MINICOMPUTERS APPLIED TO DIGITAL PHOTOGRAMMETRY

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

Abudle M E ARBUCKLE

Johannesburg 20 July 1979 To my parents

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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 uses.

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 minicoamputer 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 teats are (1) the data storage capacity of the system, (11) the accuracy of the results obtained from the block adjustments and (11) the processing times of each phase of the aericl triangulation system.

The software system has been thoroughly tested using data supplied by Dr H S Williams and T J H van Dijk. These data are the Dutban and St. Falth'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 Witwaterarand 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 havo processed the same data. The results are shown and comparisons are made in chapter 4.

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LIST OF SYMBOLS

SYMBOL

DESCRIPTION

A	Matrix of coefficients of the residual vector
a-e	Coefficients of the planimetric correction polynomial
a;:i=0,≥	Coefficients of the planimetric correction polynomial
B	Matrix of coefficients of the independent parameters
B, B, B	Model base vector
D; : i= 0.4	Coefficients of the height correction polynomial
b,:i= 0,4 b, ∆	Base length of model
	Unknown parameters
dh .	Scale factor differential
<i>åR</i> ·	Rotation matrix differential
dX shift	Shift vector differential
e _n f I	Iterative adjustment precision threshold
f	Camera focal length
	Identity matrix
i,j,k	Rectangular unit vectors
i,j,k 1 N	Vector of sample values
	Scale factor
k, µ,u	Rodrigues parameters
M.S.D.	Mean standard deviation
N	Normal equation coefficient matrix
N"	Inverse of the normal equation coefficient matrix
п	Product of terms
R	Orthogonal rotation matrix
R ¹	Transpose of the orthogonal rotation matrix
R	Vector of remainder terms
r _{ij} : i=1,3 : j=1, 3 S	Elements of the orthogonal rotation matrix
	Skew-symmetric matrix
Σ	Sum of terms
6 Anight	Standard deviation in height
0,	Standard deviation in planimetry

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SYMBOL

DESCRIPTION

o pian	Standard deviation in planimetry
ಕ್ಕೈ .	Standard deviation of y-parallax
6. 9. 6. 6. 9. 6.	Standard deviations in X, Y and Z respectively
6,,,,z	Standard deviation of residuals in X, Y or Z
4	Standard deviation of an observation of unit weight
6 height	Standard deviation of a single observation of unit
	weight in height
6 *plan	Standard deviation of a single observation of unit
plan	weight in planimetry
V	Vector of residuals
Vp (max)	Maximum y-parallax
Ŵ,	Matrix of weight coefficients for the height
	adjustment
W,	Matrix of weight coefficients for the planimetric
•	adjustment
X,Y,Z	Spatial model co-ordinates or terrain co-ordinates
X, Y, Z	Co-ordinates of a point in the strip
X, Y, Z,	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, origically 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 manitytical arclal 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 larce 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 undertakan here will apply to the majority of the available minicomputers.

1.2 Significant Events in the Bistory of Automatic Digital Computers

Page 3

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 seventsenth 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 works: 'It is unworthy of excellent men to lose hours like slaves i.' 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 origanal 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 wast 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 enacted scientists to build the first automatic universal digital compute.

Thit mext significant step in the development of automatic digital computers came in 1944 when Professor Howard Aiken of Barward University (Hartree, D B. 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 entiraly of elactronic 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 Pennsylvanie (Booth, A D and Booth, K H W. 1956) as a special purpose computer to be used in ballstic research. The vacuum tube, which was first discovered in 1919 by W W Eccles and P 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.

DI John von Neumann who worked on the EMIAC 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 Riectronic 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 EINAC 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, vis. 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 Massachumettes Institute of Technology (MIT) Whilvibul I on which work was begun in 1947.

The development of the transistor heraided the next major advancement in computer technology and the beginning of a new generation of computers. Although the transistor had been developed in 1946 it was only in 1954, when Philos 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 recognized by the achievements of computer technologies in the field of super computers. The first of the computer yiants was the Naval Ordnance Research Calculator (NORC) built by International Business Machines (IMM). 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 IEM respectively. The IMM 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 low-rehead mit 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 LDC 6600 computer built by Control Data Corporation was designed to be three times more powerful than the Stretch computer. An interesting desgin features 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 aillion 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 bency-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 aid a main memory of less than 64% words.

Minicomputers were first used in 1962 in acrospace applications (Kaenal, R A. 1970). The earlier machines were specific purpose computers and it was cally in 1969 that manufactures: 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 Gozie 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 auccessfully in process control to efficiently direct and monitor automated production lines where sequence, thing 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 (CCU), a taleprinter 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 50m by 30m by 55m. 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 acotware. The present range of minicomputers make extensive use of nicroprogrammed Read Only Memories (RON) for hardwired functions, such as arithmetic operations, trigonometric functions, matrix algebra and any frequently used aubroutines.

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 leval 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 FORTRN, ALGOL and REGIT. BASIC language interpreters are widely used on the mailer computers and is particularly guited to on-line applications. Several manufacturers provide complex, highly developed software such as real-time disk operating systems and time-sharing executive gwatems.

Of the auxiliary storage devices available for minicceputers 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 megabres to twenty meabytes.

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 hise track tape units and the slower and lower capacity tape

1.3.1 The WANG 2200 Minicomputer System

cassette units.

The Analytical Aerial triangulation system described in this dissertation was programmed and tested on the WANG 22007 and later the WANG 22007 minicomputer systems. The hardware configuration comprised a 24K-byte Central Processing Unit, a CRT display and keyboard, a 10 Megabyte disk unit for auriliary storage and a line printer. Bach of these devices will be described below (WANG 1975).

1.3.2 The WANG 2200T Central Processing Unit

The CFU operates on a single user program written in WANG 2200 Extended BASIC. BASIC, an accomy for Beginners All Purpose Symbolic Instruction Code, was originally developed as a high level interpretive language by J G Kerney and T E Kurts at Dartmouth College, New Hampshire for implementation on time-sharing systems. It was first used in 1965 on the GB 225 computer and has since become one of the more widely used languages on minicomputers (ganderson, 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 adventages of requiring less time during compilation and less storage for source and object code but has the disadvantage of incremaing 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 longic 1 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 ____tem 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 subprottine 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 22007 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 via, the processing of the iterative block adjustment to 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 semory from a disk unit. Additional features offered by the VP firmware are mainly immediate mode instructions none of which could be incorporated into the orginally developed actware 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 (TPT). 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 mullion full precision numerics (thirteen decimal digits). Since

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million full precision numerics (thirteen decimel 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 plattor 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:

- 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:

- 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 wos 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 vectorterminology, he investigated the photogrammetric single-and-doublepoint resection in space and the formulation of the relative and absolute orientation.

Concurrent with the work of Finstervalder, C Pulfrich developed the first stereocomparator in 1901 to be used in the measurement of terrestill 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 slands, was undertaken in 1920. Owing to the unsatisfactory results of this new technique, no other analytical photogrammetric projects we': 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 wast amounts of data involved in an analytical mapping project.

However, photogrammetists like Von Gruber and Barl 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 serial photographs. Church's work, presented in direction-cosise notation has been criticized for its failure to deal with redundant observations and error analysis.

The work of Church was pewerbheless a valuable contribution to the development of analytical photogrammetry and had a strong influence on B Merritt who in 1950 and 1951 and 14ter 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 meenry which were not available when Schmid developed his theory. Exotogrammetrists realised the need for less rigorous solutions which could be implemented on the current equipment. The result was to apply the computer to the nanlogue 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

abcolute orientations were largely owing to 6 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 ooplanarity 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 poblished 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 boints in model appece.

The same three photogrummetrists, 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 opproaches vis. matrix 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 Kikhail 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 meth-d of aerial triangulation based on a concept suggested by H Pourcade 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 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 Reelofs 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 Reelofs.

A more rigorous adjustment of sirip triangulation was proposed in 1960 by E Gotthardt, a procedure which in the opinion of P 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 affort to further improve the results of strip adjustment by polynomial adjustment, photogrammetristm 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 commosed 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 mounts 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 nimerical 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 5 Berroets (1960), G Schut (1964), F Amer (1962) and D Froctor (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 tile 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 Eritain, worked concurrently on the analytical block adjustment using the model or groups of modals as the adjustment unit. The approach developed by both Amer and Prootor was a numerical solution of the analogue Liczk adjustment of Jerie for planimetric adjustment which times two simremodels as the basic adjustment unit. While this methical 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 Effustment, 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 Elect method. The symmetric properties of the morral equation mefficient matrix which allow for the treatment of the solution on a collapsed normal equation matrix were recognized by warn far Hout. The handling of collapsed matrices greatly reduces the computer memory requirements for a direct solution of the hlord adjustment coefficients. The same adjustment was implemented in 1963 by D Sckhart (1962/64) and J van Leyden on the ZEERA 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

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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 (Kaller, 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 (1958) for the establishment of a linear control network by photogrammetric means. It was believed thats 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 bordared-banded uormal equation system would be solved by the method of Recurrent Particioning. By 1971 such an application had been implemented using a program capable of a simultaneous adjustment of 2000 photographs involving 10⁴ unknowns. The lunar mapping project required the adjustment 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. PANM-45 and PANM-7 was done so under the direction of H Ebner and H Klein at the Phologrammetric Institute of Stutigart University (Ackermann, F, Ebner, H, Klein, H. 1973). The Cholesky solution, which is particularly suitable for the solution of the positive definitive bandes and bordered system of normal equations, allows for up to 10⁴ 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 sterec-observation using instruments like the wild FOG 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-ordinates of plate images in a co-ordinate system which the trilaterative principle.

The two sets of data used in testing the digital photogrammetric system developed on the WANG 2200 minicomputer viz the Durhan 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,

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- 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,
- Block adjustment using either the models or the strips as the adjustment unit.

2.2 Obrarved 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:

- 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 , vseau 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 tadial 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 stmospheric refraction correction which is radial from the madir point is obtained from a function relating the madir angle and the atmospheric constant to the correction to the madir 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. Rowever, 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 R Thompson (1959).

The condition for coplanarity of homologous pairs of rays and

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the model base may be expressed as follows:

$$(n_{i}i + n_{j} + n_{k}) \cdot (x_{i}i + y_{j}i + z_{k}) \cdot (x_{i}i + y_{j}i + z_{k}i) = 0$$

(2.3.1)

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

$$\begin{pmatrix} x_{2} & y_{2} & z_{3} \end{pmatrix} \begin{pmatrix} 0 & -b_{2} & b_{3} \\ b_{2} & 0 & -1 \\ -b_{3} & 1 & 0 \end{pmatrix} \begin{pmatrix} x_{1} \\ y_{1} \\ z_{3} \end{pmatrix} = 0$$

(2.3.2)

where: $b_y = \beta_y / b_x$ $b_y = \beta_y / b_y$

> X Y Z 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.
- $\begin{array}{l} Z_{_{f}}=Z_{_{2}}=f & \text{ all points are referred to the respective plate} \\ & \text{ perspective centre as origin and therefore} \\ & \text{ all } Z_{_{1}}^{i} \text{ and } Z_{_{2}}^{i} \text{ equal the common focal length,} \end{array}$

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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.

(2.3.3)

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

$$S = \frac{V_2}{\left(\begin{array}{ccc} 0 & -\upsilon & \mu \\ \upsilon & 0 & -\lambda \\ -\mu & \lambda & 0 \end{array}\right)}$$
(2.3.4)

Since the focal length of each camera station is constant, $Z_1 = Z_2 = 1$ equation 2.3.2 may be written as

$$\begin{array}{c} x_{2} \ y_{2} \ 1 \) R_{2}^{T} \\ b_{x} \ 0 \ -1 \\ -b_{y} \ 1 \ 0 \end{array} \right) \begin{pmatrix} x_{1} \\ y_{1} \\ 1 \end{pmatrix} \approx 0$$

$$\begin{array}{c} c \\ (2.3.5) \end{array}$$

where the ordinates X_2, Y_2, X_1, Y_2 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:

$$y_1 - y_2 + (1 + y_2) = \lambda - y_1 x_2 \mu - x_2 \cup -(x_1 - x_2) b_2 + \mu = 0$$

+ $(x_1y_2 - x_2y_1) = b_2 + \mu = 0$

(2.3.6)

 R_2^r

where R represents the second and third order terms.

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

$$AV+B\Delta+F=0$$
 ; $F=R-l$

(2.3.7)

where: A = I the identity matrix

- B is the matrix of coefficients of the unknown parameters $\lambda_{,}\mu_{,}\upsilon_{,}b_{,}$, b.
- V is the vector of residuals
- Δ is the vector of unknown parameters
- is the vector of y-parallax
- R is the remainder term of second and third order terms.

The least squares solution for the unknowns, Δ_{s} follows an iterative procedure wherein $R_{s}=0$ (the null matrix) for the first iteration. Thus

 $\Delta_{i} = N^{T}B^{T}F_{i}$

(2.3.8)

where:

and

N=(B¹B) F;=-1

The vector of residuals $V_i = -B\Delta_i - (R_i - I) = R_i$ and is evaluated from the original condition equations 2.3.5. In general:

$$\Delta_{n,i} = \Delta_n - N' B' V_n$$

$$= R_{n,i} = V_n + V_{n+i}$$
(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:

$$(x_{2} \cdot y_{2} \cdot z_{2}) = R(x_{2} \cdot y_{2} \cdot z_{2})^{T}$$

(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:

$$\begin{cases} X_{j}^{i} = Z_{j}^{i} x_{i}^{i} = 1 - X_{j}^{i} \\ Y_{j}^{i} = Z_{j}^{i} y_{i}^{i} \\ Y_{j}^{i} = y_{j}^{i} (Z - b_{z}) / Z_{z}^{i} + b_{y} \\ Z_{j}^{i} = (y_{z}^{i} - x_{z}^{i} b_{z}) / (x_{j}^{i} x_{z}^{i} - x_{z}^{i}) \end{cases}$$

(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:

$$\delta_{r_p} = \sqrt{\sum y' y / (n - u)}$$

(2.3.12)

where: //

u

equals the number of condition equations equals the number of unknowns i.e 5

 $y = (Y_{t}^{i} - Y_{2}^{i}) \cdot f / Z_{p}^{i}$; 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:

(2.4.1)

where:

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

(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)'(dI + S)X

(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 seguentially 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:

(2.4.1)

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where: $S = \begin{pmatrix} 0 & -c & b \\ c & 0 & -a \\ -b & a & 0 \end{pmatrix}$

(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 - SJ'(dI + S)X

(2.4.3)

2 1 m A

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 (dl-S), expanding and simplifying yields the following three linearly dependent equations of which only two are linearly independent;

$$\begin{pmatrix} t_1 \\ t_2 \\ t_3 \\ t_5 \end{pmatrix} = \begin{pmatrix} 0 & -(Z'+Z) & (Y'+Y) & (X'-X) \\ (Z+Z) & 0 & -(X'+X) & (Y'-Y) \\ -(Y'+Y) & (X+X) & 0 & (Z'-Z) \end{pmatrix} \begin{pmatrix} a \\ b \\ c \\ d \end{pmatrix} = 0$$

(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 Schwurter (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:

 $A, V, +B, \Delta +F, = 0$



Therefore:
$$A_{i}^{c} = \begin{pmatrix} -b^{*} & -b^{*} & c^{*} & c^{*} & 1 & -1 \\ a^{*} & a^{*} & 1 & -1 & -c^{*} & -c^{*} \\ (2, 4, 7) \end{pmatrix}$$

where $a^{*}_{,,}b^{\prime}$ and c^{*} are initial approximations to the rotation matrix elements.

$$B_{r} = \begin{pmatrix} \frac{\partial f_{1}}{\partial a} & \frac{\partial f_{2}}{\partial b} & \frac{\partial f_{1}}{\partial c} \\ \frac{\partial f_{1}}{\partial a} & \frac{\partial f_{2}}{\partial b} & \frac{\partial f_{2}}{\partial c} \\ \end{pmatrix}_{i}^{r} = \begin{pmatrix} 0 & -(Z'+Z) & (Y'+Y) \\ (Z'+Z) & 0 & -(X'+X) \\ \end{pmatrix}_{i}^{r}$$

(2.4.8)

$$V_i = \left(\frac{dZ}{dZ} \quad \frac{dZ}{dY} \quad \frac{dY}{dY} \quad \frac{dX}{dX} \right)_i^T$$

(2.4.9)

(2.4.10)

(2.4.11)

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

$$\begin{array}{l} A_{\lambda}^{\prime} + B_{\lambda}^{\prime} \Delta + F_{\lambda}^{\prime} = 0 \\ A_{\lambda}^{\prime} + B_{\lambda}^{\prime} \Delta + F_{\lambda}^{\prime} = 0 \\ A_{\lambda}^{\prime} + B_{\lambda}^{\prime} \Delta + F_{\lambda}^{\prime} = 0 \end{array}$$

(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)

(2.4.15)

where: $N = \sum_{i=1}^{n} (B^{i}(AA^{i})^{\prime}B)_{i}$

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

(2.4.16)

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

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

(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+i 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 utrip 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 2) to the terrain unit (U V W). The projective transformation is thus:

(2.5.1.1)

where: $X_{terrain}$ is the vector of terrain co-ordinates (U V W)⁷ for a point in the strip.

h is the scale factor.

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_{shiff} is the vector (U₀ V₀ W₀)' 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 \hat{R} , the scale factor λ and the three shift parameters $\hat{X}_{sh/tt}$ are obtained from the solution to the equation set 2.5.1.1 using two points which are known in $(U \lor W)^T$ and $(X \not z)^T$ and a third point known in $(0 \circ W)^T$ and $(0 \circ z)^T$.

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 diguted, the method of strip transformation involving a least squares iterative procedure where redundant observations are present which provides improved tronsformation parameters has been used.

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

$$R = \begin{pmatrix} \sqrt{J - r_{21}^{+}} & -r_{21}^{+} & r_{21} + r_{21}^{-} r_{22}^{-} r_{2}^{-} r_{$$

(2, 5, 1, 2)

After the initial approximation all subsequent rotations dR will be small with the elements ζ_1 , ζ_1 and ζ_2 tending to $d\zeta_1$, $d\zeta_1$ and $d\zeta_2$ respectively. The resulting rotation matrix dR will become:

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

(2.5.1.3)

if all sect 2 and higher order terms are ignored. Similarly after the initial approximation to the transformation parameters the scale λ and the vector of dhifts X_{shift} , will tend to the small quantities $d\lambda$ and dX_{shift} respectively.

Hence, after iterating the solution n times

 $X_{\text{result}} = \sum_{R} R_{R} X_{\text{model}} + X_{\text{result}}$

(2.5.1.4)

where:

 $\lambda_n = \lambda_o + \sum_{i=1}^n d\lambda_i$

 $R = R \hat{n} dR$

(2.5.1.5)

(2.5.1.6)

(2.5.1.7)

2.5.2 Strip Adjustment

 $X_{n_{x,hiff}} = X_{n_{x,hiff}} + \sum_{i}^{n} dX_{i}_{x,hiff}$

Rolynomials for strip adjustment have been investigated by several photogrammetriste notably G Schut (1560, 1961, 1962, 1964) F Ackermann (1962/64) E Mikhail (1964) and M Keller and G C Tewinkel (1964). Although the optimus 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 S. 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 Geodwtic Survey (Keller, M. and Tewinkel, G. 1964) use the following formulae which contain terms to cacter for the local tilts in the strip:

 $\begin{aligned} X_{terrain} &= X_{model} - \Delta z \left(3hx^2 + 2ix + j \right) + ax^2 + bx^2 + \\ &+ cx - 2dxy - ey + f \end{aligned}$ $\begin{aligned} Y_{terrain} &= Y_{model} - \Delta z \left(hx^2 + (x + m) + 3ax^2y + 2bxy + \\ &+ cy + dx^2 + ex + o \end{aligned}$

(2.5.2.1)

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

$$\begin{aligned} X_{terrali} & X_{madet} + a_{1} + a_{2} x + a_{3} z - a_{2} y + {}^{t_{2}} a_{3} x^{2} + a_{5} x z - a_{1} xy \\ Y_{terralin} & = Y_{madet} + a_{2} + a_{4} y + a_{3} z + a_{4} x + a_{4} xy + a_{3} x z + {}^{t_{2}} a_{3} x^{2} \\ & Z_{terralin} = Z_{madet} + a_{3} + a_{4} z - a_{3} y - a_{5} x + a_{4} xy - {}^{t_{2}} a_{5} x^{2} \end{aligned}$$

(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:

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

(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:

$$\begin{split} X_{terrain} & X_{madet}^* a x - b y + c(x^2 - y^2) - 2 d x y + e(x^3 - 3y^2) - f(3x^2 y - y^3) \\ Y_{terrain} & - Y_{madet}^* + b x + a y + d(x^2 - y^2) + 2 c x y + e(3x^2 y - y^3) + f(x^2 - 3xy^2) \end{split}$$

and the third order polynomial:

$$Z_{i + rrain} = Z_{model} + a_r x + a_2 y + a_3 x y + a_4 x^2 + a_5 x^3$$

(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		
	В,	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;	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 (1951) 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 elightly 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 remiduals at the section tie points in the block.

The add ment follows this simple procedure:

- 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 saction are calculated.
- iii) Each section in turn is transformed to the respective tie points co-ordinate means using a linear conform.l transformation. The coefficients of the transformation equations are computed using a minimum variance determination described in 2.6.1.1.
- v) 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 Pransformations

Consider the tie point means of the jth section in strip i in the block to be $(\overline{\lambda}_i \ \overline{\gamma}, j, (\overline{\lambda}_2 \ \overline{\gamma}), \dots, (\overline{\lambda}_n \ \overline{\chi})$ and the corresponding tie points to be $(\lambda_i \ \gamma, j, (\lambda_2 \ \gamma_2), \dots, (\lambda_3 \ \gamma_2))$ then the minimum variance

coefficients $\hat{\vec{a}}, \hat{\vec{b}}, \hat{\vec{c}}$ and $\vec{\vec{d}}$ of the linear conformal . transformation observation equations 2.6.1.1.1, of which there will be two for each section tie point,

$$V_{i} = \overline{X}_{i} - aX_{i} - bY_{i} + c$$
$$V_{2} = \overline{Y}_{i} - bX_{i} + aY_{i} + d$$

(2.6.1.1.1)

are computed from:

$$\hat{a} = \frac{x_i(X,\overline{X}_i + Y,\overline{Y}_i)}{x_i^2(X_i^2 + Y_i^2)}$$

$$\hat{b} = \frac{x_i(X_i,\overline{Y}_i - Y_i,\overline{X}_i)}{x_i^2(X_i^2 + Y_i^2)}$$

$$\hat{c} = \frac{x_i}{x_i}$$

$$\hat{d} = \frac{x_i}{x_i}$$

(2.6.1.1.2)

where X, and Y, are referred to the centroid of the model under consideration.

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

$$d_{\circ} = \left(\frac{V^{T}V}{2n-4}\right)^{V_{2}} = \left(\frac{\hat{z}_{1}^{\circ}\left((\vec{X}_{1} - \hat{a}X_{1} + \hat{b}Y_{1} - \hat{c}_{1}^{+}(\vec{Y}_{1} - \hat{b}X_{1} - \hat{a}Y_{1} - \hat{c}_{1}^{+})}{2n-4}\right)^{V_{2}}$$

(2.6.1.1.3)

where n is the number of the 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,

$$\overline{Z} = Z + Z + aX + bY$$

(2.6.1.1.4)

where: Z	re: \overline{Z} is the transformed height of the point		
Z	is the height of the point in the strip		
Z,	is a shift in the Z direction		
X and Y	are the co-ordinates of the point		
<i>a</i> and <i>b</i>	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 unknown site, 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 transformion 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 cognisance 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 boight 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:

$$\begin{split} & f_{j}^{i} = a_{i}^{i} + a_{k}^{i} X_{r} - a_{k}^{i} Y_{r} + a_{k}^{i} \left(X_{r}^{k} - Y_{r}^{k} \right) - a_{i}^{i} \left(2 X_{r} Y_{r} \right) + a_{k}^{i} \left(X_{r}^{k} - 3 X_{r} Y_{r} \right) + \\ & + a_{k}^{i} \left(Y_{r}^{k} - 3 X_{r}^{k} Y_{r} \right) + X_{s} - X_{r} = 0 \\ & f_{2}^{i} = a_{i}^{i} + a_{k}^{i} Y_{r} + a_{k}^{i} X_{r} + 2 a_{k}^{i} \left(X_{r}^{k} - Y_{r}^{k} \right) + \\ & + a_{k}^{i} \left(X_{r}^{k} - 3 X_{r} Y_{r}^{i} \right) + Y_{s} - Y_{r} = 0 \end{split}$$

(2.6.2.1)

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

$$f_{s}^{i} = b_{s}^{i} + b_{i}^{i} X_{\tau} + b_{s}^{i} Y_{\tau} + b_{s}^{i} X_{\tau} Y_{\tau} + b_{k}^{i} (X_{\tau}^{i})^{2} + Z_{s} - Z_{\tau} = 0$$

(2.6.2.2)

where: a

through \hat{a}_{j}^{i} are the planimetric adjustment polynomial coefficients in strip \hat{l} .

 b_o^i through b_a^i are the height adjustment polynomial coefficients in strip i,

 X_{τ}, Y_{τ} and Z_{τ} are the control point co-ordinates in the terrain. X_{τ}, 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 plankmetric and height adjustments. Thus for a tie point between strips i and i+i the respective condition equations are:

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Planimetry:

$$\begin{split} & t_{i}^{-j} = a_{i}^{-j} + a_{i}^{j} X_{i}^{j} - a_{i}^{j} V_{i}^{j} + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} (Y_{i}^{j} A_{i}^{-}) - a_{i}^{j} (2 X_{i}^{j} Y_{i}^{j}) + \\ & + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} - 3 X_{i}^{j} Y_{i}^{j}) + a_{i}^{j} (t Y_{i}^{j} A_{i}^{-} - 3 X_{i}^{j} Y_{i}^{j} Y_{i}^{j}) + \\ & + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} - 3 X_{i}^{j} Y_{i}^{j}) + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} - t Y_{i}^{j} A_{i}^{j}) - a_{i}^{j} (2 X_{i}^{j} Y_{i}^{j}) + \\ & + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} - 3 X_{i}^{j} Y_{i}^{j}) + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} - t Y_{i}^{j} A_{i}^{j}) - a_{i}^{j} (2 X_{i}^{j} Y_{i}^{j}) + \\ & + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} - 3 X_{i}^{j} Y_{i}^{j}) + a_{i}^{j} (t Y_{i}^{j}) - 3 (X_{i}^{j} A_{i}^{j} Y_{i}^{j} Y_{i}^{j}) + \\ & + a_{i}^{j} (t X_{i}^{j} A_{i}^{-} - 3 X_{i}^{j} Y_{i}^{j}) + a_{i}^{j} (t Y_{i}^{j}) - 3 (X_{i}^{j} A_{i}^{j} Y_{i}^{j} Y_{i}^{j}) + X_{i}^{jm} - X_{i}^{im} = 0 \\ & f_{i}^{j} = a_{i}^{j} + a_{i}^{j} (Y_{i}^{j} + a_{i}^{j} X_{i}^{j} + 2 a_{i}^{j} X_{i}^{j} Y_{i}^{j} + a_{i}^{j} (Y_{i}^{j}) + a_{i}^{j} (X_{i}^{j} A_{i}^{j} - Y_{i}^{j}) + a_{i}^{j} (X_{i}^{j} A_{i}^{j} - Y_{i}^{j}) + a_{i}^{j} (X_{i}^{j} A_{i}^{j} - Y_{i}^{j}) + \\ & - (Y_{i}^{j} I) + a_{i}^{j} ((X_{i}^{j} A_{i}^{j} - 3 X_{i}^{j} Y_{i}^{j}) (Y_{i}^{j} A_{i}^{j}) + Y_{i}^{j} - Y_{i}^{j} = 0 \\ \\ & f_{i}^{jm} = a_{i}^{im} + a_{i}^{im} Y_{i}^{im} + a_{i}^{im} X_{i}^{im} + 2 a_{i}^{im} X_{i}^{im} Y_{i}^{im} + a_{i}^{im} ((X_{i}^{in})^{j} - (Y_{i}^{in}))^{j} + \\ & + a_{i}^{im} (3 (X_{i}^{im})^{j} (Y_{i}^{jm}) - (Y_{i}^{im})^{j}) + a_{i}^{j} ((X_{i}^{im})^{j} - (Y_{i}^{im})^{j}) + A_{i}^{jm} - Y_{i}^{jm} + A_{i}^{jm} (Y_{i}^{im}) + A_{i}^{jm} (Y_{i}^{im}) + A_{i}^{jm} (Y_{i}^{im}) + Y_{i}^{jm} - Y_{i}^{jm$$

Height:

$$\begin{split} f_{3}^{i} &= b_{0}^{i} + b_{1}^{i} X_{\tau}^{i} + b_{\tau}^{i} Y_{0}^{i} + b_{3}^{i} X_{\tau}^{i} Y_{\tau}^{i} + b_{\tau}^{i} (X_{\tau}^{i}) + Z_{\tau}^{i} - Z_{\tau}^{i} = 0 \\ f_{\tau}^{in} &= b_{0}^{in} + b_{\tau}^{in} X_{0}^{in} + b_{\tau}^{in} Y_{0}^{in} + b_{\tau}^{in} X_{0}^{jn} Y_{\tau}^{in} + b_{0}^{in} (X_{\tau}^{in})^{i} + Z_{\tau}^{in} - Z_{\tau}^{in} = 0 \end{split}$$

(2.6.2.3)

where X_{i}^{i}, Y_{i}^{j} and Z_{i}^{j} are the tip point co-ordinates in strip i $X_{i}^{in}, Y_{i}^{(n)}$ and $Z_{i}^{(n)}$ are the corresponding tip points co-ordinates in strip i + l

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



(2.6.2.4)

Thus, the new planimetric observation equations are:

$$\begin{split} f_{j}^{i,iv} &= a_{i}^{i} + a_{i}^{i} X_{i}^{i} - a_{i}^{i} Y_{i}^{i} + a_{i}^{i} ((X_{i}^{i} y_{i}^{i} - (Y_{i}^{i} y_{i}^{i}) - a_{i}^{i} (2X_{i}^{i} Y_{i}^{i}) + \\ &+ a_{i} ((X_{i}^{i} y_{i}^{i} - 3X_{i}^{i} Y_{i}^{i}) + a_{i}^{i} ((Y_{i}^{i} y_{i}^{i} - 3(X_{i}^{i} y_{i}^{i}) - (Y_{i}^{i} y_{i}^{i}) + \\ &- a_{i}^{iv} - a_{i}^{iv} X_{i}^{iv} + a_{i}^{iv} Y_{i}^{iv} - a_{i}^{iv} ((X_{i}^{iv} y_{i}^{i} - 3(X_{i}^{iv} y_{i}^{i} Y_{i}^{iv}) + \\ &- a_{i}^{iv} ((X_{i}^{iv} - 3X_{i}^{iv} Y_{i}^{iv}) - a_{i}^{iv} ((Y_{i}^{iv} y_{i}^{i} - 3(X_{i}^{iv} y_{i}^{iv})) + X_{i}^{i} - X_{i}^{iv} = 0 \\ f_{j}^{ivit} = a_{i}^{i} + a_{i}^{i} Y_{i}^{i} + a_{i}^{i} Y_{i}^{i} + a_{i}^{i} ((X_{i}^{i} y_{i}^{i} - (Y_{i}^{i} y_{i}^{i}) + \\ &+ a_{i}^{i} (3(X_{i}^{i} y_{i}^{i}) - (Y_{i}^{i} y_{i}) + a_{i}^{i} ((X_{i}^{i} y_{i}^{i} - 3(X_{i}^{iv}) (Y_{i}^{iv})_{i}^{i}) + \\ &- a_{i}^{iv} - a_{i}^{iv} Y_{i}^{ivit} - a_{i}^{iv} X_{i}^{ivit} - 2a_{i}^{iv} X_{i}^{iv} Y_{i}^{ivit} - a_{i}^{iv} ((X_{i}^{iv} y_{i}^{iv} - (Y_{i}^{ivit})) + \\ &- a_{i}^{iv} (3(X_{i}^{iviy})^{i} (Y_{i}^{ivi}) - (Y_{i}^{ivit})) - a_{i}^{iv} ((X_{i}^{iviy})^{-} (X_{i}^{ivit}) - (Y_{i}^{ivit})) + \\ &- a_{i}^{ivi} (3(X_{i}^{iviy})^{ivi} - (Y_{i}^{ivit})) - a_{i}^{iv} ((X_{i}^{iviy})^{-} - 3(X_{i}^{ivi})^{iv} (Y_{i}^{ivi})^{iv} + Y_{i}^{ivit}) \\ &- a_{i}^{iv} (3(X_{i}^{iviy})^{iv} (Y_{i}^{ivi}) - (Y_{i}^{ivit})) - a_{i}^{iv} ((X_{i}^{iviy})^{-} - 3(X_{i}^{ivi})^{ivi} (Y_{i}^{ivi})^{iv} + Y_{i}^{ivit} + X_{i}^{ivit}) \\ &- A_{i}^{ivi} (3(X_{i}^{iviy})^{ivi} + Y_{i}^{ivit}) + X_{i}^{ivit} + X_{i}^{ivit} + X_{i}^{ivi} (Y_{i}^{ivi}) + X_{i}^{ivit} + X_{i}^{ivit}) \\ &- A_{i}^{ivi} (3(X_{i}^{iviy})^{ivi} + Y_{i}^{ivit}) + X_{i}^{ivit} + X_{i}^{ivit}$$

and the new height observation equation is:

$$\begin{split} f_{j}^{(i)} &= b_{0}^{i} + b_{1}^{i} X_{5}^{i} + b_{5}^{i} Y_{5}^{i} + b_{5}^{j} X_{5}^{i} Y_{5}^{i} + b_{5}^{i} (X_{5}^{i})^{3} + \\ &- b_{0}^{in} - b_{0}^{in} X_{5}^{in} - b_{5}^{in} Y_{5}^{in} - b_{5}^{in} Y_{5}^{in} - b_{5}^{in} Y_{5}^{in} - b_{5}^{in} Y_{5}^{in} + Z_{5}^{i} - Z_{5}^{i} = 0 \end{split}$$

(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:

(2.6.2.6)

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

$$(B_{p}^{T}W_{p}B_{p}) + \Delta_{p} + B_{p}^{T}W_{p}F_{p} \approx 0 (B_{p}^{T}W_{p}B_{p}) + \Delta_{p} + B_{p}^{T}W_{p}F_{p} = 0$$

(2.6.2.7)

where: B_p and B_h are the matrices of coefficients of the unknowns $a_{j,i}(j=0,1,..,7)$ and $b_{k,i}(k=0,.4)$ for planimetry and height respectively

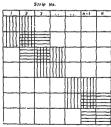
 W_p and W_h are the weight coefficient matrix of the planimetry and height respectively

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

 F_p^r and F_b^r 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)

Strip No.

CT.	2	3	•••	ι.	1-1	1
Π	Ш				_	
ht	Ħ	E			_	
<u>u</u>	2	R	π	-		
-		Ŧ	HH		-	Н
-	-	щ	щ	hπ	ш	-
-		-		44	Hł	-
	-	_		щ	E	
				_		

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.



Height n(5)x9

Planimetry n(8)x1%

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

en by:
$$\begin{split} & \phi_{p_{p(an)}} = \left(\frac{V_p^T W_p V_p}{(2m - 8n)} \right)^{T} \\ & I \\ & I \\ & I \\ & I \\ & V_p \\ & V_p \\ & V_p \end{split}$$
 $\delta_{a_{heighl}} = \left(\frac{V_p^T W_p V_p}{(m-5)} \right)$

(2.6.2.8)

where: D

m

is the number of strips in the block is the number of tie and control points in the block. CEAPTER 3

THE WANG 2200 MINICOMPUTER

ANALYTICAL AERIAL TRIANGULATION SYSTEM

THE ANALYTICAL PHOTOGRAMMETRY SYSTEM DEVELOPED FOR THE WANG 2200 MINICOMPUTER

3.1 General Overview

An analytical photogrammetry system was developed for the WMM 2200 minicomputer system with the intention of producing a workable system and not merely a sait 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, the core of which consists of the main data processing programs, the core of which consists of the main data more formation using the independent 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 infitio as no software existed which could be incorporated into it either wholly or partly.

The system has three distinct phases, viz.

- Input of the plate co-ordinates and the adjustment control data, and amendments thereto,
- 2) processing of the data, and
- 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.

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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 Ward 2200 minicomputer ten Megabyte disk drive model 2260 has 19 504 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 files area, may be used as a temporary work area.

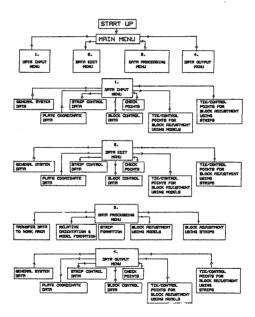
Data may be accessed from the disk using either catalogued data file procedures or by the direct sector addressing methol which is the faster of the two accessing methods.

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 serial 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 dat are transferred from these catalogued files to the uncetalogued 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 emables any routine to be restarted should an interrupt occur without having to recover from the initial temporary work area setum proutine.

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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 Meesbyte 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. $(B^{T}B)\Delta_{c} = B^{T}F$ invert the normal equation coefficient matrix vis. $(B^{T}B)\Delta_{c} = B^{T}F$ invert the normal equations to the first unknown parameters of the relative orientation, that is $\Delta_{c} = N^{-1}(B^{T}F)$. The formation and solution of the normal equations is achieved using the following five DASIC matrix statements:

10	MAT AI = 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 $N'B'$
50	MAT X = A4*F	- calculation of $\Delta = N' B' F$

The matrix inversion is performed using Gaussian elimination done in place on the WANG 2200 T and Gaussian 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:

$$V_i = \{x_j, y_j, 1\}, R_i(x_j, y_j, 1)_i^T$$

(3.2.1)

where: $\begin{pmatrix} x & y & 1 \end{pmatrix}_i$ and $\begin{pmatrix} x & y & 1 \end{pmatrix}_i^T$ 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 *i*th 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:

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

(3.2.2)

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

$$\frac{\phi_i \quad \phi_{i-j}}{\phi_j} \in e_n$$

(3.2.3)

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

 ϕ_i and ϕ_{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 microms at the scale of the photograph for any model in the strip.

3.3 Strip Formation Using the Independent Models

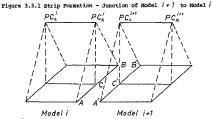
The right-hand perspective centre of the first model in each strip is adopted, for the sake of convenience, as the origin of the strip co-ordinate system in model space. Each successive model in the strip is translated, scaled and rotated to its predecessor using the method of determination of the elements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

- Model (i+i) 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+i) coincide.
- 2) Corresponding distances in each model vis. the distances between the two wing points A-B and A*-B*, and distances $PC_{R}^{i,*} - C$ and $PC_{L}^{i,*} - C'$ are compared and two swetays scale factor $\tilde{\lambda}$ is adopted. (Refer Figure 3.3.1). Thus the scale factor $\tilde{\lambda}$ is given simply by.

$$\overline{\lambda} = \left(\frac{A-B}{A-B'} + \frac{PC_{A}-C}{PC_{L}-C'}\right) / 2$$

(3.3.1)

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



The solution to the system of normal equations viz. $\Delta = N^{-1} B^{T} F$ 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 translation 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 Teet Areas and the IRC 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-crdinates 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 moduly to the terrain system is given as follows:

 $X_{max} = \lambda R X_{max} + X_{max}$

(3.4.1)

where: X terrain

terrain is the co-ordinate vector $(X \ y \ z)^7$ 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)⁷ of the point homologue in the model system.

 X_{chirr} 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 'n 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 MAMG 2200 compared favourably with those obtained by W 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 ANROCK (van den Bout, 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

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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:

- 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.
- 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.
- 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) Nodula 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 again 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 scatching and the source 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 astisfactory convergence has been achieved. In addition, the program automatically details the residuals at the 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:

- 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.
- 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.
- The transformation parameters are calculated for each model from the control and tie points of each model and the respective tie point means.

- 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 erch 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.
- All points in each model, including the original tie and control points are transformed using these new equations.

The above procedure whereby the tig 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 p'nicomputer 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 N van Djk, who used the same data as a basis for besting the accuracy of points measured with a Trilateration Microscope (Williams, H S. 1974) and the accuracy of serial triangulation using points of natural detail (van Djk, 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 or 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 abrut sea level to 170m abrut sea level. At a scale of approximately 118 000 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

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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 1:8000 using a Wild RCS camera fitted with a 153,86mm focal length Wild Aviogon lens No 1530,811. The photographic plates were measured by H S Williams and T J van Dijk using the Trilateration Mioroscope developed by H S Williams (1374). The trilaterated points were processed by a least squares adjustment routine on the University of the Witwaterarand IEM 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 vichin an accuracy of under three micros.

Two control configurations were used in the two different block adjustments vis. 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 beight adjustment of the block. The total number of control points used was thirteen.

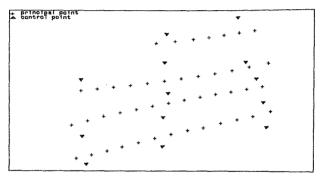
With reference to Figure 4.1.1.2, several more control points were used than in the previous case. A total of twenty-four control points in both planimetry and height were used in the strip and

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DURBAN TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT



EICHE: 4.1.1.1

DURBAN TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

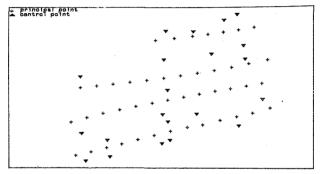


FIGURE 4.1.1.2

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 tural 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 11ford high resolution film.

A total of one hundred and seventy-three pre-marked points are fixed in planime:-y 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.

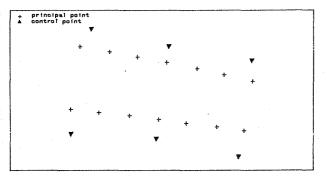
The pre-marked planimetric ground control was fixed to an acouracy of 1:15 000 and six of the perimeter control were heighted by vertical angle measurements from the secondary triangulation stations (van Digh, T 3. 1965).

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 letter case, the control points in both height were used while in

ST. FAITH'S TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT



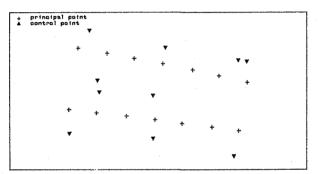


Page 61.

ST. FAITH'S TEST AREA

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT





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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 TRC 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 expecting and speed of the software developed on the KMN 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, the points and minor control points.

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

i)	Principal distance	1.52,00mm
ii)	Plate format	230mm by 230mm
iii)	Flying height above mean sea level	7 609m
1 v)	Flying height above ground	6 609m
∀}	Scale of photography	1 in 43 500
Vi)	Longitudinal overlap	60%
vii)	Lateral overlap	20%
viii)	Photo base	92ma
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 madif points were translated to assumed perspective centres. This provided data competible 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 Tilinois, Utbana, Tilinois (Sconhgen, H P 1967 and Scohngen, H P, 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 twolve points.

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

I.T.C. BLOCK

CONTROL CONFIGURATION

BLOCK RDJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT

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FIGURE 4,1.3.1

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I.T.C. BLOCK

CONTROL CONFIGURATION

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

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FIGURE 4.1.3.2

Page 64B

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64/65 3,2 14,0 24,0 65/66 4,8 11,0 29,0 66/67 3,9 6,0 12,0 66/67 3,9 6,0 12,0 66/66 4,7 9,0 21,0 68/76 1,0 16,0 34,0 70/71 6,0 12,0 16,0 72/72 6,7 12,0 20,0 72/72 6,9 12,0 13,0 73/74 4,3 9,0 13,0 73/74 4,3 9,0 13,0 74/75 4,3 9,0 13,0 74/75 4,3 3,0 10,0 21,0 36/37 3,1 13,0 20,0 30,24 36/39 3,4 10,0 21,0 30,24 38/39 3,4 10,0 21,0 30,24 40/41 4,8 1,0 13,0 42,0 40/42 3,1 6,0 13,0 42,0	3	63/64	0.4	17.0	36.0
65/66 4,8 11,0 29,0 66/67 3,9 6,0 12,0 67/68 3,0 10,0 12,0 68/69 4,7 9,0 21,0 68/69 4,7 9,0 21,0 68/69 4,7 9,0 21,0 68/70 1,0 16,0 34,0 70/71 6,0 12,0 16,0 72/73 6,9 10,0 13,0 72/73 6,9 10,0 13,0 73/74 4,3 9,0 21,0 4 36/37 3,1 13,0 21,0 37/36 3,4 10,0 22,0 38/39 3,5 12,0 22,0 38/39 3,5 12,0 22,0 43/42 3,1 6,0 13,0 42,42 3,1 6,0 13,0 42,43 4,9 8,0 10,0 42,445 2,0 13,0 24,0	-				
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38/39 3,5 12,0 22,0 39/40 4,0 11,0 22,0 40/41 0,8 11,0 27,0 41/42 3,1 6,0 13,0 42/43 4,9 8,0 10,0 43/44 1,0 10,0 127,0 44/45 2,0 13,0 24,0 45/46 1,5 10,0 18,0 45/46 1,2 7,0 11,0 46/47 1,2 7,0 11,0 47/48 2,9 10,2 17,8					
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 42/43 4,9 8,0 10,0 43/44 1,0 16,0 17,0 44/45 2,0 13,0 24,0 45/46 1,5 10,0 18,0 45/46 1,2 7,0 11,0 47/48 5,7 11,0 18,0 16/47 1,2 7,0 11,0 47/48 5,7 11,0 18,0 17,8 2,9 10,2 17,8					
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41/42 3,1 6,0 13,0 42/43 4,9 8,0 10,0 43/44 1,0 10,0 17,0 43/45 2,0 13,0 24,0 45/46 1,5 10,0 16,0 45/46 1,5 10,0 16,0 16/47 1,2 7,0 11,0 47/48 5,7 11,0 18,0 47/48 2,9 10,2 17,8					
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47/48 5,7 11,0 18,0 Means 2,9 10,2 17,8					
Means 2,9 10,2 17,8					
	Means	7//40			
Means for the Block 4,2 12,1 22,9				· · · · · · · · · · · · · · · · · · ·	<u> </u>
	Means for th	ne Block	4,2	12,1	22,9

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

- A Results of relative orientation and model formation obtained by T van Dijk.
- Results of relative orientation and model formation obtained on the WANG 2200.

 $b_{\gamma_{\beta}} = \text{Standard deviation in y-parallax after model formation.} \\ \gamma_{\mu}(m_{2M}-Maximum residual in y-parallax after model formation.$

In the relative orientation performed by T van Dijk only points of matural 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 FUG-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 Djk 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	ό _{γρ}	vyp (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 IEM 360 using the relative and absolute orientation program code-named REABO.

. . .

dyp - Standard deviation of y-parallax for the relative orientation over the whole block

Vy Imax- 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	burcan rest area.	standard Deviations of Strip
	Formation.	

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

 $\delta_{X//L}$ - 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 wate adjusted using third of ter 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		T VAN DIJK												
NO		ĸ												
	ð,	óy	62	0,	ð,	6,	6 _z	6,						
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	WANG 2200												
NO		CONTR	OL		CHECK								
	ό,	0,	٥,	6 ₈	ó,	ძყ	6 <u>7</u>	óp.					
1	5,3	10,9	7,5	12,1	-	-	-	-					
2	5,3	4,1	20,6	6,6	6,1	7,1	28,5	9,4					
3	6,5	10,0	16,3	11,9	1 - 1	-	-	-					
4	10,1	6,3	12,9	12,0	~	-	-	-					

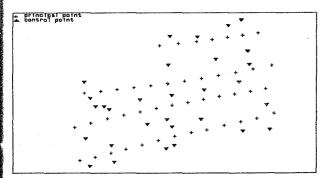
4.2.1.4 Block Adjustment Using the Strip as the Adjustment Unit

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 ROJUSTMENT





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

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

oplan - Standard deviation in planimetry.

on 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 fiftleth iteration.

DURBAN TEST AREA

RESIDUAL VECTORS IN PLANIMETRY BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

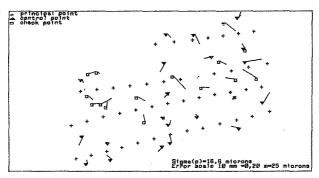


FIGURE 4.2.1.4.1

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DURBAN TEST AREA

RESIDUAL VECTORS IN HEIGHT

BLOCK ADJUSTMENT USING THE STRIP AS THE ADJUSTMENT UNIT

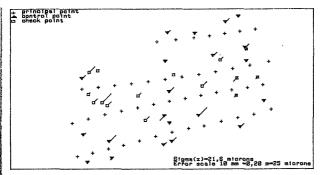


FIGURE 4.2.1.4.2

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ITERATION		s plân		6	6 HEIGHT					
NO	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				

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

 $\begin{array}{l} \phi_{pinn} \mbox{ \ = \ } & \mbox{Standard deviation in planimetry,} \\ \phi_{pinh}^{-} & \mbox{Standard deviation in height.} \end{array}$

٨

The results after ten iterations are compared with those obtained by T J van D(J) 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		S PLAN		4 HEIGHT				
	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK		
T van Dijk WANG 2200	10,1 10,5	8,3 9,0	14,4 13,8	4,0 9,0	8,3 6,0	25,1 18,9		

 ϕ_{plan} - Standard deviation in planimetry. ϕ_{belowh} - Standard deviation in height.

DURBAN TEST AREA

RESIDUAL VECTORS IN PLANIMETRY

BLOCK ADJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT 10 Iterations

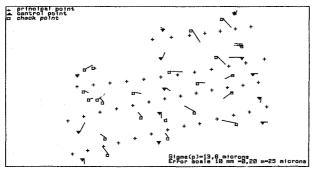


FIGURE 4.2.1.5.1

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DURBAN TEST AREA

RESIDUAL VECTORS IN HEIGHT

BLOCK RDJUSTMENT USING THE MODEL AS THE RDJUSTMENT UNIT 10 Iterations

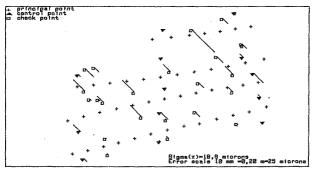


FIGURE 4.2.1.5.2

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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 E S Williams (1574) and T J van Dijk (1375) 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 consistancy 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 Paith'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 O _{Yp} A		о _{ур} В	V _{Yp} (MAX) B	
1.	61/62 62/63 63/64 64/65 65/66 65/66	4,6 5,1 3,6 6,5 7,6 6,5	13,0 9,0 8,0 10,0 11,0 18,0	22,0 20,0 15,0 23,0 21,0 39,0	
Means		5,7	11,5	23,3	
2	70/71 71/72 72/73 73/74 74/75 75/76	6,6 4,2 5,0 4,8 6,1 5,6	9,0 5,0 8,0 8,0 11,0 10,0	17,0 10,0 16,0 18,0 30,0 17,0	
Means		5,4	8,5	18,0	
Means for th	e 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.

oy, - Standard deviation in y-parallax after model formation.

Vy(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-Faraliax for all the models in the Block Obtained from Three Different Experiments.

Experiment	dyp	vyp(max)
H S Williams T van Dijk	5,8	11,2
WANG 2200	5,5 10,0	12,2 20,7

 ϕ_{γ_p} - Standard deviation of y-parallax for the relative orientation over the whole block

Vy/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.

STRIP # 1		STRIP # 2			
MODEL	6 x/ y/ T	MODEL	0 4/1/2		
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	19,0	73/74-74/75	18,0		
65/66-66/67	26,0	74/75-75/76	25,0		
Means	19,4		17,4		

Table 4.2.2.2.1 St Paith's Test Area. Standard Deviations of Strip Pormation.

or - 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	Ó x/y/ z		
Durban	19,1		
St. Faith's	18,4		

d Mean standard deviation in X, X 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 Yest 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 beight 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 T VAN DIJK									
NG		CONTR	OL			CHEC	к		
	٥,	d _y	62	6,	ό,	6,	٥ <u>,</u>	٥,	
1	9,3	10,5		14,0	10,8	12,1	-	16,2	
2	8,7	7,9	18,5	11,8	11,2	13,4	-	17,5	

STRIP				WANG 2	200			
NO		CONTROL				CHECK		
	d _x	óy	6,	ô,	ó,	óy	ó,	6,
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

 $\phi_x \phi_y \phi_z$ - Standard deviations in X, Y and Z respectively. $\phi_a \sim$ Standard deviation in planimetry ($\phi_a = / \phi_z^2 + \phi_z^3$).

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 microms at the scale of the photograph at the check points as shown in Table 4.2.2.4.1. The small number of beight check points and their unknown accuracy and doubtful reliability suggest that the standard deviation of 31,4 microms 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

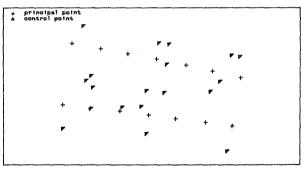


FIGURE 4.2.2.3.1

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	ó PLAN			6 HEIGHT		
NO	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

 $\begin{array}{l} \phi_{p/2n} - _ \text{Standard deviation in planimetry } (\phi_p = \int \overline{\phi_x^2 + \phi_y^2} \quad) \, , \\ \phi_{priod} = & \text{Standard deviation in height.} \end{array}$

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	o PLAN			0 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

$$\begin{split} & \phi_{p|an} - \text{ Standard deviation in planimetry } \left(\phi_p = \int \dot{\phi}_p^* + \dot{\phi}_p^* \right), \\ & \phi_{aright} - \text{ Standard deviation in height.} \end{split}$$

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

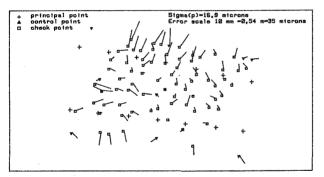


FIGURE 4.2.2.4.1

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6,1

13,5

26,1

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.

ITERATION		o plan		o Height					
30	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK			
1	-	-	12,1	-	-	24,9			
10	8,3	9,9	1 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	13,6	6,4	25,3			
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	0 2 1	0.0	15 1	12 5	6 3	26 0			

15.1

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

9,8 ϕ_{plan} - Standard deviation in planimetry ($\phi_p = \sqrt{\phi_p^L + \phi_p^L}$). operation in height.

8,2

100

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

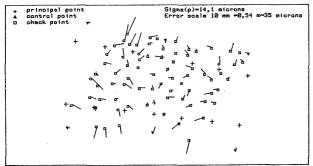


FIGURE 4.2.2.5.1

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- 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:

- 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-		6 PLA	1		6 EEIGHT				
	MENT	CONTROL	TIE	CHECK	CONTROL	TIE	CHECK			
T van Dijk	Amer	8,7	9,8 7,9	15,3	6,8	10,2	20,4			
	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			

 ϕ_{plan} - Standard deviation in planimetry ($\phi_p = \int \phi_x^2 + \phi_y^2$). $\phi_{t_n(m_p)}$ - 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-	6	PLAN		& HEIGHT					
	MENT	CONTROL	TIE	CHECK	CONTROL	TIR	CHECK			
T van Dijk	Amer ANBLOCK Bundle	10,1 10,6 9,9	8,3 6,3	14,4 19,0 16,9	4,0 8,8 16,6	8,3 9,7	25,1 21,8 29,8			
WANG 2200	Sumer C('yut	9,9 13,5	8,7 20,9	16,3 16,6	6,0 7,0	5,0 35,1	18,3 21,6			

 ϕ_{plan} - Standard deviation in planimetry ($\phi_p = \int \phi_x^* + \phi_y^2$). ϕ_{perphi} - 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 percurbed to simulate the systematic and random errors inherent in actual aerial photography and the measurchent of the photographic plates.

Unlike H Soehngen (1967/2577A) 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 Sryban 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.

				8	1/1/2					
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	68	46	41	11	24	55	26	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	0 8	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	1.6	33	29
16/17-17/18	12	29	25	21	32	25.	58	22	39	11
17/18-18/19	38	13	16	28	51	57	10	42	19	80
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

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

 $\phi_{x/y/z}$ - Standard deviations in X, Y or Z $(\phi_{x/y/z} = \int \Sigma y_z^* + \Sigma y_y^* + \Sigma y_y^*)/(3n-3)$ 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 planix-try 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



CONTROL CONFIGURATION STRIP ADJUSTMENT

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FIGURE 4.2.4.2.1

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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	ļ		. 8	SOERNO	JEN						
NO		CONTR	OL		CHECK						
	6,	dy.	ó,	0.	0,	0,	5,	6,			
1	1,31	2,03	2,41	1.00	0,98	2,43	2,64	2,14			
2	0,85	2,51	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	2,05	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	1,98	1,86			
Means	0,93	1,48	1,74	0,87	1,25	1,51	1,98	2,08			

STRIP	1			WANG 2	200				
NO		CONTR	OL			CHEC	CHECK		
	6x	0,	0,	6,	٥,	0,	0p	02	
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	2,51	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	3,24	
5	0,74	0,74	1,05	1,91	1,01	1,38	1,71	2,66	
6	0,76	9,43	0,88	1,49	2,11	1,24	2,45	1,90	
7	1,13	1,21	1,65	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	

 $\phi_{j} \phi_{j} \phi_{z}$ = Standard deviations in X, Y and Z respectively. $\phi_{p} = - Standard deviations in planimetry <math>\{\phi_{p} = \int \phi_{z}^{+} + \phi_{y}^{+}\}$

3.

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 atrips 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 the points per strip or fifty observation equations.

The tests undertaken by H Soehngen (1967) are compared in Table 4.2.4.3.). th 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

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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

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FIGURE 4.2.4.9.2

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				H SORHN						
NO		CONTROL			TIE			CHECK		
	d x	0y	02	61	67	02	d,	07	dr.	
1 1	0,77	0,90	-	0,64	0,92	-	1,16	0,98	-	
2	0,58	0,97	1 -	0,98	0,91	-	1,00	1,18	-	
3	0,89	0,44	-	0,78	0,80	- 1	1,57	1,64	-	
4	0,74	0,46	-	0,66	0,84	-	0,85	1,33		
5 6	0,52	0,58	-	0,68	1,02	-	1,29	1,21	[-]	
6	0,63	0,43	1 -	0,47	1,37	-	1,33	1,36	-	
7	1,05	0,36	-	0,69	0,79	- 1	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	-		1,20	1,10	-	
MSD	0,79	0,63	-	0,80	0,97	-	1,23	1,27	-	
STRIP				WANG 22	00					
NO		CONTROL			TIE		CHECK			
	0,	67	01	01	dy	Óz	ð r	6y	¢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	
		0,80	1,63	2,10	1,16	0,88	0,96	1,28	2,35	
5	0,97									
5	1.49	0,75	1,05	1,98	2,31	2,45	1,56	1,19	2,00	
7	1, 19 1, 32	0,75	1,05	1,98			1,56	1,19	2,00	
7	1.49	0,75	1,05	1,98	2,31	2,45				
7	1, 19 1, 32	0,75	1,05	1,98 1,60 2,38	2,31 2,53	2,45 2,75	1,27	1,44	2,50	
7	1,49 1,32 1,53	0,75 1,02 0,62	1,05 1,30 1,07	1,98	2,31 2,53 2,47	2,45 2,75 2,43	1,27 1,74	1,44	2,50	

d, d, d, - Standard deviations in X, Y and E 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	d _e Plan	d, 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

do - Standard deviation of a single observation of unit weight in

planimetry. $\phi_{s_{belob}}$ 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 iters ive 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 Sochngen (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 SOE	HNGEN		¥.	ANG 2200	
	CHECK	K POINTS		CH	CHECK POINTS	
	6,	69	0z	0x	dy	dz.
1	-	-	-	1,58	1,53	3,28
2	-	- 1	- 1	0,90	0,79	2,49
3 .	-	- 1	- 1	0,86	0,95	2,48
4	1,30	1,08	- 1	0,83	1,00	2,41
5	1,32	1,15	I _	0,65	0,93	2,42
6	1,23	1,24	-	0,60	0,85	2,01
7	1,08	1,05	- 1	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

 $\phi_z \phi_y \phi_z$ - 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	0	ONTROL		TIR		CED	CK	
NO	Ox12	61	dy/y	Ør.	ð1	64	0p	67
1	1,71	2,18	1,96	2,28	1,34	1.23	1,82	2,31
25	0,47	0,31	0,70	0,45	0,93	0,98	1,35	2,2
50	0,47	0,25	0,69	0,41	0,96	1,01	1,39	2,2
75	0,47	0,23	0,69	0,40	1,00	1,04	1,44	2,3
100	0,47	0,21	0,69	0,38	1,02	1,06	1,47	2,3
125	0,47	0,20	0.69	0,38	. 1,03	1,06	1,48	2,4
150	0,47	0.20	0.69	0,37	1,03	1,07	1,48	2,4
175	0,47	0,19	0.69	0,37	1,03	1,07	1,49	2,4
200	0,47	0,19	0,69	0.37	1,03	1,07	1,49	2,4

 $\begin{array}{l} \phi_{x,y} & - \mbox{Standard deviations in X or Y } (\phi_{x,y} f_{X'Y_{x}}^{\dagger} * x_{y}^{\dagger} / (2n-4) \), \\ \phi_{y} \phi_{y} \phi_{z} - \mbox{Standard deviations in X, Y and Z respectively,} \\ \phi_{x} & - \mbox{Standard deviations in planimetr} \left\{ \phi_{z} = \int \phi_{x}^{\dagger} + \phi_{y}^{\dagger} \ \right\}, \end{array}$

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 asparts of large data processing systems on minicomputers is the processing time. The gractical 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 (C)CD) 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 serial 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

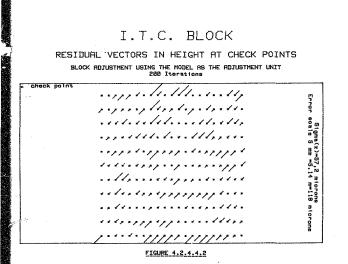
RESIDUAL VECTORS IN PLANIMETRY AT CHECK POINTS

BLOCK REJUSTMENT USING THE MODEL AS THE ADJUSTMENT UNIT 200 Iterations

check point	. I Man all Marca allahad	
		Error
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	*******************	5 am
		19 19
	<	orona 118
	*************	3
	· [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/] · [/	mtorons

FIGURE 4.2.4.4.1

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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. Paith'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 Strip Formation Strip Adjustment Block Adjustment using Strips Block Adjustment using Models	978 108 45 540 1 350	65 9 6 45 129
Durban Test Ares 41 Models 4 Strips	Model Formation Strip Formation Strip Adjustment Block Adjustment using Strips Strip Adjustment using Models	2 280 150 45 1 101 6 840	190 14 6 92 653
ITC Block 200 Models 10 Strips	Strip Formation Strip Adjustment Block Adjustment using Strips Block Adjustment using Models	3 183 45 6 133 25 322	278 6 544 2 678

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

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

Table 4.3.2 Average Processing Time per Model or Strip Units

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 IEM 360/50 or IEM 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 IEM 1620/1 for the iterative solution of the simultaneous adjustment of a one hundred section block. G C Tewinkel (1965) 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 IEM 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 meall 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 WANS 2200 minicomputer make it possible to draw the following conclusions:

- 1) Resitution of the r>del from measured plate co-ordinates is efficiently processed on the minicomputer particularly on the NANK 2200 VP which required five seconds per model for the solution. However, even using the NANG 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 efficiently 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 condinated 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 accommensite very long strips particularly if each strip was spooled off the minicomputer dikk onto some other medium before processing subsequent strips.

 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 WING 2200, the consistency of the results indicate for these two test areas processed that the WING 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:

- 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.
- 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.
- 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.
- The inexpensive hardware is generally solut 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 systema

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 verial triangulation.

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APPERDYN A

WANG 2200 MINICOMPUTER ANALYTICAL ABRIAL TRIANGULATION

PROGRAM LISTINGS

START

01/10/77 1

10 REM ---- "BTART" ----20 REM WRITTEN 08/1977 DATE & PROJECT NAME ENTRY ROUTINE M. ARBUCKLE

ED KHY WALTINK OBYLSY/ M. ARBUCKLE 50 DIT WILD IN MORES, DOSIO, 21864, 22664, 22664 190 LOAD DC FR'INFUT" 198, 252 190 LOAD DC FR'INFUT" 188, "FHOTODI* 100 DATA LOAD DC GIN, FL, NJ (), N38, DOS 100 FRITH HEK(303040) ITAGL(); "ANALYIGAL FHOTOGRAMMETRY"

.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 ("/N)",1,0) :IF Z#="N" THEN 1060 11F 24 "> Y* THEN 1040 1050 GOBU '97(8,6,1,"DATE (DD/MM/15YV)",10,0)

:DO#=Z# 1060 DBACKSPACE #1,BEG :DATA SAVE DC #1,N,F1,N1(),N9*,D0*

PHOTOBOO

01/10/77 1

LOREM -- "PHDTD900" -----VERSION# 1 PHOTOGRAMMETRY BYSTEM INPUT ROUTINES 15REM 20REM WRITTEN BY= M. ARBUCKLE DATE= 02/08/77 30DIM 2464,R48,Z1#64,Z2#60,Z3#1,Z4#1,Z5#30,26#3,Z7#3,Z8#8,Z0#10,R1# 64 70 DATA "NEW PRDJECT", "PHOTO107", "INPUT N,F1,N1(), PROJECT NAME", " 6", "RETURN TO MAIN MENU", "PHOTOBO4" 1005ELECT DISK BIO 19060TD 1000 199RETURN 202DEFFN'98(Z5,Z6,Z7) :IF Z5=0 THEN 203 :Z5=Z5-1 PRINT HEX (010D) :IF Z5=0 THEN :INIT(0A)Z1\$ E03 :PRINT STR(214,1,25) 2031F 27=0 THEN 204 FOR Z=1 TO 27 PRINT TAB(63) INEXT Z :INIT (0C)21# :PRINT STR(21\$,1,27) 2041F 26=0 THEN 199 :26=26-1 PRINT HEX(OD) 199 :INIT(09)21\$:PRINT STR(21\$,1,26) :RETURN 2050EFFN/30*6CRATCH T *;NEX(22);*PHDT0800*;NEX(22) RETURN 206DEFFN (31 *BAVE DC T (* THEX (22); *PHOTO800 * THEX (22); *) * THEX (22); *PHOTO800 * THEX (22); *) * HOTO800" (HEX (22) RETURN 207DEFFN'0"LIST 8 1000,9999* RETURN 209DEFFN'97(Z1,Z2,Z3,Z24,Z4,Z8) 210GOSUB '98(Z1,Z2,Z3) :Z1##Z2# :Z5.=LEN(21#)+1 18TR(Z14,Z5,3)=HEX(202058) 11 (22)8TR(Z14,LEN(Z14)+1,Z4) :STR(214,LEN(214)+1,1)=HEX(SF) PRINT ZIS; :Z3\$ HEX (00) ELIPRINT HEX(OD);

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PRINT HEX (OD) :

01/10/77 PHOTOBOO 23 ;FOR Z=1 TO Z4+1 E1EKEVIN STR(Z#,Z,1), 213, ERO :GOTO 212 213ADD (239,01) :IF 23*(HEX(40) THEN 214 :G08UB '98(21,22+2+3,0) :234=HEX(00) 2141F STR(24,2,1)(>HEX(09) THEN 216 :STR(Z\$,Z,1)=HEX(20) 11F Z=1 THEN 212 17 2-1 1404 610 12+2-2 11F Z=0 THEN 815 :IF Z=0 THEN 215 :STR(Z#,2+1,1)=HEX(20) :PRINT HEX(082E08): :GOTU 217 215STR(Z#,1,1)=HEX(20) IPRINT HEX(008E00); :0070 217 210PRINT STR(24,2,1); :1F STR(24,2,1) 2=24+1 (IF POS(2#=0D)=0 THEN 221 (5TR(2#,POS(2#=0D),1)=HEX(20) :15 28(>0 THEN 218 : RETURN 2181F GTR(Z\$,1,1)(>HEX(20) THEN 219 ;Z#="0" 25-0 2191F NUM(Z*)(Z4 THEN 210 CONVERT Z* TO Z :1F Z>Z8 THEN 221 RETURN 1284=1484(0) 128455578124,2,1)(>HEX(0F) THEN 212 11F 244(>11* THEN 212 1284=HEX(00) :GOSUB '93(0) 1010 1000 2019RINT HEX(07) 1KEYIN Z&, 221, 210 16010 201 2270EFFH 95(R1\$) DEFEN'SS(R1#) SELECT PRINT 005(64) SPRINT HEX(030A0A0A0A0A0 SPRINT TAB(5);** * * * * * * * SPRINT TAB(5);**";TAB(51);**" RETURN 1000BELECT PRINT 005(64) BOTHT HEY (BRAAAA (+TAD/C ++ IDTOTTA

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10REM ---- "PHOTOB01" -----VERBION= 1 ISREM PHOTOGRAMMETRY SYSTEM EDIT ROUTINES SOREM WRITTEN BY= M. ARBUCKLE DATEM 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.", "PHOTOE00", "EDIT PL ATE COORDINATES" "PHOTOE01", "EDIT STRIP CONTROL", "PHOTOE02", "EDIT ATE COURDINATES", "PHOTOECO", "BUIT STATE CONTROL", "PHOTOECO", "BUI BLOCK CONTROL (ANEE), "PHOTOECO", "BUIT TIE/CNTRL PT STATUS (ANEEN', "PHOTOECOS", "BUIT TIE/CNTRL PT STATUS (SCHUT)", "PHOTOECOS", "RETURN TO MAIN HEAV", "PHOTOECOS", 100SELECT DISK B10 19060TD 1000 199RETURN E02DEFFN'98(25,26,27) 11F 25=0 THEN 203 PRINT HEX(010D) :IF 25=0 THEN 203 :INIT (0A)Z1\$:PRINT STR(21\$,1,25) 2031F 27=0 THEN 204 :FOR Z=1 TO 27 PRINT TAB(63) IF Z7=0 THEN INIT(OC)Z1# 204 :PRINT BTR(21*,1,27) 2041F Z6=0 THEN 199 #26+26-1 #PRINT HEX(00) 11F 26=0 THEN 11HIT (09)21\$ 199 PRINT STR(218,1,26) RETURN 205DEFFN '30 "SCRATCH T *; HEX (22); "PHOTO801 *; HEX (22) RETURN 206DEFFN'31"SAVE DC T (";HEX(22);"PHOTOB01";HEX(22);")";HEX(22);"P HOTOBO1 ";HEX(22) :RETURN 207DEFFN'0"LIST & 1000,9999" :RETURN 2090EFFN '97 (21, 22, 23, 22\$, 24, 28) 210606UB '98(Z1,Z2,Z3) 1219=229 125HLEN(21\$)+1 :STR(Z1+,25,3)=HEX(202058) :INJT(2E)STR(Z1*,LEN(Z1*)+1,Z4) :STR(Z1*,LEN(Z1*)+1,1)=HEX(5D) PRINT 214; 234=HEX(00) 211PRINT HEX (0D); ; GOSUB '90 (0.4 EN (71\$)-74-1+22.01

PHOTOSO1

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:FDR Z=1 TG Z4+1 212KEYIN STR(2\$,Z,1), 213, 220 :GDTO 212 213ADD (234,01) :1F Z34(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 LIF Z=0 THEN 215 19TR(2+,Z+1,1)+HEX(20) :STR(24,Z+1,1)+HEX() :PRINT HEX(0B2E0B); :GUTO 217 2155TR(24,1,1)=HEX(20) :PRINT HEX(0B2E0B); :GOTO 217 216PRINT BTR(2\$,Z,1); IF STR(Z\$,Z,1) ()HEX(0D) THEN 817 :Z=24+1 PITNEYT 7 :1F POS(Z\$=00)=0 THEN 221 :STR(2\$,POS(2\$=07),1)=HEX(20) :IF 28(>0 THEN 218 :RETURN 218IF STR(24,1,1) (>HEX(20) THEN 219 :Z\$="0" E191F NUM(Z\$)(Z4 THEN 210 CONVERT 24 TO 2 RETURN 2201F STR(Z#,Z,1)<>HEX(DF) THEN 212 : IF Z4+<>"1" THEN 212 :GDSUB '94(0) :23\$*HEX(00) :605UB '93(0) 160TO 1000 221981NT HEX(07) 22102111 HEX(07) :GEVIN 24, 221, 210 :GOTO 281 22702270 95(R1\$) :SELECT PRINT 005(64) :PRINT HEX (030A0A0A0A0A) :PRINT TAB(5):** * * * * * * * * * * * :PRINT TAB(5); ***; TAB(51); *** 220PRINT TAB(5); ** SYSTEM LOADING :PRINT TAB(5);***;TAB(30-INT(LEN(RL#)/2));R1&;TAB(51);*** :PRINT TAB(5);***;TAB(51);*** 29PRINT TAB(5);*** :RETURN 10006ELECT PRINT 005(54)

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PHOTOSO2

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10REM

---- "PHOTOSO2" -----VERSIONE 1 OUTPUT ROUTINES 1 SPEM PHOTOGRAMMETRY SYSTEM

EOREM WFITTEN BY= M. ARBUCKLE DATE= 02/08/77 30DIM 2%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)" , "PMOTO303"

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 NAIN MENU", "PHOTO804" 1005ELECT DIEK BIO

190GOTO 1000 199RETURN

202DEFFN'98(25,26,27) IF ZS=0 THEN 203 :25=25-1 PRINT HEX(010D) 11F Z5=0 THEN 203 INIT (OA)ZIS

PRINT STR(21#,1,25) 203IF Z7=0 THEN 204 FOR Z=1 TO Z7 PRINT TAB(63)

NEXT Z :1F 27=0 THEN 204 INIT(OC)Z14

:PRINT STR(21\$,1,27) 2041F 26=0 THEN 199 :26=26-1

PRINT HEX(OD) :INIT(09)Z1# PRINT STR(Z1\$,1,Z6)

RETURN

205DEFFN '30 "SCRATCH T " (HEX (22) ; "PHDT0802" (HEX (22) RETURN

206DEFFN'31 "SAVE DC T (*;HEX(22); *PHOTOBO2";HEX(22);*)*;HEX(22);*PHO T0802" (HEX (22) RETURN

207DEFFN'0"LIST S 1000,3999" :RETURN

209DEFFN '97 (Z1,Z2,Z3,Z2\$,Z4,28) 210605UB '99 (Z1,Z2,Z3) :Z1#=Z2# :25=LEN(21#)+1 ISTR(Z1#,Z5,3)=HEX(202058) INIT(2E)STR(Z1#,LEN(Z1#)+1,Z4)

STR(Z1\$,LEN(Z1\$)+1,1)=HEX(5D) PRINT ZIS: :23\$=HEX(00)

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:GUSUB '98(0,LEN(Z1\$)-Z4-1+Z2,0) :28=" ۰. FOR Z=1 TO Z4+1 212KEYIN STR(Z\$,Z,1), 213, 220 (GOTO 212 213ADD(Z3\$,01) :IF Z3\$ (HEX (40) THEN 214 (GUIGUB '98 (21, 22+2+3,0) :Z3\$=HEX(00) 2141F STR(Z\$,Z,1)<>HEX(08) THEN 216 :STR(Z\$,Z,1)=HEX(20) :IF Z=1 THEN 812 :Z=Z-2 :1F Z=0 THEN 215 :IF Z=0 THEN 215 :STR(Z#,Z+1,1)=HEX(20) :PRINT HEX(082E08); :GOTD 217 21STR(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 11 POB(2\$=00)=0 THEN 201 578(2\$,POS(2\$=00),1)=HEX(20) IF ZB CO THEN 218 RETURN 218IF STR(Z#,1,1)<>HEX(20) THEN 219 :Z#=*0* 229="0" 2191F NUM(Z\$)(Z4 THEN 210 :CONVERT 2% TO Z :IF Z)Z8 THEN 221 :RETURN 2201F STR(24,Z,1)()HEX(0F) THEN 212 :1F 244(>"1" THEN 212 (005UB '94(0) GOSUB (93(0) 221PRINT HEX(07) IKEVIN ZS, 221, 210 160T0 221 2270EFFN 95 (R1#) SELECT PRINT 005(64) -TRATI 100131''' SVETEM LOADING 2007RINT TAB(5):"* :PRINT TAB(5):"*'TAB(30-INT(LEN(RI\$)/2));RI\$;TAB(51);"** :PRINT TAB(5):"*'TAB(51):"*" 229RRINT TAB(5):"* RETURN 1000SELECT PRINT 005(64)

PHOTOBOR

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:PRINT HEX(030A);TAB(5);"DIGITAL PHOTOGRAPHETRY DUTPUT ROUTINES" IPRINT IOIORG::NON DF DFTIDNS AVAILABLE :RESTORE :PROV TABRE :PROV TABLE :PROV T

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LOREM
                                             - "PHOTOS03" --
                                                                    - VERSION= 1
 ISREM PHOTOGRAMMETRY SYSTEM PRUCESSING ROUTINES
20REM WRITTEN BY= M. ARBUCKLE DATE= 02/08/77
 30DIM 2$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", "PHUTO405"
 E KEINMHENT,"PHOTO405"
7) DATA "MODEL FCRWAITLON","PHOTO400","STRIP FORMATION","PHOTO401"
,"STRIP ADJUSTHENT","PHOTO402","SLOCK ADJUSTHENT (AMER)","PHOTO40
4","BLOCK ADJUSTHENT (SCHUT)","PHOTO403"
20 AATA "RETURN TO MAIN MENU","PHOTO4034"
100SELECT DIEK B10
19060TD 1000
199RETURN
202DEFFN '98 (25,26,27)
    :1F 25=0 MEN 203
:25=25-1
     PRINT HEX (010D)
     :IF 25=0 THEN 203
     :INTT (0A)219
     :PRIN' STR(21$,1,25)
2031F 27=0 THEN 204
FOR Z=1 TO 27
    PRINT TAB(63)
    :IF 27=0 THEN 204
IPRINT STR(Z1$,1,27)
2041F Z5=0 THEN 199
    26=Z6-1
PRINT HEX(0D)
    :IF Z6=0 THEN 199
:INIT(09)Z1$
    PRINT STR(Z14,1,26)
205DEFFN'30"BCRATCH T *;HEX (22); "PHOTOBO3";HEX (22)
    RETURN
206DEFFN'31 "SAVE DC T (";HEX(22); "PHOTOBOS";HEX(22); ")";HEX(22); "P
    HOTO803" ;HEX (22)
:RETURN
207DEFFN'0"LIST B 1000,9999"
:RETURN
2090EFFN'97(Z1,Z2,Z3,Z2*,Z4,Z8)
210GD5UB '98(Z1,Z2,Z3)
;Z1$=Z2¢
     :25=LEN(21#)+1
     1STR(Z1$,Z5,3)=HEX(E0805B)
    :INIT(2E)STR(Z1$,LEN(Z1$)+1,Z4)
:STR(Z1$,LEN(Z1$)+1,1)=HEX(5D)
    PRINT Z1#;
;Z3#=HEX(00)
211FRINT HEX(00)1
:GOEUD '98(0,LEN(Z1+)-Z4-1+Z2,0)
    (Z$a" *
```

PHOTOSO3

01/10/77 1

PHOTOBO3 01/10/77 :FOR Z=1 TD Z4+1 212KEVIN STR(2\$,2,1), 213, 220 :GOTO 810 213ADD (234,01) :IF 234 (HEX (40) THEN 214 1GOSUB '98 (Z1, 22+Z+3,0) :Z3*=HEX(00) 1235+HEX(00) 2147F STR(2*,2,1)(>HEX(08) THEN 216 (STR(2*,2,1)=HEX(20) :IF Z=1 THEN 212 :Z=2-2 :IF Z=0 THEN 215 :STR(Z\$,Z+1,1)=HEX(20) :PRINT HEX(082E08); ;GOTO 217 2155TR(2\$,1,1)=HEX(20) :PRINT HEX(082E08): IGOTO 217 216PRINT STR(2\$,Z,1); : IF STR(Z\$,Z,1) ()HEX(0D) THEN 217 :Z=Z4+1 PITNEYT 7 :IF POG(Z#=0D)=0 THEN 281 :STR(2\$,PDS(Z\$=0D),1)=HEX(20) :IF ZB(>0 THEN 215 RETURN 2181F STR(2\$,1,1)<>HEX(20) THEN 219 2191F NUM(2#)(24 THEN 210 CONVERT 24 TO 2 IF Z>Z8 THEN 221 11 2/20 100, IRETURN 2201F STR(24,Z,1)(>HEX(0F) THEN 212 :IF 24*(>*1* THEN 212 :GOSUB (94(0) 1234 HEX(00) 1608UB (93(0) EGUTO 1000 REIPRINT HEX(07) :KEVIN 24, 221, 210 227DEFFN'95(R1%) (SELECT PRINT 005(64) PRINT HEX (030A0A0A0A0A) PRINT TAB(5);** * * * * * * * * (PRINT TAB(5);***;TAB(51);**" B28PRINT TAB(5);** SYSTEM LOADING PRINT TAB(5); ** "; TAB(30-INT(LEN(R1#)/2)); R1#; TAB(51); ** PRINT TAB(5); ** "; TAB(51); ** RETURN

1000BELECT PRINT 005(64) IPRINT HEX(030A0A);TAB(5);"DIGITAL PHOTOGRAPHETRY PROCESSING ROUT INEB" ひとぬいたい はまたたいちょう シー・シー・ステレー かんせん かみまたい とうたいしゃ たけ

PHOTOSOS

01/10/77 :

: #PLNT 1006PH (+M+D OF OFTICNS AVAILABLE 1006PT (+M+D OF OFTICNS AVAILABLE 1006PT (+M+D OF OFTICNS AVAILABLE 1006PT (+M+D OFTICS) : #PLNT TATE : #PLNT TATE : #PLNT TATE : #PLNT TATE : #PLNT (+M+D (+M+D OFTICS) : #PLNT (+M+D (+M+D OFTICS) : #PLNT (+M+D (+M+D (+M+D (+M+D OFTICS) : #PLNT (+M+D (+M+D (+M+D OFTICS) : #PLNT (+M+D (+M+D (+M+D (+M+D (+M+D))) : #PLNT (+M+D (+M+D (+M+D (+M+D))) : #PLNT (+M+D (+M+D (+M+D)) : #PLNT (+M+D (+M+D (+M+D))) : #PLNT (+M+D (+M+D)) : #PLNT (+M+D (

PHOTOR04

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10REM --- "PHOTOB04" ~----VERSION= 1 1SREM PHOTOGRAMMETRY SYSTEM MAIN MENU 20REM WRITTEN BY= M, ARBUCKLE DATE: 02/08/77 30DIM 2566,R88,Z1566,Z2565,Z361,Z451,Z553,Z553,Z753,Z858,Z0510,R15 66 70 DATA "INPUT ROUTINES", "PHOTOBOO", "EDIT ROUTINES", "PHOTOBO1", "O UTPUT RUITINES", "PHOTOBOE", "PROCESSING RUITINES", "PHOTOBOS" 100SELECT DISK BLO 1906010 1000 199RETURN 202DEFFN'98(Z5,Z6,Z7) 1F Z5=0 THEN 203 1Z5=Z5-1 PRINT HEX(010D) 11F Z5=0 THEN 203 (FRINT STR(Z1#,1,25) 2031F Z7=0 THEN 204 FOR Z=1 TD Z7 PRINT TAB(63) INTXT Z 11F Z7=0 THEN 204 :INIT(0C)Z18 PRINT STR(Z14.1.Z7) 2041F 26=0 THEN 199 :Z6=Z6-1 PRINT HEX(OD) IF Z6=0 THEN 199 :INIT(05)Z14 :PRINT STR(Z14,1,Z6) :RETURN 2050EFFN (30 *SCRATCH T *; HEX (22); *PHOTOB04*; HEX (22) :RETURN 206DEFN'31"SAVE DC T (";HEX(22);"PHOYOB04";HEX(22);")";HEX(22);"PHO TOBOA" (HEX (EE) 207DEFFN'0"LIST S 1000,9999" RETURN 209DEFFN'97(Z1,Z2,Z3,Z2*,Z4,Z9) 210G05UB '98(Z1,Z2,Z3) 1218=22% 125=LEN(21#)+1 :STR(Z1\$,Z5,3)=HEX(20205B) :INIT(2E)STR(Z1\$,LEN(Z1\$)+1,Z4) (STR(Z1*,LEN(Z1*)+1,1)+HEX(SD) PRINT Z1*; :234=HEX(00) 211PRINT HEX(0D); :GDSUB '98(0,LEN(Z1#)-Z4-1+Z2,0) 12#=* " :FOR Z#1 TO Z4+1 E12KEVIN STR(2\$,2,1), 213, 220 :GOTO 818

PHOTOBO4 01/10/77 :IF Z3\$ (MEX (40) THEN 214 :G09UB '98(Z1,Z2+Z+3,0) 2234=HEX(00) 214IF STR(Z#,Z,1)<>HEX(08) THEN 216 :STR(2#,2,1)=HEX(20) :IF Z#1 THEN 212 17-2-2 17 Z=0 THEN 215 STR(24,Z+1,1)=HEX(20) PRINT HEX(082E08); :GOTO 217 215STR(Z*,1,1)=HEX(20) :PRINT HEX(082E08); :GDT0 217 216PRINT STR(Z\$,Z,1); :IF STR(Z\$,Z,1)(>HEX(0D) THEN 217 :Z=Z4+1 217NEXT Z :IF POS(2%=0D)=0 THEN 821 :STR(2%,POS(2%+0D),1)=HEX(20) :IF 28()0 THEN 219 :RETURN 21BIF STR(Z0,1,1)(>HEX(20) THEN 219 :Z\$*"0 2191F NUM(Z#)<24 THEN 210 CONVERT Z# TO Z :IF Z>20 THEN 221 I RETURN 2201F STR(.4,Z,1)()HEX(OF) THEN 212 :IF Z4*(>*1" THEN 212 :GDSUB '94(0) :Z9\$=HEX(00) :GOBUB (93(0) 221PRINT HEX(07) :KEVIN Z#, 221, 210 :GOTO E21 2270EFFN'95(R1\$) :PRINT TAB(5);**;1AB(51);** :PRINT TAB(5);** :PRINT TAB(5);**;1TAB(30-INT(LEN(R1\$)/2));R1\$;TAB(51);** :PRINT TAB(5);**;1TAB(51);** 229PRINT TAB(5);** RETURN 1000SELECT PRINT 005(64) PRINT HEX (03CA0A); TAB (5); "DIGITAL PHOTOGRAMMETRY MAIN MENU" 1010REM NHAD OF OPTIONS AVAILABLE :N=4 RESTORE тп м

PHOTO804

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 :READ 714:05
 :READ 714:05<

PHOTOGOO

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10 EPH ----- "PHOTODOD" ---- P: --ONT TO INITIALIZE DATA FILES 20 REH WATTEN 00/1977 N. APAL;714 50 DIN 7564,21664,NI(10),D010,049855 19 GOTO 1007 R. (HEX/E2): "PHOTODOO" (HEX/E3): HOTODOO" (HEX/E3): "PHOTODOO" (HEX/E3): "P(HEX/E3): "P HOTODOO" (HEX/E3): "PHOTODOO" (HEX/E3): "P 1007 PAINT HEX/030A0A1TAB(5): "SETTING UP FILE AREAG" 1000 PAINT HEX/030A0A1TAB(5): "SETTING UP FILE AREAG" 1001 DATA SAVE DC OPEN R. 9, "PHOTODOO" 1DATA SAVE DC OPEN R. 10, "PHOTODOO" 1DATA SAVE DC OPEN R. 10, "PHOTODOO" 1DATA SAVE DC OPEN R. 10, "PHOTODOA" 1DATA SAVE DC

DATA SAVE DC END 1030 LOAD DC R*PHDT0804* PHOT0001

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10 REM ---- "PHOTOOOI" ---- PROGRAM TO TRANSFER DATA TO WORK ARE AS 20 REM WRITTEN 09/1977 M. ARBUCKLE SO DIM 2664,21864,N1(10),D0610,N9625,X\$(30)23,A1*(15)24,A2\$(30)24,A 3\$(30)24,A4\$(12)41,A3\$(40)4 190 COTO 1000 SOSDEFFN'S0°SCRATCH R ";HEX(22);"PHDT0001";HEX(22) 266DEFFN'31"SAVE DC R (";HEX(22);"PHDT0001";HEX(22);")";HEX(22);"PHD T0001";HEX(22) TODOL'INEX(82) 100 PRIIT VEX(83A0A);TAB(5)!TBP:RFERRINC DATA TD WURK AREAS" 101 DATA LAND DC OFEN RYNOTODOL. 101 DATA LAND DC OFEN RYNOTODOL' 101 DATA LAND DC OFEN RYNOTODOL' 11-5000 1L=5000 1020 DATA LCAD DC X\$() 11F END THEN 1030 :DATA SAVE DA R(L,L)X\$() :GOTU 1020 1030 DATA SAVE DA RIL,L)END :DATA LOAD DC OPEN R*PHOTODO3* 1040 DATA LOAD DC ALS() IF END THEN 1050 :GTO 1040 1050 DATA SAVE DA R(L,L)END :DATA LOAD DC OPEN R"PHOTOD04" :DATA LOAD DC AES() DATA SAVE DA R(4711,L)A2#() 1060 DATA LOAD DC UPEN R"PHOTODOS" DATA SAVE DA R(4781,L)A9\$() 1070 DATA LOAD DC OPEN R"PHOTODOG" :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 IDATA LOAD DC OPEN R"PHOTODO7* IDATA LOAD DC GMEN K"HHLT :L=4052 1100 DATA LOAD DC A5*() :IF END THEN 1110 :DATA SAVE DA R(L,L)AS*() SOTD 1100 1110 DATA BAVE DA R(L,L)END SLOAD DE R"PHOTOBOS"

01/10/77 PHOTO100 PROGRAM TO INPUT NO OF STRIPS, FOC 10 REM ---- "PHOTO100" ----AL LENGTH, MODELS PER STRIP, PROJECT NAME 20 REM WRITTEN 08/08/77 M. ARBUCKLE 50 DIM N1(10),00\$10,73\$1,71\$54,7\$64,N9\$25,72\$64 190 LOAD DC R*INPUT* 198, 230 2050EFFN (30 * SCRATCH R *;HEX (22); *PHOTO100 *;HEX (22) 2050EFFN (31 * SAVE DC R (*:HEX (22); *PHOTO100 *;HEX (22); *) *;HEX (22); *PHO T0100*;HEX(22) 1000 PRINT HEX(030A0A);TAB(5);"DATA INPUT" :J=0 :DATA LOAD DC OPEN R*PHOTODOL* :DATA LOAD DC N,F1,N1(),N9*,D0* 1010 (COSUS '97(5,6,0,"1. ENTER THE PROJECT NAME",25,0) :N9#=Z# :IF J=1 THEN 1040 1020 (DSUB '97(6,6,0,"2. NUMBER OF STRIPS IN BLOCK",2,10) IN=Z :F1=Z 1040J=1 : COSUB '97(15,6,1,"ENTER THE NUMBER TO BE CHANGED (D=NO CHANGE",1 ,3) IF Z=0 THEN 1050 P1-Z :0N ZGOTO 1010,1020,1030 1050 PRINT HEX(030A);TAB(5); "DATA INPUT - ENTER NUMBER OF MODEL B PER STRIP PRINT PRINT TAB(5); "STRIP ND" 1060FOR I=1 TO N :CONVERT 1 TO 224, (0#) 1051605UB '97(1+4.9.0, 28\$, 2,99) IF Z =0 THEN 1051 :N1(I)=Z INEXT I 1070 COSUB '97(15,5,1,"ENTER THE NUMBER TO BE CHANGED (0+NO CHANGE",2 ,10) ;P1=Z : IF Z=0 THEN 1090 1080 CONVERT P1 TO Z2*, (##) :GDSUB '97(P1+4,9,0,Z24,2,99) :1F Z(=0 THEN 1080 :N1(P1)=Z :GOTD 1070 10907=0 FOR INI TO N T#T+N1(I) INEXT 1 IF TODO THEN 2000 DATA SAVE DC N, F1,N1(),N9*,D0* 2000 PRINT HEX(030A0A); TAB(5); "NO OF MODELS EXCEEDE 200 - RE-ENTER DA

PHOTO100

01/10/77

TA* :FOR I=1 TO 250 :NEXT I :GOTO 1050

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PHOTO101
                                                                                                 01/10/77
                                                                                                                                                                                      1
              10 REN ---- "PHOTD101" ---- INPUT PLATE CODRDINATES
              12 REM WRITTEN 08/1977
15 SELECT PRINT 005(64)
                                                                                                                                                  M. ARBUCKLE
             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$25
              80% *****
                                                                    -****
                                                                                                                             ----
                                                                                                                                                                                                        ~****
             81% ########
82% PT. NO.
                                                                                 ######
X1
                                                                                                                                          ٧i
                                                                                                                                                                                                                      X1
         V1
100SELECT #1810
         190LD40 LC R "INPUT" 198, 232
205DEFFN'30 "SCRATCH R ";HEX (22); "PHOTOLO1";HEX (22)
      CHALL STATUS CONTRACT STATU
      1001 PRINT HEX(0301); "GWITCH ON PRINTER"
SELECT PRINT 215(132)
(PRINT HEX(020A0A)
109-INT((66-LEN(N94))/2)
                 . :PRINT HEX(OE);TAB(J9);H9#
:PRINT
                     PRINT HEX(OE); TAB(24); "PLATE CODRDINATES"
PRINT
                     PRINT TAB(S6);DOS
      1002 SELECT PRINT 005(64)
1010 J=0
                     :J1*="0001"
:J2*="0005"
      (JES®='0005'
1020 PRINT HEX(030A0A);TAB(5);"PLATE CDURDINAYE INPUT"
1030CDSUB '97(6,6,1,"END OF BLOCK (Y/N)*,1,0)
'IF Z$="Y" THEN 1430
'IF Z$<\*N" THEN 1030
      1040 I+3
:J=J+1
      1050 GDBUR '97(6,6,1,"PLATE NO.",6,999999)
      1060 PACK(######)A2#(1)FROM P
;PACK(#####,####/STR(A2#(1),4,10)FROM 0,0
      1070 GOSUB '9717,6,1,"P.C. NO.",6,999999)
      1080 PACK(#######)A2#(2)FR0H P1
:PACK(+#####.####)STR(A2#(2),4,10)FR0M 0.0
      1081PRINT HEXI01;1780[5]:6PACE FOR ";29-1;* POINTS"

1081PRINT HEXI01;1780[5]:6PACE FOR ";29-1;* POINTS"

1090PRINT HEXI03040A];1788[5]:*WODEL COORDINATES INPUT*

1100 COCUS '97(6,6,3,*PT K0.*,6,99999)
      :P=Z
111060908 '97(7,6,1,"X1*,10,9999.9999)
                     :X1=Z
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1120GDEUB /97(8,6,1,"V1*,10,9999.9999)
1130 PACK (######) A2# (1) FRDM P
:IF P=1 THEN 1150
1IF P=5 THEN 1160
             :IF 1=29 THEN 1151
              :GDT0 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
              INAT COPY ARE() TO ASE()
              :GOTO 1020
:GUTD 1020
1170 MAT COPY A2$() TD A4$()
:MAT COPY A4$() TD A3$()
:MAT COPY A4$() TD A3$()
1180 PRINT HEX(0300A);TAB(5);"SEARCHING AND SORTING"
1190 I=3
1K=4
1200 UNPACK(#######)A2#(1) TO P
1210 UNPACK(######)A2#(2) TO P1
1220 UNPACK(######)A3$(2) TO P2
1230 PACK(######)A1$(1)FR01 F
              1240 PACK(+######)A14(3)FRDM P2
1250 PACK(+#####,####)STR(A14(2),4,20)FRDM 0,0,0,0
1260 PACK(+##########JSTR(A1#(S),4,20)FRDM 1.0,0,0
1270 INIT(00)L0%()
              100 PACK (#######)STR (A2#(1),1,3) TO P
11F P=5 THEN 1370
1280 MAT BEARCH A3#(),*STR(AE#(I),1,3) TO LO#() STEP 13
11F L04(1)=HEX(0000) THEN 1330
1290 K1=256*VAL(STR(L04(1),1,1))+VAL(STR(L04(1),2))
1300 J=(K1-1)/13+1
1310 UNPACK(+####,####)BTR(AR#(I),4,10) TD X1,91
1320 UHPACK (+####,####) STR (A3*(J),4,10) TO X2, Y2
1330 I=I+1
1360 K=K+1
:GOTO 1270
137 10010 1470

137 10010 1470

1380 PACK 0484 484 484 1376

1380 PACK 0484 41376 (FROM P2

1390 PACK 0484 41376 (FROM P2

1390 PACK 0484 410

1397 84VE DC 4161

1397 84VE DC 6180

1396 788 780 15

1396 788 780 15

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1410 GOBUB 1440
1420 J=1
             :IF P2=1 THEN 1040
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01/10/77

PHOTO101

PHOTO101 01/10/77

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LIF PER S THEN 1010

1430 DATA SAVE DC END

1400 DATA SAVE DC END

1400 DEC

140 Lie

PERLINT

PERLINT
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10 REM ----- *PHOTO102" ---- INPUT STRIP CONTROL 12 REN MRITTEN OB/1977 15 SELECT PRINT 005(64) M. ARBUCKLE 81% ######## 82% PT. NO. ###### X1 MOTHER N ¥1 **Z1** 0 1008ELECT #1810 190LDAD DC R*INPUT* 198, 232 205DEFFN*30*SCRATCH R * (HEX(22); "PHOTDIOR"; HEX(22) 206DEFFN'31*SAVE DC R (*:HEX(22);*PHOT0102*;HEX(22);*)*;HEX(22);*PHO TOTOS. HEX (55) 10100 DATA LDAD DC DPEN T#1, "PHOTODO1" 100 DATA LDAD DC 0PEN T#1, "PHOTODO1" 1DATA LOAD DC 0PEN R "PHOTODO3" 1010 PRINT HEX(0301); "BMITCH ON PRINTER" SELECT PRINT 215(132) PRINT HEX (OCOADA) 1J9=INT((66-LEN(N94))/2) PRINT HEX(0E):TAB(J9):N94 PRINT PRINT HEX (OE) TAB (27) * STRIP CONTROL * PRINT TAB(56);DOS PRINT 1020 BELECT PRINT 005(64) 1030 DATA LOAD DC A14() IF END THEN 1040 :J1=J1+1 :GOTO 1030 1040 J,11=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 1060GDSUB '9716,6,1,"END DF STRIF (Y/N)",1,0) :IF Z*="Y" THEN 1220 :IF 2*<>"N" THEN 1050 :GDSUB '98(6,5,1) 1080PRINT HEX(01):TAB(5);"SPACE FOR ";15-1;" POINTS" 1090 GOSUB '97(7,6,5,"PT NO.",6,999999) PB7 1100GDSUB '97(B,6,1,"X1",11,999999,999) :X9=Z 1110605UB '97(9,6,1,"Y1",11,999999,999) tY9=Z 1120 GDSUB '97(10,6,1,"Z1",11,999999.999) (29*Z 1130 GUBUB '97(11,6,1,*MDBEL ND*,6,999999) 1140 PACK (#######)A1\$(1)FRDM F

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PHOTULOE

PHOTO102 01/10/77 2

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1150 PACK(+##########)STR(A1#(I),4,18)FROM X9,Y9,Z9 :PACK(@######)STR(A1#(1),82,3)FROM M 1160 I=I+1 1160 1-21-1 11F P-21 THEN 1100 11F P-21 THEN 1100 13CTD 1016HN 1170 11CTD 1016HN 1170 11CTD 1016HN 1170 11CTD 1017 1AR(5):ND MORE SPACE - END STRIP* 1CTD 1050 11ED DATA SAVE DC AN() 1DATA SAVE DC AN() :DBACKSPACE 1S :J1=J1+1 1200 GOSUB 1230 12106010 1050 1220 DATA SAVE DC END :LOAD DC R"PHOTOBOO" 1230 I=1 :Li=I1+1 SELECT PRINT 215(132) PRINT PRINT PRINT TAB(30); PRINTUSING B1,"STRIP NO ";11 PRINT :PRINT TAB(30); :PRINT TAB(30); :PRINT :PRINT 1240 UNPACK(#######)A1\$(I) TO A 1260PRINT TAB(30); :PRINTUSING 80,A,B,C,D,M 1270 IF A=1 THEN 1290 ;IF A=5 THEN 1290 1290 1=1+1 :GOTO 1240 1290 SELECT PRINT DOS(64)

0.1

01/10/77 10 REM ----- "PHOTO103" ---- INPUT PLOCK CONTROL (AM'SR ADJUSTMENT 12 REM WRITTEN 09/1977 15 BELECT PRINT 005(64) M, ARBUCKLE 20 DIM A1\$(30)24,A5\$3,J1\$2,J2\$2,Z1\$64,Z\$64,Z\$64,H(()),D0\$10,N9\$25 80% ##\$\$### -\$#\$\$###.###### -####### -####### -####### **Z**1 206DEFFN'31"SAVE DC R (":HEX(22):"PHOTO103":HEX(22):")":HEX(22):"P HOTO103" (HEX (22) 1000 DATA LOAD DC OPEN T#1, "PHOTODO1" DATA LOAD DC #1,N,F1,N1(),N9#,70# DATA LOAD DC 0PEN R "PHOTOD04" 1010 PRINT HEX (0301); "EWITCH ON PRINTER" SELECT PRINT 215(132) (PRINT HEX(OCOAOA) : J9=INT ((66-LEN(N9#))/2) PRINT HEX(0E): TAB(J9): N9# PRINT PRINT MEX(OE) TAB(23); "BLOCK CONTROL (AMER)" PRINT TAB(56):DO\$ PRINT 1020 SELECT PRINT 005(64) 1040 J,I1=0 ;J1\$="0001" : J24***0005" 1050 PRINT HEX(030A0A): TAB(5): "BLOCK CONTROL INPUT" 1070 I=1 1080PRINT HEX(01); TAB(5); "SPACE FOR ": 30-1; " POINTS" 1090 GOS # '97(7,6,5,"PT NO.",6,999999) · Q=7 11006CBUB '97(8,6,1,*X1*,11,999999.999) 1X9*7 1110GDEUB '97(9,6,1,"Y1*,11,999999.999) 1Y9=2 1120 GDSUB '97(10,6,1,"21*,11,999999.999) 229*2 1160 I=I+1 IF P=1 THEN 1180 11F P=5 THEN 1180 11F 1=30 THEN 1170 :GOTO 1080 1170PRINT HEX(01);TAB(5); "NO MORE SPACE - END INPUT" 11/0FRINT HEX(01) (AB(5 (GOTD 1090) 1180 DATA SAVE DC A1*() 1201 SAVE DC END 1200 GOSUB 1230 1220LOAD DC R"PHOTO800* 1230 I=1

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PHOTO103

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111114 16BLCCT PRINT DIS(132) PRINT PRINT PRINT(TAD(30); PRINTUSING BE PRINT 1240 UNPACK(######40:5TR(A1#(1),4,21) TD B,C,D 1240 UNPACK(#####40:5TR(A1#(1),4,21) TD B,C,D 1240 UNPACK(#####40:5TR(A1#(1),4,21) TD B,C,D 1240 EXPACT THEM 1250 1240 EXPACT THEM 1250 1260 EXPACT THEM 1250 1270 EXPACT THEM 1250 127

01/10/77 PHOTO105 10 REM ---- "PHOTO105" ---- INPUT BLOCK TIE/CNTRL PT STATUS (AME R) 12 REM WRITTEN 00/1977 M. ARBUCKLE 15 SELECT PRINT 006(64) 20 DIN A1\$(12)41,45\$3,J1\$2,J2\$2,Z1\$64,Z\$64,Z864,N1(10),D0\$10,N9\$25 80% ****** 81% ******* ** 82% PT. ND. 1005ELECT #1810 STATUS 190LDAD DC R"INPUT" 198, 232 205DEFEN/30 "SCRATCH R "(HEX(22): "PHOTD105": HEX(22) 206DEFFN'31 "SAVE DC R (";HEX(22); "PHOTO105";HEX(22); ") ";HEX(22); "PHO T0105" (HEX (22) 10105"; THEX (C2) 1000 DATA LGAD DC OPEN T#1, "PHOTODO1" 10ATA LGAD DC 0#1,N,F1,N1(), H98,D00 10ATA LGAD DC OPEN R "PHOTOD05" 1010 PRINT HEX(0301); "SWITCH ON PRINTER" SELECT PRINT 215(132) PRINT HEX(OCOADA) :J9=INT((66-LEN(N9\$))/2) :PRINT HEX(0E);TAB(J9);N9\$ PRINT HEX(DE);TAB(E1); "TIE/CONTROL POINT STATUS" PRINT TAB(55):00\$ PRINT 1020 BELECT PRINT 005(64) 1030 DBK1P END DBACKEPACE 1 :DATA LOAD DC A1#() :IF END THEN 1031 1031 J1=0 1040UNPACK(######)A1*(1) TO J1 1050 PRINT HEX(030A0A); TAB(5); "TIE/CNTRL PT STATUS" :PRINT :PRINT TAB(5): "LAST NODEL INPUT "; J1 INRI(00)A18() 106060500 97(6,6,1,"END OF INPUT (V/N)",1,0) IT 2*"'' THEN 1220 IT 2*"'' THEN 1050 1070 1=1 :GOSUB '96(6,/,1) 1080PRINT HEX(01):TAB/5):"SPACE FOR ":12~I:" PDINTE" 1090 COSUB '97(7,6,5,"PT ND.*,6,999999) :PeZ 1100GDEUB '97(8,6,1,"STATUS*,1,4) :X9=Z 1140 PACK(########A1#(1)FROM P 1150 PACK(###)STR(A1#(1),4,1)FROM X9 1160 1=1+1 11F P=1 THEN 1180 IF P=5 THEN 1180

PHOTOSIOS 01/10/77 2 IST 7-11 THEN 1170 IST 7-1

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PHOTO104
                               01/10/77
                                                          1
     10 REM ---- "PHOTOLOG" ---- 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#2,7*$64,Z#64,Z#64,H1(10),D0#10,N9#25
    -GC/1840.82898
                                                                  21
   1008ELECT #1010
190LOAD DC R"INPUT" 198, 232
   205DEFFN/30*5CRATCH R ";HEX(22);"PHOT0104";, "X(22)
206DEFFN/31*SAVE DC R (";HEX(22);"PHOT0104";, /(22);")";HEX(22);"PHO
  TOIO4" HEX (22)
1009 DATA LOAD DC OPEN T#1, "PHOTUDO1"
       DATA LOAD DC #1,N,F1,N1(),N9#,D0$
DATA LOAD DC DPEN R "PHOTODOS"
  1010 PRINT HEX(0301); "SWITCH ON PRINTER"
:SELECT PRINT 215(132)
       PRINT HEX (OCOADA)
       :19=INT((66-LEN(N9#))/2)
       IFRINT HEX (DE) TAB (JB);N9#
       PRINT
       PRINT MEXIDE); TAB(27); "CHECK PDINTS"
PRINT
       PRINT TAB(56):00$
       PRINT
  1020 SELECT PRINT 005(64)
1040 J.11=0
       :J1¢="0001"
:J2$="0005"
  1050 PRINT MEX(030A0A); TAB(5); "CHECK POINTS INPUT"
  1080PRINT HEX(01);TAB(5);"SPACE FOR ";30-I;" POINTS"
1090 COBUE '97(7,6,5,"PT NO.",5,99999)
  :P=Z
1100GGSUB '97(8,6,1,"X1",11,999999.999)
  :X9=Z
ili0605U8 '97(9.6.1, "Y1",11,999899,999)
  1120 GUEUE '97(10,6,1,"Z1",11,999999,999)
  :25=2
1140 PACK(#######)A1$(I)FROM P
  11F P=1 THEN 1180
11F P=5 THEN 1180
       :1F 1+E9 THEN 1170
       1080 1080
  1170PRINT HEX(01); TAB(5); "NO MORE SPACE - END INPUT"
(SOTO 1090
  1180 DATA SAVE DC A1s()
DATA SAVE DC END
  1200 GOSUB 1230
1220LOAD DC R"PHOTOBOO"
  1230 I=1
;I1=11+1
```

PHOTO104 01/10/77

 ISELECT PRINT 215(122)
 ISELECT PRINT 215(122)

 IPRINT IPRINT IPRINT AB(20): IPRINT 2000:
 IPRINT 2000:

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01/10/77
    19 REM ---- "PHOTO106" ---- INPUT BLOCK TIE/CNTRL PT STATUS (SCH
   UT)
12 REM WRITTEN 08/1977
                                                    M. AREUCKLE
   15 BELECT 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$25
   ##
                       #8
  82% PT. NO.
1005ELECT #1810
                            STATUS
  190LQAD DC R"INPUT" 198, 232
205DEFFN'30"SCRATCH R ";HEX(22);"PHOTO106";HEX(22)
  2050EFFFY/31"SAVE DC R (";HEX(22);"PHOTO106";HEX(22);")";HEX(22);"PHO
T0106";HEX(22)
T0106";HEX(22)
100 DATA LOAD DC GPEN T%1,"PHGTGDG1"
1DATA LOAD DC 41,H,F1,N1(),M94,D04
1DATA LOAD DC 0PEN R "PHOTGD07"
1010 PRINT MEX(0301);"SWITCH UN PRINTER"
      SELECT PRINT 215(132)
      139=INT((66-LEN(N9#))/2)
PRINT HEX(0E);TAB(J9);N9#
      :PRINT
:PRINT HEX(0E);TAB(E1);"TIE/CONTROL POINT STATUS"
      PRINT TAB (56):00#
PRINT
1020 SELECT PRINT 005(64)
1030 DATA LOAD DC A1$()
      1J1=J1+i
:GUTO 1030
1040 J.II*0
;J1$**0001*
:JE#* 0005

:JE#* 0005

1050 PRINT HEX(D30A0A);TAB(5); "TIE/CNTRL PT STATUS"
      PRINT TAB(5); "INPUT FOR STRIP NO "(J1+1
106060398 9766,61,"END OF STRIP (V/N)",1.0)
11F Z#="Y" THEN 1220
11F Z*(*"N" THEN 1050
1009UB (98(6,6,1)
1080PRINT HEX(01); TAB(5); "BPACE FOR ";40-1;" PDINTE"
1090 GDSUB /97(7,6,5,"PT No.",6,899999)
1P#Z
1100GDGUB '97(8,6,1,"X1",1,3)
     :X9=Z
1140 PACK (########)A1# (I)FRDM P
1150 PACK (###)STR(A1#(I),4,1)FRDM X9
1160 L=L+1
IF P=1 THEN 1180
     11F P=5 THEN 1180
     100TD 1080
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PHOTO106

PHOTO106 01/10/77

L1JOPCHNT HEX(C1)1TAB(5):"ND HORE GPACE - END STRIP"
iOTD 1000 01
1100 DATA SAVE DC END
iDATA SAV

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PHOTO107 01/10/77 1

10 REH ---- "PHOTOLO7" ---- PROGRAM TO CLEAR FILES FOR NEW PROJE CT EN REH WITTEN 08/1377, N. ARBUCKLE 20 REH WITTEN 08/1377, N. ARBUCKLE 190 GUTO 1000 1001 (1900) (1900) 190 GUTO 11001 (1900) (1900) (1900) 2000 FOLLT HEX (2000A) 1100 (1900) (1900) 2000 FOLLT HEX (2000A) 1100 (1910) (1900) (1900) 1001 FOLLT HEX (2000A) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1900) (1

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PROGRAM TO EDIT NO OF STRIPB, FOCA
  10 REM ---- "PHOTO200" -----
  L LENGTH, MODELS PER STRIP, PROJECT NAME
20 REM WRITTEN 08/08/77 M. ARBUCKLE
 20 REM WRITTEN 08/08/77 H, ARBUCKLE
50 DIN NI (10),D0$10,2581,21864,24864,N98E5,22864
80DATA *1. PROJECT NAME",2. NUMBER DF STRIPS","3. FDCAL LENGTH"
190 LDAD DC R*INFUT" 198, 230
203DEFFNY30*SCRATCH R "182(22)"PHOTOR00";HEX(22)
 2060EFFN '31 "SAVE DC R (":HEX(22); "PHOTO200";HEX(22); ")";HEX(22); "PHO
     TD200 * : HEX (22)
1000 PRINT HEX(030A0A); TAB(5); "DATA EDIT"
     : 3=0
     DATA LOAD DC OPEN R*PHOTODO1*
DATA LOAD DC N,F1,N1(),N9*,D0*
1001 PRINT
     READ RE
     PRINT TAB (5) ; R$; TAB (30) ; N5$
     READ RS
     PRINT TAB(5);R$;TAB(30);N
     READ R$
     PRINT TAB(5):R#:TAB(30):F1
1010G09UB (97(5,6,1,R$,25,0)
:6010 1040
102060508 '97(5,6,1,R4,2,99)
     :N=Z
     :GOTO 1040
1030GOSI/B '97(7,6,1,R#,6,999.99)
     :F1=2
1040RESTORE
     :J=1
     :GOSUB '97(15,6,1,"ENTER THE , LUMBER TO BE CHANGED (0=ND CHANGE",1
     ,3)
     :1P Z=0 THEN 1050
     RESTORE Z
     READ RS
:0N ZGUTU 1010,1020,1030
1050 PRINT HEX(030A);TAB(5);"DATA EDIT"
     PRINT TAB(5): "STRIP NO/MODELS PER STRIP"
1060FOR I=1 TO N
CONVERT I TO ZE$,($*)
IF Z=0 THEN 1090
1080 CDNVERT P1 TD 28$,(##)
:GOBUB '9/(P1+4,6,0,28*,2,99)
     :IF Z(=0 THEN 1080
:N1(P1)=2
     1070 1070
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PHOTO200 01/10/77

PHOTO200

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1987-0 :FOB I-1 TO N 174"H1(1) INEXT 1 115" T3800 "DEN ("AFTODOL" 1007 LABOD C DEN ("AFTODOL" 1001 LABOD C R"HOTOBOL" 1100 LABOD C R"HOTOBOL" 2000 PRINT HAX(030/0A) ITAR(5); "NO OF MODELS EXCEEDS 200 - RE-ENTER DATA" 167H L-1 TD ESO 1695 1695

10 REM ---- "PHOTOBOL" ---- UPDATE PLATE COORDINATES SOREN WRITTEN 08/1977 M. ARBUCKLE 50 DIM A\$(30)23,723,10\$(1)2,8\$1,81\$(30)23,72\$64,2\$64,2\$64,2 1005ELECT #1810 190LOAD DC R"INPUT" 198, 232 2050EFFN'30 "SCRATCH R ";HEX(22); "PHOTO20!";HEX(22) 2050EFFN'31 "SAVE DC R (";HEX(22); "PHOTO20!";HEX(22);")";HEX(22);"P HUTOR01 * (HEX (22) 3000EFFN (200 PRINT HEX(030A0A); TAB(S); "MODEL "; P11" NOT IN BLOCK RE-ENTER" (PRINT HEX(070707) FOR I=1 TO 2500 :A=1+2 INEXT I PETIPH 1000PRINT HEX(030A0A);TAB(5);"EDIT PLATE COORDINATES" :PRINT PRINT TAB(5); "1. CHANGE A MODEL NO" :PRINT TAB(5);"Z. INGERT A POINT" :PRINT TAB(5);"Z. INGERT A POINT" :PRINT TAB(5);"A. CHANGE A POINT" :PRINT TAB(5);"S. RETURN TO EDIY MENU" 101050504 '97(15,6,1,"ENTER THE SELECTED NUMBER",1,5) ION ZGDTO 1260,1310,1440,1050,1580 1050 DATA LOAD DC OPEN [\$1,"PHOTODOE" 1070 PRINT HEX (030ADA);TAB(5); DATA EDIT" 1080COSUB '97(5,6,1,"MODEL NG. (0 TO END)",6,999999) :P1=Z :IF Z=0 THEN 1000 1090 PACK (#######) P#FROM P1 1100 DATA LOAD DC #1,A#() ILF END GOTO 1110 THEN 1101 1101G08UB '200 :GOTO 1000 1110 IF STR(A\$(1),1,3)(>P\$ THEN 1100 1129605UB '97(6,6,1,"POINT ND",6,999999) :P2=Z 1130 PACK (#######) P6FRDM P2 1140 INT(00)L08() 1150 MAT BEARCH A\$(),#P\$ TO L0*() STEP 23 :11FL08(1)#HEX(0000) THEN 1150 :60TO 1170 1160PRINT HEX (030A0A); TAB (5); "PT NO "; P2; " NOT IN THIS MODEL" :PRINT HEX (070707) FOR IN1 TO 2500 :A=LIE :NEXT 1 :GOTO 1129 1170 I*256*VAL (STR (LO*(1),1,1))+VAL (STR (LO*(1),2)) :I=(I-1)/23+1 1180 UNPACK(+#####,####)STR(A#(I),4,20) TO X1,V1,X2,Y2 1190 PRINT "X1 = ";X1,"V1 = ";Y1,"X2 = ";X2,"Y2 = ";Y2

1191GDBUB '97(8.6.1. "POINT NO".6.999999)

01/10/77

PHOTO201

PHOTO201 01/10/77 : P2+ 1195GDEUB '97(9,6,1,"X1*,10,9999,9999) :X1=Z 1196605UB '97(10,6,1,"Y1",10,9999.9999) :Y1=Z 119760SUB '97(11,6,1,"X2",10,9999.9999) :YPeZ :GOSUB '97(12,6,1,"Y2",10,5999.9999) :YE=Z 1200PACK(+#####,#####)STR(A#(1),4,20)FROM X1,Y1,X2,Y2 1210 PACK(######)A#(1)FROM P2 1220G09UB '97(15,6,1,"ANY MORE CORRECTIONS TO THIS MODEL (Y/N)",1,0 1230 17 Z#="N" THEN 1250 1240 PRINT HEX (030A0A0A) :GOTD 1129 1250 DBACKSPACE #1,1 :DATA SAVE DC #1,A*() :GOTB 1000 1260 DATA LOAD DC DPEN T#1, "PHOTODOR" 1261PRINT HEX(030A0A); TAB(5); "DATA EDIT" 1270COSUB '97(5,6,1,"PREBENT MOLEL ND. (0 TO END)*,6,999999) :P1=Z 11F Z=0 THEN 1000 PACK(#######)P#FROM P1 1271605UB '97(6,6,1, "MODEL'S POSITION IN THE BLOCK ",3,200) 1P9=2 :DSKIP #1,(P9-1) 1280 DATA LOAD DC #1,A\$() :IF END THEN 1281 1280 DATA LOAD :IF END :GOTO 1290 1281GOSUB '200 :GOTO 1000 1290 IF STR(A*(1),1,3)<>P\$ THEN 1280 1300G08UB '97(7,6,1,"NEW MODEL NO.*,6,999999) :P#Z :PACK(######)A\$(1)FROM P :DBACKSPACE #1,1 :DATA BAVE DC #1,A#() :GOTO 1000 1310DATA LOAD DC OFEN T#1, "PHOTODO2" 1311PRINT HEX(030A0A);TAB(5);"DATA EDIT" 1320GDSUB '97(5.6.1."MODEL ND. (0 TO END)".6.899999) P1 -Z 1F Z=0 THEN 1000 1330 DATA LOAD DC #1,44() 1330 DATA LDAD DC #1,A* :IF END THEN 1331 :COTO 1340 . 1331COSUB *200 :COTO 1000 1340 IF STR(A*(1),1,3)<>P# THEM 1330 135000508 '97(7,6,1,"POINT NG",6,999999) :PE=Z

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1351PACK (######) P#FROM P2
1360 INIT(00)L0+()
:MAT SEARCH A+(),=P+ TO L0+() STEP 23
     :IF L0$(1)=HEX(0000) THEN 1361
     GOTO 1370
1361PRINT HEX(030A0A);TAB(5);"PT NO ";P2;" NOT IN THIS MODEL"
;PRINT HEX(070707)
      FOR 1=1 TO 2500
     IA=I+2
     :NEXT I
:GOTO 1350
1370 I=256*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2))
:I=(I-1)/23+1
1380 UNPACK(+####,####)STR(A$(I),4,20) TO X1,Y1,X2,Y2
1390 PRINT "X1 = ";X1,"Y1 = ";Y1,"X2 = ";X2,"Y2 = ";Y2
1400 PACK(#######)A$(I)FRDM 0
:INIT(00)B1#()
      :12=0
1410 FOR I1=1 TD 30
     11F STR(A*(11),1;3)=HEX(000000) THEN 1420
12=12+1
1420 NEXT 11
1430 JBALASPACE #1,1
:DATA SAVE DC #1,81#()
:GOTO 1000
1440DATA LOAD DC OPEN T#1, "PHOTODOE"
1441PRINT HEX (030A0A);TAB(5);"EDIT DATA"
1450 GOSUB (97(3,5,1,"MODEL ND. (0 TO END)",6,999999)
     :P1=Z
:IF Z=0 THEN 1000
:PACK (#######) PSFROM P1
1450 DATA LOAD DC #1,A$()
     TIF END THEN 1461
COTO 1470
1461GDSUB (200
:GOTO 1000
1470 IF STR(A$(1),1,3)<>P$ THEN 1460
1480 GOSUB '97(6,6,1,"AFTEN *T. NO. *.6,999999)
     :P2=7
     1PACK (#######)P#FROM P2
1490 INIT(00)L0*()
:MAT SEARCH A*(),=P* TO L0*() STEP 23
     :1F L0$(1) HEX(0000) THEN 1491
1491PRINT HEX (03040A); TAB(5); "PT ND ": P2;" NOT IN THIS MODEL"
PRINT HEX (070707)
     :FOR I=1 TO 2500
     :A=1 +2
     :NEXT 1
:GOTO 1480
1500 I=256%VAL(8TR(L0$(1),1,1))+VAL(STR(L0$(1),2))
:I=(I-1)/23+1
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PHOT0201 01/10/77

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PHCTORO1 01/10/77 4 IS80 PRINT *X1 = *X1.*V1 = *;Y1.*Z = *;X2.*V2 = *;Y2 IS80 LMT(001850) IS90 LMT(001850) IS90 LMT(001850) IS91 L11 ==A4(1) IS91 L11 ==A4(1) IS91 L11 ==A4(1) IS90 LMT(001850) IS91 L11 ==A4(1) IS90 LMT(001850) IS92 LMT(001850) IS97 LMT(

PHOTO202 01/10/77 1

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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 1005ELECT \$1810 190LOAD DC R"IMPUT" 198, 232 205DEFFH/30"ECRATCH R";HEX122); "PHDTD202";HEX122) 206DEFFN '31 "SAVE DC R (";HEX(22); "PHOTO202";HEX(22); ")";HEX(22); "P HOTO202";HEX(22) 300DEFFN '200 PRINT HEX(039A0A); TAB(5); "STRIP ":P1;" NOT IN BLOCK RE-ENTER" IPRINT HEX (070707) FOR 1=1 TO 2500 A=ItE :RETURN 1000PRINT HEX(030404);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" 101060508 '97(15,6,1, "ENTER THE SELECTED NUMBER",1,4) CN ZGOTO 1310,1440,1050,1580 1050 DATA LOAD DC DPEN T#1,"PHOTODOS" 1070 PRINT HEX (030A0A); TAB(5); "DATA EDIT" 1080COSUB '97(5,6,1,"STRIP ND. (0 TO END)",2,99) :P1=Z :IF Z=0 THEN 1000 1100FOR I=1 TO P1 SDATA LOAD DC #1,A\$() :IF END :NEXT I THEN 1101 :GOTO 1129 11011=P1 ICOBUB '200 :COTO 1000 1129GOSUB '97(6,6,1,"POINT HO",6,999999) :P2=Z 1130 PACK (*******)PSEPPH PP 1140 INIT(00)L0*() 1150 MAT SEARCH A\$(),=P\$ TO L0*() STEP 24 :IF L04(1)=HEX(0000) THEN 1160 :GOTO 1170 1160PRINT HEX (030A0A); TAB (5); "PT NO "; P2;" NOT IN THIS STRIP" :PRINT HEX (030A0A); TAB (5); "PT NO "; P2;" NOT IN THIS STRIP" :FOR 1=1 TO 2500 :NEXT I :GOTO 1129 1170 I=256*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2)) :I=(I-1)/24+1

PHOTOBOR 01/10/77 1190 PRINT "X = ";X,"Y = ";Y,"Z = ";Z,"M = ";M :GOSUB '97(9,6,1,"POINT ND",6,999999) :P=Z 119560508 '97(10,6,1,"X",10,999999.999) < Y # 7 11960DSUB '97(11,6,1,"Y*,10,999999.999) ;Y=Z 11976060B '97(12,6,1,"Z",10,959539.999) 1201005UB '97(13,6,1,"HODEL NO",6,9999991 :M=Z 19-2. 29ACK(0000084) STR(30(1),22,3)FROM M 1820GOSUB '97(15,6,1,"ANY MORE CORRECTIONS TO THIS STRIP (Υ/Ν)",1,0) 1230 IF 25=""" THEN 1250 1240 FRLNT HEX(030A0A) GOTO 1129 1250 DBACKEPACE #1,1 (DATA SAVE DC #1,A*() 1310DATA LDAD DC OPEN T#1, "PHOTODO3" 1311PRINT HEX(030A0A); TAB(5); "DATA EDIT" 1320GOSUB '97(5,6,1,"STRIP ND. (0 TO END)",2,99) :IF Z=0 THEN 1000 1230 FOR I=1 TO P1) FOR I=1 10 P1 (DATA LOAD DC #1,A*()) (IF END THEN 1331 (NEXT I (GDTO 1350 15211=P1 SHEXT I GDSUB '200 1350608UB '97(7,6,1,"POINT NO",6,999999) :P2=Z 1351PACK(######)P#FROM P2 1360 INIT(00)L0#() :MAT SEARCH A\$(),=P\$ TO LO\$() STEP 24 IF LO\$(1)<>HEX(0000) THEN 1370 1361PRINT HEX(03040A); TAB(5); "PT NO "; PE;" NOT IN THIS STRIP" :PRINT HEX(070707) FOR 1=1 TD 2500 NEXT I GOTO 1350 1370 I=256*VAL(STR(L0\$(1),1,1))+VAL(STR(L0\$(1),2)) ;I=(I-1)/24+1 :1-1.1-1//5474 1380 LNFACK(+#####3#,###)STR(A#(1),4,16) TO X,Y,Z :UNFACK(######STR(A#(1),22,3) TO M 13950 PRINT "X = ";X,"Y = ";Y,"Z = ";Z,"M = ";M 1395(GDUS '97(15,6,1,*IS THIS THE CORRECT POINT (Y/N)",1,0) IF 2#="Y" THEN 1400 IF 2\$<>"N" THEN 1391

- 78(3-W. IHEN 1491

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PHOTOPOR
                                  01/10/77
  :GOTO 1350
1400GOSUB (98(15,1,1)
        :12=0
1410 FOR 11=1 TO 15
        :1F STR(A#(11),1,3)=HEX(000000) THEN 1420
        10-1041
        191$(12)=A$(11)
  1420 NEXT 11
  1430 DBACKSPACE #1,1
:DATA SAVE DC #1,81*()
:GDTD 1000
  14400ATA LOAD DC OPEN T#1,"PHOTODO3"
1441PRINT HEX(030A0A);TAB(5);"EDIT DATA"
1450 GOSUB '97(5,6,1,"STRIP ND. (0 TO END)",2,99)
  1450 GOSUB '9/13,514) -----

P1=Z

:IF Z=0 THEN 1000

1460FDR I=1 TO P1

: DATA LOAD DC #1,A*()
        IF END
                    THEN 1461
  :GOTD 1480
14611=P1
        INEXT 1
GOSUB '200
  :GDTD 1000
1480 GOSUB '97(6,6,1,*AFTER PT. NO. ",6,999999)
        :P2*Z
#PACK(######)P#FRDM P2
  1490 INIT(00)L0$()
:MAT SEARCH: A$(),=P$ TO L0$() STEP 24
  : IF LOS(1) (>HEX(0000) THEN 1500
1491PRINT HEX(030A0A); TAB(5); "PT NO ";P2;" NOT IN THIS STRIP"
        PRINT HEX (070707)
        SI L=A:
        INEXT I
  ;GCTD 1480
1500 I=255*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2))
  :I=(I-1)/24+1
1510 UNIPACK(+#########)STR(A$(I),4,18) TD X,Y,Z
  1530 INIT(00)B1#1)
1540 FOR 11*1 TO 1
        :B1#(I1)=A*(I1)
:NEXT I1
        :12=11+1
        :I=I+1
  155060508 '97(9,6,1,"POINT NO",6,999999)
        :GOSUB '97(10,6,1,"X = ",10,999999,999)
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PHOTO202

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10 REM ----- "PHOTO203" ----- UPDATE BLOCK CONTROL (AMER) 20REM V711TEN 09/1977 M. ARBUCKLE 50 DIM A6(30)24, P\$3,L0*(1)2,B\$1,B1*(30)24,Z2*64,Z*64,Z1*64 100SELECT #1810 190LOAD DC R*INPUT* 198, 232 205DEFFN'30"SCRATCH R"(HEX(22);"PHOTO203";HEX(22) HDID503, HEX (55) HDID503, HEX (55); LEX (55) 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" 1010GDSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4) :ON ZGUTO 1310,1440,1050,1580 1050 DATA LOAD DC OPEN T#1, "PHOTODO4" :EATA LOAD DC \$1,A\$() 1070 PRINT HEX(030A0A); TAB(5); "DATA EDIT" 1129GDSUB (97(5,5,1,"PDINT ND",6,999999) 1120 PACK(######)P#FROM PE 1140 INIT(00)L0\$() 1150 MAT SEARCH A\$(),=P\$ TD L0\$() STEP 24 1IF L0\$(1)=HEX(0000) THEN 1160 1160PRINT HEX (030A0A); TAB (5); "PT NO "; P2;" NOT IN BLOCK" :PRINT HEX (070707) :FOR I=1 TO 2500 :A=1+2 INEXT I 1170 I=256*VAL(STR(L0\$(1),1,1))+VAL(STR(L0*(1),2)) :I=(I-1)/24+1 1180 UNFACK(+######.9#####)8TR(A#(I),4,21) TO X,Y,Z 1190 PRINT TAB(5);*X = *;X,*Y = *;Y,*Z = *;Z :GOSUB '97(9,5,1,*PDINT ND*,6,999999) :P=2 1195GOSUB '97(10,6,1,"X",10,999999.999) :X=Z 1196GOBUB '97(11,6,1,"Y*,10,999999,999) :Y*Z 1197GDSUB '97(12,6,1,"Z",10,999999,999) 1200PACK(######)A%(1)FROM P :PACK(++#######)STR(A#(1),4,21)FRDM X.Y.Z 1210 PACK(######)A#(I)FRDM P2 1250 DBACKSPACE #1,1 IDATA SAVE DC #1,A#() 1310DATA LOAD DC OPEN T#1,"PHOTOD04* :DATA LOAD DC #1,A#() 13(1PRINT HEX(030A0A);TAJ(5);"DATA EDIT" 1350GDEUB '9717,6,1,"PDINT ND",6,999999) :P2+Z

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PHOTOPOS

PHOTO203 1351PACK (######) PsFROM PR 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 ND *:P2:* NOT IN BLOCK* 1PRINT HEX(030A0A);TAB(5);*PT ND *:P2:* NOT IN BLOCK* FOR I=1 TO ESOD INEXT I GOTO 1350 1370 I=256*VAL(STR(L0\$(1),1,1))+VAL(STR(L0\$(1),2)) ' 11=(I=1)/24+1 / 12*(1-1)72*41
1380 UHPACK(0*64840*05TR(A*(1),4,21) TO X,V,Z
1380 FRINT TAB(5);*X = *1X,*Y = *1X,*Z = *1Z
1391GSUB(*)71(5;6,1,*15) THIS THE CORRECT POINT (V/N)*,1,0)
13F Z**Y* THEN 1400
13F Z**Y* THEN 1401 :COTO 1350 1400GOSUB '59(15,1,1) :PACK(#######}A&(I)FROM 0 :INIT(00)B1*() :I2=0 1410 FOR 11*1 TO 30 :IF STR(A#(11),1,3)=HEX(000000) THEN 1420 :12=12+1 :B1\$(12)=A\$(11) 1420 NEXT I1 1430 DBACKSPACE #1,1 :DATA SAVE DC #1,B1#() :GDTD 1000 1440DATA LOAD DC GPEN T#1, "PHOTODO4" (DATA LOAD DC #1,A*() 1441PRINT HEX (030404); TAB(5); "EDIT DATA" 1480 GOSUB '97(6,6,1, "AFTER PT. ND. ",6,999999) :P2=Z 1PACK (#######)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 ND ";PE;" NOT IN BLOCK" PRINT HEX(070707) FOR 1=1 TO 2500 :A=1+2 :NEXT I :GOTO 1480 1500 I=256*VAL (STR(L0*(1),1,1))+VAL(STR(L0*(1),2)) :1=(1-1)/24+1 1510 UNPACK(+#############BTR(A#(I),4,21) TO X,Y,Z 1520 PRINT TAB(5); "X = ";X, "Y = ";Y, "Z = ";Z 1530 INIT(00)B1*() 1540 FOR 11=1 TO 1 :B1\$(11)=A\$(11) NEXT 11

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PHOTO203

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10 REM ---- "PHOTO204" ---- UPDATE CHECK POINTS SOREM WRITTEN 09/1977 M. ARBUCKLE 50 DIM A# (30)24, P\$3,L0# (1)2,9\$1,B1\$ (30)24, 22\$64, 2\$64, 21\$64 100SELECT #1810 190LOAD DC R*INPUT" 198, 232 205DEFFN'30"SCRATCH R*IHEX(22);"PHOTO204";HEX(22) 205DEFFN'31"SAVE DC R (";HEX(22);"PHDTD204";HEX(22);")";HEX(22);"P 1000PRINT HEX(030A0A); TAB(5); "EDIT CHECK POINTS" PRINT PRINT TAB(5):*1. DELETE A POINT" PRINT TAB(5):*E. INGERT A POINT" PRINT TAB(5):*3. CHANCE A POINT" PRINT TAB(5):*4. RETURN TO EDIT MENU" 1010GGSUB '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4) :ON ZGOTO 1310,1440,1050,1580 1050 DATA LOAD DC OPEN T#1, "PHDTODQS" :DATA LOAD DC #1,A#() 1070 PRINT HEX (030404); TAB (5); "DATA EDIT" 1129GOBUE '97(6,6,1, "PDINT NO",6,999999) :P2=Z 1130 PACK (######)PSFROH P2 1140 INIT(00)L0#() 1150 MAT SEARCH A#(), *** TO L0#() STEP 24 :IF LD#(1)=HEX(0000) THEN 1160 :GOTD 1170 1160PRINT HEX(030A0A): TAB(5); "PT NO "; PE; " NOT IN BLOCK" ; PRINT HEX(070707) :FOR 1*1 TO 2500 NEXT 1 GOTO 1189 1170 I=255*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2)) ;I=(I-1)/24+1 1005U8 '9719,6,1,"POINT NG",6,999999) :P=Z 1195608UB '97(10,6,1,"X",10,999999,999) 1X=Z 119660808 '97(11,6,1,"Y",10,999999,999) :V=Z 119760908 '97(12,5,1,*2*,10,999999,599) 1200PACK(######JA#(I)FROM P 1250 DBACKSPACE #1,1 :DATA SAVE DC #1,A#() 1310DATA LOAD DC OPEN T#1,"PHOTODOS" :DATA LOAD DC \$1,A\$() 1311PRINT HEX(030A0A);TAB(5);"DATA EDLT" 1350GOBUB '97(7,6,1,"POINT NO",6,999999)

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01/10/77 PHOTO204 1351PACK (######)P#FROM P2 1360 INIT(00)L0\$() :MAT BEARCH A*(),=P* TO LO*() STEP 24 :IF LO*(1) (>HEX(0000) THEN 1370 1361PRINT HEX (030A0A); TAB(5); "PT ND "; P2; " NOT IN BLOCK" :PRINT HEX (070707) :FOR I=1 TO 2500 :NEXT I :GDTD 1350 1370 1#256*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2)) :I*(I-1)/24+1 1310 LAPACK (0446484 + 64648)STR(AS(I),4,21) TO X,V,Z 1350 LAPACK (0446484 + 147 - 2 + 72 1350 PRINT 'X = 1;X, 'V = 'IV, 'Z = 'IZ 1350 ST(15,61,1') THES THES THE CORRECT POINT (V/N)",1,0) 11F Z4-'V THEN 1400 11F Z4-'V H THEN 1391 :GUTD 1350 1400GDSUB '98(15,1,1) :PACK(######)A\$(I)FROM 0 :INIT(00)B1#() 112=0 1410 FDR 11=1 TO 30 :J'F STR(A#(11),1,3)=HEX(000000) THEN 1420 :12=12+1 :B1\$(12)=A\$(11) 1420 NEXT 11 1430 DBACKSPACE #1,1 :DATA SAVE DC #1,B1#() :GOTO 1000 1440DATA LOAD DC OPEN T#1,"PHOTODOS" DATA LOAD DC #1,A#() 1441PRINT HEX(030404);TAB(5);"EDIT DATA" 1480 COSUB '97(6,6,1,"AFTER PT. NO. ",6,999999) 1P2=Z IPACK (#######)P\$FROM P2 1450 1NLT(00)L0*() :MAT SEARCH A*(),=P\$ TO L0*() STEP E4 :IF L0*(1) (>HEX (0000) THEN 1500 1491PRINT HEX (03000A);TAB(5);"PT NO ";P2;" NOT IN BLOCK" :PRINT HEX(070707) :FDR I=1 TO 2500 :AHITE INEXT I :GDTD 1490 1500 I=256*VAL(STR(L0\$(1),1,1))+VAL(STR(L0\$(1),2)) 1500 IT=2557VAL(5)R(L0%(1),2,1);*VAL(5)R(L0%(1),2)) :I=([-1)/24+1 1510 UNPACK(*######,####)5TR(A%(1),4,21) TO X,Y,Z 1520 PRINT "X = ";X,"Y = ";Y,"Z = ";Z 1530 INT(10)51*() 1540 FOR I1=1 TO I :B1\$(I1)=A\$(I1) NEXT II

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-- "PHOTO205" ---- UPDATE TIE/CNYRL PT STATUS (AMER) 10 REM ----BOREN WAITTEN 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 #1810 190L0AD DC R*INPUT* 198, 232 205DEFFN'30 "BCRATCH R";HEX(22); "PHDT0205";HEX(22) 206DEFFN 31 "SAVE DC R (";HEX(22); "PHOTO205";HEX(22); ")";HEX(22); "P HOTO205";HEX(22) 300DEFFN'200 PRINT HEXI030A0A); TAB(5); "MODEL ":P1;" NOT IN BLOCK RE-ENTER" PRINT HEX(070707) AHINEXT I RETURN 1000PRINT HEX(030A0A); TAB(5); "EDIT TIE/CNTRL PT STATUS" PRINT PRINT TAB(5):"1. DELEYE A POINT" PRINT TAB(5):"2. INBERT A POINT" PRINT TAB(5):"3. CHANGE A POINT" PRINT TAB(5):"4. REFURN TO EDIT MENU" 101006050 "9715.6(.,'PURE THE ELECTED NUMBER",1,4) PRINT -ON ZGDTO 1310,1440,1050,1580 1050 DATA LOAD DC OPEN T#1,"PHOTODOG" 1070 PRINT HEX(03060A);TAB(5);"DATA EDIT" 1080CDGUB '97(5,6,1,"MODEL "0, (0 TD END)",6,999999) :P1=Z :IF Z=0 THEN 1000 1100DATA LEAD DC #1.A#() 11F END THEN 1101 :UNPACK(######)A\$(1) TO P2 :IF P1<>PE THEN 1100 :GOTO 1129 1101GDSUB '200 16010 1000 1129605UB '97(6,5,1,"POINT NO*,6,999999) :P2=Z 1130 PACK(######)P\$FROM P2 1140 1HIT (001L0#() 1150 MAT SEARCH A*(), *P# TO L0#() STEP 41 :IF LO#(1)=HEX(0000) THEN 1160 1160PRINT HEX (U20ACA); TAB(5); "PT ND "(P2; " NOT IN THIS MODEL" (PRINT HEX(070707) :FOR 1=1 TO 2500 :A=1 t2 NEXT I 1170 I=255*VAL(STR(L0#(1),1,1))+VAL(STR(L0#(1),2)) :I=(I-1)/41+1 1180 UNPACK(##)STR(A*(1),4,1) TO X 1190 PRINT TAB(5):"STATUS = ":X :GOBUB /97(9,6,1,*POINT NO",6,999999)

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енатазоя 01/10/77 22 1195605UB '97(10.6.1."STATUS",1,4) :X=Z 1/2 IOOPACK(Gesses)As(I)FRCM P IPACK(He)STR(As(I),4,1)FRCM X 1220GOSUB '97(I5,6,1,*ANY MORE C. RECTIONS TO THIS MODF. (Υ/Ν)*,1,0) 1230 IF 2%="N" THEN 1250 1240 PRINT HEX (030A0A0A) :GOTO 1129 1250 DBACKSPACE #1,1 :DATA SAVE DC #1,4\$() :GOTO 1000 1310DATA LOAD DC OPEN T#1, "PHOTODOG" 1311PRINT HEX(030A0A);TAB(5);"DATA EDIT" 1320GOSUB '97(5,6,1,"MODEL ND. (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 P1C)P2 THEN 1330 :GOTO 1350 1331GOSUB '200 :60TO 1000 1350605UB '97(7,6,1,"POINT NO",6.999999) 1251PACK(*#####)P#FROM P2 1360 INIT(00)L0#() :MAT SEARCH A#(),=P\$ TO L0#() STEP 41 :IF LO\$(1)()HEX(0000) THEN 1370 1351PRINT HEX(03000A):THEN 1370 1351PRINT HEX(03000A):THE(5):"PT NO "!P2:" NOT IN THIS MODEL" 1PRINT HEX(070707) 1FOR 1=1 TD 2500 AHITE :GOTO 1350 1370 1=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);*BTATUS * *;X 1391COSUB '97(15,6,1,"IS THIS THE CORRECT POINT (Y/N)*,1,0) 11F Z&**Y" THEN 1400 11F Z& :GDTD 1350 1400GDSUB '98(15,1,1) :PACK (#######)A#(I)FROM 0 IINIT(00)B1#() :12=0 1410 FOR 11=1 TO 12 :IF STR(A*(I1),1,3)=HEX(000000) THEN 1420 :I2=I2+1 :B1#(12)=A#(11) 1420 NEXT IL 1430 DBACKEPACE #1,1 (DATA SAVE DC #1,819()

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PHOTO205
        :6070 1000
  1440DATA LOAD DC OPEN T#1, "PHOTODOG"
  1441PRINT HEX (030A0A); TAB (5); "EDIT DATA"
1450 COBUB '97(5,6,1, "MODEL ND. (0 TO END)",6,999999)
  1450 60508 '97(5,6,1, "House

:PI=Z

:IF Z=0 THEN 1000

1460 DATA LOAD DC $1,A$()

:IF END THEN 1461
        :UNPACK(######)A$(1) TO PE
:IF P1<>P2 THEN 1460
  1461G0SUB '200
        :GDTD 1000
0 GDGUB '97(6,6,1,"AFTER PT. NO. ",6,999999)
  1480 GOSUB
        :P2=2
:PACK (######)2#FRDM 92
  1450 INIT(00)L0$()
:MAT SEARCH A$(),=P$ TO L0$() STEP 41
  :IF LO#(1)()+EX(0000) THEN 1500
1491PRINT HEX(030A0A);TAB(5);"PT NO ":P2;" NOT IN THIS STRIP"
        PRINT HEX(070707)
FDR 1=1 TO 2500
        :A#1+2
:NEXT I
  :0070 1480
:0070 1480
1500 I=256*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2))
  :I=(I-1)/41+1
1510 UNFACK(##*STR(A$(I),4,1) TD X
  1520 PRINT TAB(5); "STATUS = ";X
1530 INIT(00)81$()
  1540 FOR 11=1 TD 1
381$(11)=A$(11)
        INEXT II
  171+1
1550608UB '97(9,6,1,"POINT NO",6,999999)
        (P=Z
:GOSUB '97(10,6,1,*STATUS*,1,4)
  :X=Z
1559PACK (*(*****)81*(12)FRDM P
        :PACK(##)STR(B1#(I2),4,1)FRDM X
:12=12+1
  1560 FOR 11=1 TO 11
:B1$(12)=A$(11)
        :12=12+1
:NEXT 11
  1570 DBACKSPACE #1,1
:DATA SAVE DC #1,B1#()
  1580 LOAD DC R*PHOTOGO1*
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PHOTO206 01/10/77 10 REM ----- "PHOTO206" ---- UPDATE TIE/CNTRL PT STATUS (SCHUT)" 20REM WRITTEN 08/1977 M. ARBUCKLE 50 DIM A\$ (40)4, P\$3, L0\$ (1)2, B\$1, B1\$ (40)4, Z2\$64, Z\$64, Z1\$64 100SELECT #1810 190LDAD DC R"INPUT" 198, 232 205DEFFN'30"BCRATCH R";HEX(22);"PHOTO206";HEX(22) 206DEFFN'31"BAVE DC R (";HEX(22);"PHOTO206";HEX(22);"!";HEX(22);"PHOTO206";HEX(22);"PHOTO206";HEX(22);"PHOTO206";HEX(22);" HDTDE06";HEX (22) 300DEFFN '200 :PRINT HEX(030A0A);TAB(5);"STRIP ";P1;" NOT IN BLOCK RE-ENTER" PRINT HEX(070707) :FOR 1#1 TO 2500 INEXT I RETURN 1000PRINT HEX(030A0A); TAB(5); "EDIT TIE/CNTRL PT STATUS" :PRINT PRINT TAB(S):"1. DELETE A POINT" PRINT TAB(S):"2. INGERT A POINT" PRINT TAB(S):"3. CHANGE A POINT" PRINT TAB(S):"4. RETURN TO EDIT MENU" 101060508 '97(15,6,1,"ENTER THE SELECTED NUMBER",1,4) :ON ZGOTO 1310,1440,1050,1580 1050 DATA LOAD DC OPEN T#1, "PHOTODO7" 1070 PRINT HEX(030A0A); TAB(5); "DATA EDIT" 108060508 '97(5,6,1,"STRIP ND. (0 TO END)",2,99) :P1=Z :IF Z=0 THEN 1000 1100FOR I=1 TO P1 IF END THEN 1101 NEXT 1 11011-P1 INEXT I :GOSUB '200 112960608 '97(6,6,1,"POINT NO",6,999999) :P2=Z 1150 MAT BEARCH A*(),=P* TO LO*() STEP 4 :IF LO*(1)=HEX(0000) THEN 1160 :GOTO 1170 1160PENT HEX(030A0A);TAB(5);"PT NO ";P2:" NOT IN THIS STRIP" PRINT HEX (070707) SHINEXT I :GOTO 1129 1170 I=256*VAL(STR(L0\$(1),1,1))+VAL(STR(L0\$(1),2)) :1=(1-1)/4+1 1180 UNPACK(##)8TR(A#(1),4,1) TD X 1190 PRINT TAB(5); "STATUS = ":X

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        :GOSUB '97(9,6,1,"POINT NO",6,999999)
   1PxZ
119560808 '97(10,6,1,"STATUS",1,3)
        :X=Z
   1200PACK (######)A#(I)FROM P
  1200740(HHT#### 14:1/HCH T

120069UB (97115,6,1,"ANY MORE CORRECTIONS TO THIS STRIP (Y/N)",1.0)

1230 IF 2#="N" THEN 1250

1240 PRINT "EX(030A0A)
        :COTO 1129
   1250 DBACKSPACE #1,1
        :DATA SAVE DC #1,A$()
:GDTD 1000
  1310DATA LOAD DC OPEN T#1,"PHOTODO7"
1311PRINT HEX(030A0A);TAB(5);"DATA EDIT"
   1320GOSUB '97(5,6.1,"STRIP ND. (0 TO END)",2,99)
        :P1=Z
  : IF Z=0 THEN 1000
1330 FOR I=1 TO P1
        IDATA LOAD DC #1,A$()
        NEXT I
  13311=P1
INEXT I
        :QOSUB '200
        :GOTO 1000
   1350605UB '97(7,6,1,"POINT NO",6,999999)
        :PPs7
   1351PACK (######) P#FROM P2
   1360 INIT(00)LO$()
        :MAT SEARCH A$(), *P$ TO LO$() STEP 4
:IF LO$(1) (>HEX (0000) THEN 1370
   1361PRINT HEX(030A0A); TAB(5); "PT ND "; P2;" NDT IN THIS STRIP"
:PRINT HEX(070707)
        :FOR I=1 TO 2500
        :A=I+E
        SUEXT I
SEDTO 1350
   1370 1=255*VAL(BTR(L0*(1),1,1))+VAL(STR(L0*(1),2))
11=(1-1)/4+1
  130 UNPACK(#)STR(A$(1),4,1) TO X

1390 PRINT TAB(5); "STATUS " ";X

1390 BRINT TAB(5); "STATUS " ";X

1391GOSUB '97(15,6,1,"15 THIS THE CORRECT POINT (Y/N)",1,01

:17 Z&*Y'T THEN 1400
        11F 24<>"N" THEN 1391
   1400GDSUB '98(15,1,1)
:PACK(#######)A#(I)FRDM 0
        (INIT(D0)R1$()
        :12=0
   1410 FOR 11=1 TO 40
:1F STR(A*(11),1,3)=HEX(000000) THEN 1420
        :12=12+1
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PHOT0206 :01\$(I2)=A\$(I1) 1420 ! WEXT II 1436 Do .CKSPACE #1,1 :DATA SAVE DC #1,81#() :GOTD 1000 1440BATA LOAD DC OPEN T#1,"PHOTODO7" 1441PRINT HEX(030A0A);TAB(5);"EDIT DATA" 1450 GDSUB '97(5,6,1, "STRIP ND. (0 TO END)",2,99) :P1=Z 1460FDR I=1 TO P1 : DATA LOAD DC #1,A#() IF END THEN 1461 INEXT I 14611+P1 :NEXT I :GDSUB '200 1480 GQSUB '97(6,G,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 ND "; P2;" NUT IN THIS STRIP" :PRINT HEX (030A0A); TAB (5); "PT ND "; P2;" NUT IN THIS STRIP" :FOR 1=1 TO 2500 :A=142 :NEXT I :GOTO 1480 1500 1=256*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2)) :I=(I-1)/4+1 1510 UNPACK (##)STR (A#(1),4,1) TO X 1520 PRINT TAB(5); "STATUS # "X 1520 INIT(00)B1\$() 1540 FOR I1=1 TO I :B10(I1)=A#(I1) :NEXT I1 :12=11+1 ;I=I+1 1550605UB '97(9,6,1,"PDINT NO",6,999999) :P=2 :GDEUB '97(10,6,1,"STATUS",1,3) :X=Z 1599FACK(#######)B1*(I2)FRDM P :PACK(######)B1*(I2),4,1)FRDM X 12+12+1 1560 FOR 11+1 TO 39 :B1#(12)=A\$(11) :12=12+1 INEXT II 1570 DBACKBPACE #1,1 IDATA BAVE DC #1,B1#()

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COTG 1000 1580 LOAD DC R"PHOTOB01"

20 REM WRITTEN 08/08/77 M. ARBUCKLE S0 DIM N1(10), D0\$10, Z3\$1, Z1\$64, Z\$64, N9#25, Z2\$64 80% NO OF STRI PS B1% 22.48 FOCAL LENGTH ***.** MODELS PER 82% STRIP 83% STRIP NO NO OF MODELS 84% 44 885 100SELECT #1810 190GDTD 1000 205DEFFN'30"SCRATCH R ";HEX(22);"PHDT0300";HEX(22); 206DEFFN'31"SAVE DC R (";HEX(22);"PHDT0300";HEX(22);")";HEX(22);"PHD 2006EFFN'31'SAVE DC R (*)HEX(22);"PHOTOISOO";HEX(22);")"HEX(22);" TO300';HEX(22) 1000FRINT HEX(030A0A);"PRINTING THE PROJECT NAME, NO OF STRIPS ETC" 1010FRINT HEX(01);"SWITCH ON THE PRINTER" :SELECT FRINT EIS(132) SELECT PRINT DOS(64) :PRLNT HEX(01);TAB(54) ;PRLNT HEX(01);TAB(54) ;SELECT PRLNT 215(132) 1020DATA LOAD DC 0PEN T#1,"PHOTODO1" ;DATA LOAD DC #1,N,F1,N1(),N5#,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.FJ PRINT 82 PRINTUSING 83 PRINT 1040FDR I=1 TO PRINTUSING TO N 84,1,N1(1) INEXT I 1050SELECT PRINT 005(64) ILDAD DC R"PHOTOSO2"

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OUTPUT NO OF STRIPS, FOCAL LENGTH,

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PHOTOSOO

10 REM ----- "PHOTO300" ----

MODELS PER STRIP, PROJECT NAME

10 REM ---- "PHOTOSO1" ---- 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\$R,J2 \$2,21\$64,2\$64,22\$64,N1(10),D0\$10,N9\$25 80% #\$\$\$### ##### ##### ##### -#### . ##### ***** BEX PT. NO. XI ٧ı XS γa 100SELECT #1810.#2810 190GDTO 1000 205DEFFN'30*SCRATCH R ";HEX(22); "PHOTO301";HEX(22); 205DEFFN'31*SAVE DC R (";HEX(22); "PHOTO301";HEX(22);*)";HEX(22);*P HDT0301 "(HEX (22) 1000 DATA LOAD DC OPEN T#1, "PHOTODOL" :DATA LOAD DC #1,N,F1,N1(),N9#,D0# :DATA LOAD DC OPEN T#2, "PHOTODO2" 1001 WRINT HEX (0001) * SUITCH ON PRINTER" :SELECT PRINT 215(132) :PRINT HEX (000A0A) :J9=INT(66-LEN(N96))/2 IPRINT HEX (OE) TAB (JS) INS& PRINT :PRINT HEX(0E); TAB(24); "PLATE COORDINATES" 1 PPTNT PRINT TAB (56) 100\$ 1002 SELECT PRINT 005(64) 1010 J=0 1020 PRINT HEX(030A0A); TAB(S); "PLATE CUDRDINATE DUTPUT" ISELECT PRINT 215(132) 1440 INE :DATA LOAD DC #2,A1#() IF END THEN 1500 PRINT :PRINT :UNPACK(#######)A1#(1) TD P PRINT TAB(50); PRINTUSING 81,"MODEL NO",P PRINT PRINT TAB(30); PRINTUSING 62 PRINT 1450 UNPACK(#######)A1#(I) TO A 1450 UNPACK(########BTR(A1#(I),4,20) TO B.C.D.F 1470PRINT TAB(30); :PRINTUSING B0,A,B,C,D,E 1480 IF A=1 THEN 1440 IF A=5 THEN 1440 1490 I=I+1 :GOTO 1450 1500 BELECT PRINT 005(64)

PHOTO301 01/10/77 1

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PHOTOSOS
                                         01/10/77
                                                                             1
      10 REM ---- "PHDTDEDE" ---- OUTPUT STRIP CONTROL
      12 REN WRITTEN 08/1977
                                                              M. ARBUCKLE
     12 (11日、11日、13/15// 「、 「 MODURUE
15 SELET PRINT 05(64)
20 DIM A18(15)28,AS$3,J182、J2M1(13564,Z8664,Z8664,Z8664,B1(10),D0$10,N9$255
B0X 学校時秋秋 - 今年秋年後春ま、余春日
日気 学校寺校寺校会 各条会校会 - 今天、小公公、大公名、一会小学校会、会会 学校学校寺会
     82% PT. ND.
                                  XI
                                                           ¥1
                                                                                   ZI
                                                                                                      MODEL N
    100SELECT #1810
190GOTO 1000
    2050FFFN'30*SCRATCH R *;HEX(22);"PHOT0302";HEX(22);")";HEX(22);"PHO
2060FFFN'31*SAVE DC R (";HEX(22);"PHOT0302";HEX(22);")";HEX(22);"PHO
         10302" (HEX 122)
   1000 DATA LGAD DC OPEN T#1, "PHUTODO1"
  1000 DATA LOAD DC UPEN THI, THAILUDI'

(DATA LOAD DC UPEN R "PHOTODOS"

1010 PRINT HEX(C301); "BWITCH ON PRINTER"

(SELECT PRI: EIS(132)
         SPRINT HEX (OCDADA)
(J9=INT ((66-LEN(N9$))/2)
         PRINT HEX(OE); TAB(JS); N9#
          PRINT HEX(OE): TAB(27): "STRIP CONTROL"
          PRINT
        PRINT TAB(56) DO#
   1011SELECT PRINT 005(54)

PRINT HEX(USDADA); TAB '5); "PRINTING STRIP CONTROL"
  SELECT PRINT 215(132)
SELECT PRINT 215(132)
1020DATA LOAD DC A1*()
SIF END THEN 1090
1030 I=1
        :11=11+1
(PRINT
         PRINT TAB(50);
PRINTUBING 81-"STEIP ND":11
         PRINT TAB(30);
        PRINTUSING
                              82
  2040 UNPACK (#09####)A12 [2] TO A
1050 UNPACK (#0#############TR(A1#(I),4,18) TO B,C,D
  1060PRINT TAB (30):
  PRINTUSING 80, A, B, C, D, M
1070 IF A=1. THEN 1020
  1080 I=I+1
:GOTD 1040
  1090SELECT PRINT (35(64)
:LOAD DC R*PHETOBO2*
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10 REM ---- "PHOTO30S" ---- OUTPUT TIE/CNTRL PT STATUS (AMER) 12 REM WRITTEN 08/1977 15 SELECT PRINT 005(64) M. ARBUCKLE 20 DIM A1\$ (12)41, A5\$3, J1\$2, J2\$2, Z1\$64, Z\$64, Z\$64, N1(10), D0\$10, N9\$25 90\$ \$##### 100000 1005ELECT #1810 1906070 1000 205DEFFN'30"SCRATCH R ";HEX(22);"PHOT0305";HEX(22) 205DEFFN'31"SAVE DC R (";HEX(22);"PHOT0305";HEX(22);")";HEX(22);"PHO 200DEFH('31"SAVE DC R ("(HEX(22))"PHD TG305"(HEX(22) 1000 DATA LOAD DC CPEN T#1, "PHOTODO1" :DATA LOAD DC #1,N,F1,N1(),N9#,D08 :DATA LOAD DC 0PEN R "PHOTODO5" 1010 PRINT HEX (0301); "SWITCH ON PRINTER" :SELECT PRINT 215(132) :PRINT HEX (0C0A0A) :J9=INT ((66-LEN(N94))/2) PRINT HEX(OE);TAB(J9);N9% PRINT MEX(0E); TAB(21); "TIE/CONTROL POINT STATUS" PRINT TAB(56):004 1011SELECT PRINT 005(64) PRINT HEX(03000A);TAB(5); PRINTING TIE/CNTRL PT STATUS ISELECT PRINT 215(132) 1020DATA LOAD DC A1*() IF END THEN 1090 1030 I=2 (UNPACK (#######)A1#(1) TO 11 PRINT TAB (50); PRINTUSING B1, "MODEL NO "; II PRINT TAB(50); PRINTUBING 88 1040 UNPACK (#######/A1#(I) 70 A 1050 UNPACK (##)STR(A1#(I),4,1) TO B 1050 ONTAL (106) (114) (11,4,1) (10) 1050 PRINT TAB(50); 1070 IF A=1 THEN 1020 1050 UNPACK(44) (104) 10801050 UNPACK(44) STR(A14(I),4,1) TO B 1090 PRINT TAB(S0); PRINTUSING 80,A,B 1070 IF A=1 THEN 1020 :IF A=5 THEN 1020 :1F A=5 THEN 1020 1080 I=1+1 :GDTD 1040 10908ELECT PRINT 005(64) :LOAD DC R"PHDT080R"

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PHOTOSOS

01/10/77 PHOTOSOS 1 10 REM ---- "PHOTD303" ---- OUTPUT BLOCK CONTROL 12 REM WRITTEN 08/1977 15 SELECT PRINT 005(64) M. ARBUCKLE
 13
 SELECT PRENT 005(64)

 20
 DIA1 A1 60 30 24 A553 (1102)100 210 (250)200 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)000 (100)0000 (100)000 (100)0000 (100)000 (100)000 (100)0 2050EFFN'30"SCRATCH R ";HEX(22);"PHOTO303";HEX(22) 2050EFFN'31"SAVE DC R (";HEX(22);"PHOTO303";HEX(22);")";HEX(22);"PHO TD303";HEX(22) 1000 DATA LOAD DC OPEN T#1, "PHUTDD01" 1000 DATA LOAD DC OPEN THI,""HOIDDOI" DATA LOAD DC OPEN R "PHOTODO4" 1010 PRINT HEX (0301); "SWITCH ON PRINTER" :SELECT PRINT 215(132) :PRINT HEX (OCOADA) :J9=INT ((66-LEN(N9%))/2) PRINT HEX (OE); TAB (J9); N99 :PRINT HEX(0E);TAB(23);"BLOCK CONTROL (AMER)" ;PRINT PRINT TAB(56);DOS 10118ELECT PRINT 005(64) PRINT NEX(030A0A);TAB(5); "PRINTING BLOCK CONTROL" SELECT PRINT 215(132) JF END THEN 1090 1050 I=1 PRINT TAB (30); IPRANIUSING 82 ;PRINT 1940 (MPACK(*##\$####)A1\$(1) TO A 1050 (MPACK(*##\$####.sef*(A1\$(1),4,21) TO B,C,D 1060PRINT TAB(SD); 1050PRINT TAB(30); :PRINTUGING B0,A,B,C,D 1070 IF A=1 THEN 1020 1080 I=1+1 :GOTO 1040 1090BELECT PRINT 005(64) LOAD DC R"PHOTOBOR

01/10/77 PHOTO304 1 10 REM ---- "PHOTD304" ---- GUTPUT CHECK POINTS 12 REM WRITTEN 09/1977 15 SELECT PRINT 005(64) M. ARBUCKLE 1000FLECT #1810 1906DT0 1000 2050EFFN/30*8CRATCH R *;HEX(22);*PH0T0304*;HEX(22);*)*;HEX(22);*PH0 206DEFFN/31*SAVE DC R (*;HEX(22);*PH0T0304*;HEX(22);*)*;HEX(22);*PH0 TO304";HEX(22) 1000 DATA LOAD BC OPEN T#1, "PHOTODO1" DATA LOAD DC #1,N,F1,N1().N95,D05 DATA LOAD DC DPEN R "PHOTODOS" 1010 PRINT HEX(0301); "SWITCH ON PRINTER" ISELECT PRINT 215(132) :PRINT HEX (0C0A0A) :J9=INT ((66-LEN(N9#))/2) PRINT HEX(OE); TAB(J9); N9% PRINT HEX (OE); TAB (27); *CHECK POINTS* PRINT TAB(56);DO# PRINT 1011SELECT PRINT 005(64) PRINT HEX(030A0A);TAB(5); PRINTING CHECK POINTS" BELECT PRINT 215(132) : IF END THEN 1090 PRINT TAB (30); :PRINT 1040 UNPACK(######*)A1*(I) TD A PRINTUBING 80,A.B.C.D 1070 IF AN1 (NEN 1020 :IF A=S THEN 1020 1080 I=I+1 10905ELECT PKINT 005(64) 10905ELECT PKINT 005(64)

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10 REM ---- "PHOTOSOG" ---- 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,Z\$64,X2\$64,N1(10),D0\$10,N9\$25 80% ####### 80% ####### ## 4# 82% PT. ND. 1005ELECT #1810 STATUS 1005ELECT #1810 1960TD 1006 205DEFFN/30*SCRATCH R *;HEX(22);*PH0T0306*;HEX(22);*)";HEX(22);*PH0 T03%F;HEX(22) T03%F;HEX(22) 1000 DATA LOAD DC OPEN T%1, "PHOTODO1" DATA LOAD DC #1,N,F1,M1(),NS%,DO% (DATA LOAD DC UPEN R "PHOTODO7" 1010 PRINT HEX(0301); "SWITCH ON PRINTER" SELECT PRINT 215(132) :J9=INT((66-LEN(N9\$))/2) :PRINT HEX(0E):TAB(J9);N9# PRINT PRINT HEX(0E); TAB(21); "TIE/CONTROL POINT STATUS" PRINT TAB(56):DO# PRINT 1011BELECT PRINT 005(64) PRINT HEX(030A0A); TAB(5); "PRINTING TIE/CNTRL PT STATUS" SELECT PRINT 215(132) 1020DATA LOAD DC A1\$() 1030 I×1 +11+11+1 PRINT TAB(50); PRINTUSING BL. STRIP NO *: 11 PRINT PRINT TAB(50); PRINT 1040 UNPACK (#######)A1#(I) TO A 1050 UNPACK(##)STR(A1#(I),4,1) TO B 1060PRINT TAB(50); PRINTUBING BO,A,B 1070 IF A=1 THEN 1020 1080 I=I+1 :GD70 1040 1090SELECT PRINT 005(64)

PHOTOSOG

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10REM ---- "PHOT0307" -----RESIDUALS AT CHECK PDINTS TERRAIN COORD 83% 100 SELECT #1810 190 LOAD DC R"INPUT" 198, 232 1000 PRINT HEX(030A0A); TAB(5); "RESIDUALS AT CHECK POINTS" PRINT PRINT TAB(5);"1. AMER ADJUSTNENT" :PRINT TAB(5);"2. SCHUT ADJUSTNENT" 101 GOSUB (971(8,61,1"ENTER THE REGUIRED NO",1,2) :IT Z=0 THEN 1001 :ON ZGCTU 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 PDINTS" :DATA LOAD DC OPEN T#1, "PHOTODO1" :DATA LOAD DC #1,N,F1,N1(),N9\$,D0\$ 1010 SELECT PRINT 215(132) :J2=INT(66-LEN(N96))/2 PRINT HEX (OCOE) TAB (J2) :N9* PRINT PRINT HEX(OE): TAB(20): "RESIDUALS AT CHECK POINTS" PRINT 1PRINT TAB(59);00\$ PRINT 1030 PRINTUSING PRINT HEX (0A) 81 PRINTUSING 80 PRINT HEX(OA) 1060 DATA LOAD DA R(4721,L)A4*() IF END THEN 1340 1070 M=12000 :B=0 :DATA LOAD DA R(4051,L)S2() :DATA LOAD DA R(4001,L)N1,F1,S1() 1060 S=S+1 ;N2=S1(8) :IF S=N1+1 THEN 1090

PHOT0307 0.

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:N3=NE+S1(S+1) :GOTO 1100 1090 S=N1 :N3=SI(S) LOO 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 :15=0 1120 INIT(00)L0\$() MAT SEARCH A4*(),=STR(C1*(I),1,3) TO L0*() STEP 24) IF L0*(1)=HEX(0000) THEN 1300 1130 :K1=256*VAL(STR(L0\$(1),1,1))+VAL(STR(L0\$(1),2)) :K2=K(K1-1)/24+1
 122=(K(-1)/28+1

 1140 URFACK(1488588, decess)STR(A646(K2),4,21) TD X1,Y1,Z1

 256,V5,25=0

 1150 INJEES[5]+4002

 1150 DATA LOAD DA RNA,HS1C25()

 1170 INTICOLDE()

 1170 INTICOLDE()

 1180 FLOSS(1).457C(15(1),1,3) TO LOS()

 1190 FLOSS(1).452(000) THEM 1240

 1190 KL-255+VAL(5TR(LOS(1),1,3) TO LOS() LOS)

 1190 KL-255+VAL(5TR(LOS(1),1,1))+VAL(STR(LOS(1),2))

 1190 KL-255+VAL(5TR(LOS(1),1,1))+VAL(STR(LOS(1),2))
 1220 DATA BAVE DA R (N4,N5)C2\$() 1230 X6=X6+X2 :Y6=Y6+Y2 :Z6=Z6+Z2 1240 N4=N5 :NEXT J 1250 X=X6/15 :Y=Y6/15 :Z=Z6/15 1260 V1=X-X1 1V2=Y--Y1 1V3=Z-Z1 1V4=V4+V1+2 V5=V5+V212 :17=17+1 1270 PACK (#######)C1#(1)FROM 0 1270 PACK (#4184 1280 PRINTUBING :GDTD 1300 1290 PRINTUBING 1300 I*I+1 \$2.A.X.Y.Z.X1,Y1,Z1,V1,V2.V3 SE.A.X.Y.Z :GDTD 1110 1310 V7=EGR((V4+V5)/(2*17-2))

:V8=SGR(V6/(17~1))

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PHOT0307

PHOTO307

01/10/77 3

1320 PRINT HEX (0A0A0A) 1PRINTUSING 83,V7,V8 1340 LOAD DC R"PHOTOSO2" PHOT0208 01/10/77

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FINAL COORDINATE LIST 10REM ---- "PHOTO308" ----20REM WRITTEN 07/76 M. ARBUCKLE 50 DIM A4*(30)24,51*(30)24,52(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, ND. х z 95% 96% MODEL 83% ### **** **** -***** -884####.4## 100 SELECT #1810 190 LOAD DC R"INPUT" 198, 238 1000 PRINT HEX(030A0A); TAB(5); "FINAL BLOCK COORDINATE LIST" PRINT PRINT TAB(5);*1, AMER ADJUSTMENT" PRINT TAB(5);"2. SCHUT ADJUSTMENT" 1010 COSUB '97(8,6,1,"ENTER THE REGUIRED ND",1,2) 1F Z=0 THEN 1010 :DN 26DTD 1020,1030 1020L=9000 M=12000 GOTD 1040 1030L=17000 :M+12000 1040 DATA LDAD DA R(L,L)C1*() :IF END THEN 1050 :DATA SAVE DA R(M,M)C1*() :507D 1040 1050 DATA BAVE DA R(M,M)END PRINT MEX(030A0A);TAB(5);"FINAL COORDINATE LIST" 1060 SELECT PRINT 215(132) 1070 DATA LOAD DC OPEN T#1."PHOTODO1" :DATA LOAD DC #1.N.F1.N1(),N9\$,D0\$:J2=INT(66-LEN(N9%))/2 PRINT HEX (OCOE) TAB (J2) INS# PRINT 1090 PRINT HEX(OE);TAB(22);HEX(OE);*FINAL COORDINATE LIST* :PRINT PRINT TAB(59);DO% 1090 N=12000 1100 DATA LOAD DA R(M_M)CI#() IF END THEN 1150 :UNPACK(########)C1%(1) TO A PRINT PRINTUSING BE,A PRINTUSING 80 ####}STR(C1#(1).4,21) TO X2,V2,Z2

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PHOTOBOS

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1130 PRINTUBING 83,A,X2,Y2,Z2 :GOTO 1140 1140 I=I+1 :GOTO 1110 1150 LOAD DC R"PHOTOB02"

PHOT0400 01/10/77 1. 10 REM MODEL FORMATION ----*PHOTO400 "----11 REM WRITTEN 10/1975 12 PRINT HEX(OC) M. ARBUCKLE 20 JIM 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\$85,D0\$10 51 SELECT #1810 51 55LCC1 WINNU 52 DATA LOAD DC OPEN T\$1,"PHOTODO1" :DATA LOAD DC \$1,N,F1,N1(),N9*,DD\$ 53 SELECT PRINT 005(64) 54 PRINT MEX(030A0A0A0A0A0A0A);TAB(10);"M D D E L FORMA T 1 0 N" 55 SELECT PRINT 215(132) 50 N2=5000 :N4=6000 110 E=1 :I9=1 155=0.0000001 MAT F=ZER MAT AS=ZER MAT A1-ZER 120 DATA LOAD DA R(N2,N3)X\$() IF END THEN 930 121 1#4 J=0 122 UNPACK (#######)X#(I) TD P 11F P=1 THEN 124 11F P=5 THEN 124 123 J=J+1 11×1+1 160T0 122 124 N1=J-6 :N1=N1+3 130 FOR 1=4 131 J1=1-3 TO N1 140 UNPACK (+#####.####)STR(X#(I),4,20) TO X1,Y1,X2,Y2 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 2X-={E,IL}A 005 220 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)

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PHOT0400

01/10/77

270 NAT A2=A1*A 280 MAT A3*INV(A2) 290 MAT A4=A3*A1 300 MAT X=A4*F 310 MAT 11=IDN 320 D1=1,+.25*(X(1,1)+2+X(2,1)+2+X(3,1)+2) 330 S(1,1)=0 340 5(1,1)*0 340 5(1,2)*0.5*X(3,1) 350 8(1,3)*-0.5*X(2,1) 360 5(2,1)*-0.5*X(3,1) 370 5(2,2)*0 380 S(2,3)=0.5*X(1,1) 390 S(3,1)=0.5*X(2,1) 400 5(3,2)=-0.5*X(2,1) 410 5(3,2)=-0.5*X(1,1) 410 S(3,3)=0 420 MAT 51=I1-8 430 MAT 52=5*81 430 MAT 52*5*81 440 T*2/01 450 MAT 52=(T)*62 460 MAT R*11-52 470 MAT R1=TRN(R) 480 C(1,1)=0 490 C(1,2)=-X(5,1) 490 C(1,2)=X(3,1 500 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 570 HAT D=R1*C 580 FOR 1=4 TO H1 581 J1=I-3 590 UNPACK(+##########)STR(X#(I),4,20) TO X1,V1,X2,Y2 600 X1=X1/F1 610 V1=V1/F1 620 .2=X2/F1 630 Y2=V2/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 FDR J=1 TD 3 710 T+0 720 FOR K=1 TO 3 730 T=T+D(J,K)*LE(K,1) 740 NEXT K 750 DE(J,1)=T 760 NEXT J 770 T=0 780 FDR M=1 TD 3 790 T=T+L1(1,H)*D2(H,1)

HOT0400 01/10/77 800 NEXT M 810 V(J1,1)=T 820 NEXT 1 830 19=19+1 840 MAT X3=A4*V BEO MAT X=X-X3 BEO MAT X=X-X3 BEO GUBUB 1400 BTO IF ABS(E)<=0.0001 THEN 850 BEO GUTD 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 (OCOE); TAB (J); N9# PRINT PRINT HEX (OE); TAB (25); "MODEL FORMATION" PRINT TAB(59);DOF 9421=2 IDATA LOAD DA R(N4,N5)X\$() 943 UNPACK (#######)X#(1) TO P 949 PRINT PRINTUSING 1301,P PRINTUSING 1302 950 DATA LOAD DA R(N4,N5)X\$() SIF END THEN LOLO SAF ENG (HEAL KOLD) SGO UKPACK(+0+0+0+0+)Xs(I) TU P (UKPACK(+0+0+0+0+0+0)STR(X0(I),4,20) TU 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+Y712 11=1+1 160T0 960 990 S4=60R(T/(1-9)) ;PRINT ; PRINTUSING 1310,54 1000 N4=N5 ;GDTD 942 1010 SELECT PRINT 005(64) ;LOAD DC R"PHOTOBO3" 1030 I=4 1T=0 1050 PACK(+#.#######)8TR(X#(3),4.20) FROM 1,X(4,1),X(5,1) 1060 UNPACK (+***** *****)STR (X*(I),4,20) TD X1, Y1, X2, Y2

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PHOT0400 01/10/77 1070 UNPACK (######)X#(1) 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 V4=V1*Z 1180 V5=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,V6,Z,V7 1250 I=I+1 :GOTO 1060 1290 S9=SQR(T/(I-9)) 1291 RETURN 1300% 1301% MODEL NO 1302% PT ND Z Y V PARALLAX 1310% v PARALLAX STD ERR = #,40# MM AT PHOTO SCALE 1400 T=0 1405 FOR 1=4 TD N1 1410 (#PACK(+####,####)STR(X#(I),4,20) TO X1.V1.X2.VE 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)*(2-X(5,1))/R2(3,1)+X(4,1) 1500 Y7=(Y4-Y5)/2 :T=T+Y7+P :NEXT I 1501 T=T*F1 1510 S4=50R(T/(N1-4)) 1520 E=(\$4-85)/84 1530 E5<84 RETURN

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PH0T0401
                                    01/10/77
                                                                   1
                                                 JUNCTION OF ADJACENT MODELS
      10 REM ---- "PHOTO401" ----
      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
     ), A9 (30)23, X3(10), V3(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, 1), A3(3, 1), X(3, 1), R(3, 3), R1(
     3,1),R2(3,1),A4(3,3)
71 SELECT PRINT 005(64)
     IPRINT HEX (030A0A); TAB(S); "STRIP FORMATION"
72 SELECT #1810
        DATA LOAD DC OPEN T#1,"PHOTOD01"
DATA LOAD DC #1,N,F1,N1(),N9#,D0#
     :J2=INT(66-LEN(N9$))/2
73 SELECT PRINT 215(132)
        PRINT HEX(OCOE); TAB(J2); N9#
        PRINT HEX(OE) TAB(25); "STRIP FORMATION"
        1PRINT
        PRINT TAB(59);DO#
     80 L=5000
   90 INIT(00)X1$()
:DATA LOAD DA R(L,L)A$()
:IF END THEN 150
100 I=1
    120 PACK (#######)X18 (1)FRCM P
:PACK (+####,######)STR(X1$(1),4,18)FRCM X,Y,Z
    130 IF P=5 THEN 140
:IF P=1 THEN 140
        :I=I+1
:GDTD 110
    140 DATA SAVE DA R(M,M)X1#()
    150 DATA SAVE DA R(M,M)END
160 M,L=7000
    170 L=M
180 INIT(00)X1$(),X2$()
        111=0
DATA LOAD DA R(L,M)X1*()
    (19+0
190 DATA LOAD DA R(M,ME)XE4()
       S DATA LUAD DA R(M,)
SIF END THEN 1340
MAT A=ZER
MAT F=ZER
MAT A1=ZER
        MAT AS=ZER
   :MAT A4=ZER
200 V4,V5,V6=0
   210 11=2
```

01/10/77 PHOT0401 240 UNPACK(#######)X1s(I) TO P1 :IF P1=1 THEN 331 :IF P1=5 THEN 331 251 INIT(00)L0\$() :MAT SEARCH X2*(),=STR(X1*(1),1,3) TO L0*() STEP 23 :1F L0*(1)=HEX(0000) THEN 320 252 K1=256*VAL:STR(LO\$(1),1,1))+VAL(STR(LO\$(1),2)) 253 I2=(K1-1)/23+1 300 IF I1=4 THEN 331 310 I1=I1+1 :1=1+1 :GUTD E40 320 I=I+1 :GDTO 240 330 II=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 II 380 X2(I)=X2(I)-H4 390 Y2(1)=Y2(1)-H5 400 Z2(1)=Z2(1)-H6 410 X1(I)=X1(I)-H1 :V1(I)=V1(I)-HE :Z1(1)=Z1(1)-H3 4E0 NEXT 1 440 FOR 1=1 TO E :19=1+2 450 T1=(X1(I)-X1(I9))*(X1(I)-X1(I9))+(V1(I)-V1(I9))+(V1(I)-V1(I9))+(Z1(I)-Z1(I9))*(Z1(I)-Z1(I9)) 460 T2=(X2(1)-X2(19))*(X2(1)-X2(19))+(Y2(1)-Y2(19))*(Y2(1)-Y2(19)) +(Z8(1)-Z2(19))*(Z8(1)-Z2(19)) 470 L1=BGR(71/72)+L1 480 NEXT 1 490 L1=L1/2 510 FOR I 41 TO 11 520 X2(1)=X2(1)*L1 530 Y2(1)=Y2(1)*L1 540 Z2(I)=Z2(I)*L1 550 NEXT I 560 FOR I=1 570 J=2*I-1 TO IS 580 K=2*1 590 A(J,1)=0 600 A(J,2)=-(21(I)+22(I)) 610 A(J,3)=X1(I)-X2(I)

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PHOTO401 01/10/77 620 A(K,1)=Z1(I)+ZE(I) 630 A(K,2)=0 640 A(K,2)=Y1(I)-Y2(I) 650 F(J,1)=-(Y1(I)+Y2(I)) 660 F(K,1)=-(Y1(I)+Y2(I)) 660 F(K,1)=X1(I)+X2(I) 670 NEXT I 580 MAT A1=TRN(A) 590 MAT A2=A1*A 700 MAT A3=A1*F 710 MAT A4=INV(A2) 720 MAT X=A4*A3 730 MAT X=(-1)*X 730 HAT X+(-1)*X 740 R(1)*X(3)*X(3,1)*X(1,1)*X(1,1)*X(2,1)*X(2,1)*X(2,1)* 750 R(2,1)=*V(1,1)*X(2,1)*X(3,1) 750 R(2,1)=*V(1,1)*X(2,1)*X(3,1) 760 R(2,2)=X(3,1)*X(3,1)*X(1,1)*X(1,1)*X(1,1)*X(2,1)* 770 R(2,2)=X(3,1)*X(3,1)*X(1,1)*X(1,1)*X(1,1)*X(2,1)* 780 R(2,3)=*X(2,1)*X(3,1)*X(3,1) 800 R(1,3)==*X(2,1)*X(3,1)*X(3,1)* 800 R(2,3)=*X(2,1)*X(3,1)*X(3,1)* 800 R(2,3)=*X(2,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(3,1)*X(840 MAT R=(T1)*R 850 T1,T2,T3=0 860 FOR I=1 TO I1 970 R1(1,1)=X2(I) 890 R1(2,1)=Y2(I) 890 R1(3,1)=Z2(I) 900 MAT R2=R*R1 910 T1=T1-R2(1,1)+X1(1) 920 T2=T2-R2(2,1)+V1(1) 930 T3=T3-R2(3,1)+Z1(1) 940 NEXT I 950 T1=T1/I1 :T2=T2/1' 970 F=F1/H3 :H1=H1+T1 :H2=H2+T2 :H3=H3+T3 80 UNPACK(#######)X1#(1) TO B1 :UNPACK(#######)X28(1) TO B2 JUNCTION OF MODELS ":B1:*-*:B2 990 PRINT PRINT PRINTUSING 1321 1000 I=2 :IE=0 110 UNPACK(444445)X28(I) TO P1 1020 UNPACK(444445)X28(I) TO P1 1020 IF P1=1 THEN 1250 1030 IF P1=5 THEN 1250 1040 UNPACK(+444.4454546)GTR(X26(I),4,18) TD X3,V3,Z3 1050 X3=X3-H4

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:Z3=Z3-H6 1060 R1(1,1)=X3*L1 1070 R1(2,1)=Y3*L1 1060 R1(3,1)=Z3*L1 1080 R1(3,1)=23*L1 1090 MAT R2=R*R1 1100 X3=R2(1,1)+H1 :Y3=R2(2,1)+H2 :Z3=R2(3,1)+H3 1110 MAT SEARCH X1\$(),=BTR(X2\$(1),1,3) TO LO\$() 57EP 23 11F L0\$(1)=HEX(0000) THEN 1220 1120 K1=256*VAL(STR(L0\$(1),1,1))+VAL(STR(L0\$(1),2)) 1130 11=(K1-1)/23+1 1140 UNPACK(+###.########)STR(X1#(I1),4,18) TO X2,Y2,Z2 1150 V1=X3-X2 ;V2=Y3-Y2 :V3=23-22 1160 PRINTUSING 1320,P1,X3,V3,Z3,X2,V2,Z2,V1,V2,V3 1170 X3=(X3+X2)*0.5 :V3=(V3+V2)*0.5 :23=(23+22)*0.5 1180 V4=V4+V1+2 :V5=V5+V2+2 :V6=V6+V3+2 :12=12+1 1190 PACK(+###.#######)STR(X1#(I1),4,18)FROM X3,Y3,Z3 1200 PACK(+*##.**#####)5TR(X2*(1),4,18)FRDM X3,V3,Z3 1210 GOTD 1240 1220 PRINTUSING 1320,P1,X3,Y3,Z3 1220 PACK(+###,########)STR(X2*(I).4,1B)FRCM X3,V3,Z3 1240 I=I+1 160T0 1010 1250 G4=5GR((V4+V5+V6)/(3*I2-3))*F 1250 DATA SAVE DA R(L,M)X14() IDATA SAVE DA R(M,M2)X2#() PRINT PRINTUSING 1330,64 PRINT 1270 IF P1=5 THEN 1290 1280 GOTD 170 1290 L=M2 180 X +###### +##.986##### 1320% ***** +...... PT NO. X2 V2 VX vy ze vz ×1 1321% 1330% SIGMA X/Y/Z = 1340 SELECT PRINT 005(64) . THA MA AT PHOTO SCALE -# PRINT HEX(03)

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PHOTO402 -- *PHOTO402* --ABSOLUTE ORIENTATION OF A STRIP 10 REM % ---& STRIP ADJUSTMENT 11REM % WRITTEN 02/1976 15 SELECT PRINT 005(64) M. ARBUCKLE PRINT HEX (030404) (TAB(5)) "STRIP ADJUSTMENT" 16 SELECT PRINT 215(132),#1810 :DATA LOAD DC OPEN T#1, "PHOTODO1" 30 DIM R(3;3),00(3,1),C2#(30)24 V Main (13(3), 10(3), 1) (58(3)) (57 40 DIM A(7,16), F(28,1), (43,1), (43(3), A5(8,28), 29(7,1), R4(3,3), N0(14), N2(14), L05(1)E 50 DIM R3(3,3), 23(3,1), N(10), C(14), C2(14), C3(14), S1(14), S2(14), S3 (14), S(10), X14(30)E3, X9(7,1) (14,)5110, A.34(30)23, X3(7,1) 51 DH 53(4,6), B6(6,1), F2(14,1), X3(6,1), C1\$(15)24, X(8,1), A3(28,8)), A2(8,8), A6(8,1), A4(9,8), A1(10), D0\$10, M9\$25 58DATA LDAD DC \$1, M,F1, M1(1), M9\$, D0\$ 59 J5=0 60 R2=+1 61J=INT((66-LEN(N9\$))/2) PRINT HEX(OCOE); TAB(J); N9# PRINT PRINT HEX(OE); TAB(25); "STRIP ADJUSTMENT" 1PRINT PRINT TAB(59);DOS 62 L=7000 :L3=4002 :54=8000 63 5=L • 5-. :13=13+1 :1₽ 13=N+1 THEN 2151 :B(13)=L :U4,V4,W4=0 1NE(13)=84 :29=0 64 17=N1 (13) MAT F#ZER MAT X=ZER 65 18=0 1DATA LOAD DA R(L3,L3)CI#() 1"OR IE=1 TO 4 66 18=18+1 :UNFACK(#######)C1#(12) TO A :N0(18)=A 57 UNPACK(+\$######:\$###)STR(C1\$(18),4,18) TO C1(18),C2(18),C3(18) 68 UNPACK(########STR(C1#(I2),22.3) 70 M 69 81=82 :DATA LOAD DA R(81,82)X1#()

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:MAT SEARCH X1\$(), *STR(C1\$(12),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)) ;16*(K1-1)/23+1 77 81(I8)=X :52(I8)=Y 133(18)=2 79 NEXT 12 80 MAT REDIM A(3,3),F(3,1),X(3,1),A3(3,3) :L+3*17+L B1 X1=81(1) :V1=80(1) :Z1=53(1) 62 X2=51(2) :Y2=S2(2) ;Z2=S3(2) 12=63(2) 173=62(3) :Z3=63(3) 64 U1=C1(1) :V1=C2(1) :W1=C3(1) 45 (12+C1(E) :W2=C3(2) :V3=C2(3) :W3=C3(3) 110 G1=U1-UE 1GE=V1-VE :G3=W1-W2 120 G4=X1-X2 165=Y1-Y2 130 G7#¥1-¥3 :G8#¥1-W3 1H1=Z1-Z3 1H2=X1-X3 140 L1=(C1+2+G2+2+G3+2)/(G4+2+G5+2+G6+2) 150 L1=598(L1) 151 LE=1/L1 160 A1=(G3*G7-G5*G3)*LE 170 A2=G6*G7-G5*H1 180 81=(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)*(-D2-5GR(D2+2-4*D1*D3))/(2*D1) 250 R(3,1)*(A1-A2*R(3,3))*C1

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260 R(3,2)=(B1-82*R(3,3))*C1 270 E1=R2*(R(3,2)*(Z1-Z2)-R(3,3)*(V1-V2)) 290 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)+21-22 330 A(2,1)=R(3,1) 340 A(2,2)=R(3,2) 350 A(2,3)=R(3,3) 260 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 FDR 1=1 TO 3 450 R(2,1)=X(1,1) 460 NEXT I 470 R(1,1)=R2*(R(2,2)*R(3,3)-R(2,3)*R(3,2)) 510 00(2,1)=01-L1*(R(3,1)*X1+R(3,2)*V1+R(3,3)*Z1) 520 00(2,1)=01-L1*(R(3,1)*X1+R(3,2)*V1+R(3,3)*Z1) 530 MAT R4=R :MAT A5=ZER !MAT F=ZER MAT A2=ZER HAT A4=ZER MAT A=ZER :MAT REDIM F(14,1),A(7,14),A5(14,7),A2(7,7),A4(7,7),A5(7,1) 570 FOR 11=1 TO 4 1K=3*11 :I=K-2 :J=K-1 580 X3(1,1)=S1(11) :X3(2,1)=S2(11) :X3(3,1)=53(11) 581 U7=C1(11) :V7=C2(11) :W7=C3(11) 500 MAT V=R*X3 610 AS(1,1)=-L1*V(2,1) 620 AS(1,2)=-L1*V(2,1) 630 AS(1,4)=V(1,1) 640 A5(1,5)=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 AS(J,6)=1 690 AS(K,2)=L1*V(1,1) 700 A5(K,3)=L1*V(2,1) 710 AS(K,4)=V(3,1) 710 A5(K,7)=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)-U7+V4 750 F(K,1)=U0(3,1)+L1*V(3,1)-W7+W4 NEXT II 760 MAT ANTRN (AS) IMAT AS=A*AS :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 B3=ZER MAT AG=ZER MAT BE=ZER MAT X8*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=8(13) II+I+i :UNPACK(#######)C1#(I) TO A 1110 IF A=1 THEN 1240 1120 UNPACK (+###### ###)STR(C1\$(I),4,18) TO U1,V1.W1

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PHOTO402 01/10/77 **11**2 1130 18×18+1 :UNPACK (*******)STR (C1* (I),22,3) TO M 1140 C1(IB)=U1 :C2(IB)=V1 :C3(18)=W1 :NO(18) #A 1160 DATA LGAD DA R(8,5)X1\$() 1170 UNPACK(######1X1\$(1) TU B 1180 IF B=M THEN 1190 160TO 1160 190 INIT(00)LO#() (MAT SEARCH X1#(), "STR(C1#(1),1,3) TO LO#() STEP 23 IIF L0*(1)=HEX(0000) THEN 1100
1191 K1=256*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2)) 1191 K1=256*VAL (3(K(L)*(1),1,1)*VAL (3) K(L)*(1),2) :16=(K1-1)/23+1 1201 (N)ACK((****,#\$######)STR(X1*(16),4,18) TO X,Y,Z 1230 S1(18)=X :52(IB)-Y 153(18)=Z GOTO 1100 1240G1,62=0 1FOR J1=1 TO 18 :G1=G1+C1(J1) :G2=G2+C2(J1) :NEXT J1 :G1=G1/IB :C2=C2/IB 1247 FOR I=1 TO IB :N3=2*I :N2=N3-1 1248 X1=S1(I) :Y1=S2(I) :Z1×S3(1) 1249 U1=C1(1) IV1=C2(I) :W1=C3(I) :U1=(U1-G1)/1000 :V1=(V1-G2)/1000 1250 GOEUB 2160 1260 A3(N2,1)=1 1200 A3(N2,1)=1 1270 A3(N2,3)=X5 1280 A3(N2,4)=-Y5 1280 A3(N2,5)=X5*X5-Y5*Y5 1300 A3(N2,6)=-2*X5*Y5 1310 A3(N2,7)*X5*X5+3+X5-3+X5*Y5 1320 A3(N2,8)*Y5*Y3*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(N8,6) 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

PHOTO402 01/10/77 1410 F(N3,1)=V5-V1 1420 B3(1,1)=1 1430 B3(I,E)=X5 1440 B3(I,3)=Y5 1450 B3(1,4)=X5*Y5 1460 B3(1,5)=X5*X5 1470 B3(1,6)=X5#X5#XS 1480 F2(1,1)=Z5-W1 1481 NEXT I 1490 MAT AS=TRN(A3) MAT A2-A5*A3 MAT A6=A5*F 1500 MAT REDIM AS(6.12),A2(6.6),A4(6,6) MAT A8=A5*B3 MAT A4=INV(A2) 1790 PRINT TAB(S1); "PLANIMETRIC AND HEIGHT CONTROL" :PRINT 51; "VZ" 1822 V2,V5,V6=0 1830 FOR 11=1 TO 18 1840 X1=S1(I1) 191=S2(I1) :Z1=83(11) 1850 U1=C1(11) :V1=C2(11) :W1=C2(11) 1860 COSUB 2160 1800 APE=(XS=A1)145AA2 1920 NEXT 11 1930 V3=90R((V5+V2)/(2*18-8)) 1940 Y5+80R(V5/(2+16-8)) 1950 VE+80R(V2/(2+18-8)) 1960 V6+60R(V6/(18-6)) 1970 V7=50R(V6+2+V2+2+V5+2) 1990PRINT PRINTUBING 2240,V5,V2,V6 2000 PRINTUBING 2260,V3,V7 PRINT E020 PRINT TAB(20); "ADJUSTED COORDINATES" TAB(6); "PT NO"; TAB(19); "X"(TAB(33); "Y"; TAB(47); "Z" 2040 PRINT

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01/10/77 PHOTO402 ~, 2050 S=S(I3) :J3=0 2060 11=2 :DATA LOAD DA R(S,S)X1#() 2061 UNFACK(#######)X1\$(1) TO A :PRINT HEX(0A0A) : FACK (#######) CE# (1) FROM A 2063 PRINT TAB(5); "SECTION ND. ":A :PRINT HEX (0404) 2055 UNPACK (#######)X1\$(11) TO A : IF A=1 THEN 2142 : IF A=5 THEN 2141 2080 URPACK(+###, #######)STR(X1\$(I1),4,18) TO X1,Y1,Z1 2110 GOSUB 2160 E110 GDSUB 2280 2130 PRINTUSING 2270,A,X2,V2,Z2 2131 FACK(#######)CPs(I1)FRUM A :PACK(+########)BTR(CEs(I1),4,21)FRUM X2,V2,Z2 2140 11=11+1 :0010 2065 2141 J9=J9+1 :PACK (######)C2+(11)FRDM A : PACK (+4*44*** *****)STR (C2*(11), 4, 21) FROM 0,0, J9 :GDTD 2145 146 DATA SAVE DA R(84,64)(2\$() :1F B>=L THEN 2150 :GOTJ 2060 2150 PRIAT HEX(0C) EDTD 63 E151 DATA SAVE DA R(4051,L)NE() IDATA SAVE DA R(S4,S4)EHD ILDAD DC R"PHOTOBO3" 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=(1=U(3,1)+U0(3,1) 2221 X5=(X5-G1)/1000 :Y5=(Y5-62)/1000 2230 RETURN 2240% STD ERR IN X=-4.444 STD ERR IN Ym-#,### STD ERR IN Z=-#.# 2250% 2280 X2=X5-X(1,1)-X(3,1)*X5+X(4,1)*V5-X(5,1)*(X5*X5-V5*V5)+X(6,1)*2*X STYS

2290 X2=X2-X(7,1)*(X5*X5*X5-3*X5*Y5*Y5)+X(8,1)*(3*X5*X5*Y5-Y5*Y5*Y5

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2300 '/2*/5-X'(2,1)-X(4,1)*X5-X'(3,1)*Y5-X'(6,1)*(X54X5-Y5*Y5)-X'(5,1)*2*X SY5 2310 '/2*/5-X'(8,1)*(X2*Y5*X5-3*X5*Y5*Y5)-X'(7,1)*(3*X5*X5*Y5*Y5-Y5*Y5*Y5) 2320 '/2*/5*(8,1)*X5*X5*(3,1)*X5-X5(5,1)*Y5-X5(4,1)*X5*Y5*X5'(5,1)*X5*X5 2321. Y2*X5*(5,1)*Y5*X5'(5,1)*Y5-X5(5,1)*Y5-X5(5,1)*X5*Y5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5,1)*X5'(5

14070403 01/10/77 BLOCK ADJUSTMENT BY SCHUT'S METHOD 5 REM ---- "PHOTP403" -----MODULE 1 M. ARBUCKLE 6 REM WRITTEN 04/1976 11 COM X1(80),X2(80),Q1,Q2 12PRINT HEX (030A0A); TAB (5); "BLOCK ADJUETMENT" :PRINT IF GI (>O THEN 15 IPRINT TABIS): INPUT **NER THE ND OF ITERATIONS REGUIRED*,62 IIF G2(*0 THEN 13 IIF G2(*0 THEN 13 IGOTO 14 SPRINT "RINI TAB(S);"MIN = 1 ; MAX = 10" :FOR I=1 TO 250 INEXT I :GOTO 12 148ELECT PRINT 005(64) PRINT HEX (030A0A) (TAB (5) ("BLOCK ADJUSTMENT" 15PRINT :PRINT TAB(5);*ITERATION NO ";01+1 20 DIM C1*(40)24,A1*(40)4,C*(30)24,N1(10),L0*(1)2 20 DATA LOAD DA R(4051,L)N1() :3=0 :L2=4076 :L=4052 35 J=J+1 40 I≈0 IDATA 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) 100 K1=256*VAL(STR(L0\$(1),1,1)+VAL(STR(L0\$(1),2)) 100 K1=256*VAL(STR(L0\$(1),1,1)+VAL(STR(L0\$(1),2)) 102 K1=256*VAL(STR(L0\$(1),1,1)+VAL(STR(L0\$(1),2)) 110 UNPACK (+044#14,######)STR (C#(K2),4,21) TO X,V,Z 120 PACK (#######)C1#(I)FROM P 150 PACK(######)C1#(1)FROM 1 160 DATA SAVE DA R(LE,L2)C1#() 170 DATA BAVE DA R(L2,L2)END

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PHOT0413 BLOCK ADJUSTMENT BY SCHUT'S METHOD 10 REM ----- "PHOTO413" -----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 PRI T 005(64) 40 DIM A5(50,11, ,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 50 DATA LOAD DA R(4051,L9)SE() 70 DATA LOAD DA R(4001,L9)N,FI 80 L=4052 1L0×4002 :L4=13000 :1.5=13500 90 L1=4076 100 I=I+1 :IF I=N+1 THEN 350 :DATA LOAD DA R(L0,L0;C4#() MAT AS=ZER MAT FS-ZER 110 16,11,12,13,14,17=1 :H1=0 120 DATA LOAD DA R(L1,L2)C1#() :DATA LOAD DA R(L,M)A1#() :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 120 GOTO 150 140 Z\$="END" 150 UNPACK(######)A1\$(I1) TO P1 :IF P1=1 THEN 340 160 UNPACK(##)STR(A1*(11),4,1) TO P2 111=11+1 :IF Z\$="END" THEN 170 1F 200 180 170 IF 22-1 THEN 150 180 INIT(00)LO&(1) 190 NAT SEARCH (11(),=STR(A1\$(11-1),1,3) TO LO\$() STEP 24 200 K1=256*VAL(8TR(L0*(1),1,1))+VAL(STR(L0*(1),2)) :I2=(K1-1)/24:1 1129((1-1)/2*)1 104FACK(14968484.548484)STR(C14(12),4,21) TD X1,V1,Z1 210 DN P2 GOTO E20, 220, 280 220 NX1(00106(1) 230 MAT SEARCH (25(),=STR(A14(11-1),1,3) TD L04() STEP 24 :IF LO\$(1)=HEX(000) THEN 150 P40 K1=256*VAL(STR(LO\$(1),1,1)+VAL(STR(LO\$(1),2)) :I3=(K1-1)/24+1 :NPACK(+#######.#####)STR(C2#(I3),4,21) TO X2,Y2,Z2

01/10/77 1 PH0T0413 01/10/77 2 250 W=0.5 :H1=H1+1 250 GOSUB 370 270 GDTD 150 280 INIT(00)L0\$(1) 290 MAT BEARCH C4\$(),=STR(A1\$(I1-1),1.3) TO L0\$() STEP 24 300 K1=256*VAL(5TR(L0\$(1),1,1))+VAL(STR(L0\$(1),2)) :I4=(K1-1)/24+1 :UNPACK(+#######,###)5TR(C4\$(I4),4,18) TO X3,Y3,Z3 310 W=1 :H1=H1+1 320 GDSUB 830 330 6070 150 340 DATA BAVE DA R(L4,L4)H1,A5(),F5() IDATA SAVE DA R(LS,LS)H1,AG(),FG() 350 DATA SAVE DA R(L4,L4)END DATA SAVE DA R(L5,L5)END 360LDAD DC R"PHOT0423" 370 H2=2*H1 :H3=H2-1 :W1=5GR(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*1*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*V1 560 A5(H2,6)=X1+2-Y1+2 570 A5(H2.7)=3+X1+2+Y1-Y1+3 S80 A5(H2,8)=X1+3-3"X1*Y1+2 590 A5(H2,10)=-1 600 AS(H2,11)=-YE 610 AS(H2,12)=-XE 610 A5(H2,13)=-2*X2*Y2 630 A5(H2,13)=-2*X2*Y2 640 A5(H2,14)*Y2+2-X2+2 640 A5(H2,15)=Y2+3-3*X2+2*Y2 650 A5(H2,15)=3*X2*Y2+2-X2+3 660 F5(H3,1)=X1-X2 670 F5(H2,1)=V1-V2 580 A6(H1,1)=1 590 A6(H1,2)=X1

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700 AG(H1,3)=V1 710 AG(H1,4)=X1*V1 720 A6(H1,5)=X1+2 730 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+2 770 AB(H1,1)#Z1-Z2 780 F6(H1,1)#Z1-Z2 790 F0R J4=1 T0 16 (AS(H3,J4,=A5(H3,J4)*W1 (AS(H2,J4)=A5(H2,J4)*W1 INEXT J4 800 FOR J4=1 TD 10 :AG(H1,J4)=AG(H1,J4)*W1 :NEXT J4 B10 F5(H3,1) = F5(H3,1) = 64 ;F5(H2,1) = F5(H2,1) = 64 :F5(H1,1)=F5(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 860 A5(H3,4)=-Y3 870 A5(H3,5)=X3+2-Y3 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 AS(H2,2)=1 920 AS(H2,3)=73 930 A5(H2,4)=X3 940 A5(H2,5)=2*X3*Y3 A5(H2,6)=X3+2-Y3+2 A5(H2,6)=X3+2-Y3+2 A5(H2,7)=3*X3+2*Y3-Y3+3 950 960 970 A5(H2,8)=X3+3-3*X3*Y3+2 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 A5(H1,4)=X3*Y3 1040 A5(H1,5)=X3+2 1050 F6(H1,1)=21-23 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((11,J4)*A6(H1,J4)*W1 NEXT J4

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:F6(H1,1)=F6(H1,1)*W1 1090 RETURN PHOT0423 01/10/77 1 BLOCK ADJUETMENT BY SCHUT'S METHOD 10 REM ---- "PHOTO423" -----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() 1H2=2*H1 40 MAT REDIM A5(H2,16),F5(H2,1),A6(16,H2) 50 MAT AG+TRN(A5) 60 MAT A7=A5*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 50 MAT REDIM A5(H2,16), F5(H2,1), A6(16, H2) 100 MAT A7-ZER MAT FG=ZER :MAT F6=A6*F5 120 MAT A7=A6*A5 130 FOR I=9 TO 16 FOR J=9 TO 16 140 K1=1-8 :K2=J-8 150 A7(K1,K2)=A7(K1,K2)+A8(1,J) :NEXT J :F6(K1,1)=F6(K1,1)+F8(1,1) :NEXT I THRAILAINE DA R(L3,L3|A7(),F6() THAT ABANE DA R(L3,L3|A7(),F6() THAT FB-F6 16070 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,L21H1,A5(),F5() 190 MAT REDIM A5(H1,10),F5(H1,1),A6(10,H1) 200 MAT A7=ZER 210 MAT AGATRN (AS) MAT A7=A6*A5 MAT F8+F6 DATA SAVE DA R(L4.L4)A7(),F6() 220 MAT REDIM AS(25,10), F5(25,1) :DATA LOAD DA R(L2,L2)H1,A5(),F5()

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PHOT0483

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HCTTCH4233 011/10/77 IF RHD THEN 300 230 MAT REDUM AS(HL,10),FS(HL,1),AG(10,HL) 240 MAT REDUM AS(HL,10),FS(HL,1),AG(10,HL) 250 MAT AS(THM) 104 AT 74-0545 104 AT 74-0545

PHOTO433

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BLICK ADJUSTMENT BY SCHUT'S METHOD

4 REM ---- "PHDTD433" ----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)H,F1 :N3=N#8 :MAT REDIM A(N3,16), F(N3), X1(N3), X2(N3), Y(N3) 20 L=14000 :N1=0 :JP=8 :13×16 114=0 :MAT A=ZER 30 DATA LOAD DA R(L,L)A5(),F5() :IP END THEN 80 35 N2=N1*I2 40 FOR I=1 TO I2 :Ki=0 :FOR J=1 TO 13 :K1=K1+1 50 A(K,K1)=A5(I,J) :NEXT J :F(K)=F5(I,1) NEXT 1 60 N1=N1+1 10070 30 80 M=13-1 :M1=13 90 FOR I=1 TO N3 90 FOR 1%1 10 N3 100 A(I,1)=80R(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 131 IF N3=I+M THEN 150 150 140 M2+I+M :GDTD 160 150 M2=N3 155 IF M2-I-1<0 THEN 230 155 FOR M3=1+1 TO M2 190 FOR J×1 TO M+1-M3+1 280 A(M3,J)=A(M3,J)-A(I,M3-I+1)*A(I,M3-I+J) 1847 J INEXT MB 240 FOR K=1 250 8=F(K) TO NO 250 1F (K-1)=0 THEN 320 270 IF (K-M1)<0 THEN 280 280 M2+K :0070 300

```
      B00 FB-H1

      B00 FB-H1

      B01 FB-H2, FE TD HE

      B01 FB-H2, J.J*V(J)

      B00 FB-H2, J.J*V(H2, J.J*V(J)

      B00 FB-H2, J.J*V(H2, J.J
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PHOT0433

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PHOT0443
                                                                                                                   01/10/77
                    4 REM ----- "PHOTO443" ---- BLOCK ADJUSTMENT BY SCHUT'S METHOD
                    MODULE S
S REM TRANSFORMATION OF THE BLOCK
               5 REN TRANSFORMATION OF THE BLOCK

6 BELECT FRANSFORMATION OF THE BLOCK

6 BELECT FRANSFORMATION (19)

10 DTA (LOAD DC DPFN T81, "MOTDOL'

11 DTA A180 DC DPFN T81, "MOTDOL'

11 DTA A180 DC DPFN T81, "MOTDOL'

12 BELER TRANSFORMATION (19), "MOTOL'

12 BELER TRANSFORMATION (19), "MOTOL'

13 DE LE RES REALES (19) //

14 DE LE RES REALES (19) //

15 DE LE REALES (19) //

15 
                          PRINT
                           PRINT HEX(OE) TAB(25); *BLOCK ADJUSTMENT*
                          PRINT
PRINT TAB(SQ): "RESIDUALS AT TIE AND CONTROL POINTS"
                          PRINT TAB(59);DOS
               PRINT
14PRINT TAB(58); "ITERATION NO"; GI+L
                          PRINT
                          PRINTUSING 315
           PRINT
141 L1,L2=4076
                          :L0=4002
:L=4052
             :11=0
148 IF II=N THEN 300
                        :N1#11#8+1
:N2=11*5+1
                          :N3=N1+7
:N4=N2+4
                          IK=0
FOR I=N1 TO NB
                          :K=K+1
:X3(K)+X1(I)
                          NEXT I
                          FOR INE TO NA
                          :K=K+1
                          :X4(K)=X2(I)
:NEXT I
           :I1=11+1
143 IF 11=N THEN 149
           144 N1=11*8+1
:N2=11*5+1
                          1N3=N1+7
                          FOR INI TO NO
                          :K=K+1
:X5(K)=X1(I)
                        SNEXT I
SK∺0
                          FOR INNE TO N4
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01/10/77 e PHOTO443 :K=K+1 :X6(K)=X2(I) :NEXT I 149 DATA LUAD DA R(L,L)A1#() 150 L1=LE :12=12+1 :1F 12=N+1 THEN 300 DATA LOAD DA R(L1,L2)C1\$() DATA LOAD DA R(L2,L3)C2#() :GOTD 160 151 Z#="END" 160 J=1 170 UNPACK(######)A1\$(J) TO P IF P=1 THEN 142 180 UNPACK(##)BTR(A1#(J),4,1) TO M :1F 2##"END" :GOTO 200 THEN 181 181 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 (1*(),=STR(A1*(J),1,3) TO LO*() STEP 24 220 IF LO*(1)=HEX(0000) THEN 230 281 K1=256*VAL (STR(L0*(1),1,1))+VAL(STR(L0*(1),2))
:K2=(K1-1)/24+1 :XE=X :VPHY :ZE=Z 223 ON M GOTO 224, 224, 240 224 INIT(00)L0*() 225 MAT SEARCH (2*(),=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)) 229 GDBUB 870 :E1 == E1 + (X2-X) +2*W 1E2=E2+(Y2-Y)+2*W 1E3=E3+(Z2-Z)+2*W 13=13+1 1PRINTUBING 313,P,X2,Y2,Z2,X,Y,Z,X2-X,Y2-Y,Z2-Z 230 J#J+1 ;GOTD 170 240 INIT(00)L0\$() 250 MAT BEARCH C4*(),=STR(A1*(J),1,3) TO LOS() STEP PA 200 Kiw2554VAL(BTR(LO#(1),1,1))+VAL(STR(LO#(1),2)) ;K2w(K1-1)/24+1 270 UNPACK (+####### .###)STR (C4# (K2) .4.18) TO X.Y.Z

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PHOTO443
                                                               Э
   RB0 E1=E1+(X2-X)+2*W
       122=22+(Y2-Y)+2*W
123=23+(Z2-Z)+2*W
        113+13+1
   E81 PRINTUGING 314, P, X2, Y2, Z2, X, Y, Z, X2-X, Y2-Y, Z2-Z
   290 J=J+1
       :GDTD 170
   300 S1=SGR((E1+E2)/(2*I3-N*B))
:S2=SGR(E3/(I3-N*5))
   184-SQR (51+2+52+2)
310 PRINT HEX (0A0A)
       PRINTUSING 311,51,52
   311%
                                              SIGMA 0 HEIGHT = ~****.#**
   312 PRINT
       PRINT
   ------
                                                                         -##,###
## ~####
          -#######.###
X1
                                                          -##.### ~##.###
Z1
                                             -84.688
   315% PT. NO
                                                 ¥1
                                                                                      XP
                                                               ٧Ÿ
                     Y2
                                        Z2
                                                   vx
                                                                           V7
   421 L=8000
:M=16000
:I1=0
   430 IF 11=N
:N1=I1*8+1
                    THEN 467
       :N2=11+5+1
1N3=N1+7
       1143-112+7
       :K=0
        FOR I=N1 TO N3
       :K=K+1
        :X3(K)=X1(I)
        INEXT I
       FOR INE TO NA
       :K=K+1
:X4(K)=X2(I)
       :NEXT I
:I1=I1+1
   440 JI=2
:DATA LOAD DA R(L,L)A$()
       :UNPACK(######)A#(1) TO P
:PACK(######)B#(1)FROM P
   :IF END THEN 467
450 UNPACK (####### 0467
:IF P=1 THEN 464
:IF P=5 THEN 464
   11 PPS 1727 997
460 URPACK(+494848/sH484)BTR(A$(J1),4,21) TO X1,Y1,Z1
451 COSUB 770
462 PACK(+494848)DS(J1)FROM P
453 PACK(+494848,59484)JTR(D$(J1),4,21)FROM X,Y,Z
       :J1=J1+1
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PHOTO443
                                    01/10/77
        :0010 450
    105 B*(1)*A$(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
    469M=16000
:L=8000
        LIF 01(>02 THEN 470
    470 DATA LOAD DA R(M,M)A#()
:IF END THEN 471
:DATA SAVE DA R(L,L)A#()
:GOTD 470
    471 DATA SAVE DA R(L,L)END
:IF Q1()Q2 THEN 490
        LOAD DC R"PHOTOBOS"
    490MAT REDIM X1(80),X2(80)
:LDAD DC R"PHOTD403"
    770 C1=X3(1)+X1*X3(3)-Y1*X2(4)+(X1+2-Y1+2)*X3(5)-2*X1*Y1*X3(5)+(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*V1-V1+3)*X3(7)+(X1+3-3*X1*V1+2)*X3(8)
781 V=V1+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 CI=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*V1)*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)
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981 Y=Y1+C2 990 C3=X6(1)+X1*X6(2)+Y1*X6(3)+X1*Y1*X6(4)+X1+2*X6(5)

891 Z=Z1+C3

```
10SELECT PRINT 005(64)
  20 REM ----- "PHOTO404"
                                                 BLOCK ADJUSTMENT BY AMER'S ITERATIVE
       METHOD
  30 REH WRITTEN 06/1976
40 REH ** WRITTEN JUNE 1976
41000 00.01
                                                      M. ARBUCKLE
                                                                                             **
  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$1
50 DIM X(4,1),A1$(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
  E2PRINT HEX(030A0A); TAB(5); "BLOCK ADJUSTMENT"
70 DATA LQAD DA R(4711,L)CE#()
; DATA LQAD DA R(4001,L)N,F,N1()
     178 at Y
     IF DO-1 THEN 90
  71PRINT
    PRINT TAB(5);
:PRINT TAB(5);
:INFUT "DO YCU WIEH TO RESTART (Y/N)",2¢
:IF Z$="Y" THEN BO
:IF Z$="N" THEN BO
     PRINT HEX(0C);TAB(64)
PRINT HEX(0C0C)
 SOPRINT
                 71
    PRINT TAB(5):
INPLY: "ENTER THE ND OF ITERATIONS",01
     :IF 01-1NT (01/10)*10=0 THEN 90
     PRINT
    PRINT TAB(5); "MUST BE A NULTIPLE OF 10"
FOR I=1 TO 7500
     NEXT I
 90 Z9=0
:00=00+1
1001F Z#="N" THEN 430
;IF D0=D1/10+1 THEN
                                   110
    11F 00=1 THEN 121
110CDM CLEAR
:LUAD DC R*FHDTDB02*
1201-8000
    1M=9000
130 DATA LOAD DA R(L,L)C*()
11F END THEN 150
140 DATA SAVE DA R(M,M)C*()
160TO 130
150 DATA SAVE DA R(M,M)END
160 I=4201
    1J=9000
113=-1
17012=2
:DATA LOAD DA R(1,P)A$()
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PHOTO404

PHOTO404 01/10/77 2 IF END THEN 250 :13=13+1 180 UNPACK (######)A\$(12) TO Y1 :UNPACK (##)STR (A\$(12),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\$(12),1,3) TO LO\$() STEP 24 :IF LO\$(1)=HEX(0000) THEN 211 iKi=256#VAL(STR(L0#(1),1,1))+VAL(STR(L0#(1),2))
if=(Ki-1)/24+2 :GOTO 220 211UNPACK(######)AG(1) TO NO :PRINT HEX(030A0A);TAB(5);"ERROR IN MODEL NO ";MO 23007 220 UNPACK(+#######,######)STR(C#(I5),4,2L) TO X,Y,Z 200TO 230 230 PACK(+#######.######;STR(A#(I2),6,2L)FROM X,Y,Z 125/224____ :GOTO 180 240 DATA SAVE DA R(I,P)A\$() :I=P :GDT0 170 250 N3(1)=4201 ;5=0 :A5=1 :I=4201 260 53=0 FOR IR=1 TD N-1 :92=H1(12) :93=63+62 :N3(12+1)=4201+2*53 :NEXT 12 270 N2=0 :IF S=0 THEN 280 11F S=N-1 THEN 290 11F S=N THEN 430 :A5=6+2 :S1=5 :GOTO : 300 161-6+1 COTO 300 290 A5=6+1 ;51=5 300 FOR 12=51 T :N2=N2+N1(12) TO AS INEXT IR :DATA LOAD DA R(I,P)A#() :IF END THEN 430 320 17=0 ;UNPACK (######)A\$ (12) TU A4

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PHOTO404
                                                                 1
       IF A4=1 THEN
IF A4=5 THEN
                            410
                    THEN 420
   330 L1=N3(S1)
(FOR I3=1 TO NE
   340 INIT(00)L0#()
:DATA LDAD DA R(L1,L2)A1#()
   350 MAT SEARCH A1$()(42,451),=STR(A$(12),1,3) TO L0$() STEP 41
:IF L0$(1)=HEX(0000) THEN 370
   12F LUM:17HEX(U000) HEN 370

360 K1=256VAL(STR(L04(1),1,1)+VAL(STR(L04(1),2))

:15=(K1-1)/41+2

:17=17+1

:H9(17)=L1
   10(17)=16
370 L1=L2
   :NEXT 13
360 PACK (####)STR (A# (IE) .27,10)FROM M9()
   390 PACK(###)STR(A#(12),37,5)FROM MO()
400 PACK(##)STR(A#(12),5,1)FROM MO()
       :12=12+1
   10 DATA BAVE DA R(1,P)A*()
       :I=P
   420 DATA SAVE 27 1147
:1=P
:5=5+1
:60TD 270
4301F 01(>0 THEN 431
   +301F 01070 THEN 431
;0TD 930
431 IF Z9=10 THEN 930
       PRINT 29
   440 1=4201
:L2=10500
   450 12-2
:DATA LOAD DA R(I,I)A$()
       IF END THEN 640
   :M3=0
460 UNPACK(######## )A$(I2) TO A4
       :IF A4=1 THEN 630
   :UNPACK(##)STR(A#(18),4,2) TO X1,21
470 UNPACK(##)STR(A#(12),37,5) TO M0()
   :14=0
480 UNPACK (####)STR (A$(I2),27,10) TD M9()
   500 18=18+1
1X9(18)=X
       :Y9(18)=Y
:Z9(18)=Z
   $070 520
510 M3=M3+1
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PHOTO404 01/10/77 :X7(M3)=X :Y7(M3)=Y :27(H3)=Z \$20 X,Y,Z=0 (FOR I3=1 TO Z1 10ATA LOAD DA R(M9(I3),L3)A1\$() 530 14=14+1 :X=X+X2: :Z=Z+ZE :NEXT I3 540 X=X/14 :Y=Y/14 12#2/14 550 ON X1 GDTD 590, 560, 570, 600 560 X6(M3)=X :Y6(M3)=Y :26(M3)=Z :12=12+1 GOTO 460 MAT SEARCH (2*(), *STR(A*(12),1,3) TD LO*() STEP 24 :K1=256*VAL(STR(LO*(1),1,1))+VAL(STR(LO*(1),2)) :16=(K1-1)/24+1 580 UNPACK(+##################BTR(CR\$(16),4.21) TO X.Y.Z 590 X8(I8)=X :Y8(I8)=Y :28(18)=Z :12=12+1 :60TD 460 600 INIT (00)L0\$() :MAT SEARCH C2*(),=STR(A*(12),1,3) TO L0*() STEP 24 :K1*256*VAL(STR(L0*(1),1,1))+VAL(STR(L0*(1),2,1)) *15=(K1+1)/24+1 510 LNPACK(+#######,######)STR(C2#(I6),18,7) TO Z 620 X6(M3)=X :26(M3)=Z :12=12+1 :(0TU 460 G30 DATA SAVE DA R(L2,L2)XG(),YG(),Z5(),X7(),Y7(),Z7(),X8(),YB(),Z 8(),X9(),Y9(),29(),IB,M3 :COTO 450 640 DATA SAVE DA R(L2,L2)END 650 L1=10500 11=4201 650 DATA LDAD DA R(L1,L1)XG(),YG(),ZG(),X7(),Y7(),Z7(),XB(),YB(),Z8() 660 DATA LOAD DA R(L1,L1)AG),X9(),Y9(),Z9(),I8,M3 :IF END THEN 920 670 DATA LOAD DA R(1,P)A*() 680 FOR I4=1 TD M3 :M2=IB+I4

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: Y8 (M2) = Y6 (14) : 28 (M2) = 26 (14) :X9(M2)=X7(I4) :V9(M2)=V7(I4) :29(M2)=27(I4) :NEXT 14 700 S1,52,53,54,55,86,57=0 710 FOR 14=1 TD 18 720 S1=S1+X5(I4) ;S2=S2+Y9(I4) ;52*52*Y9(14) :53=53+X8(14) :54=54+Y8(14) :NEXT 14 730 51=51/18 :52=62/19 :53=53/19 :54=54/18 740 FOR 14=1 TU 750 T1=X9(14)-S1 :T2=Y9(14)-S2 TD 18 :T3=X8(14)-S3 :T4=Y8(14)-84 : |4=Y8(14)-54 760 S5=S5+T1*T1+T2*T2 : 36=S6+T1*T3+T2*T4 : 57=S7+T2*T3-T1*T4 : NEXT I4 : NEXT I4 770 H1=96/95 ;H2=97/95 :H3=93-H1*81-H2*82 :H4=94+H2*81-H1*92 780 S1=SQR (H1*H1+H2*H2) :MAT R1=ZER :MAT R2=ZER MAT R4=ZER MAT FO=ZER :MAT A0=ZER 790 FOR J1=1 TO M2 800 X5+H1*X9(J1)+H2*Y0(J1)+H3 :V5=-H2*X5(J1)+H12*Y9(J1)+H4 810 A0(J1,1)=1 :A0(J1,2)=X5 :A0(J1,2)=Y5 :F0(J1,1)=Z9(J1)*S1-Z8(J1) :NEXT J1 BED 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 12*2 SCUNPACK(######)A\$(12) TD A4 :IF A4=1 THEN 310 :IF A4=5 THEN 310 850 UNPACK(##)STR(A\$(12),4,1) TO X1 : Y5=-X*H2+Y*H1+H4 :25=Z*81+Z0+X5*C+Y5*D :GOTO 850 910 DATA SAVE DA R(I,P)A\$() :I~P GOTO 660 920 Z9=Z9+1 :GOTO 430 930 12=9000 :L1=4201 :L3=10500 940 I1=2 114=0 :DATA LOAD DA R(L1,L1)A\$() IF END THEN 1220 IDATA LDAD DA R(L3,L3)X5(),V5(),Z5(),X7(),Y7(),Z7(),X8(),V8(),Z8()),X9(),Y9(),Z9(),I8,M3 :FOR IS=1 TO M3 :M2=18+15 :X8(M2)=X6(I5) :Y8(M2)=Y6(I5) ;28(M2)=26(I5) :NEXT 15 950 DATA LUAD DA R(12,13)C4() 950 UNPACK(######)A#(11) TO P :IF P=1 THEN 1040 :IF P=5 THEN 1040 :UNPACK (##)STR(A#(11),4,1) TD 0 970 INIT(00)L0#() 980 MAT BEARCH C#(){25,696),*STR(A#(I1),1,3) TO LO#() STEP 24 990 K1=E56*VAL(STR(LO#(1),1,1))+VAL(STR(LO#(1),2)) :0N & GOTD 1010,1020,1010,1020 1010 14=14+1 :X9(14)=X :Y9(14)=Y :29(14)=Z :GOTO 1030 1020 15=15+1 :X7(I5)=X :Y7(15)=Y :Z7(15)=Z

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PHOT0404

PHOTO404 1030 11=11+1 :GOTO 960 1040 81,82,83,84,85,86.27=0 1050 FOR 14=1 TO 18 1060 51:51:45(14) :S2=S2+V9(14) 192=52+V9(14) 153=53+X8(14) 154=54+V9(14) 1070 51*51/18 192=52/18 193=53/18 :84=54/18 1080 FOR 14=1 TO 18 1090 T1*X9(14)-61 172=Y9(14)-62 :T3=XB(14)-S3 :T4=Y8(14)-S4 114#*8(14)-54 1100 85*55+T14T1+T2*T2 286*85+T14T3+T2*T4 257=87+T2*T3-T1*T4 2NEXT I4 1110 H1=85/85 2+2=87/85 :H3=63-H1+51-H2+62 :H4=64+H2+61-H1+52 1120 MAT R1=ZER MAT R3=ZER MAT R5=ZER :MAT F0=ZER 1130 S1=SGR(H1*H1+H2*H2) :FOR 15=1 TO M3 :M2=18+15 :X9(M2)=X7(15) :Y9(M2)=Y7(15) :29(M2)=27(15) :NEXT 15 1140 -DR 15=1 TO M2 :A0(15,1)=1 :A0(15,2)*H1*X9(15)+H2*Y9(15)+H3 :A0(15,3)*-H2*X9(15)+H1*Y9(15)+H4 :ro(15,1)=29(15)*81-28(15) :NEXT 15 INEXT IS 1150 NAT R1*TRN(A0) :MAT R2*R1*A0 :MAT R3*INV(R2) :MAT R4*R1*F0 MAT RJ+R3*R4 :20=R5(1,1) :C=R5(2,1)

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100-R5(3,1) 1150 14-0 1150 14-0 1150 14-0 1170 14-0 1170 14-0 1170 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0 1180 14-0

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10REM ----- "PHOTD414" ---- RESIDUALS AT TIE AND CHECK POINTS
 15REM WRITTEN 06/76
16DIM N1(10),N9$25,D0$10
                                           M. ARBUCKLE
 17DIM A$(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)
 EOSELECT #1810
;DATA LOAD DC OPEN T#1, "PHOTODOL"
   :DATA LOAD DC #1,N,F1,11(),N9$,D0$
:J2=INT(66-LEN(N9$))/2
 21PRINT HEX(030A0A);TAB(S); "RESIDUALS AT TIE/CHECK POINTS"
SOBELECT PRINT 215(132)
 SOPRINT HEX (OCDE) ; TAB (J2) ; N9#
   PRINT
   PRINT HEX (DE): TAB (16): "RESIDUALS AT THE AND CHECK POINTS"
   PRINT
   PRINT TAB(59);DOS
   PRINT TAB(59): "ITERATION ND ":00#10
 70 PRINT
   PRINT
    PRINT TAB (25) : "BECTION CORNERS" : TAB (62) : "SECTION CORNER MEANS
 "(TAB(103); "RESIDUALS"
   PRINT
 90 PRINT TAB(6); "PT NO. "; TAB(19); "X"; TAB(33); "Y"; TAB(47); "Z"; TAB(6)
   100 PRINT
120 I=4201
:G1=10500
130 DATA LOAD DA R(1,1)A$()
   11F END THEN 400
140 DATA LOAD DA R(G1,G1)X6(),Y6(),Z6(),X7(),Y7(),Z7(),X8(),Y8(),Z8(),X9(),X9(),Z9(),I8
150 12=2
:13=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# (13),4,2) TD X1,Z1
220 UNPACK(######)A#(13) TO A4
   :13=13+1
230 IF A4=5 THEN 130
IF A4=1 THEN 130
240 IF X1 =2 THEN 2
250 V1=X8 (M3) -X9 (M3)
              THEN 310
   :V2=Y8(M3)-Y9(M3)
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PHOTO414

01/10/77 PHOTO414 9 : V3 = 28 (M3) -- 29 (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 ;J2*J2+1 300 GOTD 340 310 V3=26(M2)-27(M2) 320 UG=UG+V312 ;J3=J3+1 330 GOTO 360 340 PRINTUBING 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), 27(M2), 26(M2), V3 :M2=M2+1 370% 一般教育研究学、合作的 -******* # -0.447 -0.889 -*.... 390 6070 210 400 S1=SGR((V4+V5)/(2+J1-2)) 410 S2=SGR((W4+W5)/(2+J2-4+M4)) 410 32=80R((W4+W5)/(2*J2~4*M4 420 S3=90R(V6/(J1-1)) 430 S4=80R((U6+W6)/(J3-3*M4)) 18ELECT PRINT 215(132) 1PRINT PRINT PRINT PRINTUBING 450.68.84.51.53 PRINT HEX (DADA) 450% SIGMA X/Y TIE = ~~**.0*** SIGMA Z TIE = ~~**.0*** GMA X/Y CONTROL = ~***.0*** SIGMA Z CONTROL = ~***.0** sı 460 LDAD DC R*PHOTO404"

APPENDIX B

OUTPUT FROM THE ST. FAITH'S TEST AREA

MODEL FORMATION

MARL NU 6061			
x	Y	z	Y PARALLAX
0.0000000	0.0000000	0.000000	0.000
1,000000	~0.0204915	0.0113328	0.000
0.0003291	0.9861612	1.6163602	-0.002
0.0541558	-0.0609784	1,6508440	-0.001
0.0730867	~1.0583199	1.6826477	0.000
0.9807056	0,9594191	1.6610459	0,009
1,1358843	-0.1824813	1,7084469	0.004
0,8336740	-1.0316533	1.7065988	-0.000
0.2514617	0.7086956	1.6293194	0.007
			~0, 05
			-0.017
0,0530430	0.0208593		0.012
1.2542772	0.0954141		0.001
0.1859921			-0.009
			0.000
1.0477313	-0.2241131	1.7072597	0.021
1.0360469	-0.5373858	1.7074122	0.022
0.7922759	-0.9252795		0.017
			0.009
0.0726668	-1.0724039	1.6829820	0.003
0.0091213	-0.9763046	1.6741511	0.022
	X 0.00000 1.000000 0.0003231 0.07911887 0.9207056 1.3358943 0.3514617 0.3514617 0.3712572 0.6459920 0.659921 0.659921 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.1259721 0.	Y Y Y C.0000000 -0.000000 -0.000000 1.0000000 -0.000718 -0.000718 0.001218 -0.000718 -0.000718 0.001218 -0.000718 -0.000718 0.001218 -0.000718 -0.000718 0.001218 -0.000718 -0.000718 0.001218 -0.000718 -0.000718 0.001218 -0.000718 -0.000718 0.001218 -0.000718 -0.000718 0.001218 -0.0018 -0.000718 0.001218 -0.0018 -0.000718 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001218 -0.0018 -0.0018 0.001	X Y Z 0.0000000 0.0000000 0.000000 0.000000 1.00000000 -0.0001015 1.653040 0.0002811 0.9861612 1.653040 0.0002813 -0.0001784 1.653040 0.0002811 -0.0001784 1.653040 0.0012813 -0.0001784 1.653040 0.0012813 -0.0001784 1.653040 0.0012813 -0.0001784 1.653040 0.0012813 -0.0001784 1.653040 0.0012814 -0.0001784 1.653040 0.01128272 0.0001785 1.623154 0.4315572 0.0054141 1.660354 1.2534772 0.0054141 1.7078374 0.13539521 -0.2314714 1.6611554 1.25347722 0.0354141 1.7076374 0.13539521 -0.2314714 1.6611554 1.035049 -0.5373455 1.7074432 0.7322798 -0.5373455 1.7074432 0.7322798 -0.5373455 1.7074432 0.7726498

Y PARALLAX STD ERR = 0.013 MM AT PHOTO SCALE

MODEL, NO 6062

PTNO	x	Y	z	Y PARALLAX
6065	0.0000000	0.000000	0.0000000	0.000
6063	1.0000000	-0,0179730	4555010.0	0.000
624	-0.0303983	1.0270954	1.7580485	-0.014
626	0.1444901	-0,1837084	1.8010099	-0.008
628	-0.1689068	-1,0BB5093	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
63B	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	1.7714108	~0.004
194	1,2222/343	-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 PADALLAY CTT EDD	= 0.009 MM AT PHOTO	BCALE
		T FARMELINA OLD CHIL	- 0.009 MM AT PADID	SCALE
	MODEL NO 6063			
PT ND	x	Y	z	Y PARALLAX
6063	0.000000.0	0.0000000	0.0000000	0.000
6064	1.000000	-0.0078219	0.0099340	0.000
634	-0.088'530	1.0428104	1.6923343	-0.008
636	0.157-360	-0.0117655	6675094	-0.005
638	0.0318787	~1.1714170	1.6717438	0.000
38	-0,2014810	0.2615233	1.6863290	0.002
54	-0.0452288	-0.8712524	1.6804559	-0.008
55	-0.1380868	-1.0913021	1.6757644	0.010
42	0.1562980	~0.0019557	1.6676071	0.005
194	0.2118431	-0.1917134	1.6682471	-0.010
49	0.2213115	-0.4583256	1.6671326	-0.009
644	0.9640219	0.9503279	1.6533171	-0.005
646	0.9304082	-0.0563923	1.6558340	0.015
64B	1.0819685	-0.8459167	1.6738744	-0.002
631	0.0050905	0.9128204	1.6905252	0.002
39	0,4461850	0.5998351		0.003
39 83	0,6830948	0, 5998351	1.6675485	0.003
82	0,9550920	0.6026781	1.6639448	500.0-
41	0.4422287	0.3885929	1.6759770	0.005
81	0.9354864	0.3030164	1,6763438	-0.004
44	0.4713981	~0.0390307	1.6635782	-0.005
78	0.6275809			0.005
	0.3208093	0.0065632	1.6676093	-0.00B
74		-1.1435277	1.6722421	
76	0.7849904	-0.5969433	1.671056'	-0-02
107	0.8214080	-1.0829518	1.6731466	-0.011
505	1.0764296	-0.8571515	1,6737541	0.001
		Y PARALLAX STD ERR	= 0,008 MM AT PHOTO	SCALE
	MODEL NO 6064			
PTND	X	Y	z	Y PARALLAX
6064	0.000000	0.0000000	0,000000	0.000
6065	1.0000000	-0.6417131	0,0035811	0.000
6 44	-0.0104142	0.9238411	1.5779422	-0.003
646	-0.0558450	-0.0431837	1.5924793	-0.010
648	0,0795569	-O.8040414	1.6006240	-0.023
82	-0.0234861	0,5900577	1.5893708	0.004
81	-0.0461766	0.3055320	1.6020118	0.005
78	-0.0577384	0.0174068	1.5943351	-0.005
107	-0.1739976	-1.0283807	1.6016823	0.020
506	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	-1.0876596	1.5887411	0.000
102	0.4028435	-0.5842985	1.5971391	0.011
129	0.7754164	0,4202379	1,5899086	-0.005
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
105	0.7691563	0,2334404	1.5863158	0.003
121	0.7224903	-0.6983501	1.5931107	0.002

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MODEL NO 6065

0.3130038 0.3759007 0.2094628 1.0203804 0.9967526 0.8783191 0.8342289

PTND	x	Y	z	Y PARALLAX
6065	0.0000000	6.0000000	0.0000000	0.000
6066	1.0000000	-0.0115603	0.0129142	0.000
654	0.0352390	0.9230210	1.7829773	~0.005
656	-0.0418286	0.1033171	1.7779567	-0.012
658	0.1577324	-1.1873.399	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	-0.7710549	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	-0.4339139	1.7775366	-0.004
664	1.0962686	0.9904231	1.7653453	0.004
666	1.2045643	-0.1783293	1.7793025	-0.021
668	0.8582020	-C.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
135	0.5032484	0.6985808	1.7828602	~0,004
139	1.2025188	0.7383676	1.7631963	-0,014

0.5998590 0.2194890 -0.3158086 0.3943097 -0.1746866 -0.4116622 -1.1850674

1.5907728 1.5946899 1.5965056 1.5359594 1.5837918 1.5837918 1.5875958 1.5915575

0.009 0.010 -0.005 -0.007 -0.002 0.016 0.016

Y PARALLAX STD ERR = 0.011 MM AT PHOTO SCALE

Y PARALLAX STD ERR = 0.010 MM AT PHOTO SCALE

MODEL NO 6066

PTNO	x	Y	z	Y PARALLAX
6066	0.0000000	0.000000	0,0000000	0.000
6067	1.0000000	-0.0059099	5456600.0	0.000
664	0.0950592	0.9328907	1.6336136	-0.002
666	0.2048295	-0.1555175	1.6448905	500.0
668	-0.1123730	~0.8609071	1,6620568	-0.025
159	0.0613359	-1.1307003	1.6508442	0.011
155	0.0584992	~0.6637374	1,6603728	-0.005
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

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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	1.0074343	-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	0.0000009	0.000000	0.000
6071	1.0000000	0.0415691	-0.0018588	0.000
61B	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	-0.8392840	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	1.0209378	1.8056229	-0.002

Y PARALLAX STD ERR = 0.009 MM AT PHOTO SCALE

MODEL NO 6071

6.00

TND	x	Y	z	Y PARALLAX
071	0.0000000	0.0000000	0,0000000	0.000
072	1.0000000	0.0221375	0,0040520	0.000
628	~0.06B6462	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	1.6459489	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	500.0
786	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	L.0592064	0.2040237	1-6247832	-0.009
33	0.4675636	0.8708830	1,6485786	-0.010

65 54 64

	1	0564 1034 6026	2614			- i	1.6	310838 335304 550267		
Y PA	RALLAX	SID	ERR	=	0.005	MM	AT	PHDTD	SCALE	

0.000 0.002 0.001

MODEL NO 6072

0.7515253 0.9574400 0.3963877

PT NO	x	v	7	Y PARALLAX
6072	0,0000000	0.000000	0.0000000	0.000
6073	1,0000000	0.0183421	-0.0022119	0.000
638	0.0075182	0.7781646	1,7037854	0.001
725	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	1.0653703	1.6950097	0.008
915	0.7170662	-0.2177676	1.6733244	-0.006
107	0.8006552	Q.8457378	1.6937402	~0,004
5024	1.0209075	-0.6110787	1.6676333	0.005
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 = 0.005 MM AT PHOTO SCALE

MODEL NO 6073

PT ND 6073 6074 648 736 738 738 738 71	X 0.0000000 0.0425740 0.0530804 -0.0530804 -0.3296081 -0.3296081 -0.1023858	Y 0.0000000 0.0306553 1.1522144 0.0315859 -0.9131150 0.2388396 0.4163781	Z 0.0000000 0.0009333 1.7958910 1.78088A5 1.7988070 1.7902889 1.7823161	Y PARALLAX 0.000 -0.000 -0.002 0.000 0.000 0.000 0.000 -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	0.0312568	-0,6484431	1.7871742	-0.002
916	0.0376834	-0.1627941	1.7777287	-O.00B
914	-0.3135532	-0,8828386	1.8059647	~0.008
65B	1,1823592	0.8459224	1.7718960	-0.005
746	Q.8949331	-0.1315949	1.7931904	-0,000
748	1,0334355	~0.9672934	1.7764415	-0.005
215	0,3510855	0.6816007	1.7785255	2.004
219	1.0765464	1.0784849	1.7759413	0.001
175	0.9101203	-Q.1646431	1.7883942	0.008
183	1.2176110	0,5570042	1,7729339	-0.012
211	0, 3209541	0.0811917	1.7731714	-0.002
151	0,7603624	1.2769669	1.7844226	0.018
105	0.4173976	0,9413915	1,7852953	0.006

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218 743	0.8901645	0.7339842 -0.9566322	1.7751515 1.7726842	-0.013 -0.003
		Y PARALLAX STD ERR = 0.0	IOR MM AT PHOTO SCAL	.e
	MODEL NO 6074			
PT ND	x	Y	z	Y PARALLAX
6074	0.0000000	0.000000	0.0000000	0.000
6075	1.0000000	0.0468447	~0.0046201	0.000
658	0,1755659	0.7607074	1.5789583	0.001
746	-0.0879993	-0.1166063	1.6148292	-0.003
748	0.0321441	-0.8693673	1.6129289	0.011
219	0.0817204	0.9706701	1.5796.209	-0.004
175	-0.0745495	-0.1465615	1.6113670	-0.004
183 218	0.2059208	0.5006177	1.5842065	0.005
743	0.0754013	-0.8603321	1.6097316	-0.005
668	0.8117202	0.9588387	1,5835149	-0.001
756	0,9446329	-0.0556271	1.5876070	0.009
758	1.0213153	-0.8005542	1.5787075	-0.001
168	0.6794450	0,1641625	1,5970071	-0,005
177	0, 3316137	-0.6246081	1.5942485	-9-011
156	0.8172594	0.9901531	1,5819305	-0.001
155	0.9949824	1,1375204	1.5775639	0.008
753	1.0806308	-0.8480839	1.5774065	-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 PARALI,AX STD ERR = 0.0	11) MM AT PHOTO SCAL	.E
	MODEL NO 6075			
PT ND	x	Y	z	Y PARALLAX
6075	0.000000	0.000000	0.0000000	0.000
6076	. 1.0000000	0.0021943	-0.00B141B	0.000
668	-0.1801077	1.0090844	1.7955578	0.008
756 758	-0.0601302	-0.1335858 -0.9714400	1.7865956	-0.009
156	0.0044325 -0.1729977	1,0441850	1.7942249	0.005
155	0.0307779	1.2048020	1.7902611	-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	-0.1054324	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
926	0.9984203	0.8189285	1.7558659	0.000
929	0.5328141	0.8311990	1. (003085	-9-017

Y PARALLAX STD FRR = 0.010 MM AT PHOTO SCALE

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STRIP FORMATION

JUNCTION OF MODELS 6061 - 6062

6062	+1.0000048	-0.0202276	+0.0114249	+1.0000090	-0.0204915	+0.0113328	+.489E-05	+.203E-03	+.921E-04
6063	+0.9808428		+0.0205158					333E-03	~.9338-03
624		+0.9590807	+1.6601128	+0.9807056	+0.9594191	+1.6610459	+.137E-03		+.1B2E-03
656	+1.135892,	0.1822333	+1.7083289	+1.1358843	-0.1824813	+1.7094469	+.784E-05	+.247E-03	
658	+0.8335239	-1.0318267	+1.7072575	+0.8336740	-1.0316533	+1.7065323	150E-03	173E-03	+.658E~03
621	+0.9713809	+0.9604495	+1.6611010	+0.9712572	+0.9602013	+1.8609654	+.1236-03	+.2485-03	+,135E-03
621	+0,9713809	+0.9604495	+1.6611010	+0.9713190	+0.9603254	+1.6610332	+.619E-04	+.1246-03	+.6782-04
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	+.3982-03
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	-1.1633727	+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	+1.6790609						
15	- ** 3401430	*U+ 51 12 108	11.0334545						
INTOMA.	x/Y/Z = 0.03	B MM AT PHOTO	00415						
DICHM	102 - 0.00	a per al Priuliu	SICALS:						

JUNCTION OF MODELS 6062 - 6063

6063	+1.9415819	-0.0451222	+0.0205307	+1.9419853	-0.0450806	+0.0205152	333E-05	416E-04	4.140E-04	
6064	+2.9357973	-0.0696781	+0.0296274							
634	+1.9728433	+0.9967005	+1.7014587	+1.8728557	+0.9966060	+1.7013738	-,123E-04	+.345E-04	1.8496~04	
636	+2.0992183	-0.0560774	+1.6787311	+2.0992217	-0.0560337	+1.6787964	337E-05	-,437E-04	658E-04	
638	+1.9549964	-1.2070455	+1.6854135	+1.9549773	-1.2070364	+1.6354482	+.191E-04	9156-05	3466-04	
38	+1.7470387	+0.2217294	+1.6971745	+1.7470831	+0.2216660	+1.6967745	-,443E-04	1.6345-04	+.400E-03	
54	+1.8823801	~0.3072510	+1.6935261	+1,8823625	-0.9072700	+1.6935231	+.176E-04	+.189F-04	~,195E-0S	
55	+1.7873421	-1.1245210	+1,6893838	+1.7873259	-1.1244498	+1.6893339	+, 1622-04	712E-04	+ 499E-04	
42	+2.0983510	-0.0463056	+1.6788091	+2.0983713	-0.0462809	+1.6790488	~, 202E-04	- 2475-04	E0-3625	
194	+2.1503949	-0.2359204	+1.6797892	+2.1503914	-0.2359160	+1.6796021	+.350E-05	-,443E-05	-, 128E-04	
49	+2.1553305	-0.5011840	+1.6792184	+2.1553021	-0.5011282	+1.6720609	+.284E-04	558F-04	+.157E-03	2
644	+2.9174854	+0.0869874	+1,6620059					13562 01		Q
646	+2.8671628	-0.1134413	+1.6765390							
648	+3.0046103	-0.5010241	+1.6860283							
631	+1.9533839	+0.8658765	41,6998509							
39	+2.3967049	+0, \$472073	+1.6772888							
83	+2.6323043	+0.5451657	+1.6747383							
85	+2.9027755	+0.5414780	+1.6732929							
41	+2.3892299	+0.3372450	+1.686105/3							

STRIP FORMATION

JUNCTION OF MODELS 6061 - 6062

6062 6063	+1.0000048 +1.9415853	-0.0202276	+0.0114249	+1.0000000	-0.0204915	+0,0113328	+.4896-05	+.26.3E-03	+.9216-04
624	+0.9808428	+0.9590807	+1.6601128	+. 1807056	+0.9594191	+1.6610459	+.1375-03	339E-03	933E-03
626	+1.1358921	-0.1822333	+1.7086289	+1,1358843		+1.7084469	+.7846-05	+. 247E-03	+.182E-03
					-0.1B24B13			173E-03	+.658E-03
628	+0.8335239	-1.0318267	+1.7072575	+0.8336740	-1.0316583	+1.7065938	1502-03	+.2485-03	1.1795-03
621	+0.9713809	+0.9604-95	+1.6611010	+0.9712572	+0.3602013	+1.6609654	+.123E-03		+ 678E-04
621	+0.9713809	+0.9604495	+1.6611010	+0.9713190	+0.9603854	+1.6610332	+.619E-04	+.124E-03	105E-03
13	+1.2542782	+0.0956181	+1.7075319	+1.2542772	+0.0954141	+1.7076374	+.102E-05	+.204E-03	
15	+1.0477356	~0.2233960	+1.7076582	+1.0477313	-0.2241131	+1.7072597	+. 430E-05	+.117E-03	+.3985-03
16	+1.0360163	-0.5373681	+1.7078828	+1.0360469	-0.5373858	+1.7074122	305E-Q4	+.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	+0.9366060	+1.7013738						
636	+2.0992217	-0.0560397	+1.6787954						
638	+1.9549773	-1.2070364	+1.6854482						
38	+1.7470831	+0.2216560	+1.6967745						
37	+1.5958230	-0.2312895	+1.6973970						
196	+1.7943062	-0.4840852	+1.6807818						
33	+1,38868999	-1.1633727	+1,7025033						
54	+1.8823625	-0.9072700	+1.6935281						
55	+1.7873259	-1.1244498	+1.6893339						
42	+2.0983713	-C.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	+1.6860497						
49	+2,1553021	-0.5011282	+1.6790609						
12	*1.5461496	+0.3172708	+1.6934545						
142	110401430	10. 21/2/08	41.0534040						

~0. +0. SIGMA X/Y/Z - 0.028 MM AT PHOTO SCALE

JUNCTION OF MODELS 6062 - 6063

6063 6064	+1.9415819 +2.9357973	-0.0451222 -0.0696781	+0.0205307 +0.0296274	+1.9415953	-0.0450906	+0.0205153	~+339E-05	-,416E-04	+.1426-04
634	+1.872\$433	+0.9967005	+1,7014587	+1.8728557	+0.9956050	+1,7013738	123E-04	+.9450-04	+.849E-04
636	+2.0992183	-0.0560774	+1.6787311	+2.0992217	-0.0560337	+1.6787364	337E-05	497504	6S2E-04
638	+1.9549964	~1.2070455	+1.6854135	+1.9549773	-1.2070364	+1.6354482	+.191E-04	91 SE-OS	3462-04
38	+1.7470387	+0.2217294	+1.6971745	+1.7470831	+0.2216660	+1.6967745	4428-04	+, 634E-D4	+,400E-03
54	+1.8823801	-0.9072510	+1.6935261	+1.8823625	-0.3072700	+1.6935281	+-176E-04	+.1896-04	105E-05
55	+1.7873421	-1.1245210	+1.6893838	+1.7873259	-1.1244493	41.68933339	+.162E-04	712E-04	+ 439C-04
-95	+2.0983510	-0.0463056	+1.6788091	+2.0983713	-0.0462909	+1.5790488	~.202E-04	2476-04	- 239E-03
194	+2,1503949	-0.2359204	+1.6797892	+2,1503914	~0.2359160	+1.6798081	F. 350E-05	~.443E-05	-, 123E-04
49	+2.1553305	-0.5011840	41.6792184	+2.1553021	-0.5011282	+1.6790609	+-394E-04	-, SS9E-04	+.1\$7E-03
644	+2.9174854	+0.8869874	+1.6620059						- and the day
646	+2.9671628	-0.1134413	+1.6765390						
648	+3.0046103	-0.9910241	+1.6860283						
631	+1.9633839	+0.8658765	+1.6998800						
39	+2.3967049	+0.5472073	+1.6772888						
83	+8.6323043	+0.5451657	+1.6747383						
85	+2.9027755	+0.5414780	+1.6732929						
41	+5.3855538	+0.3372450	+1.6851059						
81	48.878579	+0.2438579	+1.688293B						
44	+2.4110579	-0.0874775	+1.6745846						and the second
78	+2.8654104	-0.0507913	+1.6781780						

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

JUNCTION OF MODELS 6063 - 6064

6064	+2.9357885	-0.0696342	+0.0295166	+2.9357973	-0.0636731	+0.0294274	875E-05	+.438E-04	-, 107E-04
6065	+3.9701256	-0.1161397	+0.0400713						
644	+2.9174948	+0.8868513	+1.6615390	+2.9174854	10.885/9874	41.6630059	+.942E-05	-, 136E -03	465E-03
646	+2.8671535	-0.1133990	+1.6766895	+2.8671623	-0.1134413	+1.6765330	922E-05	+.4222-04	+.150E-03
648	+3.0046128	-0,9009741	+1.6863553	+3,0046103	-0.9010241	+1.6360233	+.854E-05	+.499E-04	+.327E-03
58	+2.9027748	+0.5415937	+1.6734181	+2.9027755	+0.5414780	+1.6732323	~.617E-06	+.1155-03	+,125E-03
81	+2.8/82507	+0.2439784	+1.6864668	+2.8782579	+0.2422679	+1.6862513	713E-05	+.11CE-03	+.215E-03
78	+2,8653918	-0.0507036	+1.6785705	+2.8654104	-0.0507313	+1.6781780	i85E-04	+.816E-04	+, 392E -03
107	+2,7415564	-1.1322076	+1,6858401	+2.7415429	-1,1323413	+1.6959973	+.135E-04	+ 199E 03	157E-03
206	1656866.5+	-0.9126319	+1.6863284	+2,9989139	-0.9121079	+1.6859361	+.9206-05	- 120E-03	+.3920-03
654	+4.0450290	+0,7452293	+1.6709899		di statut 1		112,00.02	Alasta Oli	
656	+3.9372625	-0.0034144	+1.6737031						
658	+4.0558405	-1,1976956	+1,6810314						
102	+3,3396200	-0.6747306	+1.6848317						
129	+3,7286571	+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						
84 87	+3.3146516	+0.1568952	+1.6817695						
101	+3,1406728	-0.3963235							
			+1.6827585						
131	+3-9850397	+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 6054 ~ 6065

6065 6065 654 658 129 201 121 121 124 664 668 668 126	+3.9701224 +4.8874415 +4.0450072 +3.9972597 +4.0558645 +3.7287005 +3.7287005 +3.7216034 +3.6701638 +3.952056717 +3.8323462 +3.9526717 +5.0672878 +5.0672878 +4.7116189 +4.5354613	-0.1160247 -0.1765462 +0.7452548 -0.0033010 -1.137484 +0.3633343 +0.1700195 -0.7958674 +0.3360466 -0.2529041 -0.4976789 +0.7528845 -0.2824504 -0.9381652 -0.93241504	+0.0400219 +0.0522754 +1.6707682 +1.6734149 +1.679750 +1.679750 +1.679750 +1.679750 +1.6754776 +1.6825714 +1.674265 +1.6778370 +1.6742586 +1.673735 +1.6737755	+3.9701255 +4.0490290 +3.9378639 +4.0559405 +3.7286671 +3.7215881 +3.6701394 +3.6701394 +3.99870237 +3.9950641 +3.9323437	-0.1161367 +0.7452293 -0.0034144 +0.3638949 +0.3638949 +0.3638949 +0.1700069 -0.7937938 +0.7937938 +0.73361036 -0.252761 -0.4977929	+0.0400713 +1.6703039 +1.6737031 +1.6810314 +1.6794260 +1.6734283 +1.6757478 +1.6757478 +1.6770900 +1.6770900 +1.6770900	311E-05 217E-04 31EE-05 +.230E-04 +.334E-04 114E-04 +.213E-06 +.304E-04 123E-04 +.2125-04 +.2125-04 +.254E-05	*.113E-03 *.3550-04 }.113E-03 7562-03 *.334E-04 *.3250-04 *.138E-04 *.1385-04 *.1385-04 *.1385-04 *.5438-04	493E-04 238E-03 238E-03 350E-03 350E-03 349E-03 349E-04 270E-03 270E-03 272E-03 485F-04 193E-03	220
159 155 162	+4.2659634 +4.9016681 +4.5447407	-1.2743323 -0.8153954 -1.2673716	+1.6917413 +1.6955971 +1.6938864		t to see the		•			۰.

143 +4.3827119 -0.3768766 +1.8818981 143 +4.3827119 -0.3768766 +1.6869391 187 +4.3143920 -0.2858346 +1.6688356 136 +4.467827 +0.515834 +1.6787857 139 +5.1182057 +0.5178306 +1.6545825

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

JUNCTION OF MODELS 6065 - 6066

6065	+4,8874575	-0.1763557	+0.0521605	+4.8874415	-D.1765462	+0.0523754	► 160E-04	+.1905-03	1146-03
6067	+5.8711620	-0.2436766	+0.0635863						
664	+5.0263804	+0,7537373	+1.6538269	+5,0262889	+0,7538845	+).6542526	+,915E-04	1478-03	431E-03
666	+5.0672468	-0,3239593	+1.6/72435	+5.0672378	~0.3241504	+1.6775033	+, 190E-04	+.191E-03	253E-03
668	+4.7114922	-0.9983934	+1.6989987	+4.7116189	-0.9981652	+1.6981925	126E-03	2348-03	+,806E-03
159	+4.8653949	-1.2747059	+1.6921766	+4.8659634	-1.2743323	+1,6917413	684E-04	-, 374E-03	+.435E-03
155	+4,9015506	-0.8155212	+1.6967339	+4.9016681	-0.8153954	+1.6965371	174E-04	135E-03	+.1366-03
141	+4.7978033	+0.0394057	+1.6615207	+4.7977347	+0.0394066	+1.6618492	+.6928-04	801E-06	327E-03
							+.284E-04	+. 435E-04	241F-03
187	+4.9146204	-0.2658060	+1.6686525	+4.9145920	-0.2658496	+1.6538936			
139	+5.1112387	+0.5170751	+1.6539695	+5.1112057	+0.5172006	+1.6545525	+.330E-04	129E-03	~.532E~03
674	+5.9408708	+0.6430750	+1.6489159						
676	+5.5975258	-0.3646247	+1.6864094						
678	+5.6699982	-1,2245770	+1.6890756						
358	+5,7960525	-1.1524787	+1.6854819						
144	+5.4210609	+0.5109163	+1.6606780						
145	+5.7120313	+0.5118627	+1.6540027						
	+4.71754.4	-0.9661916	+1.6973230						
155									
930	+5.7412723	-0.3244523	+1.6823619						
147	+5,5706327	+0.2048183	+1.6657389						
149	+5.1770213	-0.4205512	+1.6883009						
146	+5.3144079	+0.0938918	+1.5742244						
671	+5.9466718	+0.6453494	+1.6487457						
672	+5.8647164	-0.2521244	+1.6776752						

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

JUNCTION OF MODELS 6070 - 6071

6071 6072	+0.9999860 +2.0871581	+0.0416890	-0.0018481 +0.0021499	+1.0000000	+0.0415691	-0.0018593	1326-04	*.119E-03	+.106E-04	
638	+0.8896158	+1,1227657	+1.8199518	10.9895852	+1.1230272	+1.8205688	+.3068-04	256E-03	616E-03	
716	+1.0291462	+0.0700564	+1.7935283	+1.0291521	+0	+1.7932654	1475-04	+.122E-03	+.2625-03	
718	+1,1469829	-0.8992701	+1.7905584	+1,1463854	-0.3298840	+1.7902151	240E-05	+.139E-04	+.343E-03	
19	+0.7012190	+1.0411571	+1.825487B	+0.7012160	+1.0410360	+1.8255562	+.3055-05	+ 1216-03	CR3E 04	
29	+1.0303122	+0.0617176	+1.7936216	+1.0303234	+0.0515621	-1.7932291	111E-04	+.14PE-03	+.3930-03	
189	+1,1503644	-0.6080161	+1.7982368	+1.1503774	-0.6080517	+1.7990313	1295-04	+.3556-04	1.2050-03	
21	+0.9750772	+0.8335943	+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	-,2468-04	+-9425-04	~.141E-03	
23	+0.7670392	+0.3858691	+1.8163682	+0.7671453	+0.3856389	+1.8101203	460E-04	+.190E-03	+.2476-03	
2,38	+2.0753250	+0.9357862	+1.7774S04							
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	+2.1469270	+0.2793296	+1.7699517							
33	+1.4784497	+0.9225867	+1.8049848							
65	+1.8175581	+0.1070293	+1.7738856							
54	+2.0022010	+1.2537034	+1.7916238-						Second at	
64	+1.4556122	~0.6232335	+1.7906295							

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

JUNCTION OF MODELS 6071 - 6072

6072 5073	+2.0971591 +3.1338860	+0.1027644	+0.0021370	+2.0871981	+0-1027759	+0.0021499	+,109E -05	114E-04	128E-04
638	+2.0793219	+0.9357571	+1.7774084	+2,0793297	+0.9357862	+1,7774504	~, 3036~05	230E-04	419E-04
726	+2.1441428	+0.0048434	+1.7725962	+2.1441417	+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	+ 51-E-04	174E-04
55	+1.9015903	+1.0232968	+1.7852115	+1.9015551	+1.0235150	+1.7856097	+.352E-04	- 2188-03	3386-03
62	+1.9493880	-0.4402442	+1.78590	+1,9493572	-0,4403437	+1,7863047	+.3088-04	+. 994E-04	403E-03
59	+2.1468148	+0.2793628	+1.7686	+2,1468270	+0.2793296	+1,7689517	121E-04	+, 3326-04	260E-03
54	+2.0028023	+1.2536614	+1.791457	2.0028010	+1,2537034	+1.7916E38	+.198E-05	4196-04	165E-03
648	+3.1936521	+1.2594114	+1.7676155	2.0028010	+1,053(034	*1.79100.38	+, 1982-05		10.42 0.7
7.36	+3.1957092	+0,2173334	+1.7509448						
738	+3.0286682	-0,7676830	+1.7667243						
71	+2.8166579	+0.4260655	+1.7611481						
108	+3.0414075	+0.5390821	+1,7538185						
5000	+3,1704069	-0.8250363	+1.7633872						
206	+3.1877493	+1.247369B	+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	-0.0222415	+1.7476933						
74	+2,4481268	+0.9585126	+1.7725507						
914	+2.8166951	-0.7351995	+1,7750371						

SIGMA X/Y/Z = 0.013 MM AT DTD BCALE

JUNCTION OF MODELS 6072 - 6073

6073 6074	+3,1339803	+0.1313404	+0.0014440	+3.1938010	+0.1313653	+0.0013733	561E-05	242E-04	+,657E-04
648	+3.1936495	+1.2593852	+1.7677649	+3, 1996621	+1.2594114	+1.7676155	~.290E-05		
736	+3.1957034	+0.2173074	11.7511001	+3.1357037	0.2173334	+1.750944R		261E-04	+.143C 03
738	+3.0285380	-0.7676060	+1.7653537				576E-05	2525-04	F. 122E -03
71	12-8166308	+0.4200243		+3.0286682	0.7676830	+1.7667243	+.1385-04	+.769[-04	37CE-03
			+1.7512813	+2.8166579	+0.4200656	+1 7611431	190E-Q4	412g-04	+,133E-03
108	+3.0413984	+0.5399226	+1.7573261	+3.0414075	+0.5330821	+1,7"32185	~.90%~05	+.595F-06	+ 1076-03
5000	+3,1703863	-0,8249596	+1.7010903	+3.1704069	-0.5250393	H1.76.13872	,205E-04	1. SAEF-04	-,2968-03
205	+3.1877535	+1.2474700	+1.76 3678	+3,1377493	+1.74736/98	+1.7669744	+.4226-05	+.1002-03	+.393E-03
915	+2.9367677	· D. 1004854	+1.7577193	+2.8368019	-0.1004204	+1.7575181	-, 341E-04	~. 6501124	+.201E-03
5024	+2.1585855	 5092937 	+1.7559959	+3.1586015	-0.5093528	+1.7563367	150E-04	+. 5905-04	~, 340E-03
916	+3,1713122	-O. 0322924	+1.7475760	+3,1713843	-0.0322415	+1.7476933	- 120E-04		117E-03
914	+6.3167830	-0,7350183	+1. 77450 \	+2,8166951	-0.7351995	+1,7750371	1,939E-04	+.181E-03	533E-03
658	+4.3091113	10.9434533	+1.7919098						
746	+4, 0139500	-0.0130138	+1,7515620						
748	+4,1208210	-0.8357561	+1.7434086						
215	+3, +303573	0.7930350	+1.7494093						
219	+4.2033508	+1.17330339	1.7465145						
175	+4.0283275	-0.0456755	·1.7567687						
123	+4.3401135	+0.6591731	7424193						
211	+3.4528020	+0.2036418	. 7431192						
121	+3.9002341	+1.3724553	7556567						
105	+3.5599470	+1.0473463	+ 7564275						
218	+4,0206015	+0.8373041	+1.7453361						
743	+4.1861199	-0.825.91.0	11.7336.50						

SIGMA X/Y/Z > 0.015 MM AT POTO SCALE

	JUNCTION	OF MODELS 60	773 ~ 6074						
6074 5075 658 746 2195 123 2749 175 183 2743 668 7568 7568 168 155	JUNCTION +4.1166247 +5.2091223 +4.2091223 +4.2091223 +4.1285241 +4.2013524 +4.2013524 +4.2013524 +4.2013546 +4.2015346 +4.1265345 +5.205747 +5.1421873 +5.35555 +5.00117827 +5.201109	OF MODELS 60 +0.1425623 +0.1911447 +0.9435103 -0.0123618 -0.0123618 -0.0123618 -0.0123618 -0.2591552 -0.26591552 -0.26591552 -0.26591552 -0.26591552 -0.26591552 -0.2659155 -0.2628107 +0.5591552 -0.357365 -0.355758 -0.355758 -0.355758 -0.355758 -0.355758 -0.355758 -0.3577310 +1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.1586059 -1.158	773 - 6074 +0.0009363 +0.0009363 +1.7419602 +1.7419602 +1.741386410 +1.7463800 +1.7463800 +1.7463800 +1.74628356 +1.7403895 +1.7403895 +1.7403895 +1.7354485 +1.7403810 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.7505437 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +1.750547 +	+4.1166215 +4.3051113 +4.0138520 +4.1288210 +4.0283207 +4.0283275 +4.305126 +4.0265015 +4.1861199	+0.1482264 +0.9434532 -0.0120188 -0.8357561 +1.1733089 -0.045755 +0.65317841 +0.83737841 -0.8253120	+0.0002462 +1.7419038 +1.77615620 +1.7445145 +1.7465145 +1.756763 +1.7424193 +1.7423361 +1.7336658	+.3228-05 370E-05 +.328E-05 +.169E-05 199E-04 395E-04 683E-05 +.314E-04	+,3526-04 +,470E-04 +,363E-04 -,119E-03 +,227E-03 +,227E-04 +,227E-04 +,258E-04 +,154E-05 -,391E-03	927E-05 4.504E-04 173E-03 *.3625-03 *.3625-03 *.215E-03 215E-03 *.110E-03 *.723E-03
	+5.0117827	+1.1886069	+1.7522952						

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

COLUMN OF THE ADDRESS

6

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	+.885E-05	125E-03	+.716E-04
758	+5.2197785	-0.7681017	+1.7105190	+5,2197830	-0.7682807	+1.7109910	448E-05	+.178E-03	-, 461E-03
156	45.0117624	+1.1887716	+1.7527602	+5.0117827	+1.1926069	+1.7522952	202E-04	+.164E-03	+.46SE-03
155	+5.2071448	+1.3485564	+1,7521448	+5.2071109	+1.3481222	+1.7512920	+.3336-04	+.434E-03	+.852E-03
753	+5.2841744	-0.8206959	+1.7088232	+5.2841706	~0.8206460	+1.7087386	+, 3815-05	··· 499E -04	*- 84CE-04
752	+5.2079509	+0.0152973	+1,7355825	+5.2079377	+0.0153937	+1.7350946	+,132E-04	-,963E-04	+.437E -03
159	+5.1687528	+0.8614077	+1.7402383	+5.1687317	+0.8613175	+1.7399480	+.2110-04	+.90ZE-04	+.290E-02
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	+1.6977709						
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	41.7282546						

SIGMA X/Y/Z . 0.085 MM AT PHOTO SCALE

APPENDIX C

OUTPUT FROM THE DURBAN TEST AREA

* DURIAN TERT AREA *

MODEL FORMATION

01/01/1973

MODEL NO 1211

PT NO	x	γ	z	Y PARALLAX
4312	0,000000	0.000000	0,0000000	0.000
4911	1.0000000	0.0109704	0,0218377	0.000
31.29	0.0079458	0.7464051	1.5764331	0.000
3126	0.0195005	-6,0530044	1.5853053	0.004
9138	0.3055050	-1.0987256	1.5446485	0.010
9114	0.2923030	0,8784048	1,5156245	-0.003
9116	0.9600248	0.100.0815	1.5705434	-0.000
3118	1.0787375	-0.3919027	1.5712517	-0.000
503	0,3535171	-1.0298275	1,5391196	-0,010
101	0,5885777	0.4536385	1,5024360	0.007
9123	-0.0170250	-D, 9901313	1,5372814	0.030
9113	0,9583534	-1.0557593	1.5601183	0.009
9122	+0.0026027	0.0733400	1.5832694	550.0
9112	0.9072530	0.0231933	1.5721571	0.009
2111	0.9702923	0.8208115	1,5339532	0.010
9121	-0.0193583	0.8639432	1,5581454	0.000

Y PARALLAX STD FIR = 0.015 MM AT PHOTO SCALE

MOREL NO 1110

PT ND	x	Y	z	Y PARALLAX
4911	0.0000000	0,000000	0,0000000	0.000
4910	1.0000000	0.0192422	0,0047820	0.000
3114	-0.0741218	0,9196531	1.5361383	0.000
\$116	0.0057047	0,1088759	1,6026714	-0.001
911B	0.1183003	-1,0284464	1.6169111	0.000
3104	0,9472699	0.8939410	1.5438336	0.000
9106	0.9336044	0.0421725	1.5749029	0,006
3105	0.3357193	-0.9683103	1, 5118261	-0.001
301	1,1021333	0.3141183	1,5537253	~0.005
9101	0.9247145	0.9431539	1.5448362	0.024
9103	0.9767621	-0. 958-7731	1.6129503	0.021
. 9113	-0.0051195	-1.0885404	1,6039421	0,020
3111	0.0053573	0.9298468	1.5534901	0.022
Sild	-D. 058/123	0.0281637	1.60/3630	0,002
9102	0.2983350	0.0640673	1.5714810	0.023

Y PARALLAX STD FRR = 0.018 MM AT PHOTD SCALE

MOREL NO 1003

PEND	x	Y	z	Y PARALLAX
4910	p. 000000h	0,000000	0,000000	0.000
4900	1.000000	0.0342033	0.0028379	0,000
9104	-0.0501708	1.00.18707	1.8465493	-0.001
9106	-O. 07745.23	-0.0120958	1,8611900	-0,002

3108 -0.0565418 -1,2118509 1.8795037 -0.000 9094 9096 1 0039200 1 0075460 1.0280533 0.000 1.0134587 0.1401308 1.3351427 0,007 2025 1.1615377 -1.2275646 1.8051350 0.000 301 0.1263718 0.3098193 1.8477064 9093 0.9656491 1,1983319 1.8432876 0.026 1.0806664 1.1911452 1.2065413 -0.006 9102 -0. 1143032 0.0122462 1.8532963 0,026 ~1.2002104 1.8912230 9103 -0.0173205 9101 -0.0860318 1.0778958 1.0545630 1.2437830 0.028 Y PARALLAX STD FRR = 0.016 MM AT PHOTO SCALE MODEL NO 903 z V RADALLAY 127 MG x v 0.000000 0.0000000 0.0000000 0.000 4903 4903 1,00/0000 0.0058326 -0.0069075 0.000 3094 1.00POR75 0.1308440 0.0803873 1.2250335 0.000 0,0155564 1.8439946 9008 0.0951429 -1.7524107 1,83327.33 0.000 303/ 0.9279925 1.3228443 0.000 900 1.0634575 0.0316879 1.3607963 0.000 1.2187496 -1.1149419 3032 0.8033053 20 1,1915847 1,8119137 -0 000 9081 9083 0,9976239 0.021 1.0285850 0.9769085 -1.7072308 0.0613998 1,8085715 -0.027 1-2468136 0.006 9095 9091 0.0105330 1.1982061 0.0448420 1.8376996 0.026 0.9909033 1.8573334 9032 3093 -1.7124710 1,8343015 0.016 Y PARALLAX STD FRR = 0.015 MM AT PHOTO SCALE MODEL NO 907 PT ND х Y z Y PARALLAX 4972 0.0000000 0.0000000 0.0000000 0.000 4907 1.0000000 0.0064686 -0.0020707 0.600 0.0637670 0.000 0, 0944000 3026 0.0675968 -0.000 0.000 0.004 0.004 0.0306351 1.8725461 -1.1105062 1,8823473 9074 1.1002956 1, 1878865 1.0039706 1.9137302 1.0867520 3076 9076 1.2662724 -1.1106178 1.8007062 0.003 0.2000331 0.8129345 1,3170147 30.3 1.8474973 103 1.0976951 1.004.1274 -0,003 102 1 (1729-2012.5 1 0511914 1.04/201-21 0.000 1.8954336 504 1.22186.94 1.0039758 0.003 1.0538140 1.00072939 0.000 9071 9073 0.9488424 1.2918376 1.0746/573 0.003 -0.0051063 0.016 2092 0.0590507 1,0630118 0.0031651 1.1031045 1,3376000 9081 3077 0 9764043 0.0/25333 1.9046/314 0.013

-1.2023214 7 PARALLAX STD FER = 0.010 MM AT PILLITI SCALE

0.0218976

9033

226

0.000

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	MODEL NI 705				
PTNG	x	Y	z ,	Y PARALLAX	
4307	0,000000	0.0000000	0,0000000	0.000	
4305	1,000000	0.0294383	-0,0020798	0.000	
2074	0.0354034	1,1262109	1,3495408	C-004	
2076	0,1000183	0,0109148	1.3745058	-0.000	
9078	0.3009700	-1.1180145	1.3301535	-0.005	
3064	1.0128331	1,1973119	1,9955711	-0,000	
3066	1,0290426	-0,0033659	1,9497538	0.000	
3068	1.0940712	-0.9372205	1,3083101	0.000	
102	0.0797735	0.9923200	1,8264410	-0,004	
103	0.0377476	1.0061338	1,8270684	-0.000	
504	0,2552884	-1,0150E08	1,8383008	0,007	
906-1	0, 2795169	1,2230127	1.9963527	0.030	
9063	1.0032715	~1.1439303	1,8044358	0.002	
9072	-0.0082380	-0.0167632	1,8651550	0.018	
9071	0.0440277	1,0394260	1,8271912	0.013	
9062	1,0036997	0.0094138	1,9500764	0,021	
9073	-0.0067316	-1,2540745	1.8167119	0,035	

Y PARALLAX STO ERR = 0.018 MM AT PHOTO SCALE

MODEL NO 9089

PT NO	×	۲	z	Y PARALLA
4830	0,0000000	0,000000	0,0000000	0.000
4053	1,0000000	0.0078364	0.0088747	0,000
8904	-0.1764545	1.0813563	1,8275955	-0.001
8305	0,0750930	0.0955652	1,8678254	0,904
8908	-0.1218050	-1.1347389	1.8657397	0.001
2334	1.0413314	0.9624871	1.8728609	0.003
8836	1,0050700	0.0852212	1.8121734	0,000
8893	1,0774730	-0.2268773	1,7807:00	0.004
303	0.0244147	0,7138703	1.8343733	0,004
501	0,5393234	1.0261484	1.8729199	-0,005
502	1.0727533	1.0686555	1.8662629	-0.000
505	0.6153504	-0.2183457	1,7904307	-0.004
505	1,1231325	-0.8771078	1,7800331	-0,001
207	0.3483740	-0.2834572	1.8046753	~D, 006
8901	-D. 1093071	1.0740749	1,3501730	500.0
9891	1.0235350	1.0513643	1.8670458	-0.001
8903	-0,1203248	-1.1165999	1.8664490	-0,009
8893	0.3524045	-1,0818572	1,8039318	-0.017
33D2	0.0011219	-0.0126396	1.3631749	-0,001
8892	0.9873215	0.0733971	1,3039740	-0.000

Y PARALLAX STD ERR = 0.006 MM AT PHDTO SCALE

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MOLICE, NO 8958

PT ND	x	Y	z	Y PARALLA
4889	0,0000000	0.000000	0.0000000	0.000
4888	1.0000000	0.0102662	0.0031198	0.000
8304	0.096.0940	0.9657133	1,8656736	0.000
3836	0.0244333	0,0351049	1.8086422	0.000
PROFESSION AND ADDRESS		and an end of the second se		

8838	0,1026421	-0.83:8656	1.7803410	-0.002
2834	1.0273224	0.9444597	1,8434833	~0.000
2385	1.0145196	0.0407034	1.7949906	0.001
P323	1.0077273	0.9704691	1.786430R	-0.002
506	0.1402033	0.07051.44	1,7786996	~0.001
308	0.43(619)	-1.0876050	1.7641203	0.006
502	0.0870425	1.07/0996	1.8587449	-0.000
8803	-0.0214453	-1.0854900	1.8049634	0.005
8891	0,0372075	1.0546838	1.8595202	0.003
0831	1.0276787	1.2414334	1.8500819	-0.072
8892	0.00566822	0.0732445	1,8050728	-0.022
883P	0.9430803	0.1166.971	1,7261721	~0.008
8833	1.0519823	-1,0148109	1,7890481	0.010

Y PARALLAX STD FRR = 0.011 MM AT PHOTO SCALE

MODEL NO 8887				
PT NO	x	γ	z	Y PARALLAX
4088	0,0000000	0.0000000	0.0000000	0.000
4887	1,0000000	0.0073556	-0.0018324	0.000
8384	0,02455279	0.9000372	1.7868050	0.003
3886	0,0042052	50540E0.0	1.7339770	
8833	-0.0113F-47	-0.951P779	1.7322642	0.002
8274	1.0627420	0,7983055	1.7366696	-0,003
8876	0,0000358	-0.0976431	1.6495423	0.007
8878	1.0400316	-0.5795508	1.7198932	-0.004
3371	1.0331764	1.0685795	1.7640861	0.037
2831	0.0275703	1,1966550	1.7932 28	0.021
8872	1.0253679	-0.0165821	1.6717688	-0.005
3882	-0.0543456	0.1048036	1,7309442	-0.CO3
3883	0.0311935	-0.3348398	1.7352456	-0.007
387.3	1.0078077	-1.1002707	1.7428009	-0.033
	Y PANALL	NOREL NO 8786	T PHOTO SCALE	
PT NO	x	Y	z	Y PARALLAX
4887	0.0000000	0,000000	0.0000000	0.000
4786	1.000000	0.0756874	0,0001673	0.000
0874	0.0439001	0,7326638	1,7293565	~0,000
3376	-0.0174571	-0.1004393	1.6442639	0,000
3878	0.0387278	-0.6783970	1.7157983	0.003
0364	0.9482748	0,9515621	1.7473899	0.000
3356	1.0576640	- O.1C46647	1.7092391	-0.000
8968	1.1757449	-0.6893537	1.7205354	D.001
507	0.3112150	-0.6720473	1.6948517	-0.005
88C.)	0.0233007	1.0791477	1.7260040	0.003
8863	1.1113449	-1.0150734	1.7538105	-0.030
2272	0.0162679	-0.0192740	1.6664108	-0.000
\$873	0.0102622	-1.0981040	1.7459425	0.008
8862	1.0588355	0.09/95/09/9	1.7088640	0,005
8871	0.0112199	1.0612941	1.7554718	-0,039

Y PARALLAX STD ERR = 0.018 MM AT PHOTO SCALE

RERS MODEL NO

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PT NO x z Y PARALLAX Y 0.0000000 0.1407203 1.1440295 0.6331343 0.0550160 -0.6434879 0.0595631 -0.1488544 1.055570 0.0705724 1.035570 0.0705859 0.0705859 0.0705859 0.0705859 0.0705859 0.0537621 ADIC 0.000000 0.0000000 0.0000000 0.0013417 1.7145867 1.7145867 1.7325331 3.6307060 1.7317830 1.7483154 1.634,2453 1.7043017 1.7218493 1.7302139 1.6331237 1.7449361 1.7249365 1.7249365 1.7249365 1.7249365 1.7249365 0.000 4285 503 503 1.0000000 0.000 1.1974337 0.926333 1.176122 0.0504291 0.0573226 0.1907986 1.0796518 0.9646335 1.0131319 1.0583770 -0.076584 0.0671673 0.1901249 0.7207432 0.002 -0.002 -0.002 -0.000 0356 0853 3364 0366 2068 2128 2321 8352 8352 8352 3363 3364 3362 3363 -0.000 -0.012 -0.004 -0.006 -0.002 -0.002 0.027 0.017 -1.0535501 1.1870225 9123

Y PARALLAX STD FHR = 0.012 NM AT PHOTO SCALE

MODEL NO 8584

PTNO	×	Y	z	Y PARALLAX
4885	0,000000	0.0000000	0,0000000	0.000
4884	1,0000000	-0.0445768	0.0083075	0.000
304	0.5405363	G. P385784	1.6101042	-0.000
503	0,2503968	1,1071205	1,7887416	D.006
508	0.1279292	-0,6909320	1.7529939	-0.002
3846	1,0490033	-0.1157042	1.6888833	0.003
8848	0.9654527	-0.7305181	1,7595880	-0.002
8856	-0.0707:46	0.0333493	1.6453249	-0.001
8350	0,1069878	-0.5934815	1,7524351	0.004
9118	1,0657020	1.0538356	1.7425324	-0.002
3128	0.1907213	1.0463558	1,7304531	-0.005
8841	1,1225127	0.0636077	1.7455344	0.001
8842	1.0354137	-0.0007531	1.5865511	-0,006
3343	0.9207475	-0.3931811	1.7810048	0.011
8851	0.0724535	1.0331479	1,7334384	0.005
3852	0.0190908	0.0405/235	1.6536836	-0.009
8853	-0.035-0433	-0.9155-92	1.7629229	0.008
9113	6. 9245078	1.0104221	1.7339765	0.013

Y PARALLAX SID FRR # 0.007 MM AT PHOTO SCALE

MODEL NO 0483

PT ND	X	γ	z	Y PARALLAX
4874	0.0000000	0,0000000	0.0000000	0.000
4883	1.000000	0.0147833	0,0007510	0.000
3118	-0.0002R23	1.0876.011	1.7289455	0.000
3346	0.0462065	-0.0343599	1.0636724	-0,001
8346	-0.0031346	-0.6974532	1.7274166	0.001
9108	0.3780193	1.1066918	1.7311406	0,000
8836	1.0471642	· 0.0027417	1.6934743	0.001
3333	1.1138300	-0.6350768	>.718P35B	0.004

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1.0996043	· 0. 6387039	1,7186958	0.005
1.0101794	0.0167799	1,6367604	-0.004
1,0501107	0.0059558	1,7539487	-0.010
0.0277027	0.0197207	1.6628203	0,004
0,0615515	0.9857340	1.7316083	0.004
1,0863/973	0,0/923990	1.7034255	0.004
-0.033342 ⁻¹	-0.35346-23	1.7459597	-0.003
	1.0101794 1.0201307 0.0277027 0.061555 1.0863/989	1.0101790 0.0167795 1.0001107 -0.005958 0.0277027 0.0197207 0.0631557 1.0863799 0.06987340	1.0101703 0.0167799 1.0607604 1.0001167 -0.3869568 1.7539487 0.0277027 0.0197807 1.66281203 0.06535515 0.9367396 1.7316083 1.0863963 0.0098950 1.7316083

Y PARALLAX STD FRR = 0.005 MM AT PHOTO SCALE

8382 NUTEL NO

PT NC	x	Y	2	Y PARALLA
48R3	0.0000000	0.0000000	0.00000000	0.000
4882	1.0000000	0,0574260	0.0036114	0.000
9108	-0.1549835	1,1335557	1.7284138	-0.000
8836	0.0525339	0.0175035	1.7172438	0.000
8338	0.1407715	-0.6187969	1.7485513	-0.000
3038	0.9698321	1,1018556	1.6711244	0,005
B826	1.0403701	-0.0110903	1.7201292	0.002
8823	0.8763365	-0.6121376	1.7418559	~O_ 001
509	0.1271054	-0.6728202	1,7491803	0.000
8821	1.0332149	0,97200B1	1.6506361	-0.007
8823	1.0458452	-0.8472781	1.8018735	0.003
8822	1.03332745	0,1173875	1.7181494	-0.012
8832	0.0310666	0.0501858	1.7205429	0.009
8831	-0.0126137	0.8439999	1,6835782	0.008
9053	0.8962545	1,1359681	1.6709518	0.027
8933	0.0091043	-0.9755270	1.7921983	0.005

Y PARALLAX STD FRR = 0.011 MM AT PHOTO SCALE

MODEL NO SERI

PT NO	×	Y	z	Y PARALLAX
4822	0,000000	0.0000000	0.0000000	0.000
4331	1.0000000	-0.0113023	0.0061968	0.000
3078	0.0660690	0.0806408	1.6366336	-0.008
875-76	0.0462631	-0.0953318	1,6680154	0.000
8323	-0,1620275	-0,6647151	1.6322546	~0.004
9038	1.0674666	1.0601121	1,6574423	0,005
3815	1,1619171	0.1543013	1.6053823	-0.006
8818	0.8571312	-0, 5632744	1.7006004	0.013
305	0,4033791	0.6711192	1,5879639	0.014
510	1,1958739	-0.5362345	1.6909760	-0.006
8811	1.0604034	0.7284572	1.6043098	~0.007
8313	1.0647454	0. 3723444	1.7464457	-0.027
8821	0.1194748	0 8598482	1.6141281	0.002
8823	-0.01947562	-0.30/1502	1.7352162	-0.017
121112	1.1194385	0.0161389	1,6303002	0.011
3673	0.0504444	0.0206730	1.6677536	0.016
9083	0.84:0678	0.0891050	1.6098133	-0.001
	Y PARALLAX	STD ERR = 0.014 MPLA	1 PHOTO ISCALE	
		MOREL NO 9180		

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PASALLAX

PT NO

4031	0,000000	0.0000000	D, 0000000	0.000
4020	1.0000000	0.0402171	-0.0144470	0.000
2088	0.0423169	1,1016104	1.6074454	-0,002
8316	0.156.3310	0.2066517	1.5780428	0.005
2313	-0.1231502	-0.5081056	1.6307401	-0,00-
2078	0.9590268	1.0600811	1.6099077	0.003
3306	1.0394204	0,1332358	1.5921989	-0.002
9308	1,1346/371	-0.6784399	1,7045172	0,000
3744	0.5315338	-0.3158631	1.6603142	0.001
306	D. BBGRADE	0.4037767	1.5375847	-0.002
510	0.1609297	-0.4746233	1,6804521	0.002
8301	1.07709.12	0.7784346	1.5867627	~0.002
68303	1.0527591	-0.7891634	1.7179214	-0.001
8812	0.1180008	0.0635662	1.6067339	0.002
3311	0.0413379	0.5415089	1,5616047	0.015
9073	0.6776630	0.9717540	1.6007631	050.0
8802	1.0903345	0,1593833	1.5976115	-0.002
3813	0.0868777	-0.3074865	1.7463101	0.010

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Y PARALLAX STD ERR = 0.003 MM AT PHOTO SCALE

MUDEL	NO	8073
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PTND	x	v	z	Y PARALLAX
4830	0,0000000	0.0000000	0.0000000	0.000
4879	1.0000000	-0.0342011	0.0113135	0,000
2078	0.0125771	0.0030671	1,5338639	-0.000
3806	0.002/2021	0.0347160	1,4862503	0,001
8808	0.0446512	-0.7279467	1,5613468	-0.000
3063	0.620393)	0,9835502	1.5309463	0.002
5796	0.7354533	0.2303.124	1.5296778	~0.004
8798	0.5100759	-0.3667695	1.5299526	0.003
504	-D. 0402474	0.9325380	1.5393439	-0,000
511	0,2410002	-0.6757707	1,5583886	-0.001
8791	1.0643072	0, 3235759	1.5704582	0.005
8733	0.9765162	~D, 3451662	1.5864451	0,029
8302	0.0550305	0.0440895	1,4919900	-0.000
8301	0,0804850	0,6200070	1,5033697	-0.000
9063	0,5501051	0.8188939	1.5265504	0.013
3792	1,033280	-0.0793722	1,5096724	0.016

= 0.012 MM AT PHOTO BCALE Y PARALLAX STD PRR

NONEL NO 6364

PT ND	x	Y	z	Y PARALLAX
4863	D. 0000000	0,000000	0.0000000	0.000
4864	1,0000000	0.0324690	0.0116004	0,000
8634	-0.1912601	0.9138391	1.7700134	-0.000
86.36	0.0864557	-0.0834779	1,7851724	0,001
2632	0.1314446	-D. 3748316	1.7644463	0.012
8908	0.7666934	9,7450530	1.7847755	0.001
2646	1,0509172	0.0724236	1.7387033	-0.002
116.48	0,9202186	-1.0355186	1.7.385109	0.001
309	0.5141216	-0.7924402	1,7497100	500.0
0633	0.0549350	-0.3370105	1.7759778	-0.015
8913	-0.0541562	0.9968330	1.7522466	-0.006

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B641	1,1500416	1,1038411	1,7504797	0.036
35.4J	1,0310152	-1.0250:342	1.7595433	-0.014
25.32	-0.0352075	0,0759893	1.7473867	-0.019
2642	0.9635167	0.1489261	1.7165622	-0.001
2323	0.7725272	0.7624271	1,7855449	-0.018

Y PARALLAX STD ERR = 0.017 MM AT PHOTO ECALE

MODEL NO	6465
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PT N0	x	Ý	z	Y PARALLAX
486.4	0,000000	0.0000000	0.0000000	0.000
4865	1.0000000	0.0341995	-0.0092625	0.000
3308	-0.2095725	0.0841127	1,7692646	0.002
B646	0.0690849	0.0167305	1.7078083	-0,004
8548	-0,1612399	-1,0826266	1.7047895	0.001
8838	0.9923101	0.7624516	1.6679439	~0.000
8656	1,04743)6	-0.1266122	1.6899117	0.005
8658	0.7901044	-1.0R170FB	1.7292349	~0,002
505	0.5509631	0.8995533	1.6881499	~0.000
506	1.0334668	0.7750786	1-6667732	-0.006
8651	1.0742875	0.9312539	1-6811446	0,004
3653	0.95/1475	-1.0061315	1.7261707	-0.024
8642	-0.0117735	0.0023954	1.6934491	-0.018
8641	0,1750775	1.0405033	1,7355083	-0.010
8890	0.8463127	0.5075347	1.6886823	-0.023
2652	1,0649960	0.0597852	1.6767415	~0.005
8643	0.0481473	-1.0721023	1.1230671	-0.012

Y PARALLAX STD ERR = 0.014 MM AT PHOTO BCALE

MODEL NO 6566

PT ND	x	γ	z	Y PARALLAX
4865	0.0000000	0,000000	0.0000000	0.000
4866	1.000000	0,0373547	-0.0227483	0.000
3338	-0.0206880	0.7398025	1.5405834	-0.005
8656	0.0704055	-0.1239165	1.6694493	-0.007
8658	-0,1132977	-1.0793830	1,7206252	500.0
8033	0.8359260	0.6010383	1,6278093	-0,003
8666	1,0507806	0,0316086	1-6420507	0,004
8668	0,8662659	-0.3625555	1.6833605	-0.002
505	0.0157594	0.7556620	1,6386358	0.004
JOB	0.2766833	0.5331561	1.6157331	0,008
: 561	1,0340005	0,0004572	1.6014732	-0.001
8,3	0, 3926020	~1.0356835	1.5853419	-0.029
8662	1.0078946	0.0832502	1-6407304	0.003
2652	0,0817672	0,0550210	1.6550927	0,005
8651	0.0412035	0, 0007137	1.6504233	-0.006
8883	0.8753666	0,5548465	1.6289468	-0.009
8653	0.0434258	-1.015561P	1.7150794	0,006
	Y PARALLAX 1	310 FRR = 0.011 MM A	T PHOTO SCALE	
		MODEL NO 6667		

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Y PARALLAX

PT ND

x

0.00(3635)	0,000000	0.0000000	0.000
1.0000000	0.0036167	0.0079491	0,000
· 0. 1820544	0,6728330	1,7043582	0,007
0.0381232	0.0134464	1,7203354	-0.003
·0. 1309461	-1.0270441	1.7622094	0,000
0.0187586	0.7608482	1.6840174	-0.012
0.3570103	-0.0139443	1.6950501	0.003
0.8417507	-1.00756-69	1.7378454	~0.001
1, 1983703	0.7403584	1.6570352	0.000
1.0179316	D.8317735	1.6703060	0,008
0.8900634	~1.0134651	1.7370609	0,006
0.0143032	0.04036-39	1.7181550	-0.002
0.02833056	0.0342843	1.6808275	0.000
1.0078233	0.0390331	1.6892503	-0.003
-0.0517678	-1,1144267	1.7512671	~0,006
0, 3464854	0.1986237	1,7049479	0.006
Y PARALLAX	STO ERR = 0,000 M1 A	T PHOTO SCALE	
	MONEL NO 6768		
x	Y	z	y parali
0,0000000	0,0000000	0.000000	0,000
1.0000000	0,0301005	-0,0021010	0,000
0.0749300	0.7656794	1.5722085	-0.004
-0.0276375	-0.0074463	1.6903711	0,006
-0.13054-59	-0.3891447	1.7426203	-0.001

PT NO

2.X0

-		•	1 () 40 (2)
0,0000000	0,0000000	0.0000000	0,000
1,0000000	0,0301005	-0.0021010	0.000
0,0749320	0.7656794	1.5722885	-0.004
-0.0276375	-0.0074463	1.6903711	0,006
-0.13054-58	-0,0291447	1.7426203	-0.001
1.0852145	0.6511104	1.6516198	-0.002
1.057.8351	0.0015084	1.6935884	-0.002
0.8133761	-D, 0423825	1.7414508	0.004
0.3333171	-0.7876227	1.7401942	-0,004
0,2033784	0.7432173	1.6434512	0.001
1.0441837	0.3763336	1.5932301	0.003
1.0202407	-Q. B800331	1.7334238	-0.019
0.0425334	-0.3048233	1.7418836	5.01Z
0,0230182	0.3369739	1.6574470	0.008
1,1017570	0.0637777		0.001
0.0815345	0.0513276	1.6928163	0.011
0.3894/58	0.3229174	1.5784915	-0.018
Y PARALLAX	STO FRR × 0.010 MR A	T PHOTO SCALE	
	MOREL NO 6969		
x	Y ·	z	Y PARALI
	0.0010000 1.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.001000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.0000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.0000000 0.0000000 0.0000000 0.00000000	0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000 0.0000000 0.00000000 0.0000000 0.00000000 0.0000000 0.0000000000000 0.00000000 0.00000000000000000000000000000000000	D.0000000 D.0000000 D.0000000 D.0000000 D.000000000 D.000000000 D.00000000 D.000000000000000000000000000000000000

PTND	×	Y	z	Y PARALLAX	
4865	0,0000000	0.0000000	0,0000000	0,000	
4869	1.0000000	0.0354252	-0.00R4887	0.000	
8808	0.0413456	0.6700265	1.7130731	-0.000	
35.35	0.0217680	-0.(X)77937	1.7619275	-0,000	
86.08	-0,12963.85	-0.9208828	1.81440.5B	-0.001	
2058	1.1008656	0.6835505	1,7379146	0,005	
86%	0.9714764	0.0182768	1.7738202	-0.004	
26/35	0.7415458	-0.3424416	1.3231631	-0.005	
508	1,1240052	0.6860220	1.7386951	-0.004	
312	D. 5876254	-0.7537774	1.7850657	0.010	
3691	0.9753685	1.130/2197	1.6906816	0,000	
36/33	1.0445404	-0.0701614	1.8005106	-0.003	
2682	0.0740301	0.0664010	1.7619099	-0.007	
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Y PARALLAX STD FRR = 0.009 MM AT PHOTO SCALE

NOREL MD 6070				
PT NO	x	Y	z	Y PARALLAX
4869	0.0000000	0,000000	0,0000000	0,000
4870	1.00000000	-0,0375087	-0.0025346	0.000
23953	0.1433:77	0,6213383	1.7252442	-0.003
96/36	0.0216034	-0.0255743	1.7623023	0.004
8698	·0. 3025327	-0.9630052	1.3018661	500.0
8348	1,0403435	0.\$581097	1.7252705	0,003
3706	0.8333322	-D. D6778P4	1.7530788	-0.003
0705	0.7255767	-1.0203389	1.7837338	-0.018
503	0.1654414	0.6333056	1.7257585	0.000
8701	1,1078550	0, 3089143	1,6795267	-0.000
3703	0.9554235	-1.0678338	1.7823726	0.015
8253	-0.011/2860	0.3923539	1.7352503	-0.01a
0031	0.0451287	1,0691383	1.6871195	-0.020
8843	0.3852045	0,2842180	1,7451436	-0.007
8702	1,0756802	-O.0476417	1,7590575	0.013
3692	0.0086711	D.0361097	1.757308P	0.034
8693	-0.0051857	-1.0110973	1.7985031	0.004

Y PARALLAX STD COR + 0.015 MM AT PHDIO SCALE

MODEL NO 7073

PT NO	x	Y	z	Y PARALLAX
48*0	0.0000000	0.0000000	0.0000000	0.000
4371	1.0000000	0.0457407	0.0025021	0.000
8348	0.0318082	0.6361970	1.7531007	D- 004
8706	-0,1331030	0.0007002	1,7958393	~0.009
8708	-0.31.33386	-0.3636009	1,3355838	0.005
8838	1.23.0330	0.5372000	1.7425077	-0.001
8716	1.0073131	-D.OL31473	1.8088352	0.007
27,2	0.80(5303	-0.8505599	1.8312078	0.006
313	0.5964060	-1.1534054	1.7976299	-0.009
809	1,22008-26	C. 5847308	1,7429614	-0.005
8711	1,1003272	1.0129063	1.7239686	0.001
8713	0.9435000	-1.0171722	1.8416930	0.021
8702	0.0583352	0.0180790	1.7923862	0.013
3701	0.1065123	0,0021340	1.7013749	0.012
8843	-0.0277313	0.3530542	1.7774470	0.000
8712	0.9875595	0.1028727	1.7957863	· 0.01E
8703	-0.0801164	~1.0204163	1.8382530	-0.014
	Y PARALLAX	STO FRR ⊐ 0,032 MM A	T PHOTO SCALE	
		MODEL NO 7172		
PTNO	x	۷	z	Y PARALLAX
48.71	0,0000000	0.000000	0.0000000	0.000

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4872	1,0000000	0.0191992	-0.0141618	0.000
8338	0.2107850	0.6126876	1.7569467	-0.002
8716	0,0355720	-0.0408171	1.8112218	-0.007
\$718	-0.1324742	-0, B661587	1.8190130	0.001
8328	0.9354985	0.6701798	1,7441688	-0.005
3726	1,0970002	-0.1651170	1.8315145	0,003
8728	0.890/340	-0.6840320	1.8340115	0.0.4
509	0,1357979	0.0002713	1.7577574	0.005
8721	1.0374375	1,0022987	1.7346034	0.001
8723	1.0134908	-0.9505298	1.3318303	-0.003
8712	-0.0053297	0.1101243	1,2026090	0.019
8833	0.1421644	0.2233660	1,7949383	· 0, 003
8711	0.0470500	1.0301895	1.7485517	-0.019
8722	1.0396558	0,1540341	1,8105770	0,006
2713	0. DE52546	-1.015301R	1.8250562	C_020

Y PARALLAX STD ERR = 0.012 MM AT PHOTO SCALL

MODEL NO 7273				
PT ND	×	٧	z	Y PARALLAX
4872	0.000000	0.000000	0,0000(10)	1,000
4873	1,0000000	-0,0075055	0.0000 17	
8828	-0,0065628	0,5250953	1.7973,72	J. 00J
8726	0,0962774	-0.2235473	1,8722. 4	0.014
8728	-0.1051930	-0.7516081	1.3647 3	0.000
8818	1.1300309	0.6686392	1.8271(0,000
8735	0.9238534	-0.0406215	1.87582:4	0,000
3738	0.9336464	-1.0723712	1.845-0.73	0,005
B14	1.2454583	-0.33F0147	1.8740002	0,007
B7.31	0,9419610	0.3979783	1.7920 5	0.005
8733	0.98763(4	-1.0750084	1.8530 :3	-0.000
8722	0.0376455	0.1007723	1.8651	0.001
8823	0.1628678	0.2562250	1.8504.01	0.009
8721	0,0295458	0.9641352	1.795	0.002
8732	1.0056011	0.0276010	1,875	0.013
8723	0.0188935	-1.0/2860,34	1.857	0.003

Y PARALLAX STD BRR = D.010 MM AT PHOTO BOALD

MODEL NO 7374

PT ND	x	۷	Z	Y PARALLAN
4873	0-0000000	0,0000000	0,0000.001	0,000
4874	1.0500000	0.0258349	-0.01175-	0,000
3318	0,1876802	0.0984214	1.7.4.	0.000
8796	-0.0261919	0.0205728	1.8.	-0.007
8738	-0.0457237	-0.9832530	1.6 2.3%	0,002
8744	0.3776850	0.8911295	4.7117	0.007
8746	1.2191253	-0.0487740	1.77031	0.001
8748	1.0455130	-0,0189442	1.0301	-0.002
510	0.5074615	0.72749/13	1.7370.	-0.002
314	0.2730511	-O. 3222P5-3	1.2.87	0,003
8741	0.9374600	0.0168258	1.71.47.11	0.005
8743	1.0511514	-0.9169595	1.2031	0.012
8732	0,0490044	0,0851057	1 2210 22	0.010
8731	0.0033712	0.3262885	1 1.7120 . 3	0.013
2813	0.4008451	0.2526251	1.300	-0.003

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A REAL PROPERTY OF

8733	0.03/3104	-0.9808479	1.8320843	-0.003
8742	1.1007062	0.0189303	1.7812471	0.011
	Y PARALLAX :	A MM 200.0 = 937 GTR	T PHOTO SCALE	
		MOQGE ND 7475		
ť NO	x	γ	z	Y PARALLAX
4874	0.000000	0.0000000	0.0000000	0.000
4875	1.0000000	-0.0542042	-0.0023764	0.000
8744	-0.0395376	0,9581783	1,7611732	-0,000
8746	0.1779207	-0.0155462	1.8446485	D.007
3748	-0,0353515	-0.001458P	1.8729258	-0,003
8792	1.1241101	0.9509698	1,7576172	0.007
8756	1,0821(-23	0.0045362	1.8358857	-0.001
8758	0,9039635	-1.0792326	1.8766512	0,000
8308	0.5555793	0.5100351	1,802795B	0,003
511	0.7958503	0.5738976	1.8006125	-0.009
315	0.3766117	-0.9970544	1.8746524	0.001
3751	1.017/2594	0.9622762	1.7821416	-0.003
8753	0.9478668	-0.9716969	1.8778888	0.021
8203	D. 455/491	0.3909587	1.8212842	0,008
8752	0.9573488	0.0014319	1,8345717	0.005
8743	-0.0305793	-0.8923378	1.8730953	0.003
3742	0.0575465	0.0572313	1.8438036	0,011
8741	-0.01333/3	0.9838093	1.7614782	-0.002
	Y PARALLAX	370 FRR = 0.009 MM A	T PHOTO SCALE	
		MODEL NO 36.37		
	x	MODEL NO 36.87 Y	2	Y PARALLAX
T ND 4836	x 000000 0	MODEL NO 36.37 Y 0.0000000	2	0.000
4836 4837	x D. 0000000 1. 0000000	MODEL NO 36.87 Y 0.0000000 0.0911519	2 0.0000000 0.0008335	0.000
4836 4837 8638	X 0.0000000 1.0000000 -0.0321379	MODEL NO 36.37 Y 0.0000000 0.0911519 1.2107473	2 0.0000000 0.0008375 1.8114561	0.000
4836 4837 8638 8066	X D. 0000000 1. 0000000 -0. 03-1379 0. 2403568	MODEL NO 36.37 y 0.0000000 0.0911513 1.2107473 0.0622146	2 0.0000000 1.0008335 1.8114561 1.8070008	0.000 0.000 -0.012 -0.007
4836 4837 8638 8366 8368	X D. 0000000 -0. 0001373 0. 24031373 0. 4055775	MDDEL NO 36.37 Y 0.0000000 0.0911519 1.2107473 0.0682146 -0.3145885	2 0.0000000 0.0008335 1.8114561 1.8070008 1.7392373	0.000 0.000 -0.012 -0.007 0.003
4836 4837 8638 8366 8368 8568	X D. 0000000 1. 0000000 -0. 0321373 0. 2403564 0. 40056776 0. 300.0346	MODEL NO 36.37 y 0.0000000 0.0911513 1.2107473 0.0620146 -0.314,2286 1.1502803	2 0.0000000 0.0008335 1.8114561 1.8070008 1.7392873 1.7575477	0.000 0.000 -0.012 -0.007 0.003 -0.003
4836 4837 8638 8366 8368 8648 8648 8648	X D. 0000000 1. 0000000 0. 0.921879 0. 2403874 0. 4055775 0. 300.846 1. 0470475	MDDEL NO 36.37 Y 0.0000000 0.0911519 1.2107473 0.0602146 -0.3142266 1.1502603 -0.0437276	2 0.0000000 0.0008335 1.814561 1.8070008 1.73929378 1.7579477 1.7854827	0.000 0.000 -0.012 -0.007 0.003 -0.001 -0.000
4836 4837 8538 8558 8366 8368 8548 8376 8378	X D. DODCODO 1.0 KIGODO 4.0 X4025/77 0. 2002/37 1.04705/77 1.04705/75	MODEL NO 36.37 Y 0.0000000 0.0911519 1.2107473 0.0627146 -0.3140286 1.1502603 -0.043726 -0.65404527	2 0.0000000 0.000335 1.8114561 1.7092373 1.7559477 1.765/823 1.75794728	0.000 0.000 -0.017 -0.007 0.003 -0.000 -0.000 -0.000
4836 4837 8538 8366 8368 8648 8376 8376 8378 104	X D. 0010000 0. 03/1079 O. 24/31679 O. 40/31679 J. 04/051/76 J. 04/051/9 D. 6746050	MDDEL NO 36.37 Y 0.0000000 0.0911519 1.2107473 0.0662146 -0.314286 1.1502603 -0.043726 -0.6504727 -0.4026505	2 0.000000 0.0008355 1.814561 1.8070008 1.7959477 1.7859477 1.7859477 1.7797928 1.7797928 1.7797928	0,000 0,000 -0,07 -0,007 -0,007 -0,000 -0,000 -0,000 -0,001
4836 4837 8538 8366 8368 8648 8548 8548 8578 8378 104 8363	X D. 0000000 0. 0.391879 0. 2843264 D. 300.600 0. 300.600 1. 04700175 1. 0470519 0. 67460519 0. 6746050	MODEL NO 36.37 Y 0.0000000 0.0911519 1.2107473 0.014285 -1.114285 -1.114285 -0.054747 -0.043765 -0.6564787 -0.4086955 -0.4086955	2 0.0000005 0.0008375 1.8114561 1.0078207 1.7578477 1.7554023 1.7757427 1.7554023 1.7717328 1.7315738 1.8023100	0.000 0.012 -0.012 -0.003 -0.003 -0.000 -0.000 -0.000 -0.000
4836 4837 8638 2066 868 868 2376 8378 104 \$363 8363 8364	X 0.0000000 -0.0231379 0.24035670 0.40055770 0.900400 1.0470470 1.0470470 0.0264015 0.0264013 0.0264013	MDDEL NO 36.37 Y 0.0000000 0.0911519 1.2107473 0.0662146 -0.34746286 1.1502603 -0.043726 -0.6504527 -0.485505 -0.9855018 1.1123760	2 0.000000 0.0008355 1.814861 1.8070008 1.7959477 1.7859477 1.7859477 1.7797328 1.791738 1.8023130 1.8023130 1.8211594	0.000 0.000 -0.077 -0.007 0.003 -0.003 -0.000 -0.000 -0.001 -0.001 0.016
48355 4837 8538 8358 8358 8368 8368 8378 8378 3376 8378 304 8378 304 8378 3363 8353 8354 8371	X 0. 0000000 -0. 0541874 0. 2507846 0. 307846 0. 3078476 1. 0440531 0. 6740475 1. 0440531 0. 674055 0. 00071317 0. 0741317	MIDEL NO 36.37 Y 0.0000000 0.0911519 1.2107473 0.0622146 -0.3144286 -0.5644787 -0.442864787 -0.442864787 -0.442864787 -0.442864787 -0.442864787 -0.46286198 -0.5544787 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.5547828 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.554788 -0.	2 0.0000305 0.0008325 1.0314561 1.03070008 1.7357077 1.7357027 1.7357027 1.7357028 1.7317738 1.60231300 1.8231309 1.82313594	0.000 0.000 -0.012 -0.007 -0.001 -0.001 -0.000 -0.000 -0.000 -0.000 -0.000 0.016 0.020
4836 4837 8638 2066 8368 8648 3376 8378 3376 8363 8361 2371 2371 3371	X 0.0000000 0.00321679 0.20321679 0.40755778 0.40755778 1.0470478 1.0470478 0.02520013 0.02520013 0.02520013 0.02520013 0.02520013 0.02520013 0.02520013 0.0252013 0.0251013 0.02511217 0.2551322 1.0464127	MIDEL NO 36.37 Y 0.000000 0.0911513 1.92107473 0.002146 -0.01447876 -0.0447876 -0.0647876 -0.0640118 1.1023740 1.023740 1.023740 -0.0581184	2 0.0000000 0.0008325 1.0070008 1.7392873 1.7392874 1.7359827 1.7359827 1.7359827 1.7359827 1.7357827 1.7357827 1.7357827 1.7357827 1.7357827 1.7357827 1.7357827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.7377827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.73777827 1.737777777777777777777777777777777777	0.000 0.000 -0.017 -0.007 -0.003 -0.000 -0.000 -0.000 -0.001 -0.001 -0.016 0.016 0.016
48355 4837 8538 8286 8368 8668 8378 3076 8378 304 8378 304 8371 8371 8371 8371 8371 8371	X 0.0000000 -0.0843079 0.46056776 0.46056776 0.46056776 0.0460519 0.0460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 0.02460519 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1.2107973 0.0021945 0.0021945 0.0021945 0.0021945 0.0021945 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 0.002194 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1648	-D.0057763	1.0591363	1.7003849	-0.002
P 176-	0.0462093	-0,1073283	1.7448128	0,002
10714	0.0436645	~0,6995728	1,7466077	~0,002
0659	0.3907761	1.161283)	1.7110087	~0.003
U 235.	0.9509063	0,8399990	1.7206248	0,005
12 /1291	1.1874713	-0.4471066	1.7199002	0.003
316	1.2119373	-0.3987264	1.7133045	-0,000
310	1, 1851730	0.6414430	1.7122821	-0.011
3322	0.0038384	1,0750955	1.7125716	0.010
6.00.9	1.1114090	-0,8055873	1,7238897	-0,003
2372	0.0054365	0,0278845	1.7454421	0.018
8375	-0.0150365	0.9739006	1,7253107	-0.001
2641	0.2107741	1.0221256	1.7167248	-0.021
3352	1.020	0.1305913	1.7193593	0.008
0.173	0.0433	· 0. 991 391 1	1.7509961	0.003

MINLLAX	PUD DBR		1.010 144	A1	PADID	BUAL
	MODEL	ND	3839			

PLIND	x	Y	z	Y PARALLAD
48.00	0,000000	0.0000000	0.0000000	0.000
4(13)	1.0000000	0,0859615	-0.0036193	0.000
3058	-0.0321123	1,0491504	1,8075932	~0.002
8394-	-0.0817622	0.0876842	1,2006035	-0.004
23 W2H	0.1331975	-0.6189233	1.7937956	-0.002
0663	1.0512951	1,1917803	1,7962890	0,000
305	1,0336379	0.06/5811	1 331818	-0.003
8.2.10	1.0335720	-0.4679711	915277	0.001
310	0.1633614	0,5063034	. 9048924	0.007
316	0.1602698	-0.5695456	1,7883524	0.003
33	0.9773335	0.9490118	1,2075555	-0.000
3331	1.0307850	-0.9372730	1,7868397	-0.022
0.000	-0.0222924	-0.0169574	1.7996838	0.012
0381	-0.0215370	0,9598185	1.8078570	0.021
8/20	0,1488100	1,1215176	1.8050304	-0.003
8333	0,0442031	-0.9873189	1,7900075	-0.012
8.762	1,0435560	0.0124285	1.7978329	0.008

KODEL NO

29/10

1.140	x	۷	Z	Y PARALLA
4331	0,0000000	0,000000	0.0000000	0.000
4340	1,0000000	D, 0572855	-0.0043557	0,000
***CB	0.1093709	1.0734000	1.6442676	-0.001
0336	0.1027393	0.0887844	1.6757789	0.005
137.67	0.0247364	-0.4688401	1.6859785	-0.003
26.78	1.1206275	1.08/0086	1.6187007	0.000
241%	0,3511308	0,3658857	1.6605537	-0.007
2403	1.03073FR	-0.2476855	1.6707979	0.003
14401	0.37390(1)	1,0537348	1.6282202	0.003
8401	1.1330476	-0,3391243	1.6724285	-0.001
5 202	0.0538034	-0.0225152	1.6782226	0,070
(730)	0.0307344	0.8509078	1.6616821	0.022
No.	0.235204B	0.9949675	1.6462941	-0.001
0.027	0,0027781	-0.9054140	1.6943647	-0.001

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8402	1.04223-78	0.1635576	1.6637704	-0.001
	Y PARALLAX E	STD ERR = 0,011 Mpt A	T PHOTO SCALE	
		MODEL NO 4041		
PT MD	x	Ŷ	z	Y PARALLAX
4840	0,000000	0.0000000	0.0000000	0.000
4861	1,000000	0.0653335	-0.0016047	0.000
8678	0.0974354	1.0034005	1.6077606	-0,002
8406	-0.0624624	0.2832442	1.6412676	0.002
8408	0.0218944	-0.3140685	1.6465548	-0.001
8683	1.0278572	1,0367942	1.6200881	-0.010
8416	0.3673363	0.3159912	1.6327545	-0.010
8418		-0.5514582	1.6452081	0.001
	1.0181905			0.001
S411	0,9541483	0.3494954	1.6244055	0.003
8413	1.0313157	-0.5551188	1.6454002	-0.001
8402	0.0290981	0.0968342	1.6433841	
8401	-0.04673R1	0.9668210	1.6152445	-0.012
86.73	0.1446713	0.9973851	1.6075718	-0.010
8412	1.0173421	0.7397472	1,638,789	-0.005
8403	0.1290651	-0,4623259	1.648/222	0.017
	Y PARALLAX 1	RTD ERR = 0.011 MPIA	T PHOTO SCALE	
		MODEL NO 4142		
PT ND	×	Y	z	Y PARALLAX
4841	0-0000000	0.0000000	0.0000000	0.000
4842	1.0000000	-0.0865543	-0.0015978	0.000
4633	0.1597749	0.3619382	1.6369759	-0,001
3416	0,0068331	0.2431031	1.6478379	0.002
8418	-0,0586493	-0.6233667	1.6571998	-0,004
2698	1.0510421	0.3541177	1.6400680	-0.000
8425	0.93-0338	0.0015961	1.6434117 -	-0.006
8428	0.2301313	-0.5552580	1,5477208	0.000
312	0.0382566	1.0504387	1.60399882	-0.002
S12	1.0978599	0.5410120	1.6429325	0.001
513	0.8615112	-0.5383319	1,6500116	0.000
105	0.3382927	0.5609655	1,6540606	0,005
2421	1.0668616	0.8514343	1.6402738	0.004
8423	0,9179890	-0.5574332	1.6499193	D. D06
8412	0.04F0114	0.1662351	1.6533380	0,006
8411	0.0784500	0.0835562	1.6414423	-0.005
3633	0.3761613	0.9927225	1.6367819	-0.013
8422	1,0421905	0.1660427	1.6451450	0.011
8413	-D. Q460473	-0.6235813	1.6577574	-0.000
	Y PARALLAX S	STO FRR = 0.006 MRIA	T PHOTO SCALE	
		MODEL NO 4843		
PT NO	x	Ÿ	z	Y PARALLAX
4342	0-0000000	0.0000010	0.0000000	0,000
4843	+ 0000000	-0.0303751	-0.0104498	0.000
8698	-0.0009653	0.9404010	1.5930520	~0.005
8426	-0.057531%	0.0989581	1.6314306	0.006

MDAB. ND 4344				
TND	x	Y	z	Y PARALLAX
4843	0,000000	0,0000000	0,0000000	0.000
4844	1.0000000	-0,0259435	0.0073442	0.000
8708	-0,0810763	0,8574832	1.6141612	0,001
3436	0.0374667	-0,0492818	1.6156100	0.001
8438	-0.0034116	-0.6038293	1.6333470	-0.000
8718	0,9705631	0.9688167	1.6025743	-0.006
8446	0.3676750	0.2008757	1,6204085	-0,000
8448	0.8612533	-0.7403560	1,6202247	0,000
313	0.7730333	0.6864673	1,5710736	-0.006
8713	1.0335187	0.8152727	1.6102160	0.010
3443	0,9699604	-Q. 70572PS	1,6284639	0,006
843P	0.0225726	0.1780285	1,6309866	0.00%
8431	0.0479518	0.8230334	1.6141603	0.017
8703	0.1309569	0,8097857	1.6144138	0.011
8442	0.9834736	Q. 072R494	1,6205634	0.010
8433	- 0.0050503	-0.6320027	1,6339782	-0.011
	Y PARALLAX	510 FRR = 0.010 MM A	T PHOTO SCALE	
		MODEL NO 4445		
T NG	×	Y	2	Y PARALLAX
4844	0.000000	0.0000000	0,0000000	0.000
4845	1.0000000	0.018-0452	0.0024433	0.000
8718	-0.0535416	1.0106793	1,6272190	0.001
3445	~0.0753405	0,2330099	1.6463130	-0.003
8448	-0.1176014	-0,7307694	1,6472003	0.001
8728	0.9266725	1.1492079	1,6374203	~0.001
8456	1,0273979	D. 0774237	1.5989301	0.003
8458	0.9025396	-0,5323183	1,6185225	- 0, 001
8723	1,027033*	0,8910405	1.6400033	-0,010
8453	1.0190970	- 0.730R124	1.6502021	0.017
8442	-0.0156577	0,1026749	1.6467821	0.013
8713	0.0722186	0.0633555	1,6354338	-0.003
8443	-D. DD7766-9	-0.6322153	1,6558877	0.024
8452	1.0052475	D, 0851848	1.6414034	0.007

-0.4522089 0.3374325 -0.0616057 -0.0616057 -0.0128639 0.6373221

0.637.4921 -0.43197919 0.7993196 -0.6354026 0.2678267 0.9387393 0.8782314 0.1636274 -0.4486748

Y PARALLAX STD FRR = 0.008 MM AT PHOTO SCALE

~0.1213207

0.9577675 1.0556948 0.9975654 0.0660461

0.0660461 -0.0917836 0.9952096 0.0370013 0.0145367 0.2768359 1.0484859 -0.9352793

8428

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P1

1.6218065 1.5744874 1.525850 1.6102233 1.6048271 1.6283653 1.6732515 1.611107271

1.6111077 1.6107271 1.5991418 1.5940600 1.5988610 1.6236373 -0.003 0.005 -0.008 0.005 0.005

0.004 -0.001 -0.001 0.005 0.009 -0.005 0.009

0.009

Y PARALLAX STO FRR # 0.013 MM AT PHOTO SCALE

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		MORGEL NO 4546		
PTND	×	Y	z	Y PARALLAX
4845	0.0000000	0.000000	0.0000000	0.000
4846	1.0000000	0.070.3098	~0.0194314	0,000
8728	-0.1139784	1.0923962	1.6347223	0.000
8456	0.0469940	-0,0103254	1.5744161	-0,00Z
8458	0,04063313	·O. 5702350	1.583858R	0.001
8733	0.8549333	0.2057310	1.5054905	0.004
8466	1.0104345	0.0030862	1.0010065	0.000
8468	1.0201278	-0.5403073	1.596.7724	-D.003
317	1.1238649	-0.4469038	1.5966782	0.002
8461 8463	0.9760050	0.9708458	1.5124439	-0.003
8452	1.1429075	0.0397837	1.5919873	0.009
8723	0,0008316	0.3340835	1.5309546	0.014
8733	0.9053045	0,8061464	1.6113396	-0.012
8462	1.0733037	0.1216000	1,6026070	0,004
8453	0.0823992	-0.7636903	1.6111802	0.005
6455				0,005
	Y PARALLAX :	317) ERR = 0.010 MM A	7 PHOTO SCALE	
		MODEL NO 4647		
PT NO	x	Y	z	Y PARALLAX
4846	0,000000	0.0000000	0,0000000	0,000
4847	1.000000.	0.0231070	0.0035283	0.000
8738	-0.1664858	0,7655238	1.8769173	-0.000
3466	-0.045-2764	-0.0728583	1.6777765	0,000
8468	-0.0640503	-0.6448995	1.6731780	0.001
8748	D. 910.3647	0.8270994	1.6954292	-0.004
2476	0.9732286	-0.0164644	1.6931434	0.001
8478	1.0678558	-0.8221613	1.6893740	-0.000
317	0.0535P21	-0.5449384	1.6773710	-0.002
2471 8473	0.04052%	0.9468050	1-5964858	0.003
8462	-0.022**922	0.1208502	1.6337151	-0.003
3464	-0.0.33122	0.9392559	1.6880093	-0.005
8743	0.9162528	0.3201144	1.6957967	-0.011
8472	0.9694445	0.0513294	1.5952884	0.010
8463	0.0577653	-Q. 861535P	1.6731288	0.007
	Y PARALLAX	STD FRR = 0.007 MM A	PHOTO SCALE	
		MODEL NO 4748		
PT NO	x	Y	z	Y PARALLAX
4847	0,0000000	0,000000	0.0000000	0.000
4848	1.0000000	0.0224336	-D. DO2R216	0.000
8748	-0.02300.46	0.8332608	1.7044047	-0.001
8476	-0.0062036	~D.0223377	1.7104704	0.003
8478	0.0505979	-0.8417304	1.7148128	0,000
8758	0.889333)	0.6504818	1.7054531	-0.016
8486	1.0001424	-0.0555722	1.7137732	0.000
342B	0.7156759	-0.8316163	1.7122616	-0.003
315	0.8589644	0.7304389	1.7055271	0.003
300	0.6966680	0.212523	1.7125847	0.000

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8753	0.9236892	0.7545930	1.7079208	0.005
8953	1.0133377	0.0864 345	1.7072384	0.002
8472	-0,0057423	0,046,2006	1.7117663	0.015
3743	-0.03222107	0.8352368	1.7045047	-0.004
3471	0.0001144	0.0528315	1.7041360	0.005
8470	-0.013707/7	-0.0569307	1,7143641	0.018
107	0.0176366	1.00029745	1,70760-46	-0.016
8482	1.034 3314	-0.0122212	1.7164676	0.015

Y PARALLAX GTD FRR = 0.011 MM AT PHDTO SCALE

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DURBAN TEST AREA * STRUP PORMATION

01/01/1078

ND,	xa	Y2	IP	*1	71	Z1	vx	٧Y	vz
4911	+0.33993303	10.0170488	+0.0318420	+1.0000000	10.0169704	10.0218327	90.8E-05	+.784E-04	+. 10.2E -04
4910	11.9652478	+0,0365187	10.0423343						
9114	10.8923725	10.8783413	+1,5153973	10.802/830	+0,878404B	+1.5155245	-,1046-04	634E-04	227F 03
9116	+0.9699158	+0.1004556	+1.5705181	10.9039948	+0.1003815	11.5705434	896E-05	+.741E-04	295E-04
2113	11.0787653	-0.9910918	+1,5714039	+1.0737379	-0,9319027	+1.8712517	4.204E-04	891E-04	+.3426-03
9104	41.8702962	40.2559726	+1.5458076						
9106	+1/2854510	+0.0373104	+1.5533924						
9108	+3.8573400	-0.9328710	+1.5950005						
201	+2.028/3260	+0.3002783	+1.5552354						
9101	11.8564033	40.3076622	+1.SAE8473						
9100	1.9075234	0.9231555	1.5630445						
3113	40.9589174	~1.0559203	+1.5600787	10.9588364	-1.0557533	+1.5601183	+.190E-04	610E-04	395F-04
9111	+0.9702513	+0.8930196	+1.5341577	+0. 370,*933	+0.8333115	+1.5333592	319E-04	+.815E-05	+.190F-03
9112	+0.9072412	10.0223974	+1,5784843	+0.907.030	+0,0223933	+1.5721571	267E~04	4.413E-05	+.32EE-03
0103	+1.3314:435	40.0584645	+1.5500748						

SIGMA X/Y/7 = 0.012 MM AT PHOTO SCALE

JUNCTIDE OF MODELS 1110 - 1009

JUNCTION OF MODELS 1811 - 1110

1	т м∩.	X2	YB	22	×1	¥1	21	VX.	٧Y	vz
	4010	1.3652555	+0.0365424	10.0493523	11.95.92478	40.0355187	10.0493948	*.7838-05	1.3978-04	3-46-04
	4909	42.7737170	40,0629719	+0.0733915						
	9104	11.3782550	40,8660239	+1.5457097	11.8782563	10.8659726	+1.5458075	~.1296-05	+,5736-04	~.3786~04
	9106	11.8654610	+0,0373417	41.563036/5	1.8654510	10.0373104	+1,56388,24	+.1002-04	F. 31 32-04	185F-03
	3108	41.8670234	-0.33896599	+1.5861566	+1.19579400	-0,3,08710	+1,5853005	-, 165E-04	11185-03	4.256F-03
	9034	+2.7770260	 B672334 	+1,5548532						
	3035	12.7456026	10.1607091	+1.5654594		•				
	2033	18,88(11579)	-0,9540493	+1.5525460						
	201	+2.0232134	10.3002951	+1.55520717	12.002040	+0.3002783	+1.55142954	347E-05	+.10PE-04	- 329F -03
ţ	3031	+2.7133271	41.0PD3540	+1.5043636						
	2093	+2.8030193	-0.9242501	13.5517430						
5	9102	+1.8314794	*0.0SP2602	+1.56004-45	41.8314525	+O, D584645	+1.5600748	200E-04	19SE 03	+,1890-03
Ł	9103	+1.9075047	-0.92956.57	+1. 5389505ds	+1.5075234	-0,0201555	+1.5080545	18FF-04	410E-03	+. SO1E 03
ŧ	3101	+1.8564111	+0.9073340	+1.5466062	11.0004000	+0,90766/38	+1.5468473	+.7286-05	~, £78E-03	161E-03
\$	30%2	12.3030599	+0.1066177	+1.5684797						
÷.										
Ł										
ŝ.	SIGMA	X/Y/2 = 0.01	US MM AT PHOTO	1 INCALL						
ĩ.										

2	DINCTION	OF MODELS 1	009 - 900					
PT ND.	Xie	Ya	ZP	¥1	¥1	Z1	vx	VY
4909 4907	+2.7797127 +3.5875730	+0.0600463 +0.1036150	+0+0733277 10-0853549	42.7797170	+0.0629719	+0.0783915	4296-05	+,7430-04

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* DURBAN TEST AREA *

STRIP FORMATION

01/01/1978

JUNCI JON OF MORES 1211 - 1110

PT NO.	72	YZ	20	*1	71	21	vx	٧Y	ΨZ.
4911	+0.9099303	+0.0170438	+0.0218429	F1.000000	+0.0169704	+0.0219327	~.903E-05	+.784E-04	1.102E-04
4910	+1.965/2479	+0,0365187	+0.043:248						
9114	10.3023735	+0.8783413	+1.5153973	40.3023830	+0.2784048	+1.5156245	104E~04	634E-04	<i>227</i> E-03
9116	10.16/00158	+0.1004555	+1.5705181	+0.3634248	+0.1003815	+1.5705434	896E-05	+.741E-04	-,2522-04
9118	1.0757663	0.3313318	+1.5714939	+1.0787379	-0.9019027	+1.5717517	+.2B4E-04	~.891E-04	+.2428-03
3104	+1.0702560	10.8653726	11.5458076						
9105	<1.B654510	+0,0373104	+1.5630824						
9102	+1.3679400	-0.9383710	+1, NRS0005						
201	13.038660	+0.00272J	+1.5552354						
9101	<1.8564033	10. 30766	+1.5468473						
9103	11.0075204	-0.9291655	+1.58G0545						
2113	+'), 3589174	-1.0SS8203	+1.5600787	+0. 2582934	-1.0557593	+1.5601183	F.190E-04	610E-04	395E-04
9111	+0.9702613	+0.0933136	+1.5341577	+0. 970,29311	+0.8938515	+1.5333592	319E-04	+.815E-05	+.198F-03
9112	+0.3072418	+0.0223974	11.5724831	+0.9072680	+0.02233333	+1.5721571	267E-D4	+. 413E-05	+. 326E-07
2108	H.8314905	+0.0584645	H1.5600748						

SIGHA X/Y/7 = 0.012 MM AT PHDID BCALE

JUNCTION OF MODELS 1110 - 1009

PT NO.	XP	YE	22	×1	¥1	21	vx	ΨY	vz
4310	11.965-2556	+0.0355404	+0.0499623	+1.9652478	40.0365187	+0.0493948	+.783E~05	+.2970 -04	3-4E-04
4909	42,7737170	+0.0629713	+0.0733915						
9104	+1_3783550	+0.8660239	+1.5457607	41.8782563	+0.3659726	+1.5453076	~.1296-05	+.573E-04	37804
9106	1.8654610	+0,0373417	41.5636965	+1.8654510	40.0373104	+1.5638324	+.1006-04	1.313E-04	189F-03
9108	41,2673234	-0.9389804	+1.5000566	+1,8679400	·0.3398710	+1.5859005	-, 165E-04	118F-03	+.2555-03
30:34	+2.7770260	+0.8672034	41.554F52R						
3036	12.7556086	+0,1607031	+1.5554594						
2033	42,860767)	-0.9540493	+1,55,25060						
301	12.0282184	+0.3002951	+1.5550717	12.0202603	E0. 3002783	+1.5552954	847E-05	1.169E-DA	2235-03
9091	+2,7133271	+1.0P33549	 56436.45 						10000
2093	+2.8030193	-0.3342501	+1.5517430						
9102	+1.8314704	+0.0522602	F1. 5003645	+1.8314:05	10.0584645	+1.5600748	2008-04		+.1896-03
9103	+1,2075047	0,9295657	+1.58855555	11.9075234	-0.0291555	+1.5880545	- 18FF 04	- 410L-03	+. 501E-03
2101	11,8564111	+0.9073240	+1.5466RGB	11.056-6030	10, 9076632	+1.5468473	+. 7286-05	2786-03	
2092	12.8030590	10.1055177	+1.5034787				117676-05	-16/86-03	~.161E-03

SIGMA X/Y/2 = 0.018 MM AT PHOTO SCALE

	JINCTION	OF MODELS 1	009 90N						
PT ND.	XZ	YZ	zə	X1	¥1	Z1	VX	VY	VZ.
4900 4907	52.7797127 +3.5875730	+0.0530461	10,0733377 10,0253340	42.7797170	+0.0629710	+0.0733915	-,4290-05	+.7435-04	-, 377F-05

12.7770205 12.7556051 12.2647710 13.4624765 13.6051249 +1.105485/28 -.529E-05 +1.5654504 -.345E-05 +1.9525960 +.131E-04 -.300E-04 -.170E-03 +.721E-04 ..714E-04 -.114E-03 +.245E-03 90/04 10.0972683 +1.55468.0 12.7770280 +0.8572384 40, 06/2063 40, 140/0312 -0, 9541636 40, 9541636 40, 954176 40, 9181114 +0, 80,25602 +0, 7460750 40, 975516 -0, 8855459 40, 1066435 41, 0551453 9074 9076 9078 9084 9086 9088 9088 9088 11.5653079 42.7594.086 +0.1607091 +1.5733120 +1.5970430 +1,5970430 +1,5975107 +1,5632544 +1,5736555 +1,5446972 +1,562443 +1,5644135 +3.7721270 9031 +3.5113568 9083 9038 13.5509993 63,8030593 +0,1066177 +1.5684787 1.2586-04 -.173-04 +.5606-04 2038 2031 2032 2032 12.7130842 13.5464913 12.8039330 11.0231942 10.1261583 -0.9247471 +2.7133071 +1.0233549 +1.5543635 -. 285E-05 -.1602-03 11.5030708 11.5525007 12.8035133 -0-0242501 +1.5517430 +.137E-04 -,497E-03 +,759E-03

SIGNA X/Y/Z * 0.022 MM AT PHOTO SCALE

PT ND.	xa	Y2	za	X1	YJ	Z 1	vx	VY	VZ.
4908	13.5875361	10.1035110	10,0853961	+9,5875720	+0.1036150	+0.0853543	+.231E-04	1030-03	+.312E-04
4907	 4.3938272 	+0.1497488	40.1024357						
9094	13.4624268	+0.8824090	11,5795510	+3.4624355	10,3824176	+1.5733189	~, 860E-05	-,896E-05	4.237E-03
3096	+3.6055453	+0.1180069	41,5972841	43,0055249	+0.1181114	+1,5970439	+.204E-04	104E-03	+.2405-03
2088	+3,7720027	0.8027432	+1.5970070	+3.7721278	-0.8029602	+1.5975107	350F-04	+.216E-03	-,5035-03
3074	14.3917554	+1.0044103	11.6252360						
3076	+4.4253054	+0.1652947	+1.6498508						
207B	14.6169791	~0.7603702	1. CP25444						
202	43.6821360	+0.7463246	41.5623373	13.6821205	10.7469790	+1.5622580	+.154E-04	··. 5436-04	+.1296-03
103	14.3344584	+0.3249801	+1.6066216						
102	14.3050004	+0.9740533	F1.C053414						
504	14,5768172	-0.6767973	+1.627.3590						
9071	14.3577051	+1.0517911	<1.6059270						
0073	+4.366/6.80	-0.8791072	+1.6030430						
3082	13.5465183	46.1259477	+1.5920318	+3,5484913	+0.1261583	+1.593070B	+,2756-04	210E-07	138F-0.3
3081	+3,5113651	+0.9774240	+1.57+0015	43.5110564	+0,9776516	+1.573R358	+.833E-05	2371:03	+.1950-03
9072	14.3368263	+0.1401968	+1.6+01775						
9080	+3,5810271	0,8057823	+1.SAC2R77	+3.5803903	-0.R853499	+1.5484972	+.P7RE-04	+.1E7E-03	

SIGMA X/Y/Z = 0.017 MM AT PHOTO SCALE

JUNCTION OF MODELS - 807 ~ 706-

PT ND.	×2	YP	2.7	×1	Y1	Z1	vx	VΥ	¥7	
4007	44. 39PB281	10.1487353	10.1024425	14.1025077	10.1487488	+0.1024357	+.975E-06	+.475E-04	► 687E-05	24
4906 9074	45,8160510	+0.1052517	+0.1270383	44, 3217654	+1-0864103	+1.6252360	+.4536-05	-,1318-03	8295-03	ŝ
2076	+4.4253033	10.1653333	+1.6500003	+4.425.3054	10.1652947	11.6490508	- 140E- 05	+.451E 04	F. 1400-03	
9070	14.6160749	-0.7002310	+1.6226157	+4.6469791	0.7008702	+1.6325444	~.410P-05	+.331E-04	▶.7150-04	
2064	+5, 147851524	+1,1638170	11.7605116							
2068	15.27033806	-0.5051646	+1.6-237777							
105	+4.3082073	+0.9741573	+1.60020VB	44.30%ENK-4	10. 240533	+1.6061414	+.147E-05	+,1046-03	+.6846-04	
103	+4.3344684 +4.5768517	+0.9852290	+1,60CR00% +1,0277520	14.3:144634	10 #84:0801 -0.6707:073	+1.6066216	+.698E-07 +.3406-04	+.247E-03 166E-03	F. 25.8/5-0/3	
304		-146103637	*1.001110025	144.00441.01	-146701012	*1.061.00%	** 30042 - (m)		+* 3336-03	

× -

9061 9063 9072 9071 9071	45.113846.3 45.1957380 44.3358866 44.3577123 45.1715982	+1, 18425 13 -0, 7664758 +0, 1400016 +1, 0116085 +0, 1864/50	F1.7630944 F1.7656467 F1.6461963 F1.6461963 F1.66057147 F1.7861992	44, 3304263 14, 397 824		+1+6401775 +1+5058279			
90%*	44.3068473	-0.1798449	41.6024752	14. 36664430	-0.8791072	#1.6030638	2066-04	737F-03	+.8450-03

STGNA X/Y/Z = 0.023 MM AT PHOTO SCALE

		J144CT 1074	DF MERICLE OF	9009 - 9009						
PT	NO.	xZ	Y12	2.8	×2	Y1	Z1	٧x	٧Y	٧z
	4883 46210	10.9999922	+0.0078870	+0.0097642 +0.0820345	+1.0000000	0.0078364	+0.0083747	714E-0E	. 975L, OS	104E.04
1	6894	41.0413R2P	10.9625163	1.8723463	11.041.0814	10.9624871	+1.8773609	+.1436-05	1.2926-04	1.854E 04
	BUNG 1393	11.0050094 11.0774736	0.8003871 +0.0843106	+1,8121176 +1,7805208	11.0050700	+0.0852212 -0.0968778	+1.8121734 +1.7807100	562E-06 157E-06	1055-04 9375-05	.5' IE 04
	6884 8886	42.0033349 11.0017335	+0.0356064	+1.061344R +1.0001005						
	State of L	+1,9700597	-0.9736955	+1.7563631				3097-04	+.242E-03	-,4568~03
	-505 308	H1,1231015 H1,4094016	-0.8768650 +1.0859402	+1.75%303	+1.1231325	-0.8771078	+1.7800933			
	502	+1.0787798	 0689009 	+1.9568189	+1.0727983	+1.0686565	+1.8662689	+.2196-04	+,3336-03	+.5562-03
	BB:434	10.3524277	1.0712573	+1.8031104	+0.0%24045	-1.0818572	+1.803391B	+.23PE-04	+.593E-03	3796-03
	38:11	+1,0235003	+1.0513246	+1.8669735	+1.0230050	+1.0513648	+1.9670458	-,169E-05	-,401E-04	6639- (14
	SUST	12.0113811	11.2315778	F1.8691527						
	6835	10.9877263	40,0735092	+1.0003170	40.9373215	10,0733073	+1.8083740	4.484E-05	+.112E-03	656E-03
	SU/12	+1, 9210897	+0.1112250	+1.7:101833						
	CE 68-3	+P. 0228761	1,0171674	11.7992528						

STGHA X/Y/7 . 0.025 MM AT PHOTO SLALE

JUNCTION IN MIXELS BOOS - 8287

PT NO.	X71	γa	Za	XL	Υ1	Z3	٧x	VY	V7
474943	61,000,0007	+0.0126608	10.0220104	41-0057009	+0.0127225	+0.0239345	~.1630-05	6166-04	1808-04
4337	43.0.041240	10.0231030	10.0364031						
9084	+P.0053310	10.3350340	+1.8617073	+2,0090349	+0,9356064	+1.8613448	-, 384E-05	1.7766-04	1.3536-03
12276	+1,9917380	+0,0350372	+1.8099730	+1,3917395	10,0350021	+1.8091385	143E-05	648E-04	654E-04
8308	+1.97305.46	· 0. 97264(4-	+1.79(0040	+1.9730557	-0.9726955	+1.7963631	+.6906-05	+.488E-04	279E-03
26/4	+3,0755855	40.8369133	+1,87576385						
102 / G	40.004783R	0.0.26255	11.7. (45)(3)						
1013 755	4 6 05 740 31	-0.6003204	11, 250 35/3						
8871	13.0441706	+1+1000003	11,8445656						
SHELL	12.0113791	15.0719121	+1. SE2175476	12.011-011	41.2315/383	+1.8631527	130E-05	1.3305-03	4-6365-03
\$1372	+3,040\1441	0.00/34160	11.7442708					- Cardenia - Cris	12020
22007	01,0210564	10,1112737	11.79 11.8	41,0210867	+0.1112950	+1.7998833	+.7501-06	212E-04	G98604
State	12.0223780	-1.01723/2	+1. 79:11500	12.022061	1.0171674	+1.7993628	1.285E 05	648E-04	~ 1125-03
2273	+3.02438(-5	-1-1222184	+1.P177 KD					10112 07	a tribas "ort

STONA X/Y// = 0,017 MM AT (HITTO SCALE

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JUNCTION OF MODELS - 989-7 - 9795 vz PT NO. X.? Υ2 zə Χı ٧1 Z 1 vx w -.1048-05 +-174E-04 4837 +3.0231277 +0.0235275 10.0204265 11.0231294 10.0230036 10.0264091 -. 7COE 04 4886 14.0543204 13.0756060 +0.0415679 +0.9209058 +0.0564303 +.276E-03 13.0755855 +0.8368183 +1.8158285 +.2056-04 1.875E-04 -.930E-04 -.156E-05 +1.7208567 -0.00252% +1.7203533 +J.7903678 -.154E 05 -.179E-04 8875 13.0047312 -0.0337186 13.0047323 +. 8158-04 -. P91E-03 43.0573951 -0.6901448 11.0574031 33718 BBGA +4.00/33415 +0.3023477 1.8349331 0.1065927 +4-1131836 1.7574703 BEFAS +4.2299366 0.7105223 1.8005617 507 13, 3008339 -0.6351209 +1.7684403 +1.3134514 3864 +3.984(645 +1.1143587 8363 +4.1600525 +3.040.7434 -1.0463033 1.80626.7.3 -0,0094160 +1.744270B +1.8177360 -. 647E-OR -.193E-04 +.378E-04 +1.7443000. 13,040,941 2873 +7.0249671 -1,17221% 13.0340005 -1.1222184 -. 193E-04 ~.120E-05 +.1368-03 +1.7806164 11:6.2 +4. 1151244 +0.1038938 8871 +3.0441895 +1.1037221 +1.8445287 +3.0441706 +1.1040003 +1.8445855 +,190E-04 -.781E-04 -, 560E-04

SIGNA X/Y/Z = 0.010 MM AT PHUTO SCALE

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JUNCTION OF MODELS 19796 - 19795

PT ND-	XP	YZ	2P	×ı	¥1	Z 1	vx	٧Y	VZ
4896	+4+0543053	+0.0415512	10,0360352	+4.0543704	+0.0415679	+0.0254309	150E-04	+.9336-04	356E 04
4325	+5.0907054	10.0654791	+0.0329554						
503	(5.2429753	+1.2167867	11.0084792						
SOB	+5.2771282	-0.635487E	H1.8354193						
8655	+5.0098205	+0.0091071	+1,725099R						
2858	+5,2548507	-0,6403711	+1.8345530						
326.4	+4.0090475	+0.3828709	F1, 0346523	14.0033415	+0,9829477	+1,8349991	*, 60PE-05	-,767E-04	346E-0.3
8966	+4-1131737	-0.1054920	+1.7374170	+6.1131836	-0.1065987	+1,7374791	-,1585-04	+.997E-04	520E-04
3363	+4.2300215	-0.7106331	+1.8011061	+4.0290966	-0.7105229	+1.8006617	+.2496-04	-,1166-03	+. 4445-03
9123	45.1865786	+1.1497609	12.8260327						
3851	45-0665891	+1.1843141	+1,9242221						
3852	15.0992716	+0, 1037960	+1.7342330						
8453	45,1287061	-0.8813422	+1,8440153						
8861	+3, 3846863	+1,1146550	+1.0133602	+3.2846645	+1.1148587	+1.8139514	+.224E-04	20.3F-03	·-591E-03
8863	+4.1161264	+0.1030350	+1.7999700	+4.1161254	+0.1038938	+1.7336169	+.108E-04	+.912E-04	1.3535-03
8863	+4,1608603	-1.0471537	+1.8268336	+4.1503525	-1.0462023	+1.8252573	+.764E-05	-,2510-03	+ STEE 03
9123	+4.3158506	+1.2690548	41.0058434						

SIGMA X/Y/Z = 0.022 MM AT PHOTO SCALE

JUNCTION OF MORELS 3689 - 8504 PT NO. хz YЛ ZP X1 ty Z1 vx ٧Y νz 4835 (5,0906931 +0.0323983 +0.0055174 +5.0937054 10.0655731 10.0323554 ~. \$5587-04 1,3836-04 4.4.53E-04 41134 +5.1222576 +0.1084168 10.0473209 804 +1.6328305 503 +5.2423772 +1.2160759 +1.2167067 +1.8091700 15.2423853 +1.8084798 1.1916-05 1.8:28-04 +.6908-03 500 +5.2771134 0.0364587 11.3343093 45.2771292 -0.0064876 +1.8354103 -. B71E-05 +, 21445-04 -.5100-03 10 0306167 DOAL. 16. 100080-9 +1 771238254

884# 885% 8858 9118 9128 46.1377517 45.0003205 45.2540630 46.0813150 45.1865551 F1. 24651 78 11. 7248710 11. 8241384 11. 8341384 11. 036382 11. 0162384 11. 0162384 11. 8335476 11. 8335476 11. 7736384 -0.6023245 +0.0013516 -0.6410134 -,150E-03 -,223E-03 -,423E-04 -,354E-03 +5.00235325 -1.7250348 +.190E-04 +1.8345530 +.151E-04 +0.0801081 15,2542507 -0.6403711 +1.2497793 45,1905796 +1.1497608 41-810-3397 -, 2346-04 +,103E-03 .+,557E-03 9128 8841 8842 8842 8851 8851 8952 8853 9952 8853 9113 +5. 186551 +6. 1436343 +6. 1436343 +5. 145978 +5. 0565425 +5. 0565425 +5. 1287563 +5. 1287563 +5. 3416626 +1.1493706 +1.1463768 +0.1420596 -0.8760980 +1.1652154 +0.1037180 -0.6813199 +1.1774293 +1,7730394 +1,80,73071 +1,8750367 +1,7340149 +1,8430706 +1,8430706 +1,8294483 +1.8242221 -.465E-04 +1.7242339 +.726E-06 +1.8640153 +.5026-09 +.301E-03 +.376E-03 -.779E-04 -.219F-03 +.220E-04 -.444E-03 45.0005091 45.0932716 45.1327051 +1,1/49141 +0,1037%0 -0,83134/2

STGMA X/Y/Z # 0.026 MM AT PHUTH SCALE

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JUNCTION OF MODELS 3504 - 8483

P1 NO.	X2	Ya	2,7	XI	¥1	Z1	vx	VY	vz
4334	(6., 1222601	+0.1084348	+0.0474020	+6.1222070	10.1054168	+0.0473059	+,1512-05	+,1500-04	1.751F-04
4883	+7.15%8467	10.1571351	+0.0504696						
9118	P6.0811142	+1.2498448	+1.8346835	+5-0811158	+1.2437793	+1.8342842	~.158E-05	+.685F-04	+.3395-03
8846	+6.1602841	10.0345301	+1,7756681	+6.10-02359	+0.0146067	+1.7758894	171E-05	-, 965E-04	221E-03
3843	+6-1377534	-0.0033116	+1.346.3.45	46.1377517	~0.6023245	+1.846517B	+.178E-05	+.128E-04	··.253F-03
9108	+6, 0929717	(1.2000100	41.83869134						
18336	+7.2047035	10.1520728	+1.8146335						
0898	+7.2343363	-0.5000007	+1,838/3456						
509	17,2807161	-0.50516P7	+1,8304185						
23.31	+7.17690001	+1.0031853	11.7953002						
PB 33	+7.2503563	-0.8676635	11.8785003						
3842	+6, 1459844	+0.1413558	41.7739693	16, 1453790	40.14/20556	+1.7730.954	+.5607-05		+.2735-03
8341	46.1406512	+1.1472136	+1.8.103614	16. 1AMC 748	+1,1469768	+1.8375476	+.164E-04	+.236E-03	+.7935-03
233.3.2	+7.2447031	+0.1865149	11.8186-072						
8543	16,1151105	0.8761271	11.0073833	16.11500031	-0.8760380	+1.8676071	+,1142-04	~.291E~04	· . 223F-03

SIGMA X/Y/Z = 0.000 MM AT PHOTO SCALE

JUNCTION OF MUNELS BARD - BURD

PINO.	×	Ya	22	*1	YI	Z1	vx	VY	V2	
4893	+7,1596449	10.1571577	10.0504201	+7.1596467	+0.1571851	10.0504696	~, 1895-05	27.8E 04		
4882	18, 1806707 16, 9959607	10.2147370	+0.0500A17 +1.2351355	(6.9329717	11.2390100	+1.838:3204	·	+,1530-03	5.20.3E-03	
88.36 88.39	+7.2047000	10.1529462	11.0140541	17.2047035	+0.1529723	+1.8146.0.4 +1.878/3458	143E-05 +.111E-04	265F-04	· 2858: 03	
9038	18.1453772	11.2058343	11.7857100.						**1030-03	č
33.23	48.04054.47	0.4090513	(1.1/35/754							
509 \$3291	17.2303065	-0.5051179 +1.13:6716	11.763.980	+7.2703161	0.5051687	*1.8394185	952E-05	1.5078-04		
89/33 89/33	48.2243948 48.2125912	0.7375311 +0.2541243	41.835/#v03 (1.8916657							
883.2	+7.2443048	10.1064135	11.812 6.23	17.2443031	10.1865143	+1.8186077	-,4220-05	1018- 03	- 2448-03	
3033	17.1900100 (8.0728504	+1.0021375 FJ. 3003553	11.7854244 11.7854244	17,1157.811	11,0071523	+1.7953002	1,11%-04	477E-04	701E 04	

БИЗЈ 17.2°40/157 -0.80/ИЗН1 11.870/702 17.4946661 -0.86766666 +1.87856003 1.80/8-05 -.1670-03 4.8596-03 SIGMA X/YZ = 0.011 MR IT PINTD 309.40

JUNCTION OF PRODUCT 2000 - 0255

PT NO.	×2	۲2	20	XI	Υ1	Z1	vx	ΨY	V2
4072	+8.1066733	10,2347707	10.0006-53	114 1864-707	46,2147370	+0.0600497	+.5618-05	F.337E-04	2445-04
4931	+9.P397003	10.2004966	10.0310501						
2038	+8.1483840	11.2657085	¥1.7854903	18.143377.3	+1, <i>265</i> 8343	+1,7857105	+.7496+05	457E+04	-,218E-09
8376	+8.2191444	10.1P22435	+1.R220475)	18.2101327	+0,1222160	+1.8220579	+.573E-05	+.376E-04	135-04
355.3	18.0406.4134	-0.4950313	11.8366260	18.09:8647	-0.4950613	41.8357754	~,19RF-04	··. 20%E-04	+.250E-03
3038	19, 19, 95540	+1.4274623	1.8216841						
8816	13, 3715314	10,48-4733	+1.7711484						
8018	19.1107723	-0.2330138	1.5630077						
205	18,5352500	10.3503554	+1,7401421						
510	49.4248715	-0.3444803	11.85.30811						
3311	+9. P002171	11.1514173	11.765.003						
3813	19,36633009	-0.7116886	 *1.*%*\$310 						
8821	+0.2134124	41,13,5401	11.762:1174	+3,2134007	11.1326716	+1.7633360	+.274E-05	~.1225-03	-, 4088-03
33/23	111, 201, 2020	-0.7372203	+1.8949007	18,7242040	-0,7375311	+1.8952539	113E-04	+.310E-03	-, 350E-03
381.2	19, 33:40501	10.3335718	+1.7973866						
3482	12.2125014	40.2541477	+1.37134.4	+8,2125917	+0.2541243	+1.8216457	+.102E-04	+.234E-04	24%E-03
2083	18.30/00/002	+1.3335133	+1.7634209						

SIGMA X/Y/Z = 0.015 MM AT PIKITO RCALL

JUNETION OF MODELS 2231 - 8180

pt NR.	x2	Y2	22	81	Y1 '	21	Vχ	ΨY	VZ
4631	11.2300/92	10.2305775	+0.0303838	+9.2797003	+0.2904364	+0.0810501	~. 1090-05	+.B09E-04	602E-04
4830	110.0081004	10.3372538	10.0015043						
30141	13, 13, 24, 05 B	+1,4274138	+1.8213931	+9,1925540	+1.4274643	41.BP16841	+.518E-04	544E-D4	300C-03
8816	+9.3715973	10,4025734	+1.7703₽60	+3.3715014	+0.4824793	+2.7711484	+.156F-QS	+.1005-03	16-26-03
2313	19,1127199	-0.2333465	(1.8703n2	12.1227723	~0,2030398	+1,8698077	SEBG-04	126E -03	+.52%E.03
3076	+10.1609775	11.46360 \0	+1.3372350						
306	110.3202170	10.4603842	11,7985144						
BROW	+10,4680730	-0.405970	11,0000023						
3744	+0.867/2294	- 0.0480 Kil	11.3531297						
906	410, 1369242	10.746-2014	11.7434385						
510	+0,4240300	-0.2445707	+1.8545L/B	19,4248715	-0.2444803	+1,8839911	+.58SE-04	898i: +04	+.6761-03
3801	+10, 3161774	+1.1495304	+1.007.0G2						1.1.0.1.1.0.1
8803	410, 3377125	0. 52400213	+1.0105014						
3812	10,000000	+0,3335684	1,7278-20	+9, 3790501	40.3334718	+1.7973866	4.4036-04	+. 30FE-04	4.4425-03
2311	19,2038502	11.1515991	11.70045.48	+1. 206det 71	11.2514100	11,7653903	+. 3315-04	+ 136C 03	+.6250-04
207.1	+9.37/4/37/	11.0206369	11.8.076.01				17 Starty, 101	411100	4+062000-004
5502	+10.3601519	10.485EHild4	1.0046.00						
3813	F9, 0064227	0.7120101	11. 92 (5941)	19, 3063060	-0.7116866	11.9826310	+.2586-04		
2012	in wooner?	Sec. 17 COLOI	1. 1. 1. Sec. (1999). 1	1 JA 2010 JULY 1	-04 11106690	11.00000330	7.4705-04	3/36-03	4.9546-03

STONA X-Y/Z = 0.027 MM AT PLOTD DCALE

JUNCYION OF MUCELS BING - 8075

٧Y VZ er an. ٧X X2 4.3 72 Xı 71 Z1 (10, 30/1240 (11, 4543358) (10, 1689468) (10, 3802346 40,3071770 40,5008952 41,46,27286 40,4633817 10.08150.01 +0.0915043 +.146E-04 -. 8F-7E-04 -.113F-05 40000 110.3021004 +0.3972638 10.0059011 4079 +.1798-03 +.4222-03 -.1022-03 -.3657-04 +.6392-04 -.384E-03 3078 11.03/6575 110, 1680775 110, 06680 79 110, 4680720 11.40-0030 +1.8378350 -. 30FF- 04 +.167F-04 -.683E-00 3206 +0.4539842 11.9000023 mon 110.4680713 -0.4005340 41.0443284 +0.0662941 11.8355173 2068 2796 2796 504 +10.5038397 +1.8269048 +1.9304073 (1.8304573 (1.8522203) (1.8425340) (1.8425340) (1.8714227) (1.8714227) +10.9501829 10.0795797 +1.1604057 -0.3127094 +10.12/98033 +10.6859157 +11.415630, +11.55617 +10.359171 +10.3161335 511 8701 11.53053%2 0.4025503 10.4851827 11.1435970 +1.0043155 +1.0043155 +1.0043155 \$/01 -.755E-04 +.764E-05 +,185E-03 110.3631519 +1,2046236 +,2346-04 01202 +0.485/2524 +.2900-03 5301 +1.1436894 +1.8073562 +.615E-05 1061 410.8300607 41.4467453 10.5003072 41.8255106 11.3177c30 8792

STOMA X/Y/Z = 0.014 MM AT PHOTO SCALE

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JUNCTION OF MODELS 6064 - 6465

PT ND.	72	Y2	Z,P	×ı	Y1	Z1	VX	VY	¥2.
487.4	:1.0000003	10,0384.323	40.0115902	+1.0000000	+0.0384690	+0.0116004	+.342E-06	JREE-04	~.116E-05
496-5	12.0076125	10.0640051	+0.0129433						
53.33	16.7606627	+0.7450454	+1.7850100	+0.7686334	10,7450530	+1.7.47755	3052-04	135E-04	+.2355-03
35.46	11.0503180	10.072 30.4	+1.7327905	+1.0503172	10,0724236	41,7327039	+.8922-06	-, 371E-04	+.807F-04
36.42	10.8202479	-1.0356112	+1.7381761	+0. RP02126	-1.0356936	+1.7385109	+.2935-04	+.873E-04	3146-03
55353	F1.0806134	40.2245821	+1.6252717						
200.565	17.071774	-0.070:8/37	11.7203103						
PLIN	1.787975B	-1.0331505	+1.7733004						
5.05	11.5355551	+0.3614203	11.70/345.25						
506	+2.0281277	+0.8382032	31.0044719						
PC51	17.0628521	+0.9349006	+1.7077833						
1395.3	+1.9518032	-0.3770174	+1,7714237						
3642	40,9695125	+0.1489736	+1.7106306	+0.3695162	+0.1429261	+1.7165622	-, 364E-0S	+.495E-04	+,1185-03
0641	11.1561431	+1.1043145	+1.7516474	+1.1560416	11,1038411	+1,7504797	F. 100E-03	1.473-03	+.116E-02
20313	11.6034060	+0.6585310	41.7162149						
8652	42,0546265	10.1167952	+1.7119350						
3643	+1.03.0013	~1.0245441	11,7587913	+1.0310152	-1,0250942	+1,7595433	~.1386-04	+.5502-03	~,751F-03

STGRA X/Y/Z = 0.033 MM AT PHDTR OCALE

 JUNCTION OF MIDELS 6465 6566

PEND.	X2	YB	Zi≠	X 1	Yı	Z1	vx	vv	vz
4865 4865	12.0076240	<0.0643751 +0.0449635	10.0129175	12.007612%	10.0640661	+0.0129439	+.1158-04	+.103E-03	2639-04
38789 36783 36783 36783	+1.9800745 +2.0319959 +1.7874905 +2.8591259	40.8240.833 -0.0707831 -1.03343.0 40.6332545	+1.051257 +1.7264334 +1.7738903 +1.7026858	+1.9806194 +2.0319774 +1.7875658	+0.8/45821 -0.0709027 -1.0331505	+1.5952717 +1.7268161 +1.7733004	+.4512-/34 +.1857-04 7532 94	+.567E-04 +.119E-03 285E-07	149F-03 377E-03 +.5490-03

2666 3663 368 368 3681 3661	+3.0142252 (2.717923) (2.0231635 (7.2225755 +3.079351	+0.0351280 -0.9707057 10.8387334 10.5552075 +0.9873560	11,7226317 11,7654451 11,6941313 11,6767817 11,6806560	12.0021217	+0.8387932	+1.6,44719	4.350E-04	-,537/-04	-, 340E-03
8662 8652 8651 8651 8651	42, 92,006,68 43,004,8005 12,004,659 42,050,818 42,505,6025	-1.0523389 +0.0320213 +0.1163072 +0.3276566	+1.7653602 +1.7197265 +1.7121215 +1.7060076 +1.7047681	5 12:0566285 12:0521621	+0.1167953 +0.9949006	+1.7119250 +1.7077892	+,294E-0 +,197E-04	+.112E-03 370E-03	+.186E-03 846E-03
8653	+1.0517830	-0.9771830	11.77198.8	+1.9518032	-0.9770176	+1.7714397	2018-04	1650-03	+.543F-03

JUNCTION OF MODELS 8556 - 6667

CT NO.	xa	72	22	×ı	71	Z 1	vx	٧Y	V7
4866	+3.0341775	+0.0150502	+0.0137057	+3.0341703	10.0449535	+0.0137095	+.7355-05	+.867E-04	-, 377E-05
4367	14.0265871	:0.0103419	+0.0106410						
8368	+8,8591717	10.6332741	(1.7024313	42.8901299	+0.6322545	+1,7026852	+.458E-04	4.1955-04	· 253F 03
14.94 45	+3.05483797	+0.0362207	1,7227035	+3.0540252	+0.0361/20	+1.7226117	+.107E-04	+,927E-04	-,2736-03
3658	(2.7978592	-0.9703042	11.7649753	+3,7379230	-0.9707057	+1.7644451	~.6405-04	1995-03	+.5302-03
3878	13,9531050	+0.7705357	+1.6-9246-97						
3676	+3.95(5795	-0.0044880	41.7062220						
26.75	13,3130389	-0.2303754	+1.7505350						
507	+4-2300021	+0.7305326	41.058:0702						
8671	(4.0538339)	40.0378064	11.0725020						
86.73	13,8646652	-0.9535304	+1.7503463						
866.2	13.0042292	+0.0321105	+1.7194400	+3.0043035	+0.0930213	+1.7197265	+.1975-04	+.892E-04	285E-03
2664	+3.0799459	+0.9272170	F1.6801850	+3.0799361	10.9273560	+1.6806549	+.984E-05	-,138E-03	-, 458E-03
26.72	44-07:0060	10,0473375	11.7013695						
D64.3	47.0230.001	-1,0525806	+1.7654575	+2,9230668	-1.05-29.3939	+1,7653638	+.113E~04	+.2498-03	+, 2000E-04
1373	+3.2702207	+0, 3486152	+1.713RF45						

STREES FORTH OF 0.013 NM AT PHOTO SCALE

JURA FIGH OF MORELES. COLT - G76R

PT ND.	*2	43	2.2	×1	Y1	<u>/1</u>	٧X	Vγ	¥7	
4367	14-0265793	(0.01033F4	+0.01544-55	14.0200001	+0.0103419	+0.0156110	TT.L. 10.	1145-04	+,7356-04	
4968	+5-02X-0185	0.0194206	10,03/3311							
£38/1R	43, 9531100	10.7705520	11.1021401	F349581674	10.7706957	+1.6024647	+.567E-05	.3/3 04	- 3P46 -03	
8676	+3, 2455764	0,0045070	11.7001701	+3.0(4).16	0.0044800	+1.706-2230	904E-05	140L 04	+-1578-03	
3678	13,813,600	-0.3303122	+1.7507237	43.819130	G. 9506754	+1.7505360	+.1115-04	+.5715-04	+. 337E-04	
8959	25,1111907	10, 5084678	11.6323500							
3686	15-0510757	-0.052674H	+1.7.FT-)439							
8648	+4.7505003	-0.0817297	1.7574213							
311	44, 3375447	0.8050046	11.75/1057							
207	14.2350527	10.7334732	+1.(68.655	14	10.7325326	+1.6685202	32.32-04	··· 5438-04	-154E-03	
05.01	15,088 8:20	10, 9257845	11.6411786				1.22.4		- 4 D-HL 10.3	
DEP 3	14,9744352	0.329 1512	11,7697323							
2673	+7,0615,210	-0.2388755	+1.7508564	+3.5616552	~0.3835804	+1.7503483	341F-04	~		
BG71	14-053879	10.1.371040	11.67055-28	+4.05900001	+0.8372064	1.6796090	205E 04		+. 5086-03	
86.92	15.03036-27	+0.0158506	1.7312149	1410.0000.00	1010311-1444	110120020		.1026-03	\$61E-04	
100242										

¢

0872 44.0707925 -0.0420344 +1.7012153 44.0788080 +0.0480375 +1.7013698 -.1346-04 -.3036 05 -.1546-03 8883 44.0998759 40.2759802 +1.7134806

STONA X/Y/7 . 0.014 MM AT PHOTE SCALE

JUNCTION OF MODILS (1768 - 666)

PT ND.	821	Ye	Z/?	*1	Yl	Z1	VX	VY	∨z
436-3	45.0200100	0.0194442	+0.0323312	15,0203185	- C. 019620B	+0.0323311	784E-05	2.34E-04	+.501E-04
426.9	15, 9305254	-G., O%74330	10,0258500						
8868	15,1111834	10, 50334006	11.6023/44	+5.1111967	+0.5384696	+1,6927500	152E-04	-, 599E-04	-, 255E-04
3636	15,0510664	0.05/7040	11.7301133	+5.0510757	·0-0586748	+1,7299439	-, 928E-05	+. E92E-04	+.249E-03
0680	14,7535326	-0.9946103	41.7671470	+4,7592000	-0.3817237	41.7674219	+.3336-04	+.112E-03	-,273E-03
8353	+6-130,4737	+D. 5317C81	11.71770.83						
36-96	15, 9579256	0.0%0755	+1.7479533						
80.99	15.0075693	-1.03.0164	+1.7764160						
508	+G. 15263881	10.5353220	11.7105215						
312	45,5285288	0,8002100	1.7430307						
06/31	+6-0420418	+0.9736570	41.62.2012						
56.93	45.9561958	-1.0532330	F1. 7746 8.3						
2082	15.0909508	10.0153424	+1. 7313 352	45.030621	10.0153555	+1.7312149	··. 118E-04	16)E-04	+0-3E05.+
0651	15.0191200	+0.9257103	11.6411454	+5. 0/01.4-29	10, 3257845	+1.6411786	1156-04	736E 04	331E-04
8853	15.0752101	40.35/2534	11.7347791						
16.9.2	15,0276453	10,0229202	11.7405(10						
9080	+4. 9744344	0.7271477	+1.7094239	+4, 9744 %?	-0,9233612	+1.7697373	1716-05	4.2130-03	"DZE 09

SIGNA X/Y/Z - G.DIL MM AT PROTO SCALE

JUNE TION OF MICHLIS 6000 - 6970

PT ND,	xæ	¥2	43	×1	Y1	Z1	VX	٧Y	vz
4869	+5.300062P	0.0573(5)	10.0250386	+5,0105/56	-0-05743JD	+0.0258800	+.37PE-04	4.105E-03	415E-04
4270	+6.000130034	-0.1108737	10.02/1444						
8923	16,1302936	+0.53:3005	41.7174322	+6.1302737	+0.5337681	+1.7177023	+.13RE 04	+.375F-04	211E-03
8605	+5.9572.60	0.0 57617	11.7475511	+5. 35.7 226	· O. 0958755	+1.7473533	+.4046-04	+.1136-03	401E-03
DECK!	+5.0674777	-1.0033235	 7770 808 	15,6675013	1.0030704	+1.7764160	9155-04	2936-03	+.6592-03
8343	17.0057014	10.4563013	 7.525623 						
8705	46, 846 301 3	-0.1523174	11.7436752						
27(%;	16.6711152	-1,0210305	+1. 76-517.5						
503	15, 1528:00	10.5.53.39	41.7101510	46.15.07308	10,5353750	+1.7189295	6328 -06	+.795E-05	377E-03
51701	17.0177457	+D. 7 (98527)	+1.66(10.341)						
870.3	16. 1214 8. 57	-1.1307.345	11.76453313						
8853	15,0752060	10, 3131976	11.7245057	45-075-131	10, 3129534	+1.7247701	6.43/1.04	*.245C 03	27#F-03
36/31	16-0420517	10.2732726	11.6831.27	16.04.30418	10.3734670	+1.6838918	+.9996 -05	194L-03	690F-03
3343	+6.2473773	10.1900479	11.7334 1.42						10001-00
3702	+7.0297421	-0.19576/10	11.74(05/2)						
DUNC	+5, DE 704/06	(0.0220/033	11. 74 30 111	15, 0076455	10,0233.02	+1.7436810	+.2436~04	179E O 1	+.1306-08
8003	15.056-212	5.01714475	0.77515.0	45.4461956	-1,0532331	11.7746:053	+.2540-04	214E-03	+.497E-03

STORA X/Y/2 # DLOCA MM AT FHUTH SCALE

JUNCTION OF MERCLO 64970 - 7071

250

PT ND.	X2	γ2	27	~1	73	21	V2	VΥ	V7
4970	46.0669776	-0.1108197	0.0201255	45-060223	-0.1300/17	10.0201444	11.2. 64	1.0110.05	.161F-04
4871	+7.9846238	-0.1563680	1 4 4 4 6 4 6 4 4						
8843	+7.0055331	10.4567346	11. 3325540	17.007.8731.9	10.4508010	(1.72.4.80)	1.0736 05	100 03	1. 118-04
0706	46. 34525297	0.1523201	11. Incat	10-1250-2011	1573174	11. 7412. 15.1	- 15 ¹ C 05	- (A 0)	1.223 01
B708	16.6711397	-1.08033/4	+1. /6 11	16.6711252	1.0210385	+1.7651772	1.2451 04	1.1064. 0.4	. 2410. 00
813.313	+B. 1587203	10.4074349	11.70L						
3716	17.0365524	-0.2058254	+1.75564						
8716	17,7444545	-0.9788864	11.7553700						
313	17.5424078	-1.258.7764	+1.7205393						
509	+8.1442476	+0,4051375	+1,7070201						
0711	+8.0.01927	+0.8158101	+1.6304100						
8713	+7.8753153	~1.1303420	+1.7047508						
8702	+7.0237404	-0.1360132	11.7460/285	+7.0.2	-0.1357040	41.7400050	1672-05	1.2 CC 03	
3701	+7.0777627	+0.7988232	+1.6211581	47.0777	10.7528533	+1.6810243	+ 1706 04		1.1.3 0 03
									1.1:7:F-04
884,3	16.0479917	10.1900290	+1.7395705	+6,9479777	10,1900479	+1.73343.32	+ 38/F-02	1102-04	11111111-04
8712	+7.9193018	-0.0569580	*1.7471132						
8707	+6.8049341	-1.1311108	+1.7653566	45,894,0.69	1.: 307245	+1.7049813	5.3°E-04	~.334.03	1,4755-03

SIGMA X/Y/Z - 0.014 MM AT PHOTO SCALE

JUNCTION OF MODELS 7071 - 7172

PT NO.	xa	Ya	ZP	X1	Υ1	71	vx	VY	vz
4871	17.3846456	-0.1557916	10.0206053	17.92462 18	-0.1568683	+0.0205664	+,217E-04	+.7/1E-04	4.3926-04
487.2	18.8781358	0.2030478	+0.0167363						
2233	48.1597R37	10.4074710	11.7062430	+8,1587803	+0.4074849	+1.7055354	+.291E-05	~.1305,04	34ZE-03
2716	17.9965741	-0.2067499	<pre>+1.7554497</pre>	+7.9969524	-0.2008254	+1.7556053	+,2170-0,	+.754E 04	155F-01
2718	F7.7444080	-0.9790252	+1.7594355	11.7444545	0.9728364	+1.7539705	-, 464E-04	-,130F-03	1.4590-03
50.73	+R. 9041897	40.3/55859	1.6067241						
340	12.9914239	-0.3313362	+1.7760342						
87.51	424 4402026	0.8725495	+1.7780005						
50.)	44, 1662205	10.4051370	+1.7059918	18.14404	+0.4010.025	+1.7070201	4.2016-05	4.5004-04	· . 65:2E-04
8721	特別にお客い場	40, 7747134	+1.6892002						
B723	18.5714688	-1.1337032	+1.7754476						
8712	17.010350	0.0570475	+1.7473099	+7.9190018	0.0569514	. 7471112	1 04	· . R 25E - 04	+.2376-00
82.0	18.023 7714	(0.05)1423	+1,7410077						
B711	01.0302348	10.8157504	+1.0000245	+8,0301927	+0.0150001	1.1.1.164	1492-06	~.54(4.04	332E 03
8722	17. 317751-1	-0.0237117	+1.7FG5289						
8719	+7.8752853	1.1307281	+1.7502364	17.8753153	-1.1.30.14.20	11. R.4 P. ()	,2904, 6-,	- 3864-03	+.4776-03

STOMA X/Y/Z = 0.013 NM AT PHEINI SCALE

JUNCTINN OF MODELS 7172 - 7273

11 1404	20	, L.		~.	14		VA	22	V2
437 <i>2</i> 4873	+8.8781407 +3.8140557	0.2033431	+0.016(%	01,0781,358	0.2033473	10,01673-1	LASCE OF	+.104E U3	+.7J4F-04
8870 87,25 87,29 8311	18.0042320 18.0514200 18.7281611 19.9778112	+0. 7154784 -0. 7313010 -0. 8720439 +0. 3703070	41.0002417 41.7779835 41.7784001 41.7240071	(† 1977) 18. – A. J. J. 18. 728,2114	+0.3155853 -0.0913962 0.07254 <	+1.6957241 +1.7780343 +1.778060	.423E-04 .98E-05 .176E-04		4832 -03 9065 -04 +. 4930 -03

-0.2744175 ~1.2419104 -0.6185240 40.5087838 -1.2478285 -0.0337545 40.0534042 +0.7942878 -0.2155048 -1.1342252 3736 3738 314 8731 19. /461453 (9. 6801150) +0. 0171702 +9. 0171702 +9. 731. 1031 +8. 0177716 19. 0452546 +8. 9668148 +0. 2136466 +8. 9668148 +1,7805357 +1,7672743 +1,7846536 \$1,7844536 1,6887167 1,7752433 1,7752433 1,7504650 1,7504650 1,7504650 1,7504650 1,7504650 1,7702473 1,7763840 8733 8723 9873 +1.7655739 +.135E-04 -.428E-04 -.202E-03 18.9177661 -0.0837117 +1.609200P +.26%E-04 -.455E-03 -.785F-03 8721 HR. 9F&37845 10.7247134 +1.7754476 -.061E-04 -.443E-03 +.936E-03 8721 R. 0704026 +8.8304648 -1.1337838

GIGHA X/Y/2 = 0.031 MM AT PHOTO SCALE

JUNCTION OF MODELS 7273 - 7374

PT ND.	x2	Y2	Ze	×1	Y1	Z1	VX	VY	vz
4873	+3.8142540	·0.2762853	+0.0191633	49.8142562	-0.2763400	+0.0191788	+.2852-05	+.546E-04	1548-04
4874	H0.7773273	-0.3464433	+0,0320439						
981B	+9, 97/8020	+0.3703331	+1.7245703	19,9773119	+0.3703070	+1.7246671	~. 891E-05	+.12JE-04	361E-04
8736	19.7441554	0.2743541	+1. 780,4695	+3.744145+	-0, 2744175	+1.7805357	+, 101E-04	+.533E-04	166E-03
2733	+9.6801097	-1.2420305	41.7675519	+9.6301198	-1.2419104	+1.7672743	100E-04	~.120E-03	+.2778-03
3744	+10,7538786	10, 5206270	41.7053490						
8746	110,9425977	· 0. 3/72675	41.7652390						
8748	+10,7354630	1.8286581	+1.7737057						
\$10	+10. E325917	10.3333751	11.7170255						
314	+10-0171358	0.6136123	+1.7347408	+10.0171232	-0.€135640	+1.7846696	+.126E-04	- 4838-04	+,712E-04
8741	+10.7692724	+0.5447309	1.7053445						
8743	+10.7400851	-1,2270132	11.7741325						
8732	+9, 3136 332	-0.2156047	 7701646. 	+9.8195446	-0.2155048	+1,7789473	469E-05	~, 9398~04	+.2215-03
3731	+9, R165:942	10.5-05734	11.6304455	19,8167040	+0.5987838	+1.6997102	379E-05	-, PD4E-03	-, 261E-03
8B13	+10,1740517	-0.0701907	+1.7593548				10124		FLOID D.
8730	+9,7305334	-1.2473730	+1.7755.378	*D. 7305 '81	-1.2472265	+1,7752493	-,467E-05	146E-03	+.3086-03
3741	110.230.4646	-0.7373376	11.7653916		-110410000	· · · · · · · · · · · · · · · · · · ·	-1-10/12 (15)	-,1442-03	** abel: "0a

STGMA X/Y/7 = 0.013 MM AT PHOTO SCALE

Dimost-

JUNCTION OF MODELS 7374 ~ 7475

PT ND.	X.2	YE	22	X1	Υ1	Z 1	vx	VΥ	vz	
41374	+10.7773212	0.1454077	+0.0320325	410.7773278	+D.3464439	+0.0320409	654E-05	+.3612-04	**113E-04	
4975	111.7167695	0.4057220	+0.0206723							
8744	+10.7939021	+0.5200355	+1.7050405	110. /533756	10.5206-270	+1,7053490	+.8356 04	F.858C 05	~,302E-03	
8746	+10, 9425924	0.3372301	11.7651674	110,942%1/7	-0.39/2575	+1.7652002	SP6E-05	+.373E-04	-,1318-03	
\$74B	110,7355578	1.2287401	£1.7741512	110.73546-5	-1.2286584	+1.7737057	117E-04	8709-04	1,4456-03	N
37:33	111.2.20446	10.5055973	+1.CO70042				11110 94		4.94201.005	G
0755	+11-7924703	0.3839595	11.75756-28							Ni
8758	111.6120103	-1-4013050	11.7756810							
5803	+11,3008621	40,0048019	+1.7413040							
511	+11.5270033	10,1535102	11.7355436							
315	411.5923343	-1.3744763	+1.7753336							
8751	+11,73766/03	+0,5173566	41.7257650							
8753	+11.6602086	-1.2011770	+1.7780271							
8203	+11,2057063	-0.0105810	+1.7511062							
3757	111.0365504	-0,3961320	11.7571053							
	1111100000000		14. 790 10.03							

-___=

8742	+10,7408015 +10,8329793 +10,7632003	-0 2174223	14 70.00 23.2	A10 100-16.66	-1.2270132 -0.3273976 +0.5447309	+1.7653916	4.1537-04	230E 04	4.2798-04
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SIGMA X/Y/2 = 0.023 MM AT PHOTO SCALE

JUNCTION OF MODELS 3637 - 37.38

PT ND.	хa	72	Iù	×1	41	Z1	vx	٧Y	νz
4837	10, 93, 13360	+0.0012482	+0.0007388	43.0000000	+0,0311519	+0.0008365	394E-05	+.96.3E-04	4368-04
4838	42.0233541	+0.2149018	-0.0131645						3555-03
86.42	10,9303775	+1.1501834	<1.7575622	10.0003346	+1.1503603	+1.7579477	-,7006-05	768E-04	
8376	+1,0470305	-0.0442334	41.7851908	41.0470435	-0.0443836	+1.78528P3	-,3988-05	4.93JE -04	914E-04
U37B	41.0460F6R	-0.6505654	+1.7803133	41.0460519	-0.6504537	+1.7797928	+.1498-04	112E-03	+.5202-03
8658	12.0102399	+1.2574723	+1.7697433						
3336	11, 331 3351	10.3030323	+1.7658024						
2.018	12.2160465	-0.3584137	+1.7551334						
316	12.2411540	~0.3337236	+2.7431141						
310	+2.2107478	+0.7259153	+1.7634430						
2321	12.0135238	+1.1032378	+1.7700744						
3333	12,1395160	-0.7556271	+1.7588846						
8372	+1.0048263	10.0379848	+1.7873180	+1.0048301	40.094109B	+1.7878769	-, 3186-05	1196-03	- 588E-04
8371	10, 2811353	+1.0525508	41.7811971	10.9211352	41.0630220	+1.7870985	+.6298-06	471E-03	901E-03
864.3	11.2113568	+1-1843440	+1,7742515	+1.2120382	+1,1845050	+1.7748998	-,8136-04	1EOE-03	643E-03
838.3	12.0434773	+0.2024252	+1.7636759						
3373	+1.0464301	0.8876258	41.7793297	+1.046-127	0.8875184	+1.7787685	+.174E-04	3078-03	+.5610-03

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

JUNCTION OF MODELS 3738 - 3839

PT NO.	x.?	Ya	ZP	×1	¥1	Z1	vx	٧Y	٧Z	
4238	12.0233436	+0.2149605	-0.0181986	48.0233541	+0.2149018	-0.0181585	104E-04	+.SB3E-04	2418-04	
4239	+3,0098746	+0.3314505	-0.0451403							
3658	1P.0102250	+1.85740.24	41.7694079	12.0102333	+1,2574783	+1.7697483	14BE-04	698E-04	310E-03	
8.335	+1.000133951	10.3040515	+1.7655011	+1.9813351	+0.3039329	+1.7658024	9948-05	+-5876-04	121E-05	
8,428	12.3160015	-0.3334534	+1.7554751	12, 2100465	-0.3984137	+1.7551304	+.351E-04	477E-04	+.3354-03	
8668	13,0674173	1.4323574	+1.7330637							
8396	13, 1447339	+6.3231774	+1.7351745							
8.734	+3, 1020358	0.2107052	+1.7390463							
310	+P. 2107438	10.7760234	41.7635.320	+2.2107478	+0.7259153	+1.7634430	+,1026-05	+-1146-03	4.890F-04	
316	12.2411842	-0.33876.5	+1.7403617	48,2411540	-0.3337736	+1.7491141	+. 3075-04	3790 04	+.2475-03	
8391	13.0021454	+1,1897218	11.7464113							
8393	13,1133907	0.6753037	+1.7284016							
Sig.	12.0434732	+0.2023074	11,76-37235	+2,0434778	10,2024252	+1.7636759	~.4596-05	*+ \$77E-04	+.476E-04	
8331	42.0136133	11.1690193	+1.7620574	+2.01062381	H1. 1697378	+1.7700744	1045-04	218E-03	206F-03	
3653	42,1769854	F1.33432-31	41.76234477							
8283	+2.1395560	-0.75(3.2)3	11.7555183	+2,1735100	•0.7555.271	+1.7538836	+.4002-04	202E-03	++6308-03	
8332	13,0969,331	10.0643641	+1.7371123							

SIGNA X/Y/7 = 0.016 MPLAT PHOTO SCALE

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	JUNCTION	IN MODELS BE	3340						
PT ND.	x.'	12	27	×1	¥1	21	vx	٧Y	v7
4839	13.0038557	(0, 3315123	0.0952810	+3,0030746	+0.3314505	-0.0451408	188E-04	+.67RE-04	~.140E-03
4840 8558	14.0057722	+0.4730179 +1.4332796	+0.0523919 +1.7523041	+3,0674173	+1.4322574	+1.7339632	+.104E-04	+, 3125 -04	-,253F-03
8.195	13.1447135	+0.3232481	11.7358152	+3.1447.033	+0.3231774	+1.7061746	~.207E-04 +.280E-04	4.707E-04 159E-03	-, 3590-03 +, 7580-03
83-93 86.73	+7,1020644 +4,1382646	-0.2109550	+1.737056 (1.6612557	43.1020358	-0.2107052	+1.7320469	+.28(42*04	1692-03	· · · · · · · · · · · · · · · · · · ·
2405 2403	44.0172724 14.1510275	+0.7405.43	+1.717062B (1.7068203						
3401	13, 0856508	+1.4816005	+1.7024050						
8403 8342	44.2770120 13.0969680	-0.0468326 +0.2648333	+1.7045474 +1.7376234	+3.0969331	10.2643441	+1.7371123	+.357E-04	-,105E-03	+.5168-03
8391 8660	(3.0021653 +3.2079533	+1.1895469 +1.3502664	+1.7459571 +1.7308072	13,0021454	+1.1297218	+1.7484113	+.20%E-04	-,174E-03	~.404F-00
8393	13, 113, 913	-0.6758779	+1.7236847	+3.1100392	-0.6753037	+1.7284016	+.531E-04	574E-03	4,1295-02
8402	+4.1296.325	10.5480058	41.7133432						

SIGMA X/Y/Z = 0.037 MM AT PHOTO SCALE

SUNCTION OF MODELS 3940 - 4041

PTNO.	XS	Y2	22	X1	¥1	Zi	. vx	٧Y	VZ
43140	+4.0557750	10.4720482	-0.0628363	+4.0657722	+0.4730179	-0.0628919	+.281E-05	696E-04	+.S512-04
4841 3670	+5.1300217 +4.1360203	+0.6144545	-0.0858940 +1.6916407	+4.1382645	+1,5310997	+1.6912552	+.247E-04	+,1380-03	+, 3356-03
3406	+4.0172736	10.7494538	+1.7169469	14.0172724	+0.7495243	+1.7170528	+.1212-05	644E 04	115E-03
8408	+4.1509987	10.10506.96	<1.7024960	+4.1510275	+0.1050729	+1.7088208	~.287E~04	420E-05	~.324E-03
8693	15.1347183	1.6329277	+1.6346273						
8416 8418	+5.1251593 +5.2415E68	10,8517370	+1.6843710						
8422	15.0GS0574	+1.5337270	+1.6892041						
8413	45.2559767	-0.0823983	+1.6794921						
840,2	44.1205122	10.5485424	+1.7137304	+4-1896365	10.5486058	+1.7133992	- 136E-04	633E-04	~.1685-03
8401 8573	+3.38557.25	+1.4814100 +1.5281191	+1.7022450	+3.9896508	+1.4816005	+1.7034950	+.2175-04	190E-03	~.2490-03
8412	(5.1845395	10.7729962	+1.6885815						
8503	14.2770340	+0.0471380	+1.7047530	+4,2770120	-0.046R926	+1,7045474	+.2292-04	-,245E-03	+.311E-03

SIGMA X/Y/7 = 0.016 MM AT PHOTO SCALE

JUNCTION OF MODELS 4041 - 4142

PT ND.	xe	YB	Z/P	XX	Y1	21	vx	٧v	vz
4341 4343	45,1389290	10.6144007 10.7356586	-0.0857352 -0.1050410	15.1339313	+D. 6144545	-0.0858940	+,7868~05	~, 537E ~04	+,5876-04
8630	45.1347203	+1.6329500 +0.8516828	+1.6847441 +1.6850961	45,1347183	+1.63P9277 +0.8517370	41.6846273 +1.6849710	+.206E-05	+-2231-04	4.11CE-03
6418	15.2415483	-0.0737972	+1.6793554	15,2415668	-0.0738830	+1.67%5562	+.84 AL-05 184E-04	541E-04 1.856E-04	4.125F~03 300E-03
ter ver Pill Ve	+6.0341035 (G.1518595	+1.7091359 +0.785.078	+1.6718768 +1.6603048						
-3	+6.1607SEB	+0.1811391	+1.6564509						

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312 +5-2257137 +1.0771033 +1.020154 513 +6-2071013 +1.020056 +1.020057 +1.020154 514 +6-2071013 +1.020056 +1.020057 +1.020071 515 +6-0045 +0.020057 +1.020071 516 +1.02005 +0.020057 +1.020057 +1.0200567 +0.07720400 +1.000015 +.1506-05 -.5012-04 +.1006-03 516 +0.020072 +0.01720 +0.020077 +0.000677 +1.0507870 +1.0000015 +.1506-05 -.5012-04 +.1006-03 517 +0.000872 +0.020077 +1.020770 +0.000677 +1.0507870 +1.000001 +.55587-05 -.1006-03 +.1404-03 5081 +0.000872 +0.0000770 +1.14047100 +0.0008674 +1.0507870 +1.000001 +.55587-05 -.1006-03 +.1404-03 5183 +0.000872 +0.0000770 +1.14047100 +0.000877 +0.0008072 +1.0000071 +1.000001 +.55587-05 -.1006-03 +.1404-03 5183 +0.000872 +0.0000770 +1.14047100 +0.000877 +0.0008072 +1.0000001 +.55587-05 -.1006-03 +.1506-04 5183 +0.000000 +0.0000770 +1.14047100 +0.0008073 +0.0008092 +1.07040001 +.150700 + .133.-03 +.1604204

SIGNA X/Y/Z = 0.010 MM AT PHOTO SCALE

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JUNCTION OF MODELS 4142 - 4243

PT NO.	×2	Y2	2.7	×1	Y1	21	٧X	ΨY	vz
4842	+6.2080633	+0.7355876	-0,1050340	16.2030'937	+0,7356586	· 0, 10504B3	+.5155-05	··. 709E-04	4,148F-04
4843	+7.2370782	10.8446428	-0.1260307						
2692	15.0340349	+1,7092583	+1.6721614	16.00010.05	+1.7091359	+1.6713768	~, 2535-05	+.122E-03	+.284E-03
84E6	15, 1518639	10,7283325	1.FE07028-	+6,1518595	+0.7884078	+1.6E00048	+, 442E-05	692E-04	~.112E-03
8428	+5.1607547	10,1811568	+1.6562635	46, 1607558	+0.1811391	+1.6564503	1048-05	+.177E-D4	187E-03
2703	+7.1592775	+1.7355619	+1.0337491						
8436	+7.3819264	+0.7726972	14.5177284						
8498	+7.3971359	+0.1659054	+1.6207934						
512	+6,8097105	11.3839118	+1.66819631	+6.2007039	+1.3900057	+1,6681793	+.147E-04	9488' QA	+.15BE-04
517	+6.1901963	+0.2054321	+1.6537245	46,130,0000	+0.2054846	+1.6587340	 397E-05 	S24E-04	942E-05
8431	17.3016334	+1.7121557	+1.0301470						
3432	17.3977786	40,1411019	+1.6291013						
3422	16.2305373	+0.984893t	+1.6642970	+6,2305100	10, 9850796	11.6642324	+.2735-04	186E-03	+. CACE -04
8421	16.1113113	+1.7095715	+1.6720731	+6.7112935	+1.7036696	+1.6717953	+.118E-04	+.191E-05	1.277E-03
3603	16.4041079	11.6013315	+1.(624049						
34B*	+7.3424248	11.0155712	11.6337067						
8423	+6.2536048	+0.1072316	+1.6574178	H6.2535920	+0.1974031	+1.61./3731	+.119E-04	-,1716-03	+.4472-04

SIGNA X/Y/Z = 0.010 MR AT PHOTE SCALE

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JUNCTION OF MODELS 4243 - 4344

PT NO.	xa	Ya	22	X1	Y1	Z1	VΧ	VY	٧ž	
4843	17.207056	40.844656.3	-0.1200221	47.2970742	+0.8446428	-0.1250307		+.135F-04	+.8J7F-05	
4344 8703	48.3753762 17.1502943	10.0012030	-D. 1414533 +1.6.(38450	17.1500775	+1.73554-19	+1.6337431	+.7800-05	284E-04	+.100E-03	
8436 8436	17.3319212	+0.7727108	+1.6177704	*7. 331 3.424	+0.7726372	+1.6177294	1165-05	1.136E 04	+.4205-04	č
3718	18.8783053	+1.9596510	41.51897395	17.3371.359	40, 1653054	+1.6207994	511E-05	+,125E-05	150E-0,3	¢
8446 3440	48.35614262 48.3404898	+1.1395305	11.0057871							
313	18.0055452	+1.6421671	11,5540172							
3713 5443	+8.4333365	+1.8144373 +0.1646178	F1. (4)18 A23 F1. 5005154							
8433 8431	17.3424322	+1.0150019	+1.6334024 +1.6303301	47.3634748 47.3016339	<1.0110/12 (1.7121557	+1.6397067	1.81.32-05	161E-03	304E-03	
2703	17.4000196	11.7073/74	41.6233017	*******	11. (10155)	+1.6301470	+.1730-04	3830-04	<.183E-03	

0443 (0.357/05 (0.100351) (1.07964) 8933 (7.397/05 (0.141442 (1.697/06 (7.797/06 (0.1610)) (1.625/013 -.8152 05).4297-04 -.1026-03 91065 177/2 -.0.669 (0.17010) (24L

JUNCTION OF MODELD 4344 4445

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PT ND.	X,P	Y2	L2	×ı	71	21	VX	VΥ	vz
4844	18,375,009	10,0017867	0.1414461	18.3753762	10.9218830	-0,1414508	+,765E06	9626-04	1,52CE-04
4845	19.4308206	+1-0134128	0.15(3)(6)						
3718	11.2728307	+1.9597205	+1,5333466	48.2782809	+1.0596510	11.5389995	~. COSE-05	+.635F~04	+, 3475-03
8446	48.3551433	+1.1234349	+1.6058859	+8.3561422	+1.1335835	+1.0057871	+,118E-0S	9458-04	4, 980F-04
8448	18.3404133	+0.1155.275	+1.5320155	+8, 3404832	+0.1154063	+1.5025142	+.410E-05	+,121E~03	433E-03
87.28	+9,3040715	42.1736974	+1.59260655						
8456	19.4820020	+1.00705:12	+1,5309643						
0453	· 9,4871581	+0.4056715	+1.5426.990						
6723	19.4233460	+1.9135072	+1.5838739						
8453	+9.5410182	+0.1993948	+1.5721066						
8442	18.3855799	+1.0030048	+1,0037537	18,0365655	<1.0035511	+1.6034847	+, 1445-04	-,24FE-03	+. 200E -03
1371.3	+8.4333214	11,0147319	+1.€028423	43,4333365	+1,8144829	+1.6018728	+,449E-04	+.2936-03	1.9036-03
3443	18,4533028	+0.1642752	11,5036373	HL 45.33979	+0.1646178	+1.5995154	+,109E-04	-, 342E-03	+.1218-03
8452	19.4030103	+1.0609905	+1.5769743						

SIGNA X/Y/Z = 0.023 MM AT PHOTO SCALE

JUNCTION OF MODELS 4445 - 4546

x2	Y₽	zæ	хı	¥1	23	vx	VY	vz
9.4900258	11.0133505	-0.1508482	+3.4302205	+1,0134128	-0.1588466	+.5256-08	-,5370-04	~, 16SE-05
0,5025432	+1.10%6840	-0,1845580						
3. 3040483	+2.1780198	11.5028823	49.3040715	12.1786934	+1.5326055	~.23:E-04	4,126E03	+.2706-03
3.42300:00	11.0053384	+1.5307171	10.4890020	+1.0070592	+1.5303643	4.603E-05	-, 607E-04	1478-03
9,4871609	+0.4066533	+1.5425703	42,4371581	+0.4066715	+1.5426930	+.11BE-04	1250-04	~.128F-03
0. 3467109	41.8030444	+1,5578503						
0.5219402	1,03/0223	41.5547559						
0.5381332	10.4398500	+1,5514076						
0.6537610	10,5504718	11,5509183						
0.4748351	12.070466.2	+1.5642076						
0.6720132	+0.223/000	11.5465827						
3.4090272	+1.0603005	+1,5771030	+9,4630103	+1.0500305	11.5769743	+.163E-04	150E-0B	+.16185-03
9.4298427	+1.9135197	+1.5800683	19.4256(460	+1.913507a	+1.5883733	+. 30 HE-05	1.1252-04	+ 194F-03
0.4007472	11.8323646	+1.5646159						
0.5354445	1.2346402	H1, 5558438						
9-5410546	PO. 1996.303	+1.5722554	19,5410122	 1008948 	+1.5721056	+. 364E-04	264E 01	+,149E-03
	3. 490.22% 5. 502%43.2 5. 3060493.3 5. 4500483.3 5. 4500483 5. 4500483 5. 4500483 5. 4501482 5. 5219442 5. 5219442 5. 45007472 5. 53394455	4.402749 41.013594 5.502445 5.402445 5.402445 5.402445 5.402445 5.402445 5.402445 5.402445 5.402445 5.402445 5.402445 5.402445 5.40244 5.40244 5.4024 5.4024 5.4024 5.4024 5.402 5.402 5.402 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 5.40 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0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1<td>1.94000000 (11.0736976 0.9580400 1.92.4208200 11.0194728 -0.1589466 1.59561-05 1.9500000 1.92.1750300 1.12.8235071 1.9.275020 1.0.2777652 1.9.15580466 1.57561-05 3.9500000 1.02.1750300 1.12.8235071 1.9.275071 1.0.1476000 1.0056728 1.595605522727-0 3.477159 10.465500 1.1.553771 1.0.475759 10.465572 1.5956056 1.005674 4.0056-0 3.477159 10.465500 1.1.5547759 10.465572 1.0.5956072 1.5956728 1.595672 1.595672 1.5957500 1.0.405500 1.1.5554075 1.5957500 1.0.4255000 1.1.5554075 1.5957510 1.0.4255000 1.1.5554075 1.5977510 1.0.4255000 1.1.5554075 1.5977510 1.0.4255000 1.1.5554075 1.5977510 1.0.5070379 1.1.5554075 1.5977510 1.0.5070379 1.1.5554075 1.5977510 1.0.5070379 1.1.5554075 1.5977510 1.0.5750791 1.5554075 1.5977510 1.0.5750791 1.5554075 1.597510 1.0.5750791 1.5554075 1.597510 1.0.5750791 1.575578 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.1.575578 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.1.575578 1.5554075 1.597510 1.0.575759 1.1.575578 1.5554075 1.597510 1.0.575759 1.1.575578 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.1.575578 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.57559 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.5554075 1.597510 1.0.575759 1.597510 1.0.575759 1.5955107 1.0.575759 1.5955107 1.0.575759 1.5955107 1.0.575759 1.5955107 1.0.575759 1.5955107 1.0.575759 1.5955107 1.0.575759 1.5955107 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 1.595507 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SIGNA X/Y/Z = 0.013 MM AT FHOTO SCALE

JUNCTION OF MODELS 4545 - 4647

PT NO	X2	YZ	Z/2	×1	A7	Z1	٧X	٧Y	vz
	110.2025331					-0.1845580	~.409E-05	+.7590-05	+.1405-04

-0.2164732 +1.5577232 +1.5577232 +1.5517744 +1.5517744 +1.5357707 +1.55267751 +1.5517026 +1.55262751 +11.5351770 +10.8467753 +10.5719476 +10.5331231 1.126.7 +1.1302466 +.967E-05 -.152E-05 -.404E-05 -.671E-04 +.795E-05 +.516E-04 -.13/E-03 +.150£-03 -.331E-04 37.38 110.3467163 +1.0930444 41.0328223 41.5578609 41.5547559 41.5514076 +1.8523772 +1.0325302 8456 +1.0328302 +0.4333106 +2.0213028 +1.1530422 +0.3262278 +0.5504095 +10.5381732 +0.4308530 8748 2476 8478 411,4572559 +11.4572559 +11.5731741 +11.7208374 +10.6537793 +11.4810087 317 8471 8473 110.6537510 10,5504718 +1.5509183 +.189E-04 -. C21E-04 4.2848-03 +1.551R025 +1.5502227 +1.5274526 +1.5560515 +1.5560515 +1.556078 12.1476549 +10,5344438 +1.2346703 +.2176-03 8462 8461 8743 +10.5344445 11.2346402 +1.5558438 -.617E-06 +.307E-04 -.277E-05 -.462E-04 -,2188-03 411.4530095 42.0244180 3472 +1.5347676 +1.5471455 846-3 410.6720564 +0.2228657 +10.6720132 +0.8232000 +1.5466827 +.432E-04 -.334E-03 +.462E-03

SIGMA X/Y/2 = 0.015 MM AT PHOTO SCALE

JINCTION DE MODELS 4647 - 4748

PT NO.	X2	Ya	ZP	X1	٧1	Zi	~x	٧Y	vz
4847	+J1.5351584 +12.5554047	+1.1903557	-0.2184622	+11.5351770	+1.1902466	-0.2184722	~.1855-04	+.109E-03	+.991E-05
3743 3476	+11.4572535 +11.5731550	+2.0219013 +1.1531512	+1.5358337	*11.4572550 *11.5731741	+2.0219883 +1.1530422	+1.5363707	+.3682-05	874E-04	536E-03
3478 3758	+11.7208713 +12.4060474	+0.3251370 +1.9457875	+1.5268344	+11.7203374	+0.3252678	+1.5262751	+.339E-04	130E-03	+.555F-03
3486 3488	412.6094142 412.3965585	+1.2704558 +0.4083261	*1.5116039 *1.5036884						
315 105 3753	+12.3713000 +12.3751293 +12.4407073	+2.0144540 +0.4256745	+1.5150237 +1.5000077						
8483 8472	+12.7054106 +12.7054106 +11.9652141	+2.0457262 10.3251744	+1.5153684 +1.4360234						
8743	+11.4629930	*1.2220384 +2.0245525 *2.1476035	+1.5345042 +1.5358136 +1.5353732	+11,5058361 +11,4030095 +11,4010087	+1.2229581 +2.0244180 +2.1476540	+1.5347676 +1.5360178	119E-04 164E-04	196E-04 +.134E-03	263F-03 193E-03
8473 107	+11.6567550	+0.3045875	+1.5277491	+11.6567444	10.3047473	+1.5062227 +1.5274535	584E-05 +.105E-04	513E-04 164E-03	- 243E-03 +, 295E-03
8432	+12.6314469	+1.2774452	+1.51420%6						

SIGMA X/Y/Z = 0.021 MM AT PHOTO SCALE

* DURHAN TEST AREA * STRIP ADJUSTMENT

01/01/1978 ¥

PLANDMLINIC AND HEIGHT CONTROL

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	P4		-	~		-			
101	2637.370	26.80,050	137.900	25.17, 267	2680,041	137.377	~0.002	~0.008	-0.022
102	+30,2%0	1011,320	126.030	-30, 205	1011.335	126.097	-0.016	0.015	0.007
504	717.610	-127-860	90, 940	717.542	-127,779	90.349	- 0.097	0.080	0.009
503	3963.930	1869-250	84,950	3563, 952	1860, 243	84.956	0,022	-0.006	0.006
301	1210.650	1027.020	117.430	1810,662	1826.938	117,481	0,017	-0.081	0.051
305	\$34.710	1239,710	146.400	\$34,673	1233,544	145.444	-0.036	-0.165	-0.035
103	~39,350	1015,440	187, 270	·30, 997	1015,478	125,874	-0,047	0.033	0,004
90:08	1939,669	594.684	118.316	1933.754	594,811	118.234	0.115	0,127	-0.021

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STD ERR IN X* 0.050 STD FRR IN Y* 0.085 STD FRR IN 7* 0.050 STD ERR IN PLANIMLITRY* 0.077 STD ERR DF ADJUSTMENT= 0.111 Y

ADJUSTED CRONDINATES

. PT NO x

PT ND.

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SECTION NO. 1211

4918	3273, 657	2705-337	1354-073
4911	26 49, 759	2191.122	1353,400
9124	3247.452	3169.471	71.010
9126	325.3, 96.9	2653.000	53, 950
9125	3625,002	1257.264	78.342
9114	2223, 773	3787.74/	137.003
2116	2581.466	2257.005	84,110
9118	301:0-171-9	1511.986	71.333
503	350 3. 95 5	1860.243	84.9%
101	2017.367	2680.041	137.877
9123	3776.551	2083. 172	24.779
0113	3115.080	15.34	77.703
3122	1007,629	2751.100	91.050
3113	2611.860	2240.801	80.584
3811	2165.233	2755.507	123, 302
ទាភា	2803, 195	3*57,791	87.024
SECTION	(NR. 1110		
4911	2539, 759	2191,122	1353,400
4010	2021, 307	1695.211	1347.717
2114	3222, 773	2787.747	137.663
9116	2581.466	3257.005	84.130
9110	30R6. 759	1511.986	71,203
3104	1608.165	2261.361	1.20,630
9106	2011.044	1746.843	104.279
9108	551.783	1130,70B	73,674

301	1810.662	1826.938	117,481
3101	1600.000	2233.563	129.013
9103	2531, 790	1115.034	72.617
9113	3195, 180	1534.764	77.763
9111	2165.2 40	37145.507	1,23, 0082
9112	2061,860	,240,001	80, 534
2102	2051,453	1777.940	106.923
SECTION	ND. 1003		
4910	2021.307	1656.211	1947.713
4903	1494.153	1284.371	1048.507
9104	1605, 165	2261. 351	123.600
0106	2051.044	1746.843	104.273
9108	2561, 783	1130,708	73.6.74
3034	1041,561	17:30, 6:31	132,006
30'36	1425.817	1356-937	120.0'-2
30213	1939.784	594,811	113,234
301	1810,662	1225-933	117,481
9041	993.554	1222.357	131.008
1093	1925.693	643,054	118.003
5010	2051.453	1777, 393	105,923
3103	2531.790	1115, 334	72,617
101	1600.000	8239.569	121.018
			117.705
	1984.296 ML 908	1297.918	1172700
SECTION	NO, 308		
500 T 1 TW 4909	2494.153	1284.071	1342.537
500 T 1 FW 4909 4908	2494.153 2494.153	1284. 971 286. 101	1342.537
550 T 1 FW 4909 4008 5094	NR, 908 1494.153 953.920 1041.551	1284. 971 885. 101 1790. 581	1392, 507 1347, 576 138, 066
5ECTION 4909 4909 4908 5094 9094 9096	NR, 508 1494.153 053.920 1041.551 1425.817	1284, 971 885, 101 1790, 581 1356, 932	1342, 537 1347, 575 138, 066, 120, 052
55:0 T 1 0N 4909 4908 9094 9096 9098	NR, 908 1494,159 163,920 1641,561 1425,817 19,79,784	1284, 971 885, 101 1790, 531 1356, 902 594, 811	1342, 537 1347, 535 138, 666 120, 052 118, 734
550 T 1 DN 4909 4908 9096 9096 9098 9084	2494.153 963.920 1641.551 1425.817 19.79,714 601.669	1284, 371 886, 101 1790, 531 1356, 952 534, 811 1440, 232	1342, 507 1347, 576 138, 066 120, 052 118, 254 135, 117
550 T 1 DW 4909 4908 2094 3098 3098 3098 3084 3085	1494, 163 963, 920 1641, 551 1425, 317 1939, 784 601, 669 912, 335	1284, 971 885, 101 1790, 531 1376, 932 594, 811 1440, 239 883, 517	1342, 507 1347, 505 138, 666, 120, 082 118, 294 138, 294 135, 112 102, 551
5500 1 10% 49509 4008 5094 3098 9084 9084 9084 9088	ND, 903 963, 920 1064, 951 1645, 817 1939, 744 601, 669 912, 325 283, 730	1284, 771 885, 101 1790, 631 1376, 932 594, 811 1440, 237 883, 517 815, 84	1342.507 1347.505 138.666 138.666 138.734 138.734 135.112 108.651 23.705
5ECTION 49579 4008 9094 9096 9084 9084 9084 9084 9085 9082 207	NT. 507 1494, 153 963, 520 1641, 551 1435, 817 1939, 734 601, 669 912, 325 (293), 730 534, 673	1284, 371 886, 101 1366, 312 534, 611 1460, 332 883, 517 815, 863 1270, 544	1342, 537 1347, 576 138, 066, 120, 082 138, 234 138, 112 102, 551 23, 705 146, 444
9009 4008 2008 2008 2008 2008 3008 3008 3008 3	HO. 503 1494, 163 063, 920 1041, 561 1425, 817 1933, 784 601, 663 918, 385 1291, 780 534, 673 534, 673	1284, 771 886, 101 1790, 631 1376, 932 594, 811 1440, 232 833, 517 P15, 841 1270, 544 1474, 468	1342.507 1347.576 138.007. 138.007. 138.234 135.117 105.551 29.705 146.444 136.725
5ECTION 49579 4908 9094 9094 9094 9094 9094 9094 9084 908	NT. 507 1494, 153 963, 520 1641, 551 1435, 817 1939, 734 601, 669 912, 325 (293), 730 534, 673	1284, 971 886, 101 1790, 531 1366, 932 594, 811 1460, 239 883, 517 P15, 943 1270, 544 1474, 468 874, 698	1342, 507 1347, 506 128, 066 120, 052 138, 294 138, 294 138, 294 138, 112 102, 55 146, 51 146, 444 136, 725 1, 15, 302
5ECTION 4909 4908 9098 9098 9098 9084 9084 9084	 M0, 3003 1494, 153 362, 320 3641, 651 4625, 317 4635, 317 4601, 663 514, 673 524, 673 5240, 308 545, 673 540, 308 545, 673 540, 308 545, 673 540, 308 546, 573 546, 573 546, 573 546, 573 546, 573 546, 574 546	1284, 771 386, 101 1796, 631 1376, 332 594, 811 1440, 275 883, 517 P15, 843 1270, 544 1474, 468 264, 048 1277, 318 1332, 157	1342, 507 1347, 575 138, 066 120, 082 138, 264 135, 112 106, 681 139, 705 146, 444 136, 745 145, 562 146, 564 135, 562 147, 705
500 T104 4969 4968 4968 4968 4968 4968 3084 3084 3084 3084 3084 3082 3084 3082 3084 3082 3084 3082 3084 3082 3084 3082 3092 3092	 M0, 3003 1494, 153 362, 320 3641, 651 4625, 317 4635, 317 4601, 663 514, 673 524, 673 5240, 308 545, 673 540, 308 545, 673 540, 308 545, 673 540, 308 546, 573 546, 573 546, 573 546, 573 546, 573 546, 574 546	1284, 771 386, 101 1796, 631 1376, 332 594, 811 1440, 275 883, 517 P15, 843 1270, 544 1474, 468 264, 048 1277, 318 1332, 157	1342, 507 1347, 575 138, 066 120, 082 138, 264 135, 112 106, 681 139, 705 146, 444 136, 745 145, 562 146, 564 135, 562 147, 705
SECTION 4909 9094 9096 9096 9084 9086 9086 9087 9087 9087 9087 9087 9087 9087 9087	NU. 2008 1494.153 1053.780 1041.551 1425.817 1425.817 1425.817 1425.817 1425.817 1425.817 1425.817 291.780 534.673 534.673 534.673 534.673 534.673	1284, 071 886, 101 1790, C31 1396, 312 504, 811 1400, 250 883, 517 815, 843 1270, 544 1474, 468 264, 048 1207, 318	1342.507 1367.505 138.067 180.082 138.234 135.117 103.551 145.551 145.444 135.302 145.302
5000 1000 1000 1000 1000 1000 1000 1000	2004 1404, 153 362, 720 1061, 961 1425, 817 1425, 817 1425, 817 1425, 817 1425, 817 1425, 917 1425, 917 1425, 710 1425, 710 1425, 715 1425, 715 1455, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 7155, 71	1254, 971 886, 101 1790, 681 1844, 932 894, 811 1440, 239 883, 517 145, 844 1270, 544 1474, 463 874, 048 1997, 918 1923, 957	1342, 507 1347, 576 135, 066, 130, 082 136, 264 135, 112 100, 581 136, 112 100, 581 136, 112 100, 581 136, 745 115, 372 117, 705 131, 0012
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5000 110% 4/9029 9/008 9/024 9/024 9/024 9/024 9/024 9/024 9/024 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/027 9/02	M 3004 1494, 153 053, 720 1645, 951 1495, 817 1493, 784 601, 659 921, 785 534, 673 534, 673 1455, 219 1455, 451 1566, 694 ND 807 285, 720 285, 720 295, 720 295	1234- 771 386- 101 11366- 101 11366- 022 504, 031 1440, 275 882- 517 1477, 463 1674, 463 1674, 463 1674, 101 1675, 101 913, 650 642, 055 883- 101 491, 521	1242, 507 1347, 576 138, 66, 120, 052 138, 68, 138, 137 148, 74 138, 137 148, 74 138, 74 148, 74 111, 002 111, 002 111, 002 111, 002 112, 003 138, 003 138, 003 138, 003
SECTION 4900 2004 2008 2004 2008 2008 2008 2008 20	NT 500 1494,153 303,340 1043,981 1433,814 1133,814 1133,814 1133,814 1133,814 1133,814 1133,814 1133,814 1133,814 1133,814 1133,814 1135,614 1135,614 1143,1621 1156,614 1156,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115,614 115	1234- 771 386- 101 1785- 831 1785- 831 1785- 831 1865- 101 1865- 101 1875- 844 1975- 844 1975- 844 1975- 944 1975- 945 1975- 945 1	1342.577 1347.575 1367.575 136.066 136.056 136.113 136.113 136.113 136.113 136.113 136.113 136.113 136.113 136.113 137.705 137.002 138.003 138.003 138.003 138.003 138.003
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2.4.5	534+6-73	12 73, 544	146,444
1000	11.90	1015.470	1/25.674
8 G. L.	'E1. N.F.	1011.035	126.057
1214	717.562	-127,779	90.949
1457.4	20.505	10%1.571	120, 359
1027.4	"特别是否的	-145.029	104.303
1933 (11)	145.451	010,569	111.012
14241	1.57.102	1474.468	1.36., 7,29
124.6	4 53.201	513, 197	Rc., 695
19230113	14%-219	264,048	176, 302
147104	10, 705		
$h^* \approx 17$	037.6.30	491,530	1347,639
N 235	-111.010	83,267	1344.073
0024	· MA, 77B	1073,419	112.032
50.26	370,032	480.558	80.633
10.797	735-4503	-201.786	34.677
17.2.4	612.081	732.312	8.493
1916-0	113.200	37,505	23.733
284	aco. 691	-461.716	107.008
10.7	30,266	1011.335	126.097
1510	- 49, 997	1015,478	125.874
1. A. A.	717,552	-127.779	90, 940
P 4. 3	605.135	753, 934	B. 500
120 March 1	174.346	-510,271	107,220
3257	4 \$1, 161	513, 132	86.695
\$2.578	1 30, 202	1051.571	126349
11.1.42	112,071	106.403	P3.023
1142.2	956, 798	-145.023	104.503

PT ND.	×	Y	2	NIMETRIC AND F	ALIGHT GUNTRGL Y	z	vx .	٧Y	vz
303	6627.770	1897.420	44,550	66-27,964	22:17, 484	44,438	0.091	0.014	-0.1
307	6976-930	033.0650	55.Cet	6035.906	32.30, 649	65,701	0.046	-0.030	0.0
507	5165-460	1673.320	102, 310	5466.362	1673.313	102,550	-0.037	-0.006	0.2
503	3553, 930	1859.250	24, 550	3564.147	1869 087	85.087	0.217	-0.162	0.1
503	4375.430	831,550	64.710	4375.463	831.565	\$4,576	0.033	0.019	-0.1
509	3911.850	6,530	73.200	3211.698	6,476	72, 988	-0.151	~0.053	-0.3
510	1911-660	-B10, 780	68,720	1911.745	-810,543	68, 381	0.085	0,231	0.2
30%	1075.810	- 58-, 560	160.430	1075.649	-582.704	160.515	-0.160	-0.144	0.0
504	717.010	-127,000	30,340	717,661	-127,885	90.813	0.051	~0.025	~0.1
203	6709.540	2316.040	35,070	6709,509	2316.789	95.133	-0.030	0.143	0.0
\$06	6773,710	2560.170	85, 580	6773.624	2560,177	25,453	-0.085	0.007	-0.1

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ADJUSTED COORDINATES

PT ND

SECTION ND. 9083

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4890	7006731	3549.493	1346.585
43379	6652,154	3106.015	1343,600
8904	6612.646	4221, 274	48,591
3306	6914.664	3564,303	20,242
8908	7574-507	2975.663	20,296
13:374	5934,475	3510, 463	20, 434
8095	6407-577	3143,230	62,336
8008	6807.F37	2569,658	84.652
303	6627.861	3527,484	44.4.30
501	6242.703	3870, 337	18,729
202	\$929.594	3655,034	25,189
505	7027-303	2819.536	76.278
508	6773.624	2550, 177	85,453
307	6936-966	3P30.649	65,701
8901	6578.812	4107.165	32, 764
8931	5364-524	3667.416	29.652
8903	7565.736	2985.014	19.310
8933	6950.P42	2523.870	67,267
8905	7004-452	3538.310	19,632
8326	6432.633	3144,760	65, 300
SECTION	IND, 8408		
4389	6452.154	3105.015	1363,600
40018	5000,583	2662.232	1307.351
80134	5934-475	3610,469	20,484
2235	6407, 577	3143,230	62, 336
8393	6807.687	2560.658	84.682
87384	5472,964	3162.247	32,279
8385	5885,213	2673,742	63,709

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8980	6344.030	2123.994	70.384	
506	6773.624	2960.177	85.453	
208	6703.503	2316.783	95, 133	
502	5929, 534	3655.034	25,189	
EC2B	6959.343	2523,870	67.657	
8891	5964, 534	3667.410	24.662	
33311	\$339,207	3324.90.2	25, 365	
3392	6422.639	3344.750	65, 300	
132122	5891,055	2747.422	75,070	
3983	6340.466	2079.775	74.031	
11000	62417.404	20/30//5	141624	
SECTION	ND. 2387			
4332	5900.583	2662,232 3203,447 3162,247	1337.351	
4887	5329, 340	3203-947	1333.158	
2034	5472. 464	3162,247	32.273	
8886	5896, 213	2673,742	6E, 7Q3	
0333	6344.680	2123, 955	75, 224	
81174	4933.037	26,24.313	69.519	
8376	5385, 302	2149.692	135,487	
13378	5623, 706	1796.573	85,835	
8871	4827,095	2701.625	48.378	
8081	5339.207	3374.562	75, 865	
8872	5379, 364	2179.664	119,080	
8552	5391,055	2747.422	75,070	
	36 22 . 0.24	2079.775		
8883	6340.456	1573.775	74,891	
8883 8873	6340.456 5835.041	1572.861	65-634	
8873	6340,456 5835,041 MG. 8786	1572.861		
8873	5835.041	1572.861		
BB73 SECTION	5835.041 NO. 0786	1572.861	65.634	
2873 SECTION 4087	5835.041 NO. 2786 5329.840	2203, 447	65-634 1389, 158	
2873 SECTION 4087 4385	5835.041 NO. 2786 5329.840 4753.177	2203, 447 1755, 455	65,634 1339,159 1343,902	
5573 SECTION 4587 4385 5574	5835.041 NG. 8786 5389.840 4753.177 4933.997	1572.861 2208.447 1755.455 2524.813	65.634 1339,159 1343,902 69.519	
2873 SECTION 4087 4885 4876 2876	5835, 041 NO. 0786 5329, 840 4753, 177 4932, 997 5385, 302	2203, 447 1756, 455 2626, 813 2149, 632	65.634 1339,155 1343.902 69.519 135.487	
5573 SECTION 4037 4355 0074 9576 2576 2577	5835.041 5329.840 4753.177 4932.997 5385.908 5623.705	2203, 447 1755, 455 2626, 813 2149, 632 1796, 573	65,634 1339,159 1343,902 69,519 135,487 135,487	
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5873 SECTION 4087 4385 9876 9876 9876 9876 9876 9866 8866 8866	5835.041 NO. 0786 5329.846 4753.177 6332.97 5385.302 5623.705 4349.133 4749.131 4384.254	2203, 447 1755, 455 2644, 513 2149, 692 1795, 573 2022, 577 1645, 327 1645, 327	65, 634 1339, 158 1343, 902 69, 519 135, 487 78, 135 60, 174 93, 275 78, 103	
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0364	4349.179	2292,597	60.174
8355	47243, 101	16-45, 397	33.255
8468	4906.,254	1259.927	83.603
2128	3625,220	1857.350	73,411
8851	3703, 458	1837.447	72.831
8857	4142, 302	1319.675	136.270
8353	4565. 201	76.3,001	57,382
8361	4303, 770	2376.392	75,209
886.2	45.84, 177	1760,130	32.534
8863	5175,037	1105.341	64.648
9123	3776, 307	2034, 193	35,031
	21144 Au	0.0.0.000	0.001 - 01
SECTIO	N ND. 2534		
4885		1717 000	
4384	416/9, 267 358A, 687	1303.359 366.210	1344.434
304	3740,264	1221.771	168.644
503	3564, 147	1063.087	85.037
503	4375,463	831.569	64.576
806 8468	3582.352	802,102	112,341
8248	3885.713	164.446	51.849
8:156	4198,814	1352,087	142.281
5253	4309,770	E33.054	65.015
9118	3076.967	1511.765	71-429
9128	3625, 220	1857,359	73,411
8941	20/26 720	1464,352	63.243
8842	30/35,720	P71,770	113.717
8843	4030.530	323,869	45.788
8351	3708, 453	1897.447	72.831
8857	4142, 302	1319.675	136.270
8853	456E, 001	763.001	57.382
3113	3196.344	1534.332	77.717
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4884	3589.687	366.310	1339.762
4883	5368.631	428.030	1343.533
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8846	3582, 952	302, 102	112.341
8842	3585.713	45.4.446	61.249
9108	2561-910	1130.461	73.433
88.36	2358.858	403.421	30.897
8838	3702.081	2.103	73.221
500	2614,544	301.327	
8031 8933	3300.244	-130-425	105.003 44.340
8942	3547,709	871,770	113.717
3841	3095.720	1424.852	67.743
3837	2321,723	404.156	38.337
8843	4020,530	323.869	45,753
4443	4000, 500	ALC 31 19679	494 (BB)
SPCTIO	N MR. Bara		
4983	2982,631	428.038	1343.517

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	4082	2396, 255	0.523	1342-360
	3103	2561.910	1130-461	73.475
	8830	1953,653	403, 421	30, 297
	8333	3202.083	2,503	73, 231
	9008	1933.687	594.642	118,234
	88.%	2412.793	-53.001	91.627
	8228	3782.733	-332.643	79, 983
	503	3211,638	6,476	72,863
	8321	1963, 573	492,041	1 74. 536
	8823	2734.773	-544.657	38.710
	0672	2357, 322	7.637	92,116
	8232	2321.789	404,196	83, 337
	22331	2614.944	901.327	105.088
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	8833	3336121244	-180,429	44.340
	BFCTION	187. 8281		
	48337	23%215	0.583	1342.993
	4283	1721.316	-429.362	13,34, 849
	5.398	1933-687	594.612	113.294
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	3068	1231-133	P15.954	99, 534
	8816	1615.845	~335.402	135.565
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	012	1911.745	-810,548	68, 921
	2811	1405.999	56.544	138.515
	2813	2153.120	~1048.277	26.120
	8821	1953, 573	492.041	134.535
	8873	2774,773	-544.657	33,710
	8812	1700.441	-453,101	116, 356
	32.2.2	2357.322	7,697	92, 110
	9083	1454.369	264-031	135.685
	SECTION	AD. 2150		
	4881	1781.316	-429.362	1334.343
	4380	1147.425	-846,387	1341-672
	9038	1291.133	215.954	99.524
	3316	1615.845	985,402	136.535
	8810	2108.374	-700,827	62.067
	:)07:3	736.693	- P01, 976	34-6R0
	3806	1057.633	-247.401	122.001
	8303	1405.075	-1363.996	50.433
	8744	1579,740	-300, 263	79.962
	306	1075.649	-582.704	160.515
	510	1911-745	-R10.548	68. 921
	2801	795, 784	-440.513	116.600
	8803	1505.555	-1396.085	42.133
	8812	1700.441	~453.101	116.356
	8311	1405.999	56.549	138.515
	9073	257, 102	-144.754	104.463
	3302	106-9-1BP	-130.203	118.377
	2813	2153,120	~1042.277	25.120

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SECTION ND. 3079

4880	1147.425	-846.387	1361.672
4370	465.335	-1305.238	1346, 563
9078	736.693	-201.376	94.680
8806	1067.639	-847.491	122,801
SSOR	1405.975	~1363. 3%6	50,433
9067	261.033	+421,938	107.144
87%	481.478	-955.057	105, 540
8738	925, 137	-1314.2%	83, 130
504	717.651	-127,835	30, 313
511	1245.463	-1413,040	56, 591
8791	18,433	-722,898	79,141
8793	807,593	-1851, 560	42.080
3805	1054,183	-830,803	118, 327
8801	795,784	-440, 513	116.630
9063	374,725	-510,472	107.683
8792	414-464	-1316.935	117.043

PLANING TRUE AND HE IGHT CONTROL

8304.990 1759.470 7027.350	2134.300 -2337.510 2819.630	27.310 11.270	2305,050 1759,444	P134.819	27.293	0.060	0.019	-0.016
7027.350								
	39213 630			-2337.482	11.262	-0.085	0.027	-0.007
		76-470	7027.304	2819.587	76.559	-0.045	-0.042	0.039
6773-610	2560,170	85,530	6773,601	2560,123	85.563	-0.00R	-0.041	-0.011
5702, 540	2316.640	95.070	6700.567	2316, 649	95,050	0,027	0.009	-0.019
5466.460	1673.320	102.310	5406-502	1673.233	102,167	0.042	-0.080	-0.142
6982, 360	F/95.670	19,180	5'887.395	695,766	19.108	-0.004	0.096	-0.071
4375, 430	331,550	64.710	4375,473	831,852	64.728	0.042	0.002	0.018
5759.160	246.580	30, 770	5753,144	246.663	30,973	-0.015	0.083	0.203
3211.850	6,530	73.200	3211.733	6. 324	73,236	-0.111	-0.205	0.036
4201-270	-781.390	43,460	4201.303	-781.259	43.381	0.038	0.130	-0.078
	773.610 709.540 466.460 982.360 975.430 8759.160 811.850	773.610 750.170 3703.540 2316.640 3466.450 1673.320 9382.360 495.670 9375.430 331.550 3793.160 746.580 371.650 6.530	1773.610 PE60.170 F.5.530 1770.540 P336.640 95.070 1466.460 1673.320 102.310 1466.460 1673.320 102.310 1735.430 805.670 19.110 1735.430 831.950 64.716 1735.430 846.540 30.770 1736.75.670 33.950 64.716 1735.430 86.540 30.770	1773-610 2550.170 ₹53.530 €773.601 7570-540 2534.6.440 95.6.70 €773.601 1466.460 1673.820 106.2.10 5446.562 1522.300 4534.670 13.110 5497.287 1523.6.440 153.100 5497.287 13.110 5497.287 1523.140 244.562 13.110 5497.287 127.270 1723.140 244.563 70.770 5479.143 1723.140 246.540 73.260 21.1738	1773-6-10 2920.170 €.5.2303 £.773.601 3550.1233 1705-5-00 2336.640 95.070 £.773.601 3550.710 1466.440 1673.320 192.10 5442.602 1673.233 1462.300 1673.320 192.10 5442.602 1673.233 1421.300 1673.320 192.110 5442.602 1673.233 1421.300 1673.320 192.110 5442.602 1673.233 1473.300 192.110 5442.602 1673.233 165.670 1723.100 1673.200 192.1170 5475.144 266.642. 1723.100 156.530 37.70 5773.144 266.642. 191.1780 6.530 37.70 5771.174 6.724	1773.610 PEGD.177 E5.530 C/73.601 2550.128 E5.650 1705.400 733.610 PEGD.177 E5.030 C/73.601 2550.640 55.050 1466.440 1673.250 162.310 54/2.50 57.75.610 167.75.76 13.100 1021.400 1673.250 162.310 54/2.50 167.75.76 13.100 1021.400 1695.610 13.100 54/0.514 167.76 13.100 1021.400 1695.610 13.100 54/0.514 14.100 14.100 1021.400 169.610 13.100 54/0.514 14.100 14.100 1021.400 169.610 13.100 54/0.514 14.100 14.100 1021.400 16.111 11.100 54/0.514 14.100 14.100 1021.400 16.530 13.700 17.173 15.744 26.663 20.732	1773.610 2620.773 501 2620.773 601 2650.723 93.564 -0.008 1705.400 2531.640 050.070 670.0577 251.640 050.070 670.0577 251.640 050.070 670.0577 251.640 050.070 670.0577 251.640 050.070 670.0577 251.640 050.070 670.0577 251.640 050.070 670.070 050.070 670.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.070 050.015 0	1773.610 ρεξ0.77 65.10 ρεξ0.77 65.00 βεξ0.77 65.00 βεξ0.77 65.00 βεξ0.77 65.00 βεξ0.77 65.00 10.70 67.00 10.70 17.70 8εχ2.76 67.00 10.70 10.70 10.70 10.70 10.70 10.72 10.70 10.72

SID ERR IN X= 0.047 STD FRR IN Y= 0.078 STD FRR IN 7= 0.129 STD ERR IN H ANIMETRY= 0.089 STD ERR OF ADJUSTMENT= 0.157

ADJUSTED COORDINATES

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SECTION NO. 6-164

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496-3	83%7.702	2733.539	1288.044
481.4	7704.620	2442.1773	1279.272
86.34	8035.253	3437,206	34,471
105-105	8300.415	2726-365	11.139
26.32	8764.138	2348.337	16.333
8908	7574-605	2375-541	20, 737
r#646	7654.221	2460.061	49.609
3C4R	8600-863	1872,140	32,195
303	8305.050	2134.813	P7.293
2633	3686.536	2230.475	7,399
8913	7921.573	3435.182	43.004
(3543	7204.668	3099.301	43.340
3643	2077.394	1800.022	17.244
96.38	3351.555	2821.032	40.304
56.33	7675.831	25.46-966	62.134
\$903	7565.757	2954-683	20,405
BICTIO	IND. 6465		
4864	7709.620	2442.837	1274.272
4965	7086,655	2081.377	1277,931
8008	7574,605	2975.541	20.737
8546	7654-321	3460.061	49,609
3647	8203, 848	1872.140	32.135
SEGR	6807.626	2569.603	84.736
3656	1111.292	2005.003	51.578
8653	7630.038	1511,781	6, 394
505	7027.304	2813, 587	76.559
506	6773.601	2560.123	85,548
24.51	6603. P.38	2643.486	73.006

8,342 62,134 48,843 67,830 64,263 17,244 7499.033 1434.464 2536.966 3048.801 2523.771 2653 3653 3642 3641 3657 8657 7075.101 7204.668 6353.220 7027.344 8077.394 2111.243 86-93 SECTION ND. 6566 1277. 931 1276, 716 84, 706 51, 578 6, 394 76, 797 55, 415 13, 131 7086..665 6463.881 6807.626 2081.327 1685.397 2569.603 4365 8398 6807.626 7111.292 7620.033 6344.721 6448.586 6981.701 3005,603 1911.781 2123.741 1687.798 3658 8088 1171.433 2560.128 2316.643 2220.493 3668 508 308 6773.601 85.568 \$661 \$663 6100.009 36.009 1074.655 8662 6458.123 7027.344 6693.828 1740,517 11,601 58,163 64,263 78,055 74,617 8,343 8551 8683 2079.514 6340,413 3653 1484.464 SECTION NO. 6667 1276, 718 1274, 787 76, 707 55, 415 6468,181 1685.397 496.5 6344.721 6448.585 1292.730 4367 201312 3666 1687,700 55.415 13.131 85.491 66.365 88.949 8667 6981.701 5623.870 1171.433 5008.431 5308.431 5466.502 5537.092 6340.535 1321.513 784.731 1673.233 1798.725 3676 86.78 207 102, 167 95, 350 33, 303 8671 8673 762,070 1740.518 2220,478 1311.718 1074.655 REGR 6458.129 58.163 8661 8672 5920.570 6936.197 5835.208 70.577 96.6.9 11.601 3373 1572.600 SECTION NO. 6768 1292.730 900.165 1796.477 1391.519 5877.652 577.638 1274, 787 1262, 000 85, 491 66, 365 22, 945 4367 4863 SE23, 870 5903, 831 1011212 8676 8678 6367.018 784.73 846-8 4986.262 1253.242 83.574

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BEHE.	5 66.4 6	P36.215	48,003
86.83	5791,547	430,303	11.291
311	5382,355	695.766	10.105
507	5466.502	1673.253	102,167
8681	4377.942	1467.203	123, 922
6683	5641.057	361.707	10.315
8673	6340, 325	762.070	22, 203
	5537.00c	1798,725	25.350
8671			
BC&R	5211.785	209.785	48,972
8672	\$820.570	1311.917	70.577
8963	5175.109	1104.908	64.681
SECTION	ND. 6/459		
4868	5379.630	200,165	1262.660
4869	4707,162	516,119	1257.300
8868	4086.262	12:0.842	83.574
8585	5266, 426	R86.785	48, 283
8682	5701,547	430,268	11,851
		839,053	65.227
8358	439:1.780		
8696	47-07.201	520.558	36.263
86.38	5 46. 716	77.181	4.657
508	4375.472	831,552	64.728
312	5299.144	246.663	30, 973
56-91	4279,126	1139.427	94.568
8633	5031,984	-65.135	5.461
8682	S711,78F	909.785	48.972
8681	4877.542	1467.207	123, 928
	4566.738	762, 814	57.543
35'32	4667.825	531.583	
35'32		581.583 381.707	40, 5,98 10, 315
3692 2680	4667,825 5641,057		
3592 2683 276717W	4607, 1929, 5641,057 ND. 6070 4707,162	381.707	10.315
3692 2653 276717W 4369	4667, P25, 5641, 057 MD, 6070 4707, 162 4132, 620	381.707 516.J19 117.905	10.315 1857.309 1855.101
3532 2583 9767274 4353 4870	4607, 1929, 5641,057 ND. 6070 4707,162	381.707 515.119 117.905 839.053	10.315 1857.309 1855.101
3532 2583 2767169 4363 4870 8358	4667, P25, 5641, 057 MD, 6070 4707, 162 4132, 620	381.707 516.J19 117.905	10.315 1857.309 1865.101 65.927
3632 2683 2767269 4369 4870 8358 2690	4667, P.25, 5641, 057 MD, 6070 4707, 162 4132, 620 4389, 786, 4730, 791	515, 119 117, 905 839, 053 530, 558	10.315 1857.308 1855.101 65.827 26.853
3532 2683 576716W 4363 4870 8358 8690 3698	4667, F24, 5641, 057 kt), 6370 4707, 167 4132, 620 4389, 785, 4730, 791 5746, 710	515, 119 117, 905 839, 053 530, 558 77, 181	10.315 1857.309 1855.101 65.827 .76.863 4.657
3532 2532 2553 2557 269 4359 4359 2558 2558 2558 2558 2558 2558 2558 25	4607, F20, 5641, 057 MR, 6070 4707, 162 4132, 630 4389, 785, 4730, 791 5746, 710	515, 119 515, 119 117, 205 539, 053 530, 558 77, 181 464, 413	10.315 1867.306 1865.101 65.827 .76.853 4.65 61.473
3532 2532 2553 2557 269 4870 8358 2595 8595 8595 8598 8598 8598 8598 85	4607, F20, 5641, 057 MD, 6070 4707, 162 4132, 620 4389, 785, 4730, 791 5745, 716 3845, 716 3845, 716 3845, 716	516, 113 117, 205 839, 003 520, 552 77, 181 464, 413 153, 457	10.315 1867.308 1865.101 65.827 76.853 4.654 61.471 36.534
3532 3552 3557 4353 4353 4353 8358 8558 8558 8558 8548 3705 3705	4607, F26 5641, 057 MTL 607 4707, 162 4707, 162 47	381.707 516.119 117.505 839.063 530.558 77.181 464.413 153.457 -346.166	10.315 1867.308 1865.101 65.827 36.863 4.657 61.473 85.534 12.853
3532 3552 3557 4353 4353 4353 4353 3558 3558 3558 3558	4607, 1/24 5641, 057 4707, 1/69 41732, (30 4707, 1/69 41732, (30 4730, 785, 4730, 785, 384, 716 384, 716 384, 560 4210, 537 4664, 865	281.707 516.119 117.305 839.063 530.558 77.181 464.413 153.457 -346.166 831.552	10.315 1267.300 1265.101 (65.621 (61.471 36.53 12.853 64.727 64.727
3532 3552 355716W 4353 4870 8358 8558 8558 8558 85705 85705 8705 8706 8706 8706 8706 8706	46(7, 17, 16 5641, 057 5641, 057 4707, 169 4132, 620 43783, 785, 4730, 791 5746, 716 3746, 610 4210, 557 4564, 865 4375, 472 3713, 851	516, 119 516, 119 117, 205 530, 053 77, 181 464, 413 153, 457 -346, 468 831, 556 831, 556	10.315 1867.306 1865.101 65.827 76.65. 4.65% 61.473 18.055 18.055 18.055 05.056
3532 3652 3653 4353 4354 4353 4355 3558 3558 3558 35	46(7, 1), 4) 5641, 657 4707, 162 4707, 162 4132, 620 4378, 785 4730, 751 5746, 716 3746, 475 3746, 472 4375, 472 4375, 472 4375, 472 4375, 472 4375, 472 4375, 472 4547, 2848	281.707 516.119 117,305 838,003 530,558 77,181 464,413 153,457 -346,416 831.559 635,236 460,378	10.315 1867.306 1865.101 1865.101 18.521 18.54 64.53 18.23 18.23 18.25 64.725 25.0(4 12.44)
3592 2683 27671700 4369 4870 3858 2690 8858 2690 8858 2690 8858 2706 8701 8700 8701 8701 8701	46(7), R.2, 5641, 097 MT, 6370 4707, 162 4132, 630 4730, 785, 4730, 781, 5746, 715, 4730, 781, 4730, 781, 4740, 773, 475, 4770, 773, 475, 4770, 774, 475, 4770, 775, 4770, 775, 4770	281.707 516.119 117.505 839.053 550.558 77.181 153.457 -346.413 153.457 -346.166 731.559 (45.216 460.378	10.315 1867.305 1805.101 65.821 75.865 4.655 61.471 75.253 75.253 75.054 75.253 75.054 75.7543
3592 26592 26592 4870 4870 8358 2692 2692 2692 2692 2708 2708 2708 2708 2708 2708 2708 270	46(7, 104; 5641.097 M7. 6370 4707.162 4707.162 4389.785 4389.785 4389.785 4389.785 4375.472 3713.651 4375.472 3713.651 4375.472 3713.651 4357.288 4567.288	281.707 516.119 117.705 233.055 530.558 77.181 465.457 786.558 781.559 786.236 400.5788 762.314 762.314	10.315 1867.308 1865.101 65.827 76.63.465 18.534 18.534 18.535 18.955 64.727 95.014 12.428 12.428 95.7543 96.57.543
3592 2683 276716W 4364 4870 3358 2696 2698 2698 2698 2698 2698 2708 508 2708 500 5701 8701 8701 8701 8701 8701 8701 8870 9853 2692	46(7, 104; 5641.057 M7. 6370 4707,162 4707,162 4730,75 546,170 376,475 376,475 376,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,4	381.707 516.119 117.305 639.003 530.552 77.181 153.457 (45.216 831.557 (45.216 400.373 762.314 133.437 762.314	10.315 1867.303 1865.101 65.627 75.65.627 75.65.4 4.657 64.723 18.524 18.524 18.524 18.524 18.524 18.524 18.524 18.524 19.57.433
269C 3532 8842 3706 3706 3708 508 508 508 508 508 508 508 508 509 3855 3691 8855 3691 8843 8702	46(7, 104; 5641, 097 M7. 6370 4707, 162 4707, 162 4738, 785, 4730, 731, 5746, 716 3748, 476 4376, 472 3713, 651 4376, 472 3713, 651 4547, 2848 4566, 776; 4273, 123, 4020, 475 4020, 475	381.707 516.119 117.505 839.053 77.181 125.565 77.181 135.547 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.557 631.5577 631.5577 631.5577 631.5577 631.55777 631.55777 631.5577777 631.5577777777777777777777777777777777777	10. 315 1867, 300 1865, 101 65, 927 76, 853 4, 657 64, 947 13, 853 64, 720 95, 004 12, 420 95, 904 12, 420 95, 904 12, 420 37, 543 96, 544 37, 543
3592 2683 276716W 4364 4870 3358 2696 2698 2698 2698 2698 2698 2708 508 2708 500 5701 8701 8701 8701 8701 8701 8701 8870 9853 2692	46(7, 104; 5641.057 M7. 6370 4707,162 4707,162 4730,75 546,170 376,475 376,475 376,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,475 375,4	381.707 516.119 117.305 639.003 530.552 77.181 153.457 (45.216 831.557 (45.216 400.373 762.314 133.437 762.314	10.315 1857.309 1855.101 65.827 .76.863 4.657

GECTION NO. 7071

4370	4132.630	\$17,905	1255, 101
4871	3564.779	263,800	1267.433
8343	3865,000	464.418	52.471
8706	A210, 547	153.457	35, 539
8708	4664.866	-746.166	18,852
6838	2702.039	2.289	73,690
8716	3530.533	-310,468	31, 337
8712	397.3, 100	-686,037	17,402
313	4201.308	-781.2-5	43, 331
503	3211.733	6.325	73,236
8711	3127.443	236.365	83, 307
8713	3950.234	-927.342	13.650
8702	403.2.717	24.723	37,853
8701	3713.851	645.2%	95,066
3843			
8712	4020,485	323.713	46.244
			38, 279
8703	4547.286	-460.308	12,428
SPECTIC	N NG. 7172		
archio	11 MUL 10 12		
4871	3565.779	-203.300	1267.438
487.3	3003, 521	-654,683	1275,250
8238	3208-033	2,233	73,690
8716	3530, 533	-310,468	71, 337
8718	3373. 190	-665.007	19,402
88-98	2752.673	-332.932	80,800
8726	3018,130	-730,260	14.5%
8728	3334.765	-939.626	3,442
509	3211.733	6, 334	73,236
3721	2593.463	-107, 540	91,010
3727	3376-003	-1183.035	7,196
8712	35/21-161	-130,646	30,879
8333	3390.214	-180, 516	44.775
8711	3127.440	298, 356	13, 307
8722	2027.502	~580,480	20,230
3713	3950.234	-927.342	13,650
350.10	N ND. 7279		
4878	3003-931	-6-54 - 682	1275,200
4373	2461,039	-1043.355	1274.351
2828	2782, 6.79	-335,988	30, 100
8720	3013-130	-780, 450	14, 546
87213	3334.203	-283, 626	3,442
\$818	2103, 329	-701,460	63, 181
87.8	2491.684	-1005.341	15.510
07.00	1003 011	-1571 000	12 641

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SECTION NO. 7374

4973	2461.008	~1049.354	1,274, 3%1
4874	1900, 957	1452,601	1266-300
9316	21(42, 3/2)	-701-460	63, 181
8736	2421.634	-1005, 941	15,510
3778	2(33,071	~1571.098	13.541
8744	1573.73	-900, 27.7	10,393
8746	1808.172	-1529,608	27.507
3748	2245, 544	~1958,164	11,270
510	1911.694	-311.227	67, 325
31.4	2454, 754	~1317.665	9,057
8741	1551.359	-891,099	10.051
8747	3:41.641	~19:49,283	10,855
8732	2423,700	-938,411	17, 332
8731	2121.147	502,476	91,203
8813	3153,011	-1043.081	26.175
8730	2964.717	~1593,152	7,835
3742	1844.937	-1443.493	27.851
arcrine	1 MR. 7475		
4374	1000, 957	-1492,001	1265, 360
4875	1350.556	~1839.300	1209,693
8744	1577.734	-900,873	80,353
8746	1208.192	-1529,635	27.507
8748	2245, 544	~1:458.164	11,270
137:23	225, 103	~1315.543	12,017
8756	1295.024	~1839.919	35.249
8752	1773.101	-2334.035	10,109
8808	1405, 777	-1364.537	50,676
511	1346.351	-1413.634	96, 368
315	1750.444	-2397,492	11.262
2753	331, 335	-1271.149	67, 956
875.3	1709, P64	~2348,751	2.145
2503	1506.528	-1 496, 692	42.484
8752	1952, 491	-1800.853	35.268
8743	2241.641	1959,283	10.255
11/42	1344.030	~1443.403	47.651
3741	1561.357	- 201 - 999	50,051

PLANING INJC AND HEIGHT CONTROL

PT ND.	×	Y	z	×	Ŷ	z	VX	ΨY	vz
310	7730,450	1144.610	3, 370	7 (30, 557	1144-615	3.767	0.077	0.005	-0.
B17	3273,360	-2415,5040	4, 320	3279.934	-2015, 845	4.387	0.074	0.034	0.
104	9016.230	1170,100	5, 350	2016, 181	1170, 154	5.362	-0.048	-0,025	0.
316	8150,770	561,670	6,390	8150, 205	561.742	6.440	0,036	0.072	0.
312	5259, 160	346, 580	30,770	5393, 197	246, 527	30, 902	0.037	-0.052	0
512	5315.640	-141,180	3, 330	5315.005	-141, 132	3, 370	-0.034	-D. DJP	ο.
513	\$812,190	-767.030	2,940	5318, 165	-767.644	2,907	-0.024	0.045	-0
313	4201.770	-781, 310	43, 450	4201.270	~781.415	43.346	0.000	-0.025	-0.
315	1759, 470	-2317.510	11.270	1759,423	-2337, 528	11.257	-0.040	-0.018	-0
105	6161.330	-621.250	3,050	6161.324	-621.291	3,052	-0.065	-0.041	0
105	2409.510	-3189,430	5,050	2400, 435	-3189,412	5.113	-0.014	0.017	0

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STD ERR IN Y= 0.041 STD ERR IN Y= 0.032 STD ERR IN Z= 0.100 STD ERR IN PLANIMETRY= 0.053 STD FRR IN* ADJISTMENT= 0.113

	AD.TUD	TED CROWDINATES	
PT ND	×	Y	z
SECTION N	80. 9637		
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4837 4838 8648 8378 8378 8378 8378 8378 8378 8378 83	 B738 B621, 085 B622, 103 B622, 103 B659, 003 B59, 013 7620, 036 8026, 485 8150, 806 	1276.052 9c2.637 1871.954 1203.330 P85.073 1511.570 1012.701 545.508 561.42	1210.205 1205.588 31.777 5.126 4.083 3.726 2.488 5.440
310	7720.557	1144.615	3.767

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RIGHT	7634.444	1462.353	5,501
8383	3376.294	300,195	2,050
8372	8635.702	1300.771	4.347
1/ 37 3	8251, 154	1822.243	15.313
8643	8077.1-51	1733.005	16,645
3044	8034.300	332.772	3,437
8373	2015, 249	757.930	4.215
0212		131133	
TECTOR	IND. 309.		
48.08	8082.193	932.327	1205.502
4839	7445.854	580.228	1207.222
5658 8380	764.0.036	1511.570	6.033
		1012.701	3.726
8.483	8184.632	145.500	2.480
8003	6981.717	1171,283	
33.8	7335.337	\$45.606	3.547
8303	7677.251	277.037	3.463 3.767
310	7700.557	1144.A15 561.74P	
316	\$150,005	1063.260	6.440 4.343
23:01	7116.351		2.712
3303	7021.503	23.277 932,772	3.437
3364 3331		934,774	5,501
	7654.444	1/65.083	
86.53	7499.036	1434.335.	8.400
8383	8376994 7444058	380.135	3,100
33.15	/444,3/28	2,434,960	3.100
CPCTICA	I NI1, 3940		
4839	7445.204	520, 227	1007.824
4840	6822.202	203.764	1201.700
266B	6981.717	1171,283	13,583
8390	7335.337	545.600	3,547
8398	7637.251	277.037	3,463
3678	6367.184	784.519	23,642
8406	6753.004	415,830	3,816
8408	6945.727	15.745	5.853
8401	6453.411	8-0.665	18.603
840.3	6340.521	117.434	2,830
3393	7444,858	\$33, 980	3,100
8391	7116.351	1062,260	4.343
8663	6038. 381	1074,522	12.142
8323	78/1.508	23.877	2.712
8402	6775.744	762.047	3.162
SFC710N	I NF). 4041		
4340	6032,202	032.764	1201.700
4841	6180,270	141.973	1199,733
3678	6367, 184	784.519	73.643
8406	6753,004	615.037	3,816
3400	6045, 727	15,745	3,253
2140/00 23E 2322	5731.099	430.203	11.206
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8416	6117.459	15.713	7.055
B418	6437, 344	530, 977	3,156
0011	5660. B36	400.775	9.237
8413	64 30, 353	-538,567	2.247
8402	6775.244	262.097	3,162
8401	6469.411	820.665	18.603
SE73	6.340. 924	761,810	23.554
8412	6118.084	-50.758	3.117
G403	6940.621	-117.434	5.830
SECTION	ND. 4148		
4843	6189.279	-141,973	1199.732
4842	5566.967	-515.935	1195.373
3628	5791.699	430.203	11.006
8416	6117,459	15,713	7.055
8418	6437.334	-\$30,977	3.156
8698	5746.503	77.266	4.633
8426	5593,448	-439.732	5.664
842R	5837, 884	-762.616	4.352
312	5259.197	246.577	30, 902
51P	5315.605	-141.192	3, 370
513	5312,165	767.644	2, 207
105	\$181,934	621, 291	3,052
8421	5237.034	70,459	4.405
8423	5781.542	-798.032	2.695
8412	6118,024	~50, 753	3.117
2411	5265, 336	405.375	9,207
3683	5641.117	361,781	10.543
8432	5470,658	-366.66%	3,271
8413	6430.953	~538,568	2.847
SECTION	4 NO. 4243		
4842	5566.867	-516,935	1195.373
4843	4938.815	-904.653	1192.125
8633	5246.503	77.266	4.639
3426	5593.443	-439, 737	5.664
8428	5337.234	-762.616	4.852
870R	4664.921	-346.232	12,333
8436	4940, 838	-953,408	14.170
8438	5181-903	-1284,412	2, 817
512	5315.609	-141.192	3, 370
S10	5812.165	-767.644	2, 307
8431	4598, 272	-417.237	12.749
8433	5191.736	-1297,941	2.437
8422	\$970.653	~366,665	3, 231
8421	5837.094	70.459	4.405
8093	5001,789	-65,028	S. 765
8432	4268.526	+805.904	2.260
8423	5781.948	~798,092	2,695

SFCTION NO. 4344

2

1192.12% 1185.260 12.039 14.176 4843 4978.815 -004,657 4376.115 4329,677 4664,921 4940,838 5181,903 3973,094 4268,539 4844 -1305.990 8430 8439 -953,408 -1284.412 2.817 8718 -686.155 -1156.903 -1698.987 19.157 8446 8448 8.460 4697.196 4201.270 3950.005 -781.415 43.346 313 8713 8443 8433 ACTC ACO -1719.192 -BD6.904 5.130 4862.526 8431 8703 4598,272 4547,050 -417.237 12,743 3442 8433 4308.108 -1242,300 8.633 SECTION NO. 4445 4844 4845 8718 4329.677 3727.232 3973.014 -1305,999 -1690.076 -686,155 1135.260 1180.497 -686,155 -1156,903 -1692,987 -939,698 -1693,366 -2014,263 -1183,379 -2146,724 -1242,200 -827,200 -1719,192 8446 8448 8728 8456 4268.539 8.460 11.609 3334.256 3716.263 3963.308 3375.803 8,207 39,953 78,300 8458 8729 7.135 8453 4019.711 6.231 4308,103 2.633 8713 3350.005 13.623 4616-450 3704.778 5.130 8458 -1656.074 SECTION NO. 4546 3727.232 3115.110 3834.266 3716.263 3063.308 2193.140 3152.495 -1690.075 -2081.042 -389.698 -1693.360 -2014.268 4345 4845 1180.497 1181.283 8.207 8728 8.207 39.053 28.300 13.402 7.392 5.215 4.887 8456 8458 873B 8466 -1571.083 8465 3387.215 -2427,576 317 3:279, 904 2751, 748 0404, 516 3704, 778 3375, 003 2864, 313 3062, 068 4.887 8.144 5.371 9.351 7.198 7.942 7.672 6.271 8461 8463 -1520.620 3452 8773 -1656-074

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	246 247	3115.110	-2081,042 -2459,333	1186.418
	738	2293,140	-1571.083	13,402
	466	3158,499	-2103,483	7.332
	462	3387, 215	-2427.576	5,815
	748	2245-653	-1958.102	11.305
	476	2540,233	-2470-757	6.660
	478	2201.033	-2374.547	3,238
	317	3279, 934	-2415,345	4.3B7
	975	2181.336	-1300.613	11.693
	473	2543.786	-2959, 226	3,405
	5.0.0	3062,903	-2000, 557	7.676
a	461	2751.748	-1528,620	8,144
5	743	2241.533	-1999, 133	11.354
a	472	2515,897	-2430.081	5.749
8	463	3404.516	~2593.660	5.371
2	ECTION N	D. 4748		
	347	2527.335	-2459, 333	1188.418
	343	1945, 545	-2832,438	1131.072
8	748	3245.652	-1998, 132	11.305
8	475	2540.239	-2470,757	6,669
	478	2801-039	-2974, 547	3,238
2	1758	1773.123	-2703,388	10.576
5	436	1959.834	-2354.805	5.100
12	6334	2405.133	-3707.500	5, 234
	315	1753.429	-2337,528	11,257
	106	2419,435	~3189.412	5.113
	753	1700.054	-2343.725	9.743
	1423	2249.241	-3346.759	8.919
	472	2515,897	-2430.081	5.749
	874B	2241,533	-1957.133	11.354
	471	2181.333	-1000-613	11.693
5	3473	2843,786	-1,959.226	3.406
	107	2367.005	-3433.433	3.472
- 8	3432	19.12, 784	-2/198.603	3.302

* DURUAN TEST AREA *

RECIPIALS AT TIF AND CONTROL POINTS

01/01/1978

ITERATION NO 10 BLOCK ADJUSTMENT USING MODELS SPECTION CONNER MEANS

SECTION CORNERS

Adding P	ып.	x	Y	2	x	Y	z	vx	٧Y	vz	
WADELAID					SECTION NO	1211					
1 43	1.3	3278.025	2706,003	1354-014			1354.014			0.000	
\$ 49	13	2633,760	2191,001	1353,406			1353.430			0.024	
2 14	57	2637.351	2679.395	137.905	2637.370	2620.050	137,900	0.018	C-054	-0.005	
1 54		3564.005	1869.219	84.343	3503, 030	1869.250	84.950	-0.075	0.030	0.001	
§ 91:		2222.734	2787.670	127.730	2222. 791	2787.657	137.721	0.006	-0.019	-0.008	
1 01	13	3086.767	1511.924	71.424	30%6.815	1511,867	71.412	0.047	-0.067	-0.012	
1					SECTION NO	1110					
49.		2630,810	2191.029	1353,454			1353,430			-0.024	
\$ 31		2222.797	2787.638	137.712	2222. 731	2787.657	137.721	~0.006	0.019	0.008	
1 91		3026-856	1511.243	71.393	3086.815	1511.867	71.412	-0.041	0.023	0.018	
§ 47)		2021.338	1636.033	1347,657			1347.663			0,006	
1 910		1603.205	2261.754	129.685	1608.223	2261.255	129.608	0.016	0.001	-0.018	
1 910	28	2561-818 1310-632	11.30-551 1826, 834	73, 575	2561.R33 1810.701	1130.506	117,339	0.014	-0.045	-0.019	
5 34	21	1310.892	11676.10.44	117.383	1810-701	1866.963	117.355	0.00%	-0.005	0.010	
					OPCTION NO	1003					
49	10	2021.359	1696.078	1347.670			1347.663			-0.006	
914		1608.240	2261.856	120,500	1608.223	2261.855	129.608	-0.016	~0,003	0.013	
3 91	00	256.1.810	1130,502	73.571	2561.833	1130,505	73.556	0.013	0.003	-0.015	
	D1	1810.711	1726.823	117.410	1810.701	1226.229	117.399	~0.003	0.005	-0.010	
494		1494,150	1224, 762	1343.710			1342.683	-		-0.020	
30		1041.585	1790.628	178, 158	1041.613	1790.681	138.161	0,027	-0,007	0.003	
90	314	1939.734	594.642	118.374	1939.715	594.632	\$18,414	-0.019	-0.010	0.040	
1					SECTION NO	908					
6:30	29	1494.173	1294.020	1347.560			1342.689			0.620	
30		1041.640	1790.614	138.164	1041.613	1790,623	138.161	-0,027	0.007	-0.003	Ň
. 90		1939.727	\$94.721	118,403	1973,715	594.602	118.414	-0.012	-0.083	0.005	
49		963, 132	886.070	1347.400			1347.500			0.010	- 03
90		601,727	1440,221	135.066	601.715	1440, 223	135.064	-0.017	0,006	-0.002	
90	38	1291,176	P15.829	39,603	1531.530	215.898	99.607	0.054	0.000	-0.001	
í.					SECTION NO	807					
4:2	าส	963,970	886, 097	1347.511			1347,500			-0.010	
90		601.702	1440,234	13%,061	601.715	1440. 238	135.064	0.012	~0.005	0,007	
90		1291.267	215,867	23,523	1201.2%	215,898	99.607	-0.0%6	0.035	0.008	
- 430		4:52,704	431,405	1348.589			1348.613			0,023	

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REGIDUALS

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94,587 0000 736.634 -201.776 94.597 736.675 -201.832 0.041 -n oce -0.00% 1011.820 108 -30.244 1011.734 136.039 -30,250 0.004 0.025 -0.009 OPETION NO 705 432.728 736.661 -30.74J 4307 491.492 1348,006 1340.613 -0.623 2072 102 24.562 125.023 106.016 94.587 125.0%0 106.880 201.818 736.675 201.832 0.014 -0,014 0.025 1011.023 1011.820 -421.783 -0,003 30,250 -0,006 0.005 SOCS 260.376 -0.007 0.018 -0.035 1344.023 4900 -110.913 . BE.145 1344.027 0.000 SECTION NO 9089 4830 7006, 715 3541.473 1346.758 1346.758 0.000 6627.768 5994.303 6807.627 4839 3105,972 1343.685 1343,688 0.003 44.583 6627, 770 5934, 235 6807, 626 3897.470 44.550 0.007 0.017 303 -0.033 3610.398 -0.013 83734 36-10.411 0.006 0.022 1037313 2569,622 24.786 20,501 84,759 -0.000 -0.026 6.003 7574.140 2975.637 7574.6.15 2975.636 20, 523 -0.005 -0.001 0.021 SECTION NO 8988 3105.044 1343.688 4889 6452.107 1343.63. -0+003 20,577 84.741 1337.470 5994, 395 3510,392 0.006 0.013 -0-022 8334 59:14.40.3 83.98 6307.653 2563.583 6207.625 2569.621 84,759 -0.038 0.031 0.018 4803 \$300, 547 5472,910 3162.133 32.392 5472.944 3162.145 32,399 0.033 0.007 0.004 8884 2123, 828 6344.672 83333 6364.659 2122.275 0.012 -0.047 SECTION NO 8587 1337.473 32.406 76.956 1339.177 8900,598 2662.136 3162.152 2123.853 1337.472 32,339 76,960 -0.001 4:322 8824 3838 5472.977 6344.6%7 5329,850 -0.005 5472,944 3162.145 -0.033 «D 007 6344.672 2123, 828 -0.015 -0.025 4387 2208.357 1339,202 0.024 4934.013 2624.722 4934-027 2524.767 69, 503 0,013 0.044 8874 69.578 -0.025 2072 54-23, 703 85.812 5623,753 25. 205 0,043 -0.003 -0.00 SECTION NO 8786 4327 5379.183 2203,005 1339.226 1339,202 -0-024 4934.027 5623,753 2624.767 2624.812 69.477 35.811 -0.017 -0.044 8374 49%4.040 69,503 837R 5623.738 85,808 0.015 0.004 -0.003 1344.170 0.035 4875 4753.192 1756.414 1344.135 60,273 2292.664 1259.6-2 3364 4349.129 2232.614 4349,117 -0.011 0.049 -0.043 8358 4086,208 1259,840 83.778 4986.222 88.780 0.013 0.001 0.007 SECTION NO. 8685 27 4753.154 1796.485 2892.713 1259.883 1344, 170 60, 230 83, 780 -0.035 4286 1344.205 8364 4349.106 60.187 4343.117 2232.664 0.011 -0.049 0.042 3268 4976. 243 4986. A22 1259.342 0.021 -0.040 4885 4169.155 1303.076 1344.657 R4.974 64.672 1344.646 84.950 64.710 0.011 1869.250 0.066 0.049 3663.999 396.8, 150 -0.024 503 4375.350 831.505 4375,430 831.550 0.079 0.044 0.037 SECTION ND R584 4835 4169,805 1304.065 1244,635 1344.646 0.011 1069 250 0.021 507 3553.335 1869,728 34.37P 3567, 930 84,950 -D. OC.5 -0.022

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3622-565	266.833	1340,050			1340.036			-0.624	
								0.028	
4375.443	\$31.615	64.633	4375.43D	831.550	64.710	-0-013	-0.055	0.010	
			STOTION N	R 8483					
3022.054	266.869	1040.011			1340.036			0.024	
			3885.679	464.458		-0.047	-0.037		
3405.072	2.473	73, 57%	3202,125	2.458	73,509	0.053	-0.014	-0.017	
			SECTION N	8382 0					
2,62.653	488. 335	1343.870			1343.875			0.005	
			3202.125	2.458		~0.010	-0.023		
5435*653	-305.701	20.303	2782.942	-332,725	90.334	0.013	-0.023	0.03t	
			SECTION N	1858 0					
2096, 339	0.504	1343,286			1343.308			0.015	
1939,748	\$94,561	113,467	1939,715	594,632	118.419	-0.033	0-070	-0,058	
		80,285	2782,842	-332.725	80.334	-0.044	0.010	0.049	
2108-4.42	-700.944	62.223	2108,440	-701.015	62,759	0.008	-0.071	-0.063	
			SECTION N	0 8190					
1781.411	-423.465	1334-330			1334,998			0,007	
			2103,440	-701,015		-0.015	-0.015		
1.00.00	- 5001570				10,010	0.000	-0-040	-0. Outs	
			SECTION N	0 8079	•				
1147,357	-346.475	1341.551			1341.539			-0.011	
			924.903	-1315-076		-0.004	-0-026		N
			200 000	4.51 1995		0 007			278
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46.96.0.00.0	147.511.11				73.750	-0.031	-0.023	.0.164	
			SPCTION N	D 6364					
8337,813	2793.593	1287.047			1287.687			0.000	
			1704 COC	11.54 000		A			
8203, 593	1872,059	32,146	8763, 371 8203, 331	1872-021	16,610 32,086	0.097	-0.017	-0.033	
	30016.771 3088.4443 4572.443 2088.54443 2088.54443 2088.54443 2088.5444 2088.5444 2088.544 2088.544 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 2088.571 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8-901	7574.505	2375.655	.30, 5,73	7574,635	2975.636	20, 523	0-030	-0.018	-0.000	
5-91.61	775746455575	12.12.000	-30-54-3	SECTION NO		CO+ 2422	0.030	-0.015	-0,000	
				STATISTICS NOT	4.44.12					
4864	7709.678	2442,821	1279, 186			1279.213			0.027	
3.708	7576-(44)	2375.614	20.544	7574.635	2375.636	20, 523	-0.024	0.020	-0.021	
SK-AR	8200.027	1872.012	32,004	8-03.311	1972.021	32.035	0,004	0.006	0,002	
4365	7086,643	2081.304	1277.969			1277.089			0,000	
357 63	6307.585	2569.623	84,755	6007.636	2569.621	84, 759	0.041	-p. 00a	0,003	
\$6.58	7620.017	1511.695	C.464	7610.036	1511.662	6.463	-0.021	-0.035	-0.001	
				SECTION NO	CD645					
4865	7086.663	2001 - 330	1277.970			1277,509			~0,000	
8230	6807.635	2563, 649	84.755	6807.626	250.3,621	84.750	-0.008	-0.027	0.004	
86.53	7620.014	1511.680	6.453	7619, 996	1511.(62	6.463	-0.018	-0.017	0.009	
4266	6463, 829	1685,417	1276, 327			1277-015			0.023	
8388	6366.5303	3123,779	76,983	6344.672	2120.000	76,950	-0,016	0.048	~0.009	
80.68	6981.613	1171.403	13.414	6281.657	1171.40B	13.407	0.044	0.004	-0.007	
				SECTION NO	6667					
4365	6468.843	1685.413	1277-043			1277.015			-0.029	
13223	6344.650	2123, 804	76,944	6344,672	2123,535	76,960	0.019	0.023	0.015	
8668	698).714	1171.412	13, 307	6981.657	1171,408	13,407	-0.057	~0.004	0.019	
4867	5877.577	1232.706	1875.251	6301+651	11/1/100	1275.239	0.007	-0.004	-0.012	
8878	5623.761	1736,473	85.787	5627.753	1795,478	85,308	-0.009	0,004	0.025	
8678	6366,979	784.679	23, 343	6367,027	704.665	23, 348	0.047	-0.013	0.005	
				SECTION NO	6763					
4867	5877.625	1292,723	1275.226			1275,239			0.012	
8878	5623,004	1726,484	85, 225	5623.753	1735, 478	85, 303	~0.050	-0.005	~0.017	
8678	6367.030	784.700	23, 327	6367.027	734.666	23, 348	-0.002	-0.033	0.021	
4863	5873, 598	300,123	1202,956			1262.35)			-0.004	
3268	4936, 203	1253.793	23,747	4986.222	1259,842	83,780	0.018	0.043	0.032	
3688	5791 596	430.219	11.499	6791.572	430.230	11.473	0.036	0.011	-0.025	
				SECTION NO	6863					
4868	5279.614	300, 160	1252.946			1268,051			0,004	
8368	4986,233	1259.847	83,816	4996, 222	1259, 242	83,780	-0.010	-0,005	-0.035	
8653	5791, 533	430.237	11.237	5791.572	430,230	11.473	0.038	-0.006	0.075	
426.5	4707,119	516.116	1267.293			1267.271			-0.021	
36.20	5246.674	77.151	4,523	5246, 509	77.237	4,569	-0.074	0.035	0,046	
508	4375,439	831.550	64.677	4375.430	831,550	64.710	-0.004	-0.010	0.072	
312	5253,106	746.633	30, 208	5250.160	246.580	30.770	0.053	-0.050	-0.138	
				SECTION NO	C370					N
4369	4707, 132	516,135	1257.249			1267.271			0.021	à
80.98	5246-657	77.247	4,597	5246, 599	77.237	4,569	-0.058	-0.010	-0.027	
4870	41 42, 647	117.395	1205,081	Marcal and a second		1265,105		0.010	0.016	
8343	3865.640	464.404	G1.487	3335.679	464,458	61,457	0.030	0.034	-0.023	
3708	4665,857	-346,084	12,164	4664.320	~346.127	12.847	6.00.0	-0.048	0.002	
508	4375.462	831.578	64.704	4373.430	131.550	64.710	-0.032	150.0	0.005	
				DECTION NO	7071					
E.										
4870	4133.681	117.967	1265.172			1265.106			-0.016	
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464.465 8040 3395, 696 61.434 3005.679 464.458 61,457 0.016 -0.046 0.032 0.000 -346.102 12.519 4654. 10 346.177 12.847 0.03 0.004 -0.012 4871 0.025 83.33 3202,121 2.443 73, 509 3202.125 2.458 73.509 0.003 0.016 0,000 626-016 3973, 190 -686.003 8712 12.20 1973.125 19, 302 -0.015 0.011 0.025 SECTION NO. 2170 355-6, 850 -268.693 1267.314 4971 1267.288 0.025 8838 3602.172 2.475 -085.'93 -554.400 320.2, 125 2.458 -0.046 0.073 73,457 0.041 8718 10.358 3373,175 -686-002 19,302 -0.023 -0.018 0.050 4872 3003.980 1274.905 1274.929 0.0". 83.28 2782.802 332.748 80.419 2780.842 -33P.725 0.040 0.022 0.084 \$723 3774 267 - 393 A 76 9 179 3334, 704 -989.455 3,210 0.000 -0.033 0 025 BECTION NO. 7777 1274.953 4872 3004,044 -454,443 1274/929 -0.024 2782.893 3334.343 2712.262 -332,728 -0.009 80.334 -0.010 951279 0.004 8720 -939.403 8.209 3334.304 -989.456 -0.045 -0.022 0.001 2461.138 F108,445 -1049 035 1274.133 1274.177 62.759 4873 0.033 8R18 -701.062 2103.440 -701.015 -0.004 0.046 -0.028 0720 2397.053 -1570,876 13.472 2333.130 -1570,883 13.450 0.071 -0.011 -0.013 INCLUDE NO. 7974 4873 2461.195 -1049,026 1274.216 1274.177 62.759 13.458 -0.033 2108.429 2893.216 1900.914 1579.750 -701.055 62.706 13.469 2105 440 -701,015 0.011 0.000 0.052 8219 8738 2833.130 -1570.887 0.085 -0.011 61272 -1452.273 1266.288 0.023 1579, 753 874 -900.414 73.862 900, 404 0.001 0.003 -0.056 0 740 2245.53 11.214 2245.017 -1958.020 11,225 0.083 -0.040 0.010 DECTION NO. 7476 4772 -1452.305 --900.423 -1958.037 -2337.462 1266.311 79.728 11.828 11.817 1266.288 79.805 1901.018 -0.023 0.018 8744 1579.759 2245.691 1759.412 1579.758 ~300, 401 -0.007 0.032 -1953.020 -2337.510 11.225 -0.073 2245,617 0.00 0.002 215 -0.047 0.05 1350,423 924,928 1405,909 4875 ~1830.073 1269,626 1263,626 0.000 924,033 0.026 8703 -1315,103 87.341 -1315-076 87.404 0.004 0.055 -1364.173 -0,010 8800 50.182 1405.893 1364.154 0.018 0.124 0.040 511 1246.249 ~1413.200 55.37% 1246.700 -1413.300 55,750 -0.030 -0.076 SEL: 325-22 1637.090 1220.574 4830 3193,854 1228.574 1210.235 5.350 0,000 86-21.029 9016.184 483 -0.001 104 1170.234 E. 407 2016-230 1170.180 0.045 -0.054 0.057 280 305.104 2348.442 4.073 8318,823 885,126 2348,824 -0.021 0.022 RUZE 8919.846 4.932 0.058 8766.421 36.38 15-010 0.033 51.40 RINYA SOT 1871.969 37,002 8,103,935 1872.021 32.085 0.029 0.051 -0.005 SECTION NO 3738 42'37 8621.045 8210.007 1276, 141 1210.200 1210.296 0.008 8205, 935 1872.043 \$85.148 32.022 1872-021 92.086 4.938 1205.645 -0.026 ~9.022 0.063 8648 8375 8918.80 8118.873 0.021 -0.022 1915.120 BO22.141 7613.051 A12'80 332 670 1205.619 0.026 1511,610 7610 200 1611 463 6.463 0.046 0.052 86.98 6. 531 -0.069

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0.36.0	8104.463	5 15 556	2.450	2104.656	545,553	2.488	0.002	-0.002	C.033	
				STATION P	NO 31839					
43.38	B0652, 164-	922,608	1205.671			1205-645			-0.026	
86738	70-00-001	1511.070	6,403	754(14) 5	1511.562	6,463	~0.005	-0.017	0.059	
8335	3184-659	545,551	2.626	11184.644	545, 553	2,488	-0,002	500.0	-0.038	
45.33	7445, 701	520, 307	1207, 125			1207,151			0.026	
26.07	6331.663	1371,7989	13.450	6031.657	1171.408	13,407	-D. ODC	0.019	-0.051	
83%	7037.178	277.000	3.3	76.37.187	277.101	3, 366	0.008	0.003	0.022	
				SECTION N	R 3340					
48.33	7445.795	580.324	1207.177			1207.151			-0,026	
35.63	0933.638	1171.4.30	13,308	6:401.657	1171.405	13,407	0.019	-0.013	0.038	
85.45	7637.196	277,103	3.383	17, 187	277.101	3.366	-0.003	-0,007	~0.022	
4340	68eld. 01X	222, 852	1201.605			1201.610			0.004	
86.78	6367.058	734.664	23, 383	631 0	784. E.C.C.	23.348	-0.041	0.012	-0.034	
8400	6945.615	15.833	3.103	6945.144	15.847	3.125	0.058	0,034	0.015	
				SECTION :	4041 Ø					
4240	6822.1.23	232, 333	1201.615			1201-610			-0.004	
EC 78	6367.030	784.620	23, 391	6.367.027	784.666	29.348	-0.002	0.040	0.007	
8403	\$945.672	15.371	3.142	0345.044	15.847	3.120	-0.022	-0.034	-0.016	
4251	6189.204	-141.318	1133,611			1199.592			0.013	
861.5	5701.564	430. 7	11.477	5731.572	430.230	11.473	0.010	-D.011	-0,003	
8418	6437.364	-530.317	3.052	6437.337	-520.911	3.057	0.021	0.005	0,005	
				SECTION 1	VR 4142					
4641	6183,263	-141.013	1199.573			1199,592			0.018	
3688	5791.658	430.223	11.518	5791.372	430.230	11.473	-0.025	0,006	-0.045	
8413	6437,405	-530.704	3.00.3	6437. 333	-530, 011	3.057	-0.021	-0.006	-0.005	
4842	5566 . 14/8	S15.012	1105-436			1135.414			0.020	
8633	5,245., 4110	77.259	4.542	3746, 509	77.237	4.563	0.104	-0.032	0.026	
513	531.2.107	767.003	2.336	GC12-175		2,964	-0.022	-0.017	-0.022	
105	\$161.943	- (21, 213	3.030	6161.330	-621.750	3.050	0.045	-0.016	0.019	
312	\$259,174	246.510	n . 7 58	5799,160	246.500	30.776	-0.013	0.061	0.011	
				SECTION P	E454 (5					
4843	5554., 200	515.010	1155.333			1195.414			0.020	
9693	5.045, 571	77.220	4.613	5246.5(1)	77.237	4.569	0,03%	~0.052	-0.045	
51.3	12, 12, 153	-767.033	2.041	5812.175	-767.621	2.964	0.022	0.017	0.022	
4843	4 \$6,216	- 904, 123	11 12.1.3			1192.123			-0.005	
\$708	49 4.076	346, 14)	12.815	4654.100	-346.127	12.847	0.054	0.031	0.031	
B4 3P	5: 1,060	1284.044	2.843	5181.075	~1284.327	5-855	0.006	0.017	-0.021	
				SECTION 1	4344					
4843	49/04/810	74.552	11.4.118			1192.123			0.005	
8702	462.4.910	55-1-3	1.4.204	40.04+0.20	- 346, 127	13.84	-0.033	0.015	-0.021	
34'37	5121.821	-12:14-010		5101.875	1284.327	2.822	-0.006	0.017	9.021	
4844	4323, Fe3	-1110-116-	11052-043			1185.343			0.000	
8718	2973.137	(197-1-19)	19.298	2073,175	-636.005	10.202	0.037	0.017	0.013	
8448	45/07+170	-10-2.1-20	11.035	4697, 119	~1698.860	11.664	0.010	-0,005	-0.001	
				GECTION P	¥1 4445					·

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41444	43/23, 700	-1305.892	1105.344			1185, 343			-0.000	
8718	3973,174	-635, 991	19,785	2073.175	-636,002	13, 202	0.000	-0.011	0.017	
8448	4697.120	-1693.357	11.663	4697.189	-1608,160	11.664	-0.010	0.006	0.001	
ARAS	1727.235	-1630, 993	1180,476			1180.491			0.015	
8728	3,34,307	-083,480	3.340	3334, 304	-929, 456	8.210	-0,003	0,023	-0.029	
8458	3963.295	-2014,100	23.244	336.3, 316	-2014.111	28.241	0.020	-0.004	-0.003	
				SECTION	ND 4546					
4845	3727.258	-1603.104	1180.505			1280,491			-0,015	
372B	3334, 293	-383,470	8.215	3334,304	- 989, 455	8.210	0.010	0.021	-0.004	
8458	2063.336	-2014-115	38.238	38.1.316	-2014.111	28,241	-0.020	0.004	0,003	
4845	3115,092	-2080, 978	1181, 344	271-021-71	203-1111	1181.332			-0.012	
8738	26,25,151	~1570.376	13,445	2093, 130	-1570,887	13,458	0.008	· 0. 011	0.013	
8468	3387.211	-2427-438	5.800	3387.238	-2427,440	5.811	0.017	-0.001	C.011	
				SECTION 1	ND 4547					
4846	3115, 115	2080, 902	1181.319			1181.332			0.012	
8733	2893, 184	-1570.920	13.449	2293,130	~1570.887	13,453	0.006	0.033	0,008	
846.9	3387.245	-2427,441	5, 372	3387.228	-2427, 440	5,811	-0.017	0,001	-0.011	
4847	2527.364	2459.845	1128.331			1133.308			-0,022	
8748	2245, 593	-1958.002	11.221	2245.617	-1398,020	11.725	0.024	-0.017	0,004	
8478	2801.003	-2374.478	3,099	2801.073	2974.489	3.113	0.003	-0.011	0.014	
ł				SECTION	ND 4748					
4847	25,27, 796	-2459,890	1188,286			1188,303			0,022	
8748	2245.650	-1953.070	11.237	2045.617	-1955,020	11.225	-0.033	0.050	-0.011	
8478	2801.076	-2374,500	3, 127	2301.073	-2374,489	3.113	-0.003	0.011	-0.014	
105	2403.535	-3189.334	5.061	2403.510	-3189.430	5,060	-0.02h	-0.035	-0.001	
315	1759.400	-2337.484	11.267	1753.470	-2037.510	11.270	0.069	-0.025	0.002	
4848	1945,540	-20:32.425	1191.029			1191.029			0.000	
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SICMA X/Y TIE = 0.041

SIGMA

IGMA Z TIE 4

0.0

SIGMA X/Y CONTROL =

310

CENT

0.057

BLOCK ADJUSTMENT USING MODELS # DURBAN TEST AREA

RESIDUALS AT CHECK POINTS

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	MODEL COUR INAT'S				TERNAIN COURDINATES			RESIDUALS			
PT. NO.	x	Y	z	x	Y	z	vx	٧Y	νz		
301	1810.700	1926.727	117,3%	1810.650	1837-020	\$17,830	0,050	-0.192	-0.433		
308	5.14.713	1233, 538	146, 373	534,710	1239,700	146,480	0.003	-0.167	-0.106		
3071/	736.675	-201.233	34.583	736.550	-201.320	94.560	0.085	0.086	0.028		
103	-33,380	1015,452	125, 263	-39,950	1015,440	125, 270	-0,030	0.012	~0.001		
504	717.677	-127.779	30.838	717.610	-127.360	10,940	0.067	0.080	-0.101		
501	6242.60	3270.239	18,873	6242.780	3870, 320	13.960	-0.112	-0.030	-0.137		
502	\$933,514	3654, 350	25.252	5929.5.30	3654,990	25,300	-0.015	-0.030	-0.047		
505	70.47.307	22113,601	75. 4 JF.	7027,390	2819,630	76.470	-0,04E	~0.037	-0.033		
506	6773, LBP	2560, 144	35, 535	6773.710	2560.170	85,580	-0.127	-0,025	-0.044		
307	6936.397	3270.619	65.850	6936.020	3230.680	65.620	~0.022	-0.060	0.230		
303	6709,524	2316.700	95,152	6700.540	2316.640	95.070	-0.015	0.060	0.082		
507	5466.402	1673,225	102.519	\$466.460	1673.30	102.310	-0.057	-0.034	0,209		
503	4375,422	831.552	64,679	4375.430	831.550	64.730	-0,007	20010	-0.030		
304	3740,153	1221.243	163, 691	3740.270	1221.070	168,553	-0.115	-0.125	0.172		
509	3211.784	6-463	73.116	3211.850	6.530	73.200	-0.065	-0.067	-0.083		
305	1863, 344	297.821	152, 846	1863.350	255, 380	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	59,873	1246.290	~1413.300	SS.750	-0.004	0.028	0.123		
311	5902.348	695.734	13,413	5982.060	695,670	19.180	-0.011	0,064	0.233		
312	5259,143	246.573	30.331	5259,160	245, 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	6,330	-0.002	0.121	0.047		
310	7730, 506	1144.634	3.841	7730.480	1144.610	3.870	0.026	0.074	-0.023		
512	5315.632	-141.178	3.348	5315.640	-141,180	3.330	-0.007	0.001	0.018		
513	5812.176	-767.620	2.066	5312, 190	- 167.690	8, 340	-0,013	0.069	0.026		
317	3279.046	-2415,703	4.384	3279.860	-2415.880	4.020	0.036	0.171	-0.035		

SIGNA X/Y = 0.081

SIGMA Z = 0.143

APPENDIX D

OUTPUT FROM THE ITC BLOCK OF SYNTHETIC STRIPS

** ITC TEST BLOCK **

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BLOCK ADJUSTMENT USING STRIPS

RESIDUALS AT THE AND CONTROL POINTS ITELATION OF

	*	11021	3999.441	79998.655	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	1.538	0.598	1,256
		507	75999.275	79937,922	1002,128	76000.000	80000.000	1000.000	-0.724	-2.077	2,128
	*	11051	15998.988	72997.575	938, 173	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	-1,236	-2.128
		151	55939,139	79937.672		56000.000		1000.000	-0.860	-2,327	-2,691
	*	12:51	55998.235	72000.471	997.308		80000.000		-1.764	0,471	-1.056
		1212	-0.664		998.943	\$6000.000	72000.000	1000.000		2,636	-0.942
		1555	3999.089	72003.304	939.896	-2.362			1.718	1,723	0.385
		1232	7938.415		1002.052		72000.388	1001.726	-0.141	-0.328	-2.576
		1242	11998.429	71999.668	1001.352	7999.924	71999.997	1003.929	-1.509		-2.773
				71998.615	1000.554	12000.028	71999.281	1003, 328	-1.598	-0.666	
		1262	20001.744	71997.878	998.002	20002,529	71999.674	1000.247	-0,784	-1.796	-2.245
		1272	24002.077	1999.365	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	181	-0.521	6.294
		12102	36004.814	72000.218	1000.786	36001.635	71997.357	999,242	3,179	2.860	1.544
		15115	40001.983	72003.642	1004-058	33998.919	71997.902	996.108	3.054	5.740	7.980
		15135	48001.828	72002.601	999.883	47999.530	71937.741	996.912	5.538	4.859	2,370
		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	~5.165	-1.986	-3.413
		12182	68000.626	71995,949	995-514	68002.295	71999.432	1002.012	-1.669	-3,482	-6,498
		15505	75001.409	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	381.5	2,336	1.194
	*	1221	3938.745	72000.527	1001.760	4000.000	73000.000	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
	٠	53511	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	-8.500	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	55000,000	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	63939.473	999, 595	27999-102	64000,824	992.364	2.978	~1.351	7.231
		23102	36002.521	63939.137	995, 397	35993.381	63999.994	994,867	3,139	-0.856	0.530
		23122	44001.250	64000.102	1000.331	44001.469	63937,403	999.045	-0.218	2,699	1,285
		23142	51998.593	64000.201	938, 348	52002.970	63997.602	1000, 545	~4.376	2,599	
		23162	60001.681	64001.017	1003,492	59399,112	63998,185	1004,509	2,568	2,831	-2.197
		23182	68002.745	64001,574	1001.466	67995.657	64001.271	1000.471	7.088		~1.017
		23205	76001.279	64001.024	999,336	76000.743	64001.065	999,939	0.536	0.303	0.995
		53515	80000.616	64000.991	998.494	B0001, 331	64000.274	999.105	-0.714	-0.040	-0.€0B
	*	2311	-0.318	64001,006	1000,447	0.000	64000.000	1000.000	-0.318	0.716	-0.613
	×	3411	-1,273	55999.080	997.527	0.000	56000.000	1000.000		1.006	0.447
	*	23211	80000.983	64000,076	998,602	80000.000	64000.000	1000.000	-1.273	-0.919	-2.472
	*	34201	76000.362	55999.314	1000.235	76000.000	56000,000	1000.000	0.983	0.076	-1-397
1	*	3351	16000,509	60000.023	1002,077	16000,000	60000.000	1000.000	0.362	-0.685	0.285
÷.,		3451	16000,491	56001.512	999.842	16000.000	56000.000	1000.000	0.509	0.023	2.077
•				200011310	444,046	100001000	30000-000	1000.000	0.491	1.512	-0.157

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	33151	56002.005	60000.164	1003.199	56000.000	60000.000	1000,000	2,005	0.164	3,199
*	341SI	56003.340	56001.315	1000-878	\$5000.000	56000,000	1000,000	3.340	1,315	
	23182	67995.657	64001,271	1000-471	68002.634	64001.600	1001,128	-7.037	-0.329	-0.656
	S3505	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
	354E	4002,191	55999, 445	1000.222	3999, 977	55999.314	999,633	2.213	0,131	0,589
	3442	12001,425	56002, 940	1003-187	11998,303	55999.547	997,783	3,122	2,792	5.404
	3462	19999.036	56001,455	998,123	19999, 981	56001.095	995,699	-0.954	0,360	1.424
	3482	28000,116	55000.694	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	55399, 505	997.336	44003.358	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	50000.470	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	395.985	-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	80000.035	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
- 2	4521	3999.680	48000.170	999-719	4000.000	48000.000	1000,000	-0.319	0,170	-0.280
÷.	34201	75999.795	56000.314	995.978				-0.204	0,314	-1.021
÷	4521	3999.680			76000.000	56000.000	1000.000		0,170	-0.280
÷	4451		48000.170	999.719	4000.000	48000.000	1000,000	-0.319		0.613
		15999.389	51999.899	1000-613	16000.000	52000.000	1000,000	-0.610	~0.100	
*	4551	16000.022	42000.427	1000-370	16000.000	48000.000	1000.000	0.022	0.427	0.370
- 5	44151	\$5997.323	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, B44	0.056	0.960	-0.159
	4532	8000.455	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	0,799	~0.539
	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
	451 32	48002, 370	48000.763	1001-982	48001,168	47999.324	999.320	1.201	1.438	5.661
	45152	55999.621	48000-652	1000.363	55999.484	47998.171	1002,123	0,136	2,430	-1.759
	45172	63397.053	47338.986	996-510	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	\$31.50008	47999.553	1001.698	80001-425	48000.249	\$99.549	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	33333.748	1002.804	80000.000	40000,000	1000.000	-1.370	-0.251	2.604
٠	5551	16000.534	44000.247	1000.458	15000,000	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	SE000.000	44000,000	1000.000	-0.389	-0,412	-0.229
*	56151	56000.128	33939.845	996,978	56000.000	40000.000	1000,000	0.128	-0.154	~3.021
	\$622	3398.353	40000.422	1000.109	3999,310	39998.431	999,644	-0.957	1.991	0,465
	56-32	7998,723	39997.571	996,801	7999.060	39999,042	1001.048	-0.336	-1.470	-4.247
	5652	16001.904	39939.793	939.589	15997.817	40000.195	998,914	4.087	-0.402	0.674
	5672	24000.131	40002.105	1003,390	23999.530	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	33938.644	938,141	47999.530	39999,750	997,798	2,761	-1,105	0.343
	56152	56000.473	40000.583	997.081	56001.069	39998,865	397,840	-0.596	1.718	-0.758
	56172	64000.282	40000.052	996.094	63998.308	39999.137	996,624	1.974	0.914	
	56192	72000.083	35999.020	995, 361	71997.452	39999, 184	1000, 542	8.631	-0.163	-0.530
	56212	79999.102	39939, 558	1002,158	79999, 305	39999.072	939.377	-0.203	0.485	-5.180
*	5611	-1.379	39998.892	999,450	0.000	40000.000	1000.000	-1.379	-1.107	2.781
								** 3(9	-1.107	-0.549

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٠.	٠	6711	-0.031	32001.566	1000.742	0.000	39000.000	1000.000	-0.031	1.566	0.742
	٠	56211	79999,998	33999,284	999.233	80000,000	40000.000	1000.000	-0.001	-0,775	-0.766
	٠	67211	80000.635	32000.003	1000.797	80000.000	35000.000	1000.000	0.635	0.003	0,797
	*	6651	15999.491	35999.040	1000.846	15000.000	36000.000	1000.000	-0.508	-0.959	0.845
	*	6751	16001,291	31998.755	997.705	16000.000	35000.000	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	31993,563	939,433	56000.000	35000.000	1000.000	0.530	-0.436	-0.566
		6722	3338,637	32000.452	997.931	3997.985	31998.847	999.203	0.712	· 1.605	-1.272
		6742	12000.757	32000.346	938.544	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		-3,170
		67102	36001.068	31998.978	994.910	35938.533	36000.502	938.081	8.535	-1.228 2.381	-0.526
		67122	44000.676	32002.939	1002.008	43999.231	32000.557	1002.535	1,445	2.382	0,352
		67142	51999.439	32000.443	939, 908	52000,267	31998.459	999,550	-0.827 1.923	2,298	3,118
		67162	60000.525 67998.288	32001.006	1001.583	59998.601 67999.801	31998.707 31999.156	998,464	-1.512	1.798	1,035
		67202	67998.288	32000.954	958,630	76000.294	31999.155	1002.689	-0, 330	-0.305	-4.059
		67212	80000,988	32000.025	1000.369	79998.563	31999.354	1002.685	2,424	0.050	0.294
	*	6711	~1,430	31999.109	1000.225	0.000	38000.000	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	939,715	80000.000	35000.000	1000.000	-1,524	0,199	-0.284
	÷	78211	80002.181	23999.720	997.767	80000,000	24000,000	1000.000	2,181	-0.279	-2.232
	÷	7751	16000.372	27999.002	1001.645	16000,000	28000.000	1000.000	0.378	-0,997	1.646
		7851	15999, 933	24000,106	939,256	16000,000	24000.000	1000,000	-0.066	0.105	-0.743
	*	77151	\$6000,105	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	339,940	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	53998.932	1004.509	0.391	1.751	-1.200
		78162	\$3999, 387	24002,254	1005.956	60000.971	24000.054	999.824	~1.583	2.189	6,131
		78202	76000.469	23999.742	1001.969	75998,819	240/1.932	998.222	1.650	-2.190	3.747
		78212	80001.745	23939.392	936.915	80001.795	23999.480	1000.642	-0.051	-0,087	-3.727
	*	7811	-3,113	23999.985	998,635	0.000	24000.000	1000.000	-3.113	-0.017	-1,364
	٠	8921	4000.491	15999.029	1000.819	4000.000	16000.000	1000.000	0,491	-0.910	0,819
	*	78213	80002.318	23099.522	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	19999.905	999,481	16000.000	20000.000	1000.000	5.085	-0.093	-0.518
		8951 88151	16002.111 56001.675	16000.728	998.057	16000.000	16000.000	1000.000	2.111	0.728	-1.942
	÷	89151	56001.944	15999.327	1000.930	56010.000	20000.000	1000.000	1.675	-0.672	0.930
		8355	4000,907	15999.766	939.173 1000.639	560C 3.000 4004.648	16000.000	1000.000	1.944	~0.233 0.544	-0.826
		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		1.773	
		8972	23998,648	16002,820	999.741	23999.324	16001.855	998,064	4.551	0.965	-0.220
		8392	31936.845	16001,353	1001.979	32001.091	16001.635	999.462	-4.245	-0.285	2,516
		89112	39997.997	15998,549	998.751	40003,941	15939.632	1001.045	-9.045	-1.032	-2.294
		89132	4B000.721	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	998,993	3,885	0,951	0.150
		89172	64000, 534	16003,181	998.587	63997.946	15998,047	1000.820	2,587	5,134	-5.533
		89192	71996,922	16001.448	398, 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

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* 91021	3995.046	8002,090	999.337	4000,000	8000.000	1000.000	-4.953	2.030	-0.662
* 59211	79999.635	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
* 99151	59998.302	12000.045	1000, 596	55000.000	12000.000	1000.000	-1.697	0.045	0.596
* 910151	55998.805	8001,564	1000.696	56000.000	8000.000	1000.000	-1.114	1.564	0,696
91022	3334,630	8001,645	399, 342	3998.055	8000.100	299.895	-3.364	1.545	-0,552
91032	7998.532	7995.652	999,902	7999.297	7999.971	997,137	-0,764	-4.309	2,765
91053	16001,552	8002.022	1000,913	15999.534	\$000,867	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	BO01,106	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 °
91Q152	55999.297	8001,280	\$000.404	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	-1.123	-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	-0-385	1.703	-5.099
* 10155	55938.060	4000.887	1001.661	56000.000	4000,000	1000.000	-1.939	0,897	1.661
* J1165	59999.626	0.848	995.080	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	0.325	1.623	0.890

SIGNA O PLAN = 1.656 SIGNA O HEIGHT = 2.203

(* CONTROL POINT)

** ITC TEST BLOCK ** BLOCK ADJUSTMENT USING STARS RESIDUALS AT CHECK POINTS PTM X Y Z XI

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MODEL NO 10102 11011 1-105 80000.833 398.900 0.000 80000,000 1000.000 -1.105 -0.823 -3.071 -3.874 1.099 1111 1211 0.855 76003.071 1000,292 999,386 1001,684 0.000 76000.000 72000.000 80000.000 76000.000 1000.000 -0.855 0.571 72003.874 0.613 11021 3999.441 3999.318 79998.656 4000.000 1000.000 0.558 1.343 -1.684 1002.065 0.681 1121 1001.228 1000.000 -1.486 1221 3999.507 72001.426 4000.000 72000.000 0.498 -1.228 STD ERRS FOR THE MODEL SIG X . 0.812 M 51G Y = 2.436 M 816 Z # 1.434 516 PLAN = 2.568 SIG POS = 2,941 MODEL NO 10203 11021 3333, 441 79998.655 1001.684 4000.000 80000.000 1000.000 0.558 1.343 -1.684 76000.840 1002.065 4000.000 76000,000 0.68) 0.492 0.099 -0.840 -2.065 1121 3999.318 1000.000 3999, 507 72001.426 1000.000 1221 11031 7999.900 79998.193 8000.000 80000.000 1000.000 1.805 0.229 1001.562 1135 7999,203 75999 141 8000 000 76000 000 1000.000 0.796 0.859 -1 563 1231 7980.197 71993.568 1000, 922 8000.000 72000.000 1000.000 0.431 -0.922 1,802 STD ERRS FOR THE MODEL SIG X * 0.991 M BIG Y = 1.321 M SIG Z = 1.545 SIG PLAN . 1.652 SIG POS = 2.262 MODEL NO 10304 79998.193 75999.141 71999.568 79996.562 75998.924 999.770 1001.562 1000.922 1002.610 11031 7999 900 80000.000 0.099 0.796 1.802 0.846 8000 000 1000 000 1,805 0.223 8000.000 -1.562 -0.922 -2,610 1131 7999.203 76000.000 72000.000 80000.000 1000.000 0.858 7998.197 1000.000 0.431 11041 11999.153 12000.000 1141 11998.771 1001.189 12000.000 76000,000 1000.000 1.228 1.075 -1.189 1000, 299 72000.000 1241 11998, 121 71998.920 12000.000 1000.000 -0.293 1.878 1.079 1.383 M SIG Y = STD ERRS FOR THE MODEL. SIG X = 1.914 M BIG Z * 1.527 SIG PLAN = 2.365 SIC POS * 2,819 10405 NO 10405 11041 11999.153 79996.562 1002.610 12000.000 80000.000 1000.000 0.846 3.437 -2.610 1001.189 + +141 76000.000 1.075 -1.189 -0.299 1.126 11998.771 1241 11998.121 71998.920 12000.000 1000.000 1.878 15998, 988 998.873 16000.000 80000.000 1000.000 1-011 2 424 15999.176 75999.080 999.928 16000.000 76000.000 1000.000 0.919 0.823 0.071 1251 16000 330 71995. 703 997 871 15000.000 72000.000 1000.000 -0.330 1.296 2.128 STO ERRS FOR THE MODEL SIG X -1.230 M BIRY = 2.1PR M SIG Z = 1.680 SIG PLAN = 2.453 S10 POS = 2,974

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MODEL NO 10506

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11051 15998.988 79997.575 998.873 999.928 997.871 16000.000 80000.000 1000.000 1.011 2.424 1.126 1151 75999.080 2,128 1251 16000.330 71998.703 16000.000 72000.000 1000-000 -0.330 1.296 19999.232 79999.463 995.881 996.441 20000-000 80000.000 1000-000 0.767 75998.505 20000.000 76000,000 1000.000 -0.412 1.494 3.552 1161 20000.412 1261 20001 745 71907 592 997 747 20000 000 72000 000 1000 000 2.113 SIG POS = 3.490 BIG PLAN = 4.080 STD ERRS FOR THE MODEL SIG X . 1.059 M SIG Y = 1.828 M SIG Z = MODEL NO 10607 0.767 -0.412 -1.745 -0.681 -1.601 6,118 3,552 2,252 11061 19999.232 79999.462 393.881 2000.000 80000.000 1000.000 0.537 1161 20000.412 75998.505 995.447 76000,000 1000.000 20000.000 20000.000 72000,000 2.407 79997.604 995.233 999,576 2.336 4.766 11071 24000.681 24000 000 20000 000 1000.000 24000.000 76000.000 1000.000 0,423 1171 BADD1-6D1 -1,621 1271 24001.955 71998.534 1001.621 24000.000 72000.000 1000.000 -1.968 1.465 STO ERRS FOR THE MODEL SIG X = 2.448 SIG POS = 1.463 M BTC ¥ = 1.962 M SIG Z = 4.016 SIG PLAN = 4,703 MODEL NO 10708 11071 24000.681 79997.604 995.233 24000.000 80000.000 1000.000 -0.681 2.396 4.766 75998.254 76000.000 -1.601 1.745 0.423 1171 24001.60 999.576 24000.000 1000,000 1 2071 24001.966 1001.621 995.865 999.376 24000.000 1000-000 79997.060 1108 28000.461 28000.000 80000.000 1000.000 -0.461 2.939 4.134 0.623 1181 28001.545 75998.251 20000 000 75000 000 1000 000 -1.542 1.748 28002.356 1002.132 28000.000 72000.000 1000,000 1.520 -2.132 1681 STD FRAS FOR THE MODEL SIG X ~ 1.734 M SIG Y = 2.234 M SIG Z = 3.083 SIG PLAN = 2.828 510 908 = 4.184 HODEL ND 10809 11081 28000,461 79997.060 995,865 999,376 28000.000 80000.000 1000.000 -0.461 2.939 4,134 1,748 -1.542 -2.356 -1.253 1181 28001.542 28000.000 76000.000 1000.000 -2,132 1281 71998.474 1002,132 996,936 1000,365 28000.000 72000 000 1000.000 79998.683 80000.000 1000.000 1.316 11091 32001.257 32000,000 76000.305 32000.000 75000.000 1000.000 -1.233 -0.305 -0.365 1191 32001.233 -0.317 1291 32002.255 71999,839 1000.317 32000.000 75500.000 1000-000 -2,255 0.161 1.781 # SJG Z ≈ 2.515 SIG PLAN = 2.572 STC PDS = STD ERRS FOR THE MODEL BIG X = 1.807 M SIG Y = 3.573 MODEL NO 10910 996.936 1000.365 1000.317 996.206 999.771 11091 32001-253 79998.683 32000.000 80000.000 1000-000 -1,253 1,316 3.063 1191 32001.239 76000.305 32000.000 75000-000 1000.000 -1.233 -0.305 -0.365 32000,000 72000.000 1000.000 -0.317 3.793 0.228 1291 -2.255 0.161 101 36000.014 79999.419 36000.000 80000.000 1000.000 1110 36002, 933 36000.000 1000.000 -2.933 0.139 12101 35004,420 72000,423 1000.B20 6000.000 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 = 2,783 516 208 = 3,562

MODEL NO 11011

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3.793 0.228 -0.820 6.195 -0.014 -2.933 -4.420 -0.923 -1.430 0.580 996.206 999.771 1000.820 101 35000.014 79999.419 36000.000 80000.000 1000.000 35000.014 76000,139 72000,423 79998,213 76000,764 36000.000 76000.000 1000.000 1110 -0.423 12101 40000, 923 993.804 40000.000 80000.000 1000.000 -1.134 40000.000 76000,000 1000.000 -0.264 11111 40001-430 1001.134 -3.738 4.087 40001.788 72003, 738 1004.087 40000.000 72000.000 2000.000 -1.788 12111 3.225 910 905 = 4.970 STD ERRS FOR THE MODEL SIG X = 1.885 M SIG Z # 3.781 516 PLAN # 2.516 M SIG Y = MODEL NO 11112 40000.923 79998 212 993.804 40000.000 20000 000 1000.000 -0.923 1.787 6.195 111 11111 40001.430 40001.788 44000.898 76000.264 1001.134 1004.087 990.188 40000.000 76000.000 1000.000 -1.430 -1.788 -0.898 -2.505 -0.264 -3.738 -0.733 -1.134 12111 1000 000 9.811 121 80000.733 44000-000 80000.000 1000.000 11121 44002 509 76001.115 997,147 44000.000 76000.000 1000.000 -1.115 3.410 44001.190 44000.000 1000.000 -1.190 -1.928 12121 72001.928 995, 589 72000.000 2,732 SIG POS = 7.256 STD ERRS FOR THE NODEL BIG X = 1.708 M 816 Y = 2.132 M SIG 2 × 6.722 SIG PLAN = MODEL NO 11213 -0.733 9,811 121 44000.898 80000.733 990.188 992.147 996.589 44000.000 80000.000 1000.000 -0.898 11121 44002,505 76001.115 3.410 44001.190 72001.928 44000.000 72000,000 1000.000 -1.190 -1.928 12121 48001 312 1000.000 131 993, 370 80000-000 48001.574 76000.574 76000,000 1000.000 0.574 2.683 11131 997.310 48000.000 -1,574 0.334 12131 48001.284 72002,816 999.665 49000.000 72000.000 1000.000 -1.284 -2.816 SYD ERRS FOR THE MODEL. SIG X = 1.694 M SIG Y = 1.825 M SIG Z = 6.645 SIG PLAN = 2.490 SIG POR = 7 097 MODEL NO 11314 993.370 13) 48001.312 79998.296 48000.000 80000.000 1000.000 -1.312 1,703 6.629 76000.574 997.310 48000.000 76000.000 1000.000 -1.574 -1.284 -0.556 -0.574 2.689 11132 48001.574 48001,284 12131 52000,556 994.842 52000.000 1.138 2.41 79998.861 80000.000 1000.000 5.157 11141 75999.949 76000.000 1000.000 -0.422 1.579 51999.931 72002,302 1000.075 52000.000 72000.000 1000.000 0.068 -2.302 12141 -0.075 STO FRAS FOR THE MODEL SIG X = 1.126 N SIG Y = 1.885 M SIG Z = 4.017 SIG PLAN = 2.195 SIG PDS = 4.578 MODEL NO 13415 141 11141 79998.851 75999.948 72002.302 79997.672 994.842 998.320 52000,000 90000.000 1000 000 -0.555 52000, 555 1.138 5.157 52000, 422 76000.000 1000.000 0.051 1.679 12141 \$1999.93 1000.075 997,308 52000.000 72000.000 1000.000 0.068 -2.302 -0.075 151 55999.139 \$6000,000 80000.000 1000.000 0.860 2.327 2.691 56000.000 11151 55998.514 75998,912 999.634 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 1.998 SIG POS = SYD ERRS FOR THE MODEL STALY -1.144 M SIG Y = 1.638 M SIG Z = 2.753 SIG PLAN = 3,402

MODEL ND 11516

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0.860 2,691 153 \$5999.139 79997.678 997, 308 \$6000.000 80000.000 1000.000 2.327 1.485 1.087 11151 55398.514 55398.235 999.634 998.943 997.105 997.928 56000.000 75000.000 1000.000 1.056 12151 72000.471 56.000.000 72000,000 1000,000 2.894 161 59998.059 80000.000 11161 5999B. 653 75997.903 60000.000 76000,000 1000.000 1.346 > 006 1,554 2.499 12161 69997 290 997.500 60000.000 72000.000 1000.000 2.775 510 205 = 3.631 1.791 M BIG Y = 2.119 M SIG Z = 2.341 SIG PLAN = STD ERRS FOR THE MODEL RIG X = MODEL NO 11617 1.930 1.346 2.109 1.187 2.972 2,894 161 59398.069 79997.027 997.105 \$0000.000 80000.000 1000.000 2.096 1.554 3.292 2.071 2.499 2.958 11161 59998.653 59997.890 75997.903 71998.445 79996.707 997.928 997.500 997.041 998,183 1000.000 60000.000 76000.000 60000.000 78000,000 171 6 39998 . 212 64000.000 80000.000 1000.000 1117 63398.904 75997.520 54000-000 76000.000 1000.000 1.095 > 479 1.816 12171 63998, 382 71997.488 998, 357 64000,000 72000 000 1000.000 1.017 2.518 1.642 3.243 SIG PDS = 4.153 STO ERRS FOR THE MODEL. SIG X # 1.651 M SIG Y = 2.791 M SIG Z = 2.594 SIG PLAN = MODEL NO 11718 997.041 64000,000 80000.000 1000.000 1.187 3,292 8.958 171 63998.812 79996.707 11171 63398.904 75997.520 998.183 64000.000 64000.000 68000.000 1000.000 1.095 1.017 -0.536 -0.559 2.479 1.816 75000.000 2,513 2,785 2,785 1.642 72000.000 181 68000.536 79997,214 997.941 80000.000 1000.0001 1.526 1000.000 11181 68000.559 75997.266 99R. 473 68000,000 76000.000 68000.340 71996, 329 995.623 68000.000 72000-000 1000,000 -0-340 3.670 12181 STO ERRS FOR THE MODEL SIG X # 0.934 M SIG Y # 3.225 M SIG 7 # 2.845 SIG PLAN = 3.357 SIG POS = 4.400 MODEL NO 11819 181 68000, 536 79997,214 75997,266 71996,329 79994,277 997.941 998.473 995.623 1003.338 68000.000 80000.000 1000.000 -0.536 2.785 2.05B 2.733 3.670 5.722 11181 68000.559 68000.000 76000.000 1000,000 -0.559 -0.340 -0.424 1.526 12181 68000.340 58000.000 72000.000 72000.424 72000.000 80000,000 1000.000 -3.338 191 -0.718 11191 1002,831 2. 477 72000.718 75997 522 72000,000 75000.000 1000.000 -2.871 1001.201 72000.000 72002.030 71998,984 72000.000 1000.000 1.015 -1.201 112191 STD ERRS FUR 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 79994.277 75997.522 -0.424 -0.718 -2.030 0.724 -0.901 1003.338 72000.000 80000.000 1000.000 5,722 191 72000.424 -7. 339 11191 72000.718 1002,831 72000.000 75000.000 1000.000 -2.831 12191 72002.030 71998.984 1002,128 1000.000 1.015 72000.000 78000.000 -1.201 76000.000 80000.000 201 -2.128 11201 76000.90 75998.515 76000.000 76000.000 1000.000 1.484 -2.612 12201 76000, 907 71998, 986 999,862 76000.000 72000.000 1000.000 -0.907 1.013 0.137 STO FREE FOR THE MODEL STO X # 1.181 M SIG Y = 3.081 M SIG Z = 2.529 STOPIAN N 3.300 BIG POS # 4.157

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MODEL NO 12021

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0.724 -0.901 -0.907 -2.128 1,484 11501 76000.901 75998.515 1002 612 75000.000 76000.000 1000.000 0.137 999,862 1.013 72000.000 21 79998.053 79998.001 1006.122 80000.000 80000.000 1000.000 1.936 1.998 -0.086 1121: 79939.289 76000.974 1004.086 80000.000 0.716 76000.000 1000.000 -1.256 1221 80001.528 72000.598 20000.000 72000.000 -0,598 1001.256 1000.000 -1.525 4.212 STD ERRS FOR THE MODEL, SIG X = 1.323 M BIG Y = 1.603 M SIG Z = 3.664 BIG PLAN = 2.079 SIG POS = STD ERRS FOR THE STRIP SIG X = 1.422 M BIG Y = 2.027 M BIG Z # 3.145 SIG PLAN * 2,476 S10 POS # A. 003 SOLOS DN JODDM -0.328 -2.079 72000.298 1000.329 72000.000 -0.298 1211 0.000 1000.000 2.079 -0.238 0.954 -0.279 -0.527 0.183 1.384 0.209 1.254 1.488 221 -1.3 67999.045 0.000 1000.000 -0.209 2311 64000.279 997.886 0.000 64000 000 1000.000 -1.760 1221 3998.745 72000.527 4600.000 72000.000 1000,000 2221 A000 294 6799/2 DIC 1001.987 4000.000 68000.000 1000.000 -0.284 -0.563 2321 4000.380 64000.974 1000,563 -0.974 4000.000 54000.000 1000.000 -0.380 1.444 SIG POS # 2.229 STD ERRS FOR THE MODEL. SIG X = 1.271 M SIG Y = 0.684 M SIG Z = 1.697 SIG PLAN = MODEL NO 20203 -0.527 -1.760 -1.987 1221 3998.745 72000.527 1001.760 4000.000 72000.000 1000.000 1.254 0,183 4000.284 1001.987 4000.000 1000.000 2321 4000.380 64000.974 72000.137 1000.563 4000.000 64000.000 1000.000 -0.380 0.094 -0.762 -0.974 -0.563 72000.000 1231 1003.789 8000.000 1000.000 223 000.762 68000.263 1002.912 8000.000 68000.000 1000.000 -0.263 -2.912 2331 8000.536 EA000, 144 999.953 8000.000 64000,000 1000.000 -0.536 -0.144 0.046 0.899 SIC POS = 2.617 STD ERRS FOR THE MODEL SIG X = 0.731 M SIG Y # 0.523 M SIG Z = 2.458 SIG PLAN = MODEL NO 20304 1231 8000.000 1000.000 7999.905 72000+137 1003.789 72000,000 0.094 -0.137 -3,789 8000.762 1002.912 -0.752 -0.263 -2.912 2231 68000.263 8000.000 63000.000 1000.000 2331 64000.144 64000,000 8000.000 1000.000 1241 11999.812 71999.311 1007.688 12000.000 72000.000 1000.000 0.187 0,688 -2.682 12001-551 67999.948 1002.417 12000 000 68000.000 1000 000 -1 557 0.051 -2 A17 2341 12000.908 63999.867 1000.387 12000,000 64000,000 1000.000 -0. 90B 0.132 -0, 387 STO ERRS FOR THE MODEL. SIG X = 0.916 M SIG Y = 0.347 M SIG Z = 2.684 SIC 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 0.685 -2.682 2241 12001.567 67999.948 1002.417 12000.000 68000.000 1000.000 -1.567 0,051 12000.908 1000 927 12000 000 64000.000 1000.000 -0.908 0.132 -0.387 16000.192 1251 72000,805 999.033 16000.000 72000.000 1000.000 -0.192 -0.805 0.966 16001.955 2251 67999.968 1001.024 16000.000 68000,000 1000.000 -1.955 0.031 2351 64000,171 16000.000 64000.000 1000.000 -2.058 -0.171 ~0.939

0.484 M SIG Z =

1.791 SIG PLAN =

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507 75999.275

STD ERRS FOR THE MODEL, SIG X =

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1002.128

1.513 M BIG Y =

75000.000

80000,000

1000.000

2.077

1.589 SIG POS *

2.395

MODEL NO 20506 72000.805 -0.803 0,366 1251 15000, 192 999.033 16000.000 72000,000 1000.000 -0.198 -0.192 -1.955 -2.068 -2.549 -1.737 -1.845 -1.024 -0.939 2251 16001.955 67999.968 1001.024 16000.000 68000.000 1000,000 0.031 2351 16002.058 64000,171 71999,834 1000.939 64000.000 1000.000 16000.000 1000.103 1000.000 0.165 -0.102 1261 20002.549 20000.000 72000.000 20001.737 67993.649 64000.989 1000,862 0.350 -0.862 226 20000.000 68000.000 1000.000 2361 20000.000 64000.000 1000-000 -0.989 -0.722 0.910 SIG PLAN * 2.138 SIG POS # 2,324 STD ERRS FOR THE MODEL SIG X = 2.052 M B10 Y = 0.601 M SIG Z = NODEL NO 20607 71999.834 67999.649 64000.989 71998.729 1261 20002,549 1000.102 20000.000 72000.000 1000-000 -8-549 0.185 -0,102 -1.845 -1.569 -1.540 2261 20000.000 68000.000 0.350 -0.862 20001.737 1000.862 1000.000 1000,700 20001 845 1000.000 1-270 1271 24001.659 1001.087 24000.000 72000.000 1000.000 -1.087 207 24001.540 68000,246 1001.377 69000 000 1000 000 -1.377 0.355 0.668 24001,830 64000, 255 24000.000 64000.000 1000.000 -1.830 2371 STD ERRS FOR THE MODEL. SIG X = 2.070 M STO Y = 0.757 M STO 7 = 0.980 SIG PLAN # 2.204 SIG PDS = 2,412 MODEL NO 20708 1271 24001.569 71298.729 1001-087 24000.000 72000.000 1000,000 -1.869 1.270 -1 087 -0,246 24001,540 1001.377 24000.000 68000,000 1000.000 -2.377 227: 2371 24001-830 6400C.255 999.931 995.185 24000.000 64000.000 1000.000 -1.830 -0.347 -1.704 -1.777 0.668 1281 28000.347 28001.704 71998,786 28000.000 72000.000 1000.000 1.213 28000.00085 2281 999.507 68000.000 1000,000 1.307 0 492 2391 28001.777 63999 789 1000-129 28000.000 64000,000 1000.000 0.211 -0.1291.714 M EIG Y = 0.996 M EIG Z = 2.328 SIS PLAN = 1.983 BIG POS = 3.053 STO ERRS FOR THE MODEL BIG X = MODEL NO 20809 71998.786 -0.347 -1.704 -1.777 -3.043 1.213 4,814 1281 28000.347 995.185 28000.000 72000.000 1000.000 67998,692 63999,722 71999,669 67998,446 999.507 1000.129 995.077 998.532 2281 29001.704 28000.000 68000,000 1000-000 0.211 28000.000 64000.000 1000.000 -0.129 1591 32003.043 78000 000 72000.000 1000.010 4.923 32002.404 32000.000 68000.000 10.000 -2.464 1.553 2391 32001.028 63999.215 998.774 32000.000 64000.000 .000.000 -1.038 0.784 1.225 STD ERRS FOR THE MODEL SIG X = 2.111 M BIG Y = 1.128 N 516 Z = 3.199 BIG PLAN = 2.393 516 205 = 3,996 MODEL NO 20910 1000-000 1291 32003.043 71999.869 995.077 38000.000 72000.000 -3.043 0.330 4.923 2891 2391 12101 32002,404 67998.446 998.582 998.774 999.817 35000.000 68000.000 -2.404 1.553 1.417 32001.028 64000.000 0.000 0.000 71997.032 -1.813 2.967 0.182 26001-813 36000.000 72000.000 999.579 36000.000 22101 36001.990 68000.000 23101 36002.167 63999 301 996.010 36000,000 64000.000 -2.167 0.698 3.989 STD ERRS FOR THE MODEL SIG X = 2.368 M BIG Y = 1.600 M BIG Z = 2.858 SIG POS = 4.115

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MODEL ND 21011 12101 36001.813 71997.032 -1.813 2.967 0.187 000 017 36000.000 72000 000 1000.000 2210 999.579 996.010 996.719 68000.000 0.420 36000 000 1000.000 2210 36002.167 63993.301 36000,000 64000.000 1000.000 -2.167 0.698 12111 39999,051 40000.000 72000.000 0.948 3.280 22111 40000.853 67998 170 998.498 40000.000 68000,000 1000.000 -0.853 1.829 1.501 23111 4000P, 393 63999.574 998.451 40000.000 64000.000 1000,000 ~2.395 0. 625 1.548 STD ERRS FOR THE MODEL SIG X = 1,903 M SIG Z # 2.737 SIG POS = 3.71A 1.956 M 516 Y = 2.511 SIG PLAN = MODEL NO 21112 12111 39999.051 71997.782 67998.170 63999.574 996.719 40000.000 72000,000 1000.000 2.217 3.280 0.948 0.948 -0.853 -2,399 -0.584 -0.965 22111 40000.853 998.498 998.451 998.357 40000.000 68000.000 1000.000 1.829 1.501 23111 1.548 40000.000 1000.000 12121 44000.584 71998.864 44000.000 72000.000 7.642 1000.000 1.135 44000.965 1.423 22121 67998.196 998 571 44000 000 68000 000 1000 000 1 803 23121 44001,905 63998, 942 999-787 44000.000 64000.000 -1.905 0.212 1000.000 t-057 STD ERRS FOR THE MODEL SIG X . 1.567 M SIG Y = 1.679 M SIC Z = 2 996 DTC PLAN -2 207 570 809 w 4.587 KICEL NO 21213 12121 44000.584 71998.864 992.357 998.571 999.787 995.440 44000.000 72000,000 1000.000 -0.584 -0.965 -1.905 0.642 1.135 7.642 22121 44000.000 1.428 0.212 3.559 1000-000 1.803 1.057 2.338 23121 44001.905 63998.942 44000.000 64000.000 1000.000 12131 49000 000 72000.000 1000.000 22131 47998.952 67999.110 999.877 48000.000 68000.000 1000.000 1.047 0.885 0.122 23131 66001 269 999.974 48000.000 64000 000 1000.000 0.697 -1.365 0.025 STO ERRS FOR THE MODEL. SIG X = 1.174 M SIG Y = 1.651 M SIG Z = 3,825 SIG PLAN # 2.034 510 205 -A. 332 MODEL NO 21314 12131 47999.357 71997.661 996.440 48000.000 72000.000 1000.000 0.642 2.338 3.559 47998.952 67999.110 64001.369 71998.739 67999.948 999.877 999.974 999.165 68000.000 1.047 P2135 48000.000 1000.000 0.889 23131 42000.000 1000.000 -1.369 0.075 13145 51997.430 52000.000 72000.000 1000.000 2.569 1,260 0.835 22141 51997.926 000 600 E2000 000 68000.000 1000.000 2.070 0.051 0.441 23141 51998.967 63399.845 99B.089 52000,000 64000.000 1000.000 1.033 0.154 1.910 ETO ERRS FOR THE MODEL SIG X = 1.670 M BIG Y # 1.996 M SIG 7 # 1.856 BIG PLAN = 2.177 SIG POS = 2.861 MODEL NO 21415 71998.739 67999.948 63999.845 12141 51997,430 999.165 999.558 52000.000 72000.000 1000.000 2.569 1.250 0.835 22141 51997.925 52000,000 68000.000 1000.000 2.074 1.033 2.500 0.842 0.051 0.441 51998.967 55997.499 998.089 999.350 52000.000 64000.003 1000.000 0.154 1.910 1215 72000.473 56000.000 72000.000 2210.1 55999.157 56000.310 67999,908 1000.973 56000.000 68000.000 1000.000 0.091 -0,973 23151 63999,825 1000.977 \$6000.000 64000.000 1000.000 -0.310 0.174 -0.977 BID ERRS FOR THE MODEL SIG X . 1.950 M BTC V # 0 612 # 516 7 = 1.170 SIG PLAN = 2.044 SIG POS # 2,356

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MODEL NO 21516

12151 22151 23151	55937.499 55999.157 56000.310	72000.473 67999.908 63999.825	999.359 1000.973 1000.977	56000. 58000. 56000.	000	6800	0.000 0.000		1000.000	2.500 0.842 -0.310	ō.	473 091 174	0,6 -0.9 -0,9	73 77
15161	60000,579	72000.141	1000.731	60000.			000,000		1000.000	-0.579	-0.		-0.7	
19165	60000.730	68000.155	1003.903	60000.			0.000		1003.000	-0,730		155	-3.9	
53161	60001.529	64000.646	1003.711	60000.	000	6400	000.000		1000.000	~1,529	-0.	646	-3.7	11
STD ERRS	FOR THE MOON	EL, BΣG X ≠	1.432 M	SIG Y =	0.3	80 M	91G 2	-	2.524 510	PLAN =	1.482	SIC	PDS =	2.927
	MODEL ND 2													
15161	60000.579	72000.141	1000.731	60000.			0.000		1000.000	-0,579	-0.		-0.7	
22161	£0000.730	68000.155	1003.907	60000.			0.000		1000.000	-0.730		155	~3,9	
53161	£0001.529	64000.646	1003.711	60000.	000	6400	0,000		1000.000	-1.529		646	-3,7	
12171	64002.214	71999.536	1002.416	64000.			000.000		1000.000	-2,214		463	-2,4	
23171	64002.340	67999.896	1004.313	64000.			0.000		1000.000	~2.340		103	-4.3	
e31/1	64001.719	64000.747	1003,517	64000.	000	6400	0.000		1000.000	-1.719	-9.	747	-3.5	17
STD ERRS	FOR THE MODE	EL SIG X ≈	1.819 M	SIG Y =	0.4	99 M	SIC Z	-	3.643 810	PLAN =	1.886	816	POS =	4.102
	MODEL NO 2	1718												
12171	64002.214	71993.536	1002,416	64000.	000	7200	0.000		1000.000	-2.214	o.	463	-2.4	16
22171	64002.340	67993.896	1004.313	64000.	000	. 6800	0.000		1000.000	-2-340	ö.	103	-4-3	19
23171	64001.719	64000.747	1003.517	64000,	000	6400	0.000		1000.000	-1.719	-0.	747	-3,5	17
15181	F8003, 447	71999.172	1002.006	68000.	000	7200	0.000		1000.000	-3.447	ò.	827	-2.0	06
22181	68002.438	68000,444	1002.260	68000.			000.00		1000.000	-2,438	-0.	444	-8-8	60
53181	£8002.550	64001.574	1001.610	68000.	000	6400	000.00		1000.000	-2.550	-1.	574	-1,6	10
STD ERRS	FOR THE MODE	EL SIG X =	2.744 M	SIG Y =	0.9	10 M	s16 2	ж	3.116 SIG	PLAN =	2.891	BIG	P08 ×	4.261
	MODEL NO 2:	1819												
12181	68003.447	71999.172	1002.006	68000.	000	7200	0.000		1000-008	-3.467	0.1	8247	-2.0	05
22181	68002.438	5800D.444	1002,260	68000.			0.000		1000.000	-2,438	-0.		2.2	
23181	68002.550	64001.574	1001.610	68000.	000	6400	0. 0		1000.000	-2.550	-1.		-1.6	
15191	72001.686	71999,129	1001.354	72000.		7800	r .00		1000.000	-1.686	0.	370	-1.3	54
22191	72002, 07 <i>2</i>	68000.370	1001.710	72000.			000		1000.000	-2.072	-0.	370	-1.7	10 *
53181	72002.523	64001.300	1001.024	72000.	000	6400	0,000		1000.000	-2.523	-1-	300+	-1.0	24
STO ER ,	for the mode	EL SIG X ×	2.75; M	SIG Y =	1.05	90 M	SIG Z	-	1.872 510	PLAN =	2.999	810	PD5 +	Э.50
	MODEL NO 21	920												
12191	72001-686	71999.129	1001.354	72000.0	000	7200	0.000		1000.000-	-1.686	0.1	370	-1.3	= a
16155	72002.072	58000.370	1001.710	72000,		6800	0.000		1000.000	-2.072	-0.		-1.7	
53131	72002.523	64001,300	1001.024	72000.0	200	6400	0.000		1000.000	-2.523	-1.		~1.0	
15501	76001.782	71997.617	1000,463	76000.0		7200	0.000		1000,000	-1.788	2.		-0.4	
22201	76000.933	67999.337	1001.473	76000.0			0.000		1000.000	-0,933		6.2	-1.4	
53501	76001.415	64001.155	999, 153	76000.0	200	6400	c.000		1000.000	-1-415	-1.		0.8	
STD ERRS	FOR THE MODE	L BICX =	1.978 M	SIG Y =	1,35	юм	sic z	2	1.331 816	plan *	2.395	81C	POS =	2.741

MODEL NO 22021 71997.817 67999.337 64001.155 71997.529 -1,788 -0,933 -1,415 0,407 -0.463 -1.479 0.806 -0.062 12201 76001.788 2.182 1000,463 76000.000 72000,000 1000.000 0.662 23201 1001.479 999.193 1000.062 68000-000 1000-000 1000-000 1000-000 76001.415 76000,000 54000.000 13211 75999.592 72000.000 2.470 -0.929 1000.929 998.350 22211 79999, 869 67999.439 80000,000 69000 000 1000 000 0.140 80001.227 64001.142 -1,227 -1.142 1,649 23211 80000,000 64000.000 1000.000 STO ERRS FOR THE MODEL BIG X = 1.246 M SIG Y = 1,152 SIG PLAN = 2.038 SI¢ POS = 2 394 1,688 M SIG Z = 1.971 SIG POS = 3.005 STD ERRS FOR THE STRIP SIG X = 1.678 M SIG Y = 1.034 M SIG Z = 2.208 SIC PLAN = MODEL NO 30102 2311 0.000 84000.000 60000.000 56000.000 -1.006 -0.984 0.919 -0.447 -0.632 -0.318 64001.005 1000.447 1000.000 0.318 3323 -1.433 -1.273 60000.984 1000.632 1000.000 1.433 3411 2321 55999.080 64000.132 997.527 998.704 995.683 0.000 1000.000 2.472 4001.197 4000,000 64000.000 -1,197 -0.132 1000.000 3321 4001.449 59999.923 4000,000 60000.000 1000.000 0.075 0.316 3421 4001.595 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 > 0.883 # SIC Z = 1.305 BIG PLAN = 1.721 SIG POS = 2,160 MODEL NO 30203 2321 4001.197 64000.132 398,704 4000.000 64000.0 Ю 1000.000 -0.132 -1,197 1.295 3321 4001.449 59998.923 55998.955 63998.480 583.669 581.0001 100.351 4000.000 50000.000 56000.000 €4000.000 1000.000 -1.449 ~1.886 -3.337 ~2.882 0.076 0,316 -0,182 -C.351 3421 4001.885 2331 9000 000 59999.894 \$000.000 3331 2002 922 1002.838 60000,000 1000.000 -2.838 0.105 8002.700 3431 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 2333 8003, 337 63998,480 1000.351 8000,000 64000,000 1000.000 -3. 997 1,519 0,105 -0,252 2,326 -0,351 59999.894 56000.252 1002.838 1002.990 1001.710 1003.633 8000.000 -2.882 -2.700 -2.341 -1.552 -2,990 -2,990 3331 8002.882 60000.000 1000.000 3431 2341 3341 8002.700 56000,000 64000,000 6000,000 1000.000 12000.000 12002.341 63997.673 1000.000 50000.067 -0.067 -3.633 3441 1000.000 12001.639 5600d. 169 1003.402 12000.000 56000.000 -1.639 -2.169 ~3.402 STD ERRS FOR THE MODEL. SIG X = 2.732 M BIG Y = 1.581 M SIG Z = 2.994 SIG PLAN = 3.156 BIG POS = 4.351 MODEL NO 30405 1001.710 1003.633 1003.402 1002.844 2341 12002.341 63997.673 60000.067 56002.169 63995.862 12000.000 1000-000 -2.341 -1.552 -1.639 -0.080 64000.000 2,326 -1.710 -3.633 -3.402 -2.844 3341 3441 2351 12001-552 60000,000 12001-6 -2.169 16000.000 64000,000 4.137 3351 16000.509 60000.023 1002.077 16000.000 60000,000 1000.000 -0.509 -0.023 2 077 3451 16000.491 \$5001.512 999 842 16000.000 56000,000 1000.000 -1,512 0.157

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2,893 516 PLAN = 2,850 515 POS = A 018 STO ERRS FOR THE MODEL SIG X = 1,489 M SIG Y = 2,430 M LIG Z # MCOEL NO 30506 2351 16000.080 63995.868 1002.844 16000.000 64000.000 1000.000 -0.080 4.137 -2.844 1002.844 1002.077 999.842 999.034 999.034 60000.023 16000.000 60000.000 56000.000 64000.000 1000,000 -0.509 -0.023 3351 16000.509 3451 16000.491 56001.512 -1.512 0.157 63997.996 20000.000 3.250 199997.810 3361 59999.834 60000,000 2.189 0.165 1461 19998.815 56001.460 9 308 20000-000 56000,000 1000,000 1.184 -1.460 1,691 STD ERRS FOR THE MODEL SIG X = 1.859 M BIG Y = 2 023 STC 205 = 3,437 2.252 M 916 Z = 1.RO1 BIG PLAN # MODEL MIT 20607 999.034 999.940 998.308 995.539 1000,000 1000,000 1000,000 1000,000 19996.747 0,965 2361 63997.996 59999.834 20000 000 64000.000 60000.000 56000.000 64000.000 3.252 2.003 3361
3461 19997.510 20000.000 0.165 56001.460 19998.815 20000.000 1.184 1,691 2371 23996. 876 4,460 3371 23997.693 60000-140 997.188 24000 000 60000.000 1000,000 5.300 -0.140 2.811 3471 23998.750 56000.000 1000,000 1.249 4.976 \$6000.204 24000.000 -0.204 STD EARS FOR THE MODEL SIG X = 2.583 M SIG Y = 1.124 M SIG Z = 3.357 SIC PLAN # 2.818 SIG POS . 4 393 MODEL NO 30708 2371 23996.876 64000.301 995, 539 997, 188 995, 023 992, 006 24000.000 64000,000 1000,000 3.123 -0.301 4,460 23997.699 23998.750 27998.299 60000.140 56000.204 64000.825 24000.000 24000.000 2.300 1.249 1.700 -0.014 2.811 4.976 7.993 5.395 3371 60000.000 1000.000 -0.140 -0.204 -C.825 3471 2381 56000,000 28000.000 1000.000 1281 28000.014 59999.874 994.604 28000.000 60000.000 0.125 1000.000 3481 28000.161 995, 470 56000-504 22000.000 55000.000 1000.000 -0.161 -0.504 4.529 STD ERRS FOR THE MODEL SIG X * 1 975 M BIC V P D 469 M 616 7 ... 5.763 STC PLAN # 2.031 EIG POS = 6.110 MCDEL NO 30809 2381 27998, 299 64000.825 992,006 28000.000 64000.000 1000 000 1.700 -0.014 -0.161 -0.381 0.622 -0.825 7.993 3381 3481 28000.014 59999,874 56000,504 63998,412 60000,224 994. E04 995. 470 996. 028 997. 671 28000.000 60000,000 1000.000 0.125 5.795 2391 32000.381 31399.377 35000.000SE 64000-000 1000,000 32000.000 60000.000 1000.000 2.385 3491 31998.704 56002.017 938.455 32000.000 56000,000 1000.000 1.295 -2.017 STO ERRS FOR THE MODEL SIG X = 1.012 M SIGY = 1.232 M SIG Z = 5.236 BIC PLAN = 1.594 SIG POS = 5 479 MODEL NO 30910 32000.381 31999.377 31998.704 35993.944 -0.381 0.622 1.295 0.055 0.901 0.514 2391 63998.412 60000.224 996.028 997.671 35000,000 1000.000 3.971 2.328 1.544 4.664 64000,000 1.587 2391 3391 3491 1.587 -0.224 -2.017 -0.397 -0.605 60000,000 56007-017 998.455 32000.000 56000.000 1000.000 23101 64000.397 35999.098 996.655 36000.000 33101 60000.606 60000.000 1000,000 3.344 34101 56000.012 55000.000 1000.000 -0.012

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4.139 STD ERRS FOR THE MODEL SIC X . D.811 M SIC Y = 1.197 M SIC Z = 3.878 SIC PLAN = 1.446 SIG POS = MODE NO 31011 4.664 3.344 4.325 5.009 995.335 996.655 995.674 994.990 996.190 994.730 1000.000 0.055 0.901 0.514 -0.906 -0.397 22101 35339, 944 64000 307 20000 000 54000 000 1000.000 -0.606 33101 35999.098 50000.605 35000.000 60000-000 56000.012 36000.000 34101 35999, 485 55000.000 40000.906 633999.133 40000.000 64000.000 1000.000 0.866 23111 3,809 40000,979 -0.979 33111 59000 100 400200 0020 60000 000 1000 000 0.810 34121 55998.607 40000-000 56000.000 1000-000 1.397 5.269 STO ERRS FOR THE MODEL SIG X -0.775 M BIG Y = 0.881 M SIG Z = 4.875 SIG PLAN = 1.174 SIG POS = 5.018 HODEL NO 31112 994.990 996.190 994.730 993.334 998.353 23114 40000.906 63999,133 40000-000 54000.000 60000.000 55000.000 1000.000 -0.906 -0.979 -0.391 0.866 0.810 1.397 5.009 3.809 5.269 0.665 33111 40000.979 59999, 189 55998, 602 40000.000 1000.000 34111 23121 44001.227 63996,976 59998,699 440/00-000 64000.000 1000.000 -1.227 -1.424 -0.739 3.023 44001.424 44000-000 60000,000 1.300 1 646 33121 1000.000 2,626 24125 55000 711 997.373 44000 000 56000 000 1000 000 STO ERRS FOR THE MODEL SIG X = 2.014 SIG POS * 4.421 1.097 M 516 Y = 1.689 M STG 7 = 3.935 STC PLAN # MODEL NO 31213 63996.976 5×998.699 55999.711 63999.015 999.334 998.353 997.373 997.158 64000,000 1000-000 -1.227 2 023 0 665 -----44001.227 44000.000 1.300 0.288 0.983 1.546 2.626 2.841 33121 44001.424 44000.739 48002.713 44000.000 60000,000 1000.000 -1.424 -0.739 -2.713 34121 56000,000 1000.000 23131 64000.000 997.668 33131 48002 550 59998 702 49000 000 1000.000 -2. SEC 1.297 2, 331 34131 48002,201 55998.426 48000-000 56000.000 1000.000 -2.201 1.573 3,978 STO ERRS FOR THE MODEL SIG X # 2.135 M SIG Y = 1.791 M SIG Z = 2.805 SIG PLAN # 2.787 SIG POS = 3,955 MCCEL NO 30304 23131 48002.713 63999,016 997.158 48000.000 64000.000 1000.000 -2.713 0.983 2.841 997.158 997.668 996.021 1000.402 999.174 59998,702 55998,702 55998,426 63997,962 59999,221 60000.000 2,331 3,978 -0,402 0,825 33131 34131 48002.550 48002.201 48000.000 1000.000 -2.550 1.297 64000,000 1000.000 2.037 23141 52003.167 \$2000.000 -B. 167 33141 2002.868 52000-000 -2.868 34141 52004.259 55998.155 995.899 52000.000 55000.000 1000.000 -4.253 1.844 4,100 STD ERRS FOR THE MODEL BIG X = 3.320 M SIG Y # 1.629 M 816 7 m 3.066 SIG PLAN = 3.698 SIG POS = 4,804 MODEL NO 31415 23161 52003.167 63397.962 59993.221 1000,40⁻⁻ 999,174 995,899 52000-000 64000,000 1000.000 -3.167 2.037 -0.402 33141 1000.000 -2.868 0.778 0.825 34141 23151 52004.253 56000.628 5599B.155 52000-000 56000.000 1000.000 4.100 63997,468 1003.0B1 1003.199 56000,000 64000.000 1000.000 -0.628 33151 60000.164 56001.315 56002.005 56000.000 60000,000 1000.000 0.164 -3.199 56003, 340 34151 1000.979 56000 000 SE000.000 1000 000 -9.34 ~1.315

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4,614 STD ERRS FOR THE M" AL SIG X = 3.695 SIG POS = 3.224 M SIG Y = 1.806 M SIG Z = 2.762 SIG PLAN = HODE NO 3.516 -0.628 -2.005 -3.340 1.511 0.314 -3.081 23151 56000.628 53997,468 60000,164 1003.081 56000.000 64000.000 1000.000 2.531 -0.164 56002.005 -3,199 33151 1003, 199 60000,000 1000,000 34151 56009.340 59998.488 56001.315 1000.878 56000.000 \$6000.000 1000.000 23161 64000.000 -4.475 63998.527 60000.000 1000.000 1.072 1004.475 1003.999 33161 599999.584 60000.040 60000.000 1000.000 34161 60000, 428 56001.210 -1,210 -1.340 1001.340 60000 000 56000.000 1000.000 -0.428 STD ERRS FOR THE MODEL, BIG X = 1.904 M SIG Y = 1.468 M SIG Z = 3.415 BIG PLAN = 2.405 SIG POS = 4.171 MODEL NO. 31617 1004.475 1003.999 1001.340 60000,000 13161 59998.488 63398.927 64000.000 1000.000 1,511 0.314 -0.428 1.072 -4.475 33161 34161 60000.040 56001.210 60000,000 -0.040 -3.999 59999.685 60000.000 1000.000 60000,428 560(30,000 1000.000 23171 63996.062 63998, 505 1005.673 64000,000 64000.000 1000.000 3.937 1,494 -5.683 60000.947 56002.718 64000.000 60000.000 1.554 -0.947 33171 63398,445 1005.528 1000.000 -5,528 63998.421 56000,000 1000.000 -4,291 34171 1004.291 2.143 M SIG Y = STO ERRS FOR THE MODEL BIG X = 1.620 M SIG Z = 4,880 BIG PLAN = 2.687 BIG POS = 5,571 MODEL NO 31718 1.494 -0.947 -2.718 -0.674 -1.057 23171 63996.062 63998.505 1005,683 64000.000 64000.000 60000.000 56000.000 64000.000 1000-000 3.937 -5.683 33171 63398.445 50000, 947 56002, 718 1005.528 64000.000 64000.000 1000.000 1-554 -5,528 34171 23181 63998,421 67995,402 64000.674 1000,000 4.597 1001.128 68000,000 -1.189 33181 67396.880 80001.057 1003.001 \$8000.000 60000.000 1000.000 -3.001 24181 67397 611 56001.833 1003.089 68000,000 56000,000 1000.000 2,388 -1-333 -3.089 STD ERRS FOR THE MODEL SIG X = 3.375 M SIC Y = 1.758 M SIG Z = 4.499 SIG PLAN = 3.805 SIG POS * 5,893 NODEL NO 31919 93191 67995,402 64000.674 1001.188 68000.000 64000.000 1000.000 4.597 -0.674 -1.188 33181 67996,880 60001.057 60000.000 1003.001 68000.000 1000.000 3.119 2.388 2.329 -1.057 -3.001 34181 67997.611 56001.833 1003.089 56000,000 1000,000 23191 71997.670 64002.924 72000.000 -2.924 1.236 998.763 1000.000 33191 71997.894 60000.715 1000.405 72000.000 60000.000 1000.000 2,105 34191 71998 630 55999 581 1000 469 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 BIG POS # 4-108 MODEL NO 31920 23191 71997.670 998.763 1000.405 1000.468 1000.225 64002.924 60000.715 72000.000 64000.000 1000.000 2.329 -2.924 -0.715 0.448 -0.684 1.236 71997.894 33191 72000.000 50000.000 -0.405 34191 55999.551 64000.684 72000.000 56000.000 1000.000 1.369 23203 75000.440 76001.275 33201 50000.310 1000.973 75000.000 60000-000 1000.000 -0.310 -0.973 39501 55999.314 76000.000 56000.000 1000.285 1000.000 -0 263 0.68

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STD ERRS FOR THE MODEL SIG X = 1.654 M BIG Y = 1.435 M SIG Z = 0.773 SIG PLAN = 2 100 STC 205 # 2 323 MODEL NO 32021 -0.440 -1.275 -0.362 -0.983 -0.684 -0.310 0.685 -0.076 23201 75000.440 1000.225 1000.273 1000.285 64000.684 76000.000 64000.000 1000-000 -0.225 33201 76001.275 60000.310 55999.314 76000,000 60000.000 1000.000 -0.973 76000.000 56000 000 1000 000 80000.000 23211 80000 993 64000.076 998, 602 64000.000 1000.000 1.397 33211 80002.148 60000.276 999.807 60000.000 1000.000 -2,148 -1,885 -0.276 0.197 34211 80001.886 55998.470 997.546 80000.000 2.453 56000.000 1000.000 1.629 STO ERRS FOR THE MODEL SIG X = 1.489 M SIG Y = 0.831 # 516 7 = 1.348 S10 PLAN = 1.705 SIG POS = 2.174 STD ERRS FOR THE STRIP SIG X = 2.012 M 510 Y = 1.385 M 510 Z = 3,171 SIG PLAN = 2,443 SIG POS # A. 003 MODEL NO 40102 -0.967 0.303 0.765 0.258 0.390 0.390 3411 4411 4513 0.967 55999.283 1000.717 0.000 56000.000 1000.000 0.718 -0.717 \$2001.007 1001.531 0.000 52000.000 1000.000 -1.007 -1.531 -0.765 48001,362 4000,000 3421 999,738 1000,536 56000.000 1000.000 0.267 4421 3999, 609 52000.291 \$2000.000 0.291 0.570 3399.680 48000.170 999.719 4000.000 48000.000 1000.000 -0.170 0.280 STD ERRS FOR THE MODEL SIG X = 0.622 M SIG Y = 1.000 M SIG 7 = 1.300 STG PLAN = 1.178 SIG POS = 1.755 MODEL NO 40203 999.732 1000.536 993.719 999.916 55998.774 52000.291 48000.170 3421 3399.741 4000,000 56000 000 1000.000 0.258 1.225 0.267 4421
4521 3999,609 S2000.000 1000.000 0.280 3999, 680 4000,000 48000.000 1000.000 0.319 -0.170 7999, 646 3431 55998.313 56000,000 0.359 1.686 4431 8000, 571 52000.159 1001.820 8000.000 52000.000 1000.000 -0.571 0.159 -1-830 48001.996 1001.468 8000.000 4531 48000.000 1000.000 -0.457 -1.996 -1.468 STD ERRS FOR THE MODEL SIG X = 0.443 M 5IG Y * 1.301 M SIG Z # 1.087 SIG PLAN = 1.375 SIG POS # 1.753 MODEL NO 40304 7999.646 0.35. -0.571 -0.457 1.696 1.088 3431 55998.313 999.916 000.0008 \$6000.000 1000.000 1.686 0.083 4431 4531 8000, 571 52000, 159 48001, 996 1001.820 1001.468 997.713 8000.000 52000.000 1000.000 -1.820 -1.996 0.138 0.309 -1.468 3441 11998.303 55999.861 12000.000 56000.000 2.286 52000.000 11998,911 51999.690 1001.005 12000.000 1000-000 -1.006 4541 12000, 193 48001.705 1002,141 12000,000 48000.000 1000.000 0.193 -1 705 -2.141 STO ERRS FOR THE MODEL SIG X = 0.975 M 510 Y = 1.405 M S7G Z # 1.805 SIG PLAN = 1.711 SIG POS = 2.487 MODEL NO 40405 3441 11998, 303 55999-861 51999-690 48001-705 12000.000 12000.000 997.713 56000.000 1000-000 1.696 0.138 0.309 -1.705 0.490 2.286 4441 11998.911 1001.006 1002.141 52000.000 1000.000 4541 -0,193 -2.141 3.377 3451 15998, 335 55999.509 995.622 1000.513 16000.000 56000.000 1000.000 4451 15999, 389 16000.000 52000.000 0.610 1000.000 0 100 -0.61

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4551 16000.022 48000.427 16000.000 48000,000 -0.370 1000.370 1000,000 -0.022 -0.427 STD ERRS FOR THE MODEL SIG X = 1.203 M SIG Y = 0.83) M SIG Z = 2,133 SIG PLAN * 1,462 SIG POB * 2,586 MODEL NO 40506 3451 4451 55999.509 51999.899 48000.427 15998.335 996.622 1000.613 1000.370 16000.000 \$5000.000 1000.000 1.664 0.490 3.377 52000,000 0.610 -0.613 15999.389 16000.000 1000.000 0.100 4551 16000.027 16000.000 48000,000 1000.000 -0.427 3461 996.485 998.350 -0.492 3.514 20000.492 \$6001.066 20000.000 56000,000 1000.000 -1.065 4461 20000.177 52001.194 20000.000 52000.000 1000.000 -1,194 4561 20/00.788 48000,204 998, 168 20000.000 42000 000 1000.000 -0.788 -0.204 1.831 STD ERRS FOR THE MODEL SIG X . 0.898 M SIG V = 0.779 M SIG 7 = 2.463 SIG PLAN = 1.159 SIG POS = 2.735 MODEL NO 40507 3461 4461 4561 20000 492 66001 066 996.485 998.350 20000.000 56000.000 1000.000 -0.492 -0.177 -0.788 -1.066 3.514 20000.177 52001.194 52000.000 -1.194 1.649 20000 799 48000.204 998.168 997.305 20000,000 48000,000 1000.000 3471 56001.728 25999,060 24000.000 55000.000 1000.000 0.939 -1.728 2.694 52000.000 4471 24000.794 52001.755 1000.320 24000.000 4571 24001.416 48002.039 1000-497 24000.000 48000-000 1000 000 -1 A16 -2 099 -0.497 STD ERRS FOR THE MODEL SIG X = 0.939 M S16 Y = 1.602 M SIG Z = 2.281 SIG PLAN + 1.857 BIG POB = 2.942 MODEL NO 40705 3471 23993.060 56001.728 52001.755 48002.039 997.305 1000,320 0.939 -1.728 -1.755 -2.039 -0.236 2.694 -0.320 -0.97 24000 000 56000.000 1000 000 4471 4571 24000,794 24000.000 52000.000 1000.000 1000.497 24000.000 48000,000 1000.000 -1.416 3481 27998.349 56000.296 56000.000 1000.000 2.647 4481 52002.027 1001.810 28000.000 52000.00 / 1000.000 0.371 -2.027 -1.810 4581 27999.658 48003.725 28000.000 48000.0.20 -4.729 1004.729 1000.000 0.361 -9.725 STD ERRS FOR THE MODEL SIG X * 1,140 M SIG Y = 2.379 M S'G Z = 2.837 SIG PLAN = 2.638 SIC PDS = 3.874 MODEL NO 40809 3481 27998.349 56000.295 997.352 28000,000 56000.000 1000.000 1.650 0.371 0.341 0.122 ~0.296 2.647 4481 4581 27999.628 52002.027 1001.810 52000.000 1000.000 28000,000 -2.027 -1.810 28000 000 3491 31999.877 56002.519 993, 570 32000.000 \$6000.000 1000.000 -2.519 6.329 32000,056 52000, 444 998.723 32000.000 52000.000 1000.000 -0.056 4591 32000.503 48000,000 1000-000 47998,805 1000-459 32000.000 -O. 503 1.197 -0.459 STD ERRS FOR THE MODEL, SIG X = 0.805 M 516 Y = 2.282 M SIG Z = 3.861 SIG PLAN # 2,421 SIG POS * 4.557 MODEL NO 40910 56002.519 3491 31999.877 993.670 32000.000 \$6000.000 1000.000 0.122 -0.055 -0.503 -2.519 -0.444 1.197 6.329 1.270 0.459 2.926 4491 32000.056 52000.444 998.720 1000.459 32000.000 52000.000 1000.000 4591 32000.503 56000 000 34101 56000.154 997 072 26000 000 1000.000 -2.936 0.154 44101 36002.344 51999.411 35000,000 \$2000.000 1002.140 1000.000 -2.344 0.588 -2,140

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35002.325 47999.762 45101 1007.338 36000.000 48000.000 1000.000 -2.325 0.237 ~3,338 STD FRRS FOR THE MODEL STG Y = 1.989 M RTC V # 1.295 M 810 7 # 3.638 SIG PLAN = 2.375 SIG POS = 4.344 MODEL NO 41011 34101 36002,935 56000.154 997.073 36000.000 55000,000 1000,000 -2.936 -2.344 -2.325 -3.971 -0.154 2,926 36002.344 51999.411 1002.140 36000.000 0.588 -2.140 52000.000 1000.000 45101 36002, 325 1003.338 36000.000 48000 000 1000.000 3411: 40003.971 55998.692 1002.604 40000.000 56000.000 1,307 -2.604 44111 40004. E40 51999, 921 1005.150 40000.000 52000,000 1000.000 -4.240 0.078 -5,150 45111 40005,150 47999.744 1003.818 40000.000 48000,000 1000.000 -5.160 0.259 -3.B1B STO ERRS FOR THE MODEL SIG X = 3.997 M SIG Y = 0.664 M SIG Z # 4.052 SIG POS = 3.799 SIG PLAN = 5,555 MODEL NO 41112 34111 40000,000 40003.971 \$\$998,698 1002.604 56000,000 1000.000 -3.971 1.307 -2.604 40004.240 51999.921 1005.150 40000.000 -4.240 0.078 -5.150 44111 52000,000 1000.000 45111 48000,000 1000,000 34121 44002 449 55997.939 51999.733 1002.743 44000.000 55000.000 1000.000 -2.449 5.060 -2.743 44121 440D4-198 44000-000 52000,000 4,198 0.266 45121 44003.293 48000, 905 1005,401 44000.000 48000.000 1000.000 -3.292 -0.908 -5.401 STO ERRS FOR THE MODEL SIG X = 4.355 M SIC Y = 1.176 M BIC Z = 4.806 SIG PLAN = 4.511 SIG POS = 6 692 MODEL NO 41213 1002.743 1005.553 1005.401 1003.651 34121 44121 44002.449 55997.939 51999.733 44000-000 56000.000 1000,000 -2.449 2.060 0.266 -0.908 3.425 -2,743 -5,559 -5,401 -3,651 44004.198 44000-000 52000.000 1000.000 -4.198 44003,293 48000.908 45121 44000.000 48000.000 1000.000 48000-000 36131 55000.000 1000 000 ~1.065 51999.538 48000,403 4413 48001.860 1003.855 48000.000 52000.000 1000.000 -1.860 0.461 -3.855 45131 48002.504 1002.168 48000,000 48000,000 1000.000 -2,504 -0.403 -2,162 STO 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 MODE NO 41214 34131 44132 48001.055 55996.574 51999.538 1009.651 48000.000 3,425 0,461 -0,403 3,126 0,426 55000.000 1000.000 -1.065 ~3.651 52000.000 1000.000 -1.860 -3 855 42002.504 48000.403 48000.000 45131 1002, 162 49000 000 1000,000 -2.504 -2,162 34141 51998,898 1001.283 \$2000.000 1000.000 1.101 -1.283 62000 256 61999 677 1003.679 52000.000 52000.000 1000.000 45141 52000 532 48001.894 1001.676 52000.000 48000.000 1000.000 -0.532 -1.894 -1.670 STD ERRS FOR THE MODEL SIG X * 1.576 M SIG Y * 2.264 M BIG Z = 3.189 STG PLAN # 2.759 SIG POS + 4.217 NODEL NO 41415 34141 51998.898 1001.283 52000-000 56000,000 1000.000 55996,873 1.101 3.126 0.426 -1.894 -1.283 -3.679 -1.676 44141 45141 52000,256 51999.573 48001.894 1003.679 1001.676 996.847 52000.000 52000.000 1000.000 -0.532 1000.000 55000.000 74151 56995.553 55997.942 56000.000 1000.000 2.057 3.152 44151 55997.323 51998,649 1000.327 56000.000 52000-000 1000 000 2.676

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45151 55993.272 48000.55t 1000,435 56000.000 48000,000 1000.000 0,727 -0.551 -0.435 STD ERRS FOR THE MODEL. SIG X = 2.409 M BIG Y # 1.995 M SIG Z = 2.376 SIC PLAN * 3.128 SIG POS = 3,928 MODEL ND 41516 55997,942 56000.000 56000,000 1000.000 2,057 3.152 34151 55995.553 396.847 4.446 996.847 1000.327 1000.435 994.978 998.607 1000.758 44151 55997.323 51998.649 56000.000 52000.000 1000.000 2.676 1.350 -0.327 48000.551 48000.000 0.727 3.624 2.569 \$\$999.272 1000.000 1.361 55998.638 60000.000 56000.000 1000.000 5.021 34161 59996.375 59997.430 59995.751 51997.992 1-392 44161 60000.000 52000.000 1000.000 60000.000 -0.363 45161 48000.000 1000.000 3.248 STD ERRS FOR THE MODEL SIG X = 3. 398 M 51C V = 1.511 M BIG 7 = 2.755 STC P AN = 3.761 SIC POB = 4-662 MODEL NO 41617 34161 59996.375 55998.638 51997.992 48000,863 994.978 998.607 1000.758 60000.000 \$5000.000 1000.000 3.624 2.569 3.248 1.361 5-021 44161 59997.430 59996.751 52000.000 1000.000 1.392 45161 60000.000 48000,000 1000,000 -0.863 34171 63996.180 63997.087 55997.440 996.624 997.383 64000,000 55000.000 1000.000 3.819 2.559 3,375 44171 52000.000 1000.000 1.382 2.610 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 BIC Y # 1.820 M SIG 2 = 3.589 SIC PLAN = 3.969 SIG POS = 5,351 MODEL NO 41719 54000.000 54000.000 64000.000 2,559 1,382 1,218 34171 63996.180 55997.440 996.624 56000.000 1000.000 3.819 3.375 44171 997.383 995.704 995.300 63997.087 51998.617 52000.000 1000.000 2.912 2.616 47998.781 55999.723 4.295 45171 63997.029 A8000 000 1000.000 2.970 34181 67997.454 68000.000 56000.000 1000.000 2.545 0.276 4.699 44101 67997.689 51999.258 995.475 68000.000 52000.000 1000-000 2.310 0.741 4.524 45181 47997.373 994.614 68000.000 67999.742 42000-000 1000.000 0.257 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 MOOFL NO 41819 0.276 0.741 2.626 1.265 55999.723 51999.258 995, 300 995, 475 994, 614 997, 755 68000.000 2.545 34181 67997.454 56000.000 1000.000 4.699 44181 67997.689 67999.742 71998.527 52000.000 1000.000 4.524 45181 47997.373 68000.000 48000.000 1000.000 0.257 36191 55998.734 51999.409 48001.795 72000 000 56000.000 1000.000 1.478 2.244 44191 72000.179 999.782 72000.000 52000.000 1000.000 0.590 0.217 45191 72001.229 1001.547 72000.000 48000-000 1000.000 -1.225 -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 * 2,379 510 208 = 4.633 MODEL NO 41920 34191 71998.527 55998.734 997.755 999.782 1001.547 72000.000 \$6000.000 1000.000 1.472 1.265 2.244 44191 72000.179 51999.409 48001.796 72000.000 52000.000 1000,000 -0.179 0,590 0.217 45191 72000.000 -1.229 -1.547 34201 75999.795 56000.314 998.978 1000.838 76000.000 56000.000 1000.000 44201 76000.000 76000, 166 51999.290 52000.000 1000.000 -0.166 0,105 0.839

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45201 76000.337 48000.231	1001.089 76000.000	48000,600 1000,000	-0.337	-0,231 -1.089
STD ERRS FOR THE MODEL. SIG X =	0.882 M SIG Y = 1.0	033 M SIG Z = 1.443 SIG	PLAN = 1	.359 EIG POS # 1.982
MCDEL NO 42021				
34201 75999.795 55000.314 44201 76000.166 51399.890	998.978 76000.000 1000.838 76000.000	56000.000 1000.000 52000.000 1000.000	0.204	-0.314 1.021 0.109 -0.835
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 % =	1.126 M BIG Y # 0.4	37 M SIC 2 = 3.244 SIC	PLAN = 1	.208 SIG POE = 3.462
STD ERRS FOR THE STRIP SIG X *	2.058 M SIC Y = 1.4	30 M BIG Z = 2.914 BIG	PLAN ≠ 2	.506 SIG POS = 3.843
MODEL NO SOLOR				
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 40001.558 4521 3999.683 47999.775	1001.045 0.000	40000,000 1000,000	1.281	-1.568 -1.045
4521 3999-689 47999-275 5521 3998-706 44000.337	999.669 4000.000 1001.053 4000.000	48000,000 1000,000 44000,000 1000,000	0.310	0.724 0.330
5621 3998,592 40000,527	1000.184 4000.000	40000-000 1000-000	1.407	-0.527 -0.184
STD ERRS FOR THE MODEL BIG X =		,		.510 STG PDS = 1.949
MORE NO SOROR	1100211 810 1 4 110	//3 // DIA 2 - 1.235 DIG	, runn - 1.	
ALDEL NO SDEVS				
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 7999.695 47998.956 5531 7999.333 43999.499	1000.014 B000.000 999.662 B000.000	48000-000 1000-000 44000-000 1000-000	0.303	1.043 -0.014 0.504 0.337
5631 7998.461 39998.711	997.340 8000.000	40000.000 1000.000	1.538	0.504 0.337
	337-340 2001-000	4000.000 1000.000	1.936	1.208 2.659
BTD ERRS FOR THE MODEL SIG X =	1.153 M SIG Y = 0.8	385 M SIG Z = 1,299 SIG	PLAN = 1	.454 SIG POS = 1.949
MODEL NG 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 £000.000	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
5543 31999.660 43999.635 5641 12001.400 39997.943	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 = 1.3	92 M SIG Z = 1.477 BIG	PLAN = 1	.840 SIC 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

504.1 4551 15998.618 47999, 992 998, 597 16000.000 48000,000 1000,000 1.381 0.007 -0.247 0.458 5551 16000.534 44000.247 1000.458 15000.000 44000-000 1000.000 -0.534 16001.383 0.316 0.121 5651 399.878 40000-000 -1.383 15000.000 1000.000 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 1.381 -0.534 -1.383 -0.472 4551 16000.000 16000.000 16000.000 0.007 1.402 15998.618 47999.992 998.597 48000.000 1000 000 5551 16000.534 44000.247 39399.683 48000.703 1000.458 44000.000 1000,000 -0.247 0.316 -0.703 -0,458 0,121 -1,110 993.878 16001.999 40000.000 455.1 20000.472 1001.110 20000.000 1000.000 -0.783 -3,567 5561 20000.426 44000.782 1003.567 20000.000 44000,000 1000.000 -0.426 5661 20001.345 40002.058 1003-863 20000.000 40000.000 -1.345 -2.058 -3,863 1000.000 2.929 STD SERRS FOR THE MODEL, BIG X = 1.124 M SIG Y = 1.049 M SIG Z = 2.492 SIG PLAN = 1.535 SIC POS * MODEL NO 50607 1001.110 -0.472 -0.703 4561 20000.472 48000.703 2000.0000 48000-000 1000.000 -1.110 48000.703 44000.782 40002.058 48001.715 44001.229 5561 20000.426 20000.000 44000.000 1000.000 -0.426 -1.345 -0.107 -2.567 5661 1003.863 40000,000 -2.058 4571 24000.102 1000.222 24000.000 -0,226 5571 24000.004 44000 000 1000.000 -0.004 -1.229 -2 760 5671 23393.828 40002.422 1003.065 24000.000 40000,000 1000.000 0.171 -2 423 -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 POD = 3,673 MODEL NO 50708 4571 24000.102 48001,715 44001,229 40002,422 1000.222 24000.000 24000.000 24000.000 1000.000 -0.102 -1.715 -1.229 -2,482 -1,460 48000,000 -0.222 -2,760 -3,065 5571 24000.004 1002.760 44000,000 1000.000 5671 23393.828 1000.000 0.171 4581 28000.863 48001.460 1003.161 28000.000 48000.000 1000.000 -3.161 5581 27999.860 44002,142 1003.328 28000.000 44000, DDD 1000.000 0,139 -2.142 -3.329 40000.000 5681 27999.767 40002,426 1001-587 28000.000 1000.000 0.232 -2.476 -1.581 STO ERRS FOR THE MODEL. SIG X = 0.414 M BIG Y = 2.14; M SIG Z = 2.851 EIG PLAN = 2.181 STC POS -3, 590 MODEL NO SOROS 4581 28000,863 48,01,460 1003-161 2000.00085 48000.000 1000.000 -0, 363 -1,460 -3 161 \$581 27999, 860 44002, 142 40002, 426 48001, 335 1003.328 28000.000 28000.000 32000.000 32000.000 44000.000 1000.000 0,139 0,232 -2,142 -2,426 -1,335 -3.328 -1.587 -4.464 27599.767 5681 4591 1004.464 48000,000 1000,000 0.851 \$591 31999.174 44002. 664 1000.000 -2.664 -3,335 5691 31998, 972 A0003.224 1000.155 32000.000 40000.000 1000.000 1.027 -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 FOS = 4.235 MODEL NO 50910 45.91 31999.148 48001.335 44002,664 1004.464 32000.000 48000,000 1000-000 0.851 -1,335 -4,464 -3,335 5591 31999.174 32000.000 1000.000 0.825 44000,000 -2.654 5691 31998.972 40003, 224 1000.155 40000.000 -3 224 -0.155

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48000.000 1000,000 -0.840 0.024 3.087 35999.710 36000.222 48002-618 1000.840 36000.000 0.289 -2.618 45101 1000.000 -0.222 -2.143 5520 56101 36000.104 40001.093 996.918 36000.000 40000.000 1000.000 -0.104 -1.093 STD ERRS FOR THE MODEL SIG X # 0.722 # SIG Y = 2.5.36 M SIG Z = 2.374 BIG PLAN × 2.628 510 209 = 3,894 MODEL NO SIOIL 48002,518 1000.840 36000.000 48000.000 1000-000 0.289 -2.618 -0.840 45101 35999.710 36000.222 44002.143 999.975 35000,000 44000,000 1000.000 -0.222 -2.143 0.024 5510 -0,104 3.087 40001.093 996.918 1003.117 36000,000 40000.000 1000.000 56101 36000.104 -3.112 45111 40001.695 47999.444 40000.000 48000.000 1000.000 -1.695 0.555 5511 40001.122 44000, 987 1001.997 40000 000 44000.000 1000 000 -1 122 -0.987 56111 40000.544 40000.000 40000.000 1000.000 -0.903 -0.544 1,543 40000.903 STD ERRS FOR THE MODEL BIG X . 1.965 SIG POS # 3.031 1.009 M SIG Y = 1.585 M SIG Z # 2.307 SIG PLAN = MODEL NO 51112 47999.444 44000.987 40000.544 47997.458 40000.000 -1.695 0.555 -3.112 -1.997 1.643 -3.331 45111 40001.695 1003,118 48000.000 1000 000 1001.997 998.356 40000.000 44000.000 1000-000 -1.122 -0.903 -0.478 50111 40001,122 56111 40000+903 40000,000 40000.000 1000.000 -0.544 41111 1007 22 44000 000 49000 000 55121 44000, 945 43399.583 1001.835 44000,000 44000.000 1000.000 -0.945 0.410 -1.835 56121 44001.497 199999, 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 BIG Y = 1.318 M BIG Z = 2,484 SIG PLAN = 1.842 SIG POS = 3.093 MODEL NO 51213 44000.000 48000,000 -0.478 -0.945 -1.487 45121 44000, 478 47997,458 1003.331 1000.000 2,541 -3.331 43999.589 0.410 55121 44000.945 1001.835 44000,000 1000.000 -1-835 44000.000 40000.000 1000.000 45131 48000.973 47999,454 999.354 49000.000 1000.000 -0.973 0.545 0.645 47228,890 1000,165 48000.000 44000.000 1000.000 1.109 0.165 55131 48001.584 -1.584 56131 48001.784 39999.031 993,891 48000.000 40000.000 1000.000 -1.794 0,968 6.102 STO FRES FOR THE MODEL SIG X = 1.438 1 SIG Y # 1.383 M SIG Z = 3.230 B1G PLAN = 1.995 SIG POS = 3.791 MODEL NO 51314 48000,973 48000.000 48000,000 1000,000 45131 47999.454 999,354 -0.973 0.545 0.645 48001.684 55131 43998.890 1000.165 48000.000 44000,000 1000.000 -1.684 -1.794 -0.824 1.109 0.968 2.368 -0.165 6.102 55131 39999.031 45141 52000.824 47997.631 1003.135 52000.000 48000.000 1000.000 -3.135 1001.786 35141 52001.146 44000.005 52000.000 44000.000 1000.000 -1.146 -0.056 -1.726 52001.862 56141 40001.378 52000,000 40000.000 1000.000 -1.862 -1.378 STD ERRS FOR THE MODEL SIG X = 1.579 M SIC Y = 1.412 M STG 7 M 3.195 SIG PLAN = 2.119 BIG PDE = 3.834 MODEL NO 51415 45141 52000, R24 47997.631 44000.066 1003.135 52000.000 48000,000 1000.000 -0.824 2.368 -3.135 -1.786 0.605 55141 52001-146 52000.000 1000.000 -1.146 5614: 52001-862 40001.378 999.394 52000.000 40000.000 1000.000

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												-1.550
45151	55999.022	47998.372	1001.550	56000			0.000		1000.000	0.389	1.627	0.229
55151 56151	55339.610 56000.128	43399.587	999.770 996.978	56000 56000			0,000		1000.000	-0.128	0.154	3.021
	56000.168	39737.045	3301310	560.00	.000	4000	0.000		1000.00			
STO ENRS	FER THE MODE	L SIC X ≠	1.147 M	BIC Y =	1.43	39 M	SJG Z		2.235 \$10	; plan =	1.841 BIG	POS = 2.895
	MODEL NO 51	516										
												-1.550
45151 55151	55999.022 55399.610	47993.372 43999.587	1001.550 999,770	56000 55000			0,000		1000.000	0,977	1.627	-1.550
56151	56000.128	39999.845	995.770	56000			0,000		1000.000	-0,128	0.154	3.02)
45161	60000.237	47998, 305	1000.354	60000			0.000		1000.000	-0.237	1,094	-0.354 -
55161	60000.647	43999.597	998.615	60000			0.000		1000.000	-0.647	0.402	1.384
56161	60000.768	39998.963	995.090	60000	000	4000	0.000		1000.000	-0.768	1.036	4,909
STO EKRS	FOR THE MODE	а. БІСХ =	0.661 M	516 Y =	1.06	27 M	sjç z		2.747 SI	S PLAN =	1.222 SIG	POS = 3.006
	MODEL NO 53											
45161	60000.237	47998.005	1000.354	50000	000	4900	0.000		1000.000	-0.237	1.094	-0.354.
55161	60000.647	43999.597	998.615	60000			0.000		1000.000	-0.647	0.402	1-384
56161	60000.768	39998.963	995.090	50000			0.000		1000.000	-0.768	1.036	4,909
45171	63399.599	47996.854	1004.111	64000			0.000		1000.000	D. 400	3.145	-4.111
55171	63999.973	43999.621	1000.678	64000		4400	0,000		1000,000	0.026	0.378	-0.678
56171	54000.585	40000.345	996.520	64000	000	4000	0.000		1000.000	-0.985	-0,345	3.479
STD ERRS	FOR THE MODE	1. SIG X =	0.663 M	516 Y =	1.58	36 M	916 Z		3,335 510	S PLAN ≖	1.719 516	POS = 3.752
	MODEL NO 53	718										
45171	63999.599	47996,854	1004.111	64000	.000	4800	0.000		1000.000	0,400	3,145	-4.111
55171	63999.973	43999.621	1000.678	64000	000		0.000		1000.000	0.026	0.378	-0.578
56171	64000,985	40000.345	996.520	64000			0.000		1000,000	-0,985	~0.345	3.479
45181	67997.724	47998.330	1003.228	68000			0.000		1000.000	2.275	1.669	-3.228
55181	67998.656	44000.473	1000.199	68000			0.000		1000.000	1.343	-0,473	-0.199
56181	67999.634	40000.030	996.053	68000	.000	4000	0,000		1000.000	0.365	-0+030	3.946
STD ENRS	FOR THE MODE	L SIG X #	1.284 M	81C Y =	1.68	82 M	SIG Z	м	3,332 810	SPLAN ≈	2.06" 510	926 = 3,922
	MODEL NO 51	819										
45181	67997.724	47998.330	1003.228	68000	000	4800	0,000		1000.000	2.275	1,669	-3.228
55181	67998.656	44000.473	1000, 199	68000			0.000		1000-000	1.343	-0.473	-0.199
56181	67339.634	40000.030	395.053	68000			0.000		1000.000	0, 365	-0.030	3.946
45191	71997.529	48000.439	999.748	72000			0.000		1000.000	2.470	-0.439	0.251
55191	71998.847	43999, 734	998.309	72000			0,000		1000.000	1.152	0.265	1.690
56191	72000.303	39999.390	995.579	72000	000	4000	0,000		1000.000	-0.303	0.609	4.420
STD ERRS	FOR THE MODE	L 516 X =	1.711 M	816 Y =	0,8	54 M	916 Z	9	3.114 51	SPLAN ≈	1.912 516	POS = 3.654
	MODEL NO 51	920										
45191	71997.529	48000.439	999.748	72000	000	4800	0.000		1000.000	2.470	-0.439	0.251
55,91	71098,847	43999.734	398,309	72000	000	4400	0.000		1000.000	1.152	0.265	1,690
56191	72000, 303	39999.390	995.579	72000	000	4000	0.000		1000.000	-0.303	0.609	4,420

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45201 75999.643 47999.738 1000.271 76000.000 48000.000 1000.000 0,356 0.261 -0,271 -1.045 76000.267 1001.045 76000.000 \$5201 43999.005 44000.000 1000.000 -0.267 0.993 56201 76000.631 40000,000 1000.000 -0.531 0.302 0.263 39999.697 STD ERRS FOR THE MODEL SIC X = 1.265 M SIG Y # 0.596 M SIG 7 = 2.177 SIG PLAN = 1.399 510 PDS = 2.587 NCOEL NO 58021 45201 75999.643 1000.371 76000.000 48000.000 1000.000 -0.271 47999.738 0.355 0.261 76000,000 \$5201 76000 267 42999.006 1001.045 999.736 998.831 44000 000 1000 000 -0.267 0.993 56201 1000.000 0.263 76000.531 39999.697 76000.000 40000.000 45211 80001.559 48000,490 80000.000 48000.000 -1.559 -0.490 5621 80000.363 43998.260 1002.219 80000,000 44000,000 56,211 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 SIC Y = 0.945 M SIG Z = 1.754 SIG PLAN # 1,371 SIG POS = 2,225 STD ERRS FOR THE STRIP SIG X = 1.031 M SIC Y = 1.383 M SIC Z = 2.370 BIG PLAN * 1.725 516 205 = 2.931 MODEL NO 60102 1.379 0.799 0.031 1.512 5611 1.379 39998, 892 999.450 0.000 40000.000 1000.000 1.107 0.549 1000.497 1000.742 999.394 999.142 -0.497 -0.742 0.605 0.857 6611 6711 -0.799 35999.249 0.000 36000.000 1000.000 32001,565 39399,051 35999,541 1000.000 -1.566 1000.000 56.21 3998.487 4000,000 40000.000 6631 3333.177 4000.000 36000.000 0.822 0.458 6721 3998.409 32001.086 998.506 4000.000 35000,000 1000.000 1.590 -1.056 1.493 STD ERRS FOR THE MODEL SIG X = 1.267 M SIC Y = 1.141 M SIC Z = 0,941 BIG PLAN = 1.706 SIG POS = 1.948 MODEL NO 60203 999.394 995.142 995.506 1001.054 562) 6621 672) 3998.487 3999.177 39999.061 4000.000 40000.000 \$000.000 0.605 0.857 1.493 1.512 0.938 4000.000 1000.000 0.822 0.458 3998,409 32001.086 4000.000 32009.000 1000.000 5631 7933.085 8000.000 1000.000 66.91 7333.097 35999.851 31999.518 999.314 995.563 8000.000 1000.000 0.902 D.148 0.685 6731 7599.780 8000.000 32000,000 1000.000 0.211 0.481 4.436 STO ERRS FOR THE MODEL BIG X . 1.199 M SIG Y = 0.723 M SIG : = 2.717 SIG PLAN = 1.400 516 205 = 2.627 PEDEL NO 60304 -1.054 0.685 4.436 -3.206 5631 7999.085 39999.695 35999.851 31999.518 1001.054 8000,000 40000-000 1000.000 0.914 0.303 6631 6731 7999.097 999.314 995.563 8000,000 36.0(x),000 1000.000 0.302 0.148 0.491 92000.000 1000.000 12000.000 e. 449 \$641 11397.550 39998.398 1003,206 40000.000 1000.000 1.601 6641 35999.795 11999.111 1003.282 36000,000 1000.000 0.204 -3.292 5741 12000, 825 32000.411 998.508 12000.000 32000.000 1000.000 -0.822 0.413 1.491 0.790 m SIG Z = STO ERRS FOR THE MODEL SIC X = 1,353 M SIG Y = 2.984 BIG FLAN # 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

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35999.795 1003.292 998.508 998.769 1000.846 0.000 0.204 -3,282 6641 11999-111 12000.000 36000.000 1000.000 0.888 -0.882 2.007 0.508 -0.411 -0.531 0.959 1.491 6741 12000.829 1000.000 56.51 15997.992 40000.531 16000.000 40000.000 1000.000 35999.040 16000.000 -0.846 6651 360d0.000 15999.491 2.293 6751 16001.291 31998.755 997.706 16000.000 38000,000 1000.000 -1.291 1.244 STD FRRS FOR THE MODEL BIG X = 1.638 M STG V = 1.051 M SIG Z . 2,480 SIG PLAN * 1,946 910 PDG = 12 1 5 3 MODEL NO 60506 1.230 -0.845 2.293 -0.527 -0.784 GEEI 15397.998 40000.531 35993.040 31998.755 40000.249 998.769 1000.846 997.705 16000.000 40000.000 1000.000 2.007 -0.531 0.959 1.244 -0.249 6651 15999.491 16000 000 32000,000 1000.000 -1.291 675) 16001.291 16000.000 1000.527 20000.000 5861 19399.113 6661 20000.378 36000.119 20000.000 36000.000 1000.000 -0,372 -0.119 -1.211 6761 20001.337 1001.211 20000.000 32000.000 1000.000 -1.337 -1.473 STD ERRS FOR THE MODEL BIG X = 1 316 M STOVE 0 999 M 910 7 -1 402 915 9444 2 1.653 SIG POR = 2,168 MODEL NO 60607 40:00.249 36000.119 32001.473 39999.353 35993.554 0.886 -0.372 -1.337 0.736 -0.249 -0.119 -1.473 0.646 5661 19999.113 20000.372 20001.337 23999.263 1000.527 20000,0005 40000.000 1000.000 -0,527 -0,784 -1,211 -0,221 6661 20000.000 1000.000 1001.211 20000.000 32000.000 24000.000 5671 40000 000 6671 24000.455 399.999 24000.000 36000,000 1000.000 -0.456 0,435 0.000 6771 24000.699 32001.076 999. R46 24000.000 32000.000 1000.000 -0,633 -1.076 0,153 STO FRES FOR THE MODEL SIG X . 1.262 STG POS # 0.889 m 516 Y = 0.895 M SIG 7 = 0.697 BIG PLAN 3 1.447 MEDEL NO 60708 5671 23899.263 39999.353 1000.221 24000.000 40000 000 1000.000 0.736 -0.456 -0.693 1.034 0.646 0.435 -1.076 0.909 -0 531 1000.000 6671 24000.456 35999.564 999.339 24000,000 36000.000 0.000 0.153 6771 24000.693 32001.076 999.846 24000-000 32000.000 5681 27998, 965 39999.091 28000.000 40000.000 1000.000 35993.375 32001.475 6681 28000 192 999 376 28000.000 26000 000 1000 000 -0.192 0,624 0.023 6783 27399,805 999.570 28000.000 32000-000 -1-475 0.323 1000.000 0.194 STD ERRS FOR THE MODEL SIG X = 0.690 M SIG Y = 1.015 M SIG Z = 0.553 SIG PLAN * 1.228 SIC POS = 1.347 MODEL NO 60809 0.909 0.624 -1.475 0.628 0.234 0.234 5683 27998.965 39999.091 35999.375 998.938 28000,000 40000-000 1000.000 1.034 1.161 28000.192 999.976 999.670 -0.192 0.194 1.148 1.727 6681 28000.000 36000.000 1000,000 0.023 38001,475 39399,371 35999,765 31999,583 1000.000 4781 28000.000 22000 000 5691 31992.851 999.076 32000.000 40000.000 0.923 6691 31998.272 998.893 995.043 32000.000 35000,000 1000.000 6791 32000.000 1.807 STO ERRS FOR THE MODEL BIG X = 1.320 M SIG Y = 0.895 M STG 7 . 1.956 SIG PLAN = \$10 POS = 1.000 2.524 MCCEL NO 60910 5691 31398,851 39999.371 999.076 32000,000 40000.000 1000.000 1.149 0.0.3 0.923

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1.727 1.607 0.956 -0.353 6691 31998.272 35390.765 398.893 324/00+000 36000-000 1000.000 0,234 1,106 6791 56101 31998.192 31999.583 40002.277 36000.578 996.049 994.627 995.759 3604141-000 32000,000 0.410 3,950 66101 35000, 353 36000, 550 38000,050 1000.000 -0.528 36001.007 31998.330 5.666 67101 994, 313 35000.016 92020.000 1010.000 -1.007 1.667 4.798 STD ERRS FOR THE MODEL SIG X = 1.387 M SIG Y = 1.331 M SIG Z = 4.336 SIG PLAN = 1.923 610 POS = MODEL NO 61011 994.627 995.759 994.333 998.122 1.00.435 5.372 4.240 5.666 56101 35999.043 40002.27 * 36000.000 1000.000 40000.000 0.956 -2.217 66101 36000.353 36000,528 36000.000 36000.000 1000.000 -0.528 1.667 -0.116 36000.355 -1.007 22000.000 1000.000 40000.116 1.877 56111 40001.763 40000.000 40000.000 1000.000 66111 40001.758 40000,000 -0.43F 35000.000 1000.000 -1.752 -0, 392 67111 40001 . 75F 32001,984 40000.000 36000.000 1000.000 -1.984 -0.524 STD ERRS FOR THE MODEL BIG X = 1.505 E SIG Y = 1.571 # SIG 7 = 4.083 SIG PLAN = 2.175 SIG POS = 4.626 MODEL NO 61112 40000.116 4 / 10,000 40 000 -1.763 -1.758 -1.756 -0.502 -0.875 \$6111 40001.763 998.122 40000.000 1000.000 -0.11E 1.277 66111 36000.382 1000.436 1000.824 1000.377 36000.000 1000.000 -0.382 -1.984 0.554 -0,435 -0,824 -0,377 -1,048 40001.758 67111 40001.756 56121 44000.502 39999 445 A6000 (KA 1000.000 40000 000 -1.084 66121 35001.084 1001.048 44000.000 36000.000 67121 44000, 351 32003, 154 1001.867 44000.000 32000.000 1000.000 -0,351 -3.164 +1 967 STD ERRS FOR THE MODEL BIG 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 36001.084 1000.377 44000.000 40008,000 1000.000 -0.502 0.554 -1.094 -3.164 0.740 -0.377 66121 44000.275 44000.000 -0.875 -0.351 0.647 67121 44000.351 32003.164 1001.867 997.616 44000.000 32000,000 1000,000 -1.867 56131 35999.973 999.617 999.787 ARCOD. 000 35000,000 1000.000 0.382 47999 905 0.094 0.026 67135 47999, 579 48000.000 0,320 -1.516 STD ERRS FOR THE MODEL SIG X = 0.578 M SIG Y = 1.455 SIG PLAN = 1.693 M SIG 7 = 1.789 SIG POS = 2, 307 MODEL NO 61314 0,647 0.094 0,320 -0,421 0,791 56431 47999.352 997.616 45/000.000 0.740 39999.259 40000.000 1000.000 5.383 66131 47999.905 35999.973 999.617 999.787 996.653 42000.000 3(4/2/, 000 1000.000 0.026 0.382 47993.679 32001.516 39393.798 48000.000 1000.000 -1.516 52000.421 52000.000 40000000 56141 3.340 66141 35999 676 999 637 36001 114 1000 000 0.323 0.462 67143 51999.769 32000.043 999.939 52000.000 35000.("/) 1000,010 0,230 0.060 -0.043 STO ERRS FOR THE MODEL STG X = 0.526 M BIG Y = 0.773 M BIG Z = 1.857 SIG H AN # 0 926 910 POR # 2 000 MODEL NO 61415 56141 52000.421 39999.798 396.659 52000.000 40000-000 1000.000 -6.421 0.201 3,340

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0,462 999.537 999.939 997.620 0,791 0,230 -0,919 -0,577 0.323 -0.043 0.959 66141 51999.208 35999.676 52000,000 36000+000 1000.000 67141 51999.769 S2000.043 52000.000 32000,000 1000.000 2,380 56000.000 1000.000 66151 56000.577 999.017 1000.143 56000.000 36000.000 1000.000 0.982 0.143 0.436 0.566 56000.230 67151 31999.563 999.433 56000.000 32000.000 1000.000 -0,230 STD FRRS FOR THE MODEL SIG X = 0.646 M SIG Y = 0.666 # 976 7 # 1 854 STC PLAN # 0.928 SIG PDS = 2,083 MODEL NO 61516 56151 66151 56000,919 39999.040 35999.017 997.620 1000.143 999.433 1000.954 56000.000 40000.000 36000.000 1000.000 -0,919 -0,577 -0,230 0,891 0.959 0.982 0.436 3.213 2.380 -0.143 0.566 -0.954 -2.376 56000.S77 67151 56161 56000.230 31999.563 56000.000 32000.000 1000.000 35399.484 66161 60000, 021 1002,376 60000.000 36000,000 1000.000 -0.021 0.515 60000.000 -1.440 67161 60000.175 32000.875 1001.440 32000,000 1000.000 -0.175 -0.875 0.641 M SIG Y = 1.711 SIG PLAN = STD ERRS FOR THE MODEL SIG X = 1.639 M SIG Z = 1.760 SIG POS = 2.454 MODEL NO 61617 56161 59999 105 39995.786 35999.484 32000.875 1000.954 60000.000 60000.000 60000.000 0.891 -0.021 -0.175 1.429 3.213 0.515 -0.875 -0.954 40000.000 1000.000 66161 50000,021 36000.000 1000.000 32000,000 67161 60000,175 1001.440 -1.440 56171 63998, 570 64000.000 64000.000 40000-000 1000.000 0,595 39399,404 66171 63999,466 64000.283 35998.767 1000.309 36000-000 1000.000 0,533 1.232 -0.303 31929,723 1000.232 64000,000 32000.000 -0.283 0.275 -0.238 67171 1000.000 STO FROM FOR THE MODEL STO Y = 0.ROAM STC Y > 1.631 M STC 7 .: 2 133 574 PI AN # 1 918 576 905 # 2.803 MODEL NO 61718 55171 55171 63998.570 39999.404 35998.767 996.262 1000.309 64000.000 40000.000 1000.000 1.429 0,533 -0.283 1.104 0,595 1,232 0,276 2,076 3.737 63999.466 64000.283 31999.723 1000.232 64000.000 32000.000 1000.000 -0.232 67171 56181 F6181 67999, 142 35998.647 1002.127 68000.000 39000-000 1000.000 857 1.352 -2, 127 67181 67998.372 32001.185 1002.496 68000.000 32000.000 1000.000 1.627 -1.1BS -2.496 1.184 M SIG Y = 1.378 M SIG Z = STD ERRS FOR THE MODEL SIG X * 2.230 SIG PLAN = 1.817 SIG POS = 2.877 MODEL NO 61819 56181 67998.895 39997.923 1000.063 62000.000 40000.000 1000.000 1.104 2.076 -0,063 56181 35998.647 1002.127 1002.496 1000.218 68000,000 36000.000 0.857 1.352 -R.127 -R.495 67999.142 67181 67998.372 32001-185 68000.000 32000-000 1000,000 1.627 -1.185 56191 71997.518 33339,493 72000.000 0.500 -0.218 66191 71997.922 35999.853 1000.236 72000.000 36000.000 1000.000 2.077 -0.236 67191 71999.021 31999,502 72000-000 0.407 32000.000 1000.000 0,978 0.857 1.523 SIG PLAN = STO FREE FOR THE MODEL STO Y -1.790 M GTC V > 1 262 M STC 7 a 2,191 BIG POS > 2.663 MODEL, NO 61920 0.500 56191 71997.518 39999.499 1000.218 72000.000 40000.00 1000.000 2,483 -0.21R

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66191 71997.922 35999.853 1000,236 72000.000 36000.000 2.077 0.146 0.407 0.556 -0,236 1000.000 67191 71999, 021 75998, 697 31999.592 999, 142 72000.000 32000,000 1000.000 0.978 2.018 66201 75999.518 36339.556 999.778 76000.000 36000.000 1000.000 0,48 0.443 0,221 67201 76000.002 B1999, 408 998 811 76000.000 32000 000 1000.000 -0.003 0.591 1.188 STO FREE FOR THE MODEL BIC Y = 1.712 SIG POS = 2,051 1.634 M BIG Y = 0.511 M STG Z = 1.129 STG PLAN # MODEL NO. 63031 997.981 999.778 998.811 999.233 2.018 0.221 56201 56201 75998.697 39999.433 35993.556 76000.000 40000,000 1000.000 1,302 0.565 76000.000 67201 76000,002 31999,408 0.002 0.591 2.198 76000.000 32000.000 1000.000 80000-000 40000 000 1000.000 0,001 35000.000 -2.776 66211 80000.195 35999, 770 1002,776 80000.000 0.195 0.225 67215 80000 636 22000 003 1000 797 80000 000 1000 000 -0.639 -0.007 STD ERRS FOR THE MODEL SIG X = 0.688 M SIG Y = 0.551 M STG 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 BIG POS = 2 505 MODEL NO 70102 32000,000 28000,000 24000,000 6713 -1.430 31999.109 1000,225 0.000 1000.000 1.430 0.890 -0.225 7711 -0.945 28000.574 24002.111 1000,689 0.000 1000.000 0.945 -0.574 -1.891 7811 3999.093 999, 529 1000, 137 0.906 1.292 6721 31998.707 4000.000 32000.000 1000.000 0.470 7721 4000.000 399R 474 P8000 461 28000 000 1000.000 0.137 1000,640 782) 3999.040 24002.438 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 NDDEL ND 70203 6721 3999, 093 31998.707 999,529 4000.000 32000,000 1000.000 0.906 1.292 0.470 7721 3598.474 3998.040 8000.270 28000, 461 1000.137 4000.000 28000,000 1000.000 1.525 -0.461 0.137 20002 435 6000 000 1000.000 -2.438 -0.540 994.525 996.507 996.902 6731 32000.683 8000.000 32000.000 1000,000 7731 8000,085 27999.972 8000.000 28000.000 1000.000 -0.085 0.027 3.492 8000.000 1000.000 7831 23999.257 24000,000 1.258 STD ERRS FOR THE MODEL. SIG X = 1.071 M BIG Y = 1.330 M SIG 7 = 3.237 SIG PLAN = 1.707 SIG POS = 3 660 MODEL NO 70304 6731 8000.270 994,525 996,507 996,902 996,848 32000,000 -0.270 32000.683 8000.000 1000.000 -0.683 5.474 7731 8000.085 27993.972 8000.000 28000.000 1000.000 0.027 -0.085 3.492 23999.257 1000.000 1.258 7831 7998.741 8000.000 6741 12001.668 31999.637 12000.000 32000,000 3.151 7741 12001.286 27999.827 1000.290 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 STU ERRS FOR THE MODEL SIG X = 1.271 M SIG Y = 0.580 M SIG Z = 3.515 \$16 PLAN = 1.397 SIG POS # 3.783 MODEL NO 70405

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3.151 6741 12001.66B 12001.285 12001.407 16001.009 31999.637 27999.827 996.848 1000.296 1000.077 12000,000 32000.000 28000.000 24000.000 1000.000 -1.668 0.382 -0.296 7741 12000.000 -1.407 -0.708 7841 24000.708 12000.000 1000.000 -1.202 31995.425 6751 1001.202 16000 000 32000,000 1000.000 16000.378 -1.846 7751 27993.002 16000.00 28000.000 1000.000 -0.378 0.997 7851 15959.922 24000 106 16000.000 24000.000 1000.000 0.065 -0.105 STD ERRS FOR THE MODEL BIG X = 1.231 M SIG Y = 2.125 M SIG Z # 1.716 SIG PLAN = 2,457 BIG POS # 2-997 MODEL NO 70506 1001.202 16000,000 1000.000 -1.202 6751 16001.009 31995, 485 32000.000 -1.009 4.574 7751 16000.378 1001.646 28000,000 1000.000 -0.378 0.997 -1.646 27999.002 16000.000 24000-106 16000,000 6761 19999.230 31996.936 999.751 20000.000 32000.000 1000.000 0.769 3.063 0.248 0.166 7761 20000.478 27999 097 \$99.833 20000 000 28000 000 1000.000 -0.478 0.912 7861 20000.943 23998,766 396.717 20000.000 24000.000 1000.000 -0.943 1.233 3.282 STD ERRS FOR THE MODEL SIG X = 0.758 M SIG Y = 1.764 SIG PLAN = 2.703 SIG POS # 2.595 M SIG Z # 3 229 MODE NO 20507 6761 31996.936 27999.087 23998.765 31997.584 999.751 999.833 996.717 997.636 19999 230 20000 000 35000,000 1000.000 0,769 3.063 0.248 7761 20000.478 28000,000 0.912 0.166 20000.000 1000.000 -0.478 7861 20000.943 20000.000 24000,000 1000.000 -0.943 1.779 0.417 1.233 3.282 6771 2399B. 220 24000.000 1000.000 2,415 2.363 7771 23999.582 27999.035 999.401 28000.000 1000.000 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 BIG Y = 1.925 M SIG Z = 1.968 SIG PLAN = 2,222 510 905 = 2, 968 MODEL NO 70708 6771 23938.220 31997.584 997.636 24000.000 24000.000 24000.000 32000.000 1000.000 1.779 2.415 2.363 997.636 999.401 998.399 996.159 998.005 997.757 7771 23999.502 27999.035 28000.000 1000.000 0.417 -1.046 0.118 0.964 0,598 7871 24001.046 0,183 1.600 3.840 27993.881 32000.068 28000.000 35000*000 1000.000 -0.068 6781 27399.688 23000.000 1000.000 0.477 7781 27999, 522 28000-000 0.311 1.934 1000.000 7881 27399.201 28000.000 24000.000 6.282 R-247 STD ERRS FOR THE MODEL BIG X = 1.031 M SIG Y * 1.181 M SIG Z # 2.540 BIG PLAN = 1.558 STG 209 -2 946 MODEL NO 70809 996.159 998.005 997.757 1000.355 1002.064 32000.068 27999.688 23999.717 31999.421 6781 27993 921 28000.000 32000.000 1000 000 0.118 -0.068 3.840 7781 27999.522 28000,000 1000.000 28000.000 0.477 0.311 0.282 0.578 1.994 2.242 27399.201 7881 28000.000 24000.000 1000.000 6791 32000.000 1000.000 32000.142 28000.337 32000,000 1000.000 -0.327 779: 28000.000 0.14 -2.064 32001.310 1001.068 32000.000 24000.000 7891 24001.469 1000.000 -1.910 -1 4/39 -1.068 STD ERRS FOR THE MODEL SIC X = 1.074 M 516 Y = 0.747 M SIG 7 * 2.420 SIG PLAN # 1.309 SIG POS = 2.751

MODEL NO 70910

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31999.421 28000.337 1000.355 32000.000 32000.000 1000.000 1.777 -0.142 -1.310 0.578 -0.355 6791 31998.222 7791 32000.14 -0.337 -2,064 -1.068 7891 32001.310 24001.459 1001.068 38000.000 24000.000 1000.000 1,181 0.247 1,952 -2.747 -4.908 37101 35998.818 31999.752 28000.139 998-047 36000.000 32000.000 0.303 77101 35999.696 1002.747 36,000.000 28000.000 1000.000 -0.139 -1.602 78101 36000,612 24001.602 1004.908 36000.000 24000.000 1000.000 1,550 SIG POB = 3,255 STD ERRS FOR THE MODEL SIG X = 1.162 M BIG Y = 1.025 M BIG Z # 2.863 SIG PLAN = MODEL ND 73011 1000.000 1.181 0.247 -0.139 -1.602 -0.201 1.952 -2.747 -4.908 67101 35998.818 31999.752 998.047 36000.000 35000.000 77101 35999.698 28000.139 1002,747 36,000,000 29000.000 78101 24001.602 1004.908 36000.000 2+000.000 1000.000 0.612 0.330 1.135 36000.612 -0.680 39999.669 39998.864 1000.680 40000.000 32000.000 1000.000 32000.201 1004.273 28000,00085 -1.410 -4.273 28001.410 40000.000 -4.379 78111 39008 843 24002.971 1004.379 40000.000 24000.000 1000.000 1.156 -2.971 STD ERRS FOR THE MODEL SIG X = 0.959 M SIG Y = 1.543 M SIG Z = 3.830 SIG PLAN = 1,903 SIG POS # A. 277 NOCEL NO 71112 1000.000 0.330 -0.201 -0.680 67111 39999, 663 32000.201 16-30-680 40000.000 32000.000 39998.864 39398.843 28001.410 24002.971 1004.273 40000.000 1000.000 1.135 -1.410 -4,273 77151 22000.000 -2.971 -1.007 -1.297 -4.379 78111 24000.000 1002,141 1000.000 0.642 -2.141 67121 43999,358 32001.007 44000,000 35000,000 28000,000 1000.000 0.911 77121 43399,088 28001.297 44000,000 78121 43999.375 24001,560 1003.113 44000.000 24000.000 1000.000 0,624 -1.560 -3.113 STD ERRS FOR THE MODEL SIC X = 1.788 M SIC Z = 3.458 S10 PLAN = 2.018 STS PDS = A-001 0.924 M SIG Y = MODEL NO 71213 67121 43999.358 32001.007 1002.141 44000.000 44000.000 44000.000 32000,000 1000.000 0.642 -1.007 -2.141 77121 43999.088 28001.297 24001.560 1002.753 1003.113 28000.000 1000.000 0.911 -1.297 -2.738 78121 24000,000 1000.000 67131 48000.001 31999.388 1000.611 48000-000 32000.000 1000-000 -0.001 0.611 -0.61) 48000.019 28000.243 1002.160 48000.000 28000.000 -0.019 0.243 -2-160 781 31 24000.459 1003.137 48000.000 24000,000 1000,000 -0.459 47999.528 -3.13 0.000 -STO ERRS FOR THE MODEL, SIG X = SIG Y # 1.075 M SIC I = 2.708 SIG PLAN = 1.235 S10 POS = 2.976 MODEL NO 71314 0.611 -0.243 -0.459 1.086 67131 48000.001 1000.611 48000.000 32000.000 1000.000 -0.001 31999, 388 -0.611 77131 48000.019 28000.243 24000.453 31398.913 1002.160 48000-000 28000,000 24000,000 32000,000 1000.000 -0.019 -2.160 -3.137 0.597 78131 48000.000 1000.000 0.471 67141 52000.507 999.40P 77141 52000 442 28000 045 1002.472 \$2000 000 28000 000 1000 000 -0.062 -0.045 -2.472 8141 52000.022 24001 258 1003.708 52000.000 24000,000 1000.000 -0.032 -1.258 STD ERRS FOR THE MODEL. SIG X . 0.367 M SIG Y = 0.826 M BIG Z = 2.649 SIC PLAN = 0.904 STC 208 -2,799 MODEL NO 71415

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-0.507 -0.442 -0.022 1.086 0.597 67141 1000.000 52000.507 52000.442 31998.913 999,402 1002,472 1003,708 52000.000 32000.000 2.472 77141 28000,000 1000.000 78143 -3.708 52000.022 24001.258 52000.000 24000.000 1000.000 2.504 997.495 1000.000 0.652 0.102 67151 31999, 897 32000.000 56000.000 56000.105 28000.498 1000,121 55000,000 28000,000 1000.000 -0.105 -0.498 0.121 77151 -0.566 -0,478 -8,206 78151 \$6000, 566 24000 472 1002,206 56000.000 24000.000 1000.000 0.944 BIG PCG # 2.677 STO FORS FOR THE MODEL SIG X -0.49P M SIG Y # 0.806 8 516 7 # 2.504 SIG PLAN = MODEL ND 71516 2.504 67153 55999,347 31993.897 997,495 55000.000 32000.000 1000.000 0.652 0.102 -0.121 -0.105 0.498 56000.105 56000.566 28000.498 1000.121 \$6000.000 56000.000 7715 28000.000 24000.000 1000.000 -0.472 1.743 0.117 7815 31998.256 27999.882 998, P82 0.748 67161 \$9999.251 60000.000 32000.000 1000.000 77161 59999.645 60000.000 28000.000 1000.000 -2.624 78161 59998.867 24002.269 1005,347 60000.000 24000.000 1000.000 1.132 2.269 -6.347 STD ERRS FOR THE MODEL SIG X > 1.317 M SIG Z = 1.510 SIG POS * 3,813 0.778 M SIG Y = 3.501 SIG PLAN = MODEL NO 71617 67163 59999.251 31998,255 998,282 60000 000 22000 000 1000 000 0.748 1.743 1.717 7716 59999.645 27999.882 1002, 524 60000.000 28000.000 1000.000 -2.624 -6.347 1.960 70161 59998.867 63999,941 24002.269 1008, 347 60000.000 24000.000 1000 000 1.132 0.058 1.346 67171 64000.000 32000,000 1000.000 0.219 7717 63998.653 63998.024 27999,764 24000.527 1001,716 64000.000 28000,000 1000.000 0.235 -1.716 1.975 64000.000 1000.000 78171 1004.390 24000.000 -0.525 -4.390 STO 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. 21718 31999.780 27999.764 24000.527 31999.476 998,079 1001.716 1004.390 1001.639 1000.000 1000.000 1000.000 67171 63999.941 64000.000 32000.000 0,058 0.219 1-960 \$4000.000 \$4000.000 77171 63998.653 28000.000 1.346 0.235 ~0.527 0.523 -1.716 -4.390 -1.639 78171 63998.024 24000.000 58000.000 32000.000 77181 67929.575 28000.47E 1002.819 68000.000 28000.000 1000.000 0.424 0.472 -2.819 £/098.675 23399.689 68000,000 78181 1001.553 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 6718 67999,695 31999.476 1001,639 68000,000 35000.000 1000.000 0.304 0.523 -1.639 67999.575 67998.675 P8000.47F 1002.819 1001.557 1000.994 1002.684 68000.000 28000,000 0.424 -Q.472 0.310 0.670 77181 1000,000 -2.819 78181 23999.689 1000.000 -1.557 -0.994 -2.684 67191 72000.209 31999.329 72000 000 32000.000 1000.000 72000.389 77191 27999.814 72000.000 28000,000 1000.000 -0,389 0.185 24000.249 24000.000 79101 72000 293 1003,187 72000.000 1000.000 -0.249 -3.187 STD ERRS FOR THE MODEL SIG X = 0.679 M 810 Y = 0.477 M SIG Z = 2.506 BIG PLAN = 0.530 SIC POS * 2.640

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MODEL NO 71920

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0.670 -0.994 67191 72000.205 31999.329 1000.994 72000.000 32000.000 1000.000 0.205 -2.684 1002.684 72000.000 28000.000 24000.000 -0.389 0.185 77191 72000.389 27999.814 1000.000 -3,187 72000.293 24000.249 1000.000 78191 0.829 -2.656 67201 75993.880 31999.170 1002.656 76000.000 32000.000 1000.000 0.119 -0.274 -3.751 77201 75000.431 28000.274 1003.751 76000.000 28000.000 1000.000 -0.431 78201 76000,404 24000.256 1002.045 76000.000 24000.000 1000.000 -0.404 -0.256 -2.045 3.022 BID ERRS FOR THE MODEL. SIG X = 0.358 M SIG Y = 0.524 M SIG Z # 2.955 SIG PLAN * 0.635 SIG POS # MODEL NO 72021 0.829 -2.656 -3.751 -2.045 57201 75999.880 1002.656 1003.751 1002.045 999.715 0.119 -0.431 -0.404 1.524 31999.170 76000 000 32000 000 1000 000 -0.274 77201 76000.431 28000.274 76000.000 22000.000 1000.000 78201 75000.404 24000.256 76000.000 24000.000 1000.000 0.284 80000,000 -0,134 79998.475 80000.024 28001,143 1000.609 80000.000 28000.000 1000.000 0.024 -1.143 77211 2.232 80002,181 80000.000 -2.181 0.279 78211 24000.000 1000.000 STD ERRS FOR THE MODEL SIG X = 2.479 SIG PLAN * 1.392 SIG POS = 2.844 1.220 M BIG Y = 0.671 M BIG Z = STO ERRS FOR THE STRIP SIG X -1,521 SIC POS -2.992 0.901 M SIG Y # 1.225 M SIG Z = 2.576 SIG PLAN = MODEL NO BOLOZ 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 6.000 4000.000 4000.000 20000.000 1000-000 1.105 -0.010 -0.287 8.409 1000.662 1000.000 3.081 -0.662 8911 16000.000 7821 23999.467 998-944 1001-192 0.532 1.055 4000.287 24000 000 1000.000 4001.240 19998.496 20000.000 1000.000 -1.240 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 516 Y = 1.932 M SIG Z = 1.725 S10 PLAN = 2.508 SIG POS = 3.044 MODEL NO 80203 7821 4000.283 23999.467 998.944 4000.000 24000.000 1000.000 -0.287 0.532 1.055 8521 8921 4001.240 19998.496 1001,192 4000.000 20000.000 -1.240 -0.491 -1.836 1,503 0,910 ~0,329 0,387 -1.192 1000.000 1000.000 7831 8001.836 24000.323 399.827 8000.000 24000.000 1000.000 0.172 8831 8002.018 19999.612 1001,448 1000.000 -2.018 -1.448 8931 8001.829 16000.402 393.694 8000.000 16000,000 1000.000 -1.829 -0.402 0.305 STO ERRS FOR THE MODEL. SIG X -1.591 M BIG Y = 0.870 M SIG Z = 1.041 SIG PLAN = 1.813 816 805 # 2.091 MODEL NO SOBOA 7831 8001.836 24000.329 999.822 8000.000 -1.836 24000.000 1000.000 -0, 329 0.172 8831 8002.019 19999.612 1001.448 999.694 1002.130 8000.000 2000.000 12006.000 20000,000 1000.000 -2.018 0.387 ~0.402 -1.448 16000.402 8931 16000.000 1000.000 ~1.829 0.305 7841 12003.050 24000,000 1.214 -2-130 RBA 12002.251 20000.102 1000.558 12000.000 20000.000 1000.000 -2.251 0,102 -0.558 8941 12001.440 12000.000 16000.000 1000.000 -1.440 -1.577 0.732 STD ERRS FOR THE MODEL. BIG X = 2.334 M SIG Y * 0.937 N SIG Z = 1.233 SIG PLAN # 2.515 S10 POS = 2,801

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MDDEL NO 80405 7843 8843 8941 23998.785 1002.130 12000.000 24000,000 1000.000 -3,050 1.214 2.130 12003.050 12002,251 2001,440 16001,330 20000.102 20000,000 1000.000 -2,251 -0.102 -0.558 0.732 -1.443 0.518 12000.000 999.267 1001.443 1000,000 -1.440 -1.577 16001.577 12000.000 15000.000 7851 23999.150 16000.000 24000.000 0.849 0251 16002 023 19:199.906 999.481 15000.000 20000 000 1000.000 -2 092 0.093 16002.111 -2,111 -0,728 1.942 8951 16000.728 998.057 16000.000 16000.000 1000.000 1.517 SIC FLAN = 2.539 SIG POS = 2.958 STO FRRS FOR THE MODEL SIG X = 2.324 M S10 Y = 1.0P3 M SIG Z = MODEL NO ROSOS 7851 16001,330 1001.443 999.481 -1.330 0.849 -1.443 23999.150 16000.000 24000.000 1000.000 8851. 16002.082 19999.906 16000.000 20000.000 1000.000 0.093 0.518 8951 7861 16002.111 998.057 15000.000 16000.000 1000.000 -2.111 -0.728 -0.081 -2.304 -0.466 20001.005 23998.904 1000.081 20000-000 24000,000 1000.000 8861 20001,226 19999,822 1002.304 20000.000 20000.000 1000.000 -1.226 0,177 8961 20001.649 16002.279 1000.465 20000.000 16000.000 1000.000 -1.643 -2.279 2,167 SIG POS * STD ERRS FOR THE MODEL SIG X = 1.777 M STO V # 1.840 M STO 7 = 1 525 STG PLAN = B-651 MODEL ND 80607 7861 20001.005 23998.904 1000-081 2000.0005 24000+000 1000.000 -1.005 1.095 -0.081 8261 20001.226 1002.304 20000.000 1000.000 0,177 ~1.226 8961 20001.649 16002.279 20000.000 16000.000 1000.000 -1.649 1.717 2.231 -2.279 -0,466 23998.282 23998.340 1002.695 1,659 7871 84000.000 24000.000 1000.000 20000.000 -1.576 887 24000.000 1000.000 8971 23998.279 16002 314 999.699 24000.000 16000.000 1000.000 1.720 -2.314 0.300 STO ERRS FOR THE MODEL SIG X = 1.795 M BIG Y = 1.706 M SIG Z = 1.753 SIC PLAN = 2.477 SIG POS = 3.035 MODEL NO 80708 7871 23998.282 24000-000 1.659 23998, 340 1002.695 24000.000 1000,000 1.717 -2.695 23997.768 20000.166 16002.314 23999.097 19999.460 1001.576 24000,000 2.231 1.720 3.419 2.714 -0.166 -1.576 8871 20000.000 1000.000 16000,000 8971 1000.000 7881 999.791 24000.000 0.208 27995.580 28000.000 1000.000 0.902 27997,285 28000-000 1000.000 0 639 8981 27998.497 16000.684 998.086 28000.000 16000-000 1000.000 1.502 -0.684 1,913 STO ERRS FOR THE MODEL. SIG X = 2.535 M S16 Y = 1.393 M SIG Z = 1.814 BIC PLAN * 2.895 SIG PCS = 3,417 MODEL NO 80809 7881 27596,580 23999.097 999.791 28000.000 24000.000 1000,000 3.419 0.572 0 202 8981 27997.285 19999,450 998.289 998.086 28000.000 20000.000 1000.000 2.714 0. 19 1.710 27998,497 28000,000 16000.000 1000.000 1.913 7891 23998.935 1001.839 32000.000 24000.000 1000.000 2,245 9891 31997,805 19999, 335 1002.194 37000.000 8 200,000 1000.000 2.194 0.664 -2.194 16001.338 8991 31996.516 1001.698 95000°0008E 16000-000 1000.000 -1,339 -1.692 STO FRRS FOR THE MODEL SIG X = 2.943 M SIG Y # 0.994 M SIG Z # 1,880 SIG PLAN = 3.106 SIG POE = 3,631

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MODEL NO 80910			
7891 31997,754 23998.935	1001.835 32000.000 24000.000	1000.000 2.249	
8891 31997.805 19999.335	1002,194 32000.000 20000.000	1000.000 2.194	
8991 31995.516 16001.338	1001.692 32000.000 16000.000	1000.000 3.483	
78101 35996.533 23998.063	1004.551 35000.000 24000.000	1000.000 3.466	1.936 -4.551 0.730 -3.146
88101 #5.997 19993.259 89101	1003.146 26000.000 20000.000 1000.556 36000.000 16000.000	1000.000 3.00E 1000.000 2.854	-0.090 -0.556
89101 33.97.145 16000.090	1000.555 36000.000 16000.000	1000.000 2.854	-0.030 -0.208
STD ERRS FOR THE MODEL SIG X =	3.199 M BIG Y = 1.297 M SIG Z	= 2.897 SIG PLAN =	3.430 SIG POS = 4.490
are which for the block of a	51155 14 616 1 - 11251 (4 616 2		
MODEL NO 81011			
78101 35996.533 23998.063	1004.551 36000.000 24000.00.	1000.000 3.465	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 78111 39997.238 23999.906	1000.555 36000.000 16000.000	1000.000 2.854	-0.630 -0.555 0.093 -1.423
78111 39997.238 23999.906 88111 39997.573 19999.156	1001.423 40000.000 24000.000 1002.325 40000.000 20000.000	1000.000 2.761 1000.000 2.426	0.093 -1.423 0.843 -2.325
89111 39998,471 15998,974	998.928 40000.000 16000.000	1000.000 1.528	1.025 1.071
25111 25550(4)1 1555015/4	3741 Sen 400001000 100001000	1000.000 71000	1.04.0
STO ERRS FOR THE MODEL SIG X .	3.000 M SIG Y # 1.101 M SIG 7	= 2.810 SIG PLAN =	3.196 SIG POS = 4.256
MODEL NO 81112			
78111 39997.238 23999.906 88111 39997.573 19999.156	1001.423 4000.000 24000.000	1000.000 2.761	0.093 -1.423
88111 39997.573 19999.156 89111 39998.471 15998.974	1002.325 40000.000 20000.000 998.928 40000.000 16000.000	1000.000 2.426	0.843 -2.325
78121 43998.194 23998.366	1004,550 44000,000 24000,000	1000,000 1.528	1.025 1.071
88121 43398.868 19999.403	1004,903 44000,000 20000,000	1000.000 1.131	0.596 -4.803
89121 44000.055 15999.306	1000.553 44000.000 16000.000	1000.000 -0.055	0.093 -0.559
		10001110 01033	01000 01000
STO ERRS FOR THE MODEL. SIG X =	2.019 M SIG Y = 0.980 M SIG Z	= 3.249 SIC PLAN =	2.244 SIG POS = 3.948
MODEL NO 812:3			
78121 43998,194 23998,365	1004.560 1000.000 24000.000		
28121 43998.863 19999.403	1004.500 1000.000 24000.000	1000.000 1.805	1.634 -4.56C 0.596 -4.803
89121 44000.055 15999.906	1000,559 44000.000 16000.000	1000.000 -0.055	0,596 -4.803 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 -1,571	-0.785 -0.877
STD ERRS FOR THE MODEL SIG X =	1.161 M BIG Y = 0.927 M SIG Z	= 4.111 BIG PLAN =	1.486 SIG POS # 4.371
MODEL NO 81314			
NOVET NO 91314			
78131 47998.633 23929.217	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	0.782 -4.844 0.182 -4.01P
89331 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	C. 502 -3. 964
89141 52061.808 15999.764	1000.980 55000.000 16000.000	1000,000 -1.808	0.235 -0.980
STO FRRS FOR THE MODEL SIG X =	1.073 M BIG Y = 0,623 M BIG Z	 3.822 SIG PLAN × 	1.241 SIG POS = 4,019

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-4.006 0.015 0.515 78141 51999.984 23999, 484 19999, 397 1004.005 \$2000.000 24000.000 1000,000 -3.964 1003.964 52000.000 20000.000 1000.000 -0.537 0.602 88141 2000.537 1000.980 1000.000 89141 52001.808 15999.764 52000.000 16000.000 SE000.000 24000,000 1000.000 -1.397 0.587 -0,992 78151 56001.397 23999.418 0.23 00151 56001.675 19999.327 1000, 930 55000 000 20000.000 1000.000 -1.675 56001,944 56000.000 16000.000 1000,000 -1.944 0.233 6.5 89151 15999.766 999, 173 1.651 816 POS * STO FREE FOR THE MODEL STO Y = 1 655 M BIC Y = 0.554 M STG 7 = 2.655 BIG PLAN = 3.127 MODEL NO 81516 -0.992 -0.930 0.826 78151 56001.397 23999.412 19999.327 1000.992 56000,000 24000.000 1000,000 -1.397 0.587 56001.675 56000.000 20000,000 1000.000 -1.675 0.672 88151 56001.944 60000.992 999.173 999.460 1000.000 -1.944 0.233 89151 15999.766 56000.000 16000.000 0.539 60000.000 24000.000 78161 24000.330 88161 60001.699 20000.688 1000.393 60000.000 20000.000 1000.000 -1.699 -0.688 -0.393 2.265 89161 60002.028 15001 138 997 734 60000.000 16000.000 1000.000 -2.078 -1.138 1 977 510 208 -STD ERRS FOR THE MODEL SIG X = 1.829 M SIG Y = 0.738 M SIG 7 = 1.273 SIG PLAN -2 345 MODEL NO BIGIT 78161 60000.992 24000.330 993.460 1000.393 997.734 60000.000 24000.000 1000.000 -0.992 -0,330 0.539 88161 60001.699 20000.698 50000-000 20000.000 1000.000 -1.699 -2.078 -0.688 89161 60000,000 -1.138 2.265 16001.138 1002,118 1000,499 64000.000 64000.000 0.424 -2.118 78171 63399.575 23998.957 24000.000 1000.000 1,042 20000.000 -0.951 63999.956 20000.951 1000.000 -0,499 88171 89171 64000.730 16002.749 998.267 64000.000 16000.000 1000,000 -0.730 1,732 STO JERS FOR THE MODEL SIG X = 1.334 % SIG Y = 1,511 H SIG Z = 1.632 SIG FLAN + 2.016 SIG POG = 2,594 MCOSI, NO 81718 64000.000 64000.000 1000.000 79272 63999.575 23998.957 1002.118 24000.000 0.424 1.042 -2.118 8817 20000.951 1000.499 1000.000 0.043 -0.951 -0.499 63999.956 20000,000 64000.000 89171 16000.000 72181 67997.962 23399.621 999.703 68000.000 24000.000 1000.000 2.037 0.378 0.296 8518 67998, 906 20001.034 1001.219 68000,000 1000.000 1.093 -1.034 -1.219 89181 67999.137 999.056 68000,000 16000.000 1000.000 0,862 -3.019 0.343 STD ERRS FOR THE MODEL SIG X = 1.165 M 516 Y # 1.993 M SIC 2 = 1.373 BIG PLAN . 2.310 516 205 = 2-687 MONT NO 81919 70101 67997.962 23999.621 999.703 £8000 000 24000 000 1000 000 2,037 0.378 0.296 67998.906 20001.034 1001,219 68000.000 20000,000 1000.000 88181 1.093 -1.034 -1.219 39181 67999.137 16003.019 999.656 68000.000 16000.000 1000.000 0.862 -3.019 0.343 72000,000 24000.102 399.773 24000,000 1000,000 -0.102 78191 0.226 20000.531 1001.138 72000.000 20000.000 1000.000 2.368 88191 71997.631 -1-139 89191 71997.136 16000 870 997.615 72000.000 16000.000 1000.000 2.863 -0.870 2.384 2.101 M BIG Y = STO ERRS FOR THE MODEL. BIG & . 1.509 M SIG 7 = 1.320 SIG PLAN # 2.587 SIG POB = 2 904

MODEL NO 81415

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	MODEL NO 8:	920													
78191 88191 89191 78201 88201 89201	71998.526 71997.63J 71997.136 75997.886 75998.149	24000, 102 20000, 539 16000, 870 24001, 592 19399, 982	999.779 1001.138 997.615 997.539 998.315	72000 72000 72000 76000 76000	000	200 160 240 200	100.000 100.000 100.000	- 	1000.000 1000.000 1000.000 1000.000	2. 2. 2.	473 368 863 113 850	-0. -0. -1. 0.	102 539 870 992 017	-1. 2. 2.	384 140 584
	75997.999	16000.236	997.328	76000			00.000		1000.000		000		236		571
	FOR THE MODE		2.361 M	SIC Y =	1.0	M 804	SIG 2	-	2.077	SIC PLAN		2,567	SIC	P05 =	3, 303
	MODEL NO 82	15021													
78201 88201 89201 78211 88211 89211	75997.886 75998.149 75997.999 80002.318 80000.141 79998.257	24001.992 19999.982 16000.236 23999.522 19998.139 15999.629	997.859 998.315 997.328 1000.357 1001.173 1000.698	76000 76000 76000 80000 80000 80000	-000 -000 -000	200 160 240 200	00.00	>	1000.000 1000.000 1000.000 1000.000 1000.000	1	113 850 310 214 70	0. -0. 0. 1.	992 017 236 477 860 370	1.	173
STD ERRS	FOR THE MODE	L SIC X =	2.016 M	SIG Y =	1.2	53 M	SIC :	-	1.819	SIC PLAN		2.374	816	POS =	2,990
STD ERRS	FOR THE STR	P SIG X =	1.903 M	SIC Y =	1.1	36 M	51G 3	-	S. 060	SIG PLAN		2.216	516	POS =	3.026
	MODEL NO 90	50102													
8911 9911 91011 8921 9321 9321	4.883 0.094 -3.134 4003.570 3993.491 3995.046	16004, 995 12005, 354 8006, 048 15998, 431 12000, 635 8002, 090	999, 989 998, 832 998, 257 1000, 401 999, 766 999, 337	ō	,000	120 80 160 120	00.000		1000.000 1000.000 1000.000 1000.000 1000.000	-0. 3. -3. 0.	094 134	-0.	354 048 568	1. -0. 0.	010 167 742 901 233 562
STD ERRS	FOR THE MODE	L SIG X =	3.774 M	SIG Y =	4.4	14 M	816 J	-	1.005	SIG PLAN		5.808	516	P05 =	5.894
	MODEL NO 90	203													
8921 9921 91021 8931 9931 91031	4003.570 3999.491 3995.046 7999.415 7999.455 7999.097	15998, 431 12000, 636 8002, 090 15993, 492 11994, 620 7995, 862	1000.401 999.766 999.237 997.620 993.858 993.858	4000 4000 8000 8000 8000 8000	.000 .000 .000	120 80 160 120	00,000 00,000 00,000 00,000 00,000		1000.000 1000.000 1000.000 1000.000 1000.000	0. 4. 0.	570 508 953 584 584 544 902	-0. -2. 6.		0.1 0.1 2.1	233 62 379 41
STD ERRS	FOR THE MODE	L SIC X *	2.792 M	SIG Y #	4.3	173 M	SIG 2	*	1.126	BIG PLAN		5.189	SIC	POS ×	5.309
	MODEL NO 90	304													
8931 9931 91031 8941 9941 91041	7999.415 7999.455 7999.097 11994.837 11999.679 12003.883	15993, 492 11994, 620 7995, 862 15998, 778 11997, 435 7998, 569	997.620 979.858 999.938 993.831 997.622 999.086	8000 8000 12000 12000 12000	000	120 80 160 120	00,000 00,000 00,000 00,000 00,000		1000.000 1000.000 1000.000 1000.000 1000.000 1000.000	0. 0. 5.	584 544 902 162 320 889	5. 4. 1.	507 979 137 221 564 430	2.1 0.0 5.1 2.1	41 61 08 377

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SYD ERRS FOR THE MODEL, SIG X -STG POS = 6.186 2.943 M SIG Y = 4,438 M SIG Z = 3.146 SIG PLAN # 5.326 NDOEL NO 90405 8941 11994.837 15998.778 993.891 12000.000 16000.000 5.162 1.221 6.108 2.377 0.913 1000.000 9941 91041 11999.679 11997.435 997.622 12000.000 1000,000 2.564 12003.883 7998.569 999.085 12000 000 8000.000 1000.000 -3,889 8951 15997.754 15998.610 998.418 16000.000 16000,000 1000.000 2.245 1.581 -1.551 9951 15999 797 12000, 325 1001.551 16000.000 12000.000 1000.000 0.202 -0.326 -0.803 91051 16001.552 8001.748 16000.000 8000.000 1000.000 -1,552 ~1.748 STD ERRS FOR THE MODEL SIG X = 3.142 M SIG Y = 3.593 916 205 -1.743 M SIG Z = 3.141 SIG PLAN = 4 773 MODEL NO 90506 15997.754 8951 15998.610 12000.326 8001.748 1.389 -0.326 -1.748 998.418 16000.000 16000.000 1000.000 2,245 1,591 9951 1001.551 -1.551 15000 000 12000 000 1000 000 0 505 91051 16001.552 1000,803 16000.000 8000.000 1000.000 -1.552 -0.803 19997 978 -1.266 8951 16001 255 997.358 1000.586 20000.000 16000.000 1000.000 2.121 D 641 9951 19998.628 12002.023 20000.000 12000.000 1000.000 -0, 586 91061 20000.021 8003.923 1001.191 20000.000 8000.000 1000.000 -0.021 -3.923 -1.194 STO ERRS FOR THE MODEL, SIG X = 1.665 M SIC Y = 2.288 M SIG Z = 1,690 BIG PLAN -2,830 SIG POS = 3.297 MODEL NO 90607 2961 9961 19997.878 16001.266 397, 358 2000.000 16000.000 1000.000 2.121 2,641 -1.266 19098 6.72 12002.023 1000.586 20000.000 12000;000 1000.000 1.371 -2.023 --3.923 -0.559 0.586 91061 20000.021 8003.923 1001.191 20000.000 8000,000 -0.021 -1.191 8971 23999.192 16000.559 998.828 24000,000 16000.000 1000.000 1001.605 0.871 -2,563 9971 23999.128 12002.563 12000-000 1000-000 -1.605 23999.045 8003.995 1002,155 24000.000 8000.000 1000.000 91071 -2.155 SYD ERRS FOR THE MODEL SIG X = 1.319 M SIG Y = 2.964 M SIG Z = 1.862 STC PLAN = 2.244 BIG POS * 3,741 MODEL NO 90708 8971 22990 192 16000 659 000 000 24000.000 16000 000 1000.000 0.807 -0,559 1.171 9971 23999.128 12002.563 1001.605 24000.000 12000.000 1003-000 0.871 -2.563 -3.995 -1.900 ~1.605 91071 23999.045 8003, 995 1002.155 24000.000 8000.000 1000.000 8981 27998.987 16001,900 999.168 1002.347 28000.000 15000.000 1000.000 1.012 0.83 9981 12002,106 28000.000 0.752 27999.247 12000.000 1000.000 -2,106 -2 347 910R1 2799R, 364 8003.465 1002-263 000.000 8000.000 1000 000 1.635 -2-263 STD ERRS FOR THE MODEL SIG X = 1.148 M SIG Y = 2.929 M SIG Z = 1,996 BIG 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 8003.465 100h.347 1002.263 28000.000 12000.000 1000.000 0.752 91081 27998.364 ~3,465 1000.000 -8.263 8991 32001.091 16002.345 999.423 32000.000 16000.000 1000.000 -1.091 0.576 32000.039 12002.489 1000.189 3991 32000.000 12000.000 1000.000 -0.039 -2.489 \$1091 31999.697 8000.855 998, 440 32000.000 8000.000 1000.000 0.302 -0.855 1.55

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2.758 SIG POS # STD ERRS FOR THE MODEL SIG X = 1,053 M BIG Y = 2.549 M SIG Z * 1.630 BIG PLAN = 2 220 MODEL ND 90910 16002.345 -2.345 -2.489 -0.855 0.576 8991 32001.091 999.423 32000.000 16000.000 1000.000 -1.091 9991 1000.189 998.440 999.704 1000.000 -0.039 -0.189 1.559 0.295 32000.039 35000.000 12000.000 31999.697 8000.855 8000.000 32000.000 89101 36001.728 16001, 362 35000.000 16000,000 1000.000 -1.728 -1.362 -2.958 99101 36002,705 1002.958 36400,000 12000.000 1000.000 -2.705 -1.600 36002.183 8002.036 1002.290 8000.000 1000.000 -2.036 -2.290 910101 36000.000 -2.183 2,733 SIG POS # 3.293 STD ERRS FOR THE MODEL SIG X = 1.808 M SIC Y = 2.049 M SIC Z = 1.837 SIG PLAN = MODEL NO 91011 16001.362 89103 36001.728 999.704 1002.958 1002.290 36000.000 16000.000 1000 000 -1.728 -2.705 -2.183 -3.379 -1.362 0.295 -1.600 -2.958 99101 36002.705 36000.000 12000.000 1000.000 910101 36002.183 8002.036 36000.000 8000.000 1000.000 89111 40003.379 16001.162 1000.760 16000.000 -1,162 -0.760 83111 40002.084 12000.604 1003.772 40000.000 12000.000 1000.000 -2.084 -0.604 -3.772 40001.350 1003.869 -1.360 910111 8001.958 8000.000 -1.95 -3.869 40000.000 1000.000 STO FRAS FOR THE MODEL SIG X = 2.556 M 916 V = 1.579 M SIG 7 # 2.962 SIG PLAN = 3.058 SIG PDS = 4,257 NODEL ND 91112 89113 40003-379 16001.162 1000.760 40000.000 16000.000 1000.000 -3.379 -1.162 -0.760 12000.604 40000.000 12000.000 1000.000 -2.084 -1.360 -2.596 -0.604 -3.772 99111 40002.084 910111 40001.360 1003.869 8000.000 891.21 44002.595 15999.214 1001-845 44000.000 16000.000 1000.000 0,785 -1.845 99121 44002.005 12000.769 1002.440 44000.000 12000.000 1000.000 -2.006 -0.769 -2.440 910121 44001-295 8000.40 1000.810 44000.000 8000.000 1000.000 -1.295 -0.810 STD ERRS FOR THE MODEL SIG X = 2,452 M BIC Y # 1,175 M SIG Z = 2,821 SIG PLAN = 2.719 SIG POS = 3.918 MODEL NO 91213 0.785 89121 44002.59F 15999.214 1001.845 44000,000 16000,000 1000.000 -2.595 -1.845 -2.440 -0.810 1002.440 44000.000 99121 44002.005 12000.765 12000.000 1000.000 -2.006 44001.295 -1.295 910121 8000.40 8000.000 1000.000 -0 407 89131 48000.977 15997.584 1000.568 48000.000 16000.000 1000.000 -0.977 2,415 ~0.568 99131 48000 490 12000 222 1001,405 48000 000 12000.000 1000 000 +D. 490 ~0.237 -1.405 48000-225 8000.835 1001.269 48000.000 2000.000 -0,225 910131 1000.000 -0.835 -1.269 STO ERRS FOR THE MODEL SIG X = 1.655 M SIC Y * 1.261 M 81G 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 -0,490 2,415 -0.568 991 31 4800D.490 1001.405 48000.000 12000.000 1000.000 -0.227 -1.405 910121 49000.225 8000 935 1001.269 48000,000 9000 000 1000,000 -0,225 89341 51999.548 15997, 594 16000.000 0.451 2.405 -0.098 99141 51999.332 12000.324 1000.210 52000.000 12000.000 1000.000 0.667 51998.654 9:0141 8000.000

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1.865 316 POS = 2,107 UTD ERRS FOR THE MODEL BIG X = 0.861 M SIC Y -1.657 M SIC Z # 0.974 BIC PLAN = MODEL ND 91415 89143 51999, 548 15997.594 1000.085 52000.000 15000.000 1000.000 0.451 0.667 1.345 2.180 2.405 -0.028 99141 51999, 338 12000.324 1000.210 52000.000 12000.000 -0.210 0.898 1.222 -1.127 910141 8001.127 999.111 998.777 52000 000 8000 000 1000.000 55997 820 15998.860 56000.000 8915 16000.000 1000.000 -0.596 99161 EEG-66 TOD 12000 066 1000.596 56000.000 12000-000 1000.000 1.697 -0.045 -0.696 910151 55948.885 8001,564 -1,564 1000.696 55000 000 8000 000 1000 000 1 114 STO ERRS FOR THE MODEL SIG X = 1 505 M 816 Y -1 477 M 910 7 # 0.705 810 8 61 -2.109 SIG POS = 2.254 MODEL ND 91516 55997.820 55998.302 15998.860 998.777 1000.596 1,139 1.222 89151 \$6000.000 16000.000 1000,000 2.180 1.222 -0.596 -0.696 2.178 0.330 56000,000 99151 1.697 12000.000 1000 000 910151 1000.000 -1.564 55998.885 8001.564 1000.595 56000.000 8000.000 99161 50097 071 16999 227 997 9.21 60000.000 16000.000 1000.000 2.028 99161 59999.008 12000,406 399.669 60000.000 15000.000 1000.000 -0.405 910161 59998.017 7999, 744 399,498 60000.000 8000.000 1000.000 0.255 0.501 1,986 STO ERRS FOR THE MODEL SIG X = 1.893 M SIG Y = 0.954 M SIC 7 = 1.220 SIG PLAN = 2,120 SIG POS # 2.445 MODEL NO 91617 89161 59997.971 15979-237 997,821 60000.000 16000.000 1000.000 2.028 0.762 -0.405 0.255 2.178 99161 59999.008 12000.405 999.669 999.498 1000.716 60000.000 12000.000 1000.000 0.991 0.330 910161 59998.013 60000,000 2000.000 1000.000 0.501 89171 63997.877 15998.562 64000-000 16000.000 1000.000 1.437 11999.746 -1.515 99171 67999.548 1001.515 12000.000 1000.000 0.457 0.253 64000,098 8001,066 1000.836 64000.000 910171 8000.000 1000.000 -0.092 -1.066 STO ERRS FOR THE MODEL SIG X = 1.659 M SIG Y = 0.903 M SIC Z = 1.312 SIG PLAN = 1.889 SIG POS = 2,300 MODEL NO 91718 15998.562 89171 63997.877 1000.716 64000.000 16000.000 1000.000 2,122 0,457 -0,092 0,541 1.437 -0.716 64000.000 99171 63999.548 11999.746 1001.515 12000.000 1000.000 -1.515 910171 6A000-05E 8001.066 1000.836 999.341 1000.962 8000.000 1000.000 -1.066 -0.836 \$7999.458 68000.000 \$9181 16000.000 1000.000 0.658 99181 67999-331 11999.384 69000 000 12000 000 1000.000 J. 668 0.615 910181 1000.962 68000.139 7999.880 68000.000 8000.000 1000 000 -0 179 0.119 -0.676 STO FREE EOR THE MODEL BLC Y # 1,047 M SIG Y = 0,955 M SIG Z = 1.082 SIG PLAN = 1.417 SIG POS -1.753 MODEL NO 91819 \$2181 67939,458 15999.052 999.341 1000.968 68000.000 16000.000 1000.000 0.541 0.698 -0.962 -0.676 0.947 99181 67599.331 11999.384 12000.000 0.615 68000.139 72001.309 7995.880 1000.676 8000.000 -0.133 -1.309 -1.648 910181 68000.000 1000.000 72000.000 8919: 1000 000 -1,083 2.804 00101 72001.648 11999.763 997.765 72000.000 12000.000 1000.000 0.236 2.172 910191 72001-896 7997.657 72000 000 8000 000 1000.000 2, 342 -1.896 2.234

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1.333 BIG POS = 2.690 STO FREE FOR THE MODEL SIG X = 1 326 M S16 V = 1.265 M SIC 7 = 1.969 SIC PLAN = MODEL NO 91920 2.804 39191 72001+309 16001.083 997.195 72000.000 16000.000 1000.000 -1.309 -1.083 2.172 0.236 997.827 997.765 72000.000 12000.000 99191 72001.648 2,342 910191 7397.657 72000.000 8000.000 1000.000 -1.896 -1.148 -2.766 72001.896 -2.513 15997.739 89201 76001.148 1002.513 76000.000 16000.000 1000-000 1004.296 76000 000 12000.000 0.261 -4,296 99201 760.02.766 1000.000 -3.033 910201 76003.689 8001.346 1003.033 76000.000 8000.000 1000,000 -3.689 -1,346 2,977 516 POS * 4,378 STD ERRS FOR THE MODEL SIG X = 2.474 M SIG Y = 1.655 M SIG Z = 3.211 BIG PLAN = MODEL ND 92021 89201 76001.148 15997.739 1002.517 76000.000 16000.000 1000.000 -1.148 5.560 -2.513 99201 76002.766 11999.738 1004.298 76000.000 12000.000 1000,000 -2.766 0.261 -4.296 910201 76003.689 8001.346 1003.033 999.569 998.373 75000.000 8000.000 1000.000 16000.000 0.304 1.610 89211 79999.699 80000.000 1000.000 0.430 1.626 20211 80000.911 12000 619 80000-000 12000.000 1000.000 1000.000 8001.354 80000.000 8000.000 -1.561 -1.354 1.950 910211 80001.661 99B.049 2.292 M SIG Y = 2.849 SIG PLAN = 2.759 SIG POS = 3,966 STD ERRS FOR THE MODEL. SIG X . 1.535 M SIG Z = 1.903 SIG PLAN # 2.930 SIG POS = 3,494 STO FRAS FOR THE STRIP STG I = 1.941 M BIG Y * 2.195 M SIG Z = MODEL NO 100102 6.753 -3.462 -3.242 91011 -3,599 7999.246 1003.462 0.000 8000.000 1000-000 3.599 3998,201 0.000 2.818 101011 -2.818 1002 242 4000.000 1000-000 101111 4.875 998.771 0.000 0,000 1000.000 1.275 4.875 1.228 -1.279 91021 3997.815 8000.155 4000 000 1000.000 2.184 -0.155 0.179 0.467 3999, 532 1001.537 4000.000 4000.000 1000,000 0.349 -1.537 101021 3999.650 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 = 2.323 SIG PLAN * 3.404 SIG POS = 4.128 MODEL NO 100203 91021 3997.815 8000.155 999.820 4000.000 8000.000 1000.000 2, 184 -0.155 0.179 3999.532 1001.537 1000.768 996.532 4000.000 0.349 -1.537 101021 3999.650 4000.000 1000.000 0.467 1000.000 1.144 101121 4001-187 -1.144 0.000 91031 7999.345 8000.137 4000.067 8000,000 B000.000 1000.000 0.654 3.467 101031 7999.417 999.210 8000.000 1000.000 0.585 -0.067 0.789 8000.000 1000.000 101131 7999, 954 0.739 999,958 0.000 0.045 -0.739 0_047 STD ERRS FOR THE MODEL. SIG X = 1.189 M BIC Y = 0.651 M SIG 7 = 1.768 SIG PLAN = 1.356 SIG PDS = 2.228 MEDEL NO. 100304 7999,345 8000.137 4000.067 0.739 8001.424 8000.000 8000.000 91031 998.532 1000.000 0.654 -0,137 3.467 101031 999.210 999.952 996.978 3000.000 4000,000 1000,000 7999.417 -0.067 0.789 8000.000 101131 7999.954 0.000 1000.000 0.045 12000.000 8000,000 11999.219 1000.000 -1.424 91041 0.780 3.021 101047 4000.942 997.794 12000.000 4000,000 1000.000 11998 907 1.095 2,205

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101141	12000.302	0.551	998,291	2,2000	0.000	0	.000	1000-000	-0,305		551		708
STD ERRS	FOR THE MODEL	SIG X =	0.731 M	SIG Y =	0.871	M S	1G Z =	2.431	SIG PLAN +	1.137	516	P06 =	2.684
	MODEL NO 100	405											
91091	11399.219	8001.424	396.978	1200	0.000	8000	.000	1000.000	0,780	-1.	424	Э.(
101041	11998.303	4000, 942	997.794	12000		4002		1000.000			942	2.1	
101141	12000.302	0,551	998,291	12000	0.000	o	.000	1000,000			551		708
91051	15999.617	8001.703	997.900	16000	0.000	8000	,000	1000.000			703	a.e	
101051	15998.754	4001.109	1000,899		0.000	4000		1000.000			109	-0.1	
101151	15998.732	2.374	1000.553	16000	0.000	a	•000	1000.000	1.267		374	-0.1	
STD ERRS	FOR THE MODEL	514 X =	1.020 M	516 Y =	1.612	M S	10 7 =	2,118	SIG PLAN =	1,907	SIG	P05 =	2.850
	MODEL NO 100	506											
91051	15999.617	1,001.70.	997.900		000.0	8000		1000.000			703		099
101051	15998-754	4-001.109	1000.899		0.000	4000		1000.000			109	-0.1	
101151	15998.732	2.374	1000.553		0.000		- 900	1000.000			374	-0.1	
91051	322.0006	8001.623	1000.290	20000		8000		1000.000			623	-0.1	
101061	19999.542	4001+566	1000.326	2000		4000		1000.000			566	-0.	
101161	19999.024	1.472	997.251	2000	0.000	c	.000	1000.000	0.975	-1.	472	5.	748
STD ERRS	FOR THE MODEL	SIC X =	0.955 M	SIG Y =	1,845	6 M S	1C Z =	1.671	916 PLAN =	2.078	516	P08 =	2.667
	MODEL NO 100	607											
91661	20000.322	8001.623	1000,890	2000	0.000	8000	,000	1000.000	-0.322	-1.	623	-0.1	890
101061	19999.542	4001.566	1000.326	20004		4000		1000.000			566	-0.1	
101161	19999,024	1,472	997.251	2000			.000	1000.000			472	5.	
91071	23998.295	8000.395	1004.520	2400		8000		1000,000			395	-4.	
101071	23999.457	4001.419	1001.820	2400		4000		1000,000			419	-1.1	
101171	23999.953	2.768	997.400	24000	0.000	0	. 000	1000.000	0.046	-10.	768	2.	599
STD ERRS	FOR THE MODEL	⊲IC X =	0.945 M	SIC Y =	1.849	M S	1G Z =	2,791	SIG PLAN =	2.075	BIC	P05 =	3,479
	MODEL NO 100	708											
91071	23998,295	8000, 395	1004.520	2400	000.0	8000	.000	1000.000	1.704	~0.	395	-4-	520
101071	23999.457	4001.419	1001.820	24000		4000	.000	1000.000	0,542	-1.	419	-1.1	820
101171	23999.953	2.768	997.400	24000			. 000	1000.000		-2,	768	2,	599
91081	27997.820	8002.712	1000.095	28000		8000		1000.000		-2,	712	~0.	095
101081	27999.787	4001.163	1001.932	28000		4000		1000-000			163	-1_1	
101181	28001.637	0.430	1000.215	28000	3,000	a	.000	1000,000	-1.637	-0.	430	-0.1	216
STD ERRS	FOR THE MODEL	SIG X =	1.461 M	SIG Y #	1,935	im S	IG Z #	2.619	SIG PLAN =	2.425	\$16	POS ×	3.569
	MODEL ND 100	809											
91081	27997.820	8002.712	1000.095	28000	000,0	8000	,000	1000.000	2.179	-2.	512	-0.	nar
101081	27999.787	4001.163	1001.932	58000		4000		1000.000			163	-1.	
101181	28001.637	0.430	1000.215	28004			.000	1000.000	~1.637		430	-0.	
91091	35000, 352	8060.609	1004.281	35000		8000		1000.000		-0.	609	-4	
101091	32000, 764	4000.369	1007.209	35000	000	4000	.000	1000.000	-0.764	-0,	969	-7.	209

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101191 32000.722	1.823	1005.872	35000.000	0.000	1000.000 -0.722	-1.823 -5.872
STD ERRS FOR THE MOD	DEL BIG X ⊨	1.318 M	BIG Y = 1.545	M SIG Z =	4.660 SIG PLAN =	2.108 SIG POS = 5.114
, MODEL NO 1	100910					
91091 32000.325	8000.609	1004.261	32000.000	8000.000	1000.000 -0.925	
101091 32000.764 101191 32000.722	4000.969	1007.209	32000.000	4000.000	1000,000 -0.764	-0.969 -7.209
910101 36000-840	7999.808	1007.862	35000.000	8000.000	1000.000 -0.840	
10105 35000.269	4000.871	1007.680	35000,000	4000.000	1000.000 -0.863	-0.871 -7.680
STO ERRS FOR THE MOD)EL BIG X =	1.254 M	BIC Y = 1.541	3 M SIG 2 =	7.318 SIG PLAN =	1.992 SIG POS = 7.584
MODEL NO 1	101011					
910101 35000.840 10105 35000.859	7999.808	1007.862	36000.000	8000.000	1000.000 -0.840	0.191 -7.862 -0.871 -7.680
11105 36002,273	4000.871	1007.680	36000.000	4000.000	1000.000 -2.279	-2,559 -6,494
910111 40001.269	8000.121	1005.307	40000.000	8000.000	1000.025 -1.269	-0.121 -5.307
10115 40003.907	4001.460	1006.319	40000.000	4000.000	1000,000 -1.907	-1.460 -6.319 -2.447 -5.614
11115 40001.626	2.447	1005.614	40000.000	0.000	1000.000 -1.62%	-2.447 -5.614
STD ERRS FOR THE MOD	NEL SIG X #	1.706 M	SIG Y = 1.759	M SIG Z =	7.247 BIG PLAN =	2.451 SIG POS = 7.650
MODEL NO 5	01115					
910111 40001.269	8000.121	1005.307	40000.000	8000.000	1000.000 -1.269	-0.121 -5.307
10115 40001.907 11115 40001.626	4001.460	1005.319	40000.000	4000,000	1000.000 -1.907	-1.460 -5.319 -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	4001.252	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 ~6.67B
STO ERRS FOR THE MOD	DEL SIO X =	1.869 M	SIG Y = 3.178	2 M SIG Z =	6.752 SIG PLAN =	2.866 SIG POS = 7.335
MODEL NO 1	01213					
910121 44000.812	7999,421	1005,835	44000.000	8000.000	1000.000 ~0.812	
10125 44001.778 11125 44002.401	4001.252	1007-045	44000,000	4000,000	1000.000 -1.778	-1.262 -7.046
910131 48001.223	7998,890	1004,788	48000.000	8000.000	1000.000 -1.223	-3.677 -6.678 1.109 -4.788
10125 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
STO ERRS FOR THE MOD	XEL SIG X =	1,499 M	91C Y = 2.613	M SIG Z =	7.141 SIG PLAN =	3.012 SIG POS = 7.750
MODEL NO 1	01314					
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 910141 51998.724	3.927 7999.300	1006.936	48000.000	0.000	1000.000 0.112 1000.000 2.275	-3.887 -6.936 0.639 -1.591
10145 51999.089	4001.197	1003.944	52000,000	4000.000	1000.000 0.910	-1.197 -3.944

4 0,000 1000.000 0.742 -3.331 -3.256 11145 \$1999.257 3, 331 1003.256 52000.000 2.697 SIG POS * 6,192 STO SERR FOR THE MODEL, SIG X = 0.964 M SIG Y * 2.518 M SIG Z * 5.574 SIG PLAN # MODEL NO. 101415 -1.591 7999.300 1001.591 52000.000 8000.000 1000.000 1.275 0.699 91014 51998.784 0.910 -1,197 10145 51999.089 4001.197 1003.944 S2000.000 4000.000 1000.000 -3.256 0.173 55998.022 7998.978 1003.173 56000.000 8000,000 1000.000 1.977 1-021 910151 -0.88 55998.060 55997,952 1001.661 56000.000 1000.000 -1,651 10155 4000 997 4000.000 1.979 11155 2.655 56000.000 0.000 1000.000 2.047 -2.655 -O. 924 2.093 M SIG Z = 2.712 SIG POS > 3.718 STO FRRS FOR THE MODEL SIG X # 1.724 M SIG Y = 2,543 BIG PLAN * MDOEL NO 101516 1.977 1.939 2.047 3.201 910151 55998.022 7998.978 1000.173 1001.661 1000.924 995.603 55000.000 8000.000 1000.000 1.021 -0.173 10155 55998.060 55997.952 59996.798 4000.887 56000.000 4000,000 1000.000 -0.287 -2.655 -0.081 -1.661 -0.924 3.395 11100 2,655 55000.000 0.000 1000.000 60000.000 910161 8000-081 1000.000 996.991 10165 59398.302 4000, 863 60000.000 4000.000 1000 000 1 697 -0 963 3,008 0.845 3,919 11165 59999,676 0.848 996.080 60000.000 0.000 1000.000 0.373 1.438 M SIG Z = 2.814 516 PLAN = 2.664 816 206 = 3.875 STO ERRS FOR THE MODEL BIG X = 2.242 M STG X = MODEL NO 101617 59996. 798 59998. 308 8000.081 4000.863 996.603 996.991 996.080 993.400 8000.000 -0.081 3.396 910161 60000.000 1000 000 2 201 3.201 1.697 0.373 0.768 -0.347 60000,000 1000.000 3.008 10165 60000.000 64000.000 64000.000 11165 59999.626 0.848 0.000 1000.000 -0.848 3,919 8002.047 -2.047 910171 63999.231 64000.347 8000.000 1000 000 6.599 4000.071 993.243 4000.000 1000.000 -0.671 11175 64001,198 -0.020 994.634 54000.000 0.000 1000.000 -1,198 0.020 5,365 STD ERRS FOR THE MODEL BIG X = 1.756 M SIG Y = 1.105 M STG Z a 5,548 SIC PLAN = 2,075 SIG POS = 5.924 MODEL NO 101718 64000,000 64000,000 64000,000 68000,000 68000,000 6.593 6.756 5.365 3.884 63999.231 8002.047 4000.671 -0.020 993.400 910171 8000.000 1000.000 0.768 -0.347 -1.198 -2.047 10175 64000.347 64001.198 933.243 4000,000 -0,671 11175 0,000 1000.000 91018 68002.518 8000.465 996.115 8000.000 1000.000 -2.518 -0.465 4000,850 997.576 4000.000 1000.000 10185 -2.939 -0.850 2. 425 68002-995 2.601 68000.000 0.000 1000.000 11185 997,422 -2.999 -2.601 2.577 STO ERRS FOR THE MODEL SIG X # 2.284 M STG Y = 1.571 M SIG Z = 5.395 BIG PLAN # 2,773 GIG POS * 6 067 MODEL NO 101819 910181 68002,518 8000.465 996.119 68000.000 8000.000 1000.000 -2.518 -2.939 -2.995 -3.333 -0.465 3.884 10185 68002.939 68002.995 72003.333 4000.850 997.576 997.422 995.081 68000.000 4000.000 1000.000 2.423 11185 P.601 68000.000 1000.000 -2.601 8001.277 72000.000 1000.000 910191 4.918 10195 72004.261 3999.926 997 109 72000.000 4000.000 1000.000 4.261 0.073 2.891

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• 11195 72003, 744 0.000 1000.000 -0.671 4.986 0.671 995-013 72000.000 -3.745 STD ERRS FOR THE MODEL BIG X -610 POG = 5,693 SIG Y . 1 399 M BIG 7 = 4.123 SIC PLAN = 3.925 3.667 M MODEL NO 101980 72000.000 72000.000 72000.000 76000.000 4.918 2.891 4.986 0.862 910191 72003.333 8001.277 3999.936 995.081 2000.000 1000.000 -3.333 -1.277 10195 72004,261 997.108 995.013 1000.000 -4.261 -3.746 -3.815 -4.513 11195 0.671 0.000 1000.000 -0.671 7998, 518 4000, 118 910201 76003.815 999.137 1000.923 8000,000 1.481 1000.000 10205 76004.513 76000.000 1000.000 -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 = 3.443 SIG PLAN = 4.248 M SIG Y = 1.374 M SIG Z = 4.465 BIG PDS # 5.638 MCOEL NO 102021 910201 76003.815 7998.518 999.137 76000.000 8000,000 1000.000 -3.815 1.481 0.862 -0.923 -0.520 76004.513 76003.466 4000.118 2.268 1000.923 4000.000 0.000 8000.000 1000-000 -4.513 -3.466 -1.477 -1.551 -0.118 10205 76000.000 11205 75000.000 910211 80001.477 7997.533 1000.596 2.466 -0.596 80000.000 1000.000 10215 3999.474 80000.000 4000 000 1000.000 11215 80000.680 3.281 1002.318 80000.000 0,000 1000.000 -0.680 -3.281 2.318 BYD ERRE FOR THE MODEL. SIG X = 3.224 M SIC Y # 2.212 m SIG Z = 1.675 SIG PLAN = 3.911 SIG PDS # 4.254 STD ERRS FOR THE STRIP SIG X -1.876 M SIG Y = 1.654 M 916 Z = 4.088 FIG PLAN = 2.50t STG 205 F 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 S1G P05 ≠ 4 324

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Author Arbuckle Mark Edward **Name of thesis** Minicomputers Applied To Digital Photogrammetry. 1978

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