-0.201	-0.680
77111	39998.864	28001.410	1004.273	40000.000	28000.000	1000.000	1.135	-1.410	-4.273
78111	39998.843	24002.971	1004.379	40000.000	24000.000	1000.000	1.156	-2.971	-4.379
67121	43999.358	32001.007	1002.141	44000.000	32000.000	1000.000	0.642	-1.007	-2.141
77121	43999.088	28001.297	1002.738	44000.000	28000.000	1000.000	0.911	-1.297	-2.738
78121	43999.375	24001.560	1003.113	44000.000	24000.000	1000.000	0.624	-1.560	-3.113

STD ERRS FOR THE MODEL SIG X = 0.934 M SIG Y = 1.788 M SIG Z = 3.455 SIG PLAN = 2.018 SIG POS = 4.001

MODEL NO 71213

67121	43999.358	32001.007	1002.141	44000.000	32000.000	1000.000	0.642	-1.007	-2.141
77121	43999.088	28001.297	1002.738	44000.000	28000.000	1000.000	0.911	-1.297	-2.738
78121	43999.375	24001.560	1003.113	44000.000	24000.000	1000.000	0.624	-1.560	-3.113
67131	48000.001	31999.388	1000.611	48000.000	32000.000	1000.000	-0.001	0.611	-0.611
77131	48000.019	28000.243	1002.160	48000.000	28000.000	1000.000	-0.019	-0.243	-2.160
78131	47999.528	24000.459	1003.137	48000.000	24000.000	1000.000	0.471	-0.459	-3.137

STD ERRS FOR THE MODEL SIG X = 0.6[illegible] SIG Y = 1.075 M SIG Z = 2.708 SIG PLAN = 1.235 SIG POS = 2.976

MODEL NO 71314

67131	48000.001	31999.388	1000.611	48000.000	32000.000	1000.000	-0.001	0.611	-0.611
77131	48000.019	28000.243	1002.160	48000.000	28000.000	1000.000	-0.019	-0.243	-2.160
78131	47999.528	24000.459	1003.137	48000.000	24000.000	1000.000	0.471	-0.459	-3.137
67141	52000.507	31998.913	999.402	52000.000	32000.000	1000.000	-0.507	1.086	0.597
77141	52000.442	28000.045	1002.472	52000.000	28000.000	1000.000	-0.442	-0.045	-2.472
78141	52000.022	24001.258	1003.708	52000.000	24000.000	1000.000	-0.022	-1.258	-3.708

STD ERRS FOR THE MODEL SIG X = 0.367 M SIG Y = 0.826 M SIG Z = 2.649 SIG PLAN = 0.904 SIG POS = 2.799

MODEL NO 71415

67141	52000.507	31998.913	999.402	52000.000	32000.000	1000.000	-0.507	1.086	0.597
77141	52000.442	28000.045	1002.472	52000.000	28000.000	1000.000	-0.442	-0.045	-2.472
78141	52000.022	24001.258	1003.708	52000.000	24000.000	1000.000	-0.022	-1.258	-3.708
67151	55999.347	31999.897	997.495	56000.000	32000.000	1000.000	0.652	0.102	2.504
77151	56000.105	28000.498	1000.121	56000.000	28000.000	1000.000	-0.105	-0.498	-0.121
78151	56000.566	24000.472	1002.206	56000.000	24000.000	1000.000	-0.566	-0.472	-2.206

STD ERRS FOR THE MODEL SIG X = 0.492 M SIG Y = 0.806 M SIG Z = 2.504 SIG PLAN = 0.944 SIG POS = 2.677

MODEL NO 71516

67151	55999.347	31999.897	997.495	56000.000	32000.000	1000.000	0.652	0.102	2.504
77151	56000.105	28000.498	1000.121	56000.000	28000.000	1000.000	-0.105	-0.498	-0.121
78151	56000.566	24000.472	1002.206	56000.000	24000.000	1000.000	-0.566	-0.472	-2.206
67161	59999.251	31998.256	998.282	60000.000	32000.000	1000.000	0.748	1.743	1.717
77161	59999.645	27999.882	1002.624	60000.000	28000.000	1000.000	0.354	0.117	-2.624
78161	59998.867	24002.269	1006.347	60000.000	24000.000	1000.000	1.132	-2.269	-6.347

STD ERRS FOR THE MODEL SIG X = 0.738 M SIG Y = 1.317 M SIG Z = 3.501 SIG PLAN = 1.510 SIG POS = 3.813

MODEL NO 71617

67161	59999.251	31998.256	998.282	60000.000	32000.000	1000.000	0.748	1.743	1.717
77161	59999.645	27999.882	1002.624	60000.000	28000.000	1000.000	0.354	0.117	-2.624
78161	59998.867	24002.269	1006.347	60000.000	24000.000	1000.000	1.132	-2.269	-6.347
67171	63999.941	31999.780	998.039	64000.000	32000.000	1000.000	0.058	0.219	1.960
77171	63998.653	27999.764	1001.716	64000.000	28000.000	1000.000	1.346	0.235	-1.716
78171	63998.024	24000.527	1004.390	64000.000	24000.000	1000.000	1.975	-0.527	-4.390

STD ERRS FOR THE MODEL SIG X = 1.239 M SIG Y = 1.310 M SIG Z = 3.903 SIG PLAN = 1.804 SIG POS = 4.300

MODEL NO 71718

67171	63999.941	31999.780	998.039	64000.000	32000.000	1000.000	0.058	0.219	1.960
77171	63998.653	27999.764	1001.716	64000.000	28000.000	1000.000	1.346	0.235	-1.716
78171	63998.024	24000.527	1004.390	64000.000	24000.000	1000.000	1.975	-0.527	-4.390
67181	67999.695	31999.476	1001.639	68000.000	32000.000	1000.000	0.304	0.523	-1.639
77181	67999.575	28000.472	1002.819	68000.000	28000.000	1000.000	0.424	-0.472	-2.819
78181	67998.675	23999.689	1001.557	68000.000	24000.000	1000.000	1.324	0.310	-1.557

STD ERRS FOR THE MODEL SIG X = 1.244 M SIG Y = 0.442 M SIG Z = 2.797 SIG PLAN = 1.320 SIG POS = 3.093

MODEL NO 71819

67181	67999.695	31999.476	1001.639	68000.000	32000.000	1000.000	0.304	0.523	-1.639
77181	67999.575	28000.472	1002.819	68000.000	28000.000	1000.000	0.424	-0.472	-2.819
78181	67998.675	23999.689	1001.557	68000.000	24000.000	1000.000	1.324	0.310	-1.557
67191	72000.205	31999.329	1000.994	72000.000	32000.000	1000.000	-0.205	0.670	-0.994
77191	72000.389	27999.814	1002.684	72000.000	28000.000	1000.000	-0.389	0.185	-2.684
78191	72000.293	24000.249	1003.187	72000.000	24000.000	1000.000	-0.293	-0.249	-3.187

STD ERRS FOR THE MODEL SIG X = 0.679 M SIG Y = 0.477 M SIG Z = 2.506 SIG PLAN = 0.830 SIG POS = 2.640

MODEL NO 71920

67191	72000.205	31999.329	1000.994	72000.000	32000.000	1000.000	-0.205	0.670	-0.994
77191	72000.389	27999.814	1002.684	72000.000	28000.000	1000.000	-0.389	0.185	-2.684
78191	72000.293	24000.249	1003.187	72000.000	24000.000	1000.000	-0.293	-0.249	-3.187
67201	75999.880	31999.170	1002.656	76000.000	32000.000	1000.000	0.119	0.829	-2.656
77201	76000.431	28000.274	1003.751	76000.000	28000.000	1000.000	-0.431	-0.274	-3.751
78201	76000.404	24000.256	1002.045	76000.000	24000.000	1000.000	-0.404	-0.256	-2.045

STD ERRS FOR THE MODEL SIG X = 0.358 M SIG Y = 0.524 M SIG Z = 2.955 SIG PLAN = 0.635 SIG POS = 3.022

MODEL NO 72021

67201	75999.880	31999.170	1002.656	76000.000	32000.000	1000.000	0.119	0.829	-2.656
77201	76000.431	28000.274	1003.751	76000.000	28000.000	1000.000	-0.431	-0.274	-3.751
78201	76000.404	24000.256	1002.045	76000.000	24000.000	1000.000	-0.404	-0.256	-2.045
67211	79998.475	32000.154	999.715	80000.000	32000.000	1000.000	1.524	-0.194	0.284
77211	80000.024	28001.143	1000.609	80000.000	28000.000	1000.000	-0.024	-1.143	-0.609
78211	80002.181	23999.720	997.767	80000.000	24000.000	1000.000	-2.181	0.279	2.232

STD ERRS FOR THE MODEL SIG X = 1.220 M SIG Y = 0.671 M SIG Z = 2.479 SIG PLAN = 1.392 SIG POS = 2.844

STD ERRS FOR THE STRIP SIG X = 0.901 M SIG Y = 1.225 M SIG Z = 2.576 SIG PLAN = 1.521 SIG POS = 2.992

MODEL NO 80102

7811	-3.113	23999.982	998.635	0.000	24000.000	1000.000	3.113	0.017	1.364
8811	-1.105	19997.590	1003.064	0.000	20000.000	1000.000	1.105	2.409	-3.064
8911	0.010	15996.918	1000.662	0.000	16000.000	1000.000	-0.010	3.081	-0.662
7821	4000.287	23999.467	998.944	4000.000	24000.000	1000.000	-0.287	0.532	1.055
8821	4001.240	19998.496	1001.192	4000.000	20000.000	1000.000	-1.240	1.503	-1.192
8921	4000.491	15999.089	1000.819	4000.000	16000.000	1000.000	-0.491	0.910	-0.819

STD ERRS FOR THE MODEL SIG X = 1.598 M SIG Y = 1.932 M SIG Z = 1.725 SIG PLAN = 2.508 SIG POS = 3.044

MODEL NO 80203

7821	4000.287	23999.467	998.944	4000.000	24000.000	1000.000	-0.287	0.532	1.055
8821	4001.240	19998.496	1001.192	4000.000	20000.000	1000.000	-1.240	1.503	-1.192
8921	4000.491	15999.089	1000.819	4000.000	16000.000	1000.000	-0.491	0.910	-0.819
7831	8001.836	24000.329	999.827	8000.000	24000.000	1000.000	-1.836	-0.329	0.172
8831	8002.018	19999.612	1001.448	8000.000	20000.000	1000.000	-2.018	0.387	-1.448
8931	8001.829	16000.402	999.694	8000.000	16000.000	1000.000	-1.829	-0.402	0.305

STD ERRS FOR THE MODEL SIG X = 1.591 M SIG Y = 0.870 M SIG Z = 1.041 SIG PLAN = 1.813 SIG POS = 2.091

MODEL NO 80304

7831	8001.836	24000.329	999.827	8000.000	24000.000	1000.000	-1.836	-0.329	0.172
8831	8002.018	19999.612	1001.448	8000.000	20000.000	1000.000	-2.018	0.387	-1.448
8931	8001.829	16000.402	999.694	2000.000	16000.000	1000.000	-1.829	-0.402	0.305
7841	12003.050	23998.785	1002.130	12000.000	24000.000	1000.000	-3.050	1.214	-2.130
8841	12002.251	20000.102	1000.558	12000.000	20000.000	1000.000	-2.251	-0.102	-0.558
8941	12001.440	16001.577	999.267	12000.000	16000.000	1000.000	-1.440	-1.577	0.732

STD ERRS FOR THE MODEL SIG X = 2.334 M SIG Y = 0.937 M SIG Z = 1.233 SIG PLAN = 2.515 SIG POS = 2.801

MODEL NO 80405

7841	12003.050	23998.785	1002.130	12000.000	24000.000	1000.000	-3.050	1.214	-2.130
8841	12002.251	20000.102	1000.558	12000.000	20000.000	1000.000	-2.251	-0.102	-0.558
8941	12001.440	16001.577	999.267	12000.000	16000.000	1000.000	-1.440	-1.577	0.732
7851	16001.330	23999.150	1001.443	16000.000	24000.000	1000.000	-1.330	0.849	-1.443
8851	16002.082	19999.906	999.481	16000.000	20000.000	1000.000	-2.082	0.093	0.518
8951	16002.111	16000.728	998.057	16000.000	16000.000	1000.000	-2.111	-0.728	1.942

STD ERRS FOR THE MODEL SIG X = 2.324 M SIG Y = 1.023 M SIG Z = 1.517 SIG PLAN = 2.539 SIG POS = 2.958

MODEL NO 80506

7851	16001.330	23999.150	1001.443	16000.000	24000.000	1000.000	-1.330	0.849	-1.443
8851,	16002.082	19999.906	999.481	16000.000	20000.000	1000.000	-2.082	0.093	0.518
8951	16002.111	16000.728	998.057	16000.000	16000.000	1000.000	-2.111	-0.728	1.942
7861	20001.005	23998.904	1000.081	20000.000	24000.000	1000.000	-1.005	1.095	-0.081
8861	20001.226	19999.822	1002.304	20000.000	20000.000	1000.000	-1.226	0.177	-2.304
8961	20001.649	16002.279	1000.466	20000.000	16000.000	1000.000	-1.649	-2.279	-0.466

STD ERRS FOR THE MODEL SIG X = 1.777 M SIG Y = 1.240 M SIG Z = 1.526 SIG PLAN = 2.167 SIG POS = 2.651

MODEL NO 80607

7861	20001.005	23998.904	1000.081	20000.000	24000.000	1000.000	-1.005	1.095	-0.081
8861	20001.226	19999.822	1002.304	20000.000	20000.000	1000.000	-1.226	0.177	-2.304
8961	20001.649	16002.279	1000.466	20000.000	16000.000	1000.000	-1.649	-2.279	-0.466
7871	23998.282	23998.340	1002.695	24000.000	24000.000	1000.000	1.717	1.659	-2.695
8871	23997.768	20000.166	1001.576	24000.000	20000.000	1000.000	2.231	-0.166	-1.576
8971	23998.279	16002.314	999.699	24000.000	16000.000	1000.000	1.720	-2.314	0.300

STD ERRS FOR THE MODEL SIG X = 1.795 M SIG Y = 1.706 M SIG Z = 1.753 SIG PLAN = 2.477 SIG POS = 3.035

MODEL NO 80708

7871	23998.282	23998.340	1002.695	24000.000	24000.000	1000.000	1.717	1.659	-2.695
8871	23997.768	20000.166	1001.576	24000.000	20000.000	1000.000	2.231	-0.166	-1.576
8971	23998.279	16002.314	999.699	24000.000	16000.000	1000.000	1.720	-2.314	0.300
7881	27996.580	23999.097	999.791	28000.000	24000.000	1000.000	3.419	0.902	0.208
8881	27997.285	19999.460	998.289	28000.000	20000.000	1000.000	2.714	0.539	1.710
8981	27998.497	16000.684	998.086	28000.000	16000.000	1000.000	1.502	-0.684	1.913

STD ERRS FOR THE MODEL SIG X = 2.532 M SIG Y = 1.393 M SIG Z = 1.814 SIG PLAN = 2.895 SIG POS = 3.417

MODEL NO 80809

7881	27996.580	23999.097	999.791	28000.000	24000.000	1000.000	3.419	0.[illegible]2	0.208
8881	27997.285	19999.460	998.289	28000.000	20000.000	1000.000	2.714	0.[illegible]9	1.710
8981	27998.497	16000.684	998.086	28000.000	16000.000	1000.000	1.502	-0.684	1.913
7891	31997.754	23998.935	1001.835	32000.000	24000.000	1000.000	2.245	1.064	-1.835
8891	31997.805	19999.335	1002.194	32000.000	2[illegible]000.000	1000.000	2.194	0.664	-2.194
8991	31996.516	16001.338	1001.692	32000.000	16000.000	1000.000	3.483	-1.338	-1.692

STD ERRS FOR THE MODEL SIG X = 2.943 M SIG Y = 0.994 M SIG Z = 1.880 SIG PLAN = 3.106 SIG POS = 3.631

MODEL NO 80910

7891	31997.754	23998.935	1001.835	32000.000	24000.000	1000.000	2.245	1.064	-1.835
8891	31997.805	19999.335	1002.194	32000.000	20000.000	1000.000	2.194	0.664	-2.194
8991	31996.516	16001.338	1001.692	32000.000	16000.000	1000.000	3.483	-1.338	-1.692
78101	35996.533	23998.063	1004.551	36000.000	24000.000	1000.000	3.466	1.936	-4.551
88101	[illegible]6.997	19999.269	1003.146	36000.000	20000.000	1000.000	3.002	0.730	-3.146
89101	[illegible]97.145	16000.090	1000.556	36000.000	16000.000	1000.000	2.854	-0.090	-0.556

STD ERRS FOR THE MODEL SIG X = 3.193 M SIG Y = 1.237 M SIG Z = 2.897 SIG PLAN = 3.430 SIG POS = 4.490

MODEL NO 81011

78101	35996.533	23998.063	1004.551	36000.000	24000.0[illegible]	1000.000	3.466	1.936	-4.551
88101	35996.997	19999.269	1003.146	36000.000	20000.000	1000.000	3.002	0.730	-3.146
89101	35997.145	16000.090	1000.556	36000.000	16000.000	1000.000	2.854	-0.030	-0.556
78111	39997.238	23999.906	1001.423	40000.000	24000.000	1000.000	2.761	0.093	-1.423
88111	39997.573	19999.156	1002.325	40000.000	20000.000	1000.000	2.426	0.843	-2.325
89111	39998.471	15998.974	998.928	40000.000	16000.000	1000.000	1.528	1.025	1.071

STD ERRS FOR THE MODEL SIG X = 3.000 M SIG Y = 1.101 M SIG Z = 2.810 SIG PLAN = 3.196 SIG POS = 4.256

MODEL NO 81112

78111	39997.238	23999.906	1001.423	40000.000	24000.000	1000.000	2.761	0.093	-1.423
88111	39997.573	19999.156	1002.325	40000.000	20000.000	1000.000	2.426	0.843	-2.325
89111	39998.471	15998.974	998.928	40000.000	16000.000	1000.000	1.528	1.025	1.071
78121	43998.194	23998.366	1004.560	44000.000	24000.000	1000.000	1.805	1.634	-4.560
88121	43998.868	19999.403	1004.803	44000.000	20000.000	1000.000	1.131	0.596	-4.803
89121	44000.055	15999.306	1000.559	44000.000	16000.000	1000.000	-0.055	0.093	-0.559

STD ERRS FOR THE MODEL SIG X = 2.019 M SIG Y = 0.980 M SIG Z = 3.248 SIG PLAN = 2.244 SIG POS = 3.948

MODEL NO 81213

78121	43998.194	23998.366	1004.560	44000.000	24000.000	1000.000	1.805	1.634	-4.560
88121	43998.868	19999.403	1004.803	44000.000	20000.000	1000.000	1.131	0.596	-4.803
89121	44000.055	15999.906	1000.559	44000.000	16000.000	1000.000	-0.055	0.093	-0.559
78131	47998.633	23999.217	1004.844	48000.000	24000.000	1000.000	1.366	0.782	-4.844
88131	47999.894	19999.817	1004.012	48000.000	20000.000	1000.000	0.105	0.182	-4.012
89131	48000.571	16000.785	1000.877	48000.000	16000.000	1000.000	-0.571	-0.785	-0.877

STD ERRS FOR THE MODEL SIG X = 1.161 M SIG Y = 0.927 M SIG Z = 4.111 SIG PLAN = 1.486 SIG POS = 4.371

MODEL NO 81314

78131	47998.639	23999.217	1004.844	48000.000	24000.000	1000.000	1.366	0.782	-4.844
88131	47999.894	19999.817	1004.012	48000.000	20000.000	1000.000	0.105	0.182	-4.012
89131	48000.571	16000.785	1000.877	48000.000	16000.000	1000.000	-0.571	-0.785	-0.877
78141	51999.984	27999.484	1004.006	52000.000	24000.000	1000.000	0.015	0.515	-4.006
88141	52000.537	19999.397	1003.964	52000.000	20000.000	1000.000	-0.537	0.602	-3.964
89141	52001.808	15999.764	1000.980	52000.000	16000.000	1000.000	-1.808	0.235	-0.980

STD ERRS FOR THE MODEL SIG X = 1.073 M SIG Y = 0.623 M SIG Z = 3.822 SIG PLAN = 1.241 SIG POS = 4.019

MODEL NO 81415

78141	51999.984	23999.484	1004.006	52000.000	24000.000	1000.000	0.015	0.515	-4.006
88141	52000.537	19999.397	1003.964	52000.000	20000.000	1000.000	-0.537	0.602	-3.964
89141	52001.808	15999.764	1000.980	52000.000	16000.000	1000.000	-1.808	0.235	-0.980
78151	56001.397	23999.412	1000.992	56000.000	24000.000	1000.000	-1.397	0.587	-0.992
88151	56001.675	19999.327	1000.930	56000.000	20000.000	1000.000	-1.675	0.672	-0.930
89151	56001.944	15999.766	999.173	56000.000	16000.000	1000.000	-1.944	0.233	[illegible]

STD ERRS FOR THE MODEL SIG X = 1.555 M SIG Y = 0.554 M SIG Z = 2.655 SIG PLAN = 1.651 SIG POS = 3.127

MODEL NO 81516

78151	56001.397	23999.412	1000.992	56000.000	24000.000	1000.000	-1.397	0.587	-0.992
88151	56001.675	19999.327	1000.930	56000.000	20000.000	1000.000	-1.675	0.672	-0.930
89151	56001.944	15999.766	999.173	56000.000	16000.000	1000.000	-1.944	0.233	0.826
78161	60000.992	24000.330	999.460	60000.000	24000.000	1000.000	-0.992	-0.330	0.539
88161	60001.699	20000.688	1000.393	60000.000	20000.000	1000.000	-1.699	-0.688	-0.393
89161	60002.078	16001.138	997.734	60000.000	16000.000	1000.000	-2.078	-1.138	2.265

STD ERRS FOR THE MODEL SIG X = 1.829 M SIG Y = 0.738 M SIG Z = 1.273 SIG PLAN = 1.973 SIG POS = 2.348

MODEL NO 81617

78161	60000.992	24000.330	993.460	60000.000	24000.000	1000.000	-0.992	-0.330	0.539
88161	60001.699	20000.688	1000.393	60000.000	20000.000	1000.000	-1.699	-0.688	-0.393
89161	60002.078	16001.138	997.734	60000.000	16000.000	1000.000	-2.078	-1.138	2.265
78171	63999.575	23998.957	1002.118	64000.000	24000.000	1000.000	0.424	1.042	-2.118
88171	63999.956	20000.951	1000.499	64000.000	20000.000	1000.000	0.043	-0.951	-0.499
89171	64000.730	16002.749	998.267	64000.000	16000.000	1000.000	-0.730	-2.749	1.732

STD ERRS FOR THE MODEL SIG X = 1.334 M SIG Y = 1.511 M SIG Z = 1.632 SIG PLAN = 2.016 SIG POS = 2.594

MODEL NO 81718

78171	63999.575	23998.957	1002.118	64000.000	24000.000	1000.000	0.424	1.042	-2.118
88171	63999.956	20000.951	1000.499	64000.000	20000.000	1000.000	0.043	-0.951	-0.499
89171	64000.730	16002.749	998.267	64000.000	16000.000	1000.000	-0.730	-2.749	1.732
72181	67997.962	23999.621	999.703	68000.000	24000.000	1000.000	2.037	0.378	0.296
88181	67998.906	20001.034	1001.219	68000.000	20000.000	1000.000	1.093	-1.034	-1.219
89181	67999.137	16003.019	999.656	68000.000	16000.000	1000.000	0.862	-3.019	0.343

STD ERRS FOR THE MODEL SIG X = 1.166 M SIG Y = 1.993 M SIG Z = 1.373 SIG PLAN = 2.310 SIG POS = 2.687

MODEL NO 81819

78181	67997.962	23999.621	999.703	68000.000	24000.000	1000.000	2.037	0.378	0.296
88181	67998.906	20001.034	1001.219	68000.000	20000.000	1000.000	1.093	-1.034	-1.219
89181	67999.137	16003.019	999.656	68000.000	16000.000	1000.000	0.862	-3.019	0.343
78191	71998.526	24000.102	999.773	72000.000	24000.000	1000.000	1.473	-0.102	0.226
88191	71997.631	20000.539	1001.138	72000.000	20000.000	1000.000	2.368	-0.539	-1.138
89191	71997.136	16000 870	997.615	72000.000	16000.000	1000.000	2.863	-0.870	2.384

STD ERRS FOR THE MODEL SIG X = 2.101 M SIG Y = 1.509 M SIG Z = 1.320 SIG PLAN = 2.587 SIG POS = 2.904

MODEL NO 81920

78191	71998.526	24000.102	999.773	72000.000	24000.000	1000.000	1.473	-0.102	0.226
88191	71997.631	20000.539	1001.138	72000.000	20000.000	1000.000	2.368	-0.539	-1.138
89191	71997.136	16000.870	997.615	72000.000	16000.000	1000.000	2.863	-0.870	2.384
78201	75997.886	24001.992	997.559	76000.000	24000.000	1000.000	2.113	-1.992	2.140
88201	75998.149	19999.982	998.315	76000.000	20000.000	1000.000	1.850	0.017	1.684
89201	75997.999	16000.236	997.328	76000.000	16000.000	1000.000	2.000	-0.236	2.671

STD ERRS FOR THE MODEL SIG X = 2.361 M SIG Y = 1.008 M SIG Z = 2.077 SIG PLAN = 2.567 SIG POS = 3.303

MODEL NO 82021

78201	75997.886	24001.992	997.859	76000.000	24000.000	1000.000	2.113	-1.992	2.140
88201	75998.149	19999.982	998.315	76000.000	20000.000	1000.000	1.850	0.017	1.684
89201	75997.999	16000.236	997.328	76000.000	16000.000	1000.000	[illegible]	-0.236	2.671
78211	80002.318	23999.522	1000.357	80000.000	24000.000	1000.000	[illegible]	0.477	-0.357
88211	80000.141	19998.139	1001.173	80000.000	20000.000	1000.000	[illegible]	1.860	-1.173
89211	79998.257	15999.629	1000.698	80000.000	16000.000	1000.000	[illegible]	0.370	-0.698

STD ERRS FOR THE MODEL SIG X = 2.016 M SIG Y = 1.253 M SIG Z = 1.819 SIG PLAN = 2.374 SIG POS = 2.990

STD ERRS FOR THE STRIP SIG X = 1.903 M SIG Y = 1.136 M SIG Z = 2.060 SIG PLAN = 2.216 SIG POS = 3.026

MODEL NO 90102

8911	4.883	16004.996	999.989	0.000	16000.000	1000.000	-4.883	-4.996	0.010
9911	0.094	12005.354	998.832	0.000	12000.000	1000.000	-0.094	-5.354	1.167
91011	-3.134	8006.048	998.257	0.000	8000.000	1000.000	3.134	-6.048	1.742
8921	4003.570	15998.431	1000.401	4000.000	16000.000	1000.000	-3.570	1.568	-0.401
9921	3999.491	12000.636	999.766	4000.000	12000.000	1000.000	0.508	-0.636	0.233
91021	3995.046	8002.090	999.337	4000.000	8000.000	1000.000	4.953	-2.090	0.662

STD ERRS FOR THE MODEL SIG X = 3.774 M SIG Y = 4.414 M SIG Z = 1.005 SIG PLAN = 5.808 SIG POS = 5.894

MODEL NO 90203

8921	4003.570	15998.431	1000.401	4000.000	16000.000	1000.000	-3.570	1.568	-0.401
9921	3999.491	12000.636	999.766	4000.000	12000.000	1000.000	0.508	-0.636	0.233
91021	3995.046	8002.090	999.337	4000.000	8000.000	1000.000	4.953	-2.090	0.662
8931	7999.415	15993.492	997.620	8000.000	16000.000	1000.000	0.584	6.507	2.379
9931	7999.455	11994.620	999.858	8000.000	12000.000	1000.000	0.544	5.379	0.141
91031	7999.097	7995.862	999.938	8000.000	8000.000	1000.000	0.902	4.137	0.061

STD ERRS FOR THE MODEL SIG X = 2.792 M SIG Y = 4.373 M SIG Z = 1.126 SIG PLAN = 5.189 SIG POS = 5.309

MODEL NO 90304

8931	7999.415	15993.492	997.620	8000.000	16000.000	1000.000	0.584	6.507	2.379
9931	7999.455	11994.620	999.858	8000.000	12000.000	1000.000	0.544	5.379	0.141
91031	7999.097	7995.862	999.938	8000.000	8000.000	1000.000	0.902	4.137	0.061
8941	11994.837	15998.778	993.891	12000.000	16000.000	1000.000	5.162	1.221	6.108
9941	11999.679	11997.435	997.622	12000.000	12000.000	1000.000	0.320	2.564	2.377
91041	12003.889	7998.569	999.086	12000.000	8000.000	1000.000	-3.889	1.430	0.913

STD ERRS FOR THE MODEL SIG X = 2.943 M SIG Y = 4.438 M SIG Z = 3.146 SIG PLAN = 5.326 SIG POS = 6.186

MODEL NO 90405

8341	11994.837	15998.778	993.891	12000.000	16000.000	1000.000	5.162	1.221	6.108
9341	11999.679	11997.435	997.622	12000.000	12000.000	1000.000	0.320	2.564	2.377
91041	12003.889	7998.569	999.086	12000.000	8000.000	1000.000	-3.889	1.430	0.913
8351	15997.754	15998.610	998.418	16000.000	16000.000	1000.000	2.245	1.389	1.581
9951	15999.797	12000.326	1001.551	16000.000	12000.000	1000.000	0.202	-0.326	-1.551
91051	16001.552	8001.748	1000.203	16000.000	8000.000	1000.000	-1.552	-1.748	-0.803

STD ERRS FOR THE MODEL SIG X = 3.142 M SIG Y = 1.743 M SIG Z = 3.141 SIG PLAN = 3.593 SIG POS = 4.773

MODEL NO 90506

8951	15997.754	15998.610	998.418	16000.000	16000.000	1000.000	2.245	1.389	1.581
9951	15999.797	12000.326	1001.551	16000.000	12000.000	1000.000	0.202	-0.326	-1.551
91051	16001.552	8001.748	1000.803	16000.000	8000.000	1000.000	-1.552	-1.748	-0.803
8961	19997.878	16001.266	997.358	20000.000	16000.000	1000.000	2.121	-1.266	2.641
9961	19998.628	12002.023	1000.586	20000.000	12000.000	1000.000	1.371	-2.023	-0.586
91061	20000.021	8003.923	1001.191	20000.000	8000.000	1000.000	-0.021	-3.923	-1.191

STD ERRS FOR THE MODEL SIG X = 1.665 M SIG Y = 2.288 M SIG Z = 1.690 SIG PLAN = 2.830 SIG POS = 3.297

MODEL NO 90607

8961	19997.878	16001.266	997.358	20000.000	16000.000	1000.000	2.121	-1.266	2.641
9961	19998.628	12002.023	1000.586	20000.000	12000.000	1000.000	1.371	-2.023	-0.586
91061	20000.021	8003.923	1001.191	20000.000	8000.000	1000.000	-0.021	-3.923	-1.191
8971	23999.192	16000.559	998.828	24000.000	16000.000	1000.000	0.807	-0.559	1.171
9971	23999.128	12002.563	1001.605	24000.000	12000.000	1000.000	0.871	-2.563	-1.605
91071	23999.045	8003.995	1002.155	24000.000	8000.000	1000.000	0.954	-3.995	-2.155

STD ERRS FOR THE MODEL SIG X = 1.319 M SIG Y = 2.964 M SIG Z = 1.862 SIG PLAN = 3.244 SIG POS = 3.741

MODEL NO 90708

8971	23990.192	16000.559	998.828	24000.000	16000.000	1000.000	0.807	-0.559	1.171
9971	23999.128	12002.563	1001.605	24000.000	12000.000	1000.000	0.871	-2.563	-1.605
91071	23999.045	8003.995	1002.155	24000.000	8000.000	1000.000	0.954	-3.995	-2.155
8981	27998.987	16001.900	999.168	28000.000	16000.000	1000.000	1.012	-1.900	0.831
9981	27999.247	12002.106	1002.347	28000.000	12000.000	1000.000	0.752	-2.106	-2.347
91081	27998.364	8003.465	1002.263	28000.000	8000.000	1000.000	1.635	-3.465	-2.263

STD ERRS FOR THE MODEL SIG X = 1.148 M SIG Y = 2.929 M SIG Z = 1.996 SIG PLAN = 3.146 SIG POS = 3.726

MODEL NO 90809

8981	27998.987	16001.900	999.168	28000.000	16000.000	1000.000	1.012	-1.900	0.831
9981	27999.247	12002.106	1002.347	28000.000	12000.000	1000.000	0.752	-2.106	-2.347
91081	27998.364	8003.465	1002.263	28000.000	8000.000	1000.000	1.635	-3.465	-2.263
8991	32001.091	16002.345	999.423	32000.000	16000.000	1000.000	-1.091	-2.345	0.576
9991	32000.039	12002.489	1000.189	32000.000	12000.000	1000.000	-0.039	-2.489	-0.189
91091	31999.697	8000.855	998.440	32000.000	8000.000	1000.000	0.302	-0.855	1.559

STD ERRS FOR THE MODEL SIG X = 1.053 M SIG Y = 2.549 M SIG Z = 1.680 SIG PLAN = 2.758 SIG POS = 3.230

MODEL NO 90910

8991	32001.091	16002.345	999.423	32000.000	16000.000	1000.000	-1.091	-2.345	0.576
9991	32000.039	12002.489	1000.189	32000.000	12000.000	1000.000	-0.039	-2.489	-0.189
91091	31999.697	8000.855	998.440	32000.000	8000.000	1000.000	0.302	-0.855	1.559
89101	36001.728	16001.362	999.704	36000.000	16000.000	1000.000	-1.728	-1.362	0.295
99101	36002.705	12001.600	1002.958	36000.000	12000.000	1000.000	-2.705	-1.600	-2.958
910101	36002.183	8002.036	1002.290	36000.000	8000.000	1000.000	-2.183	-2.036	-2.290

STD ERRS FOR THE MODEL SIG X = 1.808 M SIG Y = 2.049 M SIG Z = 1.837 SIG PLAN = 2.733 SIG POS = 3.293

MODEL NO 91011

89101	36001.728	16001.362	999.704	36000.000	16000.000	1000.000	-1.728	-1.362	0.295
99101	36002.705	12001.600	1002.958	36000.000	12000.000	1000.000	-2.705	-1.600	-2.958
910101	36002.183	8002.036	1002.290	36000.000	8000.000	1000.000	-2.183	-2.036	-2.290
89111	40003.379	16001.162	1000.760	40000.000	16000.000	1000.000	-3.379	-1.162	-0.760
99111	40002.084	12000.604	1003.772	40000.000	12000.000	1000.000	-2.084	-0.604	-3.772
910111	40001.360	8001.952	1003.869	40000.000	8000.000	1000.000	-1.360	-1.952	-3.869

STD ERRS FOR THE MODEL SIG X = 2.556 M SIG Y = 1.679 M SIG Z = 2.962 SIG PLAN = 3.058 SIG POS = 4.257

MODEL NO 91112

89111	40003.379	16001.162	1000.760	40000.000	16000.000	1000.000	-3.379	-1.162	-0.760
99111	40002.084	12000.604	1003.772	40000.000	12000.000	1000.000	-2.084	-0.604	-3.772
910111	40001.360	8001.952	1003.869	40000.000	8000.000	1000.000	-1.360	-1.952	-3.869
89121	44002.596	15999.214	1001.845	44000.000	16000.000	1000.000	-2.596	0.785	-1.845
99121	44002.006	12000.769	1002.440	44000.000	12000.000	1000.000	-2.006	-0.769	-2.440
910121	44001.295	8000.407	1000.810	44000.000	8000.000	1000.000	-1.295	-0.407	-0.810

STD ERRS FOR THE MODEL SIG X = 2.452 M SIG Y = 1.175 M SIG Z = 2.821 SIG PLAN = 2.719 SIG POS = 3.918

MODEL NO 91213

89121	44002.596	15999.214	1001.845	44000.000	16000.000	1000.000	-2.596	0.785	-1.845
99121	44002.006	12000.769	1002.440	44000.000	12000.000	1000.000	-2.006	-0.769	-2.440
910121	44001.295	8000.407	1000.810	44000.000	8000.000	1000.000	-1.295	-0.407	-0.810
89131	48000.977	15997.584	1000.568	48000.000	16000.000	1000.000	-0.977	2.415	-0.568
99131	48000.490	12000.227	1001.405	48000.000	12000.000	1000.000	-0.490	-0.227	-1.405
910131	48000.225	8000.835	1001.269	48000.000	8000.000	1000.000	-0.225	-0.835	-1.269

STD ERRS FOR THE MODEL SIG X = 1.655 M SIG Y = 1.261 M SIG Z = 1.668 SIG PLAN = 2.081 SIG POS = 2.667

MODEL NO 91314

89131	48000.977	15997.584	1000.568	48000.000	16000.000	1000.000	-0.977	2.415	-0.568
99131	48000.490	12000.227	1001.405	48000.000	12000.000	1000.000	-0.490	-0.227	-1.405
910131	48000.225	8000.835	1001.269	48000.000	8000.000	1000.000	-0.225	-0.835	-1.269
89141	51999.548	15997.594	1000.088	52000.000	16000.000	1000.000	0.451	2.405	-0.088
99141	51999.332	12000.324	1000.210	52000.000	12000.000	1000.000	0.667	-0.324	-0.210
910141	51998.654	8001.127	999.111	52000.000	8000.000	1000.000	1.345	-1.127	0.888

STD ERRS FOR THE MODEL SIG X = 0.861 M SIG Y = 1.657 M SIG Z = 0.974 SIG PLAN = 1.868 SIG POS = 2.107

MODEL NO 91415

89141	51999.548	15997.594	1000.088	52000.000	16000.000	1000.000	0.451	2.405	-0.088
99141	51999.332	12000.324	1000.210	52000.000	12000.000	1000.000	0.667	-0.324	-0.210
910141	51998.654	8001.127	999.111	52000.000	8000.000	1000.000	1.345	-1.127	0.888
89151	55997.820	15998.860	998.777	56000.000	16000.000	1000.000	2.180	1.139	1.222
99151	55998.302	12000.045	1000.596	56000.000	12000.000	1000.000	1.697	-0.045	-0.596
910151	55998.885	8001.564	1000.696	56000.000	8000.000	1000.000	1.114	-1.564	-0.696

STD ERRS FOR THE MODEL SIG X = 1.505 M SIG Y = 1.477 M SIG Z = 0.796 SIG PLAN = 2.109 SIG POS = 2.254

MODEL NO 91516

89151	55997.820	15998.860	998.777	56000.000	16000.000	1000.000	2.180	1.139	1.222
99151	55998.302	12000.045	1000.596	56000.000	12000.000	1000.000	1.697	-0.045	-0.596
910151	55998.885	8001.564	1000.696	56000.000	8000.000	1000.000	1.114	-1.564	-0.696
89161	59997.971	15999.237	997.821	60000.000	16000.000	1000.000	2.028	0.762	2.178
99161	59999.008	12000.406	999.669	60000.000	12000.000	1000.000	0.991	-0.406	0.330
910161	59998.013	7999.744	999.498	60000.000	8000.000	1000.000	1.986	0.255	0.501

STD ERRS FOR THE MODEL SIG X = 1.893 M SIG Y = 0.954 M SIG Z = 1.220 SIG PLAN = 2.120 SIG POS = 2.446

MODEL NO 91617

89161	59997.971	15999.237	997.821	60000.000	16000.000	1000.000	2.028	0.762	2.178
99161	59999.008	12000.406	999.669	60000.000	12000.000	1000.000	0.991	-0.406	0.330
910161	59998.013	7999.744	999.498	60000.000	8000.000	1000.000	1.986	0.255	0.501
89171	63997.877	15998.562	1000.716	64000.000	16000.000	1000.000	2.122	1.437	-0.71
99171	63999.542	11999.746	1001.515	64000.000	12000.000	1000.000	0.457	0.253	-1.515
910171	64000.092	8001.066	1000.836	64000.000	8000.000	1000.000	-0.092	-1.066	-0.836

STD ERRS FOR THE MODEL SIG X = 1.659 M SIG Y = 0.903 M SIG Z = 1.312 SIG PLAN = 1.889 SIG POS = 2.300

MODEL NO 91718

89171	63997.877	15998.562	1000.716	64000.000	16000.000	1000.000	2.122	1.437	-0.716
99171	63999.542	11999.746	1001.515	64000.000	12000.000	1000.000	0.457	0.253	-1.515
910171	64000.052	8001.066	1000.836	64000.000	8000.000	1000.000	-0.092	-1.066	-0.836
89181	67999.458	15999.052	999.341	68000.000	16000.000	1000.000	0.541	0.947	0.658
99181	67999.331	11999.384	1000.962	68000.000	12000.000	1000.000	0.668	0.615	-0.962
910181	68000.139	7999.880	1000.676	68000.000	8000.000	1000.000	-0.139	0.119	-0.676

STD ERRS FOR THE MODEL SIG X = 1.047 M SIG Y = 0.955 M SIG Z = 1.032 SIG PLAN = 1.417 SIG POS = 1.753

MODEL NO 91819

89181	67999.458	15999.052	999.341	68000.000	16000.000	1000.000	0.541	0.947	0.658
99181	67599.331	11999.384	1000.962	68000.000	12000.000	1000.000	0.668	0.615	-0.962
910181	68000.139	7999.880	1000.676	68000.000	8000.000	1000.000	-0.139	0.119	-0.676
89191	72001.309	16001.083	997.195	72000.000	16000.000	1000.000	-1.309	-1.083	2.804
99191	72001.648	11999.763	997.827	72000.000	12000.000	1000.000	-1.648	0.236	2.172
910191	72001.896	7997.657	997.765	72000.000	8000.000	1000.000	-1.896	2.342	2.234

STD ERRS FOR THE MODEL SIG X = 1.325 M SIG Y = 1.265 M SIG Z = 1.969 SIG PLAN = 1.833 SIG POS = 2.690

MODEL NO 91920

89191	72001.309	16001.083	997.195	72000.000	16000.000	1000.000	-1.309	-1.083	2.804
99191	72001.648	11999.763	997.827	72000.000	12000.000	1000.000	-1.648	0.236	2.172
910191	72001.896	7997.657	997.765	72000.000	8000.000	1000.000	-1.896	2.342	2.234
89201	76001.148	15997.739	1002.513	76000.000	16000.000	1000.000	-1.148	2.260	-2.513
99201	760?2.766	11999.738	1004.296	76000 000	12000.000	1000.000	-2.766	0.261	-4.296
910201	76003.689	8001.346	1003.033	76000.000	8000.000	1000.000	-3.689	-1.346	-3.033

STD ERRS FOR THE MODEL SIG X = 2.474 M SIG Y = 1.655 M SIG Z = 3.211 SIG PLAN = 2.977 SIG POS = 4.378

MODEL NO 92021

89201	76001.148	15997.739	1002.513	76000.000	16000.000	1000.000	-1.148	2.260	-2.513
99201	76002.766	11999.738	1004.296	76000.000	12000.000	1000.000	-2.766	0.261	-4.296
910201	76003.689	8001.346	1003.033	76000.000	8000.000	1000.000	-3.689	-1.346	-3.033
89211	79999.695	15998.389	999.569	80000.000	16000.000	1000.000	0.304	1.610	0.430
99211	80000.911	12000.619	998.373	80000.000	12000.000	1000.000	-0.911	-0.619	1.626
910211	80001.661	8001.354	998.049	80000.000	8000.000	1000.000	-1.661	-1.354	1.950

STD ERRS FOR THE MODEL SIG X = 2.292 M SIG Y = 1.536 M SIG Z = 2.849 SIG PLAN = 2.759 SIG POS = 3.966

STD ERRS FOR THE STRIP SIG X = 1.941 M SIG Y = 2.195 M SIG Z = 1.903 SIG PLAN = 2.930 SIG POS = 3.494

MODEL NO 100102

91011	-3.599	7999.246	1003.462	0.000	8000.000	1000.000	3.599	0.753	-3.462
101011	-2.818	3998.201	1003.242	0.000	4000.000	1000.000	2.818	1.798	-3.242
101111	-1.275	-4.875	998.771	0.000	0.000	1000.000	1.275	4.875	1.228
91021	3997.815	8000.155	999.820	4000.000	8000.000	1000.000	2.184	-0.155	0.179
101021	3999.650	3999.532	1001.537	4000.000	4000.000	1000.000	0.349	0.467	-1.537
101121	4001.187	-1.144	1000.768	4000.000	0.000	1000.000	-1.187	1.144	-0.768

STD ERRS FOR THE MODEL SIG X = 2.401 M SIG Y = 2.413 M SIG Z = 2.322 SIG PLAN = 3.404 SIG POS = 4.122

MODEL NO 100203

91021	3997.815	8000.155	999.820	4000.000	8000.000	1000.000	2.184	-0.155	0.179
101021	3999.650	3999.532	1001.537	4000.000	4000.000	1000.000	0.349	0.467	-1.537
101121	4001.187	-1.144	1000.768	4000.000	0.000	1000.000	-1.187	1.144	-0.768
91031	7999.345	8000.137	996.532	8000.000	8000.000	1000.000	0.654	-0.137	3.467
101031	7999.417	4000.067	999.210	8000.000	4000.000	1000.000	0.582	-0.067	0.789
101131	7999.954	0.739	999.952	8000.000	0.000	1000.000	0.045	-0.739	0.047

STD ERRS FOR THE MODEL SIG X = 1.189 M SIG Y = 0.651 M SIG Z = 1.768 SIG PLAN = 1.356 SIG POS = 2.228

MODEL NO 100304

91031	7999.345	8000.137	996.532	8000.000	8000.000	1000.000	0.654	-0.137	3.467
101031	7999.417	4000.067	999.210	8000.000	4000.000	1000.000	0.582	-0.067	0.789
101131	7999.954	0.739	999.952	8000.000	0.000	1000.000	0.045	-0.739	0.047
91041	11999.219	8001.424	996.978	12000.000	8000.000	1000.000	0.780	-1.424	3.021
101041	11998.903	4000.342	997.794	12000.000	4000.000	1000.000	1.096	-0.942	2.205

101141	12000.302	0.551	998.291	12000.000	0.000	1000.000	-0.302	-0.551	1.708

STD ERRS FOR THE MODEL SIG X = 0.731 M SIG Y = 0.871 M SIG Z = 2.431 SIG PLAN = 1.137 SIG POS = 2.684

MODEL NO 100405

91041	11999.219	8001.424	996.978	12000.000	8000.000	1000.000	0.780	-1.424	3.021
101041	11998.903	4000.942	997.794	12000.000	4000.000	1000.000	1.096	-0.942	2.205
101141	12000.302	0.551	998.291	12000.000	0.000	1000.000	-0.302	-0.551	1.708
91051	15999.617	8001.703	997.900	16000.000	8000.000	1000.000	0.382	-1.703	2.099
101051	15998.754	4001.109	1000.899	16000.000	4000.000	1000.000	1.245	-1.109	-0.899
101151	15998.732	2.374	1000.553	16000.000	0.000	1000.000	1.267	-2.374	-0.553

STD ERRS FOR THE MODEL SIG X = 1.020 M SIG Y = 1.612 M SIG Z = 2.118 SIG PLAN = 1.907 SIG POS = 2.850

MODEL NO 100506

91051	15999.617	8001.703	997.900	16000.000	8000.000	1000.000	0.382	-1.703	2.099
101051	15998.754	4001.109	1000.899	16000.000	4000.000	1000.000	1.245	-1.109	-0.899
101151	15998.732	2.374	1000.553	16000.000	0.000	1000.000	1.267	-2.374	-0.553
91061	20000.322	8001.623	1000.890	20000.000	8000.000	1000.000	-0.322	-1.623	-0.890
101061	19999.542	4001.566	1000.326	20000.000	4000.000	1000.000	0.457	-1.566	-0.326
101161	19999.024	1.472	997.251	20000.000	0.000	1000.000	0.975	-1.472	2.748

STD ERRS FOR THE MODEL SIG X = 0.955 M SIG Y = 1.845 M SIG Z = 1.671 SIG PLAN = 2.078 SIG POS = 2.667

MODEL NO 100607

91061	20000.322	8001.623	1000.890	20000.000	8000.000	1000.000	-0.322	-1.623	-0.890
101061	19999.542	4001.566	1000.326	20000.000	4000.000	1000.000	0.457	-1.566	-0.326
101161	19999.024	1.472	997.251	20000.000	0.000	1000.000	0.975	-1.472	2.748
91071	23998.295	8000.395	1004.520	24000.000	8000.000	1000.000	1.704	-0.395	-4.520
101071	23999.457	4001.419	1001.820	24000.000	4000.000	1000.000	0.542	-1.419	-1.820
101171	23999.953	2.768	997.400	24000.000	0.000	1000.000	0.046	-2.768	2.599

STD ERRS FOR THE MODEL SIG X = 0.945 M SIG Y = 1.849 M SIG Z = 2.791 SIG PLAN = 2.076 SIG POS = 3.479

MODEL NO 100708

91071	23998.295	8000.395	1004.520	24000.000	8000.000	1000.000	1.704	-0.395	-4.520
101071	23999.457	4001.419	1001.820	24000.000	4000.000	1000.000	0.542	-1.419	-1.820
101171	23999.953	2.768	997.400	24000.000	0.000	1000.000	0.046	-2.768	2.599
91081	27997.820	8002.712	1000.095	28000.000	8000.000	1000.000	2.179	-2.712	-0.095
101081	27999.787	4001.163	1001.932	28000.000	4000.000	1000.000	0.212	-1.163	-1.932
101181	28001.637	0.430	1000.216	28000.000	0.000	1000.000	-1.637	-0.430	-0.216

STD ERRS FOR THE MODEL SIG X = 1.461 M SIG Y = 1.935 M SIG Z = 2.619 SIG PLAN = 2.425 SIG POS = 3.569

MODEL NO 100809

91081	27997.820	8002.712	1000.095	28000.000	8000.000	1000.000	2.179	-2.712	-0.095
101081	27999.787	4001.163	1001.932	28000.000	4000.000	1000.000	0.212	-1.163	-1.932
101181	28001.637	0.430	1000.216	28000.000	0.000	1000.000	-1.637	-0.430	-0.216
91091	32000.325	8000.609	1004.281	32000.000	8000.000	1000.000	-0.325	-0.609	-4.281
101091	32000.764	4000.969	1007.209	32000.000	4000.000	1000.000	-0.764	-0.969	-7.209

101191	32000.722	1.823	1005.872	32000.000	0.000	1000.000	-0.722	-1.823	-5.872

STD ERRS FOR THE MODEL SIG X = 1.318 M SIG Y = 1.645 M SIG Z = 4.660 SIG PLAN = 2.108 SIG POS = 5.114

MODEL NO 100910

91091	32000.325	8000.609	1004.281	32000.000	8000.000	1000.000	-0.325	-0.609	-4.281
101091	32000.764	4000.969	1007.209	32000.000	4000.000	1000.000	-0.764	-0.969	-7.209
101191	32000.722	1.823	1005.872	32000.000	0.000	1000.000	-0.722	-1.823	-5.872
910101	36000.840	7999.808	1007.862	36000.000	8000.000	1000.000	-0.840	0.191	-7.862
10105	36000.269	4000.871	1007.680	36000.000	4000.000	1000.000	-0.869	-0.871	-7.680
11105	36002.279	2.559	1006.494	36000.000	0.000	1000.000	-2.279	-2.559	-6.494

STD ERRS FOR THE MODEL SIG X = 1.254 M SIG Y = 1.548 M SIG Z = 7.318 SIG PLAN = 1.932 SIG POS = 7.584

MODEL NO 101011

910101	36000.840	7999.808	1007.862	36000.000	8000.000	1000.000	-0.840	0.191	-7.862
10105	36000.869	4000.871	1007.680	36000.000	4000.000	1000.000	-0.869	-0.871	-7.680
11105	36002.279	2.553	1006.494	36000.000	0.000	1000.000	-2.279	-2.559	-6.494
910111	40001.269	8000.121	1005.307	40000.000	8000.000	1000.000	-1.269	-0.121	-5.307
10115	40001.907	4001.460	1006.319	40000.000	4000.000	1000.000	-1.907	-1.460	-6.319
11115	40001.626	2.447	1005.614	40000.000	0.000	1000.000	-1.626	-2.447	-5.614

STD ERRS FOR THE MODEL SIG X = 1.706 M SIG Y = 1.759 M SIG Z = 7.247 SIG PLAN = 2.451 SIG POS = 7.650

MODEL NO 101112

910111	40001.269	8000.121	1005.307	40000.000	8000.000	1000.000	-1.269	-0.121	-5.307
10115	40001.907	4001.460	1006.319	40000.000	4000.000	1000.000	-1.907	-1.460	-6.319
11115	40001.626	2.447	1005.614	40000.000	0.000	1000.000	-1.626	-2.447	-5.614
910121	44000.812	7999.421	1005.835	44000.000	8000.000	1000.000	-0.812	0.578	-5.835
10125	44001.778	4001.262	1007.046	44000.000	4000.000	1000.000	-1.778	-1.262	-7.046
11125	44002.401	3.677	1006.678	44000.000	0.000	1000.000	-2.401	-3.677	-6.678

STD ERRS FOR THE MODEL SIG X = 1.869 M SIG Y = [illegible].172 M SIG Z = 6.752 SIG PLAN = 2.866 SIG POS = 7.335

MODEL NO 101213

910121	44000.812	7999.421	1005.835	44000.000	8000.000	1000.000	-0.812	0.578	-5.835
10125	44001.778	4001.262	1007.046	44000.000	4000.000	1000.000	-1.778	-1.262	-7.046
11125	44002.401	3.677	1006.678	44000.000	0.000	1000.000	-2.401	-3.677	-6.678
910131	48001.223	7998.890	1004.788	48000.000	8000.000	1000.000	-1.223	1.109	-4.788
10135	48000.371	4001.534	1007.457	48000.000	4000.000	1000.000	-0.371	-1.534	-7.457
11135	47999.887	3.887	1006.936	48000.000	0.000	1000.000	0.112	-3.887	-6.936

STD ERRS FOR THE MODEL SIG X = 1.499 M SIG Y = 2.613 M SIG Z = 7.141 SIG PLAN = 3.012 SIG POS = 7.750

MODEL NO 101314

910131	48001.223	7998.890	1004.788	48000.000	8000.000	1000.000	-1.223	1.109	-4.788
10135	48000.371	4001 534	1007.457	48000.000	4000.000	1000.000	-0.371	-1.534	-7.457
11135	47999.887	3.987	1006.936	48000.000	0.000	1000.000	0.112	-3.887	-6.936
910141	51998.724	7999.300	1001.591	52000.000	8000.000	1000.000	1.275	0.699	-1.591
10145	51999.089	4001.197	1003.944	52000.000	4000.000	1000.000	0.910	-1.197	-3.944

11145	51999.257	3.331	1003.256	52000.000	0.000	1000.000	0.742	-3.331	-3.256

STD ERRS FOR THE MODEL SIG X = 0.964 M SIG Y = 2.518 M SIG Z = 5.574 SIG PLAN = 2.697 SIG POS = 6.192

MODEL NO 101415

910141	51998.724	7999.300	1001.591	52000.000	8000.000	1000.000	1.275	0.699	-1.591
10145	51999.089	4001.197	1003.944	52000.000	4000.000	1000.000	0.910	-1.197	-3.944
11145	51999.257	3.331	1003.256	52000.000	0.000	1000.000	0.742	-3.331	-3.256
910151	55998.022	7998.978	1000.173	56000.000	8000.000	1000.000	1.977	1.021	-0.173
10155	55998.060	4000.887	1001.661	56000.000	4000.000	1000.000	1.939	-0.887	-1.661
11155	55997.952	2.655	1000.924	56000.000	0.000	1000.000	2.047	-2.655	-0.924

STD ERRS FOR THE MODEL SIG X = 1.724 M SIG Y = 2.093 M SIG Z = 2.543 SIG PLAN = 2.712 SIG POS = 3.718

MODEL NO 101516

910151	55998.022	7998.978	1000.173	56000.000	8000.000	1000.000	1.977	1.021	-0.173
10155	55998.060	4000.887	1001.661	56000.000	4000.000	1000.000	1.939	-0.887	-1.661
11155	55997.952	2.655	1000.924	56000.000	0.000	1000.000	2.047	-2.655	-0.924
910161	59996.798	8000.081	996.603	60000.000	8000.000	1000.000	3.201	-0.081	3.396
10165	59998.302	4000.863	996.991	60000.000	4000.000	1000.000	1.697	-0.863	3.008
11165	59999.626	0.848	996.080	60000.000	0.000	1000.000	0.373	-0.848	3.919

STD ERRS FOR THE MODEL SIG X = 2.242 M SIG Y = 1.438 M SIG Z = 2.814 SIG PLAN = 2.664 SIG POS = 3.875

MODEL NO 101617

910161	59996.798	8000.081	996.603	60000.000	8000.000	1000.000	3.201	-0.081	3.396
10165	59998.302	4000.863	996.991	60000.000	4000.000	1000.000	1.697	-0.863	3.008
11165	59999.626	0.848	996.080	60000.000	0.000	1000.000	0.373	-0.848	3.919
910171	63999.231	8002.047	993.400	64000.000	8000.000	1000.000	0.768	-2.047	6.599
10175	64000.347	4000.671	993.243	64000.000	4000.000	1000.000	-0.347	-0.671	6.756
11175	64001.198	-0.020	994.634	64000.000	0.000	1000.000	-1.198	0.020	5.365

STD ERRS FOR THE MODEL SIG X = 1.756 M SIG Y = 1.105 M SIG Z = 5.548 SIG PLAN = 2.075 SIG POS = 5.924

MODEL NO 101718

910171	63999.231	8002.047	993.400	64000.000	8000.000	1000.000	0.768	-2.047	6.599
10175	64000.347	4000.671	993.243	64000.000	4000.000	1000.000	-0.347	-0.671	6.756
11175	64001.198	-0.020	994.634	64000.000	0.000	1000.000	-1.198	0.020	5.365
910181	68002.518	8000.465	996.115	68000.000	8000.000	1000.000	-2.518	-0.465	3.884
10185	68002.939	4000.850	997.576	68000.000	4000.000	1000.000	-2.939	-0.850	2.423
11185	68002.995	2.601	997.422	68000.000	0.000	1000.000	-2.995	-2.601	2.577

STD ERRS FOR THE MODEL SIG X = 2.284 M SIG Y = 1.571 M SIG Z = 5.396 SIG PLAN = 2.773 SIG POS = 6.067

MODEL NO 101819

910181	68002.518	8000.465	996.115	68000.000	8000.000	1000.000	-2.518	-0.465	3.884
10185	68002.939	4000.850	997.576	68000.000	4000.000	1000.000	-2.939	-0.850	2.423
11185	68002.995	2.601	997.422	68000.000	0.000	1000.000	-2.995	-2.601	2.577
910191	72003.333	8001.277	995.081	72000.000	8000.000	1000.000	-3.333	-1.277	4.918
10195	72004.261	3999.926	997.108	72000.000	4000.000	1000.000	-4.261	0.073	2.891

11195	72003.74(	0.671	995.013	72000.000	0.000	1000.000	-3.746	-0.671	4.986

STD ERRS FOR THE MODEL SIG X = 3.667 M SIG Y = 1.399 M SIG Z = 4.123 SIG PLAN = 3.925 SIG POS = 5.693

MODEL NO 101920

910191	72003.333	8001.277	995.081	72000.000	8000.000	1000.000	-3.333	-1.277	4.918
10195	72004.261	3999.926	997.108	72000.000	4000.000	1000.000	-4.261	0.073	2.891
11195	72003.746	0.671	995.013	72000.000	0.000	1000.000	-3.746	-0.671	4.986
910201	76003.815	7998.518	999.137	76000.000	8000.000	1000.000	-3.815	1.481	0.862
10205	76004.513	4000.118	1000.923	76000.000	4000.000	1000.000	-4.513	-0.118	-0.923
11205	76003.466	2.268	1000.520	76000.000	0.000	1000.000	-3.466	-2.268	-0.520

STD ERRS FOR THE MODEL SIG X = 4.248 M SIG Y = 1.374 M SIG Z = 3.443 SIG PLAN = 4.465 SIG POS = 5.638

MODEL NO 102021

910201	76003.815	7998.518	999.137	76000.000	8000.000	1000.000	-3.815	1.481	0.862
10205	76004.513	4000.118	1000.923	76000.000	4000.000	1000.000	-4.513	-0.118	-0.923
11205	76003.466	2.268	1000.520	76000.000	0.000	1000.000	-3.466	-2.268	-0.520
910211	80001.477	7997.533	1000.596	80000.000	8000.000	1000.000	-1.477	2.466	-0.596
10215	80001.551	3999.474	1002.537	80000.000	4000.000	1000.000	-1.551	0.525	-2.537
11215	80000.680	3.281	1002.318	80000.000	0.000	1000.000	-0.680	-3.281	-2.318

STD ERRS FOR THE MODEL SIG X = 3.224 M SIG Y = 2.212 M SIG Z = 1.675 SIG PLAN = 3.911 SIG POS = 4.254

STD ERRS FOR THE STRIP SIG X = 1.876 M SIG Y = 1.654 M SIG Z = 4.088 SIG PLAN = 2.501 SIG POS = 4.793

STD ERRS FOR THE BLOCK SIG X = 1.697 M SIG Y = 2.811 M SIG Z = 2.811 SIG PLAN = 3.284 SIG POS = 4.324