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SOLAR CENTRAL RECEIVER PROTOTYPE HELIOSTAT CDRL ITEM B.d

Final Technical Report, Volume 2

By
C. R. Easton

August 1978

Work Performed Under Contract No. EG-77-C-03-1605

McDonnell Douglas Astronautics Company
Huntington Beach, California

U.S. Department of Energy

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PROTOTYPE HELIOSTAT CDRL ITEM B.d**

**Final Technical Report
Volume II**

AUGUST 1978

MDC G 7399

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PROTOTYPE HELIOSTAT

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PREFACE

This report was prepared under DOE contract EG-77-C-03-1605. It presents the results of a 9-month study to define a low-cost approach to the production, installation, and operation of heliostats. The guidance and support of the program manager, R. W. Hughey, and the technical assistance of C. J. Pignolet and C. L. Marvis of the Sandia Laboratories were of immeasurable benefit in the conduct of this study and we wish to acknowledge their contributions.

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Section 7

PERFORMANCE ANALYSES

MDAC has evaluated the performance of heliostats located in the reference positions as defined in Specification 001. In addition, MDAC has selected a point in the field which is representative of the best heliostat performance and estimated the average performance of the field. Results of these analyses are presented in this section.

7.1 FIELD LOCATIONS FOR HELIOSTAT EVALUATION

Three specific field locations for which heliostat performance is to be evaluated were given in Specification 001. These locations are shown in Figure 7-1. MDAC evaluations of these heliostat locations indicated that they are among the worst in the field because of relatively poor cosine angles or remoteness from the receiver. To balance out the indications of heliostat performance, MDAC added location D (550 m due north of the tower) as representative of the best overall performance. In addition, an estimate of the performance of the average heliostat was included.

Figure 7-1 also shows both the collector field boundaries and the locations of the slip planes defined in Section 6. The collector field is laid out in a radial staggered array. Heliostats are aligned along rays from the tower. Alternate rays are occupied in alternate circles centering on the tower. When the azimuthal spacing exceeds 2.2 times the reflective unit width, a radial gap is left, and the azimuthal spacing is reset to 1.8 times width. The radial gap is called a slip plane. In the prototype heliostat field layout, the slip plane also contains a circumferential access road.

7.2 PERFORMANCE RESULTS

Figures 7-2 through 7-5 show the instantaneous power incident on the receiver for heliostats in locations A through D. Separate curves are shown for

Figure 7-1. Heliostat Evaluation Locations

Figure 7-2. HelioStat Performance at Location A

Figure 7-3. Heliostat Performance at Location B

Figure 7-4. Heliostat Performance at Location C

Figure 7-5. Heliostat Performance at Location D

summer solstice, winter solstice, and equinox. The power curves were calculated by MDAC computer program CONCEN. The insolation was assumed to be 950 W/m^2 , the heliostat area 49 m^2 , and the reflectivity 0.92.

Location A, Figure 7-2, shows, as expected, a distinct improvement in performance at winter solstice. This improvement is due to the better cosine factor when the sun elevation angle is lower. Peak power is about 34.8 kW.

Location B, Figure 7-3, exhibits substantially higher peak power than location A for all seasons, because of the shorter slant range and higher interception factor at the receiver. The peak power of 35.8 kW is still at winter solstice. Peak power at equinox and summer solstice are proportionally larger, as compared to location A, because the sun is at a lower elevation angle when aligned with the tower.

Location C, Figure 7-4, shows a reversal of the previous patterns, with peak power accruing at summer solstice. The cosine and interception factors at peak power are still higher, and the power level is about 41 kW. Power throughout the remainder of the year is reduced because of lower cosine factors.

Location D, Figure 7-5, shows the performance of the best heliostat. Cosine and interception factors at the peak power time (winter solstice) are essentially unity. The power peaks at 42.4 kW. Summer solstice power suffers from a lower cosine factor, but still peaks at 37.7 kW.

The average power for the collector field was estimated from annual statistics on previous field layouts. Results are shown in Figure 7-6. Average field power is seen to peak at about 35 kW during equinox. The summer peak is essentially the same at 34.8 kW. Winter solstice is down only marginally at 33.8 kW. These figures tend to indicate that calculations based on Locations A, B, and C will not represent the field as a whole. Note also that the average field power at the start and end of the "day" is down from the peak value by only 7 to 21 percent, indicating that the period of operation may be significantly too short.

Figure 7-6. Average Heliostat Performance

Table 7-1 summarizes the heliostat performance results. The table clearly shows that the average daily energy is distinctly better than that for locations A, B, and C.

It may also be interesting to note that the average heliostat produces approximately 56 KWH/day, or about 18.5 MWHe/year (330 days/year basis at 20 percent conversion). If one assumes an 18 percent levelized fixed-charge rate, the value of the annual energy collected from an average heliostat can be capitalized as about equal to the value of 100 MWHe (18.5 MWH/year divided by 0.18). The collector cost is about 80 percent of the combined cost of the collector and receiver subsystem. Hence, the heliostat value is about equivalent to 80 MWHe. At \$65/m², the cost of the heliostat becomes about 40 mils/KWH. In equivalent thermal energy, the cost is about \$2.33/MBtu, the approximate current price of imported oil.

Table 7-1
HELIOSTAT PERFORMANCE RESULTS

DAILY ENERGY (KWH/HELIOSTAT)	HELIOSTAT LOCATION				FIELD AVERAGE
	A	B	C	D	
SUMMER	310.2	323.3	399.5	406.5	385.0
SOLSTICE	244.1	242.0	235.1	312.8	268.4
WINTER	229.0	197.0	147.5	249.7	197.4
AVERAGE	256.9	251.1	229.3	320.5	279.8

Section 8

CRITICAL R&D AREAS

During the course of the Prototype Heliostat Phase I study, five areas were identified in which further research and development may lead to substantial additional cost reductions. These areas are discussed in this section, together with the cost reduction potential estimated for each area.

8.1 ELIMINATE INVERTED STOWAGE REQUIREMENT

Eliminating the requirement for inverted stowage is estimated to reduce the equivalent heliostat cost approximately $\$10/\text{m}^2$.

Inverted stowage is desirable to prevent sunlight reflected from the mirrors from forming regions of concentrated sunlight in the air space above the collector field or adjacent to the field. MDAC believes that excessive concentrations of sunlight can also be prevented by careful control of the heliostats during the transition between stowage and on target orientations. However, the control algorithms become much more complicated. Executing the movement between stowage and on target will probably require more elapsed time for portions of the field because of the varying rates of motion of the beams from heliostats at varying distances from points of potential beam convergence.

The increase in time will be partially, if not fully, counteracted by the fact that the angular rotation required of the heliostat to achieve stowage will be less for face up stowage. Maximum rotations for face-up stowage range from 0 to about 75 degrees, while rotations for face down stowage range from 105 to 180 degrees.

The normal stowage position for heliostats in either case is with the reflector vertical. Hence, face up stowage would only be used when the wind is expected to rise above an established minimum threshold. The wind speed for face up stowage would be somewhat site dependent and probably set by the speed at

which blowing sand may be expected, about 15 m/sec. Hence, the frequency of face-up stowage will be low, especially the frequency for which significant direct beam sunlight is present.

If the requirement for inverted stowage were deleted, heliostat costs would be reduced by:

- 1) Eliminating the stowage actuator, drag link, and associated support points and bushings.
- 2) Filling in the slot between reflector panels, thereby increasing the effective reflector area by about 10 percent.

8.2 WIND LOADS MANAGEMENT

Wind loads on the heliostat have been taken to be those for an isolated heliostat in an undisturbed free stream. Preliminary results of wind tunnel tests indicate that the wind loads in a collector field with wind control fences surrounding the field will be reduced by at least 40 percent. The cost reductions which might result from designing to the reduced wind loads are estimated at about \$5/m².

The cost reductions might be achieved by further increases in reflective unit area per heliostat or by reduced material gages and drive unit component sizes. A comprehensive analysis would be required to select the better approach.

Before any design modifications can be recommended, it will be necessary to define new design wind load requirements. MDAC recommends the following steps:

- 1) Completion of the analysis of existing wind tunnel data.
- 2) Potential additional wind tunnel tests to complete the data base.
- 3) Analysis of data taken by MDAC during the heliostat array tests at Naval Weapons Center (Phase I Pilot Plant Collector SRE).

- 4) Instrumentation of heliostats at STTF, data collection and analyses, and correlation to wind tunnel tests to verify scalability relationships.
- 5) Translation of wind load data to heliostat design requirements.

8.3 DELETION OF POWER AND COMMUNICATIONS WIRING

The power and communications wiring to the heliostats may be deleted by appropriate modifications to the design. An estimated $\$3/\text{m}^2$ savings would result.

Power for operating the heliostat would be generated on the heliostat by a small photovoltaic array. Energy for operation at night would be stored in a battery, also located on the heliostat.

Communication with the heliostat would be by FM or similar means. The choice of means and the associated cost will be greatly affected by the required data rate. The cost savings to the heliostat is probably only valid if the return data communication from the heliostat to the master control can be eliminated or simplified to the point that only single, binary data bits are required, i.e., yes/no answers to interrogation.

The modifications to the heliostat design are rather simple. The controller already possess the capability to operate with only mode commands and time checks from master control. Addition of a data receiver and transmitter interface, the photovoltaic power supply, and storage battery are required. Also, the motors and motor controllers must be altered to be consistent with the DC power available from the photovoltaic array and battery.

8.4 ALTERNATIVE MOTOR/DRIVE UNIT CONCEPTS

Several changes or modifications to the drive motors and the azimuth drive unit may, in aggregate, lead to an additional $\$2/\text{m}^2$ cost reduction.

A synchronous motor concept appears to offer the potential of a 50 percent reduction in motor cost. This concept is proprietary to the vendor and may not be discussed here. The motor controller would require a major redesign, and controller costs might increase as a result. However, a net savings should still result.

A wave generator concept for the Harmonic drive which is able to be adjusted upon assembly to provide the required preload will reduce the cost of the wave generator. Several concepts seem feasible, but extensive analyses and tests are required to determine which, if any, are feasible.

MDAC has also considered several alternative approaches for both the elevation and azimuth drive units which were out of the scope of the Prototype Heliostat Contract. Further analyses and tests will be required to determine the most promising concepts and evaluate the performance and cost savings which may result.

8.5 FREQUENCY AND EFFICACY OF MIRROR CLEANING

MDAC has defined equipment and methods for mirror cleaning which lead to a very low cost. These methods were described in Section 5 of this report. No effort was included to optimize the frequency of washing as this frequency is dependent on site and local meteorology.

Additionally, the efficacy of the baseline washing technique might be improved by better washing solutions or modifications to the methods. Improvements in average reflectivity equivalent to $1-2/m^2$ might be realized by improved washing.

MDAC recommends that further study be done on washing solutions, methods, and frequency, in order to ascertain which combinations offer the most cost-effective mirror performance.

Section 9

COST ANALYSIS

This section contains the results of the Prototype Heliostat cost analysis for annual production rates of 25,000 units, 250,000 units, and 1 million units along with an analysis for a Pilot Plant production of 2,500 heliostats. The analysis has covered both heliostat investment cost and annual operations and maintenance cost. After an overview of costing results, this section presents details on costs, scenarios, and the costing methods for each production rate. Also, the special costing cases of non-inverting heliostats and use of mil standard versus commercial electronic components are addressed. Cost work sheets are included in Appendix H.

9.1 COST OVERVIEW

Pilot Plant and Commercial Plant costs are based on the design portrayed in Figure 9-1 as supported by the technical descriptions and programmatic provided in Sections 1 through 8 of this report. Generally, the costs that are presented will show a significant reduction over the Nth Commercial Plant Heliostat costs presented in Volume 7 of the May 1977 Pilot Plant Preliminary Design Review (PDR) document. The projected reduction is encouraging and supports the feasibility of the DOE goal of 72 dollars per square meter reflectivity. The following overview summarizes cost projection at the various studied production rates, provides a comparison between current and prior cost projections, and touches on the basic scenarios and costing approaches used in developing the projections.

9.1.1 Costing Results

Summarized costing results for the studied production rates are shown below in terms of first half of 1978 dollars per square meter, reflectivity ($\$/m^2R$):

Figure 9-1. Baseline Heliostat

<u>COST ELEMENT</u>	<u>AVERAGE \$/m²R</u>			
	<u>2500 (PILOT)</u>	<u>25K/ YEAR</u>	<u>250K/ YEAR</u>	<u>1 MIL/ YEAR</u>
Non-Recurring	\$ 36	-	-	-
Heliostat Investment	\$193	\$72	\$59	\$55
Visibility	<u>-</u>	<u>7</u>	<u>5</u>	<u>5</u>
Total w/Visibility	\$193	\$79	\$64	\$60
Maintenance Equipment	\$ 4	\$ 1	\$ 1	\$ 1
O&M - 1ST Year	\$ 1	\$ 1	\$ 1	\$ 1
- Next 29 Years	\$ 22	\$19	\$19	\$19
Memo: Reflectivity	.92	.92	.94	.95

These results indicate that the \$72/m²R goal is feasible at the lower production rate of 25,000 heliostats per year, and that it is very probable that the goal would be underrun at higher production rates. Visibility, which is intended to cover design and estimating unknowns, has been listed separately for the higher production rates because of the propensity for compensating "break-throughs" to occur that support the eventual realization of feasible cost targets. Indeed, a non-inverting heliostat design would cause a \$10/m²R reduction in cost. Also, it is possible that some of the plans projected for the 250,000 units per year scenario could be incorporated at lower production rates causing a savings. The reflectivity shown above has been varied with production rate to indicate the probability that improved glass transmissivity will become economically available as the required daily tonnage of glass increases.

9.1.2 Reductions in Cost

Table 9-1 provides a breakdown of the average costs per heliostat that support the above projections. As might be expected, large cost reductions are

Table 9-1

PROTOTYPE HELIOSTAT COST COMPARISON

1978 Dollars Per Heliostat (49.05 m²)

<u>Cost Element</u>	<u>2,500 Units</u>	<u>25,000 Per Year</u>	<u>250K Per Year</u>	<u>1 Million Per Year</u>
<u>Heliostat Investment</u>				
Reflective Unit	\$2,163	\$ 883	\$ 778	\$ 743
Drive Unit	3,666	1,306	1,002	953
Control/Instrumentation	823	114	83	72
Foundation/Site Preparation	786	609	548	525
Heliostat Support Structure	328	136	125	119
Field Assembly & Checkout	472	193	172	167
Sustaining Engineering	466	-	-	-
Subtotal	\$8,703	\$3,241	\$2,708	\$2,579
Initial Spares	11	2	2	2
Total	\$8,713	\$3,242	\$2,710	\$2,581
Visibility	-	304	251	238
<u>Maintenance Equipment</u>				
Handling Equipment	\$ 53	\$ 8	\$ 8	\$ 8
Test Vans	91	18	18	18
Washing Equipment	50	12	12	12
Total	\$ 194	\$ 38	\$ 38	\$ 38
<u>Operations and Maintenance</u>				
Spares	\$ 5.10	\$ 1.80	\$ 1.40	\$ 1.30
Repair Parts	6.70	1.90	1.50	1.40
Other	8.30	8.60	8.60	8.60
Corrective Maintenance	36.30	36.30	36.30	36.30
Scheduled Maintenance	6.70	6.40	6.40	6.40
	\$64.10	\$55.00	\$54.20	\$54.00
Follow-On	\$35.00	\$30.00	\$30.00	\$30.00
<u>Non-Recurring</u>				
Engineering	\$112			
Manufacturing and Other	132			
Total	\$244			

projected between the initial pilot production and the higher production rates. These reductions range from 86 percent for electronics to 23 percent for the foundations and average 63 percent. This is justified by the elimination of sustaining engineering, the advantages of volume procurement, and the ability to effectively employ capital equipment leverage. Once rate production at 25,000 units per year is achieved, cost reduction is not as dramatic but still significantly averages 16 percent between 25,000 and 250,000 units per year and an additional 5 percent in going to 1 million units produced per year. These cost reductions are supported by potential weight and part reductions, further automation (robotics), improved production flows, and improved supplier control. Further cost depth and cost justification is provided in the subsections for each production volume scenario and by the cost work sheets.

Table 9-2 shows a comparison between the cost data shown in the May 1977 PDR report and the current cost projection status. The adjusted PDR cost reflects improved PDR commercial design/cost visibility. The PDR commercial cost projections did not include scrap and rework, so this cost has been treated in sum in Table 9-2 for comparison purposes. Lower costs are shown for all elements except for foundation and site preparation. However, the more costly foundation allows important cost reductions in other areas by supporting a larger heliostat and a much simplified field assembly and checkout procedure. The latter shows the most dramatic cost reduction which is due to reduced and more automatic checkout procedures, to the reduced number of field assemblies, and to special installation equipment. The next largest reduction has been in the drive unit which has been simplified in a number of areas including the housing, the bearings, the Jackscrews, and various azimuth, components. Reductions in other element costs, as with the drive, reflect many small improvements that accumulate to significant reductions in total.

An interesting point is that at the time of PDR, the projection of $\$89/\text{m}^2$ ($\$8.31/\text{ft}^2$) for the Nth Plant may have been considered by some as a high risk estimate because visibility and scrap and rework factors had not been applied. However, "Prototype" projections, even when such factors are included, are still 20 percent lower than the PDR projections. The PDR stressed that

Table 9-2
COMPARISON WITH PDR RESULTS

<u>Element</u>	<u>PDR \$/m² (1977 \$)</u>	<u>Prototype \$/m² (1978 \$)</u>
Reflector Unit	\$18.87	\$17.15
Drive Unit	34.61	25.36
Control and Instrumentation	4.62	2.20
Foundation and Site	8.86	11.83
Heliostat Support	3.43	2.65
Field Assembly and Checkout	17.01	3.74
Site Plant Activation	2.00	--
Subtotal	<u>\$89.40</u>	<u>\$62.93</u>
Scrap and Rework	<u>-0-</u>	<u>3.15</u>
Total Investment	\$89.40	\$66.08
Annual Operations		
First Year		\$1.00M
Average	\$1.53M	\$0.54M

projected Nth plant costs represented a specific design/production scenario and that TBD (at that time) evolution in design or production scenarios justified assuming that the PDR cost of \$89/m² was a reasonable projection. Similar arguments concerning design/production plan evolution are also appropriate in support of the belief that \$72/m²R is obtainable at the 25,000 heliostats per year rate.

9.1.3 Basic Scenarios

As indicated, the prototype heliostat projections are based on a specific set of cost driving ground rules and assumptions, design characteristics,

and production scenarios. Although covered in detail in previous sections of this report, a summary of the major drivers is useful in understanding costing results.

9.1.3.1 Major Costing Ground Rules

The costs that are presented assume the following major financial ground rules.

- 1) First half 1978 dollars -- no escalation.
- 2) Eight percent fee applied to each CBS line item.
- 3) Interest during construction (IDC) not costed.
- 4) No state sales tax applied due to uncertainty of state and potential tax rulings.
- 5) Special collector production profit center.
- 6) Minimal manufacturing support practice. No analysis except as purchased from the outside.
- 7) Overhead and fringe benefits applied as a factor on direct labor only.
- 8) Cost projected as that typical of the 10th year of operation of production facilities at the studied production rates (except Pilot).
- 9) Vendor quotes and production facility manning baseline at 25,000 heliostats per year.
- 10) Assumed utility operations hourly labor rate (\$15) -- actual not known.
- 11) Commercial grade (non-mil standard) electronic components.
- 12) Scrap and rework, machine downtime, labor efficiency, operations refix factors, and first year failure rate factors applicable.
- 13) Cost reduction curves applied where specific cost difference from the 25,000 per year baseline are not identified.

These ground rules apply generally except that for the 2,500 unit Pilot production scenario, an existing profit center and standard support practices are assumed, and vendor quote from the Pilot Plant PDR have been applied where appropriate.

Figure 9-2 illustrates another important aspect of the costing ground rules. The figure shows the assumptions concerning the evolution from low to high production rates. As approximately indicated, the projected costs represent the average cost for the first 2,500 units, unit number 350 thousand, unit 3.5 million, and the 15 millionth unit for the Pilot production, 25,000 per year, 250,000 per year, and one million per year rates, respectively. These production points were selected as representative of one of possibly several logical production volume progressions. Perhaps of greatest interest is that this schedule assumes that the first production facility (25,000/year) goes into operation after 100,000 heliostats have been produced in other facilities. This starting point could have just as easily been assumed to be, say, unit 38 thousand, which would cause a small (approximately 3 percent) increase in average unit cost for the 25,000/year rate.

Figure 9-2. High Volume Costs — CRC Basis

9.1.3.2 Technical Characteristics

Table 9-3 summarizes the technical characteristics of the selected design. Key top level cost drivers include the enlarged reflector area (49 m²) that has been divided into two main panels for ease of transport and installation; inverting stowage which is accomplished with a second screwjack and other, additional, hardware; the Harmonic azimuth drive; and the factory integrated drive/pedestal/electronics assembly which may be checked and calibrated in the factory. Other important drivers include the deep pile foundation which features a 1.22 meter above grade tapered pipe interface extension; the use of a weldment versus a casting for the drive housing; and the stringer/semi-radial beam mirror backing structure configuration. Except for inversion, these design characteristics generally have allowed a simplified production scenario as well as purchased part and material economics.

9.1.3.3 Baseline Scenarios

Main features of the baseline production/installation scenario are listed below.

- 1) 25,000 units per year
- 2) 62,500 ft² production facility (no site assembly plant)
 - Central, unnamed location -- outside Los Angeles
 - Integrated mirror line and Harmonic drive fabrication
 - Automated assembly/transfer
 - NC machining
- 3) Low skill labor -- less than 300 factory direct
- 4) Private fleet transportation
- 5) Four basic installations -- mechanized using special equipment
 - Foundation
 - Pedestal/drive/electronic unit
 - L&R reflector
 - Power/control distribution
- 6) One shift plus operation (240 days)

TECHNICAL DESCRIPTION - COLLECTOR SUBSYSTEM

● Reflector - 6 laminated reflector mirrors bonded to the reflector support structure.	
● Reflective Surface	787 Kg (1734 lbs)
Reflective Surface Area	49.05 m ² (528f ²)
Second Surface Mirror	1.5 mm (0.060")
Glass Back Lite	4.8 mm (0.1875")
● Mirror Backing Structure	469 Kg (1034 lbs)
IMBD Cross Beam 14 Gage	173" - 27" Deep
OuTBD Cross Beam 18 Gage	173" - 11" Deep
Diagonal Beam 14 Gage	112" - 26" Deep
Hats 16 Gage	130" - 6"
● Drive - Consists of a rotary azimuth drive, a double jack elevation drive, center main beam, and pedestal.	578 Kg (1273 lbs)
Center Main Beam	122 Kg (268 lbs)
Tube	81" - 16" Dia
Flange	18" Square
Elevation Drive	102 Kg (225 lbs)
Jacks	5 Ton Ball Screw (63 Kg, 139 lbs)
Motor (Two)	1/4 hp; 480 VAC (9.5 Kg, 21 lbs)
Drag Link-Weldment	29.4 Kg (65 lbs)
Azimuth Drive	185 Kg (407 lbs)
Housing-Weldment	108 Kg (238 lbs)
Drive Unit (Retainer)	68 Kg (150 lbs)
Helicon Input	162:1
Harmonic Output	242:1
Final Drive Ratio	39,204:1
Motor	1/2 hp; 480 VAC (8.6 Kg, 19 lbs)
Pedestal	169 Kg (373 lbs)
Power Distribution Equipment & Wiring	4160 VAC, 3 Phase
Step Down Transformers	480 VAC, 3 Phase
Position Indicators	
Incremental Encoder - Motor Turn Feedback	

Table 9-3

TECHNICAL DESCRIPTION - COLLECTOR SUBSYSTEM

- Control/Instrumentation Equipment

- Heliostat Array Controller

- High Speed Digital Microprocessor

- Master Control Interface

- Heliostat Control Interface

- Data Distribution Interface

- Digital Microprocessor

- Communication Interface

- Heliostat Controller

- Digital Microprocessor

- Drive Motor Controller

- Control Sensors

- Communication Interface

- Signal Distribution Equipment

- Fiber Optic Transmission Cable

- Foundation

- Concrete

- 5478 Kg (12076 lbs)

- Steel Reinforcement

- 194 Kg (428 lbs)

- Steel Form

- 34 Kg (75 lbs)

As indicated, the baseline has been oriented to the 25,000 units per year production rate. The main changes associated with higher production include introduction of robotics, improved line flow, integration and/or more direct control of specialized production facilities (e.g., fusion glass/mirror panel production), and increased supplier and services control. Pilot production is assumed accomplished in existing facilities of potential collector manufacturers.

The operations and maintenance scenario calls for the use of conventional handling equipment, mobile test vans, and special mirror washing equipment. In most cases, defective assemblies or components are first removed and replaced with a spare or a previously repaired part and then the defective item repaired or scrapped. The main exceptions occur where certain structural damage may be repaired in place. The preponderance of maintenance actions involve repairs rather than scrapping defective hardware.

9.1.4 Costing Approach

The costing approach has been to develop a data base associated with the 25,000 units per year production rate and then perturb the data base to reflect special circumstances associated with the other production volumes. The 25,000 unit data base has been developed as resource loads for labor where operator and support positions required for each item of production equipment or responsibilities are counted and classified by skill in order to accumulate staffing by CBS. Vendor quotes at ongoing 25,000 units per year requirements were obtained for important cost items and catalogs consulted for common items. Like item costs were employed where certain electronic components have been projected as being available off the shelf at future dates. Appropriate factors have been applied to the data base along with burdened labor rates to arrive at total costs.

Changes to the 25,000 per year data base were accomplished specifically where design or production differences were identified and generally through appropriate changes in factors, labor rates, and overhead rates and through cost reduction curve logic. Examples, of specific changes include potential weight reductions such as for the drive housing, eliminated operator positions due to robotics, and specific unit cost changes reflecting vendor information pertinent to the particular production rate.

Costs not specifically addressed were altered along a cost reduction curve. Each basic cost entry has been "pegged" to a specific point on a cost reduction curve. Where an item cost change associated with a new production rate is identified, the cost is repegged at its new point on the curve and the curve

has no affect. Otherwise, the cost is adjusted in accordance with cost reduction curve logic to a new estimate for the new production rate. Specifics on cost reduction curve logic as well as factors, labor rates, and other cost methodology are treated in more detail in the subsections that follow.

9.2 COSTS FOR 25,000 UNITS

As indicated, the Prototype heliostat cost data developed using the production, installation and operating plans derived for the 25,000 unit per year scenario provide the primary cost standard for comparison with the DOE goals and the baseline for development of costs at the other production rates. For these reasons, costs have been studied in greatest depth for this production rate, and are treated first in order to establish a basis of discussion for the other production rates.

9.2.1 Cost Breakdown by CBS

Tables 9-4 and 9-5 provide a cost breakdown into labor and material for each CBS element. Table 9-4 shows average investment cost per heliostat and dollars per square meter in 1978 dollars. Investment costs are based on approximately the tenth year of plant operation, and include no visibility adjustment. Investment labor is slightly less than 25 percent of the total cost, and well over half of the labor relates to field requirements. The major share of the cost is made up of purchased parts which, by definition, tend to relieve factory labor requirements. Note that costs shown for the power supply/distribution, certain control instrumentation items, miscellaneous equipment, and initial spares have been prorated over all 25,000 heliostats and do not represent the actual unit costs of such items. As with previous estimates, the drive unit is still the outstanding cost, although a large improvement is indicated for the azimuth drive, mainly due to the lightened housing weldment, the "wire race" bearings, the helicon input stage, revised Harmonic component fabrication plans, and several other minor changes.

First year operations and maintenance costs required in operating 18,000 heliostats are shown in Table 9-5 for spares, repair parts, other non-labor, and corrective and scheduled labor. The main inclusions in the other category

Table 9-4

(Sheet 1 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

WBS NUMBER AND TITLE		+-NON+-----CAPITAL INVESTMENT-----+						INVEST
		RECUR	+-LABOR-----	+-MATL	DOLLAR-+			
		(THOU)	HOURS	DOLL	PUR PT	RAW MTL	TOTAL	\$/SMR
	GRAND TOTAL-HELIOSTAT	0.	39.3	748.	1923.	570.	3241.	66.08
4410	REFLECTIVE UNIT	0.	4.3	60.	735.	88.	883.	18.00
4411	REFLECTIVE SURFACE	0.	1.3	18.	407.	46.	471.	9.61
4412	MIRROR BACK STRUCT	0.	1.5	22.	328.	13.	363.	7.39
4413	ASSY & BOND	0.	1.5	21.	0.	28.	49.	.99
4420	DRIVE UNIT	0.	7.8	110.	937.	260.	1306.	26.63
4421	AZIMUTH	0.	4.0	56.	141.	156.	354.	7.21
4422	ELEVATION	0.	2.5	36.	482.	103.	621.	12.67
4423	MOTOR TOTAL	0.	0.0	0.	164.	0.	164.	3.34
4424	POS/LIMIT INDICATO	0.	.8	11.	17.	0.	29.	.58
4425	PWR SPLY/DIST	0.	0.0	0.	131.	0.	131.	2.68
4426	ASSY DR/PED/ELECT	0.	.5	7.	1.	0.	8.	.16
4430	CONTROL/INSTRMT EQ	0.	2.4	36.	78.	0.	114.	2.31
4431	SENSOR/CALIB EQUIP	0.	0.0	0.	1.	0.	1.	.02
4432	FIELD CONTROL	0.	.0	0.	1.	0.	1.	.03
4433	CNTRL/SIG EQ	0.	2.4	33.	68.	0.	102.	2.08
44320101	COLLECTOR CONTROL	0.	.1	2.	8.	0.	9.	.19
4440	FOUND/SITE PREP	0.	14.5	336.	172.	102.	609.	12.42
4441	FOUNDATION	0.	10.5	243.	172.	102.	517.	10.54
4442	SITE PREPARATION	0.	4.0	93.	0.	0.	93.	1.89
4450	HELIO SPT ST/PR EN	0.	1.1	15.	1.	121.	136.	2.78
4451	HELIO SUPP STRUCT	0.	1.1	15.	1.	121.	136.	2.78
4452	PROTECTION ENCL	0.	0.0	0.	0.	0.	0.	0.00
4453	LIGHTNING PROT.	0.	0.0	0.	0.	0.	0.	0.00

Table 9-4

(Sheet 2 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

WBS NUMBER AND TITLE		+-NON+-----CAPITAL INVESTMENT-----+						INVST
		RECUR +---LABOR-----+-MATL DOLLAR-+						
		(THOU)	HOURS	DOLL	PUR PT	RAW MTL	TOTAL	\$/SMR
4460	FIELD ASSY & C/O	0.	9.2	192.	1.	0.	193.	3.93
4461	HELIOSTAT	0.	3.2	74.	0.	0.	74.	1.51
4462	SENSOR/CALIB EQ	0.	.0	0.	0.	0.	0.	.00
4463	ELECTRICAL/DISTRIB	0.	1.8	42.	0.	0.	42.	.85
4464	ALIGN HELIOSTATS	0.	.8	18.	0.	0.	18.	.38
4465	FIELD SUPPORT	0.	1.1	25.	0.	0.	25.	.51
4466	PACK & TRANSP	0.	2.3	33.	1.	0.	33.	.68
4100	SITE,STRU,MISC EQ	0.	.2	3.	34.	1.	38.	.78
4130	MISC.EQUIP	0.	.2	3.	34.	1.	38.	.78
4800	DIST AND INDIR	0.	0.0	0.	2.	0.	2.	.04
4840	INITIAL SPARES	0.	0.0	0.	2.	0.	2.	.04

Table 9-5
FIRST YEAR OPERATIONS
(1978 DOLLARS IN \$000)

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

WBS NUMBER AND TITLE

+++OPERATIONS AND MAINTENANCE-----+
 +---NON-LABOR-----+ +---LABOR-----+
 SPARES REP PT OTHER CORRECT SCHED TOTAL

	GRAND TOTAL	32.	35.	154.	653.	116.	991.
4410	REFLECTIVE UNIT	3.	0.	1.	14.	0.	18.
4411	REFLECTIVE SURFACE	3.	0.	1.	12.	0.	16.
4412	MIRROR BACK STRUCT	0.	0.	0.	2.	0.	2.
4420	DRIVE UNIT	15.	20.	4.	416.	0.	454.
4421	AZIMUTH	3.	6.	2.	130.	0.	141.
4422	ELEVATION	2.	4.	1.	34.	0.	41.
4423	MOTOR TOTAL	4.	8.	1.	230.	0.	244.
4425	PWR SPLY/DIST	5.	1.	1.	22.	0.	28.
4430	CONTROL/INSTRMT EQ	14.	15.	8.	222.	0.	260.
4431	SENSOR/CALIB EQUIP	0.	0.	0.	0.	0.	0.
4432	FIELD CONTROL	7.	0.	0.	2.	0.	9.
4433	CNTRL/SIG EQ	8.	15.	8.	220.	0.	251.
4450	HELIO SPT ST/PR EN.	0.	0.	0.	1.	0.	1.
4451	HELIO SUPP STRUCT	0.	0.	0.	1.	0.	1.
0M000	O AND M SUMMARY	0.	0.	141.	0.	116.	257.
0M100	OPERATIONS	0.	0.	0.	0.	0.	0.
0M200	MAINT. MATERIAL	0.	0.	141.	0.	0.	141.
0M300	MAINTENANCE LABOR	0.	0.	0.	0.	116.	117.

are transportation, washing solution, lubricants and fuel. Corrective maintenance covers both removal and replacement time and bench labor. Schedule maintenance covers washing 12 times per year and corrosion control. The main difference between first year O&M and ongoing O&M is in the areas of the motors and electronic elements where failures are expected to be 3.3 and 13 times greater in the first year of operations. The results of a cursory analysis to determine whether it may be more economical to employ mil specification parts is inconclusive but has indicated that substantially increased burn-in time at an increase in electronic spare and repair parts cost may be cost-effective. The details of operations costs and the investment costs are provided in the work sheets included in Appendix H.

9.2.2 Summary of Costing Scenario

The costs cover the expenditure of resources associated with the tenth year of operation of a production facility geared to output 25,000 heliostats per year, and operations and maintenance required to employ 18,000 heliostats at a 100 MWe power plant. The production plant is sized to produce this volume on essentially a one shift basis, and covers a 62,500 square foot area. The facility is centrally located in a yet unnamed location outside of Los Angeles for consistency with applied labor rates.

The plant features automated assembly and material transfer, NC machining, automatic electronic component insertion, and wave soldering. The integrated mirror/reflector panel line is of special interest where glass is brought in, cleaned, mirrored, and laminated into mirror modules; prefabricated steel stringers and beams are assembled into a backing structure; and the mirror modules and backing structure are integrated using a bonding material into a "pre-focused" reflector panel which is then loaded in its shipping container. This entire operation is handled on a continuous line using special material transfer equipment. Generally, the plant is designed to reduce both the number of factory laborers (approximately 200 touch) and the skill level.

Currently, a site assembly facility is not planned. Essentially, four basic installations are required--the foundation, the pedestal/drive/electronic

assembly, reflector panels, and power/control distribution equipment. These assemblies are shipped to site using a private truck fleet.

The foundation is designed with a four foot tapered interface above ground level, so that a special piece of equipment may be employed to position and secure the pedestal/drive/electronic assembly within 7.1 minutes with a crew of 3 men. The reflector panels are also installed with a special rig so that when bolted down they are properly aligned relative to the drive. This is accomplished within 17.7 minutes with 6 men. The power/control distribution equipment and foundations are installed with conventional equipment. In the case of the former, only 57 installations are required per field and a small crew can make all 57 installations in approximately 2 weeks. However, the foundation installation scenario could probably be improved with the identification of specially modified equipment since 18,000 foundations per field are required.

The operations and maintenance scenario calls for the use of essentially conventional handling equipment. This equipment include a mobile crane, several pickup trucks, forklifts and a hoisting sling. In addition, a mobile test van and the alignment "cameras" are employed for heliostat calibration operations. Washing of reflective surfaces is accomplished with special wash and rinse trucks. It is apparent that reflector panel and drive failure rates will be too low to justify keeping the special installation equipment at site.

Generally, maintenance actions involve locating the failure, driving to the point of failure, removal of the failed item and replacement with a spare, and return to the maintenance base. At this point, the replaced part is usually repaired and entered into the spares inventory. A small percentage of failed hardware is scrapped and replaced with a new spare. It is assumed that a significant percentage of repairs must be redone because the initial fix does not work. Most heliostat support structure maintenance will be performed in the field and when mirror modules are replaced, they will be refastened with fasteners and shims rather than by bonding.

Scheduled maintenance consists mainly of washing and corrosion control inspection. Painting of galvanized metal other than minor touchups for corrosion control is assumed not required. This basic operations and maintenance scenario applies for all production rates.

9.2.3 Costing Approach

The costing approach employed in developing costs for the 25,000 heliostats per year scenario is based on annual resource loading for labor and, in the main, on vendor information quoted at the level of parts and materials required to support annual factory output. For certain electronic components that currently do not exist, the costs of like components were used based on the projection that demand will cause the required components to be produced in the near future. The balance of material costs (e.g., fasteners) are based on catalog prices, while transportation costs are based on the experience at MDC in Long Beach who operate their own transportation fleet.

Although manhours have been primarily developed through manning of the required factory equipment, direct support hours for planning, sustaining tooling, and product support are currently based on standard factors. Quality control hours are derived by a specially studied factor for the Prototype heliostat. Other areas such as material handling and supervision are covered within the applied burden rates.

Various factors have been applied to the costs derived in the above manner. Material has been factored by visibility, scrap and rework, and fee. Labor hours have been adjusted to reflect scrap and rework, and efficiency. Fee is covered in the labor rate. Applied efficiency factors mainly cover impacts on lapsed time while other efficiencies are implicit in the crew loads. This is most apparent in the field where a crew of 7 may be accomplishing a task, but at any one time only 2 or 3 members may be actually involved. Table 9-6 shows the applied factors.

For the rate of 25,000 units per year, cost reduction curves have been applied only to factory labor. In the 25,000 unit scenario, production is assumed to

Table 9-6
FISCAL GROUND RULES AND ASSUMPTIONS

FEE		8%	
VISIBILITY	LABOR	20%	
	MATERIAL	10%	
SCRAP/REWORK	GENERAL	5%	
	ELECT ASSEMBLY	15%	
EFFICIENCY*	FACTORY (MACHINE PACED)	90%	
	FIELD (ON LAPSED TIME)	67%	
	FIELD SUPPORT	77%	
LABOR RATES	FACTORY	\$13.00	} EXCLUDING FEE
	FIELD	\$21.40	
	ENGR	\$39.00	
CRC	MATERIAL -- STEEL	98%	} 350,000 BASIS
	GLASS	98%	
	ELECT	92%	
	LABOR -- FACTORY	89%	125,000 BASIS
	FIELD	98%	350,000 BASIS

*"WAIT TIME" INEFFICIENCY IMPLICIT IN MANLOAD

commence after 100,000 heliostats have been produced for pilot plants, demonstration plants, and first commercial plants, and to continue out to unit 600,000 for a total of 500,000 heliostats over 20 years. The manloads have been projected as those required at the start of the second year of rate production in the factory, or at unit 125,000. In order to arrive at unit hours in the tenth year of operations, labor has been extended down on 89 percent cost reduction curve from unit number 125,000 to the average hours for units 335,000 to 360,000. This is intended to reflect tooling improvements, more efficient alignment of material flows, and better utilization of manpower as the plant matures.

Operations and maintenance costs are based on both resource loading and direct estimates of hours, unit investment cost for replaced or spared parts, and on quotes or prior study information on operations materials such as washing solution. Spares and repair parts are the product of annual failures (based on failure rates tables), hardware unit costs estimated for investment, and repair or replacement factors. Corrective maintenance is the product of crew size and lapsed time or a direct hour estimate for bench labor, annual failures, repair factors for bench labor, and burdened labor rates. Scheduled maintenance is based on direct estimates or crew size and burdened labor rates, material quotes, and estimated frequencies. Results were factored to consider efficiency, added first year failures or problems, and refix where the first attempt at repair is not successful and must be redone. The applied factors are shown in Table 9-7.

Applied labor and burden rates vary between factory, field, and operations. Factory rates are based on low side National average labor costs and MDAC burden and G&A experience at volume production facilities. Installation rates are based on Riverside, California trade labor and fringe rates adjusted to allocate distributable cost. Both the factory and field rates include an 8 percent fee. The O&M labor rate has been estimated at 15 dollars per hour and does not include fee since the utility presumably would not charge itself a fee.

Table 9-7
O&M LABOR FACTORS

EFFICIENCY

FIELD	50%
BENCH	85%
WASH & INSPECT	85%

REFIX

DRIVE & REFLECTOR	1.10
ELECTRONICS	1.25

FIRST YEAR FACTOR

MOTORS	3.34
ELECTRONICS	13.00
WASH & INSPECT	1.20
OTHER	1.00

LABOR RATE	\$15.00
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CRC	100%
-----	------

9.2.4 Cost Detail

The work sheets included in Appendix H provide cost detail at the parts level. The investment sheets show average unit cost for 25,000 heliostats per year while operations show both reference unit costs and the annual costs of operating and maintaining 18,000 heliostats. The adjustment factor shown for operations is the product of efficiency, refix, and the repair or replace factor.

9.3 COSTS FOR 250,000 UNITS

Costs for 250,000 heliostats produced per year have been derived from an adjusted 25,000 units per year data base reflecting certain specifically identified cost changes appropriate to a 250,000 per year production rate.

9.3.1 Cost Breakdown by CBS

Table 9-8 shows the average investment cost per heliostat broken down into labor and material for each CBS element and also shows dollars per square meter in 1978 dollars. Operations and maintenance costs are the same as that projected for 25,000 units per year except that spares and repair parts cost is about 15 percent less due to the reduced investment cost.

9.3.2 Changes in the Costing Scenario

Three main changes have been made in the costing scenario. First, material weights have been reduced to their theoretical minimum for the mirror backing structure and integrated drive unit structure. Second, parts have been eliminated in the drive housing by assuming a welded flexspline/housing assembly, and third, robotics have been appraised capable of eliminating 90 percent of the touch labor positions. However, production plant adjustments necessary to assimilate robotics assume most of the direct support is still required and that additional directs will be required to maintain and provide basic direction to the robots. Also, overhead is assumed constant (i.e., reduced fringe will be balanced by increased equipment cost and fringe rates), so that overhead rates increase, dramatically. Two types of industrial robots were considered: one produced by Unimation, Incorporated which is used in numerous automobile production situations, and a highly flexible robot produced by Cincinnati Milacron. These machines are capable of performing almost any assembly, machine loading, welding or handling operation. One other change assumed is that foundation installation will become more mechanized. Additional changes such as improved line flow, integration and increased supplier control are considered through the operation of the cost reduction curve.

Table 9-8

(Sheet 1 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

WBS NUMBER AND TITLE		+--NON+-----CAPITAL INVESTMENT-----+						INVEST
		RECUR	LABOR	MATL	DOLLAR		TOTAL	
		(THOU)	HOURS	DOLL	PUR PT RAW MTL			\$/SMR
	GRAND TOTAL-HELIOSTAT	0.	23.8	638.	1585.	485.	2708.	55.21
4410	REFLECTIVE UNIT	0.	1.4	46.	650.	82.	778.	15.87
4411	REFLECTIVE SURFACE	0.	.4	14.	381.	43.	438.	8.92
4412	MIRROR BACK STRUCT	0.	.5	17.	269.	13.	299.	6.09
4413	ASSY & BOND	0.	.5	16.	0.	26.	42.	.86
4420	DRIVE UNIT	0.	2.8	90.	718.	194.	1002.	20.43
4421	AZIMUTH	0.	1.4	46.	108.	99.	252.	5.14
4422	ELEVATION	0.	.9	30.	314.	95.	440.	8.97
4423	MOTOR TOTAL	0.	0.0	0.	153.	0.	153.	3.12
4424	POS/LIMIT INDICATO	0.	.3	9.	17.	0.	25.	.52
4425	PWR SPLY/DIST	0.	0.0	0.	125.	0.	125.	2.54
4426	ASSY DR/PED/ELECT	0.	.2	5.	1.	0.	6.	.13
4430	CONTROL/INSTRMT EQ	0.	.8	27.	56.	0.	83.	1.70
4431	SENSOR/CALIB EQUIP	0.	0.0	0.	1.	0.	1.	.02
4432	FIELD CONTROL	0.	.0	0.	1.	0.	1.	.02
4433	CNTRL/SIG EQ	0.	.8	26.	52.	0.	78.	1.58
44320101	COLLECTOR CONTROL	0.	.0	1.	2.	0.	4.	.08
4440	FOUND/SITE PREP	0.	10.9	292.	160.	96.	548.	11.16
4441	FOUNDATION	0.	7.9	211.	160.	96.	467.	9.52
4442	SITE PREPARATION	0.	3.0	80.	0.	0.	80.	1.64
4450	HELIO SPT ST/PR EN	0.	.3	11.	1.	113.	125.	2.55
4451	HELIO SUPP STRUCT	0.	.3	11.	1.	113.	125.	2.55
4452	PROTECTION ENCL	0.	0.0	0.	0.	0.	0.	0.00
4453	LIGHTNING PROT.	0.	0.0	0.	0.	0.	0.	0.00

Table 9-8

(Sheet 2 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

WBS NUMBER AND TITLE		+--NON+---CAPITAL INVESTMENT-----+						
		RECUR +---LABOR-----++-MATL DOLLAR-+					INVST	
		(THOU)	HOURS	DOLL	PUR PT	RAW MTL	TOTAL	\$/SMR
4460	FIELD ASSY & C/O	0.	7.5	171.	1.	0.	172.	3.51
4461	HELIOSTAT	0.	2.4	64.	0.	0.	64.	1.31
4462	SENSOR/CALIB EQ	0.	.0	0.	0.	0.	0.	.00
4463	ELECTRICAL/DISTRIB	0.	1.4	36.	0.	0.	36.	.74
4464	ALIGN HELIOSTATS	0.	.6	16.	0.	0.	16.	.33
4465	FIELD SUPPORT	0.	.8	22.	0.	0.	22.	.45
4466	PACK & TRANSP	0.	2.3	33.	1.	0.	33.	.68
4100	SITE,STRU,MISC EQ	0.	.2	3.	34.	1.	38.	.78
4130	MISC.EQUIP	0.	.2	3.	34.	1.	38.	.78
4800	DIST-AND INDIR	0.	0.0	0.	2.	0.	2.	.04
4840	INITIAL SPARES	0.	0.0	0.	2.	0.	2.	.04

9.3.3 Costing Approach

The costing approach has been to recost material line items where weight has been adjusted, on a dollar per pound basis. Where parts and assembly requirements have been eliminated, the cost has simply been dropped. Labor has been adjusted by reducing touch to 10 percent of the 25,000 per year requirement and then adding on equal number additional "maintenance" directs for a net touch manning adjustment to 20 percent of the original manning. Direct support has been adjusted to 80 percent of the original manning while the burden and G&A rates were increased in accordance with the constant overhead and the reduced labor base. Both labor and material line items that were changed have been repegged to the 3.5 millionth unit of production. Other line items were adjusted along cost reduction curves to unit 3.5 million. The fully loaded labor rates (without fee) applied for the higher production level is \$30.10 in the factory and \$24.82 in the field.

9.4 ONE MILLION UNITS PER YEAR

Costs for one million units per year have been developed from the 250,000 unit per year data base.

9.4.1 Cost Breakdown by CBS

Table 9-9 shows the average investment cost per heliostat broken down into labor and material for each CBS element and indicates the dollars per square meter in 1978 dollars. Operations and maintenance costs are the same as that projected for the 25,000 per year scenario, except that spares and repair parts costs are expected to be approximately 20 percent lower than that projected for the baseline operations and maintenance cost.

9.4.2 Changes in the Costing Scenario and Approach

The one million unit per year scenario assumes that production facilities will be further functionally specialized, that the design, materials, and processes will continue to improve, and that great control may be exercised over supply. It also may become feasible to vertically integrate the production of certain basic materials. All such changes have been given effect through adjustments along the cost reduction curve to reflect costs at the 15 millionth unit.

Table 9-9

(Sheet 1 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

WBS NUMBER AND TITLE		+-NON+-----CAPITAL INVESTMENT-----+						INVEST
		RECUR	+-LABOR-	+-MATL	DOLLAR-			
		(THOU)	HOURS	DOLL	PUR PT	RAW MTL	TOTAL	\$/SMR
	GRAND TOTAL-HELIOSTAT	0.	22.6	604.	1511.	464.	2579.	52.57
4410	REFLECTIVE UNIT	0.	1.3	42.	623.	78.	743.	15.15
4411	REFLECTIVE SURFACE	0.	.4	13.	365.	41.	419.	8.53
4412	MIRROR BACK STRUCT	0.	.5	15.	258.	12.	285.	5.81
4413	ASSY & BOND	0.	.4	14.	0.	25.	39.	.80
4420	DRIVE UNIT	0.	2.5	81.	685.	186.	953.	19.42
4421	AZIMUTH	0.	1.3	41.	103.	95.	239.	4.87
4422	ELEVATION	0.	.8	27.	301.	91.	420.	8.57
4423	MOTOR TOTAL	0.	0.0	0.	147.	0.	147.	2.99
4424	POS/LIMIT INDICATO	0.	.2	8.	16.	0.	24.	.48
4425	PWR SPLY/DIST	0.	0.0	0.	118.	0.	118.	2.40
4426	ASSY DR/PED/ELECT	0.	.1	5.	1.	0.	6.	.12
4430	CONTROL/INSTRMT EQ	0.	.8	25.	47.	0.	72.	1.47
4431	SENSOR/CALIB EQUIP	0.	0.0	0.	1.	0.	1.	.02
4432	FIELD CONTROL	0.	.0	0.	1.	0.	1.	.02
4433	CNTRL/SIG EQ	0.	.7	23.	44.	0.	67.	1.36
44320101	COLLECTOR CONTROL	0.	.0	1.	2.	0.	3.	.07
4440	FOUND/SITE PREP	0.	10.4	279.	154.	92.	525.	10.70
4441	FOUNDATION	0.	7.5	202.	154.	92.	448.	9.13
4442	SITE PREPARATION	0.	2.9	77.	0.	0.	77.	1.57
4450	HELIO SPT ST/PR EN	0.	.3	10.	1.	108.	119.	2.43
4451	HELIO SUPP STRUCT	0.	.3	10.	1.	108.	119.	2.43
4452	PROTECTION ENCL	0.	0.0	0.	0.	0.	0.	0.00
4453	LIGHTNING PROT.	0.	0.0	0.	0.	0.	0.	0.00

Table 9-9

(Sheet 2 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

WBS NUMBER AND TITLE		+-NON+-----CAPITAL INVESTMENT-----+						INVEST
		RECUR +--LABOR-----+-MATL DOLLAR-+						
		(THOU)	HOURS	DOLL	PUR PT	RAW MTL	TOTAL	\$/SMR
4460	FIELD ASSY & C/O	0.	7.3	167.	1.	0.	167.	3.41
4461	HELIOSTAT	0.	2.3	62.	0.	0.	62.	1.26
4462	SENSOR/CALIB EQ	0.	.0	0.	0.	0.	0.	.00
4463	ELECTRICAL/DISTRIB	0.	1.3	35.	0.	0.	35.	.71
4464	ALIGN HELIOSTATS	0.	.6	15.	0.	0.	15.	.31
4465	FIELD SUPPORT	0.	.8	22.	0.	0.	22.	.45
4466	PACK & TRANSP	0.	2.3	33.	1.	0.	33.	.68
4100	SITE,STRU,MISC EQ	0.	.2	3.	34.	1.	38.	.78
4130	MISC.EQUIP	0.	.2	3.	34.	1.	38.	.78
4800	DIST AND INDIR	0.	0.0	0.	2.	0.	2.	.04
4840	INITIAL SPARES	0.	0.0	0.	2.	0.	2.	.04

9.5 PILOT PRODUCTION COSTS (2500 UNITS)

Pilot Plant costs have been developed from an adjusted 25,000 unit per year data base reflecting certain specifically identified cost changes appropriate to a 2,500 unit pilot production.

9.5.1 Cost Breakdown by CBS

Tables 9-10 and 9-11 provide a cost breakdown into labor and material for each CBS element. Table 9-10 shows average investment cost per heliostat and dollars per square meter in 1978 dollars. First year Pilot Plant operations and maintenance costs are shown in Table 9-11 and cover the costs of operating 1800 heliostats. In addition, non-recurring costs are shown in Table 9-10 which cover vendor tooling, non-recurring direct support for planning and design and fabrication, hardware design preproduction unit support, and special site activation associated with a Pilot Plant only. One notable change is that in addition to the costs being higher, investment labor is a much higher percentage (43 percent) of the total costs for the pilot plant reflectivity increased lapsed times and manning.

9.5.2 Changes in the Costing Scenario

The major changes in the costing scenario for the 2500 unit production relate to the assumption that the pilot production and installation is a short-term operation that is semi-developmental in nature. However, costing also presumes the project maturity that would be gained through production of the Barstow baseline heliostat, the development phases of the prototype heliostat, and miscellaneous other small production opportunities.

Production is expected to occur in existing general purpose facilities but with lines arranged and tooled to provide a reasonable production flow to the extent justified by the limited volume. A site facility is assumed required in support of the installation procedures which are essentially the same as for the production rates. The required specialized equipment is procured and modified to allow checkout of the installation procedures.

Table 9-10

(Sheet 1 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 2500 UNITS

WBS NUMBER AND TITLE		+--NON+-----CAPITAL INVESTMENT-----+						INVEST
		RECUR	LABOR	MATL	DOLLAR		TOTAL	
		(THOU)	HOURS	DOLL	PUR PT	RAW MTL		\$/SMR
	GRAND TOTAL-HELIOSTAT	4399.	116.0	3697.	4090.	916.	8703.	177.44
4410	REFLECTIVE UNIT	310.	18.1	638.	1366.	158.	2163.	44.09
4411	REFLECTIVE SURFACE	88.	5.5	193.	871.	84.	1148.	23.40
4412	MIRROR BACK STRUCT	124.	6.5	229.	496.	22.	746.	15.21
4413	ASSY & BOND	99.	6.1	217.	0.	52.	269.	5.48
4420	DRIVE UNIT	542.	32.8	1157.	2053.	456.	3666.	74.74
4421	AZIMUTH	280.	16.7	589.	210.	273.	1072.	21.86
4422	ELEVATION	175.	10.7	377.	1105.	183.	1664.	33.93
4423	MOTOR TOTAL	0.	0.0	0.	413.	0.	413.	8.43
4424	POS/LIMIT INDICATO	54.	3.4	119.	28.	0.	147.	3.00
4425	PWR SPLY/DIST	0.	0.0	0.	295.	0.	295.	6.02
4426	ASSY DR/PED/ELECT	33.	2.0	72.	2.	0.	74.	1.51
4430	CONTROL/INSTRMT EQ	171.	10.7	378.	444.	1.	823.	16.77
4431	SENSOR/CALIB EQUIP	0.	0.0	0.	10.	0.	10.	.20
4432	FIELD CONTROL	1.	.1	3.	4.	0.	7.	.14
4433	CNTRL/SIG EQ	161.	10.0	354.	389.	1.	744.	15.17
44320101	COLLECTOR CONTROL	9.	.5	21.	41.	0.	62.	1.26
4440	FOUND/SITE PREP	134.	18.6	430.	225.	131.	786.	16.02
4441	FOUNDATION	122.	13.5	311.	225.	131.	667.	13.60
4442	SITE PREPARATION	12.	5.1	119.	0.	0.	119.	2.42
4450	HELIO SPT ST/PR EN	71.	4.4	157.	1.	170.	328.	6.68
4451	HELIO SUPP STRUCT	71.	4.4	157.	1.	170.	328.	6.68
4452	PROTECTION ENCL	0.	0.0	0.	0.	0.	0.	0.00
4453	LIGHTNING PROT.	0.	0.0	0.	0.	0.	0.	0.00

Table 9-10

(Sheet 2 of 2)

PROTOTYPE HELIOSTAT INVESTMENT COST - 2500 UNITS

WBS NUMBER AND TITLE		+-NON+-----CAPITAL INVESTMENT-----+							INVEST
		RECUR	LABOR	MATL	DOLLAR			TOTAL	
		(THOU)	HOURS	DOLL	PUR PT	RAW	MTL		\$/SMR
4460	FIELD ASSY & C/O	636.	31.5	471.	1.	0.		472.	9.63
4461	HELIOSTAT	593.	10.3	238.	0.	0.		238.	4.85
4462	SENSOR/CALIB EQ	1.	.1	3.	0.	0.		3.	.05
4463	ELECTRICAL/DISTRIB	39.	5.8	134.	0.	0.		134.	2.73
4464	ALIGN HELIOSTATS	3.	2.6	59.	0.	0.		59.	1.21
4465	FIELD SUPPORT	1.	.5	11.	0.	0.		11.	.23
4466	PACK & TRANSP	1.	.8	27.	1.	0.		28.	.56
4470	DESIGN/ENGINEER'G	2534.	0.0	466.	0.	0.		466.	9.50
4471	DESIGN	1274.	0.0	0.	0.	0.		0.	0.00
4472	SUSTAINING ENGR.	580.	11.5	466.	0.	0.		466.	9.50
4473	PRE PROD UNIT	170.	0.0	0.	0.	0.		0.	0.00
4474	SITE ACTIVATION	510.	0.0	0.	0.	0.		0.	0.00
4100	SITE,STRU,MISC EQ	0.	1.0	15.	174.	5.		194.	3.96
4130	MISC.EQUIP	0.	1.0	15.	174.	5.		194.	3.96
4800	DIST AND INDIR	0.	0.0	0.	11.	0.		11.	.23
4840	INITIAL SPARES	0.	0.0	0.	11.	0.		11.	.23

Table 9-11

FIRST YEAR OPERATIONS

(1978 DOLLARS IN \$000)

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

WBS NUMBER AND TITLE		+--OPERATIONS AND MAINTENANCE-----+					
		+---NON-LABOR-----+			+---LABOR-----+		
		SPARES	REP	PT	OTHER	CORRECT	SCHED TOTAL
	GRAND TOTAL	11.	12.	15.	65.	12.	116.
4410	REFLECTIVE UNIT	1.	0.	0.	1.	0.	2.
4411	REFLECTIVE SURFACE	1.	0.	0.	1.	0.	2.
4412	MIRROR BACK STRUCT	0.	0.	0.	0.	0.	0.
4420	DRIVE UNIT	4.	4.	0.	42.	0.	50.
4421	AZIMUTH	1.	1.	0.	13.	0.	15.
4422	ELEVATION	0.	1.	0.	3.	0.	5.
4423	MOTOR TOTAL	1.	2.	0.	23.	0.	26.
4425	PWR SPLY/DIST	2.	0.	0.	2.	0.	4.
4430	CONTROL/INSTRMT EQ	7.	8.	1.	22.	0.	38.
4431	SENSOR/CALIB EQUIP	0.	0.	0.	0.	0.	0.
4432	FIELD CONTROL	3.	0.	0.	0.	0.	3.
4433	CNTRL/SIG EQ	4.	0.	1.	22.	0.	35.
4450	HELIO SPT ST/PR EN	0.	0.	0.	0.	0.	0.
4451	HELIO SUPP STRUCT	0.	0.	0.	0.	0.	0.
OM000	O AND M SUMMARY	0.	0.	14.	0.	12.	26.
OM100	OPERATIONS	0.	0.	0.	0.	0.	0.
OM200	MAINT. MATERIAL	0.	0.	14.	0.	0.	14.
OM300	MAINTENANCE LABOR	0.	0.	0.	0.	12.	12.

9.5.3 Costing Approach

The costing approach has been to adjust the 25,000 unit per year data base to incorporate vendor quotes obtained for the PDR Pilot Plant cost projections and other low volume procurement information, as appropriate, and to repeg the costs on the cost reduction curve as the average for the first 2,500 units. Material items not changed, simply have been brought up the cost reduction curve from their 25,000 per year peg point. The 25,000 unit labor basis peg point also has been retained, but the cost reduction curve changed to 87 percent providing a steeper ascent along the curve to the pilot production quantity. In addition, labor and material visibility have been incorporated into each CBS line item, and loaded factory labor rates have been increased to \$32.70 per hour, without fee, to reflect added indirects expected at the type of production facility described.

Non-recurring costs were based, in great part, on PDR non-recurring data as adjusted for 1 year inflation and on certain vendor tooling expectations. Non-recurring direct support costs for tooling, product support, quality assurance and production planning are developed by factors applied to the recurring touch labor base.

The Operations and Maintenance costing approach is identical to that applied for the 25,000 per year scenario. Differences in cost are caused by the order of magnitude difference in field quantities and the higher hardware costs which impact spares and repair parts cost.

9.6 SPECIAL CASES

Two special cases were examined from a cost point of view. The first involves the cost of inverting the heliostat and the second deals with the use of mil specification versus commercial electronic components.

9.6.1 Inversion Costs

The cost of being able to invert the design baseline manifests in three ways-- added azimuth weight, additional elevation drive parts, and lost mirror area less the cost of additional mirror surface area. These costs are shown in

Table 9-12 and are based on the costs as factored for the 25,000 heliostat per year scenario. An additional 0.82 square meter of mirror is lost due to the slot required for inversion. The cost of the mirror includes both the added square footage of the mirror module and added stringer length, both of which are costed on a dollar per area basis. The overall cost per square meter is calculated as the difference in cost per square meter between the inverting heliostat at 49.05 m² and the non-inverting heliostat at 49.87 m², after adjusting the non-inverting heliostat total cost for net cost difference.

Table 9-12
COST OF INVERTING

Azimuth Housing Weight		\$ 0.90
Elevation Drive		
Drag Link	\$ 22.56	
Bushing	.50	
Pin	1.50	
Invert Hinge Point	6.00	
Stowage Jack	224.58	
Motor	49.25	
		<u>\$304.39</u>
Cost to Invert		\$305.29
Lost Mirror Surface		
Cost of Mirror (0.82 m ²)		(49.46)
Equivalent Cost		<u>\$210.17</u>
	TOTAL	\$466.00
	\$/m ²	\$ 9.50
	\$/m ² R (0.92)	\$ 10.32

9.6.2 Mil Specification Versus Commercial Component Cost

The issue has been raised concerning whether it is better to employ more costly mil specification electronic components or commercial grade electronic components in order to save both first year infant mortality costs as well as follow-on costs. A preliminary analysis uncovered the following:

- 1) Mil specification components cost 4 to 10 times more than commercial grade parts.
- 2) Commercial grade parts average 9 to 50 times higher failure rates, depending on grades compared, although information available on this relationship is sketchy.
- 3) Infant mortality may be cut considerably by increasing burn-in of components at an elevated temperature to 168 hours.
- 4) High grade commercial parts that have been screened by the vendor to the equivalent of quality level B-2 of the Military Standardization Handbook will cost approximately 1.7 to 2 times more than average grade commercial components, but will support a 22 times better failure rate.

The extra investment cost of using "mil-spec" components could range between 4 and 10 million dollars while the extra cost of failures may run between \$160,000 and \$890,000 per year. Although tending to support the use of military specification parts, if the extra investment cost were 10 million dollars and the annual savings 890 thousand dollars, then a rate of return that is only 8 percent on top of the inflation rate (e.g., 6 + 8 or 14%) would just allow recovery in 30 years. Since better investment opportunities are not uncommon, this scenario might be rejected.

Item 4, above, suggests a better solution. For approximately 1 million dollars additional investment over an investment in average grade commercial parts, an operating savings of 400 thousand dollars per year might be realized. In this case, the rate of return is 40 percent.

APPENDIX H
COST WORK SHEETS

APPENDIX H
COST WORK SHEETS

The material in this appendix contains computer printed cost work sheets.
The order in which they are presented is as follows:

- 25,000 Heliostats Per Year (H-4 to H-64)
 - Heliostat Investment (H-4 to H-46)
 - Maintenance Equipment Investment (H-47)
 - Initial Spares Investment (H-48 to H-50)
 - First Year Operations and Maintenance (H-51 to H-64)
- 250,000 Heliostats Per Year Investment (H-65 to H-106)
- 1,000,000 Heliostats Per Year Investment (H-107 to H-148)
- 2,500 Heliostats (H-149 to H-209)
 - Heliostat Investment (H-149 to H-191)
 - Maintenance Equipment Investment (H-192)
 - Initial Spares Investment (H-193 to H-195)
 - First Year Operations and Maintenance (H-196 to H-209)

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PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

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REFLECTIVE SURFACE 441

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A			TOTAL	\$/SK
10101. LAMINATE T636									
LABOR REQUIRED FOR LAMINATING LINE/ SOURCE: MDL/MDC	LBR	.27 HRS	4.93	1.33	1.00	2.32	1.23	3.80	.08
1010201. FAB T637									
LABOR REQUIRED FOR MIRRORING LINE. SOURCE: ADL/MDC	LBR	.81 HRS	4.93	3.99	1.00	2.32	1.23	11.39	.23
1010202. FRONT LITE ID40044-3									
.060 X 48 X 132 CORNING FUSION GLASS. SOURCE: CORNING	P P	12.00 UNITS	15.98	191.71	1.00	0.00	0.00	191.71	3.91
1010203. CHEMICALS T638									
MIRRORING SOLUTION, SILVER AND COPPER. SOURCE: SOMMER & MAGA IND. (LONDON, ENG.).	R M	12.00 UNITS	1.50	17.97	1.00	0.00	0.00	17.97	.37
1010204. SETUP T501									
	ERR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10103. BACK LITE ID40044-5									
.188 X 48 X 132 FLOAT GLASS SOURCE: ASG	P P	12.00 UNITS	17.97	215.67	1.00	0.00	0.00	215.67	4.40
10104. ADHESIVE IXA3504									
BOND GLASS SHEETS TOGETHER WITH POLYURETHANE ADHESIVE. WT=2 LB. 3M CORPORATION	R M	12.00 UNITS	2.31	27.78	1.00	0.00	0.00	27.78	.57
10105. SETUP T503									
	ERR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10120. PLANNING T 1									
FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBR	.03 HRS	4.93	.16	1.00	2.32	1.23	.46	.01
10121. QUAL & HA IND T 2									
FACTOR OF .062 PERCENT X MFG HOURS	LBR	.07 HRS	4.93	.33	1.00	2.32	1.23	.94	.02

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

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REFLECTIVE SURFACE 4411										
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
			COST		CRC	OVERHEAD	G&A			
10123.										
TOOLING MATERIAL T 4										
\$.70 PER TOOLING HOURS PLUS .06	LBR	.07 HRS	4.93	.36	1.00	2.32	1.23	1.03		.02
PERCENT OF THE MFG. HOUR.	R M	1.00 UNITS	.06	.06	1.00	0.00	0.00	.06		.00
10124.										
PROD SUPPORT T 5										
.042 PERCENT OF MFG + PLAN + TOOL	LBR	.05 HRS	4.93	.22	1.00	2.32	1.23	.64		.01
REFLECTIVE SURFACE 4411								471.	9.61	

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

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MIRROR BACK STRUCT 4412

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CNC	OVERHEAD	G&A		
10201. ASSY SUPPORT STR ID40045 INBOARD, OUTBOARD CROSS BEAM DIAGONAL BEAMS AND OUTBOARD AND INBOARD ANGLES.	LBR	1.28 HRS	4.93	6.32	1.00	2.32	1.23	18.04	.37
10202. INBOARD CROSS BM ID40045-3 .0785 X 27 X 173 148 LB. EA	P P	2.00 UNITS	43.70	87.40	1.00	0.00	0.00	87.40	1.78
10203. OUTBOARD CROSS BM ID40045-5 .0516 X 11 X 173 44 LB. EA. SOURCE: U.S. STEEL	P P	2.00 UNITS	13.02	26.04	1.00	0.00	0.00	26.04	.53
10204. DIAGONAL BEAM/LH ID40045-7 .0785 X 26 X 112 66 LB. EACH	P P	2.00 UNITS	19.20	38.41	1.00	0.00	0.00	38.41	.78
10205. DIAGONAL BEAM/RH ID40045-8 .0785 X 26 X 112 66 LB. EACH	P P	2.00 UNITS	19.20	38.41	1.00	0.00	0.00	38.41	.78
10206. HAT/STRINGER ID40045-9 .0635 (16 GA) X 6.00 IN. X 130 GALV. STEEL SHEET HATS, HT= 14 LB EA. SOURCE: WOODSIDE ENGR. CO.	P P	24.00 UNITS	5.56	133.39	1.00	0.00	0.00	133.39	2.72
10207. OUTBOARD ANGLES ID40045-15 .0516 X 3.5 X 4.5 .23 LB. EACH SOURCE: U.S. STEEL	R M	4.00 UNITS	.07	.27	1.00	0.00	0.00	.27	.01
10208. INBOARD ANGLES ID40045-13 .0516 X 4.0 X 10.50 .61 LB EACH SOURCE: U.S. STEEL	R M	4.00 UNITS	.18	.73	1.00	0.00	0.00	.73	.01
10209. GUSSET ANGLE ID40045-11 .25X8.5X17.50 11 LB. EA. SOURCE: U.S. STEEL	R M	4.00 UNITS	3.11	12.43	1.00	0.00	0.00	12.43	.25
10211. CLINCH NUT S-0420-1-Z SOURCE: S.P.S. CO.	P P	46.00 UNITS	.04	1.90	1.00	0.00	0.00	1.90	.04
10212. BOLT T501 .25 UNC-20 X .75 LONG SAE SOURCE: MCMASTER	P P	48.00 UNITS	.04	1.85	1.00	0.00	0.00	1.85	.04

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

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MIRROR BACK STRUCT 4412

DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
						CRC	OVERHEAD	G&A		
10213.										
WASHER	T602									
.25 ID SAE WASHER		P P	48.00 UNITS	.00	.13	1.00	0.00	0.00	.13	.00
SOURCE: MCMASTER										
10220.										
PLANNING	T 1									
FACTOR OF 10 PERCENT X MFG HOURS		LBR	.04 HRS	4.93	.19	1.00	2.32	1.23	.54	.01
DIST. .03 TO LABOR AND										
.07 TO NON-RECURRING.										
10221.										
QUAL & RA IND	T 2									
FACTOR OF .062 PERCENT X MFG HOURS		LBR	.08 HRS	4.93	.39	1.00	2.32	1.23	1.12	.02
10223.										
TOOLING MATERIAL	T 4									
\$.70 PER TOOLING HOURS PLUS .06		LBR	.09 HRS	4.93	.43	1.00	2.32	1.23	1.23	.03
PERCENT OF THE MFG. HOUR.		R M	1.00 UNITS	.07	.07	1.00	0.00	0.00	.07	.00
10224.										
PHOD SUPPORT	T 5									
.042 PERCENT OF MFG + PLAN + TOOL		LBR	.05 HRS	4.93	.27	1.00	2.32	1.23	.76	.02
MIRROR BACK STRUCT 4412									363.	7.39

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

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ASSY & BOND 4413

DESCRIPTION	QTY/HRS/ ANH. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CHC OVERHEAD G&A			TOTAL	\$/SM
10301. ASSY & BOND 441301 BONDS MIRRORS TO BACKING/STRINGERS TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M COMP) SOURCE: ADL/MDC	LBR 1.21 HRS	4.93	5.98	1.00	2.32	1.23	17.09	.35
10302. ADHESIVE 441301 BONDS MIRRORS TO BACKING/STRINGERS TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M COMP) SOURCE: ADL/MDC	H M 12.00 UNITS	2.35	28.18	1.00	0.00	0.00	28.18	.57
10303. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBR .04 HRS	4.93	.18	1.00	2.32	1.23	.51	.01
10304. QUAL & RA IND T 2 FACTOR OF .002 PERCENT X MFG HOURS	LBR .38 HRS	4.93	.37	1.00	2.32	1.23	1.06	.02
10306. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	LBR .08 HRS R M 1.00 UNITS	4.93 .07	.4 .07	1.00 1.00	2.32 0.00	1.23 0.00	1.16 .07	.02 .00
10307. PROD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL	LBR .05 HRS	4.93	.25	1.00	2.32	1.23	.72	.01
ASSY & BOND 4413								

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PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

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AZIMUTH 4421

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A	TOTAL	\$/SH
20101. ASSEMBLY ID40065 DRIVE COMPONENTS ASSEMBLY SOURCE: ADL/WDAC	LBR	.67 HRS	4.93	3.32	1.00 2.32 1.23	9.49	.19
2010201. HOUSING ID40038 WELDMENT HOUSING WT= 348 LB. SOURCE: U.S. STEEL	LBR R M	.79 HRS 1.00 UNITS	4.93 81.61	3.88 81.61	1.00 2.32 1.23 1.00 0.00 0.00	11.08 81.61	.23 1.66
2010203. BUSHING PIVOT KJS1616060 PER SPECIFICATION. PIVOT POINT BUSHING. SOURCE: SARGENT	P P	2.00 UNITS	.73	1.45	1.00 0.00 0.00	1.45	.03
201030101. MEMBRANE T607 10 O.D. X .156 WALL	R M	1.00 UNITS	3.94	3.94	1.00 0.00 0.00	3.94	.08
201030102. TUBE T608 10 O.D. X .156 WALL X 8 HIGH MADE OF 4130, 7 TL, SOURCE: U.S. STEEL	R M	1.00 UNITS	10.44	10.44	1.00 0.00 0.00	10.44	.21
201030103. SPLINE T609 10 O.D. X .312 WALL X 3 LONG	R M	1.00 UNITS	7.96	7.96	1.00 0.00 0.00	7.96	.16
201030104. DOUBLE T610 6.50 OD X .375 L.C. STEEL SOURCE: U.S. STEEL	R M	2.00 UNITS	1.82	3.65	1.00 0.00 0.00	3.65	.07
201030105. ASSEMBLY T603 FAB AND ASSY. FLEX SPLINE SOURCE: ADL/WDAC	LBR	.64 HRS	4.93	3.16	1.00 2.32 1.23	9.02	.18
201030201. PLUG T605 7 OD X 1.50 L.C. STEEL SOURCE: U.S. STEEL	R M	1.00 UNITS	3.38	3.38	1.00 0.00 0.00	3.38	.07
201030202. DRIVE SHAFT T611 1.75 OD, .75 ID X 10.75 LONG L.C. STEEL PIPE. SOURCE: KELLY PIPE.	R M	1.00 UNITS	1.93	1.93	1.00 0.00 0.00	1.93	.04
201030203. BEARING BB-2151 PER SPECIFICATION SOURCE: MC GILL MFG. CO.	P P	1.00 UNITS	75.62	75.62	1.00 0.00 0.00	75.62	1.54

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AZIMUTH 4421						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ AJN. FAIL	REF UNIT COST	SUB TOTAL		CRC	OVERHEAD	G&A		\$/SM
201030204. FABRICATION T653 FAB AND ASSY. WAVE GENERATOR SOURCE: ADL/MDAC	LBR	.54 HRS	4.93	2.66		1.00	2.32	1.23	7.59	.15
20104. BEARING TURNET BB-2149 PER SPECIFICATION. SOURCE: MC GILL MFG. CO.	P P	1.00 UNITS	20.78	20.78		1.00	0.00	0.00	20.78	.42
2010601. RETAINER-OUTER IT49852-1 19.625 OD X 15.1875 ID X 1.25 LG. L.C. STEEL. WT = 29.28 SOURCE: U.S. STEEL	LBR R M	.02 HRS 1.00 UNITS	4.93 6.87	.08 6.87		1.00 1.00	2.32 0.00	1.23 0.00	.24 6.87	.00 .14
2010602. NUT T640 1/2 I.D. SOURCE: MCMASTER	P P	8.00 UNITS	.14	1.09		1.00	0.00	0.00	1.09	.02
2010603. BOLTS T510 1/2 X 3, GLASS 5 SOURCE: MC MASTER	P P	6.00 UNITS	.45	3.53		1.00	0.00	0.00	3.63	.07
2010604. WASHER T511 1/2 ID. SOURCE: MC MASTER	P P	8.00 UNITS	.00	.03		1.00	0.00	0.00	.03	.00
2010701. PAN-OIL T513 1500 X .125 L.C. STEEL WT = 6.25 SOURCE: U.S. STEEL	P P	1.00 UNITS	1.85	1.85		1.00	0.00	0.00	1.85	.04
2010703. SCREW T515 1/2 LONG FLAT HEAD SOURCE: MC MASTER	P P	8.00 UNITS	.00	.03		1.00	0.00	0.00	.03	.00
2010801. CIRCULAR SPLINE T 36 15 OD X 10 ID X 2.75 LG LC STEEL SHEET. WT = 73 LB. SOURCE: LINCOLN FOUNDRY	LBR R M	.51 HRS 1.00 UNITS	4.93 33.09	2.49 33.09		1.00 1.00	2.32 0.00	1.23 0.00	7.12 33.09	.15 .67
2010803. BOLTS T516 1/2 X 2 CLASS 5 SOURCE: MC MASTER	P P	8.00 UNITS	.31	2.45		1.00	0.00	0.00	2.45	.05

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AZIMUTH 4421										
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
						CNC	OVERHEAD	G&A		
2010804. WASHER 1/2 ID SOURCE: MC MASTER T520	T517	P P	8.00 UNITS	.00	.03	1.00	0.00	0.00	.03	.00
2010901. HELICON PER SPECIFICATION SOURCE: SPIROID	RMJ22178	LBH H M	.13 HRS 1.00 UNITS	4.93 2.01	.66 2.01	1.00 1.00	2.32 0.00	1.23 0.00	1.89 2.01	.04 .04
201090101. PINION PER SPECIFICATION. SOURCE: SPIROID	T519	P P	1.00 UNITS	3.40	3.40	1.00	0.00	0.00	3.40	.07
201090102. RING-PINION-RET 2.75 O.D. SOURCE: MC MASTER	T520	P P	1.00 UNITS	.36	.36	1.00	0.00	0.00	.36	.01
201090103. SHIM-GEAR 1.50 O.D./1.125 ID SOURCE: MC MASTER	T521	P P	1.00 UNITS	.06	.06	1.00	0.00	0.00	.06	.00
201090104. KEY-GEAR 1 LONG X 1/4 WIDE SOURCE: MC MASTER	NAS558-308-8	P P	1.00 UNITS	.22	.22	1.00	0.00	0.00	.22	.00
201090105. NUT GEAR AFBMA STANDARD M-05 SOURCE: MC MASTER	T522	P P	1.00 UNITS	1.04	1.04	1.00	0.00	0.00	1.04	.02
201090106. WASHER GEAR AFBMA STANDARD M-05 SOURCE: MC MASTER	T523	P P	1.00 UNITS	.15	.15	1.00	0.00	0.00	.15	.00
201090107. BEARING DRIVE SHAFT BEARING PER SPECIFICATION.	67046NR1641DC	P P	1.00 UNITS	3.97	3.97	1.00	0.00	0.00	3.97	.08
201090108. RING-BEARING-RET DRIVE SHAFT BEARING PER SPECIFICATION.	MS16625-1200 RETAINER	P P	1.00 UNITS	.36	.36	1.00	0.00	0.00	.36	.01

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AZIMUTH 4421						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	CNC	OVERHEAD	G&A		\$/SM	
2011001. BOLTS PER SPECIFICATION. SOURCE: LAWRENCE ENGINEERING	HLI-116-16-20	P P	12.00 UNITS	.34	4.08	1.00	0.00	0.00	4.08	.08
2011002. NUT PER SPECIFICATION SOURCE: LAWRENCE ENGINEERING 5644	HLI-73PB-16	P P	12.00 UNITS	1.70	20.42	1.00	0.00	0.00	20.42	.42
2011201. TUBE-ELEC.WIRE .688 OD X .063 WALL X 13 LONG. L.C. STEEL. SOURCE: KELLY PIPE.	T543	P P	1.00 UNITS	.16	.16	1.00	0.00	0.00	.16	.00
2011202. CLAMP-WIRE TUBE SOURCE: MC MASTER	5644	P P	1.00 UNITS	.23	.23	1.00	0.00	0.00	.23	.00
2011301. COVER 9 DIA. X .125 AND 8 DIA. X .125 L.C. STEEL SHEET.	T646	LBR M M	.00 HRS 1.00 UNITS	4.93 1.17	.00 1.17	1.00 1.00	2.32 0.00	1.23 0.00	.01 1.17	.00 .02
2011302. SCHEM AFFIX COVER TO DRIVE HOUSING. SOURCE: MC MASTER	T613	P P	4.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
2011303. GROMMET HOLDS WIRE AND SEALS GEN HOUSING COMPARTMENT. SOURCE: MC MASTER	T526	P P	1.00 UNITS	.06	.06	1.00	0.00	0.00	.06	.00
20114. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR	.10 HRS	4.93	.49	1.00	2.32	1.23	1.39	.03
20115. Q & RA-IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR	.20 HRS	4.93	1.01	1.00	2.32	1.23	2.88	.06
20117. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBR M M	.22 HRS 1.00 UNITS	4.93 .18	1.11 .18	1.00 1.00	2.32 0.00	1.23 0.00	3.16 .18	.06 .00

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DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CRC	OVERHEAD	G&A		
20118. PRODUCTION SUPT. T 5 .042 PERCENT OF MFG + PLAN + TOOL LBR								
	.14 HRS	4.93	.68	1.00	2.32	1.23	1.95	.04
AZIMUTH							354.	7.21

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ELEVATION		4422					F A C T O R S			TOTAL	\$/SM
DESCRIPTION		QTY/HRS/ ANW. FAIL	REF UNIT COST	SUB TOTAL	ChC	OVERHEAD	G&A				
2020101. WELDMENT DRAG LINK WT= 65 LB. SOURCE: U.S. STEEL	T 50 LBR R M	.52 HRS 1.00 UNITS	4.93 15.26	2.56 15.26	1.00 1.00	2.32 0.00	1.23 0.00	7.30 15.26	.15 .31		
2020103. BUSHING PER SPECIFICATION. BUSHING. SOURCE: SARGENT	KJS1616060 PIVOT POINT P P	2.00 UNITS	.25	.50	1.00	0.00	0.00	.50	.01		
2020104. SHIM PIVOT POINT SHIM RESTRICTS MOVEMENT. SOURCE: MC MASTER	T 41 R M	4.00 UNITS	.34	1.36	1.00	0.00	0.00	1.36	.03		
2020105. BOLT 3/4 DIA X 5 LONG SOURCE: MC MASTER	T52B P P	2.00 UNITS	2.26	4.51	1.00	0.00	0.00	4.51	.09		
2020106. SEAL-DUST SOURCE: MC MASTER	T529 P P	2.00 UNITS	.06	.11	1.00	0.00	0.00	.11	.00		
2020107. THRUST BRG PER SPECIFICATION. SOURCE: SARGENT	KTM-1622060 P P	4.00 UNITS	.20	.82	1.00	0.00	0.00	.82	.02		
2020108. NUT .75 I.D. SOURCE: MC MASTER	T530 P P	2.00 UNITS	.35	.70	1.00	0.00	0.00	.70	.01		
2020109. BUSHING-CLAMP UP .75 DIA X 5 LONG, CLASS 8	T531 P P	2.00 UNITS	1.93	3.86	1.00	0.00	0.00	3.86	.08		
2020110. BOLT-ROD END .75 DIA X 3.25 LONG, CLASS 8 SOURCE: MC MASTER	T532 P P	2.00 UNITS	1.20	2.40	1.00	0.00	0.00	2.40	.05		
2020111. NUT-ROD END .75 I.D. SOURCE: MC MASTER	T533 P P	2.00 UNITS	.35	.70	1.00	0.00	0.00	.70	.01		
2020112. BUSHING CLAMP UP SOURCE: MC MASTER	T534 P P	2.00 UNITS	.25	.50	1.00	0.00	0.00	.50	.01		

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ELEVATION 4422						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	CHC	OVERHEAD	G&A			\$/SM
2020113. SHIM MID END SOURCE: MC MASTER	T535	P P 4.00 UNITS	.34	1.36	1.00	0.00	0.00	1.36	.03	
2020114. SEAL-DUST HOOD END SOURCE: MC MASTER	T536	P P 4.00 UNITS	.06	.23	1.00	0.00	0.00	.23	.00	
20202. JACK SCREW 5 TON, 6 INCH RAISE, .85 INCH X 2 INCH X 22 INCH. WT=80.4 LB. DUFF NORTON	T 52	P P 2.00 UNITS	224.58	449.16	1.00	0.00	0.00	449.16	9.16	
2020301. TUBE 16 IN. OD X .105 IN WALL X 81 IN. LONG. LC STEEL PIPE 124 LB. SOURCE: KELLY PIPE	ID40042-3	R M 1.00 UNITS	43.76	43.76	1.00	0.00	0.00	43.76	.89	
2020302. TAB ACTUATION .5 X 10 X 10 LC STEEL WT=5.73 LB SOURCE: U.S. STEEL	ID40042-5	LBR .13 HRS R M 2.00 UNITS	4.93 3.21	.64 6.42	1.00 1.00	2.32 0.00	1.23 0.00	1.82 6.42	.04 .13	
2020303. TAB HINGE .5 X 9 X 9 LC STEEL WT=5 LB. SOURCE: U.S. STEEL	ID40042-9	LBR .02 HRS R M 4.00 UNITS	4.93 2.60	.11 10.39	1.00 1.00	2.32 0.00	1.23 0.00	.31 10.39	.01 .21	
2020304. FLANGE .625 X 18.00 X 18.00 LOW CARBON STEEL PLATE SOURCE: U.S. STEEL	ID40042-7	LBR .23 HRS R M 2.00 UNITS	4.93 13.00	1.12 26.00	1.00 1.00	2.32 0.00	1.23 0.00	3.20 26.00	.07 .53	
2020305. ASSEMBLY SUPPORTS REFLECTOR AND TIES ELEVATIONAL AZIMUTH DRIVE TOGETHER. WT=193 LBS. SOURCE: ADL/MDC	ID40042	LBR 1.21 HRS	4.93	5.98	1.00	2.32	1.23	17.09	.35	
2020401. BUSHING PER SPECIFICATION SOURCE: SARGENT	KJS-1616060	P P 4.00 UNITS	.20	.82	1.00	0.00	0.00	.82	.02	
2020402. SHAFT PIVOT SHAFT.	T647	P P 4.00 UNITS	4.03	16.11	1.00	0.00	0.00	16.11	.33	

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ELEVATION	4422									
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A		TOTAL		\$/SM	
2020403. SEAL-DUST PER SPECIFICATION. SOURCE: SARGENT	KTM-1622060	P P	4.00 UNITS	.06	.23	1.00 0.00 0.00	.23	.00		
2020404. WASHER SOURCE: LAWRENCE ENGINEERING	AN-960-416L	P P	4.00 UNITS	.07	.27	1.00 0.00 0.00	.27	.01		
20209. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR	.05 HRS	4.93	.31	1.00 2.32 1.23	.89	.02		
20210. O & RA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR	.13 HRS	4.93	.65	1.00 2.32 1.23	1.84	.04		
20212. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBR	.14 HRS	4.93	.71	1.00 2.32 1.23	2.02	.04		
		R M	1.00 UNITS	.11	.11	1.00 0.00 0.00	.11	.00		
20213. PRODUCTION SPT .042 PERCENT OF MFG + PLAN + TOOL	T 5	LBR	.09 HRS	4.93	.44	1.00 2.32 1.23	1.25	.03		
ELEVATION	4422						621.	12.67		

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MOTOR TOTAL 4423

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S COC OVERHEAD GRA			TOTAL	\$/SA
2030101. BOLTS T538 1/4 DIA. X 1 LONG, CLASS 2 SOURCE: MC MASTER	P P	4.00 UNITS	.06	.23	1.00	0.00	0.00	.23	.00
2030102. WASHER T539 1/4 DIA. SOURCE: MC MASTER	P P	1.00 UNITS	.03	.03	1.00	0.00	0.00	.03	.00
2030103. AZIMUTH MOTOR T667	P P	1.00 UNITS	64.89	64.89	1.00	0.00	0.00	64.89	1.32
2030201. BOLT/NUT T541 1/4 DIA. X 1 LONG, CLASS 2 SOURCE: MC MASTER	P P	4.00 UNITS	.36	1.45	1.00	0.00	0.00	1.45	.03
2030202. WASHER T542 1/4 DIA. SOURCE: MC MASTER	P P	4.00 UNITS	.03	.14	1.00	0.00	0.00	.14	.00
2030203. TRKING MOTOR T665 1/4 HP., 24V, THREE PHASE WITH A MENA "C" CURVE SOURCE: W.C. PEART CO.	P P	1.00 UNITS	47.66	47.66	1.00	0.00	0.00	47.66	.97
2030301. BOLT/NUT T544 1/4 X 1 LONG, CLASS 2 SOURCE: MC MASTER	P P	4.00 UNITS	.36	1.45	1.00	0.00	0.00	1.45	.03
2030302. WASHER T545 1/4 DIA. SOURCE: MC MASTER	P P	4.00 UNITS	.03	.14	1.00	0.00	0.00	.14	.00
2030303. STORAGE MOTOR T666 1/4 HP, 240V, THREE PHASE WITH	P P	1.00 UNITS	47.66	47.66	1.00	0.00	0.00	47.66	.97
MOTOR TOTAL								164.	3.34

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POS/LIMIT INDICATO 4424

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A	TOTAL	\$/SM
20401. ASSEMBLY OF ELECTRONIC SOURCE: ADL	T614	LBR .66 HRS	4.93	3.26	1.00 2.32 1.23	9.32	.19
2040201. HALL EFFECT SENSOR SOURCE: MICRO SWITCH	T616	P P 2.00 UNITS	1.82	3.64	1.00 0.00 0.00	3.64	.07
2040202. LINE DRIVER SOURCE: FAIRCHILD	9614	P P 3.00 UNITS	.76	2.27	1.00 0.00 0.00	2.27	.05
2040203. FERROUS METAL DISC SOURCE: MDAC	T618	P P 3.00 UNITS	1.13	3.40	1.00 0.00 0.00	3.40	.07
2040301. DUEL DIFF LINE REC SOURCE: FAIRCHILD	9615	P P 1.00 UNITS	.87	.87	1.00 0.00 0.00	.87	.02
2040302. OPT.ISOL. TRIACS PER SPECIFICATION SOURCE: MOTOROLA	02T3244	P P P 4.00 UNITS	1.08	4.31	1.00 0.00 0.00	4.31	.09
2040303. RESISTOR PER SPECIFICATION SOURCE: RCA	11 Z 13	P P P 4.00 UNITS	.12	.50	1.00 0.00 0.00	.50	.01
2040304. CAPACITOR PER SPECIFICATION SOURCE: RCA	0.1MF1400V	P P P 4.00 UNITS	.11	.45	1.00 0.00 0.00	.45	.01
2040305. PRINTED CIRCUIT BD T107 6 IN. X 6 IN. TWO SIDE EPOXY GLASS, P P COPPER CIRCUITRY, WITH THRU PLATED HOLES. .02 SOURCE: MDAC		P P P 1.00 UNITS	.82	.82	1.00 0.00 0.00	.82	.02
2040306. COVER PER SPECIFICATION SOURCE: MDAC	T226	P P P 1.00 UNITS	1.02	1.02	1.00 0.00 0.00	1.02	.02
20405. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR .02 HRS	4.93	.10	1.00 2.32 1.23	.28	.01

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POS/LIMIT INDICATO 4424

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CHC	OVERHEAD	G&A		
20406.								
Q & MA IND T 2								
FACTOR OF .062 PERCENT X MFG HOURS LBR	.04 HRS	4.93	.20	1.00	2.32	1.23	.58	.01
20408.								
TOOLING MATERIAL T 4								
\$.70 PER TOOLING HOURS PLUS .06 LBR	.05 HRS	4.93	.22	1.00	2.32	1.23	.63	.01
PERCENT OF THE MFG. HOUR. R M	1.00 UNITS	.04	.04	1.00	0.00	0.00	.04	.00
20409.								
PRODUCTION SUPPT. T 5								
.042 PERCENT OF MFG + PLAN + TOOL LBR	.03 HRS	4.93	.14	1.00	2.32	1.23	.39	.01
POS/LIMIT INDICATO 4424							29.	.58

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PMR SPLY/DIST 4425

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CRC	OVERHEAD	G&A		
2050201. FEEDER CABLE CLX 3, NO. 4 AWG, 5KV, COPPER CABLE/GALITEP P 2000, WITH ALUMINUM SHEATH AND PVC JACKETS SUITABLE FOR DIRECT BURIAL. SOURCE: OKONITE	1.00 UNITS	7.76	7.76	1.00	0.00	0.00	7.76	.16
2050202. TRANSFORMER 225T(19)H PER SPECIFICATIONS. SOURCE: SQUARE D	1.00 UNITS	18.10	18.10	1.00	0.00	0.00	18.10	.37
2050203. DIST PANEL 50.0-H-4172-4M 480V THREE PHASE WITH 100 AMP C/B. SOURCE: SQUARE D	1.00 UNITS	1.87	1.87	1.00	0.00	0.00	1.87	.04
2050204. BRANCH CIR BKN SQD NO.FA-34040 480V, 3 POLE, 40 AMP SOURCE: SQUARE D	15.00 UNITS	.23	3.47	1.00	0.00	0.00	3.47	.07
2050205. BRANCH CIR CABLE CLX-AIS 3, NO.8 AWG, 600V, COPPER CABLE/GALITEP P 2000 WITH ALUMINUM SHEATH AND PVC JACKET, SUITABLE FOR DIRECT BURIAL. SOURCE: OKONITE	1.00 UNITS	48.37	48.37	1.00	0.00	0.00	48.37	.99
2050206. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBR ERR	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
2050207. O & RA - IND T 2 FACTOR OF .062 PERCENT X MFG HOURS	LBR ERR	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
2050208. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	LBR ERR R M	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
2050209. PRODUCTION SUPT. T 5 .042 PERCENT OF MFG + PLAN + TOOL + O & RA (DIRECT & IND.)	LBR ERR	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00

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PMH SPLY/DIST		4425									
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
						CHC	OVERHEAD	G&A			
2050301.											
WIRE	CLX-16										
3 NO. 16 AWG WITH OPTICAL FIBER		P P	1.00 UNITS	8.17	8.17	1.00	0.00	0.00	8.17	.17	
SOURCE: OKONITE											
2050302.											
CIR BKR/HOLDER	T663										
480V, 15 AMP, 3 PHASE C/B PLUS		P P	1.00 UNITS	37.33	37.33	1.00	0.00	0.00	37.33	.76	
HOLDER.											
SOURCE: SQUARE D											
2050303.											
CONNECTORS	T664										
OPTICAL FIBER COUPLINGS.		P P	2.00 UNITS	3.17	6.35	1.00	0.00	0.00	6.35	.13	
PMH SPLY/DIST		4425								131.	2.68

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

ASSY DR/PED/ELECT 4426

T

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	
					CHC	OVERHEAD	G&A		\$/SH
20601.									
ASSY DR/PED/ELECT 4426	T								
DRIVE AND PEDESTAL LABOH REQUIRED	LBR	.40 HRS	4.93	1.99	1.00	2.32	1.23	5.70	.12
ASSEMBLY OF MAIN BEAM, JACKS,	P P	1.00 UNITS	1.13	1.13	1.00	0.00	0.00	1.13	.02
DRAG LINK, AZIMUTH DRIVE, PEDESTAL									
AND ELECTRIC.									
SOURCE: ADL/MDAC									
20604.									
PLANNING	T 1								
FACTOR OF 10 PERCENT X MFG HOURS	LBR	.01 HRS	4.93	.06	1.00	2.32	1.23	.17	.00
DIST. .03 TO LABOH AND									
.07 TO NON-RECURRING.									
20605.									
QUAL & MA IND	T 2								
FACTOR OF .062 PERCENT X MFG HOURS	LBR	.03 HRS	4.93	.12	1.00	2.32	1.23	.35	.01
20607.									
TOOLING MATERIAL	T 4								
\$.70 PER TOOLING HOURS PLUS .06	LBR	.03 HRS	4.93	.14	1.00	2.32	1.23	.39	.01
PERCENT OF THE MFG. HOUR.	R M	1.00 UNITS	.02	.02	1.00	0.00	0.00	.02	.00
20608.									
PROD SUPPORT	T 5								
.042 PERCENT OF MFG + PLAN + TOOL	LBR	.02 HRS	4.93	.08	1.00	2.32	1.23	.24	.00
ASSY DR/PED/ELECT 4426	T							8.	.16

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

SENSOR/CALIB EQUIP 4431

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
3010201. CAMERA SOURCE: GENERAL ELECTRIC	TN2200	P P	1.00 UNITS	.79	.79	1.00	0.00	0.00	.79 .02
3010202. CAMERA LENS	T648	P P	1.00 UNITS	.04	.04	1.00	0.00	0.00	.04 .00
3010203. TRIPOD 6 FT HIGH SOURCE: MDAC	T649	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010204. COOLER-HEATER SOURCE: MDAC	T650	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010205. ELECTRONICS CAMERA ELECTRONICS SOURCE: MDAC	T651	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010206. CABLE 3 NO. 16 AWG WITH OPTICAL FIBER SOURCE: OKONITE	CLX-16	P P	1.00 UNITS	.01	.01	1.00	0.00	0.00	.01 .00
30105. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
30106. Q & RA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
30107. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBR ERR R M	0.00 HRS 0.00 0.00 UNITS	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
30108. PRODUCTION SUPT. .042 PERCENT OF MFG + PLAN + TOOL + Q & RA (DIRECT & IND.)	T 5	LBR ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00

SENSOR/CALIB EQUIP 4431

1. .02

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

FIELD CONTROL 4432

DESCRIPTION		QTY/HRS/ ANW. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
30201. ASSEMBLY T62C DDI COMPONENT ASSEMBLY	LBR	.02 HRS	4.93	.09	1.00	2.32	1.23	.25	.01
3020201. TWO SIDED PMB 44320201 SOURCE: MDAC	P P	2.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
3020202. CONNECTOR T652 24 PIN SOURCE: AMP INC.	P P	2.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
3020203. LED SG1010 PER SPECIFICATION SOURCE: RCA	P P	10.00 UNITS	.00	.03	1.00	0.00	0.00	.03	.00
3020204. OPT TRANSCEIVER T622 COMMUNICATION WITH HELIOSTAT ARRAY CONTROLLER SOURCE: TI	P P	2.00 UNITS	.05	.10	1.00	0.00	0.00	.10	.00
3020205. MICRO-COMPUTER T623 SIMILAR TO NAT'L SEMI 8748 SOURCE: NAT'L SEMICONDUCTOR	P P	2.00 UNITS	.05	.10	1.00	0.00	0.00	.10	.00
3020206. OPT TRANSCEIVER T624 COMMUNICATION WITH HELIOSTAT CONTROLLER. SOURCE: TI	P P	8.00 UNITS	.04	.33	1.00	0.00	0.00	.33	.01
3020207. RELAY T660 4 PDT (5V) SOURCE: POTTER BROMFIELD	P P	3.00 UNITS	.01	.08	1.00	0.00	0.00	.08	.00
3020208. CERAMIC CAPS T626 0.1 MF .50V SOURCE: BELL	P P	8.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
3020209. MODULAR PWR-SUPPLY T627 PV SOURCE: LAURELA	P P	2.00 UNITS	.14	.29	1.00	0.00	0.00	.29	.01
3020210. FOAM PADS T628 ATTACH FOAM CUSHIONS TO TOP OF BOX.	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00

PHOTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

FIELD CONTROL 4432

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CHC	OVERHEAD	G&A		
3020211. PHOTO DETECTOR OPTICAL FIBER SOURCE: I.T.	T629 P P 2.00 UNITS	.02	.03	1.00	0.00	0.00	.03	.00
3020212. PHOTO TRANSISTORS OPTICAL FIBER SOURCE: I.T.	T630 P P 8.00 UNITS	.00	.02	1.00	0.00	0.00	.02	.00
3020213. BOX ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVER. SOURCE: NEWPORT PLASTIC	T631 P P 1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
3020214. CONNECTOR 36 COND NO. 24 AWG FLAT WIRE AND CONNECTORS. SOURCE: AMP INC.	T231 P P 2.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
30215. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1 LBR .00 HRS	4.93	.00	1.00	2.32	1.23	.01	.00
30216. Q & RA - IND FACTOR OF .062 PERCENT X MFG HOURS	T 2 LBR .00 HRS	4.93	.01	1.00	2.32	1.23	.02	.00
30218. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4 LBR .00 HRS R M 1.00 UNITS	4.93 .00	.01 .00	1.00 1.00	2.32 0.00	1.23 0.00	.02 .00	.00 .00
30219. PROD SUPPORT. .042 PERCENT OF MFG + PLAN + TOOL	T 5 LBR .00 HRS	4.93	.00	1.00	2.32	1.23	.01	.00
FIELD CONTROL	4432						1.	.03

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

CNTHL/SIG EO 4433

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
30301. ASSEMBLY TOTAL COMPONENTS	T201	LBR	1.98 HRS	4.93	9.75	1.00	2.32	1.23	27.84 .57
3030201. PRINTED CIRCUIT BD T100 4 IN X 5 IN TWO SIDED EPOXY GLASS COPPER CIRCUITRY WITH THRU PLATED HOLES. .02 SOURCE: MDAC		T P P	1.00 UNITS	.82	.82	1.00	0.00	0.00	.82 .02
3030203. CONNECTOR 24 PIN SOURCE: AMP INC.	T652	P P	1.00 UNITS	1.14	1.14	1.00	0.00	0.00	1.14 .02
3030204. MU.COMPUTER SIMILAR TO NAT'L SEMI 8748 SOURCE: NAT'L SEMICONDUCTOR	T623	P P	1.00 UNITS	13.62	13.62	1.00	0.00	0.00	13.62 .28
3030205. QUAD.DIFF. LINE DR T656 MOTOR DRIVER INTERFACE SIMILAR TO NAT'L SEMI. DS1638		P P	2.00 UNITS	.79	1.59	1.00	0.00	0.00	1.59 .03
3030206. QUAD.DIFF. LINE WE T657 ENCODER INTERFACE SIMILAR TO NAT'L SEMI. DS1639		P P	2.00 UNITS	.79	1.59	1.00	0.00	0.00	1.59 .03
3030207. HEX D-FLIP FLOP ENCODER INTERFACE SOURCE: T.I.	T658	P P	3.00 UNITS	.57	1.70	1.00	0.00	0.00	1.70 .03
3030208. CAPACITOR 0.1 MF .50V SOURCE: BELL	T626	P P	3.00 UNITS	.16	.49	1.00	0.00	0.00	.49 .01
3030209. POWER SUPPLY PER SPECIFICATION SOURCE: SEMICONDUCTOR CIR., INC	3425-0000	P P P	1.00 UNITS	45.40	45.40	1.00	0.00	0.00	45.40 .93
3030210. BOX ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVER. SOURCE: NEWPORT PLASTIC	T631	P P	1.00 UNITS	1.02	1.02	1.00	0.00	0.00	1.02 .02

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

CNTRL/SIG EQ 4433

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
		COST		CHC	OVERHEAD	G&A			
3030211. CONNECTOR 24 PIN FEMALE SOURCE: AKP INC.	T602 P P 1.00 UNITS		1.14	1.14	1.00	0.00	0.00	1.14	.02
30312. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1 LBH .06 HRS		4.93	.29	1.00	2.32	1.23	.84	.02
30313. Q & RA - IND FACTOR OF .062 PERCENT X MFG HOURS	T 2 LBH .12 HRS		4.93	.60	1.00	2.32	1.23	1.73	.04
30315. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4 LBH .13 HRS R M 1.00 UNITS		4.93	.66 .11	1.00 1.00	2.32 0.00	1.23 0.00	1.89 .11	.04 .00
30316. PROD. SUPPORT .042 PERCENT OF MFG + PLAN + TOOL	T 5 LBH .08 HRS		4.93	.41	1.00	2.32	1.23	1.17	.02
CNTRL/SIG EQ	4433							102.	2.08

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

COLLECTOR CONTROL 44320101

DESCRIPTION	QTY/HRS/ AMB. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G/A	TOTAL	\$/SMR
30401. CPU COLLECTOR CONTROL CPU'S WITH 32KB OF ADS. MEMORY.	2.00 UNITS	1.50	3.01	1.00 0.00 0.00	3.01	.06
30402. LINE INTERFACE DL11-MB SERIAL LINE INTERFACES TO MCS, BEAM CHARACTERIZATION SYSTEM AND DATA ACQUISITION SYSTEM TO 9600 BAUD	6.00 UNITS	.10	.61	1.00 0.00 0.00	.61	.01
30403. WATCH DOG TIMER KM11-M COMPUTER RESETABLE CLOCK SOURCE: DEC	2.00 UNITS	.07	.14	1.00 0.00 0.00	.14	.00
30404. UNIBUS LINK DATA HIGHSPEED PARALLEL COMMUNICATION INTERFACE. SOURCE: DEC	1.00 UNITS	.41	.41	1.00 0.00 0.00	.41	.01
30405. FIELD INTERFACE DZ11-E A SYNCHRONOUS 16 LINE MULTIPLEXOR TRANSMISSION TO 9600 BAUD TO FIELD CONTROLLERS	2.00 UNITS	.20	.40	1.00 0.00 0.00	.40	.01
30406. STORAGE MSH J6	6.00 UNITS	.35	2.08	1.00 0.00 0.00	2.08	.04
30407. FORTRAN IV PLUS OP100-CE HIGH LEVEL ENGLISH CONVERSION LANGUAGE COMPILER.	2.00 UNITS	.13	.26	1.00 0.00 0.00	.26	.01
30408. UNIVERSAL TIME TONE REC T632 UNIVERSAL TIME TONE SAV	2.00 UNITS	.24	.47	1.00 0.00 0.00	.47	.01
30409. TIME CODE GEN To33 HIGH B BCD OUTPUT (DAY, MONTH, HOUR, P MINUTE, SECOND)	2.00 UNITS	.09	.19	1.00 0.00 0.00	.19	.00
30412. COLLECTOR CONTROL 44320101 TOTAL - HELIOSTAT CONTROLLER	.04 HRS	13.66	.57	1.00 2.32 11.23	1.64	.03

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

COLLECTOR CONTROL 44320101

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CNC	OVERHEAD	G&A		
30414. Q & RA - IND T 2 FACTOR OF .062 PERCENT X MFG HOURS LBR	.00 HRS	4.93	.01	1.00	2.32	1.23	.04	.00
30415. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 LBR PERCENT OF THE MFG. HOUR. R M	.00 HRS 1.00 UNITS	4.93 .00	.01 .00	1.00 1.00	2.32 0.00	1.23 0.00	.04 .00	.00 .00
30416. PRODUCTION SUPT. T 5 .042 PERCENT OF MFG + PLAN + TOOL LBR + Q & RA (DIRECT & IND.)	.00 HRS	4.93	.01	1.00	2.32	1.23	.02	.00
30417. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS LBR	.00 HRS	4.93	.01	1.00	2.32	1.23	.02	.00
COLLECTOR CONTROL 44320101							9.	.19

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

FOUNDATION 4441

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A			TOTAL	\$/SM
4010101. FORM, POUR/FINISH 444111 LABOR TO POSITION TAPERED PIPE, POUR CONCRETE AND VIBRATE. 5 CREWS (25 WEEK BASE) EACH 5 LABORERS (INCL. LEAD) SOURCE: STEARNS-ROGER	LBR	2.50 HRS	13.61	34.04	1.00	1.70	1.00	57.86	1.18
4010102. CAGES 444112 LABOR TO SET UP AND PLACE CAGES IN AUGERED HOLE. 5 CREWS (25 WEEK BASE) EACH 2 RODMEN 2 IRONWORKERS SOURCE: STEARNS-ROGER	LBR	2.00 HRS	13.61	27.23	1.00	1.70	1.00	46.29	.94
4010103. EQUIP OPER & DRIVE 444113 EQUIPMENT OPERATORS AND TRUCK DRIVERS USED IN SUPPORT OF FOUNDATION INSTALLATION. 5 CREWS (25 WEEK BASE) EACH 1 HYDRAULIC CRANE OPERATOR 1 OILER 3 TRUCK DRIVERS SOURCE: STEARNS-ROGER	LBR	2.50 HRS	13.61	34.04	1.00	1.70	1.00	57.86	1.18
40102. CONCRETE 44412 3.0 CUBIC YARDS OF CONCRETE PRICED AT \$37 PER YARD INCLUDING COST OF MATERIALS, MIXING AND DELIVERY TO FOUNDATIONS POSITION. SOURCE: STEARNS-ROGER	P P	1.00 UNITS	131.90	131.90	1.00	0.00	0.00	131.90	2.69
40103. CAGES 44413 428.2 LBS. OF HEBAR PRICED AT \$.20 PER LB. AND LABOR TO PRE- FABRICATE HEBAR CAGES. 5 CREWS (25 WEEK BASE) EACH 2 RODMEN 3 LABORERS (INCLUDING LEAD) 1 HYDRAULIC CRANE OPERATOR 1 TRUCK DRIVER SOURCE: STEARNS-ROGER	LBR H M	3.50 HRS 1.00 UNITS	13.61 102.19	47.65 102.19	1.00 1.00	1.70 0.00	1.00 0.00	81.01 102.19	1.65 2.08
40104. TAPERED PIPE 44414 98.25 LBS PRICED AT \$.31 PER LB DELIVERED. BASED ON U.S. STEEL PRICE INFORMATION.	P P	1.00 UNITS	35.16	35.16	1.00	0.00	0.00	35.16	.72

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

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DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A			TOTAL	\$/SM
FOUNDATION 4441								
40105. BRACING 44415								
BRACING - - 50 SETS AT \$200 EACH . P P	1.00 UNITS	4.54	4.54	1.00	0.00	0.00	4.54	.09
FOUNDATION 4441							517.	10.54

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

SITE PREPARATION 4442

DESCRIPTION		QTY/HRS/ AM. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHC	OVERHEAD	G&A		
40201.									
SURVEY	44421								
5 SURVEY CREWS (25 WEEK BASE)		LBR	1.00 HRS	13.61	13.61	1.00	1.70	1.00	23.14 .47
2 SURVEYORS									
SOURCE: STEARNS-ROGER									
40202.									
DRILLING	44422								
DRILLING OPERATIONS, USING DRILL		LBR	3.00 HRS	13.61	40.84	1.00	1.70	1.00	69.43 1.42
SITE PREPARATION	4442								
								93.	1.89

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

HELIO SUPP STRUCT 4451

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CNC OVERHEAD G&A			TOTAL	\$/SM
50101. ASSEMBLY T455 ASSEMBLY PROCESS OF PEDESTAL COMPONENTS.	LBN	.88 HRS	4.93	4.32	1.00	2.32	1.23	12.34	.25
5010201. TUBE ID40046-3 24 OD X .105 WALL X 123 LONG LC STEEL, WT=270 LBS. SOURCE: KELLY PIPE	R M	1.00 UNITS	96.89	96.89	1.00	0.00	0.00	96.89	1.98
5010202. CAP ID40046-5 .375 X 30 X 30, LC STEEL PLATE WT=75 LB. SOURCE: U.S. STEEL	R M	1.00 UNITS	22.75	22.75	1.00	0.00	0.00	22.75	.46
5010203. COVER ID40046-7 .0396 X 10 X 10 L.C. STEEL WT=4 LB. SOURCE: U.S. STEEL	R M	1.00 UNITS	.94	.94	1.00	0.00	0.00	.94	.02
5010204. J BOX ID40046-9	P P	1.00 UNITS	.85	.85	1.00	0.00	0.00	.85	.02
50114. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBN	.03 HRS	4.93	.13	1.00	2.32	1.23	.37	.01
50115. QUAL & RA TND T 2 FACTOR OF .062 PERCENT X MFG HOURS	LBN	.05 HRS	4.93	.27	1.00	2.32	1.23	.77	.02
50117. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	LBN R M	.06 HRS 1.00 UNITS	4.93 .05	.29 .05	1.00 1.00	2.32 0.00	1.23 0.00	.84 .05	.02 .00
50118. PROD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL	LBN	.04 HRS	4.93	.18	1.00	2.32	1.23	.52	.01
HELIO SUPP STRUCT 4451								136.	2.78

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

PROTECTION ENCL 4452

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
DRC OVERHEAD G&A

TOTAL

\$/SM

PROTECTION ENCL 4452

0. 0.00

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

LIGHTNING PROT. 4453

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CMC OVERHEAD G&A

TOTAL

\$/SM

LIGHTNING PROT. 4453

0. 0.00

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

HELIOSTAT 4461

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SA
				CNC	OVERHEAD	GAA		
7010201.								
DRIVE/PED/ELTRONIC 446121								
REMOVE 803 LBS. DPE UNIT FROM FLAT BED, PLACE OVER TAPERED FOUNDATION PROTRUSION AND VIBRATE USING GROVE (MODEL 36) HYDRAULICS, DIESEL, CRANE MODIFIED TO ADD MANIPULATION. 2 CREWS (26.625 WK BASE) EACH: 1 EQUIPMENT OPERATOR 1 MILLWRIGHT 1 LABORER	LBR .53 HRS	13.61	7.25	1.00	1.70	1.00	12.32	.25
7010202.								
REFLECTOR PANELS 446122								
USE YALE MODEL G3 P-150, DIESEL, 240 IN. HIGH LIFT FORK TRUCK TO REMOVE PANEL CONTAINERS AND PLACE ON DROT 1000 SERIES 3, DIESEL 4 WHEEL STEERING TRAVELIFT, MODIFIED TO ADD 2 CRANE/MANIPULATORS. 5 CREWS (26.625 WK BASE) EACH: 1 FORKLIFT OPERATOR 1 TRAVELIFT OPERATOR 2 MILLWRIGHTS 2 LABORERS	LBR 2.66 HRS	13.61	36.25	1.00	1.70	1.00	61.62	1.26
7010203.								
OIL - DRIVE S.A.3. 30	P P 2.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
HELIOSTAT 4461							74.	1.51

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PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

SENSOR/CALIB EQ 4462

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CRC	OVERHEAD	G&A		
70202.								
INSTALL 44621								
USE STANDARD ELECTRICIAN TOOLS TO	LBR	.00 HRS	13.61	.04	1.00	1.70	1.00	.07 .00
INSTALL DIGITAL EYE UNITS								
1 CREW (1 WK.BASE) EACH								
1 ELECTRICIAN								
EFFORT IS CONCURRENT AND IN								
ASSOCIATION WITH CALIBRATION.								
8.3 UNITS (6/FIELD).								
70203.								
CALIBRATE 44622								
ONE VOLT-OHM METER AND ONE	LBR	.00 HRS	13.61	.04	1.00	1.70	1.00	.07 .00
SENSOR/CALIB EQ 4462								0. .00

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

ELECTRICAL/DISTRIB 4463

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	
					CNC	OVERHEAD	G&A		\$/SM
70302. INSTAL CABLE 44631 EMPLOY VIBRATORY, DIESEL, PLOW TO BURY ONE POWER/FIBEROPTICS CABLE. 3 CREWS (26.625 WK. BASE) EACH 1 CABLE PLOW OPERATOR 2 LABORS	LBH	1.07 HRS	13.61	14.50	1.00	1.70	1.00	24.65	.50
70303. PWR TR/DISTRIB PNL 44632 INSTALL POWER TRANSFORMER/ DISTRIBUTION PANELS USING 1 TRUCK AND 1 FORKLIFT. 1 CREW (2 WK BASE) EACH 1 TRUCK DRIVER 1 FORKLIFT OPERATOR 1 MILLWRIGHT 2 LABORS	LBH	.03 HRS	13.61	.35	1.00	1.70	1.00	.59	.01
70304. CONN,C/O&CLUSE OUT 44633 USE 1 SPECIAL TEST SET AND	LBH	.71 HRS	13.61	9.67	1.00	1.70	1.00	16.43	.33
ELECTRICAL/DISTRIB 4463								42.	.85

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

ALIGN HELIOSTATS 4464

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CRC OVERHEAD G&A

TOTAL

\$/SM

ALIGN HELIOSTATS 4464

0. 0.00

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

FIELD SUPPORT 4465

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CHC	OVERHEAD	G&A		
70501.								
INSTALLATION MGMT 44651								
OVERALL MANAGEMENT OF FIELD EFFORT. LBR	.11 HRS	13.61	1.45	1.00	1.70	1.00	2.47	.05
1 FIELD MANAGER (28.46 WK BASE).								
7050201.								
SUPERVISION 44652-1								
1 LOGISTICS SUPERVISOR LBR	.11 HRS	13.61	1.45	1.00	1.70	1.00	2.47	.05
(28.46 WK BASE).								
7050202.								
RECORDS 44652-2								
KEEP ACCOUNTABLE RECORDS FOR FIELD LBR	.11 HRS	13.61	1.45	1.00	1.70	1.00	2.47	.05
MATERIALS, COMPLETIONS TO SPEC.,								
RECORDS, ETC.								
1 RECORDS CLERK (28.46 WK BASE).								
7050203.								
FIELD COORDINATION 44652-3								
COORDINATE MATERIAL HANDLING, LBR	.43 HRS	13.61	5.82	1.00	1.70	1.00	9.89	.20
MOVEMENT AND SCHEDULES.								
4 FIELD COORDINATORS (28.46 WK BASE)								
7050204.								
PERSONNEL 44652-4								
KEEPS PERSONNEL FILES, ADMINISTERS LBR	.11 HRS	13.61	1.45	1.00	1.70	1.00	2.47	.05
HOUSING AND BENEFITS FOR FIELD								
PERSONNEL, TIME RECORDS, ETC.								
1 PERSONNEL CLERK (28.64 WK BASE).								
70503.								
QUALITY CONTROL 44653								
OVERSEE AND ASSURE QUALITY OF LBR	.08 HRS	13.61	1.05	1.00	1.70	1.00	1.78	.04
INSTALLATIONS THROUGH FIELD								
INSPECTION, PRACTICES REVIEW, AND								
DECEPANT MATERIAL, FAILURE AND								
CONNECTIVE ACTION REPORTS.								
1 QUAL. ASSUR. REP.								
(26.625 WK BASE).								
70504.								
FIELD ENGINEERING 44654								
PROVIDE ENGINEERING SUPPORT DURING LBR	.15 HRS	13.61	2.09	1.00	1.70	1.00	3.56	.07
							25.	.51
FIELD SUPPORT 4465								

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PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

PACK & TRANSP 4466

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	FACTORS - CRC OVERHEAD GRA			TOTAL	\$/SH
7060101.									
DRIVE 44661-1									
SPECIALIZED TRAILER BED WITH RACK ON ONE SIDE FOR PEDESTAL, DRIVE, SHORT MAIN BEAM ASSEMBLY TO LEAN AGAINST, AND WITH 4 BY 4'S ATTACHED TO FLOOR FOR BRACING. QTY PER TRAILER BED = 12. REUSABLE SPECIALIZED TRAILER BEDS: MINIMUM QUANTITY NEEDED FOR 1 WEEK: 42.	P P	1.00 UNITS	.19	.19	1.00	0.00	0.00	.19	.00
7060102.									
REFLECTOR 44661-2									
SPECIALIZED PALLET FOR HOLDING REFLECTOR PANELS (ALREADY ATTACHED TO MIRROR BACKING STRUCTURE) IN AN UPRIGHT POSITION, EACH BRACED ON A BOX STRUCTURE WHICH IS MOUNTED ON THE PALLET. CUSHIONED HOLDOWN ASSEMBLY KEEPS THE TOPS OF THE PANELS SECURE. QTY PER PALLET = 4 PANELS. REUSABLE PALLETS: MINIMUM QTY. NEEDED FOR 1 WEEK = 250	P P	1.00 UNITS	.39	.39	1.00	0.00	0.00	.39	.01
7060103.									
DISTRUB ELECT 44661-3									
TRANSFORMERS STRAPPED TO REUSABLE PALLETS.	P P	1.00 UNITS	.04	.04	1.00	0.00	0.00	.04	.00
7060201.									
DRIVE 44662-1									
SPECIALIZED TRAILER BEDS REMAIN AT SITE UNTIL UNLOADED (1 WEEK'S INSTALLATION SUPPLY) ONE TRAILER, IS PULLED BY ONE TRUCK CAB. WEIGHT PER DRIVE ASSEMBLY = 1450 LBS 12 DRIVE ASSEMBLIES PER TRAILER BED 17,400 LBS. WEIGHT OF MODIFICATION TO TRAILER BED = 700 LBS. TOTAL WEIGHT OF ASSEMBLIES AND MOD. = 18,100 LBS.	LBR	.33 HRS	4.93	1.63	1.00	2.32	1.23	4.67	.10
7060202.									
REFLECTOR 44662-2									
ONE LOWBOY PULLED BY ONE TRUCK CAB, LBR ONE PALLET PER LOWBOY, PALLET LIFTED FROM LOWBOY WITH FORKTRUCK. QTY: 4 PANELS WITH BACKING STRUCTURE PALLET. WEIGHT: 1374 LBS. EACH X 4 5496 LBS. PLUS WT.. OF PALLET.	LBR	1.99 HRS	4.93	9.80	1.00	2.32	1.23	28.00	.57

PROTOTYPE HELISTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM.
			COST		CRC	OVERHEAD	G&A		
7000203. DISTRIB ELECT TRANSFORMER WEIGHT:	44662-3 2500 LBS.	LBR	.00 HRS	4.93	.01	1.00	2.32	1.23	.02 .00
PACK & TRANSP	4466							33.	.68

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

DESIGN	4471								
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHC	OVERHEAD	G&A		
DESIGN	4471							0.	0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10th YEAR

08.31.55.

DATE 05/23/78

SUSTAINING ENGR. 4472

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF. UNIT SUB TOTAL
COST

F A C T O R S
CNC OVERHEAD G&A

TOTAL

\$/SM

SUSTAINING ENGR. 4472

0. 0.00

H-44

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

PHE PROD UNIT	4473							
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A	TOTAL		\$/SM
PHE PROD UNIT	4473					0.	0.00	

H-45

PROTOTYPE HELIOSTAT INVESTMENT COST - 25000 UNITS PER YEAR - 10TH YEAR

08.31.55.

DATE 05/23/78

DESCRIPTION	QTY/HMS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CRC	OVERHEAD	GSA		
SITE ACTIVATION	4474	T					0.	0.00

PROTOTYPE HELIOSTAT INVESTMENT COST- 25000 UNITS PER YEAR- 10TH YEAR

15.54.35.

DATE 05/24/78

COLLECTOR 41311				QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A			TOTAL	\$/SM
MOBILE CRANE ME-1 ROADMOWER 4 FT WIDE, 8 FT HIGH BOOM TIP 36 FT ABOVE GROUND AT CLOSEST RADIUS CAPACITY: 10,000 LBS.		P P	1.39 UNITS	1.85	2.57	1.00	0.00	0.00	2.57	.05	
PICKUP TRUCK ME-2 3/4 TON LOW PRESSURE TIRES		P P	1.39 UNITS	2.53	3.51	1.00	0.00	0.00	3.51	.07	
FORKLIFT ME-3 JOHN DEERE AND CO. MODEL JD 380 WITH 7 FT. 8 IN MAST LIFTING CAPACITY: 4000 LBS.		P P	1.39 UNITS	1.60	2.22	1.00	0.00	0.00	2.22	.05	
HOISTING SLING ME-4 STANDARD SLING TO BE ATTACHED TO MOBILE CRANE		LBH P P H M	.01 HRS 1.39 UNITS 1.39 UNITS	4.93 .04 .01	.02 .06 .01	1.00 1.00 1.00	2.32 0.00 0.00	1.23 0.00 0.00	.07 .06 .01	.00 .00 .00	
VAN ME-51 DODGE, CHEV, FORD, OR GMC W/AUX. A1H AND AC POWER GENERATOR (240V, 15 AMPS) WITH WINDOWS ALL AROUND LOW PRESSURE TIRES, 4 WHEEL DRIVE.		P P	1.39 UNITS	2.08	2.88	1.00	0.00	0.00	2.88	.06	
EQUIPT. ME-52 PRINTER, TAPE READER, CRT SCREEN, KEYBOARD, RECORDERS, MEASUREMENT EQ.		LBH P P H M	.21 HRS 1.39 UNITS 1.39 UNITS	4.93 8.19 .75	1.02 11.38 1.04	1.00 1.00 1.00	2.32 0.00 0.00	1.23 0.00 0.00	2.90 11.38 1.04	.06 .23 .02	
WASHING EQUIP. ME-6 TWO TRUCKS IN TANDEM, ONE TO WASH WITH CB120D SOLUTION, ONE ONE TO RINSE WITH DEIONIZED WATER.		P P	1.39 UNITS	8.48	11.79	1.00	0.00	0.00	11.79	.24	
COLLECTOR 41311										38.	.78

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PROTOTYPE HELIOSTAT INVESTMENT COST- 25000 UNITS PER YEAR- 10TH YEAR

15.54.35.

DATE 05/24/78.

INITIAL SPARES 4840

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
REFLECTIVE SURFACE 4841011									
BECAUSE ALL MODULES ARE DISCARDED	F P	1.39 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
UPON FAILURE, A ONE YEAR SUPPLY	P P	1.39 UNITS	.10	.15	1.00	0.00	0.00	.15	.00
PLUS A 30-DAY CONTINGENCY SUPPLY	P P	1.39 UNITS	.01	.02	1.00	0.00	0.00	.02	.00
ARE REQUIRED.									
AZIMUTH 4841021									
BECAUSE AZIMUTH DRIVES ARE REPAIRED	F P	1.39 UNITS	.04	.06	1.00	0.00	0.00	.06	.00
ON SITE, A 30 DAY CONTINGENCY	P P	1.39 UNITS	.10	.14	1.00	0.00	0.00	.14	.00
PLUS A FIVE DAY PIPE LINE QUANTITY	P P	1.39 UNITS	.11	.16	1.00	0.00	0.00	.16	.00
ARE REQUIRED.									
JACK SCREW 48410221									
BECAUSE JACK SCREWS ARE REPAIRED	P P	1.39 UNITS	.15	.21	1.00	0.00	0.00	.21	.00
ON SITE, A 30 DAY CONTINGENCY PLUS									
A 5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
JACK SCREW 48410221									
BECAUSE JACK SCREWS ARE REPAIRED	P P	1.39 UNITS	.02	.02	1.00	0.00	0.00	.02	.00
ON SITE, A 30 DAY CONTINGENCY PLUS									
A 5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
AZIMUTH MOTOR 48410231									
BECAUSE AZIMUTH MOTORS ARE REPAIRED	P P	1.39 UNITS	.05	.07	1.00	0.00	0.00	.07	.00
ON SITE, A 30 DAY CONTINGENCY PLUS A									
5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
TRACKING MOTOR 48410232									
SAME AS AZIMUTH MOTOR.	P P	1.39 UNITS	.04	.05	1.00	0.00	0.00	.05	.00
STORAGE MOTOR 48410233									
SAME AS AZIMUTH AND TRACKING	P P	1.39 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
MOTORS.									
TRANSFORMER 484102522									
BECAUSE TRANSFORMERS ARE REPAIRED	P P	1.39 UNITS	.46	.64	1.00	0.00	0.00	.64	.01
OFF SITE, A 30 DAY CONTINGENCY									
PLUS A 5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
BRANCH CIR BKR 484102524									
BECAUSE ALL ARE SPARED, AND NONE	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
REPAIRED, ONLY A 30 DAY CONTINGENCY									
IS REQUIRED.									
COOLER-HEATER 484103124									
BECAUSE THE FAILURE RATE IS SO LOW	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
AND THE NUMBER PER FIELD IS SO LOW,									
ONLY THE PIPE LINE QTY IS REQUIRED.									

PROTOTYPE HELIOSTAT INVESTMENT COST- 25000 UNITS PER YEAR- 10TH YEAR

15.54.35.

DATE 05/24/78

INITIAL SPARES 4840										
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SH	
					CRC	OVERHEAD	G&A			
DATA DIST.INT 48410322										
BECAUSE THE DDI IS ALWAYS SPARED	P P	1.39 UNITS	.01	.01	1.00	0.00	0.00	.01	.00	
AND NEVER REPAIRED, A 30 DAY	P P	1.39 UNITS	.03	.04	1.00	0.00	0.00	.04	.00	
CONTINGENCY PLUS PIPE LINE QUANTITY	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
ARE REQUIRED.										
CNTNL/SIG EO 48410331										
BECAUSE THE CONTROL/SIG.EO. ARE	P P	1.39 UNITS	.02	.03	1.00	0.00	0.00	.03	.00	
REPAIRED OFF SITE, A 30 DAY CON-	P P	1.39 UNITS	.04	.06	1.00	0.00	0.00	.06	.00	
TINGENCY PLUS A 30 DAY PIPE LINE	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
QUANTITY ARE REQUIRED.										
REFLECTIVE SURFACE 48411111										
REFLECTIVE SURFACE WITH MAT SECTIONS	P P	1.39 UNITS	.04	.05	1.00	0.00	0.00	.05	.00	
TRANSPORTED ON REUSABLE A-FRAME	P P	1.39 UNITS	.01	.01	1.00	0.00	0.00	.01	.00	
MOUNTED ON TRUCK										
10 4X11 MODULES PER TRUCKLOAD										
MIRROR BACK STRUCT 48411121										
NO INITIAL SPHS REQUIRED	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
AZIMUTH 48411211										
5.80/CMT TRANSPORTED IN COVERED WOOD	P P	1.39 UNITS	.04	.05	1.00	0.00	0.00	.05	.00	
SKIDS	P P	1.39 UNITS	.01	.01	1.00	0.00	0.00	.01	.00	
JACK SCREW 48411221										
5.80/CMT STRAPPED TO PALLET	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
	P P	1.39 UNITS	.01	.01	1.00	0.00	0.00	.01	.00	
JACK SCREW 48411222										
5.80/CMT STRAPPED TO PALLET	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
AZIMUTH MOTOR 48411231										
6.44/CMT SHIPPED IN CARDBOARD BOX	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
	P P	1.39 UNITS	.00	.01	1.00	0.00	0.00	.01	.00	
TRKING MOTOR 48411232										
6.44/CMT SHIPPED IN CARDBOARD BOX	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
	P P	1.39 UNITS	.00	.01	1.00	0.00	0.00	.01	.00	
STORAGE MOTOR 48411233										
6.44/CMT SHIPPED IN CARDBOARD BOX	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
FEEDER CABLE 48411251										
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	
TRANSFORMER 48411252										
6.44/CMT STRAPPED TO PALLET	P P	1.39 UNITS	.01	.02	1.00	0.00	0.00	.02	.00	
	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00	

PROTOTYPE HELIOSTAT INVESTMENT COST- 25000 UNITS PER YEAR- 10TH YEAR

15.54.35.

DATE 05/24/78

INITIAL SPARES 4840

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A	TOTAL	\$/SM
DIST PANEL 484112523							
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
BRANCH CIR BKH 484112524							
0.44/CMT SHIPPED IN MCD BOX	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
BRANCH CIR CABLE 484112525							
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
WIRE 484112531							
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
CIR BKH/HOLDER 484112532							
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
CAMERA 484113121							
0.44/CMT SHIPPED IN FIBRE BOARD BOX	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
COOLER-HEATER 484113124							
0.44/CMT SHIPPED IN FIBRE BOARD BOX	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
DATA DIST. INT 48411322							
0.44/CMT SHIPPED IN CARDBRD CONTAINER	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
CNTRL/SIG EQ 4841133							
0.44/CMT SHIPPED IN CARDBRD BOX	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
HELIO. SUPP STRUCT 4841151							
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
INITIAL SPARES 4840						2.	.04
INITIAL SPARES 4840						2.	0.00

H-50

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.10.38.

DATE 05/25/78

SPARES

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	FACTORS ADJ OVERHEAD G&A			TOTAL	\$/SMH
REFLECTIVE SURFACE 4411 PANELS R/H WITH A MOBILE CRANE AND SLING, DISCARDED UPON FAILURE, FAILURE RATE/YR/1 PANEL .0003287 ALWAYS SPARED (HOWEVER, MINOR CRACKS COULD BE REPAIRED BY ADHESIVE BOND) WOOD CRATE SHIPPING 9.12/CMT	N/L	71.00 FAIL	39.19	2782.66	1.11	0.00	0.00	3074.84	.00
AZIMUTH 4421 COMPLETE ASSEMBLY R/H UPON FAILURE BENCH REPR: REPLACE DEFECTIVE GEAR TRAIN COMPONENTS, LUBRICATE HARMONIC DR SECTION WITH HEAVY DUTY OIL, PACK OIL WITH GREASE. FAILURE RATE: .00972 SPARES TRANS- PORTED IN COVERED WOODEN SKID. CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	174.96 FAIL	350.60	61340.32	.06	0.00	0.00	3373.72	.00
JACK SCHEM 442201 JACK ASSEMBLY R/H UPON COMPONENT FAIL- URE, BENCH REPR: REPLACEMENT OF DE- FECTIVE COMPONENTS. FAILURE RATE: .009 SPARES STRAPPED TO PALLET CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	162.00 FAIL	225.40	36514.26	.06	0.00	0.00	2008.28	.00
JACK SCHEM 442202 SAME AS ABOVE EXCEPT THAT FAILURE RATE IS .000444 BECAUSE THIS JACK SCHEM IS UTILIZED FEWER HRS/YR	N/L	7.99 FAIL	225.40	1801.37	.06	0.00	0.00	99.08	.00
AZIMUTH MOTOR T537 DRIVE MOTOR ASSEMBLY R/H UPON COMPO- NENT FAILURE, BENCH REPR: REPLACE INCRE- MENTAL ENCODER, DR. ELECTRONICS, MOTOR COMPONENTS. FAILURE RATE: .011167 SHIPPED IN CARDBD. BOX CMT/6.44 5 PERCENT OF FAILURES SPARED	N/L	671.36 FAIL	65.39	43898.16	.06	0.00	0.00	2414.40	.00
TRKING MOTOR T540 SAME AS AZIMUTH MOTOR	N/L	673.34 FAIL	49.43	33282.78	.06	0.00	0.00	1830.55	.00
STORAGE MOTOR T543 SAME AS AZIMUTH MOTOR EXCEPT THAT FAIL- URE RATE IS .000556 BECAUSE IT IS UTILIZED FEWER HOURS/YR.	N/L	33.43 FAIL	49.43	1652.25	.06	0.00	0.00	90.87	.00
TRANSFORMER 225T(19)H TRANSFORMER R/H FOR INTERNAL ELECT. FAILURE WITH A FORKLIFT OR MOBILE CRANE AND SLING. FAILURE RATE: .00702 SHIP BY STRAPPING TO PALLET 6.44/CMT REPR OFF SITE 25 PERCENT ARE SPARED	N/L	1.34 FAIL	5732.00	7660.63	.28	0.00	0.00	2114.33	.00

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.10.38.

DATE 05/25/78

SPARES

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
				ADJ	OVERHEAD	G&A			
BRANCH CIR BKN SOD NO.FA-34040 ALL BRANCH CIR BKN SPARED FAILURE RATE: .0033 SHIPPED IN FIBRE BOARD BOX 6.44/CMT	N/L	2.69 FAIL	73.24	196.74	.95	0.00	0.00	187.30	.00
CIR BKN/HOLDER T603 ALL CIRCUIT BKMS SPARED FAILURE RATE: .0033 SHIPPED IN FIBRE BD. BOX 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	N/L	59.40 FAIL	37.32	2216.69	1.25	0.00	0.00	2766.43	.00
COOLER-HEATER T650 COOLER-HEATER N/H, NEVER REPAIRED. SHIPPED IN FIBRE BOARD BOX CMT/6.44 FAILURE RATE: .00333	N/L	.02 FAIL	24.99	.50	1.25	0.00	0.00	.62	.00
DATA DIST.INT 443202 DDI CIRCUIT CARDS REPLACED UPON FAILURE N/L ALWAYS SPARED: REPLACE DEFECTIVE COM- PONENTS DETECTED BY MOBILE TEST VAN AND BY DETECTION OF SOFTWARE BUGS. FAILURE RATE: .017544 SHIP IN CARDBOARD CONTAINER 6.44/CMT	N/L	13.00 FAIL	403.84	5247.14	1.25	0.00	0.00	6548.44	.00
	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CNTRL/SIG EQ 4433 CIRCUIT BOARD N/H UPON FAILURE DETECTED N/L BY MOBILE TEST VAN AND OPERATIONAL IN- DICATIONS AND SOFTWARE BUGS BENCH REPH: REPLACEMENT OF DEFECT- IVE COMPONENTS FAILURE RATE: .00544 SHIP IN CARDBOARD BOX CMT/6.44 5 PERCENT SPARED 95 PERCENT REPAIRED OFF SITE	N/L	1272.96 FAIL	98.59	125506.66	.86	0.00	0.00	7906.92	.00
	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPARES								32416.	.02

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OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.14.11.

DATE 05/25/78

REPAIR PTS

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S ADJ OVERHEAD G&A			TOTAL	S/SM
MIRROR BACK STRUCT 4412 STRUCT ALWAYS REPR IN PLACE, NEVER SPARED FAILURE RATE/1 st .001 REPAIR PARTS SHIPPED IN CARDBOARD BOX CMT/4.36	N/L	18.00 FAIL	7.22	129.98	1.11	0.00	0.00	143.62	.00
AZIMUTH 4421 COMPLETE ASSEMBLY R/R UPON FAILURE BENCH REPR: REPLACE DEFECTIVE GEAR TRAIN COMPONENTS, LUBRICATE HARMONIC DR SECTION WITH HEAVY DUTY OIL, PACK GEAR WITH GREASE. FAILURE RATE: .00972 SPARES TRANS- PORTED IN COVERED WOODEN SKID.CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	174.96 FAIL	34.93	6110.78	1.05	0.00	0.00	6416.32	.01
JACK SCREW 442201 JACK ASSEMBLY R/R UPON COMPONENT FAIL- URE, BENCH REPR: REPLACEMENT OF DE- FECTIVE COMPONENTS. FAILURE RATE: .009 SPARES STRAPPED TO PALLET CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	162.00 FAIL	22.46	3638.20	1.05	0.00	0.00	3820.11	.00
JACK SCREW 442202 SAME AS ABOVE EXCEPT THAT FAILURE RATE IS .000444 BECAUSE THIS JACK SCREW IS UTILIZED FEWER HRS/YR	N/L	7.99 FAIL	22.46	179.48	1.05	0.00	0.00	188.46	.00
AZIMUTH MOTOR T537 DRIVE MOTOR ASSEMBLY R/R UPON COMPON- ENT FAILURE, BENCH REPR: REPLACE INCRE- MENTAL ENCODER, DR.ELECTRONICS, MOTOR COMPONENTS. FAILURE RATE: .011167 SHIPPED IN CARDBO.BOX CMT/6.44 5 PERCENT OF FAILURES SPARED	N/L	671.36 FAIL	6.51	4373.91	1.05	0.00	0.00	4592.61	.00
TRKING MOTOR T540 SAME AS AZIMUTH MOTOR	N/L	673.34 FAIL	4.92	3316.22	1.05	0.00	0.00	3482.03	.00
STOWAGE MOTOR T543 SAME AS-AZIMUTH MOTOR EXCEPT THAT FAIL- URE RATE IS .000556 BECAUSE IT IS UTILIZED FEWER HOURS/YR.	N/L	33.43 FAIL	4.92	164.63	1.05	0.00	0.00	172.86	.00
FEEDER CABLE CLX ALL FIELD POWER DATA CABLES REPR IN PLACE BY STANDARD ELECT. METHODS IN- CLUDING REPLACEMENT OF TERMINALS AND CONNECTORS. FAILURE RATE: .0007199 SHIPPED IN FIBRE BOARD BOX 6.44/CMT	N/L	.04 FAIL	245.57	9.80	1.25	0.00	0.00	12.23	.00

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OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.14.11.

DATE 05/25/78

REPAIR PTS

DESCRIPTION	QTY/HRS/ ABN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				ADJ	OVERHEAD	G&A		
TRANSFORMER 225T(19)H TRANSFORMER R/R FOR INTERNAL ELECT. FAILURE WITH A FORKLIFT OR MOBILE CRANE AND SLING. FAILURE RATE: .00702 SHIP BY STRAPPING TO PALLET 6.44/CMT REPR OFF SITE 25 PERCENT ARE SPARED	N/L 1.34 FAIL	572.79	765.51	.83	0.00	0.00	634.61	.00
DIST PANEL SO.D-H-4172-4N ALL DIST PANELS REPR IN PLACE FAILURE RATE: .049332 SHIPPED IN WOOD BOX 6.44/CMT	N/L 2.81 FAIL	59.18	166.40	1.25	0.00	0.00	207.67	.00
BRANCH CIR CABLE CLX-ALS ALL HELIOSTAT CABLES REPR IN PLACE FAILURE RATE: .000367 REPR PARTS SHIPPING: 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	N/L 6.61 FAIL	4.84	31.95	1.25	0.00	0.00	39.88	.00
WIRE CLX-16 ALL WIRE REPR IN PLACE BY STANDARD ELECTN/L METHODS FAILURE RATE=.002 FOR THE SUMATION OF THE 5 WIRES WITHIN THE PEDESTAL PARTS SHIPPED IN FIBRE BD.BOX 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	36.00 FAIL	.82	29.41	1.25	0.00	0.00	36.71	.00
CAMERA TR2200 CAMERA R/R, ALL REPAIRED OFF SITE SHIPPED IN FIBRE BOARD BOX CMT/6.44 FAILURE RATE: .01	N/L .06 FAIL	246.88	14.81	1.11	0.00	0.00	16.37	.00
	N/L 0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CNTRL/SIG EQ 4433 CIRCUIT BOARD R/R UPON FAILURE DETECTED BY MOBILE TEST VAN AND OPERATIONAL IN- DICATIONS AND SOFTWARE BUGS BENCH REPR + REPLACEMENT OF DEFECT- IVE COMPONENTS FAILURE RATE: .00544 SHIP IN CARDBO BX CMT/6.44 5 PERCENT SPARED 95 PERCENT REPAIRED OFF SITE	N/L 1272.96 FAIL	9.95	12670.02	1.19	0.00	0.00	15026.64	.00
	N/L 0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HELIO SUPP STRUCT 4451 ALL PEDESTALS REPR IN PLACE USING STAND-W/L AND STRUCTURAL REPAIR PROCESSES FAILURE RATE: .001 REPAIR PARTS SHIPPED AT 4.36/CMT ASSUMES SHIPMENT IN ECONOMIC QTY	N/L 18.00 FAIL	2.70	48.65	1.11	0.00	0.00	53.75	.00

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OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.14.11.

DATE 05/25/78

REPAIR PTS

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
ADJ OVERHEAD G&A

TOTAL

\$/SM

N/L

0.00 FAIL

0.00

0.00

0.00

0.00

0.00

0.00

0.00

REPAIR PTS

34844.

.02

H-55

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.18.35.

DATE 05/25/78

OTHER

DESCRIPTION

QTY/HRS/
ANN. FAILREF UNIT
COST

SUB TOTAL

F A C T O R S
ADJ OVERHEAD G&A

TOTAL

\$/SM

REFLECTIVE SURFACE 4411										
PANELS R/H WITH A MOBILE CRANE AND SLING, DISCARDED UPON FAILURE, ALWAYS SPARED (HOWEVER, MINOR CRACKS COULD BE REPAIRED BY ADHESIVE BOND) WOOD CRATE SHIPPING 9.12/CMT	N/L	71.00 FAIL	12.82	909.90	1.11	0.00	0.00	1005.44	.00	
	N/L	71.00 FAIL	1.68	119.28	1.11	0.00	0.00	131.80	.00	
MIRROR BACK STRUCT 4412										
STRUCT ALWAYS REPR IN PLACE, NEVER SPARED FAILURE RATE/14 .001	N/L	18.00 FAIL	.29	5.26	.95	0.00	0.00	5.01	.00	
CMT/4.36	N/L	18.00 FAIL	.13	2.25	.95	0.00	0.00	2.14	.00	
AZIMUTH 4421										
COMPLETE ASSEMBLY R/H UPON FAILURE	N/L	174.96 FAIL	51.04	8929.96	.06	0.00	0.00	493.38	.00	
BENCH REPR: REPLACE DEFECTIVE GEAR	N/L	174.96 FAIL	10.00	1749.60	.06	0.00	0.00	96.67	.00	
TRAIN COMPONENTS, LUBRICATE HARMONIC DR	N/L	174.96 FAIL	5.10	893.00	1.05	0.00	0.00	937.42	.00	
SECTION WITH HEAVY DUTY OIL, PACK GEAR	N/L	174.96 FAIL	1.00	174.96	1.05	0.00	0.00	183.66	.00	
FAILURE RATE: .00972 SPARES TRANS-PORTED IN COVERED WOODEN SKID.CMT/5.80										
5 PERCENT OF FAILURES ARE SPARED										
JACK SCREW 442201										
JACK ASSEMBLY R/H UPON COMPONENT FAILURE, BENCH REPR: REPLACEMENT OF DEFECTIVE COMPONENTS. FAILURE RATE: .009	N/L	162.00 FAIL	4.64	751.68	.06	0.00	0.00	41.53	.00	
SPARES STRAPPED TO PALLET CMT/5.80	N/L	162.00 FAIL	15.00	2430.00	.06	0.00	0.00	134.26	.00	
	N/L	162.00 FAIL	.46	75.17	1.05	0.00	0.00	78.91	.00	
	N/L	162.00 FAIL	1.50	243.00	1.05	0.00	0.00	255.09	.00	
JACK SCREW 442202										
SAME AS ABOVE EXCEPT THAT FAILURE RATE IS .000444 BECAUSE THIS JACK SCREW IS UTILIZED FEWER HRS/YR	N/L	7.99 FAIL	4.64	37.08	.06	0.00	0.00	2.05	.00	
	N/L	7.99 FAIL	15.00	119.88	.06	0.00	0.00	6.62	.00	
	N/L	7.99 FAIL	.46	3.71	1.05	0.00	0.00	3.89	.00	
	N/L	7.99 FAIL	1.50	11.99	1.05	0.00	0.00	12.58	.00	
AZIMUTH MOTOR T537										
DRIVE MOTOR ASSEMBLY R/H UPON COMPONENT FAILURE, BENCH REPR: REPLACE INCREMENTAL ENCODER, DR.ELECTRONICS, MOTOR	N/L	671.36 FAIL	1.09	735.00	.06	0.00	0.00	40.61	.00	
COMPONENTS. FAILURE RATE: .011167	N/L	671.36 FAIL	5.00	3356.80	.06	0.00	0.00	185.46	.00	
5 PERCENT OF FAILURES SPARED	N/L	671.36 FAIL	.11	73.50	1.05	0.00	0.00	77.16	.00	
	N/L	671.36 FAIL	.50	335.68	1.05	0.00	0.00	352.38	.00	

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OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.18.35.

DATE 05/25/78

OTHER

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					ADJ	OVERHEAD	G&A		
TAKING MOTOR T540									
SAME AS AZIMUTH MOTOR	N/L	673.34 FAIL	1.09	737.18	.06	0.00	0.00	40.73	.00
	N/L	673.34 FAIL	5.00	3366.72	.06	0.00	0.00	186.01	.00
	N/L	673.34 FAIL	.11	73.72	1.05	0.00	0.00	77.39	.00
	N/L	673.34 FAIL	.50	336.67	1.05	0.00	0.00	353.42	.00
STORAGE MOTOR T543									
SAME AS AZIMUTH MOTOR EXCEPT THAT FAILURE RATE IS .000556 BECAUSE IT IS UTILIZED FEWER HOURS/YR.	N/L	33.43 FAIL	1.09	36.50	.06	0.00	0.00	2.02	.00
	N/L	33.43 FAIL	5.00	167.13	.06	0.00	0.00	9.23	.00
	N/L	33.43 FAIL	.11	3.66	1.05	0.00	0.00	3.84	.00
	N/L	33.43 FAIL	.50	16.71	1.05	0.00	0.00	17.54	.00
FEEDER CABLE CLX									
ALL FIELD POWER DATA CABLES REPR IN PLACE BY STANDARD ELECT. METHODS IN CONNECTIONS. FAILURE RATE: .0007199 SHIPPED IN FIBRE BOARD BOX 6.44/CMT	N/L	.04 FAIL	7.33	.29	.95	0.00	0.00	.28	.00
	N/L	.04 FAIL	.63	.02	.95	0.00	0.00	.02	.00
TRANSFORMER 225T(19)H									
TRANSFORMER N/A FOR INTERNAL ELECT. FAILURE WITH A FORKLIFT OR MOBILE CRANE AND SLING. FAILURE RATE: .00702 SHIP BY STRAPPING TO PALLET 6.44/CMT	N/L	1.34 FAIL	167.44	223.78	.28	0.00	0.00	61.82	.00
	N/L	1.34 FAIL	10.00	13.36	.28	0.00	0.00	3.69	.00
	N/L	1.34 FAIL	334.88	447.56	.83	0.00	0.00	370.91	.00
	N/L	1.34 FAIL	10.00	13.36	.83	0.00	0.00	11.08	.00
DIST. PANEL SQ.D-H-4172-4N									
ALL DIST PANELS REPR IN PLACE. FAILURE RATE: .049332 SHIPPED IN WOOD	N/L	2.81 FAIL	.64	1.81	.95	0.00	0.00	1.72	.00
	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BRANCH CIR BKN SQD NO. FA-34040									
ALL BRANCH CIR BKN SPARED. FAILURE RATE: .0033	N/L	2.69 FAIL	.19	.52	.95	0.00	0.00	.49	.00
	N/L	2.69 FAIL	5.00	13.43	.95	0.00	0.00	12.79	.00
BRANCH CIR CABLE CLX-ALS									
ALL HELIOSTAT CABLES REPR IN PLACE. FAILURE RATE: .000367 ASSUMES SHIPMENT IN ECONOMIC QUANTITY	N/L	6.61 FAIL	.12	.77	.95	0.00	0.00	.73	.00
	N/L	6.61 FAIL	.63	4.13	.95	0.00	0.00	3.93	.00

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OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.18.35.

DATE 05/25/78

OTHER

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				ADJ	OVERHEAD	G&A		
WIRE CLX-13								
ALL WIRE REPR IN PLACE BY STANDARD ELECTN/L	36.00 FAIL	.12	4.17	.95	0.00	0.00	3.97	.00
METHODS N/L	36.00 FAIL	.63	22.50	.95	0.00	0.00	21.42	.00
THE 5 WIRES WITHIN THE PEDESTAL								
PANTS SHIPPED IN FIBRE BD.BOX 6.44/CMT								
ASSUMES SHIPMENT IN ECONOMIC QUANTITY								
CIM BKR/HOLDER T663								
ALL CIRCUIT BKMS SPARED N/L	59.40 FAIL	.02	1.15	.95	0.00	0.00	1.09	.00
FAILURE RATE: .0033 N/L	59.40 FAIL	.50	29.70	.95	0.00	0.00	28.27	.00
ASSUMES SHIPMENT IN ECONOMIC QUANTITY								
CAMERA TH2200								
CAMERA R/R, ALL REPAIRED OFF SITE N/L	.06 FAIL	3.86	.23	.95	0.00	0.00	.22	.00
SHIPPED IN FIBRE BOARD BOX CMT/6.44 N/L	.06 FAIL	5.00	.30	.95	0.00	0.00	.29	.00
CXILER-HEATER T650								
CXILER-HEATER R/R, NEVER REPAIRED. N/L	.02 FAIL	.19	.00	1.25	0.00	0.00	.00	.00
SHIPPED IN FIBRE BOARD BOX CMT/6.44 N/L	.02 FAIL	5.00	.10	1.25	0.00	0.00	.12	.00
DATA DIST.INI 443202								
DDI CIRCUIT CARDS REPLACED UPON FAILURE N/L	13.00 FAIL	.13	1.67	1.25	0.00	0.00	2.09	.00
ALWAYS SPARED: REPLACE DEFECTIVE COM- N/L	13.00 FAIL	5.00	65.00	1.25	0.00	0.00	81.12	.00
AND BY DETECTION OF SOFTWARE BUGS.								
FAILURE RATE: .017544								
SHIP IN CARDBOARD CONTAINER 6.44/CMT								
	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00
CNTRL/SIG EO 4433								
CIRCUIT BOARD R/R UPON FAILURE DETECTED N/L	1272.96 FAIL	.13	163.96	.06	0.00	0.00	10.23	.00
BY MOBILE TEST VAN AND OPERATIONAL IN- N/L	1272.96 FAIL	5.00	6364.80	.06	0.00	0.00	397.16	.00
DICATIONS AND SOFTWARE BUGS N/L	1272.96 FAIL	.03	32.79	1.19	0.00	0.00	38.88	.00
BENCH REPR & REPLACEMENT OF DEFECT- N/L	1272.96 FAIL	5.00	6364.80	1.19	0.00	0.00	7546.11	.00
SHIP IN CARDBRD BX CMT/6.44								
5 PERCENT SPARED								
95 PERCENT REPAIRED OFF SITE								

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OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.18.35.

DATE 05/25/78

OTHER

DESCRIPTION

	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				ADJ	OVERHEAD	G&A		
N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HELIO SUPP STRUCT 4451								
ALL PEDESTALS WEPH IN PLACE USING STAND-N/L	18.00 FAIL	.55	9.81	1.11	0.00	0.00	10.84	.00
AND STRUCTURAL REPAIR PROCESSES N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
REPAIR PARTS SHIPPED AT 4.36/CWT ASSUMES SHIPMENT IN ECONOMIC QTYs								
WASHING SOLUTION 0M231								
MC GEAN CHEM.CO,DOWNY,CA.								
USED IN 5 PERCENT SOLUTION N/L	17280.00 FAIL	3.25	56160.00	1.00	0.00	0.00	56160.00	.80
DEIONIZED HWSE WAT 0M232								
ANROWHEAD WATER N/L	***** FAIL	.05	63180.00	1.00	0.00	0.00	63180.00	.01
FUEL 0M233								
FUEL FOR WASH TRUCKS,PICK-UP TRUCKS, N/L	38232.00 FAIL	.56	21409.92	1.00	0.00	0.00	21409.92	.14
LUBRICANT 0M234								
OIL FOR AZIMUTH DRIVE N/L	180.00 FAIL	.31	56.25	1.00	0.00	0.00	56.25	.01
SOURCE: DAC, LONG BEACH								
N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OTHER

154152. .95

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.22.13.

DATE 05/25/78

CORRECT

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
					ADJ	OVERHEAD	G&A			
REFLECTIVE SURFACE 4411										
PANELS R/R WITH A MOBILE CRANE AND SLING, DISCARDED UPON FAILURE, ALWAYS SPARED (HOWEVER, MINOR CRACKS COULD BE REPAIRED BY ADHESIVE BOND) MOD CRATE SHIPPING 9.12/CMT	LBR LBR	355.00 0.00	HRS HRS	15.00 0.00	5324.94 0.00	2.21 0.00	1.00 0.00	1.00 0.00	11757.47 0.00	.01 0.00
MIRROR BACK STRUCT 4412										
STRUCT ALWAYS REPR IN PLACE, NEVER REPAIR PARTS SHIPPED IN CARDBOARD BOX CMT/4.36	LBR	54.00	HRS	15.11	815.94	2.21	1.00	1.00	1801.60	.00
AZIMUTH 4421										
COMPLETE ASSEMBLY R/R UPON FAILURE BENCH REPR: REPLACE DEFECTIVE GEAR SECTION WITH HEAVY DUTY OIL, PACK GEAR WITH GREASE. FAILURE RATE: .00972 SPARES TRANS-PORTED IN COVERED WOODEN SKID. CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	LBR LBR	3359.23 938.22	HRS HRS	15.00 15.11	50388.48 14176.55	2.21 1.30	1.00 1.00	1.00 1.00	111257.76 18372.81	.13 .02
JACK SCREW 442201										
JACK ASSEMBLY R/R UPON COMPONENT FAILURE, BENCH REPR: REPLACEMENT OF DE-SPARES STRAPPED TO PALLET CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	LBR LBR	712.80 473.85	HRS HRS	15.00 15.11	10692.00 7159.87	2.21 1.30	1.00 1.00	1.00 1.00	23607.94 9279.20	.03 .01
JACK SCREW 442202										
SAME AS ABOVE EXCEPT THAT FAILURE RATE IS .000444 BECAUSE THIS JACK SCREW IS	LBR LBR	35.16 .07	HRS HRS	15.00 15.11	527.47 1.13	2.21 1.62	1.00 1.00	1.00 1.00	1164.66 1.83	.00 .00
AZIMUTH MOTOR T537										
DRIVE MOTOR ASSEMBLY R/R UPON COMPONENT FAILURE, BENCH REPR: REPLACE INCRE- COMPONENTS. FAILURE RATE: .011167 SHIPPED IN CARDED BOX CMT/6.44 5 PERCENT OF FAILURES SPARED	LBR LBR	2282.62 1636.44	HRS HRS	15.00 15.11	34239.36 24726.61	2.21 1.30	1.00 1.00	1.00 1.00	75609.51 32045.69	.03 .01
TRACKING MOTOR T540										
SAME AS AZIMUTH MOTOR	LBR LBR	2558.71 1541.28	HRS HRS	15.00 15.11	38380.61 24799.68	2.21 1.30	1.00 1.00	1.00 1.00	84744.38 32140.39	.03 .01

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.22.13.

DATE 05/25/78

CONNECT

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL		
		COST		ADJ	OVERHEAD	G&A		\$/\$M	
STORAGE MOTOR T543 SAME AS AZIMUTH MOTOR EXCEPT THAT FAIL- URE RATE IS .000556 BECAUSE IT IS	LBN LBN	127.02 HRS 81.48 HRS	15.00 15.11	1905.32 1231.13	2.21 1.30	1.00 1.00	4206.95 1595.54	.00 .00	
FEEDER CABLE CLX ALL FIELD POWER DATA CABLES REPR IN CLUDING REPLACEMENT OF TERMINALS AND CONNECTORS. FAILURE RATE: .0007199 SHIPPED IN FIBRE BOARD BOX 6.44/CMT	LBN	.28 HRS	15.11	4.22	2.50	1.00	10.53	.00	
TRANSFORMER 225T(19)H TRANSFORMER H/H FOR INTERNAL ELECT. FAILURE WITH A FORKLIFT ON MOBILE CHANE SHIPPING TO PALLET 6.44/CMT REPR OFF SITE 25 PERCENT ARE SPARED	LBN LBN	11.23 HRS 11.69 HRS	15.00 15.11	168.39 176.70	2.21 1.30	1.00 1.00	371.82 229.00	.00 .00	
DIST PANEL S0.D-H-4172-4N ALL DIST PANELS REPR IN PLACE BOX 6.44/CMT	LBN	9.00 HRS	15.11	135.96	2.21	1.00	300.20	.00	
BRANCH CIR BKR S0D NO.FA-34040 ALL BRANCH CIR BKR SPARED FAILURE RATE: .0033	LBN LBN	8.60 HRS 8.60 HRS	15.00 15.11	128.94 129.88	2.50 2.50	1.00 1.00	321.83 324.19	.00 .00	
BRANCH CIR CABLE CLX-ALS ALL HELIOSTAT CABLES REPR IN PLACE REPR PARTS SHIPPING: 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	LBN	23.78 HRS	15.11	359.34	2.50	1.00	896.91	.00	
WIRE CLX-16 ALL WIRE REPR IN PLACE BY STANDARD ELECTLBN FAILURE RATE=.002 FOR THE SUMATION OF THE 5 WIRES WITHIN THE PEDESTAL PARTS SHIPPED IN FIBRE BD.BOX 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	LBN	129.60 HRS	15.11	1958.26	2.50	1.00	4887.81	.01	
CIR BKR/HOLDER T663 ALL CIRCUIT BKRS SPARED FAILURE RATE: .0033 ASSUMES SHIPMENT IN ECONOMIC QUANTITY	LBN LBN	190.08 HRS 190.08 HRS	15.00 15.11	2851.20 2872.11	2.50 2.50	1.00 1.00	7116.60 7168.78	.01 .01	

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.22.13.

DATE 05/25/18

CONNECT

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SJB TOTAL	F A C T O R S			TOTAL	\$/SM
					ADJ	OVERHEAD	G&A		
CAMERA TH2200									
CAMERA R/R, ALL REPAIRED OFF SITE	LBR	.18 HRS	15.00	2.70	2.21	1.00	1.00	5.96	.00
SHIPPED IN FIBRE BOARD BOX CNT/6.44	LBR	.18 HRS	15.11	2.72	1.30	1.00	1.00	3.52	.00
COOLER-HEATER T450									
COOLER-HEATER R/R, NEVER REPAIRED.	LBR	.06 HRS	15.00	.90	2.21	1.00	1.00	1.99	.00
SHIPPED IN FIBRE BOARD BOX CNT/6.44	LBR	.03 HRS	15.11	.45	2.21	1.00	1.00	1.00	.00
DATA DIST.INT 443202									
DOI CIRCUIT CARDS REPLACED UPON FAILURE	LBR	41.60 HRS	15.00	624.00	2.50	1.00	1.00	1557.52	.00
ALWAYS SPARED: REPLACE DEFECTIVE COM- AND BY DETECTION OF SOFTWARE BUGS.	LBR	22.75 HRS	15.11	343.76	2.50	1.00	1.00	858.01	.00
FAILURE RATE: .017544									
SHIP IN CARDBOARD CONTAINER 6.44/CNT									
	LBR	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CNTRL/SIG EQ 4433									
CIRCUIT BOARD R/R UPON FAILURE DETECTED	LBR	3309.70 HRS	15.00	49645.44	2.50	1.00	1.00	123915.02	.01
BY MOBILE TEST VAN AND OPERATIONAL IN- BENCH REPR: REPLACEMENT OF DEFECT- IVE COMPONENTS FAILURE RATE: .00544	LBR	4343.98 HRS	15.11	65637.48	1.46	1.00	1.00	96093.27	.01
SHIP IN CARDBOARD CNT/6.44									
5 PERCENT SPARED									
95 PERCENT REPAIRED OFF SITE									
	LBR	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HELIO SUPP STRUCT 4451									
ALL PEDESTALS REPR IN PLACE USING STAND-LBR		36.00 HRS	15.11	543.96	2.21	1.00	1.00	1201.06	.00
FAILURE RATE: .001									
REPAIR PARTS SHIPPED AT 4.36/CNT									
ASSUMES SHIPMENT IN ECONOMIC QTYs									
CONNECTIVE MAINT. 04320									
ALLOCATED ABOVE	LBR	12.00 HRS	15.00	180.00	1.00	1.00	1.00	180.00	.00
VARIES BETWEEN LABOR ON SITE (ON LINE ON BENCH REPAIR) AND OFF SITE									
EFFECTENCY FACTOR OF ON LINE IS 2									
EFFECTENCY FACTOR OF BENCH REPR 1.176									

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OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.22.13.

DATE 05/25/78

CORRECT

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	FACTORS			TOTAL	
		COST		ADJ	OVERHEAD	G&A		\$/SM
LBR	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LBR	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CORRECT

653022. .32

OPERATIONS AND MAINTENANCE 18000 HELIOSTATS (25K)

09.24.58.

DATE 05/25/78

SCHED

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	
			COST		ADJ	OVERHEAD	G&A		\$/SM
WASHING LABOR OM311 TRUCK DRIVERS, ONLY, REQUIRED 1 FOR WASH SOLUTION TRUCK 1 FOR DEIONIZED RWSE WATER TRUCK	LBR	5134.00 HRS	15.00	77760.00	1.17	1.00	1.00	90979.20	.09
CORROSION CONTRL OM312 INCLUDE: VERIFY THAT GREASE AND OIL SEALS ARE NOT LEAKING	LBR	1447.20 HRS	15.00	21708.00	1.17	1.00	1.00	25398.36	.02
	LBR	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LBR	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SCHED

116378. .11

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

REFLECTIVE SURFACE 4411

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	S/SM
					CHC	OVERHEAD	G&A		
10101. LAMINATE T636 LABOR REQUIRED FOR LAMINATING LINE/ SOURCE: ADL/MDC	LBH	.06 HRS	4.93	.29	1.00	4.99	1.32	1.94	.04
1010201. FAB T637 LABOR REQUIRED FOR MIRRORING LINE. SOURCE: ADL/MDC	LBH	.18 HRS	4.93	.88	1.00	4.99	1.32	5.81	.12
1010202. FRONT LITE ID40044-3 .060 X 48 X 132 CORNING FUSION GLASS. SOURCE: CORNING	P P	12.00 UNITS	14.93	179.17	1.00	0.00	0.00	179.17	3.65
1010203. CHEMICALS T638 MIRRORING SOLUTION, SILVER AND COPPER. SOURCE: SOMMER & MAGA IND. (LONDON, ENG.).	H M	12.00 UNITS	1.40	16.80	1.00	0.00	0.00	16.80	.34
1010204. SETUP T501	ERR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10103. BACK LITE ID40044-5 .188 X 48 X 132 FLOAT GLASS SOURCE: ASG	P P	12.00 UNITS	16.80	201.57	1.00	0.00	0.00	201.57	4.11
10104. ADHESIVE IXA3504 BOND GLASS SHEETS TOGETHER WITH POLYURETHANE ADHESIVE. WT=2 LB. 3M CORPORATION	H M	12.00 UNITS	2.16	25.96	1.00	0.00	0.00	25.96	.53
10105. SETUP T503	ERR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10120. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBH	.03 HRS	4.93	.14	1.00	4.99	1.32	.93	.02
10121. QUAL & HA IND T 2 FACTOR OF .062 PERCENT X MFG HOURS	LBH	.06 HRS	4.93	.29	1.00	4.99	1.32	1.92	.04

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

REFLECTIVE SURFACE 4411

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
10123.								
TIDDLING MATERIAL T 4								
8.70 PER TIDDLING HOURS PLUS .06	LBR	.06 HRS	4.93	.32	1.00	4.99	1.32	2.11
PERCENT OF THE MFG. HOUR.	R M	1.00 UNITS	.05	.05	1.00	0.00	0.00	.05
10124.								
PROD SUPPORT T 5								
.042 PERCENT OF MFG + PLAN + TIDL	LBR	.04 HRS	4.93	.20	1.00	4.99	1.32	1.30
							438.	8.92

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

MINOR BACK STRUCT 4412

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	FACTORS			TOTAL	\$/SM
		COST		CHC	OVERHEAD	G&A		
10201. ASSY SUPPORT STR ID40045 INBOARD, OUTBOARD CROSS BEAM DIAGONAL BEAMS AND OUTBOARD AND INBOARD ANGLES.	LBR	.28 HRS	4.93	1.40	1.00	4.99	1.32	9.19 .19
10202. INBOARD CROSS BM ID40045-3 .0785 X 27 X 173 104 LB. EA.	P P	2.00 UNITS	30.58	61.17	1.00	0.00	0.00	61.17 1.25
10203. OUTBOARD CROSS BM ID40045-5 .0515 X 11 X 173 44 LB. EA SOURCE: U.S. STEEL	P P	2.00 UNITS	13.02	26.04	1.00	0.00	0.00	26.04 .53
10204. DIAGONAL BEAM/LH ID40045-7 .0785 X 26 X 112 46 LB. EACH	P P	2.00 UNITS	13.44	26.88	1.00	0.00	0.00	26.88 .55
10205. DIAGONAL BEAM/RH ID40045-8 .0785 X 26 X 112 46 LB. EACH	P P	2.00 UNITS	13.44	26.88	1.00	0.00	0.00	26.88 .55
10206. HAT/STRINGER ID40045-9 .0635 (16 GA) X 6.00 IN. X 130 GALV. STEEL SHEET HATS, WT= 14 LB EA. SOURCE: MIDDSIDE ENGR. CO.	P P	24.00 UNITS	5.20	124.71	1.00	0.00	0.00	124.71 2.54
10207. OUTBOARD ANGLES ID40045-15 .0516 X 3.5 X 4.5 .23 LB. EACH SOURCE: U.S. STEEL	R M	4.00 UNITS	.06	.25	1.00	0.00	0.00	.25 .01
10208. INBOARD ANGLES ID40045-13 .0516 X 4.0 X 10.50 .61 LB EACH SOURCE: U.S. STEEL	R M	4.00 UNITS	.17	.68	1.00	0.00	0.00	.68 .01
10209. GUSSET ANGLE ID40045-11 .25X8.5X17.50 11 LB. EA. SOURCE: U.S. STEEL	R M	4.00 UNITS	2.91	11.62	1.00	0.00	0.00	11.62 .24
10211. CLINCH NUT S-0420-1-Z SOURCE: S.P.S. CO.	P P	48.00 UNITS	.04	1.78	1.00	0.00	0.00	1.78 .04
10212. BOLT T601 .25 UNC-20 X .75 LONG SAE SOURCE: MCMASSTER	P P	48.00 UNITS	.04	1.73	1.00	0.00	0.00	1.73 .04

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

MIRROR BACK STRUCT 4412

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
10213.									
MASHER	T602								
.25 ID SAE MASHER		P P	48.00 UNITS	.00	.12	1.00	0.00	0.00	.12 .00
SOURCE: MCMASTER									
10220.									
PLANNING	T 1								
FACTOR OF 10 PERCENT X MFG HOURS		LBR	.03 HRS	4.93	.17	1.00	4.99	1.32	1.10 .02
DIST. .03 TO LABOR AND									
.07 TO NON-RECURRING.									
10221.									
QUAL & RA END	T 2								
FACTOR OF .062 PERCENT X MFG HOURS		LBR	.07 HRS	4.93	.35	1.00	4.99	1.32	2.28 .05
10223.									
TOOLING MATERIAL	T 4								
\$.70 PER TOOLING HOURS PLUS .06		LBR	.08 HRS	4.93	.38	1.00	4.99	1.32	2.50 .05
PERCENT OF THE MFG. HOUR.		R M	1.00 UNITS	.06	.06	1.00	0.00	0.00	.06 .00
10224.									
PROD SUPPORT	T 5								
.042 PERCENT OF MFG + PLAN + TOOL		LBR	.05 HRS	4.93	.23	1.00	4.99	1.32	1.54 .03
MIRROR BACK STRUCT 4412									299. 6.09

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

ASSY & BOND

4413

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
CHC OVERHEAD G&A

TOTAL

\$/SM

10301. ASSY & BOND BONDS MIRRORS TO BACKING/STRINGERS TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M CORP) SOURCE: ADL/MDC	441301 LBR	.27 HRS	4.93	1.32	1.00	4.99	1.32	8.71	.18
10302. ADHESIVE BONDS MIRRORS TO BACKING/STRINGERS TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M CORP) SOURCE: ADL/MDC	441301 R M	12.00 UNITS	2.20	26.34	1.00	0.00	0.00	26.34	.54
10303. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1 LBR	.03 HRS	4.93	.16	1.00	4.99	1.32	1.05	.02
10304. QUAL & RA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2 LBR	.07 HRS	4.93	.33	1.00	4.99	1.32	2.16	.04
10306. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4 LBR R M	.07 HRS 1.00 UNITS	4.93 .06	.36 .06	1.00 1.00	4.99 0.00	1.32 0.00	2.37 .06	.05 .00
10307. PROD SUPPORT .042 PERCENT OF MFG + PLAN + TOOL	T 5 LBR	.05 HRS	4.93	.22	1.00	4.99	1.32	1.46	.03
ASSY & BOND	4413							42.	.86

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

AZIMUTH 4421

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S -			TOTAL	
					CHC	OVERHEAD	G&A		\$/SM
20101. ASSEMBLY ID40065 DRIVE COMPONENTS ASSEMBLY SOURCE: ADL/MDAC	LBR	.15 HRS	4.93	.73	1.00	4.99	1.32	4.84	.10
2010201. HOUSING ID40038 WELDMENT HOUSING WT=160 LB. SOURCE: U.S. STEEL	LBR R M	.17 HRS 1.00 UNITS	4.93 32.64	.86 32.64	1.00 1.00	4.99 0.00	1.32 0.00	5.65 32.64	.12 .67
2010203. BUSHING PIVOT KJS1616060 PER SPECIFICATION. PIVOT POINT BUSHING. SOURCE: SARGENT	P P	2.00 UNITS	.68	1.36	1.00	0.00	0.00	1.36	.03
201030101. MEMBRANE T6C7 10 O.D. X .156 WALL	R M	1.00 UNITS	3.68	3.68	1.00	0.00	0.00	3.68	.08
201030102. TUBE T6C8 10 O.D. X .156 WALL X 8 HIGH MADE OF 4130, 7 TL, SOURCE: U.S. STEEL	R M	1.00 UNITS	9.76	9.76	1.00	0.00	0.00	9.76	.20
201030103. SPLINE T609 10 O.D. X .312 WALL X 3 LONG	R M	1.00 UNITS	7.44	7.44	1.00	0.00	0.00	7.44	.15
201030105. ASSEMBLY T603 FAB AND ASSY. FLEX SPLINE SOURCE: ADL/MDAC	LBR	.14 HRS	4.93	.70	1.00	4.99	1.32	4.60	.09
201030201. PLUG T605 7 OD X 1.50 L.C. STEEL SOURCE: U.S. STEEL	R M	1.00 UNITS	3.16	3.16	1.00	0.00	0.00	3.16	.06
201030202. DRIVE SHAFT T611 1.75 OD, .75 ID X 10.75 LONG L.C. STEEL PIPE. SOURCE: KELLY PIPE.	R M	1.00 UNITS	1.80	1.80	1.00	0.00	0.00	1.80	.04
201030203. BEARING BB-2151 PER SPECIFICATION SOURCE: MC GILL MFG. CO.	P P	1.00 UNITS	70.70	70.70	1.00	0.00	0.00	70.70	1.44
201030204. FABRICATION T653 FAB AND ASSY. WAVE GENERATOR SOURCE: ADL/MDAC	LBR	.12 HRS	4.93	.59	1.00	4.99	1.32	3.87	.08

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

AZIMUTH 4421						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	CRC	OVERHEAD	G&A		\$/SM	
20104. BEARING TURNER PER SPECIFICATION. SOURCE: MC GILL MFG. CO.	BB-2149	P P	1.00 UNITS	19.43	19.43	1.00	0.00	0.00	19.43	.40
2010601. RETAINER-OUTER 19.625 OD X 15.1875 ID X 1.25 LG. L.C. STEEL. MT = 29.28 SOURCE: U.S. STEEL	IT49852-1	LBR H M	.01 HRS 1.00 UNITS	4.93 6.43	.06 6.43	1.00 1.00	4.99 0.00	1.32 0.00	.38 6.43	.01 .13
2010602. NUT 1/2 I.D. SOURCE: MCMASTER	T640	P P	8.00 UNITS	.13	1.02	1.00	0.00	0.00	1.02	.02
2010603. BOLTS 1/2 X 3, CLASS 5 SOURCE: MC MASTER	T510	P P	8.00 UNITS	.42	3.39	1.00	0.00	0.00	3.39	.07
2010504. WASHER 1/2 ID. SOURCE: MC MASTER	T511	P P	8.00 UNITS	.00	.03	1.00	0.00	0.00	.03	.00
2010801. CIRCULAR SPLINE 15 OD X 10 ID X 2.75 LG LC STEEL SHEET. MT = 73 LB. SOURCE: LINCOLN FOUNDRY	T 36	LBR H M	.11 HRS 1.00 UNITS	4.93 30.93	.55 30.93	1.00 1.00	4.99 0.00	1.32 0.00	3.63 30.93	.07 .63
2010803. BOLTS 1/2 X 2 CLASS 5 SOURCE: MC MASTER	T516	P P	8.00 UNITS	.29	2.29	1.00	0.00	0.00	2.29	.05
2010804. WASHER 1/2 ID SOURCE: MC MASTER T520	T517	P P	8.00 UNITS	.00	.03	1.00	0.00	0.00	.03	.00
2010901. HELICON PER SPECIFICATION SOURCE: SPIROID	RMJ22178	LBR H M	.07 HRS 1.00 UNITS	4.93 1.88	.35 1.88	1.00 1.00	4.99 0.00	1.32 0.00	2.33 1.88	.05 .04
201090101. PINION PER SPECIFICATION. SOURCE: SPIROID	T519	P P	1.00 UNITS	3.18	3.18	1.00	0.00	0.00	3.18	.06

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

DESCRIPTION	AZIMUTH	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	FACTORS			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
201090102. RING-PINION-RET 2.75 O.D. SOURCE: MC MASTER	T520	P P 1.00 UNITS	.34	.34	1.00	0.00	0.00	.34	.01
201090103. SHIM-GEAR 1.50 O.D./1.125 ID SOURCE: MC MASTER	T521	P P 1.00 UNITS	.05	.05	1.00	0.00	2.00	.05	.00
201090104. KEY-GEAR 1 LONG X 1/4 WIDE SOURCE: MC MASTER	NAL558-808-8	P P 1.00 UNITS	.20	.20	1.00	0.00	0.00	.20	.00
201090105. NUT GEAR AFBMA STANDARD #4-05 SOURCE: MC MASTER	T522	P P 1.00 UNITS	.98	.98	1.00	0.00	0.00	.98	.02
201090106. WASHER GEAR AFBMA STANDARD #4-05 SOURCE: MC MASTER	T523	P P 1.00 UNITS	.14	.14	1.00	0.00	0.00	.14	.00
201090107. BEARING DRIVE SHAFT BEARING PER SPECIFICATION.	67046NR1641DC	P P 1.00 UNITS	3.71	3.71	1.00	0.00	0.00	3.71	.08
201090108. RING-BEARING-RET DRIVE SHAFT BEARING RETAINER PER SPECIFICATION.	MS16625-1200	P P 1.00 UNITS	.34	.34	1.00	0.00	0.00	.34	.01
2011201. TUBE-ELEC.WIRE .688 OD X .063 WALL X 13 LONG, L.C. STEEL. SOURCE: KELLY PIPE.	T643	P P 1.00 UNITS	.15	.15	1.00	0.00	0.00	.15	.00
2011202. CLAMP-WIRE TUBE SOURCE: MC MASTER	5644	P P 1.00 UNITS	.21	.21	1.00	0.00	0.00	.21	.00
2011301. COVER 9 DIA. X .125 AND 8 DIA. X .125 L.C. STEEL SHEET.	T646	LBR .00 HRS R M 1.00 UNITS	4.93 1.09	.00 1.09	1.00 1.00	4.99 0.00	1.32 0.00	.02 1.09	.00 .02
2011302. SCREW AFFIX COVER TO DRIVE HOUSING. SOURCE: MC MASTER	T613	P P 4.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

AZIMUTH 4421											
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SH	
				COST		CRC	OVERHEAD	G&A			
2011303.											
GROMMET	T526										
HOLDS WIRE AND SEALS GEN		P P	1.00 UNITS	.05	.05	1.00	0.00	0.00	.05	.00	
HOUSING COMPARTMENT.											
SOURCE: MC MASTER											
20114.											
PLANNING	T 1										
FACTOR OF 10 PERCENT X MFG HOURS		LBR	.09 HRS	4.93	.46	1.00	4.99	1.32	3.04	.06	
DIST. .03 TO LABOR AND											
.07 TO NON-RECURRING.											
20115.											
O & MA-IND	T 2										
FACTOR OF .062 PERCENT X MFG HOURS		LBR	.19 HRS	4.93	.95	1.00	4.99	1.32	6.28	.13	
20117.											
TOOLING MATERIAL	T 4										
\$.70 PER TOOLING HOURS PLUS .06		LBR	.21 HRS	4.93	1.05	1.00	4.99	1.32	6.89	.14	
PERCENT OF THE MFG. HOUR.		R M	1.00 UNITS	.17	.17	1.00	0.00	0.00	.17	.00	
20118.											
PRODUCTION SUPT.	T 5										
.042 PERCENT OF MFG + PLAN + TOOL		LBR	.13 HRS	4.93	.65	1.00	4.99	1.32	4.25	.09	
AZIMUTH 4421										252.	5.14

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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ELEVATION 4422						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	CRC	OVERHEAD	G&A			\$/SM
2020101. WELDMENT T 50										
DRAG LINK WT=63 LB. SOURCE: U.S. STEEL		LBR H M	.11 HRS 1.00 UNITS	4.93 12.97	.56 12.97	1.00 1.00	4.99 0.00	1.32 0.00	3.72 12.97	.08 .26
2020103. BUSHING KJS1610060 PER SPECIFICATION. PIVOT POINT BUSHING. SOURCE: SARGENT		P P	2.00 UNITS	.23	.47	1.00	0.00	0.00	.47	.01
2020104. SHIM T 41 PIVOT POINT SHIM. RESTRICTS MOVEMENT. SOURCE: MC MASTER		R M	4.00 UNITS	.32	1.27	1.00	0.00	0.00	1.27	.03
2020105. BOLT T528 3/4 DIA X 5 LONG SOURCE: MC MASTER		P P	2.00 UNITS	2.11	4.22	1.00	0.00	0.00	4.22	.09
2020106. SEAL-DUST T529 SOURCE: MC MASTER		P P	2.00 UNITS	.05	.11	1.00	0.00	0.00	.11	.00
2020107. THRUST BRG KTM-1622060 PER SPECIFICATION. SOURCE: SARGENT		P F	4.00 UNITS	.19	.76	1.00	0.00	0.00	.76	.02
2020108. NUT T530 .75 I.D. SOURCE: MC MASTER		P P	2.00 UNITS	.33	.66	1.00	0.00	0.00	.66	.01
2020109. BUSHING-CLAMP UP T531 .75 DIA. X 5 LONG, CLASS 8		P P	2.00 UNITS	1.80	3.61	1.00	0.00	0.00	3.61	.07
2020110. BOLT-ROD END T532 .75 DIA X 3.25 LONG, CLASS 8 SOURCE: MC MASTER		P P	2.00 UNITS	1.12	2.25	1.00	0.00	0.00	2.25	.05
2020111. NUT-ROD END T533 .75 I.D. SOURCE: MC MASTER		P P	2.00 UNITS	.33	.66	1.00	0.00	0.00	.66	.01
2020112. BUSHING T534 CLAMP UP SOURCE: MC MASTER		P P	2.00 UNITS	.23	.47	1.00	0.00	0.00	.47	.01

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ELEVATION 4422

DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
						CHC	OVERHEAD	G&A		
2020113. SHIM ROD END SOURCE: MC MASTER	T535	P P	4.00 UNITS	.32	1.27	1.00	0.00	0.00	1.27	.03
2020114. SEAL-DUST ROD END SOURCE: MC MASTER	T536	P P	4.00 UNITS	.05	.21	1.00	0.00	0.00	.21	.00
20202. JACK SCREW 5 TON, 6 INCH RAISE, .85 INCH X 2 INCH X 22 INCH. WT=80.4 LB. DUFF NORTON	T 52	P P	2.00 UNITS	141.75	283.51	1.00	0.00	0.00	283.51	5.78
2020301. TUBE 16 IN. OD X .105 IN WALL X 81 IN. LONG. LC STEEL PIPE 124 LB. SOURCE: KELLY PIPE	ID40042-3	R M	1.00 UNITS	40.91	40.91	1.00	0.00	0.00	40.91	.83
2020302. TAB ACTUATOR .5 X 10 X 10 LC STEEL WT=5.73 LB SOURCE: U.S. STEEL	ID40042-5	LBR R M	.07 HRS 2.00 UNITS	4.93 3.00	.34 6.00	1.00 1.00	4.99 0.00	1.32 0.00	2.25 6.00	.05 .12
2020303. TAB HINGE .5 X 9 X 9 LC STEEL WT=5 LB. SOURCE: U.S. STEEL	ID40042-9	LBR R M	.01 HRS 4.00 UNITS	4.93 2.43	.07 9.71	1.00 1.00	4.99 0.00	1.32 0.00	.48 9.71	.01 .20
2020304. FLANGE .625 X 18.00 X 18.00 LOW CARBON STEEL PLATE SOURCE: U.S. STEEL	ID40042-7	LBR R M	.05 HRS 2.00 UNITS	4.93 12.15	.25 24.30	1.00 1.00	4.99 0.00	1.32 0.00	1.63 24.30	.03 .50
2020305. ASSEMBLY SUPPORTS REFLECTOR AND TIES ELEVATIONAL AZIMUTH DRIVE TOGETHER. WT=193 LBS. SOURCE: ADL/MDC	ID40042	LBR	.27 HRS	4.93	1.32	1.00	4.99	1.32	8.71	.18
2020401. BUSHING PER SPECIFICATION SOURCE: SARGENT	KJS-1616060	P P	4.00 UNITS	.19	.76	1.00	0.00	0.00	.76	.02
2020402. SHAFT PIVOT SHAFT.	T647	P P	4.00 UNITS	3.76	15.06	1.00	0.00	0.00	15.06	.31

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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ELEVATION 4422						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ADM. FILL	REF UNIT	SUB TOTAL	CRC	OVERHEAD	G&A			\$/SM
2020403. SEAL-DUST PER SPECIFICATION. SOURCE: SARGENT	KTM-1622060	P P	4.00 UNITS	.05	.21	1.00	0.00	0.00	.21	.00
2020404. WASHER SOURCE: LAWRENCE ENGINEERING	AN-900-416L	P P	4.00 UNITS	.06	.25	1.00	0.00	0.00	.25	.01
20209. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR	.06 HRS	4.93	.31	1.00	4.99	1.32	2.01	.04
20210. Q & RA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR	.13 HRS	4.93	.63	1.00	4.95	1.32	4.16	.08
20212. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBR	.14 HRS	4.93	.69	1.00	4.99	1.32	4.57	.09
		R M	1.00 UNITS	.11	.11	1.00	0.00	0.00	.11	.00
20213. PRODUCTION SUPT .042 PERCENT OF MFG + PLAN + TOOL	T 5	LBR	.09 HRS	4.93	.43	1.00	4.99	1.32	2.82	.06
ELEVATION	4422								440.	8.97

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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MOTOR TOTAL		4423										
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM			
			COST		CRC	OVERHEAD	G&A					
2030101.												
BOLTS	T538											
1/4 DIA. X 1 LONG, CLASS 2		P P	4.00 UNITS	.05	.21	1.00	0.00	0.00	.21	.00		
SOURCE: MC MASTER												
2030102.												
WASHER	T539											
1/4 DIA.		P P	1.00 UNITS	.03	.03	1.00	0.00	0.00	.03	.00		
SOURCE: MC MASTER												
2030103.												
AZIMUTH MOTOR	T607											
		P P	1.00 UNITS	60.67	60.67	1.00	0.00	0.00	60.67	1.24		
2030201.												
BOLT/NUT	T541											
1/4 DIA. X 1 LONG, CLASS 2		P P	4.00 UNITS	.34	1.36	1.00	0.00	0.00	1.36	.03		
SOURCE: MC MASTER												
2030202.												
WASHER	T542											
1/4 DIA.		P P	4.00 UNITS	.03	.13	1.00	0.00	0.00	.13	.00		
SOURCE: MC MASTER												
2030203.												
TRKING MOTOR	T665											
1/4 HP, 24V, THREE PHASE WITH A		P P	1.00 UNITS	44.56	44.56	1.00	0.00	0.00	44.56	.91		
NEMA "C" CURVE												
SOURCE: W.C. PEART CO.												
2030301.												
BOLT/NUT	T544											
1/4 X 1 LONG, CLASS 2		P P	4.00 UNITS	.34	1.36	1.00	0.00	0.00	1.36	.03		
SOURCE: MC MASTER												
2030302.												
WASHER	T545											
1/4 DIA.		P P	4.00 UNITS	.03	.13	1.00	0.00	0.00	.13	.00		
SOURCE: MC MASTER												
2030303.												
STORAGE MOTOR	T666											
1/4 HP, 240V, THREE PHASE WITH		P P	1.00 UNITS	44.56	44.56	1.00	0.00	0.00	44.56	.91		
MOTOR TOTAL	4423								153.	3.12		

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PROTOTYPE HELIOSTAT INVESTMENT COST - 25000G UNITS PER YEAR - 10TH YEAR

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POS/LIMIT INDICATO 4424

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
20401. ASSEMBLY OF ELECTRONIC SOURCE: ADL	T614	LBH .15 HRS	4.93	.72	1.00	4.99	1.32	4.75	.10
2040201. HALL EFFECT SENSOR SOURCE: MICRO SWITCH	T616	P P 2.00 UNITS	1.85	3.71	1.00	0.00	0.00	3.71	.08
2040202. LINE DRIVER SOURCE: FAIRCHILD	9614	P P 3.00 UNITS	.77	2.31	1.00	0.00	0.00	2.31	.05
2040203. FERROUS METAL DISC SOURCE: MDAC	T618	P P 3.00 UNITS	1.06	3.18	1.00	0.00	0.00	3.18	.06
2040301. DUAL DIFF LINE REC SOURCE: FAIRCHILD	9615	P P 1.00 UNITS	.82	.82	1.00	0.00	0.00	.82	.02
2040302. OPT. ISOL. TRIACS PER SPECIFICATION SOURCE: MOTOROLA	Q2T3244	P P 4.00 UNITS	1.01	4.03	1.00	0.00	0.00	4.03	.08
2040303. RESISTOR PER SPECIFICATION SOURCE: RCA	11 Z 13	P P 4.00 UNITS	.12	.47	1.00	0.00	0.00	.47	.01
2040304. CAPACITOR PER SPECIFICATION SOURCE: RCA	0.1MF1400V	P P 4.00 UNITS	.11	.42	1.00	0.00	0.00	.42	.01
2040305. PRINTED CIRCUIT BD 6 IN. X 6 IN. TWO SIDE EPOXY GLASS, COPPER CIRCUITRY, WITH THRU PLATED HOLES. .02 SOURCE: MDAC	T107	P P 1.00 UNITS	.76	.76	1.00	0.00	0.00	.76	.02
2040306. COVER PER SPECIFICATION SOURCE: MDAC	T226	P P 1.00 UNITS	.95	.95	1.00	0.00	0.00	.95	.02
20405. PLANNING FACTOR OF 10 PERCENT X WFO HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBH .02 HRS	4.93	.09	1.00	4.99	1.32	.57	.01

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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POS/LIMIT INDICATO 4424

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
20406. Q & MA IND T 2 FACTOR OF .002 PERCENT K MFG HOURS LBR	.04 HRS	4.93	.18	1.00	4.99	1.32	1.18	.02
20408. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 LBR PERCENT OF THE MFG. HOUR. R M	.04 HRS 1.00 UNITS	4.93 .03	.20 .03	1.00 1.00	4.99 0.00	1.32 0.00	1.29 .03	.03 .00
20409. PRODUCTION SUPPT. T 5 .042 PERCENT OF MFG + PLAN + TOOL LBR	.02 HRS	4.93	.12	1.00	4.99	1.32	.80	.02
POS/LIMIT INDICATO 4424							25.	.52

PROTOTYPE HELICSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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PMW SPLY/DIST 4425

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRK	OVERHEAD	G&A		
2050201. FEEDER CABLE CLX 3, NO. 4 AWG, 5KV, COPPER CABLE/GALITEP P 2000, WITH ALUMINUM SHEATH AND PVC JACKETS SUITABLE FOR DIRECT BURIAL. SOURCE: OKONITE	1.00 UNITS	7.26	7.26	1.00	0.00	0.00	7.26	.15
2050202. TRANSFORMER 225T(19)H PER SPECIFICATIONS. P P SOURCE: SQUARE D	1.00 UNITS	13.73	13.73	1.00	0.00	0.00	13.73	.28
2050203. DIST PANEL 50.D-H-4172-4M 480V THREE PHASE WITH 100 P P AMP C/B. SOURCE: SQUARE D	1.00 UNITS	1.42	1.42	1.00	0.00	0.00	1.42	.03
2050204. BRANCH CBL BKN SQD NO.FA-34040 480V, 3 POLE, 40 AMP P P SOURCE: SQUARE D	15.00 UNITS	.18	2.63	1.00	0.00	0.00	2.63	.05
2050205. BRANCH CBL CABLE CLX-ALS 3, NO. 8 AWG, 600V, COPPER CABLE/GALITEP P 2000 WITH ALUMINUM SHEATH AND PVC JACKET, SUITABLE FOR DIRECT BURIAL. SOURCE: OKONITE	1.00 UNITS	45.22	45.22	1.00	0.00	0.00	45.22	.92
2050206. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS LBN DIST. .03 TO LABOR AND ERN .07 TO NON-RECURRING.	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
2050207. Q & HA - IND T 2 FACTOR OF .002 PERCENT X MFG HOURS LBN ERN	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
2050208. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 LBN PERCENT OF THE MFG. HOUR. ERN H M	0.00 HRS 0.00 0.00 UNITS	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
2050209. PRODUCTION SUPT. T 5 .042 PERCENT OF MFG + PLAN + TOOL LBN + Q & HA (DIRECT & IND.) ERN	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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PMR SPLY/DIST 4425

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SN
					CHC	OVERHEAD	G&A		
2050301.									
WIRE	CLI-16								
3 NO. 16 AWG WITH OPTICAL FIBER	P P	1.00 UNITS	8.59	8.59	1.00	0.00	0.00	8.59	.18
SOURCE: OKUMITE									
2050302.									
CIR BKN/HOLDER	T663								
480V, 15 AMP, 3 PHASE C/B PLUS	P P	1.00 UNITS	39.28	39.28	1.00	0.00	0.00	39.28	.80
HOLDER.									
SOURCE: SQUARE D									
2050303.									
CONNECTORS	T664								
OPTICAL FIBER COUPLINGS.	P P	2.00 UNITS	3.34	6.68	1.00	0.00	0.00	6.68	.14
PMR SPLY/DIST	4425							125.	2.54

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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ASSY DR/PED/ELECT 4426 T

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
20601. ASSY DR/PED/ELECT 4426 DRIVE AND PEDESTAL LABOR REQUIRED ASSEMBLY OF MAIN BEAM, JACKS, DRAG LINK, AZIMUTH DRIVE, PEDESTAL AND ELECTRIC. SOURCE: ADL/NDAC	T LBR P P							
	.09 HRS	4.93	.44	1.00	4.99	1.32	2.90	.06
	1.00 UNITS	1.06	1.06	1.00	0.00	0.00	1.06	.02
20604. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBR							
	.01 HRS	4.93	.05	1.00	4.99	1.32	.35	.01
20605. QUAL & MA IND T 2 FACTOR OF .062 PERCENT X MFG HOURS	LBR							
	.02 HRS	4.93	.11	1.00	4.99	1.32	.72	.01
20607. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	LBR R M							
	.02 HRS	4.93	.12	1.00	4.99	1.32	.79	.02
	1.00 UNITS	.02	.02	1.00	0.00	0.00	.02	.00
20608. PROD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL	LBR							
	.02 HRS	4.93	.07	1.00	4.99	1.32	.49	.01
ASSY DR/PED/ELECT 4426 T							6.	.13

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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SENSOR/CALIB EQUIP 4431

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
3010201. CAMERA SOURCE: GENERAL ELECTRIC	TN2200	P P	1.00 UNITS	.79	.79	1.00	0.00	0.00	.79 .02
3010202. CAMERA LENS	T648	P P	1.00 UNITS	.04	.04	1.00	0.00	0.00	.04 .00
3010203. TRIPOD 6 FT HIGH SOURCE: ADAC	T649	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010204. CIRCUIT-HEATER SOURCE: ADAC	T650	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010205. ELECTRONICS CAMERA ELECTRONICS SOURCE: ADAC	T651	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010206. CABLE 3 NO. 16 AWG WITH OPTICAL FIBER SOURCE: DUKONITE	CLX-16	P P	1.00 UNITS	.01	.01	1.00	0.00	0.00	.01 .00
30105. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBH ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
30106. Q & MA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBH ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
30107. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBH ERR R M	0.00 HRS 0.00 0.00 UNITS	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00
30108. PRODUCTION SUPT. .042 PERCENT OF MFG + PLAN + TOOL + Q & MA (DIRECT & IND.)	T 5	LBH ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
SENSOR/CALIB EQUIP 4431									1. .02

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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FIELD CONTROL 4432

DESCRIPTION		QTY/HRS/ AMM. FAIL	REF UNIT COST	SUB TOTAL	FACTORS			TOTAL	\$/SM
					CBC	OVERHEAD	G&A		
30201. ASSEMBLY DDI COMPONENT ASSEMBLY	T620	LBR	.01 HRS	4.93	.03	1.00	4.99	1.32	.17 .00
3020201. TWO SIDED PWB SOURCE: MDAC	44320201	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3020202. CONNECTOR 24 PIN SOURCE: AMP INC.	T652	P P	2.00 UNITS	.00	.01	1.00	0.00	0.00	.01 .00
3020203. LED PER SPECIFICATION SOURCE: RCA	SG1010	P P	10.00 UNITS	.00	.02	1.00	0.00	0.00	.02 .00
3020204. OPT TRANSCEIVER COMMUNICATION WITH HELIOSTAT ARRAY CONTROLLER SOURCE: TI	T622	P P	2.00 UNITS	.04	.07	1.00	0.00	0.00	.07 .00
3020205. MICRO-COMPUTER SIMILAR TO NAT'L SEMI 8748 SOURCE: NAT'L SEMICONDUCTOR	T623	P P	2.00 UNITS	.04	.07	1.00	0.00	0.00	.07 .00
3020206. OPT TRANSCEIVER COMMUNICATION WITH HELIOSTAT CONTROLLER. SOURCE: TI	T624	P P	8.00 UNITS	.03	.25	1.00	0.00	0.00	.25 .01
3020207. RELAY 4 PDT (5V) SOURCE: POTTER BROWNFIELD	T660	P P	8.00 UNITS	.01	.06	1.00	0.00	0.00	.06 .00
3020208. CERAMIC CAPS 0.1 MF .50V SOURCE: BELL	T626	P P	8.00 UNITS	.00	.01	1.00	0.00	0.00	.01 .00
3020209. MODULAR PWR-SUPPLY PV SOURCE: LAMBDA	T627	P P	2.00 UNITS	.11	.22	1.00	0.00	0.00	.22 .00
3020210. FOAM PADS ATTACH FOAM CUSHIONS TO TOP OF BOX.	T628	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

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FIELD CONTROL 4432

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	FACTORS			TOTAL	\$/SM	
			COST		CRC	OVERHEAD	G&A			
3020211. PHOTO DETECTOR OPTICAL FIBER SOURCE: I.T.	T629	P P	2.00 UNITS	.01	.03	1.00	0.00	0.00	.03	.00
3020212. PHOTO TRANSISTORS OPTICAL FIBER. SOURCE: I.T.	T630	P P	8.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
3020213. BOX ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVER. SOURCE: NEWPORT PLASTIC	T631	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
3020214. CONNECTOR 36 COND NO. 24 ANG FLAT WIRE AND CONNECTORS. SOURCE: AMP INC.	T231	P P	2.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
30215. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR	.00 HRS	4.93	.00	1.00	4.99	1.32	.02	.00
30216. O & MA - IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR	.00 HRS	4.93	.01	1.00	4.99	1.32	.04	.00
30218. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBR H M	.00 HRS 1.00 UNITS	4.93 .00	.01 .00	1.00 1.00	4.99 0.00	1.32 0.00	.05 .00	.00 .00
30219. PROD SUPPORT .042 PERCENT OF MFG + PLAN + TOOL	T 5	LBR	.00 HRS	4.93	.00	1.00	4.99	1.32	.03	.00
FIELD CONTROL	4432								1.	.02

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

CNTL/SIG EC 4433

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A			TOTAL	\$/SM	
30301. ASSEMBLY TOTAL COMPONENTS	T201	LBR	4.44 HRS	4.93	2.15	1.00	4.99	1.32	14.19	.29
3030201. PRINTED CIRCUIT BD T100 4 IN X 5 IN TWO SIDED EPOXY GLASS COPPER CIRCUITRY WITH THIN PLATED HOLES. .02 SOURCE: MDAC	T	P P	1.00 UNITS	.62	.62	1.00	0.00	0.00	.62	.01
3030203. CONNECTOR 24 PIN SOURCE: AMP INC.	T652	P P	1.00 UNITS	.86	.86	1.00	0.00	0.00	.86	.02
3030204. MU.COMPUTER SIMILAR TO NAT'L SEMI 8748 SOURCE: NAT'L SEMICONDUCTOR	T623	P P	1.00 UNITS	10.32	10.32	1.00	0.00	0.00	10.32	.21
3030205. QUAD.DIFF. LINE DR T656 MOTOR DRIVER INTERFACE SIMILAR TO NAT'L SEMI. DS1688		P P	2.00 UNITS	.60	1.20	1.00	0.00	0.00	1.20	.02
3030206. QUAD.DIFF. LINE RE T657 ENCODER INTERFACE SIMILAR TO NAT'L SEMI. DS1689		P P	2.00 UNITS	.60	1.20	1.00	0.00	0.00	1.20	.02
3030207. HEX D-FLIP FLOP ENCODER INTERFACE SOURCE: T.I.	T658	P P	3.00 UNITS	.43	1.29	1.00	0.00	0.00	1.29	.03
3030208. CAPACITOR 0.1 MF .50V SOURCE: BELL	T626	P P	3.00 UNITS	.12	.37	1.00	0.00	0.00	.37	.01
3030209. POWER SUPPLY PER SPECIFICATION SOURCE: SEMICONDUCTOR CIR., INC	3425-0000	P P P	1.00 UNITS	34.39	34.39	1.00	0.00	0.00	34.39	.70
3030210. BOX ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVEN. SOURCE: NEWPORT PLASTIC	T631	P P	1.00 UNITS	.77	.77	1.00	0.00	0.00	.77	.02

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

CNTRL/SIG EQ 4433

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
3030211. CONNECTOR 24 PIN FEMALE SOURCE: AMP INC.	T662 P P 1.00 UNITS		.86	.86	1.00	0.00	0.00	.86 .02
30312. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1 LBR .05 HRS		4.93	.26	1.00	4.99	1.32	1.70 .03
30313. O & MA - IND FACTOR OF .062 PERCENT X MFG HOURS	T 2 LBR .11 HRS		4.93	.53	1.00	4.99	1.32	3.52 .07
30315. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4 LBR .12 HRS R M 1.00 UNITS		4.93 .09	.59 .09	1.00 1.00	4.99 0.00	1.32 0.00	3.86 .09 .08 .00
30316. PROD. SUPPORT .042 PERCENT OF MFG + PLAN + TOOL	T 5 LBR .07 HRS		4.93	.36	1.00	4.99	1.32	2.38 .05
CNTRL/SIG EQ	4433							78. 1.58

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

COLLECTOR CONTROL 44320101

DESCRIPTION		QTY/HRS/ AMN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
30401. CPU COLLECTOR CONTROL CPU'S WITH 32KB OF MOS. MEMORY.	SM3CJJALA P P	2.00 UNITS	.57	1.13	1.00	0.00	0.00	1.13	.02
30402. LINE INTERFACE SERIAL LINE INTERFACES TO MCS, BEAM CHARACTERIZATION SYSTEM AND DATA ACQUISITION SYSTEM TO 9600 BAUD	DL11-WB P P	6.00 UNITS	.01	.08	1.00	0.00	0.00	.08	.00
30403. WATCH DOG TIMER COMPUTER RESETABLE CLOCK SOURCE: DEC	KW11-W P P	2.00 UNITS	.03	.05	1.00	0.00	0.00	.05	.00
30404. OMIBUS LINK HIGHSPEED PARALLEL COMMUNICATION INTERFACE. SOURCE: DEC	DA11 P P	1.00 UNITS	.41	.41	1.00	0.00	0.00	.41	.01
30405. FIELD INTERFACE A SYNCHRONOUS 16 LINE MULTIPLEXOR TRANSMISSION TO 9600 BAUD TO FIELD CONTROLLERS	DZ11-E P P	2.00 UNITS	.08	.15	1.00	0.00	0.00	.15	.00
30406. STORAGE	MSH J6 P P	6.00 UNITS	.04	.27	1.00	0.00	0.00	.27	.01
30407. FORTRAN IV PLUS HIGH LEVEL ENGLISH CONVERSION LANGUAGE COMPILER.	QP103-CE P P	2.00 UNITS	.05	.10	1.00	0.00	0.00	.10	.00
30408. MINI TIME TONE REC UNIVERSAL TIME TONE SAV	T632 P P	2.00 UNITS	.09	.18	1.00	0.00	0.00	.18	.00
30409. TIME CODE GEN HIGH B BCD OUTPUT (DAY, MONTH, HOUR, MINUTE, SECOND)	T633 P P	2.00 UNITS	.04	.07	1.00	0.00	0.00	.07	.00
30412. COLLECTOR CONTROL 44320101 TOTAL - HELIOSTAT CONTROLLER.	LBN	.02 HRS	5.92	.12	1.00	4.99	1.32	.82	.02

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

COLLECTOR CONTROL 44320101

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
30414. O & MA - IND T 2 FACTOR OF .062 PERCENT X MFG HOURS LBR	.01 HRS	4.93	.03	1.00	4.99	1.32	.17	.00
30415. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 LBR PERCENT OF THE MFG. HOUR. R N	.01 HRS 1.00 UNITS	4.93 .00	.03 .00	1.00 1.00	4.99 0.00	1.32 0.00	.19 .00	.00 .00
30416. PRODUCTION SUPT. T 5 .042 PERCENT OF MFG + PLAN + TOOL LBR + O & MA (DIRECT & IND.)	.00 HRS	4.93	.02	1.00	4.99	1.32	.11	.00
30417. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS LBR	.00 HRS	4.93	.01	1.00	4.99	1.32	.08	.00
COLLECTOR CONTROL 44320101							4.	.08

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

FOUNDATION 4441

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	FACTORS CMC OVERHEAD G&A			TOTAL	\$/SM
4010101. FORM, POUR/FINISH 444111 LABOR TO POSITION TAPERED PIPE, POUR CONCRETE AND VIBRATE. 5 CHEMS (25 WEEK BASE) EACH 5 LABORS (INCL. LEAD) SOURCE: STEARNS-ROGER	LBR	1.88 HRS	13.61	25.52	1.00	1.97	1.00	50.27	1.02
4010102. CAGES 444112 LABOR TO SET UP AND PLACE CAGES IN AUGERED HOLE. 5 CHEMS (25 WEEK BASE) EACH 2 RODMEN 2 IRONWORKERS SOURCE: STEARNS-ROGER	LBR	1.50 HRS	13.61	20.41	1.00	1.97	1.00	40.22	.82
4010103. EQUIP OPER & DRIVER 444113 EQUIPMENT OPERATORS AND TRUCK DRIVERS USED IN SUPPORT OF FOUNDATION INSTALLATION. 5 CHEMS (25 WEEK BASE) EACH 1 HYDRAULIC CRANE OPERATOR 1 OILER 3 TRUCK DRIVERS SOURCE: STEARNS-ROGER	LBR	1.88 HRS	13.61	25.52	1.00	1.97	1.00	50.27	1.02
40102. CONCRETE 44412 3.0 CUBIC YARDS OF CONCRETE PRICED AT \$37 PER YARD INCLUDING COST OF MATERIALS, MIXING AND DELIVERY TO FOUNDATIONS POSITION. SOURCE: STEARNS-ROGER	P P	1.00 UNITS	123.31	123.31	1.00	0.00	0.00	123.31	2.51
40103. CAGES 44413 428.2 LBS. OF REBAR PRICED AT \$.20 PER LB. AND LABOR TO PRE- FABRICATE REBAR CAGES. 5 CHEMS (25 WEEK BASE) EACH 2 RODMEN 3 LABORS (INCLUDING LEAD) 1 HYDRAULIC CRANE OPERATOR 1 TRUCK DRIVER SOURCE: STEARNS-ROGER	LBR H M	2.53 HRS 1.00 UNITS	13.61 95.54	35.72 95.54	1.00 1.00	1.97 0.00	1.00 0.00	70.38 95.54	1.43 1.95
40104. TAPERED PIPE 44414 98.25 LBS PRICED AT \$.31 PER LB DELIVERED. BASED ON U.S. STEEL PRICE INFORMATION.	P P	1.00 UNITS	32.87	32.87	1.00	0.00	0.00	32.87	.67

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

FOUNDATION		4441									
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S CMC OVERHEAD G&A			TOTAL	\$/SM	
40105.											
BRACING		44415									
BRACING - - 50 SETS AT 1200 EACH		P P	1.00 UNITS	4.24	4.24	1.00	0.00	0.00	4.24	.09	
FOUNDATION		4441							467.	9.52	

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

SITE PREPARATION		4442								
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				COST		CRC	OVERHEAD	G&A		
40201.										
SURVEY	44421									
5 SURVEY CREWS (25 WEEK BASE)		LBN	.75	HRS	13.61	10.21	1.00	1.97	1.00	20.11 .41
2 SURVEYORS										
SOURCE: STEARNS-ROGER										
40202.										
DRILLING	44422									
DRILLING OPERATIONS, USING DRILL		LBN	2.25	HRS	13.61	30.62	1.00	1.97	1.00	60.32 1.23
SITE PREPARATION									4442	80. 1.64

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

HELIO SUPP STRUCT 4451

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
		COST		CHC	OVERHEAD	G&A			
50101. ASSEMBLY T455 ASSEMBLY PROCESS OF PEDESTAL COMPONENTS.	LBR	.19 HRS	4.93	.96	1.00	4.99	1.32	6.29	.13
5010201. TUBE ID40040-3 24 OD X .105 WALL X 123 LONG LC STEEL, WT=276 LBS. SOURCE: KELLY PIPE	R M	1.00 UNITS	90.58	90.58	1.00	0.00	0.00	90.58	1.85
5010202. CAP ID40040-5 .375 X 30 X 30, LC STEEL PLATE WT=75 LB. SOURCE: U.S. STEEL	R M	1.00 UNITS	21.27	21.27	1.00	0.00	0.00	21.27	.43
5010203. COVER ID40040-7 .0396 X 10 X 10 L.C. STEEL WT=4 LB. R M SOURCE: U.S. STEEL	R M	1.00 UNITS	.88	.88	1.00	0.00	0.00	.88	.02
5010204. J BOX ID40040-9	P P	1.00 UNITS	.80	.80	1.00	0.00	0.00	.80	.02
50114. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBR	.02 HRS	4.93	.11	1.00	4.99	1.32	.75	.02
50115. QUAL & RA IND T 2 FACTOR OF .062 PERCENT X MFG HOURS	LBR	.05 HRS	4.93	.24	1.00	4.99	1.32	1.56	.03
50117. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	LBR R M	.05 HRS 1.00 UNITS	4.93 .04	.26 .04	1.00 1.00	4.99 0.00	1.32 0.00	1.71 .04	.03 .00
50118. PROD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL	LBR	.03 HRS	4.93	.16	1.00	4.99	1.32	1.06	.02
HELIO SUPP STRUCT 4451								125.	2.55

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PROTOTYPE HELICSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

PROTECTION ENCL 4452

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
CMC OVERHEAD G&A

TOTAL

\$/SM

PROTECTION ENCL 4452

0. 0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

LIGHTNING PROT. 4453

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

FACTORS
CRC OVERHEAD G&A

TOTAL

\$/SM

LIGHTNING PROT. 4453

0. 0.00

H-95

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

09.26.08.

DATE 05/24/78

HELIOSTAT 4401						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL		CRC	OVERHEAD	G&A		\$/SM
7010201.										
DRIVE/PEU/ELECTRONIC 440121										
REMOVE 803 LBS. DPE UNIT FROM FLAT LBR		40 HRS	13.61	5.43		1.00	1.97	1.00	10.71	.22
BED, PLACE OVER TAPEDED FOUNDATION										
PROTHUSION AND VIBRATE USING GROVE										
(MODEL 30) HYDRAULICS, DIESEL,										
CRANE MODIFIED TO ADD MANIPULATION.										
2 CREWS (26.025 WK BASED EACH)										
1 EQUIPMENT OPERATOR										
1 MILLWRIGHT										
1 LABORER										
7010202.										
REFLECTOR PANELS 440122										
USE YALE MODEL G3 P-150, DIESEL, LBR		2.00 HRS	13.61	27.17		1.00	1.97	1.00	53.53	1.09
240 IN. HIGH LIFT FORK TRUCK TO REMOVE										
PANEL CONTAINERS AND PLACE ON DROTT										
1000 SERIES B, DIESEL 4 WHEEL										
STEERING TRAVELIFT, MODIFIED TO ADD										
2 CRANE/MANIPULATIONS.										
5 CREWS (26.025 WK BASED EACH)										
1 FORKLIFT OPERATOR										
1 TRAVELIFT OPERATOR										
2 MILLWRIGHTS										
2 LABORERS										
7010203.										
OIL - DRIVE	S.A.3. 30									
	P P	2.00 UNITS	.00	.00		1.00	0.00	0.00	.00	.00
HELIOSTAT 4401									64.	1.31

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

SENSOR/CALIB EQ 4462

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
CMC OVERHEAD GRA

TOTAL

\$/SM

70202.
INSTALL 44621
USE STANDARD ELECTRICIAN TOOLS TO LBR .00 HRS 13.61 .06 1.00 1.97 1.00 .12 .00
INSTALL DIGITAL EYE UNITS
1 CREW (1 WK.BASE) EACH
1 ELECTRICIAN
EFFORT IS CONCURRENT AND IN
ASSOCIATION WITH CALIBRATION.
8.3 UNITS (6/FIELD).

70203.
CALIBRATE 44622
ONE VOLT-OHM METER AND ONE LBR .00 HRS 13.61 .06 1.00 1.97 1.00 .12 .00

SENSOR/CALIB EQ 4462 0. .00

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

ELECTRICAL/DISTRIB 4463

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
				COST		CHC	OVERHEAD	G&A		
70302.										
INSTALL CABLE 44631										
EMPLOY VIBRATORY, DIESEL, PLOW TO	LBR	.80	HRS	-13.61	10.87	1.00	1.97	1.00	21.41	.44
BURY ONE POWER/FIBEROPTICS CABLE.										
3 CREWS (26.625 WK. BASE) EACH:										
1 CABLE PLOW OPERATOR										
2 LABORERS										
70303.										
PWR TR/DISTRIB PML 44632										
INSTALL POWER TRANSFORMER/	LBR	.02	HRS	13.61	.31	1.00	1.97	1.00	.62	.01
DISTRIBUTION PANELS USING										
1 TRUCK AND 1 FORKLIFT.										
1 CREW (2 WK BASE) EACH:										
1 TRUCK DRIVER										
1 FORKLIFT OPERATOR										
1 MILLWRIGHT										
2 LABORERS										
70304.										
CONN,C/08CLOSE OUT 44633										
USE 1 SPECIAL TEST SET AND	LBR	.53	HRS	13.61	7.25	1.00	1.97	1.00	14.28	.29
ELECTRICAL/DISTRIB 4463									36.	.74

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

ALIGN HELIOSTATS 4464

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CNC OVERHEAD G&A

TOTAL

\$/SM

ALIGN HELIOSTATS 4464

0. 0.00

66-H

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

FIELD SUPPORT 4465

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	S/SM
				CHC	OVERHEAD	G&A		
70501.								
INSTALLATION MGMT 44651								
OVERALL MANAGEMENT OF FIELD EFFORT. LBN	.13 HRS	13.61	1.73	1.00	1.97	1.00	3.41	.07
1 FIELD MANAGER (28.46 MK BASE).								
7050201.								
SUPERVISION 44652-1								
1 LOGISTICS SUPERVISOR LBN	.13 HRS	13.61	1.73	1.00	1.97	1.00	3.41	.07
(28.46 MK BASE).								
7050202.								
RECORDS 44652-2								
KEEP ACCOUNTABLE RECORDS FOR FIELD LBN	.06 HRS	13.61	.86	1.00	1.97	1.00	1.70	.03
MATERIALS, COMPLETIONS TO SPEC.,								
RECORDS, ETC.								
1 RECORDS CLERK (28.46 MK BASE).								
7050203.								
FIELD COORDINATION 44652-3								
COORDINATE MATERIAL HANDLING, LBN	.25 HRS	13.61	3.46	1.00	1.97	1.00	6.82	.14
MOVEMENT AND SCHEDULES.								
4 FIELD COORDINATORS (28.46 MK BASE)								
7050204.								
PERSONNEL 44652-4								
KEEPS PERSONNEL FILES, ADMINISTERS LBN	.06 HRS	13.61	.86	1.00	1.97	1.00	1.70	.03
HOUSING AND BENEFITS FOR FIELD								
PERSONNEL, TIME RECORDS, ETC.								
1 PERSONNEL CLERK (28.64 MK BASE).								
70503.								
QUALITY CONTROL 44653								
OVERSEE AND ASSURE QUALITY OF LBN	.09 HRS	13.61	1.25	1.00	1.97	1.00	2.45	.05
INSTALLATIONS THROUGH FIELD								
INSPECTION, PRACTICES REVIEW, AND								
DECREPANT MATERIAL, FAILURE AND								
CORRECTIVE ACTION REPORTS.								
1 QUAL. ASSUR. REP.								
(26.625 MK BASE).								
70504.								
FIELD ENGINEERING 44654								
PROVIDE ENGINEERING SUPPORT DURING LBN	.09 HRS	13.61	1.25	1.00	1.97	1.00	2.45	.05
							22.	.45
FIELD SUPPORT 4465								

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PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

PACK & TRANSP 4406

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	FACTORS			TOTAL	\$/SM	
		COST		CRC	OVERHEAD	G&A			
7060101. DRIVE SPECIALIZED TRAILER BED WITH WACK ON ONE SIDE FOR PEDESTAL, DRIVE, SHORT MAIN BEAM ASSEMBLY TO LEAN AGAINST AND WITH 4 BY 4'S ATTACHED TO FLOOR FOR BRACING. QTY PER TRAILER BED = 12. REUSABLE SPECIALIZED TRAILER BEDS: MINIMUM QUANTITY NEEDED FOR 1 WEEK: 42.	44661-1 P P	1.00 UNITS	.19	.19	1.00	0.00	0.00	.19	.00
7060102. REFLECTOR SPECIALIZED PALLET FOR HOLDING REFLECTOR PANELS (ALREADY ATTACHED TO MINION BACKING STRUCTURE) IN AN UPRIGHT POSITION, EACH BRACED ON A BOX STRUCTURE WHICH IS MOUNTED ON THE PALLET. CUSHIONED HOLDDOWN ASSEMBLY KEEPS THE TOPS OF THE PANELS SECURE. QTY PER PALLET = 4 PANELS. REUSABLE PALLETS: MINIMUM QTY. NEEDED FOR 1 WEEK = 250	44661-2 P P	1.00 UNITS	.39	.39	1.00	0.00	0.00	.39	.01
7060103. DISTRUB ELECT TRANSFORMERS STRAPPED TO REUSABLE PALLETS.	44661-3 P P	1.00 UNITS	.04	.04	1.00	0.00	0.00	.04	.00
7060201. DRIVE SPECIALIZED TRAILER BEDS REMAIN AT SITE UNTIL UNLOADED (1 WEEK'S INSTALLATION SUPPLY) ONE TRAILER, IS PULLED BY ONE TRUCK CAB. WEIGHT PER DRIVE ASSEMBLY = 1450 LBS 12 DRIVE ASSEMBLIES PER TRAILER BED 17,400 LBS. WEIGHT OF MODIFICATION TO TRAILER BED = 700 LBS. TOTAL WEIGHT OF ASSEMBLIES AND MOD. = 18,100 LBS.	44662-1 LBH	.33 HRS	2.14	.71	1.00	4.99	1.32	4.67	.10
7060202. REFLECTOR ONE LOWBOY PULLED BY ONE TRUCK CAB, LBH ONE PALLET PER LOWBOY, PALLET LIFTED FROM LOWBOY WITH FORKTRUCK. QTY: 4 PANELS WITH BACKING STRUCTURE PALLET. WEIGHT: 1374 LBS. EACH X 4 5496 LBS. PLUS WT. OF PALLET.	44662-2 LBH	1.99 HRS	2.14	4.25	1.00	4.99	1.32	27.99	.57

H-101

PROTOTYPE HELISTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CHC	OVERHEAD	G&A		
7060203. DISTRIB ELECT TRANSFORMER WEIGHT: 2600 LBS.	44662-3 LBR	2.14	.00	1.00	4.99	1.32	.02	.00
PACK & TRANSP	4466						33.	.68

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

DESIGN	4471							
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL
					CHC	OVERHEAD	G&A	\$/SM
DESIGN	4471							0. 0.00

H-103

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

SUSTAINING ENGR. 4472

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
CRC OVERHEAD G&A

TOTAL

\$/SM

SUSTAINING ENGR. 4472

0. 0.00

H-104

PHOTO TYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	
		COST		CHC	OVERHEAD	G&A		\$/SM
PRE PROD UNIT	4473						0.	0.00

PROTOTYPE HELIOSTAT INVESTMENT COST - 250000 UNITS PER YEAR - 10TH YEAR

08.26.08.

DATE 05/24/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S CHC OVERHEAD G&A	TOTAL \$/SM
SITE ACTIVATION	4474	T			
0L SITE ACTIVATION	4474	T			0. 0.00

H-106

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

REFLECTIVE SURFACE 4411

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
10101. LAMINATE T636 LABOR REQUIRED FOR LAMINATING LINE/ SOURCE: MDL/ADC	LBN	.05 HRS	4.90	.26	1.00	4.99	1.33	1.74	.04
1010201. FAB T637 LABOR REQUIRED FOR MIRRORING LINE. SOURCE: ADL/ADC	LBN	.16 HRS	4.90	.79	1.00	4.99	1.33	5.21	.11
1010202. FRONT LITE ID40044-3 .060 X 48 X 132 CORNING FUSION GLASS. SOURCE: CORNING	P P	12.00 UNITS	14.31	171.73	1.00	0.00	0.00	171.73	3.50
1010203. CHEMICALS T638 MIRRORING SOLUTION, SILVER AND COPPER. SOURCE: SOMMER & MAGA IND. (LONDON, ENG.).	H M	12.00 UNITS	1.34	16.10	1.00	0.00	0.00	16.10	.33
1010204. SETUP T501	ERH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10103. BACK LITE ID40044-5 .188 X 48 X 132 FLOAT GLASS SOURCE: ASG	P P	12.00 UNITS	16.10	193.19	1.00	0.00	0.00	193.19	3.94
10104. ADHESIVE IXA3504 BOND GLASS SHEETS TOGETHER WITH POLYURETHANE ADHESIVE. WT=2 LB. 3M CORPORATION	H M	12.00 UNITS	2.07	24.88	1.00	0.00	0.00	24.88	.51
10105. SETUP T503	ERH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10120. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBN	.03 HRS	4.90	.13	1.00	4.99	1.33	.83	.02
10121. QUAL & RA IND T 2 FACTOR OF .062 PERCENT X MFG HOURS	LBN	.05 HRS	4.90	.26	1.00	4.99	1.33	1.72	.04

H-107

PHOTO TYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

REFLECTIVE SURFACE 4411

DESCRIPTION	QTY/HRS/ AJN. FAIL	REF UNIT COST	SUB TOTAL	FACTORS			TOTAL	\$/SK
				C&C	OVERHEAD	G&A		
10123.								
TOOLING MATERIAL T 4								
\$.70 PER TOOLING HOURS PLUS .06	LBR	.06 HRS	4.90	.28	1.00	4.99	1.33	1.89
PERCENT OF THE MFG. HOUR.	R M	1.00 UNITS	.05	.05	1.00	0.00	0.00	.05
10124.								
PROD SUPPORT T 5								
.042 PERCENT OF MFG + PLAN + TOOL	LBR	.04 HRS	4.90	.18	1.00	4.99	1.33	1.17
							419.	8.53

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

MIRROR BACK STRUCT 4412

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CRC	OVERHEAD	G&A		
10201. ASSY SUPPORT STR ID40045- INBOARD, OUTBOARD CROSS BEAM DIAGONAL BEAMS AND OUTBOARD AND INBOARD ANGLES.	LBH .25 HRS	4.90	1.24	1.00	4.99	1.33	8.25	.17
10202. INBOARD CROSS BM ID40045-3 .0785 X 27 X 173 104 LB. EA.	P P 2.00 UNITS	29.31	58.63	1.00	0.00	0.00	58.63	1.20
10203. OUTBOARD CROSS BM ID40045-5 .0516 X 11 X 173 44 LB. EA SOURCE: U.S. STEEL	P P 2.00 UNITS	12.48	24.96	1.00	0.00	0.00	24.96	.51
10204. DIAGONAL BEAM/LH ID40045-7 .0785 X 26 X 112 46 LB. EACH	P P 2.00 UNITS	12.88	25.76	1.00	0.00	0.00	25.76	.53
10205. DIAGONAL BEAM/RH ID40045-8 .0785 X 26 X 112 46 LB. EACH	P P 2.00 UNITS	12.88	25.76	1.00	0.00	0.00	25.76	.53
10206. HAT/STRINGER ID40045-9 .0635 (16 GA) X 6.00 IN. X 130 GALV. STEEL SHEET HATS, WT= 14 LB EA. SOURCE: WINDSIDE ENGR. CO.	P P 24.00 UNITS	4.98	119.52	1.00	0.00	0.00	119.52	2.44
10207. OUTBOARD ANGLES ID40045-15 .0516 X 3.5 X 4.5 .23 LB. EACH SOURCE: U.S. STEEL	R M 4.00 UNITS	.06	.24	1.00	0.00	0.00	.24	.00
10208. INBOARD ANGLES ID40045-13 .0516 X 4.0 X 10.50 .61 LB EACH SOURCE: U.S. STEEL	R M 4.00 UNITS	.16	.65	1.00	0.00	0.00	.65	.01
10209. GUSSET ANGLE ID40045-11 .25X8.5X17.50 11 LB. EA. SOURCE: U.S. STEEL	R M 4.00 UNITS	2.78	11.14	1.00	0.00	0.00	11.14	.23
10211. CLINCH NUT S-0420-1-Z SOURCE: S.P.S. CO.	P P 48.00 UNITS	.04	1.71	1.00	0.00	0.00	1.71	.03
10212. BOLT T601 .25 UNC-20 X .75 LONG SAE SOURCE: MCMASTER	P P 48.00 UNITS	.03	1.66	1.00	0.00	0.00	1.66	.03

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

MIRROR BACK STRUCT 4412

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHC	OVERHEAD	G&A		
10213. WASHER .25 ID SAE WASHER SOURCE: MCMASTER	T602	P P	49.00 UNITS	.00	.12	1.00	0.00	0.00	.12 .00
10220. PLANNING FACTOR OF 10 PERCENT 2 MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR	.03 HRS	4.90	.15	1.00	4.99	1.33	.99 .02
10221. QUAL & RA 3ND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR	.06 HRS	4.90	.31	1.00	4.99	1.33	2.05 .04
10223. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBR R M	.07 HRS 1.00 UNITS	4.90 .05	.34 .05	1.00 1.00	4.99 0.00	1.33 0.00	2.25 .05 .00
10224. PROD SUPPORT .042 PERCENT OF MFG + PLAN + TOOL	T 5	LBR	.04 HRS	4.90	.21	1.00	4.99	1.33	1.39 .03
MIRROR BACK STRUCT 4412									285. 5.81

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PROTOTYPE HELIOSIAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

ASSY & BOND

4413

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
10301. ASSY & BOND 441301 BONDS MINORHS TO BACKING/STRINGERS LBR TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M COMP) SOURCE: ADL/MDC	.24 HRS	4.90	1.18	1.00	4.99	1.33	7.82	.16
10302. ADHESIVE 441301 BONDS MINORHS TO BACKING/STRINGERS H M TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M COMP) SOURCE: ADL/MDC	12.00 UNITS	2.10	25.25	1.00	0.00	0.00	25.25	.51
10303. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS LBR DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	.03 HRS	4.90	.14	1.00	4.99	1.33	.94	.02
10304. QUAL & PA IND T 2 FACTOR OF .062 PERCENT X MFG HOURS LBR	.06 HRS	4.90	.29	1.00	4.99	1.33	1.94	.04
10306. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 LBR PERCENT OF THE MFG. HOUR. H M	.07 HRS 1.00 UNITS	4.90 .05	.32 .05	1.00 1.00	4.99 0.00	1.33 0.00	2.13 .05	.04 .00
10307. PRXD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL LBR	.04 HRS	4.90	.20	1.00	4.99	1.33	1.31	.03
ASSY & BOND 4413							39.	.80

H-111

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

AZIMUTH 4421						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL		CRC	OVERHEAD	G&A		\$/SM
20101. ASSEMBLY ID40065 DRIVE COMPONENTS ASSEMBLY SOURCE: ADL/NDAC	LBN	.13 HRS	4.90	.65		1.00	4.99	1.33	4.34	.09
2010201. HOUSING ID40038 WELDMENT HOUSING WT=160 LB. SOURCE: U.S. STEEL	LBN R M	.16 HRS 1.00 UNITS	4.90 31.28	.76 31.28		1.00 1.00	4.99 0.00	1.33 0.00	5.07 31.28	.10 .64
2010203. BUSHING PIVOT KJS1010060 PER SPECIFICATION. PIVOT POINT BUSHING. SOURCE: SARGENT	P P	2.00 UNITS	.65	1.30		1.00	0.00	0.00	1.30	.03
201030101. MEMBRANE T607 10 O.D. X .156 WALL	R M	1.00 UNITS	3.53	3.53		1.00	0.00	0.00	3.53	.07
201030102. TUBE T608 10 O.D. X .156 WALL X 8 HIGH MADE OF 4130, 7 TL, SOURCE: U.S. STEEL	R M	1.00 UNITS	9.35	9.35		1.00	0.00	0.00	9.35	.19
201030103. SPLINE T609 10 O.D. X .312 WALL X 3 LONG	R M	1.00 UNITS	7.13	7.13		1.00	0.00	0.00	7.13	.15
201030105. ASSEMBLY T603 FAB AND ASSY. FLEX SPLINE SOURCE: ADL/NDAC	LBN	.13 HRS	4.90	.62		1.00	4.99	1.33	4.13	.08
201030201. PLUG T605 7 OD X 1.50 L.C. STEEL SOURCE: U.S. STEEL	R M	1.00 UNITS	3.03	3.03		1.00	0.00	0.00	3.03	.06
201030202. DRIVE SHAFT T611 1.75 OD, .75 ID X 10.75 LONG L.C. STEEL PIPE. SOURCE: KELLY PIPE.	R M	1.00 UNITS	1.73	1.73		1.00	0.00	0.00	1.73	.04
201030203. BEARING BB-2150 PER SPECIFICATION SOURCE: MC GILL MFG. CO.	P P	1.00 UNITS	67.76	67.76		1.00	0.00	0.00	67.76	1.38
201030204. FABRICATION T653 FAB AND ASSY. WAVE GENERATOR SOURCE: ADL/NDAC	LBN	.11 HRS	4.90	.52		1.00	4.99	1.33	3.48	.07

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

DESCRIPTION	AZIMUTH	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S COC OVERHEAD G&A			TOTAL	\$/SM
20104. BEARING TURRET PER SPECIFICATION. SOURCE: MC GILL MFG. CO.	4421 BB-2149	P P	1.00 UNITS	18.62	18.62	1.00	0.00	0.00	18.62 .38
2010601. RETAINER-OUTER 19.525 OD X 15.1875 ID X 1.25 LG. L.C. STEEL. MT = 29.28 SOURCE: U.S. STEEL	IT49852-1	LBR H M	.01 HRS 1.00 UNITS	4.90 6.16	.04 6.16	1.00 1.00	4.99 0.00	1.33 0.00	.30 6.16 .01 .13
2010602. NUT 1/2 I.D. SOURCE: MCMASTER	T640	P P	8.00 UNITS	.12	.94	1.00	0.00	0.00	.94 .02
2010603. BOLTS 1/2 X 3, CLASS 5 SOURCE: MC MASTER	T510	P P	8.00 UNITS	.39	3.12	1.00	0.00	0.00	3.12 .06
2010604. WASHER 1/2 ID. SOURCE: MC MASTER	T511	P P	8.00 UNITS	.00	.02	1.00	0.00	0.00	.02 .00
2010801. CIRCULAR SPLINE 15 OD X 10 ID X 2.75 LG LC STEEL SHEET. MT = 73 LB. SOURCE: LINCOLN FOUNDRY	T 36	LBR H M	.10 HRS 1.00 UNITS	4.90 29.65	.49 29.65	1.00 1.00	4.99 0.00	1.33 0.00	3.20 29.65 .07 .00
2010803. BOLTS 1/2 X 2 CLASS 5 SOURCE: MC MASTER	T516	P P	8.00 UNITS	.26	2.10	1.00	0.00	0.00	2.10 .04
2010804. WASHER 1/2 ID. SOURCE: MC MASTER T520	T517	P P	8.00 UNITS	.00	.02	1.00	0.00	0.00	.02 .00
2010901. HELICON PER SPECIFICATION SOURCE: SPIROID	HMJ22178	LBR H M	.07 HRS 1.00 UNITS	4.90 1.80	.34 1.80	1.00 1.00	4.99 0.00	1.33 0.00	2.23 1.80 .05 .04
201090101. PINION PER SPECIFICATION. SOURCE: SPIROID	T519	P P	1.00 UNITS	3.05	3.05	1.00	0.00	0.00	3.05 .06

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

AZIMUTH 4421						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	CRC	OVERHEAD	G&A			\$/SM
201090102. RING-PINION-RET 2.75 O.D. SOURCE: MC MASTER	T520	P P	1.00 UNITS	.33	.33	1.00	0.00	0.00	.33	.01
201090103. SHIM-GEAR 1.50 O.D./1.125 ID SOURCE: MC MASTER	T521	P P	1.00 UNITS	.05	.05	1.00	0.00	0.00	.05	.00
201090104. KEY-GEAR 1 LONG X 1/4 WIDE SOURCE: MC MASTER	NAS558-808-B	P P	1.00 UNITS	.19	.19	1.00	0.00	0.00	.19	.00
201090105. NUT GEAR AFBMA STANDARD N-05 SOURCE: MC MASTER	T522	P P	1.00 UNITS	.94	.94	1.00	0.00	0.00	.94	.02
201090106. WASHER GEAR AFBMA STANDARD N-05 SOURCE: MC MASTER	T523	P P	1.00 UNITS	.13	.13	1.00	0.00	0.00	.13	.00
201090107. BEARING DRIVE SHAFT BEARING PER SPECIFICATION.	67046NH104-1DC	P P	1.00 UNITS	3.56	3.56	1.00	0.00	0.00	3.56	.07
201090108. RING-BEARING-RET DRIVE SHAFT BEARING RETAINER PER SPECIFICATION.	MS16625-1200	P P	1.00 UNITS	.33	.33	1.00	0.00	0.00	.33	.01
2011201. TUBE-ELEC.WIRE .688 OD X .063 WALL X 13 LONG, L.C. STEEL. SOURCE: KELLY PIPE.	T643	P P	1.00 UNITS	.14	.14	1.00	0.00	0.00	.14	.00
2011202. CLAMP-WIRE TUBE SOURCE: MC MASTER	5644	P P	1.00 UNITS	.20	.20	1.00	0.00	0.00	.20	.00
2011301. COVER 9 DIA. X .125 AND 8 DIA. X .125 L.C. STEEL SHEET.	T646	LBR R M	.00 HRS 1.00 UNITS	4.90 1.05	.00 1.05	1.00	4.99 0.00	1.33 0.00	.02 1.05	.00 .02
2011302. SCREEN AFFIX COVER TO DRIVE HOUSING. SOURCE: MC MASTER	T613	P P	4.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CRC	OVERHEAD	G&A		
<p>2011303. T526</p> <p>GROMMET HOLDS WIRE AND SEALS GEN HOUSING COMPARTMENT. SOURCE: MC MASTER</p>								
P P	1.00 UNITS	.05	.05	1.00	0.00	0.00	.05	.00
<p>20114. T 1</p> <p>PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.</p>								
LBR	.08 HRS	4.90	.41	1.00	4.99	1.33	2.74	.06
<p>20115. T 2</p> <p>O & HA-IND FACTOR OF .002 PERCENT X MFG HOURS</p>								
LBR	.17 HRS	4.90	.85	1.00	4.99	1.33	5.66	.12
<p>20117. T 4</p> <p>TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.</p>								
LBR	.19 HRS	4.90	.94	1.00	4.99	1.33	6.21	.13
R M	1.00 UNITS	.15	.15	1.00	0.00	0.00	.15	.00
<p>20118. T 5</p> <p>PRODUCTION SUPT. .042 PERCENT OF MFG + PLAN + TOOL</p>								
LBR	.12 HRS	4.90	.58	1.00	4.99	1.33	3.83	.08
							239.	4.87
<p>AZIMUTH 4421</p>								

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

ELEVATION	4422									
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL		
					CRC	OVERHEAD	G&A		\$/SM	
2020101. WELDMENT DRAG LINK- MT-63 LB. SOURCE: U.S. STEEL	T 50	LBN R M	.10 HRS 1.00 UNITS	4.90 12.43	.50 12.43	1.00 1.00	4.99 10.00	8.33 6.00	3.34 12.43	.07 .25
2020103. BUSHING PER SPECIFICATION. PIVOT POINT BUSHING. SOURCE: SARGENT	KJS1016060	P P	2.00 UNITS	.22	.45	1.00	0.00	0.00	.45	.01
2020104. SHIM PIVOT POINT SHIM RESTRICTS MOVEMENT. SOURCE: MC MASTER	T 41	R M	4.00 UNITS	.30	1.22	1.00	0.00	0.00	1.22	.02
2020105. BOLT 3/4 DIA X 5 LONG SOURCE: MC MASTER	T528	P P	2.00 UNITS	2.02	4.05	1.00	0.00	0.00	4.05	.08
2020106. SEAL-DUST SOURCE: MC MASTER	T529	P P	2.00 UNITS	.05	.10	1.00	0.00	0.00	.10	.00
2020107. THRUST BKG PER SPECIFICATION. SOURCE: SARGENT	KTM-1622060	P P	4.00 UNITS	.18	.73	1.00	0.00	0.00	.73	.01
2020108. NUT .75 I.D. SOURCE: MC MASTER	T530	P P	2.00 UNITS	.32	.63	1.00	0.00	0.00	.63	.01
2020109. BUSHING-CLAMP UP .75 DIA. X 5 LONG, CLASS 8	T531	P P	2.00 UNITS	1.73	3.46	1.00	0.00	0.00	3.46	.07
2020110. BOLT-ROD END .75 DIA X 3.25 LONG, CLASS 8 SOURCE: MC MASTER	T532	P P	2.00 UNITS	1.08	2.15	1.00	0.00	0.00	2.15	.04
2020111. NUT-ROD END .75 I.D. SOURCE: MC MASTER	T533	P P	2.00 UNITS	.32	.63	1.00	0.00	0.00	.63	.01
2020112. BUSHING CLAMP UP SOURCE: MC MASTER	T534	P P	2.00 UNITS	.22	.45	1.00	0.00	0.00	.45	.01

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

ELEVATION 4422				QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
DESCRIPTION							CRC	OVERHEAD	G&A		
2020113.	T535										
SHIM ROD END											
SOURCE: MC MASTER		P P	4.00 UNITS	.30	1.22	1.00	0.00	0.00	1.22	.02	
2020114.	T536										
SEAL-DUST ROD END		P P	4.00 UNITS	.05	.20	1.00	0.00	0.00	.20	.00	
SOURCE: MC MASTER											
20202.	T 52										
JACK SCREW		P P	2.00 UNITS	135.86	271.73	1.00	0.00	0.00	271.73	5.54	
5 TON, 8 INCH RAISE, .85 INCH											
X 2 INCH X 22 INCH. WT=80.4 LB.											
DUFF NORTON											
2020301.	ID40042-3										
TUBE		R M	1.00 UNITS	39.21	39.21	1.00	0.00	0.00	39.21	.80	
16 IN. OD X .105 IN WALL X 81 IN.											
LONG. LC STEEL PIPE 124 LB.											
SOURCE: KELLY PIPE											
2020302.	ID40042-5										
TAB ACTUATOR		LBR	.07 HRS	4.90	.33	1.00	4.99	1.33	2.16	.04	
.5 X 10 X 10 LC STEEL WT=5.73 LB		R M	2.00 UNITS	2.88	5.75	1.00	0.00	0.00	5.75	.12	
SOURCE: U.S. STEEL											
2020303.	ID40042-9										
TAB HINGE		LBR	.01 HRS	4.90	.06	1.00	4.99	1.33	.38	.01	
.5 X 9 X 9 LC STEEL WT=5 LB.		R M	4.00 UNITS	2.33	9.31	1.00	0.00	0.00	9.31	.19	
SOURCE: U.S. STEEL											
2020304.	ID40042-7										
FLANGE		LBR	.05 HRS	4.90	.22	1.00	4.99	1.33	1.46	.03	
.625 X 18.00 X 18.00		R M	2.00 UNITS	11.65	23.30	1.00	0.00	0.00	23.30	.47	
LOW CARBON STEEL PLATE											
SOURCE: U.S. STEEL											
2020305.	ID40042										
ASSEMBLY		LBR	.24 HRS	4.90	1.18	1.00	4.99	1.33	7.82	.16	
SUPPORTS REFLECTOR AND TIES											
ELEVATIONAL AZIMUTH DRIVE											
TOGETHER. WT=193 LBS.											
SOURCE: ADL/MDC											
2020401.	KJS-1616060										
BUSHING		P P	4.00 UNITS	.18	.73	1.00	0.00	0.00	.73	.01	
PER SPECIFICATION											
SOURCE: SARGENT											
2020402.	T647										
SHAFT		P P	4.00 UNITS	3.61	14.43	1.00	0.00	0.00	14.43	.29	
PIVOT SHAFT.											

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

ELEVATION		4422									
DESCRIPTION			QTY/PKS/ ANN. FAIL	REF UNIT	SUB TOTAL	FACTORS			TOTAL	\$/SM	
				COST		CRC	OVERHEAD	G&A			
2020403. SEAL-DUST PER SPECIFICATION. SOURCE: SARGENT	KT4-1622060	P P	4.00 UNITS	.05	.20	1.00	0.00	0.00	.20	.00	
2020404. WASHER SOURCE: LAWRENCE ENGINEERING	AN-960-416L	P P	4.00 UNITS	.06	.24	1.00	0.00	0.00	.24	.00	
20209. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECYCLING.	T 1	LBR	.06 HRS	4.90	.27	1.00	4.99	1.33	1.82	.04	
20210. Q & RA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR	.12 HRS	4.90	.57	1.00	4.99	1.33	3.76	.08	
20212. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS PERCENT OF THE MFG. HOUR.	T 4	LBR	.13 HRS	4.90	.62	1.00	4.99	1.33	4.12	.08	
		R M	1.00 UNITS	.10	.10	1.00	0.00	0.00	.10	.00	
20213. PRODUCTION SUPT. .042 PERCENT OF MFG + PLAN + TOOL	T 5	LBR	.08 HRS	4.90	.38	1.00	4.99	1.33	2.55	.05	
ELEVATION		4422						420.		8.57	

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

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MOTOR TOTAL 4423									
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHC	OVERHEAD	G&A		
2030101. BOLTS 1/4 DIA. X 1 LONG, CLASS 2 SOURCE: MC MASTER	T538	P P 4.00 UNITS	.05	.20	1.00	0.00	0.00	.20	.00
2030102. WASHER 1/4 DIA. SOURCE: MC MASTER	T539	P P 1.00 UNITS	.03	.03	1.00	0.00	0.00	.03	.00
2030103. AZIMUTH MOTOR	T607	P P 1.00 UNITS	58.15	58.15	1.00	0.00	0.00	58.15	1.19
2030201. BOLT/NUT 1/4 DIA. X 1 LONG, CLASS 2 SOURCE: MC MASTER	T541	P P 4.00 UNITS	.33	1.30	1.00	0.00	0.00	1.30	.03
2030202. WASHER 1/4 DIA. SOURCE: MC MASTER	T542	P P 4.00 UNITS	.03	.12	1.00	0.00	0.00	.12	.00
2030203. TRKING MOTOR 1/4 HP, 24V, THREE PHASE WITH A MENA "C" CURVE SOURCE: W.C. PEART CO.	T665	P P 1.00 UNITS	42.71	42.71	1.00	0.00	0.00	42.71	.87
2030301. BOLT/NUT 1/4 X 1 LONG, CLASS 2 SOURCE: MC MASTER	T544	P P 4.00 UNITS	.33	1.30	1.00	0.00	0.00	1.30	.03
2030302. WASHER 1/4 DIA. SOURCE: MC MASTER	T545	P P 4.00 UNITS	.03	.12	1.00	0.00	0.00	.12	.00
2030303. STORAGE MOTOR 1/4 HP, 240V, THREE PHASE WITH	T666	P P 1.00 UNITS	42.71	42.71	1.00	0.00	0.00	42.71	.87
MOTOR TOTAL	4423							147.	2.99

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PROTOTYPE HELIOSIAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

POS/LIMIT INDICATO 4424

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
					CRC	OVERHEAD	GA			
20401. ASSEMBLY OF ELECTRONIC SOURCE: ADL	T614	LBH	.13 HRS	4.90	.64	1.00	4.99	1.33	4.27	.09
2040201. HALL EFFECT SENSOR SOURCE: MICRO SWITCH	T686	P P	2.00 UNITS	1.78	3.55	1.00	0.00	0.00	3.55	.07
2040202. LINE DRIVER SOURCE: FAIRCHILD	9684	P P	3.00 UNITS	.74	2.22	1.00	0.00	0.00	2.22	.05
2040203. FERROUS METAL DISC SOURCE: MDAC	T618	P P	3.00 UNITS	1.02	3.05	1.00	0.00	0.00	3.05	.06
2040301. DUAL DIFF LINE REC SOURCE: FAIRCHILD	9615	P P	1.00 UNITS	.78	.78	1.00	0.00	0.00	.78	.02
2040302. OPT. ISOL. TRIACS PER SPECIFICATION SOURCE: MOTOROLA	02T3244	P P P	4.00 UNITS	.97	3.86	1.00	0.00	0.00	3.86	.08
2040303. RESISTOR PER SPECIFICATION SOURCE: RCA	11 Z 13	P P P	4.00 UNITS	.11	.45	1.00	0.00	0.00	.45	.01
2040304. CAPACITOR PER SPECIFICATION SOURCE: RCA	0.14F1400V	P P P	4.00 UNITS	.10	.41	1.00	0.00	0.00	.41	.01
2040305. PRINTED CIRCUIT BD 6 IN. X 6 IN. TWO SIDE EPOXY GLASS, COPPER CIRCUITRY, WITH THRU PLATED HOLES. .02 SOURCE: MDAC	T107	P P	1.00 UNITS	.73	.73	1.00	0.00	0.00	.73	.01
2040306. COVER PER SPECIFICATION SOURCE: MDAC	T225	P P P	1.00 UNITS	.91	.91	1.00	0.00	0.00	.91	.02
20405. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T I	LBH	.02 HRS	4.90	.08	1.00	4.99	1.33	.51	.01

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

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POS/LIMIT INDICATO 4424

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	S/SM
		COST		CRC	OVERHEAD	G&A		
20406. O & MA IND T 2								
FACTOR OF .052 PERCENT X MFG HOURS LBR	.03 HRS	4.90	.16	1.00	4.99	1.33	1.06	.02
20408. TOOLING MATERIAL T 4								
\$.70 PER TOOLING HOURS PLUS .06 LBR	.04 HRS	4.90	.17	1.00	4.99	1.33	1.16	.02
PERCENT OF THE MFG. HOUR. H M	1.00 UNITS	.03	.03	1.00	0.00	0.00	.03	.00
20409. PRODUCTION SUPPT. T 5								
.042 PERCENT OF MFG + PLAN + TOOL LBR	.02 HRS	4.90	.11	1.00	4.99	1.33	.72	.01
POS/LIMIT INDICATO 4424							24.	.48

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

PMR SPLY/DIST 4425

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CHC	OVERHEAD	G&A		
2050201. FEEDER CABLE CLX 3, NO. 4 AWG, 5KV, COPPER CABLE/GALITEP P 2000, WITH ALUMINUM SHEATH AND PVC JACKETS SUITABLE FOR DIRECT BURIAL. SOURCE: OKOMITE	1.00 UNITS	6.96	6.96	1.00	0.00	0.00	6.96	.14
2050202. TRANSFORMER 225T(19)H PER SPECIFICATIONS. P P SOURCE: SOJARE D	1.00 UNITS	11.53	11.53	1.00	0.00	0.00	11.53	.23
2050203. DIST PANEL SQ.D-H-4172-4M 480V THREE PHASE WITH 100 P P AMP C/B. SOURCE: SOJARE D	1.00 UNITS	1.19	1.19	1.00	0.00	0.00	1.19	.02
2050204. BRANCH CIR BKN SQD NO.FA-34040 480V, 3 POLE, 40 AMP P P SOURCE: SOJARE D	15.00 UNITS	.15	2.21	1.00	0.00	0.00	2.21	.05
2050205. BRANCH CIR CABLE CLX-ALS 3, NO. 8 AWG, 600V, COPPER CABLE/GALITEP P 2000 WITH ALUMINUM SHEATH AND PVC JACKET, SUITABLE FOR DIRECT BURIAL. SOURCE: OKOMITE	1.00 UNITS	43.34	43.34	1.00	0.00	0.00	43.34	.88
2050206. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS LBR DIST. .03 TO LABOR AND ERR .07 TO NON-RECURRING.	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
2050207. Q & HA - IND T 2 FACTOR OF .062 PERCENT X MFG HOURS LBR ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
2050208. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 LBR PERCENT OF THE MFG. HOUR. ERR H M	0.00 HRS 0.00 0.00 UNITS	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
2050209. PRODUCTION SUPT. T 5 .042 PERCENT OF MFG + PLAN + TXNL LBR + Q & HA (DIRECT & IND.) ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

PMR SPLY/DIST	4425									
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CNC OVERHEAD G&A			TOTAL	\$/SM	
2050301.										
WIIE CLX-16										
3 NO. 16 AWG WITH OPTICAL FIBER	P P	1.00 UNITS	8.23	8.23	1.00	0.00	0.00	8.23	.17	
SOURCE: OKONITE										
2050302.										
CIR BRK/HOLDER T663										
480V, 15 AMP, 3 PHASE C/B PLUS	P P	1.00 UNITS	37.64	37.64	1.00	0.00	0.00	37.64	.77	
HOLDER.										
SOURCE: SQUARE D										
2050303.										
CONNECTORS T664										
OPTICAL FIBER COUPLINGS.	P P	2.00 UNITS	3.20	6.40	1.00	0.00	0.00	6.40	.13	
PMR SPLY/DIST	4425							118.	2.40	

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

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DATE 05/24/78

ASSY DR/PED/ELECT 4426

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB. TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
20601.									
ASSY DR/PED/ELECT 4426	T								
DRIVE AND PEDESTAL LABMR REQUIRED	LBR	.08 HRS	4.90	.39	1.00	4.99	1.33	2.61	.05
ASSEMBLY OF MAIN BEAM, JACKS,	P P	1.00 UNITS	1.02	1.02	1.00	0.00	0.00	1.02	.02
DHAG LINK, AZIMUTH DRIVE, PEDESTAL									
AND ELECTRIC.									
SOURCE: ADL/ADAC									
20604.									
PLANNING T 1									
FACTOR OF 10 PERCENT X MFG HOURS	LBR	.01 HRS	4.90	.05	1.00	4.99	1.33	.31	.01
DIST. .03 TO LABOR AND									
.07 TO NON-RECURRING.									
20605.									
QUAL & RA IND T 2									
FACTOR OF .062 PERCENT X MFG HOURS	LBR	.02 HRS	4.90	.10	1.00	4.99	1.33	.65	.01
20607.									
TOOLING MATERIAL T 4									
\$.70 PER TOOLING HOURS PLUS .06	LBR	.02 HRS	4.90	.11	1.00	4.99	1.33	.71	.01
PERCENT OF THE MFG. HOUR.	R M	1.00 UNITS	.02	.02	1.00	0.00	0.00	.02	.00
20608.									
PROD SUPPORT T 5									
.042 PERCENT OF MFG + PLAN + TOOL	LBR	.01 HRS	4.90	.07	1.00	4.99	1.33	.44	.01
ASSY DR/PED/ELECT 4426	T							6.	.12

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

SENSOR/CALIB EQUIP 4431

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB-TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
3010201. CAMERA SOURCE: GENERAL ELECTRIC	TN2200	P P	1.00 UNITS	.79	.79	1.00	0.00	0.00	.79 .02
3010202. CAMERA LENS	T648	P P	1.00 UNITS	.04	.04	1.00	0.00	0.00	.04 .00
3010203. TRIPOD 6 FT HIGH SOURCE: MDAC	T649	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010204. COOLER-HEATER SOURCE: MDAC	T650	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010205. ELECTRONICS CAMERA ELECTRONICS SOURCE: MDAC	T651	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00 .00
3010206. CABLE 3 NO. 16 AWG WITH OPTICAL FIBER SOURCE: OKONITE	CLX-16	P P	1.00 UNITS	.01	.01	1.00	0.00	0.00	.01 .00
30105. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBR ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
30106. O & RA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBR ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
30107. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBR ERR H M	0.00 HRS 0.00 0.00 UNITS	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
30108. PRODUCTION SUPT. .042 PERCENT OF MFG + PLAN + TIME + O & RA (DIRECT & IND.)	T 5	LBR ERR	0.00 HRS 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
SENSOR/CALIB EQUIP 4431									1. .02

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

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FIELD CONTROL 4432

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
				CHK	OVERHEAD	G&A			
30201. ASSEMBLY T620 DOT COMPONENT ASSEMBLY	LBR	.00 HRS	4.90	.02	1.00	4.99	1.33	.15	.00
3020201. TWO SIDED PMB 44320201 SOURCE: MDAC	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
3020202. CONNECTION T652 24 PIN SOURCE: AMP INC.	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
3020203. LED SG1010 PER SPECIFICATION SOURCE: RCA	P P	10.00 UNITS	.00	.02	1.00	0.00	0.00	.02	.00
3020204. OPT TRANSCEIVER T622 COMMUNICATION WITH HELIOSTAT ARRAY CONTROLLER SOURCE: TI	P P	2.00 UNITS	.03	.06	1.00	0.00	0.00	.06	.00
3020205. MICRO-COMPUTER T623 SIMILAR TO NAT'L SEMI 8748 SOURCE: NATL SEMICONDUCTOR	P P	2.00 UNITS	.03	.06	1.00	0.00	0.00	.06	.00
3020206. OPT TRANSCEIVER T624 COMMUNICATION WITH HELIOSTAT CONTROLLER. SOURCE: TI	P P	3.00 UNITS	.03	.21	1.00	0.00	0.00	.21	.00
3020207. RELAY T560 4 PDT (5V) SOURCE: POTTER BRUMFIELD	P P	8.00 UNITS	.01	.05	1.00	0.00	0.00	.05	.00
3020208. CERAMIC CAPS T626 0.1 MF .50V SOURCE: BELL	P P	8.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
3020209. MODULAR PMH-SUPPLY T627 PV SOURCE: LAMBDA	P P	2.00 UNITS	.09	.18	1.00	0.00	0.00	.18	.00
3020210. FOAM PADS T628 ATTACH FOAM CUSHIONS TO TOP OF BOX.	P P	2.00 UNITS	.00	.60	1.00	0.00	0.00	.00	.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

FIELD CONTROL		4432								
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
						CRC	OVERHEAD	G&A		
3020211. PHOTO DETECTOR OPTICAL FIBER SOURCE: I.T.	T629	P P	2.00 UNITS	.01	.02	1.00	0.00	0.00	.02	.00
3020212. PHOTO TRANSISTORS OPTICAL FIBER. SOURCE: I.T.	T630	P P	8.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
3020213. BOX ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVER. SOURCE: NEWPORT PLASTIC	T631	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
3020214. CONNECTOR 36 COND NO. 24 AWG FLAT WIRE AND CONNECTORS. SOURCE: AMP INC.	T231	P P	2.00 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
30215. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	LBN	.00 HRS	4.90	.00	1.00	4.99	1.33	.02	.00
30216. O & MA - IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBN	.00 HRS	4.90	.01	1.00	4.99	1.33	.04	.00
30218. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS PERCENT OF THE MFG. HOUR.	T 4	LBN M M	.00 HRS 1.00 UNITS	4.90 .00	.01 .00	1.00 1.00	4.99 0.00	1.33 0.00	.04 .00	.00 .00
30219. PROD SUPPORT .042 PERCENT OF MFG + PLAN + TOOL	T 5	LBN	.00 HRS	4.90	.00	1.00	4.99	1.33	.03	.00
FIELD CONTROL	4432								1.	.02

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

CNTRL/SIG EQ 44.33

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CNC	OVERHEAD	G&A		
30301. ASSEMBLY	T281								
TOTAL COMPONENTS		LBR	.39 HRS	4.90	1.92	1.00	4.99	1.33	12.74 .26
3030201. PRINTED CIRCUIT BD T100 4 IN X 5 IN TWO SIDED EPOXY GLASS COPPER CIRCUITRY WITH THRU PLATED HOLES. .02 SOURCE: MDAC		T P P	1.00 UNITS	.52	.52	1.00	0.00	0.00	.52 .01
3030203. CONNECTION	T652								
24 PIN SOURCE: AMP INC.		P P	1.00 UNITS	.72	.72	1.00	0.00	0.00	.72 .01
3030204. MU.COMPUTER	T623								
SIMILAR TO NAT'L SEMI 8748 SOURCE: NAT'L SEMICONDUCTION		P P	1.00 UNITS	8.66	8.66	1.00	0.00	0.00	8.66 .18
3030205. QUAD.DIFF. LINE DR T656 MOTOR DRIVER INTERFACE SIMILAR TO NAT'L SEMI. DS1688		P P	2.00 UNITS	.51	1.01	1.00	0.00	0.00	1.01 .02
3030206. QUAD.DIFF. LINE RE T657 ENCODER INTERFACE SIMILAR TO NAT'L SEMI. DS1689		P P	2.00 UNITS	.51	1.01	1.00	0.00	0.00	1.01 .02
3030207. HEX D-FLIP FLOP ENCODER INTERFACE SOURCE: T.I.	T658								
		P P	3.00 UNITS	.36	1.08	1.00	0.00	0.00	1.08 .02
3030208. CAPACITOR 0.1 MF .50V SOURCE: BELL	T625								
		P P	3.00 UNITS	.10	.31	1.00	0.00	0.00	.31 .01
3030209. POWER SUPPLY PEN SPECIFICATION SOURCE: SEMICONDUCTOR CIR., INC	3425-0000	P P P	1.00 UNITS	28.86	28.86	1.00	0.00	0.00	28.86 .59
3030210. BOX ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVER. SOURCE: NEWPORT PLASTIC	T631								
		P P	1.00 UNITS	.65	.65	1.00	0.00	0.00	.65 .01

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

CNTRL/SIG EQ 4433

DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
						CRC	OVERHEAD	G&A		
3030211. CONNECTOR 24 PIN FEMALE SOURCE: AMP INC.	T662	P P	1.00 UNITS	.72	.72	1.00	0.00	0.00	.72	.01
30312. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO 1.00 H AND .07 TO NON-RECURRING.	T 1	LBH	.05 HRS	4.90	.23	1.00	4.99	1.33	1.53	.03
30313. Q & MA - IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	LBH	.10 HRS	4.90	.48	1.00	4.99	1.33	3.16	.06
30315. TOOLING MATERIAL 5.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	LBH H M	.11 HRS 1.00 UNITS	4.90 .08	.52 .08	1.00 1.00	4.99 0.00	1.33 0.00	3.47 .08	.07 .00
30316. PROD. SUPPORT .042 PERCENT OF MFG + PLAN + TOOL	T 5	LBH	.07 HRS	4.90	.32	1.00	4.99	1.33	2.14	.04
CNTRL/SIG EQ	4433								67.	1.36

COLLECTOR CONTROL 44320101

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
				CRC	OVERHEAD	G&A			
30401. CPU SM30JJALA COLLECTOR CONTROL CPU'S WITH 32KB OF MOS. MEMORY.	P P	2.00 UNITS	.48	.95	1.00	0.00	0.00	.95	.02
30402. LINE INTERFACE DL11-WB SERIAL LINE INTERFACES TO MCS, BEAM CHARACTERIZATION SYSTEM AND DATA ACQUISITION SYSTEM TO 9600 BAUD	P P	6.00 UNITS	.01	.07	1.00	0.00	0.00	.07	.00
30403. WATCH DOG TIMER KMI1-M COMPUTER RESETABLE CLOCK SOURCE: DEC	P P	2.00 UNITS	.02	.04	1.00	0.00	0.00	.04	.00
30404. URIBUS LINK DAI1 HIGHSPEED PARALLEL COMMUNICATION INTERFACE. SOURCE: DEC	P P	1.00 UNITS	.41	.41	1.00	0.00	0.00	.41	.01
30405. FIELD INTERFACE DZ11-E A SYNCHRONOUS 16 LINE MULTIPLEXOR TRANSMISSION TO 9600 BAUD TO FIELD CONTROLLERS	P P	2.00 UNITS	.06	.13	1.00	0.00	0.00	.13	.00
30406. STORAGE MSH Jo	P P	6.00 UNITS	.04	.23	1.00	0.00	0.00	.23	.00
30407. FORTRAN IV PLUS QP100-CE HIGH LEVEL ENGLISH CONVERSION LANGUAGE COMPILER.	P P	2.00 UNITS	.04	.08	1.00	0.00	0.00	.08	.00
30408. NAV TIME TONE REC T632 UNIVERSAL TIME TONE SAV	P P	2.00 UNITS	.07	.15	1.00	0.00	0.00	.15	.00
30409. TIME CODE GEN T633 IRIG B BCD OUTPUT (DAY, MONTH, HOUR, P P MINUTE, SECOND)	P P	2.00 UNITS	.03	.06	1.00	0.00	0.00	.06	.00
30412. COLLECTOR CONTROL 44320101 TOTAL - HELIOSTAT CONTROLLER	LBR	.02 HRS	5.88	.12	1.00	4.99	1.33	.82	.02

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

COLLECTOR CONTROL 44320101

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
30414.								
Q & RA - IND T 2								
FACTOR OF .062 PERCENT X MFG HOURS LBR	.01 HRS	4.90	.03	1.00	4.99	1.33	.17	.00
30415.								
TOOLING MATERIAL T 4								
\$.70 PER TOOLING HOURS PLUS .06 LBR	.01 HRS	4.90	.03	1.00	4.99	1.33	.19	.00
PERCENT OF THE MFG. HOUR. H M	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
30416.								
PRODUCTION SUPT. T 5								
.042 PERCENT OF MFG + PLAN + TOOL LBR	.00 HRS	4.90	.02	1.00	4.99	1.33	.11	.00
+ Q & RA (DIRECT & IND.)								
30417.								
PLANNING T 1								
FACTOR OF 10 PERCENT X MFG HOURS LBR	.00 HRS	4.90	.01	1.00	4.99	1.33	.08	.00
COLLECTOR CONTROL 44320101							3.	.07

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

FOUNDATION	4441									
DESCRIPTION		QTY/HMS/ ADM. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
					CRC	OVERHEAD	G&A			
4010101. FORM, POUR/FINISH 444111 LABOR TO POSITION TAPERED PIPE, POUR CONCRETE AND VIBRATE. 5 CREWS (25 WEEK BASE) EACH 5 LABORERS (INCL. LEAD) SOURCE: STEARNS-ROGER		LBR	1.80 HMS	13.61	24.46	1.00	1.97	1.00	48.18	.98
4010102. CAGES 444112 LABOR TO SET UP AND PLACE CAGES IN AUGURED HOLE. 5 CREWS (25 WEEK BASE) EACH 2 RODMEN 2 IRONWORKERS SOURCE: STEARNS-ROGER		LBR	1.44 HMS	13.61	19.57	1.00	1.97	1.00	38.55	.79
4010103. EQUIP OPER & DRIVN 444113 EQUIPMENT OPERATORS AND TRUCK DRIVERS USED IN SUPPORT OF FOUNDATION INSTALLATION. 5 CREWS (25 WEEK BASE) EACH 1 HYDRAULIC CRANE OPERATOR 1 OILER 3 TRUCK DRIVERS SOURCE: STEARNS-ROGER		LBR	1.80 HMS	13.61	24.46	1.00	1.97	1.00	48.18	.98
40102. CONCRETE 44412 3.0 CUBIC YARDS OF CONCRETE PRICED AT \$37 PER YARD INCLUDING COST OF MATERIALS, MIXING AND DELIVERY TO FOUNDATIONS POSITION. SOURCE: STEARNS-ROGER		P P	1.00 UNITS	118.19	118.19	1.00	0.00	0.00	118.19	2.41
40103. CAGES 44413 428.2 LBS. OF REBAR PRICED AT \$.20 PER LB. AND LABOR TO PRE- FABRICATE REBAR CAGES. 5 CREWS (25 WEEK BASE) EACH 2 RODMEN 3 LABORERS (INCLUDING LEAD) 1 HYDRAULIC CRANE OPERATOR 1 TRUCK DRIVER SOURCE: STEARNS-ROGER		LBR R M	2.52 HMS 1.00 UNITS	13.61 91.57	34.24 91.57	1.00 1.00	1.97 0.00	1.00 0.00	67.45 91.57	1.38 1.87
40104. TAPERED PIPE 44414 98.25 LBS PRICED AT \$.31 PER LB DELIVERED. BASED ON U.S. STEEL. PRICE INFORMATION.		P P	1.00 UNITS	31.51	31.51	1.00	0.00	0.00	31.51	.64

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

FOUNDATION	4441										
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL		F A C T O R S CRC OVERHEAD G&A			TOTAL	\$/SM	
40105. BRACING	44415										
BRACING - - 50 SETS AT \$200 EACH		P P	1.00 UNITS	4.07	4.07	1.00 0.00 0.00			4.07	.08	
FOUNDATION:	4441								448.	9.13	

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

SITE PREPARATION 4442

DESCRIPTION		QTY/HRS/ ANW. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CMC	OVERHEAD	G&A		
40201.									
SURVEY	44421								
5 SURVEY CREWS (25 WEEK BASE)		LBR	.72 HRS	13.61	9.78	1.00	1.97	1.00	19.27 .39
2 SURVEYORS									
SOURCE: STEAHNS-ROGER									
40202.									
DRILLING	44422								
DRILLING OPERATIONS, USING DRILL		LBR	2.16 HRS	13.61	29.35	1.00	1.97	1.00	57.82 1.18
SITE PREPARATION	4442								77. 1.57

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

HELIO SUPP STRUCT 4451

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	FACTORS CRC OVERHEAD G&A			TOTAL	\$/SM
50101. ASSEMBLY T455 ASSEMBLY PROCESS OF PEDESTAL COMPONENTS.	LBR	.17 HRS	4.90	.85	1.00	4.99	1.33	5.65	.12
5010201. TUBE ID40046-3 24 OD X .105 WALL X 123 LONG LC STEEL, WT=276 LBS. SOURCE: KELLY PIPE	R M	1.00 UNITS	86.82	86.82	1.00	0.00	0.00	86.82	1.77
5010202. CAP ID40046-5 .375 X 30 X 30, LC STEEL PLATE WT=75 LB. SOURCE: U.S. STEEL	R M	1.00 UNITS	20.39	20.39	1.00	0.00	0.00	20.39	.42
5010203. COVER ID40046-7 .0396 X 10 X 10 L.C. STEEL WT=4 LB. H M SOURCE: U.S. STEEL	H M	1.00 UNITS	.84	.84	1.00	0.00	0.00	.84	.02
5010204. J BOX ID40046-9	P P	1.00 UNITS	.76	.76	1.00	0.00	0.00	.76	.02
50114. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	LBR	.02 HRS	4.90	.10	1.00	4.99	1.33	.68	.01
50115. QUAL & RA IND T 2 FACTOR OF .052 PERCENT X MFG HOURS	LBR	.04 HRS	4.90	.21	1.00	4.99	1.33	1.40	.03
50117. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	LBR H M	.05 HRS 1.00 UNITS	4.90 .04	.23 .04	1.00 1.00	4.99 0.00	1.33 0.00	1.54 .04	.03 .00
50118. PROD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL	LBR	.03 HRS	4.90	.14	1.00	4.99	1.33	.95	.02
HELIO SUPP STRUCT 4451								119.	2.43

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

PROTECTION ENCL	4452								
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CNC OVERHEAD G&A	TOTAL			
PROTECTION ENCL	4452					0.	0.00		

PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

LIGHTNING PROT. 4453

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CRC OVERHEAD G&A

TOTAL

\$/SM

LIGHTNING PROT. 4453

0. 0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

HELIOSTAT 4401

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CHC	OVERHEAD	G&A		

7010201. DRIVE/PED/ELTRONC 440121 REMOVE 803 LBS. DPE UNIT FROM FLAT BED, PLACE OVER TAPERED FOUNDATION PROTRUSION AND VIBRATE USING GROVE (MODEL 36) HYDRAULICS, DIESEL. CRANE MODIFIED TO ADD MANIPULATION. 2 CHWS (26.625 MK BASE) EACH 1 EQUIPMENT OPERATOR 1 MILLWRIGHT 1 LABORER	LBR	.38 HRS	13.61	5.21	1.00	1.97	1.00	10.26	.21
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7010202. REFLECTOR PANELS 446122 USE YALE MODEL G3 P-150, DIESEL, 240 IN. HIGH LIFT FORK TRUCK TO REMOVE PANEL CONTAINERS AND PLACE ON DOTT 1000 SERIES B, DIESEL 4 WHEEL STEERING TRAVELIFT, MODIFIED TO ADD 2 CRANE/MANIPULATORS. 5 CHWS (26.625 MK BASE) EACH 1 FORKLIFT OPERATOR 1 TRAVELIFT OPERATOR 2 MILLWRIGHTS 2 LABORERS	LBR	1.91 HRS	13.61	26.04	1.00	1.97	1.00	51.31	1.05
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7010203. OIL - DRIVE	S.A.3. 30	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
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HELIOSTAT 4401								62.	1.26
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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

SENSOR/CALIB EO 4462

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
		COST		CNC	OVERHEAD	G&A		
70202. INSTALL 44621 USE STANDARD ELECTRICIAN TOOLS TO INSTALL DIGITAL EYE UNITS 1 CHEN (1 K.BASE) EACH 1 ELECTRICIAN EFFORT IS CONCURRENT AND IN ASSOCIATION WITH CALIBRATION. 8.3 UNITS (6/FIELD).	LBR	.00 HRS	13.61	.06	1.00	1.97	1.00	.12 .00
70203. CALIBRATE 44622 ONE VOLT-OHM METER AND ONE	LBR	.00 HRS	13.61	.06	1.00	1.97	1.00	.12 .00
SENSOR/CALIB EO 4462								0. .00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09..24.14.

DATE 05/24/78

ELECTRICAL/DISTRIB 4463

DESCRIPTION	QTY/HRS/ AMB. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CHC	OVERHEAD	G&A		
70302. INSTAL CABLE 44631 EMPLOY VIBRATORY, DIESEL, PLOW TO BURY ONE POWER/FIBEROPTICS CABLE. 3 CREWS (26.625 AM. BASE) EACH 1 CABLE PLOW OPERATOR 2 LABORS	LBR .77 HRS	13.61	10.42	1.00	1.97	1.00	20.52	.42
70303. PWR TR/DISTRIB FOL 44632 INSTALL POWER TRANSFORMER/ DISTRIBUTION PANELS USING 1 TRUCK AND 1 FORKLIFT. 1 CREW (2 AM BASE) EACH 1 TRUCK DRIVER 1 FORKLIFT OPERATOR 1 MILLRIGHT 2 LABORS	LBR .02 HRS	13.61	.30	1.00	1.97	1.00	.59	.01
70304. CONN./CLOSE OUT 44633 USE 1 SPECIAL TEST SET AND	LBR .51 HRS	13.61	6.95	1.00	1.97	1.00	13.68	.28
ELECTRICAL/DISTRIB 4463							35.	.71

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

ALIGN HELIOSTATS 4464

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CRC OVERHEAD G&A

TOTAL

\$/SM

ALIGN HELIOSTATS 4464

0. 0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

FIELD SUPPORT 4465

DESCRIPTION	QTY/HRS/ ANN. FILL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
70501. INSTALLATION MGMT 44651 OVERALL MANAGEMENT OF FIELD EFFORT. LBN 1 FIELD MANAGER (28.46 WK BASE).	.13 HRS	13.61	1.73	1.00	1.97	1.00	3.41	.07
7050201. SUPERVISION 44652-1 1 LOGISTICS SUPERVISOR LBN (28.46 WK BASE).	.13 HRS	13.61	1.73	1.00	1.97	1.00	3.41	.07
7050202. RECORDS 44652-2 KEEP ACCOUNTABLE RECORDS FOR FIELD LBN MATERIALS, COMPLETIONS TO SPEC., RECORDS, ETC. 1 RECORDS CLERK (28.46 WK BASE).	.06 HRS	13.61	.86	1.00	1.97	1.00	1.70	.03
7050203. FIELD COORDINATION 44652-3 COORDINATE MATERIAL HANDLING, LBR MOVEMENT AND SCHEDULES. 4 FIELD COORDINATORS (28.46 WK BASE)	.25 HRS	13.61	3.46	1.00	1.97	1.00	6.82	.14
7050204. PERSONNEL 44652-4 KEEPS PERSONNEL FILES, ADMINISTERS LBR HOUSING AND BENEFITS FOR FIELD PERSONNEL, TIME RECORDS, ETC. 1 PERSONNEL CLERK (28.64 WK BASE).	.06 HRS	13.61	.86	1.00	1.97	1.00	1.70	.03
70503. QUALITY CONTROL 44653 OVERSEE AND ASSURE QUALITY OF LBR INSTALLATIONS THROUGH FIELD INSPECTION, PRACTICES REVIEW, AND DECEPANT MATERIAL, FAILURE AND CORRECTIVE ACTION REPORTS. 1 QUAL. ASSUR. REP. (26.625 WK BASE).	.09 HRS	13.61	1.25	1.00	1.97	1.00	2.45	.05
70504. FIELD ENGINEERING 44654 PROVIDE ENGINEERING SUPPORT DURING LBR	.09 HRS	13.61	1.25	1.00	1.97	1.00	2.45	.05
FIELD SUPPORT 4465							22.	.45

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

PACK & TRANSP 4466

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL COST	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
7060101. DRIVE 44661-1 SPECIALIZED TRAILER BED WITH RACK P P ON ONE SIDE FOR PEDESTAL, DRIVE, SHORT MAIN BEAM ASSEMBLY TO LEAN AGAINST AND WITH 4 BY 4'S ATTACHED TO FLOOR FOR BRACING. QTY PER TRAILER BED = 12. REUSABLE SPECIALIZED TRAILER BEDS: MINIMUM QUANTITY NEEDED FOR 1 WEEK: 42.	1.00 UNITS		.19	.19	1.00	0.00	0.00	.19 .00
7060102. REFLECTOR 44661-2 SPECIALIZED PALLET FOR HOLDING P P REFLECTOR PANELS (ALREADY ATTACHED TO MIRROR BACKING STRUCTURE) IN AN UPRIGHT POSITION, EACH BRACED ON A BOX STRUCTURE WHICH IS MOUNTED ON THE PALLET. CUSHIONED HOLDOWN ASSEMBLY KEEPS THE TOPS OF THE PANELS SECURE. QTY PER PALLET = 4 PANELS. REUSABLE PALLETS: MINIMUM QTY. NEEDED FOR 1 WEEK = 250	1.00 UNITS		.39	.39	1.00	0.00	0.00	.39 .01
7060103. DISTRUB ELECT 44661-3 TRANSFORMERS STRAPPED TO P P REUSABLE PALLETS.	1.00 UNITS		.04	.04	1.00	0.00	0.00	.04 .00
7060201. DRIVE 44662-1 SPECIALIZED TRAILER BEDS REMAIN LBR AT SITE UNTIL UNLOADED (1 WEEK'S INSTALLATION SUPPLY) ONE TRAILER, IS PULLED BY ONE TRUCK CAB. WEIGHT PER DRIVE ASSEMBLY = 1450 LBS 12 DRIVE ASSEMBLIES PER TRAILER BED 17,400 LBS. WEIGHT OF MODIFICATION TO TRAILER BED = 700 LBS. TOTAL WEIGHT OF ASSEMBLIES AND MOD. = 18,100 LBS.	.33 HRS	2.12	.70	1.00	4.99	1.33	4.67	.10
7060202. REFLECTOR 44662-2 ONE LONBOY PULLED BY ONE TRUCK CAB, LBR ONE PALLET PER LONBOY, PALLET LIFTED FROM LONBOY WITH FORKTRUCK. QTY: 4 PANELS WITH BACKING STRUCTURE PALLET. WEIGHT: 1374 LBS. EACH X 4 5496 LBS. PLUS WT. OF PALLET.	1.99 HRS	2.12	4.22	1.00	4.99	1.33	27.99	.57

DATE 05/24/78

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR - 10TH YEAR

09.24.14.

DATE 05/24/78

DESIGN	4471							
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL
			COST		CHC	OVERHEAD	G&A	\$/SM
DESIGN	4471							0. 0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

SUSTAINING ENGR. 4472

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CNC	OVERHEAD	G&A		
SUSTAINING ENGR.	4472						0.	0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

PHE PROD UNIT 4473

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CNC OVERHEAD G&A

TOTAL

\$/SM

PHE PROD UNIT 4473

0. 0.00

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PROTOTYPE HELIOSTAT INVESTMENT COST - 1000000 UNITS PER YEAR -- 10TH YEAR

09.24.14.

DATE 05/24/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL COST	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
SITE ACTIVATION	4474	T					0.	0.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

REFLECTIVE SURFACE 4411

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
10101. LAMINATE T636 LABOR REQUIRED FOR LAMINATING LINE/ SOURCE: ADL/MDC	LBH	1.13 HRS	9.26	10.44	1.00	2.63	1.45	39.83	.81
1010201. FAB T637 LABOR REQUIRED FOR MIRRORING LINE. SOURCE: ADL/MDC	LBH	3.39 HRS	9.26	31.34	1.00	2.63	1.45	119.50	2.44
1010202. FRONT LITE ID40044-3 .060 X 48 X 132 CORNING FUSION GLASS. SOURCE: CORNING	P P	12.00 UNITS	35.83	429.96	1.00	0.00	0.00	429.96	8.77
1010203. CHEMICALS T638 MIRRORING SOLUTION, SILVER AND COPPER. SOURCE: SUMNER & MAGA IND. (LONDON, ENG.).	H M	12.00 UNITS	2.76	33.06	1.00	0.00	0.00	33.06	.67
1010204. SETUP T501	ERR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10103. BACK LITE ID40044-5 .188 X 48 X 132 FLOAT GLASS SOURCE: ASG	P P	12.00 UNITS	36.74	440.86	1.00	0.00	0.00	440.86	8.99
10104. ADHESIVE 1XA3504 BOND GLASS SHEETS TOGETHER WITH POLYURETHANE ADHESIVE. WT=2 LB. 3M CORPORATION	H M	12.00 UNITS	4.26	51.10	1.00	0.00	0.00	51.10	1.04
10105. SETUP T503	ERR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10120. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	N H LBH	0.00 .14 HRS	0.00 9.26	11.15 1.25	0.00 1.00	0.00 2.63	0.00 1.45	11.15 4.78	.23 .10
10121. QUAL & MA IND T 2 FACTOR OF .062 PERCENT X MFG HOURS	N H LBH	0.00 .28 HRS	0.00 9.26	6.05 2.59	0.00 1.00	0.00 2.63	0.00 1.45	6.05 9.88	.12 .20

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

REFLECTIVE SURFACE 4411

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHC	OVERHEAD	G&A		
10123.									
TOOLING MATERIAL T 4									
5.70 PER TOOLING HOURS PLUS .00	N R	0.00	0.00	16.25	0.00	0.00	0.00	16.25	.33
PERCENT OF THE MFG. HOUR.	LBN	.34 HRS	9.26	3.13	1.00	2.63	1.45	11.92	.24
	R N	1.00 UNITS	.29	.29	1.00	0.00	0.00	.29	.01
10124.									
PRND SUPPORT T 5									
.042 PERCENT OF MFG + PLAN + TOOL	N R	0.00	0.00	1.59	0.00	0.00	0.00	1.59	.03
+ O & RA (DIRECT & IND.)	LBN	.19 HRS	9.26	1.75	1.00	2.63	1.45	6.69	.14
REFLECTIVE SURFACE 4411								1183.	24.12

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

MIRROR BACK STRUCT 4412

DESCRIPTION		QTY/HRS/ AIRM. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CIC	OVERHEAD	G&A		
10201. ASSY SUPPORT STR ID40045 INBOARD, OUTBOARD CROSS BEAM DIAGONAL BEAMS AND OUTBOARD AND INBOARD ANGLES.	N H LBN	0.00 5.36 HRS	0.00 9.26	8.00 49.65	0.00 1.00	0.00 2.63	0.00 1.45	8.00 189.33	.16 3.86
10202. INBOARD CROSS BM ID40045-3 .0785 X 27 X 173 148 LB. EA	P P	2.00 UNITS	69.46	138.93	1.00	0.00	0.00	138.93	2.83
10203. OUTBOARD CROSS BM ID40045-5 .0516 X 11 X 173 44 LB. EA SOURCE: U.S. STEEL	P P	2.00 UNITS	20.71	41.41	1.00	0.00	0.00	41.41	.84
10204. DIAGONAL BEAM/LH ID40045-7 .0785 X 26 X 112 66 LB. EACH	P P	2.00 UNITS	30.52	61.03	1.00	0.00	0.00	61.03	1.24
10205. DIAGONAL BEAM/RH ID40045-8 .0785 X 26 X 112 66 LB. EACH	P P	2.00 UNITS	30.52	61.03	1.00	0.00	0.00	61.03	1.24
10206. HAT/STRINGER ID40045-9 .0635 (16 GA) X 6.00 IN. X 130 GALV. STEEL SHEET HATS, WT= 14 LB EA. SOURCE: MIDSIDE ENGR. CO.	P P	24.00 UNITS	7.83	187.87	1.00	0.00	0.00	187.87	3.83
10207. OUTBOARD ANGLES ID40045-15 .0516 X 3.5 X 4.5 .23 LB. EACH SOURCE: U.S. STEEL	N H	4.00 UNITS	.11	.43	1.00	0.00	0.00	.43	.01
10208. INBOARD ANGLES ID40045-13 .0516 X 4.0 X 10.50 .61 LB EACH SOURCE: U.S. STEEL	N H	4.00 UNITS	.28	1.12	1.00	0.00	0.00	1.12	.02
10209. GUSSET ANGLE ID40045-11 .25X8.5X17.50 11 LB. EA. SOURCE: U.S. STEEL	N H	4.00 UNITS	4.93	19.72	1.00	0.00	0.00	19.72	.40
10211. CLINCH NUT S-0420-1-Z SOURCE: S.P.S. CO.	P P	48.00 UNITS	.05	2.63	1.00	0.00	0.00	2.63	.05
10212. BOLT T601 .25 UNC-20 X .75 LONG SAE SOURCE: MCMASTER	P P	48.00 UNITS	.05	2.56	1.00	0.00	0.00	2.56	.05

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AVERAGE PROTOTYPE HELIOSIAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

MIRRON BACK STRUCT 4412

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CHC OVERHEAD G&A			TOTAL	\$/SM
10213. WASHER .25 TO SAE WASHER SOURCE: MCMASTER	T602	P P	48.00 UNITS	.00	.18	1.00	0.00	0.00	.18 .00
10220. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	N R LBR	0.00 .16 HRS	0.00 9.26	13.25 1.49	0.00 1.00	0.00 2.63	0.00 1.45	13.25 5.68 .27 .12
10221. QUAL & RA IND FACTOR OF .052 PERCENT X MFG HOURS	T 2	N R LBR	0.00 .33 HRS	0.00 9.26	7.19 3.08	0.00 1.00	0.00 2.63	0.00 1.45	7.19 11.74 .15 .24
10223. TOOLING MATERIAL 8.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	N W LBR N M	0.00 .40 HRS 1.00 UNITS	0.00 9.26 .35	19.31 3.71 .35	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	19.31 14.16 .39 .29 .01
10224. PROD SUPPORT .042 PERCENT OF MFG + PLAN + TOOL + Q & RA (DIRECT & IND.)	T 5	N R LBR	0.00 .23 HRS	0.00 9.26	1.89 2.99	0.00 1.00	0.00 2.63	0.00 1.45	1.89 7.95 .04 .16

MIRRON BACK STRUCT 4412

796. 16.22

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

ASSY & BOND 4413

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CIRC OVERHEAD G&A			TOTAL	\$/SM
10301. ASSY & BOND 441301 BONDS MIRRORS TO BACKING/STRINGERS TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M CORP) SOURCE: ADL/MDC	LBR 5.08 HRS	9.26	47.00	1.00	2.63	1.45	179.25	3.05
10302. ADHESIVE 441301 BONDS MIRRORS TO BACKING/STRINGERS TO GLASS. .14 GAL. PER PANEL OF 3MEC3532 ADHESIVE (3M CORP) SOURCE: ADL/MDC	N M 12.00 UNITS	4.32	51.85	1.00	0.00	0.00	51.85	1.06
10303. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	N R 0.00 LBR .15 HRS	0.00 9.26	12.55 1.41	0.00 1.00	0.00 2.63	0.00 1.45	12.55 5.38	.26 .11
10304. QUAL & RA IND T 2 FACTOR OF .062 PERCENT X MFG HOURS	N R 0.00 LBR .31 HRS	0.00 9.26	6.81 2.91	0.00 1.00	0.00 2.63	0.00 1.45	6.81 11.11	.14 .23
10306. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	N R 0.00 LBR .38 HRS N M 1.00 UNITS	0.00 9.26 .33	18.28 3.52 .33	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	18.28 13.41 .33	.37 .27 .01
10307. PROD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL + O & RA (DIRECT & IND.)	N R 0.00 LBR .21 HRS	0.00 9.26	1.79 1.97	0.00 1.00	0.00 2.63	0.00 1.45	1.79 7.53	.04 .15
ASSY & BOND 4413							308.	6.29

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS.

10.05.10.

DATE 05/27/78

AZIMUTH 4421

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CIC OVERHEAD G&A	TOTAL	\$/SM
20101. ASSEMBLY ID40065 DRIVE COMPONENTS ASSEMBLY SOURCE: ADL/MDAC	LBN	2.82 HRS	9.20	26.13	1.00 2.63 1.45	99.64	2.03
2010201. HOUSING ID40038 WELDMENT HOUSING WT= 348 LB. SOURCE: U.S. STEEL	N R LBN R M	0.00 3.29 HRS 1.00 UNITS	0.00 9.26 159.65	1.40 30.50 159.65	0.00 0.00 0.00 1.00 2.63 1.45 1.00 0.00 0.00	1.40 116.30 159.65	.03 2.37 3.25
2010203. BUSHING PIVOT KJS1010060 PEN SPECIFICATION. PIVOT POINT BUSHING. SOURCE: SARGENT	P P	2.00 UNITS	1.02	2.04	1.00 0.00 0.00	2.04	.04
201030101. MEMBRANE T607 10 O.D. X .156 WALL	R M	1.00 UNITS	5.11	5.11	1.00 0.00 0.00	5.11	.10
201030102. TUBE T608 10 O.D. X .156 WALL X 8 HIGH MADE OF 4130, 7 TL, SOURCE: U.S. STEEL	R M	1.00 UNITS	13.56	13.56	1.00 0.00 0.00	13.56	.28
201030103. SPLINE T609 10 O.D. X .312 WALL X 3 LONG	R M	1.00 UNITS	10.34	10.34	1.00 0.00 0.00	10.34	.21
201030104. DOUBLER T610 6.50 OD X .375 L.C. STEEL SOURCE: U.S. STEEL	R M	2.00 UNITS	1.65	3.30	1.00 0.00 0.00	3.30	.07
201030105. ASSEMBLY T603 FAB AND ASSY. FLEX SPLINE SOURCE: ADL/MDAC	N R LBN	0.00 2.60 HRS	0.00 9.26	1.14 24.82	0.00 0.00 0.00 1.00 2.63 1.45	1.14 94.66	.02 1.93
201030201. PLUG T605 7 OD X 1.50 L.C. STEEL SOURCE: U.S. STEEL	R M	1.00 UNITS	4.75	4.75	1.00 0.00 0.00	4.75	.10
201030202. DRIVE SHAFT T611 1.75 OD, .75 ID X 10.75 LONG L.C. STEEL PIPE. SOURCE: KELLY PIPE.	R M	1.00 UNITS	2.72	2.72	1.00 0.00 0.00	2.72	.06

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

AZIMUTH 4421

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHK	OVERHEAD	G&A		
201030203. BEARING PER SPECIFICATION SOURCE: MC GILL MFG. CO.	BU-2151	P P 1.00 UNITS	106.51	106.51	1.00	0.00	0.00	106.51	2.17
201030204. FABRICATION FAB AND ASSY. WAVE GENERATOR SOURCE: ADL/WDAC	T653	N R 0.00 LBH 2.26 HRS	0.00 9.26	.96 20.90	0.00 1.00	0.00 2.63	0.00 1.45	.96 79.71	.02 1.63
20104. BEARING TURKET PER SPECIFICATION. SOURCE: MC GILL MFG. CO.	BB-2149	P P 1.00 UNITS	39.80	39.80	1.00	0.00	0.00	39.80	.81
2010601. RETAINER-OUTER 19.025 OD X 15.1875 ID X 1.25 LG. L.C. STEEL. WT = 29.28 SOURCE: U.S. STEEL	IT49852-1	N R 0.00 LBH .07 HRS R M 1.00 UNITS	0.00 9.26 9.84	.03 .67 9.84	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.03 2.55 9.84	.00 .05 .20
2010602. NUT 1/2 I.D. SOURCE: MCMASTER	T640	P P 8.00 UNITS	.19	1.53	1.00	0.00	0.00	1.53	.03
2010603. BOLTS 1/2 X 3. GLASS 5 SOURCE: MC MASTER	T510	P P 8.00 UNITS	.64	5.11	1.00	0.00	0.00	5.11	.10
2010604. WASHER 1/2 ID. SOURCE: MC MASTER	T511	P P 8.00 UNITS	.00	.04	1.00	0.00	0.00	.04	.00
2010701. PAN-OIL 1500 X .125 L.C. STEEL WT = 6.25 SOURCE: U.S. STEEL	T513	P P 1.00 UNITS	2.60	2.60	1.00	0.00	0.00	2.60	.05
2010703. SCREW 1/2 LONG FLAT HEAD SOURCE: MC MASTER	T515	P P 8.00 UNITS	.00	.04	1.00	0.00	0.00	.04	.00
2010801. CIRCULAR SPLINE 15 OD X 40 ID X 2.75 LG. LC STEEL SHEET. WT = 73 LB. SOURCE: LINCOLN FOUNDRY	T 36	N R 0.00 LBH 2.12 HRS R M 1.00 UNITS	0.00 9.26 58.61	.90 19.60 58.61	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.90 74.73 58.61	.02 1.52 1.19

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CHC OVERHEAD G&A	TOTAL	\$/SM
AZIMUTH 4421						
2010803. BOLTS 1/2 X 2 CLASS 5 SOURCE: MC MASTER	T516 P P	8.00 UNITS .43	3.45	1.00 0.00 0.00	3.45	.07
2010804. WASHER 1/2 ID SOURCE: MC MASTER T520	T517 P P	8.00 UNITS .00	.04	1.00 0.00 0.00	.04	.00
2010901. HELICON PER SPECIFICATION SOURCE: SPIROID	HAJ22178 N N LBR N N	0.00 .56 HRS 1.00 UNITS	0.00 9.26 2.46	.24 1.00 2.63 1.45 1.00 0.00 0.00	.24 19.81 2.46	.00 .40 .05
201090101. PINION PER SPECIFICATION. SOURCE: SPIROID	T519 P P	1.00 UNITS 4.79	4.79	1.00 0.00 0.00	4.79	.10
201090102. RING-PINION-RET 2.75 O.D. SOURCE: MC MASTER	T520 P P	1.00 UNITS .51	.51	1.00 0.00 0.00	.51	.01
201090103. SHIM-GEAR 1.50 O.D./1.125 ID SOURCE: MC MASTER	T521 P P	1.00 UNITS .08	.08	1.00 0.00 0.00	.08	.00
201090104. KEY-GEAR 1 LONG X 1/4 WIDE SOURCE: MC MASTER	NAS558-808-8 P P	1.00 UNITS .30	.30	1.00 0.00 0.00	.30	.01
201090105. NUT-GEAR AFBMA STANDARD W-05 SOURCE: MC MASTER	T522 P P	1.00 UNITS 1.47	1.47	1.00 0.00 0.00	1.47	.03
201090106. WASHER-GEAR AFBMA STANDARD W-05 SOURCE: MC MASTER	T523 P P	1.00 UNITS .21	.21	1.00 0.00 0.00	.21	.00
201090107. BEARING DRIVE SHAFT BEARING PER SPECIFICATION.	67046NH1641DC P P	1.00 UNITS 5.59	5.59	1.00 0.00 0.00	5.59	.11

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

AZIMUTH 4421						FACTORS			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL		REF UNIT COST	SUB TOTAL	CHC	OVERHEAD	G&A		\$/SM
201090108. RING-BEARING-NET MS10025-1200 DRIVE SHAFT BEARING RETAINER PER SPECIFICATION.		P P	1.00 UNITS	.51	.51	1.00	0.00	0.00	.51	.01
2011001. BOLTS HLT-116-16-20 PER SPECIFICATION. SOURCE: LAWRENCE ENGINEERING		P P	12.00 UNITS	.48	5.75	1.00	0.00	0.00	5.75	.12
2011002. NUT HLT-73PB-16 PER SPECIFICATION SOURCE: LAWRENCE ENGINEERING 5644		P P	12.00 UNITS	2.40	28.76	1.00	0.00	0.00	28.76	.59
2011201. TUBE-ELEC. WIRE T643 .688 OD X .063 WALL X 13 LONG. L.C. STEEL. SOURCE: KELLY PIPE.		P P	1.00 UNITS	.22	.22	1.00	0.00	0.00	.22	.00
2011202. CLAMP-WIRE TUBE 5644 SOURCE: MC MASTER		P P	1.00 UNITS	.32	.32	1.00	0.00	0.00	.32	.01
2011301. COVER T646 9 DIA. X .125 AND 8 DIA. X .125 L.C. STEEL SHEET.		N R LBR N M	0.00 .00 HRS 1.00 UNITS	0.00 9.26 1.65	.00 .03 1.65	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.00 .13 1.65	.00 .00 .03
2011302. SCREW T613 AFFIX COVER TO DRIVE HOUSING. SOURCE: MC MASTER		P P	4.00 UNITS	.00	.02	1.00	0.00	0.00	.02	.00
2011303. GROMMET T526 HOLDS WIRE AND SEALS GEN HOUSING COMPARTMENT. SOURCE: MC MASTER		P P	1.00 UNITS	.04	.08	1.00	0.00	0.00	.08	.00
20114. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.		N H LBR	0.00 .41 HRS	0.00 9.26	34.12 3.83	0.00 1.00	0.00 2.63	0.00 1.45	34.12 14.62	.70 .30
20115. O & HA-IND T 2 FACTOR OF .062 PERCENT X MFG HOURS		N H LBR	0.00 .86 HRS	0.00 9.26	18.52 7.93	0.00 1.00	0.00 2.63	0.00 1.45	18.52 30.22	.38 .62

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

AZIMUTH		4421								
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
			COST		CMC	OVERHEAD	G&A			
20117.										
TOOLING MATERIAL - T 4										
\$.70 PER TOOLING HOURS PLUS .06	N H	0.00	0.00	49.72	0.00	0.00	0.00	49.72	1.01	
PERCENT OF THE MFG. HOUR.	LBN	1.03 HRS	9.26	9.56	1.00	2.63	1.45	36.47	.74	
	R M	1.00 UNITS	.90	.90	1.00	0.00	0.00	.90	.02	
20118.										
PRODUCTION SUPT. - T 5										
.042 PERCENT OF MFG + PLAN + TOOL	N H	0.00	0.00	4.87	0.00	0.00	0.00	4.87	.10	
+ Q & RA (DIRECT & IND.)	LBN	.50 HRS	9.26	5.37	1.00	2.63	1.45	20.47	.42	
AZIMUTH								4421	1184. 24.14	

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

ELEVATION 4422

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
CMC OVERHEAD G&A

TOTAL

\$/SM

2020101. WELDMENT DNAG LINK WT= 65 LB. SOURCE: U.S. STEEL	T 50	N H LBN H M	0.00 2.17 HRS 1.00 UNITS	0.00 9.26 25.03	.92 20.09 25.03	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.92 76.00 25.03	.02 1.56 .51
2020103. BUSHING PER SPECIFICATION. PIVOT POINT BUSHING. SOURCE: SARGENT	KJ51010000	P P	2.00 UNITS	.35	.70	1.00	0.00	0.00	.70	.01
2020104. SHIM PIVOT POINT SHIM RESTRICTS MOVEMENT. SOURCE: MC MASTER	T 41	H M	4.00 UNITS	.48	1.92	1.00	0.00	0.00	1.92	.04
2020105. BOLT 3/4 DIA X 5 LONG SOURCE: MC MASTER	T528	P P	2.00 UNITS	3.18	6.36	1.00	0.00	0.00	6.36	.13
2020106. SEAL-DUST SOURCE: MC MASTER	T529	P P	2.00 UNITS	.08	.16	1.00	0.00	0.00	.16	.00
2020107. THRUST BKG PER SPECIFICATION. SOURCE: SARGENT	KTN-1622060	P P	4.00 UNITS	.29	1.15	1.00	0.00	0.00	1.15	.02
2020108. NUT .75 I.D. SOURCE: MC MASTER	T530	P P	2.00 UNITS	.50	.99	1.00	0.00	0.00	.99	.02
2020109. BUSHING-CLAMP UP .75 DIA. X 5 LONG, CLASS 8	T531	P P	2.00 UNITS	2.72	5.43	1.00	0.00	0.00	5.43	.11
2020110. BOLT-BOD END .75 DIA X 3.25 LONG, CLASS 8 SOURCE: MC MASTER	T532	P P	2.00 UNITS	1.69	3.39	1.00	0.00	0.00	3.39	.07
2020111. NUT-BOD END .75 I.D. SOURCE: MC MASTER	T533	P P	2.00 UNITS	.50	.99	1.00	0.00	0.00	.99	.02

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.10.

DATE 05/27/78

ELEVATION	4422									
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
						CRC	OVERHEAD	G&A		
2020112. BUSHING CLAMP UP SOURCE: MC MASTER	T534	P F	2.00 UNITS	.35	.70	1.00	0.00	0.00	.70	.01
2020113. SHIM ROD END SOURCE: MC MASTER	T535	P P	4.00 UNITS	.48	1.92	1.00	0.00	0.00	1.92	.04
2020114. SEAL-DUST ROD END SOURCE: MC MASTER	T536	P P	4.00 UNITS	.08	.32	1.00	0.00	0.00	.32	.01
20202. JACK SCREW 5 TON, 6 INCH RAISE, X 2 INCH X 22 INCH. WT=80.4 LB. DUFF MORTON	T 52	P P	2.00 UNITS	529.02	1058.03	1.00	0.00	0.00	1058.03	21.57
2020301. TUBE 16 IN. OD X .105 IN WALL X 81 IN. LONG. LC STEEL PIPE 124 LB. SOURCE: KELLY PIPE	ID40042-3	H M	1.00 UNITS	66.67	66.67	1.00	0.00	0.00	66.67	1.36
2020302. TAB ACTUATOR .5 X 10 X 10 LC STEEL WT=5.73 LB SOURCE: U.S. STEEL	ID40042-5	N H LBR H M	0.00 .54 HRS 2.00 UNITS	0.00 9.26 6.63	.23 5.02 13.26	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.23 19.15 13.26	.00 .39 .27
2020303. TAB HINGE .5 X 9 X 9 LC STEEL WT=5 LB. SOURCE: U.S. STEEL	ID40042-9	N H LBR H M	0.00 .09 HRS 4.00 UNITS	0.00 9.26 5.37	.04 .84 21.47	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.04 3.21 21.47	.00 .07 .44
2020304. FLANGE .625 X 18.00 X 18.00 LOW CARBON STEEL PLATE SOURCE: U.S. STEEL	ID40042-7	N H LBR H M	0.00 .95 HRS 2.00 UNITS	0.00 9.26 26.86	.40 8.80 53.73	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.40 33.55 53.73	.01 .68 1.10
2020305. ASSEMBLY SUPPORTS REFLECTOR AND TIES ELEVATIONAL AZIMUTH DRIVE TOGETHER. WT=193 LBS. SOURCE: ADL/MOC	ID40042	LBR	5.08 HRS	9.26	47.01	1.00	2.63	1.45	179.26	3.65

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

ELEVATION	4422									
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CNC OVERHEAD G&A			TOTAL	\$/SM
2020401. BUSHING PER SPECIFICATION SOURCE: SARGENT	KJS-1616060	P P	4.00 UNITS	.29	1.15	1.00	0.00	0.00	1.15	.02
2020402. SHAFT PIVOT SHAFT.	T647	P P	4.00 UNITS	5.67	22.69	1.00	0.00	0.00	22.69	.46
2020403. SEAL-DUST PER SPECIFICATION. SOURCE: SARGENT	KTM-1622060	P P	4.00 UNITS	.00	.32	1.00	0.00	0.00	.32	.01
2020404. WASHER SOURCE: LAMHENCE ENGINEERING	AN-960-416L	P P	4.00 UNITS	.10	.38	1.00	0.00	0.00	.38	.01
20209. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	N H LBR	0.00 .20 HRS	0.00 9.20	21.82 2.45	0.00 1.00	0.00 2.63	0.00 1.45	21.82 9.35	.44 .19
20210. O & HA IND FACTOR OF .002 PERCENT X MFG HOURS	T 2	N R LBR	0.00 .55 HRS	0.00 9.26	11.85 5.07	0.00 1.00	0.00 2.63	0.00 1.45	11.85 19.33	.24 .39
20212. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	N H LBR H H	0.00 .06 HRS 1.00 UNITS	0.00 9.26 .58	31.80 6.12 .58	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	31.80 23.33 .58	.05 .48 .01
20213. PRODUCTION SUPT .042 PERCENT OF MFG + PLAN + TOOL + O & HA (DIRECT & IND.)	T 5	N R LBR	0.00 .37 HRS	0.00 9.26	3.12 3.43	0.00 1.00	0.00 2.63	0.00 1.45	3.12 13.09	.06 .27
ELEVATION	4422								1734.	35.36

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1970 DOLLARS

10.05.10.

DATE 05/21/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRK OVERHEAD G&A			TOTAL	\$/SM
MOTOR TOTAL 4423								
2030101. BOLTS T538 1/4 DIA. X 1 LONG, CLASS 2 SOURCE: MC MASTER	P P	4.00 UNITS	.08	.32	1.00	0.00	0.00	.32 .01
2030102. WASHER T539 1/4 DIA. SOURCE: MC MASTER	P P	1.00 UNITS	.05	.05	1.00	0.00	0.00	.05 .00
2030103. AZIMUTH MOTOR T667	P P	1.00 UNITS	140.63	140.63	1.00	0.00	0.00	140.63 2.87
2030201. BOLT/NUT T541 1/4 DIA. X 1 LONG, CLASS 2 SOURCE: MC MASTER	P P	4.00 UNITS	.51	2.04	1.00	0.00	0.00	2.04 .04
2030202. WASHER T542 1/4 DIA. SOURCE: MC MASTER	P P	4.00 UNITS	.05	.19	1.00	0.00	0.00	.19 .00
2030203. TRKING MOTOR T665 1/4 HP, 24V, THREE PHASE WITH A NEMA "C" CURVE SOURCE: W.C. PEART CO.	P P	1.00 UNITS	133.93	133.93	1.00	0.00	0.00	133.93 2.73
2030301. BOLT/NUT T544 1/4 X 1 LONG, CLASS 2 SOURCE: MC MASTER	P P	4.00 UNITS	.51	2.04	1.00	0.00	0.00	2.04 .04
2030302. WASHER T545 1/4 DIA. SOURCE: MC MASTER	P P	4.00 UNITS	.05	.19	1.00	0.00	0.00	.19 .00
2030303. STORAGE MOTOR T666 1/4 HP, 240V, THREE PHASE WITH	P P	1.00 UNITS	133.93	133.93	1.00	0.00	0.00	133.93 2.73
MOTOR TOTAL 4423							413.	8.43

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1970 DOLLARS

10.05.16.

DATE 05/27/78

PDS/LIMIT INDICATO 4424

DESCRIPTION

QTY/HRS/
AWN. FAILREF UNIT
COST

SUB TOTAL

F A C T O R S
CNC OVERHEAD G&A

TOTAL

\$/SM

20401. ASSEMBLY OF ELECTRONIC SOURCE: ADL	T014	LBH	2.70 HRS	9.26	25.74	1.00	2.63	1.45	98.15	2.00
2040201. HALL EFFECT SENSOR SOURCE: MICRO SWITCH	T616	P P	2.00 UNITS	3.34	6.69	1.00	0.00	0.00	6.69	.14
2040202. LINE DRIVER SOURCE: FAIRCHILD	9614	P P	3.00 UNITS	1.39	4.18	1.00	0.00	0.00	4.18	.09
2040203. FERROUS METAL DISC SOURCE: ADAC	T018	P P	3.00 UNITS	2.09	6.26	1.00	0.00	0.00	6.26	.13
2040301. DUAL DIFF LINE REC SOURCE: FAIRCHILD	9615	P P	1.00 UNITS	1.23	1.23	1.00	0.00	0.00	1.23	.03
2040302. OPT. ISOL. TRIACS PER SPECIFICATION SOURCE: MOTOROLA	02T3244	P P P	4.00 UNITS	1.52	6.07	1.00	0.00	0.00	6.07	.12
2040303. RESISTOR PER SPECIFICATION SOURCE: RCA	11 Z 13	P P P	4.00 UNITS	.18	.70	1.00	0.00	0.00	.70	.01
2040304. CAPACITOR PER SPECIFICATION SOURCE: RCA	0.1MF1400V	P P P	4.00 UNITS	.16	.64	1.00	0.00	0.00	.64	.01
2040305. PRINTED CIRCUIT BD T107 6 IN. X 6 IN. TWO SIDE EPOXY GLASS, COPPER CIRCUITRY, WITH THRU PLATED HOLES. .02 SOURCE: ADAC		P P	1.00 UNITS	1.15	1.15	1.00	0.00	0.00	1.15	.02
2040306. COVER PER SPECIFICATION SOURCE: ADAC	T226	P P P	1.00 UNITS	1.44	1.44	1.00	0.00	0.00	1.44	.03
20405. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	N R LBH	0.00 .08 HRS	0.00 9.26	6.87 .77	0.00 1.00	0.00 2.63	0.00 1.45	6.87 2.94	.14 .06

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

POS/LIMIT INDICATO 4424

DESCRIPTION	QTY/HRS/ AMP. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	
				CHC	OVERHEAD	G&A		\$/SM
20406.								
O & MA IND T 2								
FACTOR OF .002 PERCENT X AFG HOURS	M H	0.00	0.00	3.73	0.00	0.00	3.73	.01
	LBH	.17 HRS	9.26	1.00	2.63	1.45	6.09	.12
20408.								
TOOLING MATERIAL T 4								
\$.70 PER TOOLING HOURS PLUS .00	M H	0.00	0.00	10.01	0.00	0.00	10.01	.20
PERCENT OF THE AFG. HOUR.	LBH	.21 HRS	9.26	1.93	1.00	2.63	7.34	.15
	R A	1.00 UNITS	.18	.18	1.00	0.00	.18	.00
20409.								
PRODUCTION SUPPT. T 5								
.042 PERCENT OF AFG + PLAN + TOOL	M H	0.00	0.00	.98	0.00	0.00	.98	.02
+ O & MA (DIRECT & IND.)	LBH	.12 HRS	9.26	1.08	1.00	2.63	4.12	.08
POS/LIMIT INDICATO 4424							169.	3.44

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.10.

DATE 05/21/78

PWR SPLY/DIST 4425

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CNC	OVERHEAD	G&A		
2050201. FEEDER CABLE CLX 3, NO. 4 AWG, 5KV, COPPER CABLE/GALITEP P 2000, WITH ALUMINUM SHEATH AND PVC JACKETS SUITABLE FOR DIRECT BURIAL. SOURCE: OKONITE		1.00 UNITS	10.77	10.77	1.00	0.00	0.00	10.77	.22
2050202. TRANSFORMER 225T(19)H PER SPECIFICATIONS. P P SOURCE: SQUARE D		1.00 UNITS	39.53	39.53	1.00	0.00	0.00	39.53	.81
2050203. DIST PANEL SQ.D-H-4172-4H 480V THREE PHASE WITH 100 P P AMP C/B. SOURCE: SQUARE D		1.00 UNITS	4.09	4.09	1.00	0.00	0.00	4.09	.08
2050204. BRANCH CIR BKN SQD NO.FA-34040 480V, 3 POLE, 40 AMP P P SOURCE: SQUARE D		15.00 UNITS	.49	7.42	1.00	0.00	0.00	7.42	.15
2050205. BRANCH CIR CABLE CLX-ALS 3, NO.8 AWG, 600V, COPPER CABLE/GALITEP P 2000 WITH ALUMINUM SHEATH AND PVC JACKET, SUITABLE FOR DIRECT BURIAL. SOURCE: OKONITE		1.00 UNITS	68.13	68.13	1.00	0.00	0.00	68.13	1.39
2050206. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS N R DIST. .03 TO LABOR AND LBR .07 TO NON-RECURRING. ERR		0.00 0.00 0.00	0.00 HRS 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
2050207. Q & RA - IND T 2 FACTOR OF .062 PERCENT X MFG HOURS N R LBR ERR		0.00 0.00 0.00	0.00 HRS 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
2050208. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR. N R LBR ERR K M		0.00 0.00 0.00 0.00	0.00 HRS 0.00 UNITS	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00
2050209. PRODUCTION SUPT. T 5 .042 PERCENT OF MFG + PLAN + TOOL N R + Q & RA (DIRECT & IND.) LBR ERR		0.00 0.00 0.00	0.00 HRS 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

PNR SPLY/DIST 4425

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
		COST		CNC	OVERHEAD	G&A			
2050301. WIRE CLX-16 3 NO. 16 AWG WITH OPTICAL FIBER SOURCE: OKONITE	P P	1.00 UNITS	15.03	15.03	1.00	0.00	0.00	15.03	.31
2050302. CIR BKN/HOLDEN T663 480V, 15 AMP, 3 PHASE C/B PLUS HOLDEN. SOURCE: SQUARE D	P P	1.00 UNITS	138.76	138.75	1.00	0.00	0.00	138.76	2.83
2050303. CONNECTORS T664 OPTICAL FIBER COUPLINGS.	P P	2.00 UNITS	5.84	11.68	1.00	0.00	0.00	11.68	.24
PNR SPLY/DIST 4425								295.	6.02

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

ASSY DR/PED/ELECT 4426

T

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
CNC OVERHEAD G&A

TOTAL

\$/SM

20601.

ASSY DR/PED/ELECT 4426
DRIVE AND PEDESTAL LABOR REQUIRED
ASSEMBLY OF MAIN BEAM, JACKS,
DRAG LINK, AZIMUTH DRIVE, PEDESTAL
AND ELECTRIC.
SOURCE: ADL/MDAC

T
LBR
P P

1.69 HRS
1.00 UNITS

9.26
1.60

15.68
1.60

1.00 2.63 1.45
1.00 0.00 0.00

59.79 1.22
1.60 .03

20604.

PLANNING T 1
FACTOR OF 10 PERCENT X MFG HOURS
DIST. .03 TO LABOR AND
.07 TO NON-RECURRING.

N R
LBR

0.00
.05 HRS

0.00
9.26

4.18
.47

0.00 0.00 0.00
1.00 2.63 1.45

4.18 .09
1.79 .04

20605.

QUAL & RA IND T 2
FACTOR OF .062 PERCENT X MFG HOURS

N R
LBR

0.00
.11 HRS

0.00
9.26

2.27
.97

0.00 0.00 0.00
1.00 2.63 1.45

2.27 .05
3.71 .08

20607.

TOOLING MATERIAL T 4
\$.70 PER TOOLING HOURS PLUS .06
PERCENT OF THE MFG. HOUR.

N R
LBR
N R

0.00
.13 HRS
1.00 UNITS

0.00
9.26
.11

6.10
1.17
.11

0.00 0.00 0.00
1.00 2.63 1.45
1.00 0.00 0.00

6.10 .12
4.47 .09
.11 .00

20608.

PROD SUPPORT T 5
.042 PERCENT OF MFG + PLAN + TOOL
+ O & MA (DIRECT & IND.)

N R
LBR

0.00
.07 HRS

0.00
9.26

.60
.66

0.00 0.00 0.00
1.00 2.63 1.45

.60 .01
2.51 .05

ASSY DR/PED/ELECT 4426

T

87. 1.78

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

SENSOR/CALIB EQUIP 4431

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM	
				CHK	OVERHEAD	G&A			
3010201. CAMERA SOURCE: GENERAL ELECTRIC	1N2200 P P	1.00 UNITS	9.42	9.42	1.00	0.00	0.00	9.42	.19
3010202. CAMERA LENS	T648 P P	1.00 UNITS	.43	.43	1.00	0.00	0.00	.43	.01
3010203. TRIPOD 6 FT HIGH SOURCE: MDAC	T649 P P	1.00 UNITS	.04	.04	1.00	0.00	0.00	.04	.00
3010204. CIRCUIT-HEATER SOURCE: MDAC	T650 P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
3010205. ELECTRONICS CAMERA ELECTRONICS SOURCE: MDAC	T651 P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
3010206. CABLE 3 NO. 16 AWG WITH OPTICAL FIBER SOURCE: OKONITE	CLX-16 P P	1.00 UNITS	.12	.12	1.00	0.00	0.00	.12	.00
30105. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1 N H LBR ENR	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
30106. O & MA IND FACTOR OF .062 PERCENT X MFG HOURS	T 2 N H LBR ENR	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
30107. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4 N H LBR ENR H A	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00
30108. PRODUCTION SUPT. .042 PERCENT OF MFG + PLAN + TOOL + O & MA (DIRECT & IND.)	T 5 N H LBR ENR	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00

SENSOR/CALIB EQUIP 4431

10. .20

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.10.

DATE 05/21/78

FIELD CONTROL 4432

DESCRIPTION		QTY/HRS/ ARR. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHC	OVERHEAD	G&A		
30201. ASSEMBLY T620 DDI COMPONENT ASSEMBLY	LBH	.06 HRS	9.26	.59	1.00	2.63	1.45	2.23	.05
3020201. TWO SIDED PCB SOURCE: ADAC	P P	2.00 UNITS	.01	.01	1.00	0.00	0.00	.01	.00
3020202. CONNECTOR T652 24 PIN SOURCE: AMP INC.	P P	2.00 UNITS	.01	.02	1.00	0.00	0.00	.02	.00
3020203. LED SG1010 PER SPECIFICATION SOURCE: RCA	P P	10.00 UNITS	.01	.05	1.00	0.00	0.00	.05	.00
3020204. OPT TRANSCEIVER T622 COMMUNICATION WITH HELIOSTAT ARRAY CONTROLLER SOURCE: TI	P P	2.00 UNITS	.10	.21	1.00	0.00	0.00	.21	.00
3020205. MICRO-COMPUTER T623 SIMILAR TO NAT'L SEMI 8748 SOURCE: NAT'L SEMICONDUCTOR	P P	2.00 UNITS	1.05	2.10	1.00	0.00	0.00	2.10	.04
3020206. OPT TRANSCEIVER T624 COMMUNICATION WITH HELIOSTAT CONTROLLER. SOURCE: TI	P P	8.00 UNITS	.09	.70	1.00	0.00	0.00	.70	.01
3020207. RELAY T600 4 PDT (5V) SOURCE: POTTER BRUNFIELD	P P	8.00 UNITS	.02	.17	1.00	0.00	0.00	.17	.00
3020208. CEMATIC CAPS T626 0.1 MF .50V SOURCE: BELL	P P	8.00 UNITS	.00	.03	1.00	0.00	0.00	.03	.00
3020209. MODULAR PWB-SUPPLY T627 PV SOURCE: LAMBDA	P P	2.00 UNITS	.36	.72	1.00	0.00	0.00	.72	.01
3020210. FOAM PADS T628 ATTACH FOAM CUSHIONS TO TOP OF BOX.	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

FIELD CONTROL		4432										
DESCRIPTION			QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM		
						CRC	OVERHEAD	G&A				
3020211. PHOTO DETECTOR OPTICAL FIBER SOURCE: I.T.	T629	P P	2.00 UNITS	.04	.07	1.00	0.00	0.00	.07	.00		
3020212. PHOTO TRANSISTORS OPTICAL FIBER. SOURCE: I.T.	T630	P P	8.00 UNITS	.00	.03	1.00	0.00	0.00	.03	.00		
3020213. BOX ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVER. SOURCE: NEWPORT PLASTIC	T631	P P	1.00 UNITS	.01	.01	1.00	0.00	0.00	.01	.00		
3020214. CONNECTOR 36 COND NO. 24 AWG FLAT WIRE AND CONNECTIONS. SOURCE: AMP INC.	T231	P P	2.00 UNITS	.01	.02	1.00	0.00	0.00	.02	.00		
30215. PLANNING FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	T 1	N H LBR	0.00 .00 HRS	0.00 9.26	.16 .02	0.00 1.00	0.00 2.63	0.00 1.45	.16 .07	.00 .00		
30216. O & MA - IND FACTOR OF .062 PERCENT X MFG HOURS	T 2	N R LBR	0.00 .00 HRS	0.00 9.26	.08 .04	0.00 1.00	0.00 2.63	0.00 1.45	.08 .14	.00 .00		
30218. TOOLING MATERIAL \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	T 4	N H LBR R N	0.00 .00 HRS 1.00 UNITS	0.00 9.26 .00	.23 .04 .00	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	.23 .17 .00	.00 .00 .00		
30219. PROD SUPPORT .042 PERCENT OF MFG + PLAN + TOOL + O & MA (DIRECT & IND.)	T 5	N H LBR	0.00 .00 HRS	0.00 9.26	.02 .02	0.00 1.00	0.00 2.63	0.00 1.45	.02 .09	.00 .00		
FIELD CONTROL	4432								7.	.15		

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.10.

DATE 05/21/78

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CMC OVERHEAD G&A			TOTAL	\$/SM
CNTNL/SIG EO 4433								
30301. ASSEMBLY T201 TOTAL COMPONENTS	LBN 8.30 HRS	9.26	76.87	1.00	2.63	1.45	293.10	5.98
3030201. PRINTED CIRCUIT BD T100 4 IN X 5 IN TWO SIDED EPOXY GLASS COPPER CIRCUITRY WITH THRU PLATED HOLES. .02 SOURCE: MDAC	T P P 1.00 UNITS	1.99	1.99	1.00	0.00	0.00	1.99	.04
3030203. CONNECTOR T652 24 PIN SOURCE: AMP INC.	P P 1.00 UNITS	2.76	2.76	1.00	0.00	0.00	2.76	.06
3030204. MU.COMPUTER T623 SIMILAR TO NAT'L SEMI 8748 SOURCE: NAT'L SEMICONDUCTION	P P 1.00 UNITS	332.95	332.95	1.00	0.00	0.00	332.95	6.79
3030205. QUAD.DIFF. LINE DR T656 MOTOR DRIVEN INTERFACE SIMILAR TO NAT'L SEMI. DS1688	P P 2.00 UNITS	1.93	3.86	1.00	0.00	0.00	3.86	.08
3030206. QUAD.DIFF. LINE RE T657 ENCODER INTERFACE SIMILAR TO NAT'L SEMI. DS1689	P P 2.00 UNITS	1.93	3.86	1.00	0.00	0.00	3.86	.08
3030207. HEX D-FLIP FLOP T658 ENCODER INTERFACE SOURCE: T.I.	P P 3.00 UNITS	1.38	4.14	1.00	0.00	0.00	4.14	.08
3030208. CAPACITOR T626 0.1 MF .50V SOURCE: BELL	P P 3.00 UNITS	.39	1.18	1.00	0.00	0.00	1.18	.02
3030209. POWER SUPPLY 3425-0000 PER SPECIFICATION SOURCE: SEMICONDUCTOR CIR., INC	P P P 1.00 UNITS	33.29	33.29	1.00	0.00	0.00	33.29	.68
3030210. BOX T631 ONE PIECE MOLDED PLASTIC BOX WITH ATTACHED COVER. SOURCE: NEWPORT PLASTIC	P P 1.00 UNITS	2.48	2.48	1.00	0.00	0.00	2.48	.05

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

CNTRL/SIG EQ 4433

DESCRIPTION		QTY/HRS/ ANN. FILL	REF UNIT COST	SUB TOTAL	F A C T O R S CNC. OVERHEAD G&A			TOTAL	\$/SM	
3030211. CONNECTOR 24 PIN FEMALE SOURCE: AMP INC.	T602	P P	1.00 UNITS	2.76	2.76	1.00	0.00	0.00	2.76	.06
30312. PLANNING	T 1	N H	0.00	0.00	20.52	0.00	0.00	0.00	20.52	.42
FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.		LBH	.25 HRS	9.26	2.31	1.00	2.63	1.45	8.79	.18
30313. O & MA - IND	T 2	N H	0.00	0.00	11.14	0.00	0.00	0.00	11.14	.23
FACTOR OF .062 PERCENT X MFG HOURS		LBH	.51 HRS	9.26	4.77	1.00	2.63	1.45	18.18	.37
30315. TOOLING MATERIAL	T 4	N H	0.00	0.00	29.90	0.00	0.00	0.00	29.90	.61
6.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.		LBH	.62 HRS	9.26	5.75	1.00	2.63	1.45	21.93	.45
		R A	1.00 UNITS	.54	.54	1.00	0.00	0.00	.54	.01
30316. PRIM. SUPPORT	T 5	N H	0.00	0.00	2.93	0.00	0.00	0.00	2.93	.06
.042 PERCENT OF MFG + PLAN + TXIL + O & MA (DIRECT & IND.)		LBH	.35 HRS	9.26	3.23	1.00	2.63	1.45	12.31	.25

CNTRL/SIG EQ 4433

809. 16.49

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

COLLECTOR CONTROL 44320101

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CNC OVERHEAD G&A	TOTAL	\$/SM
30401. CPU COLLECTION CONTROL CPU'S WITH 32KB OF MOS. MEMORY.	2.00 UNITS	10.06	20.12	1.00 0.00 0.00	20.12	.41
30402. LINE INTERFACE DL11-HB SERIAL LINE INTERFACES TO MCS, BEAM CHARACTERIZATION SYSTEM AND DATA ACQUISITION SYSTEM TO 9600 BAUD	6.00 UNITS	.22	1.33	1.00 0.00 0.00	1.33	.03
30403. WATCH DOG TIMER KW11-M COMPUTER RESETABLE CLOCK SOURCE: DEC	2.00 UNITS	.47	.93	1.00 0.00 0.00	.93	.02
30404. UNIBUS LINK DA11 HIGHSPEED PARALLEL COMMUNICATION INTERFACE. SOURCE: DEC	1.00 UNITS	4.83	4.83	1.00 0.00 0.00	4.83	.10
30405. FIELD INTERFACE DZ11-E A SYNCHRONOUS 16 LINE MULTIPLEXOR TRANSMISSION TO 9600 BAUD TO FIELD CONTROLLERS	2.00 UNITS	1.35	2.69	1.00 0.00 0.00	2.69	.05
30406. STORAGE MSH J6	6.00 UNITS	.75	4.53	1.00 0.00 0.00	4.53	.09
30407. FORTRAN IV PLUS QP100-CE HIGH LEVEL ENGLISH CONVERSION LANGUAGE COMPILER.	2.00 UNITS	.87	1.75	1.00 0.00 0.00	1.75	.04
30408. RMV TIME TONE REC T632 UNIVERSAL TIME TONE SAV	2.00 UNITS	1.59	3.18	1.00 0.00 0.00	3.18	.06
30409. TIME CODE GEN T633 HIGH B BCD OUTPUT (DAY, MONTH, HOUR, P P MINUTE, SECOND)	2.00 UNITS	.64	1.27	1.00 0.00 0.00	1.27	.03
30412. COLLECTOR CONTROL 44320101 TOTAL - HELIOSTAT CONTROLLER	.45 HRS	10.23	4.64	1.00 2.63 1.45	17.69	.36

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

COLLECTOR CONTROL 44320101

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
30414. Q & RA - IND T 2								
FACTOR OF .062 PERCENT X MFG HOURS	N H	0.00	0.00	.61	0.00	0.00	.61	.01
	LBR	.03 HRS	9.26	.26	1.00	2.63	.99	.02
30415. TOOLING MATERIAL T 4								
\$.70 PER TOOLING HOURS PLUS .06	N H	0.00	0.00	1.63	0.00	0.00	1.63	.03
PERCENT OF THE MFG. HOUR.	LBR	.03 HRS	9.26	.31	1.00	2.63	1.20	.02
	H M	1.00 UNITS	.03	.03	1.00	0.00	.03	.00
30416. PRODUCTION SUPT. T 5								
.042 PERCENT OF MFG PLAN + TOOL	N H	0.00	0.00	.16	0.00	0.00	.16	.00
+ Q & RA (DIRECT & IND.)	LBR	.02 HRS	9.26	.18	1.00	2.63	.67	.01
30417. PLANNING T 1								
FACTOR OF 10 PERCENT X MFG HOURS	N H	0.00	0.00	1.12	0.00	0.00	1.12	.02
DIST. .03 TO LABOR AND	LBR	.01 HRS	9.26	.13	1.00	2.63	.48	.01
COLLECTOR CONTROL 44320101							65.	1.33

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

FOUNDATION 4441

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
4010101.									
FORM, POUR/FINISH 444111									
LABOR TO POSITION TAPERED	N H	0.00	0.00	3.00	0.00	0.00	0.00	3.00	.06
PIPE, POUR CONCRETE AND VIBRATE.	LBN	3.20 HRS	13.61	43.61	1.00	1.70	1.00	74.13	1.51
5 CREWS (25 WEEK BASE) EACH:									
5 LABORERS (INCL. LEAD)									
SOURCE: STEARNS-HUGER									
4010102.									
CAGES 444112									
LABOR TO SET UP AND PLACE CAGES IN	N H	0.00	0.00	2.40	0.00	0.00	0.00	2.40	.05
AugERED HOLE.	LBN	2.50 HRS	13.61	34.88	1.00	1.70	1.00	59.30	1.21
5 CREWS (25 WEEK BASE) EACH:									
2 RODMEN									
2 IRONWORKERS									
SOURCE: STEARNS-HUGER									
4010103.									
EQUIP OPEN & DRIVE 444113									
EQUIPMENT OPERATORS AND TRUCK	N H	0.00	0.00	39.19	0.00	0.00	0.00	39.19	.80
DRIVERS USED IN SUPPORT OF	LBN	3.20 HRS	13.61	43.61	1.00	1.70	1.00	74.13	1.51
FOUNDATION INSTALLATION.									
5 CREWS (25 WEEK BASE) EACH:									
1 HYDRAULIC CRANE OPERATOR									
1 OILER									
3 TRUCK DRIVERS									
SOURCE: STEARNS-HUGER									
40102.									
CONCRETE 44412									
3.0 CUBIC YARDS OF CONCRETE	P P	1.00 UNITS	169.02	169.02	1.00	0.00	0.00	169.02	3.45
PRICED AT \$37 PER YARD INCLUDING									
COST OF MATERIALS, MIXING AND									
DELIVERY TO FOUNDATIONS POSITION.									
SOURCE: STEARNS-HUGER									
40103.									
CAGES 44413									
428.2 LBS. OF REBAR PRICED AT	N H	0.00	0.00	4.20	0.00	0.00	0.00	4.20	.09
\$1.20 PER LB. AND LABOR TO PRE-	LBN	4.48 HRS	13.61	61.05	1.00	1.70	1.00	103.78	2.12
FABRICATE REBAR CAGES.	H M	1.00 UNITS	130.95	130.95	1.00	0.00	0.00	130.95	2.67
5 CREWS (25 WEEK BASE) EACH:									
2 RODMEN									
3 LABORERS (INCLUDING LEAD)									
1 HYDRAULIC CRANE OPERATOR									
1 TRUCK DRIVER									
SOURCE: STEARNS-HUGER									
40104.									
TAPERED PIPE 44414									
98.25 LBS PRICED AT \$.31 PER LB	P P	1.00 UNITS	49.53	49.53	1.00	0.00	0.00	49.53	1.01
DELIVERED. BASED ON U.S. STEEL									
PRICE INFORMATION.									

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

FOUNDATION	4441									
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A			TOTAL		
									\$/SM	
40105.										
BRACING	44415									
BRACING - - 50 SETS AT \$200 EACH		P P	1.00 UNITS	6.39	6.39	1.00	0.00	0.00	6.39 .13	
FOUNDATION	4441									
								716.	14.60	

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

SITE PREPARATION 4442

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CHC	OVERHEAD	G&A		
40201.									
SURVEY	44421								
5 SURVEY CREWS (25 WEEK BASE)		N R	0.00	0.00	1.20	0.00	0.00	1.20	.02
2 SURVEYORS		LDR	1.28	13.61	17.44	1.00	1.70	29.65	.60
SOURCE: STEARNS-KUGER									
40202.									
DRILLING	44422								
DRILLING OPERATIONS, USING DRILL		N R	0.00	0.00	3.60	0.00	0.00	3.60	.07
RIG AND AUGERS.		LDR	3.84	13.61	52.33	1.00	1.70	88.96	1.81
SITE PREPARATION	4442							123.	2.52

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

HELIO SUPP STRUCT 4451

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CRC OVERHEAD G&A			TOTAL	\$/SM
50101. ASSEMBLY T455 ASSEMBLY PROCESS OF PEDESTAL COMPONENTS.	LDR	3.67 HRS	9.26	33.97	1.00	2.63	1.45	129.54	2.64
5010201. TUBE ID40046-3 24 OD X .105 WALL X 123 LONG LC STEEL, WT=276 LBS. SOURCE: KELLY PIPE	R M	1.00 UNITS	136.47	136.47	1.00	0.00	0.00	136.47	2.78
5010202. CAP ID40046-5 .375 X 30 X 30, LC STEEL PLATE WT=75 LB. SOURCE: U.S. STEEL	R M	1.00 UNITS	32.05	32.05	1.00	0.00	0.00	32.05	.65
5010203. COVER ID40046-7 .0396 X 10 X 10 L.C. STEEL WT=4 LB. R M SOURCE: U.S. STEEL	R M	1.00 UNITS	1.33	1.33	1.00	0.00	0.00	1.33	.03
5010204. J BOX ID40046-9	P P	1.00 UNITS	1.20	1.20	1.00	0.00	0.00	1.20	.02
50114. PLANNING T 1 FACTOR OF 10 PERCENT X MFG HOURS DIST. .03 TO LABOR AND .07 TO NON-RECURRING.	N R LDR	0.00 .11 HRS	0.00 9.26	9.07 1.02	0.00 1.00	0.00 2.63	0.00 1.45	9.07 3.89	.18 .08
50115. QUAL & RA IND T 2 FACTOR OF .002 PERCENT X MFG HOURS	N R LDR	0.00 .23 HRS	0.00 9.26	4.92 2.11	0.00 1.00	0.00 2.63	0.00 1.45	4.92 8.03	.10 .16
50117. TOOLING MATERIAL T 4 \$.70 PER TOOLING HOURS PLUS .06 PERCENT OF THE MFG. HOUR.	N R LDR R M	0.00 .27 HRS 1.00 UNITS	0.00 9.26 .24	13.21 2.54 .24	0.00 1.00 1.00	0.00 2.63 0.00	0.00 1.45 0.00	13.21 9.69 .24	.27 .20 .00
50118. PHOD SUPPORT T 5 .042 PERCENT OF MFG + PLAN + TOOL + Q & RA (DIRECT & IND.)	N R LDR	0.00 .15 HRS	0.00 9.26	1.30 1.43	0.00 1.00	0.00 2.63	0.00 1.45	1.30 5.44	.03 .11
HELIO SUPP STRUCT 4451								356.	7.27

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.10.

DATE 05/27/78

PROTECTION ENCL 4452

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CHC OVERHEAD G&A

TOTAL

\$/SM

PROTECTION ENCL 4452

0. 0.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.10.

DATE 05/21/78

LIGHTNING PROT. 4453

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SH
				CRC	OVERHEAD	G&A		
LIGHTNING PROT. 4453							0.	0.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

HELIOSTAT 4461						F A C T O R S			TOTAL	
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL		CNC	OVERHEAD	G&A		\$/SM
7010201.										
DRIVE/PEDESTAL 446121										
REMOVE 803 LBS. DPE UNIT FROM FLAT N R										
BED, PLACE OVER TAPED FOUNDATION LBR		0.00	0.00	59.95	0.00	0.00	0.00	59.95	1.22	
PROTRUSION AND VIBRATE USING GROVE		1.71 HRS	13.61	23.30	1.00	1.70	1.00	39.61	.81	
(MODEL 36) HYDRAULICS, DIESEL,										
CRANE MODIFIED TO ADD MANIPULATION.										
2 CREWS (26.625 WK BASE) EACH:										
1 EQUIPMENT OPERATOR										
1 MILLWRIGHT										
1 LABORER										
7010202.										
REFLECTOR PANELS 446122										
USE YALE MODEL G3 P-150, DIESEL, N R										
240 IN. HIGH LIFT FORK TRUCK TO REMOVE		0.00	0.00	177.12	0.00	0.00	0.00	177.12	3.61	
PANEL CONTAINERS AND PLACE ON DROT:		8.50 HRS	13.61	116.50	1.00	1.70	1.00	198.05	4.04	
1000 SERIES B, DIESEL 4 WHEEL										
STEERING TRAVELIFT, MODIFIED TO ADD										
2 CRANE/MANIPULATORS.										
5 CREWS (26.625 WK BASE) EACH:										
1 FORKLIFT OPERATOR										
1 TRAVELIFT OPERATOR										
2 MILLWRIGHTS										
2 LABORERS										
7010203.										
OIL - DRIVE		S.A.3. 30	P P	2.00 UNITS	.00	.00	1.00	0.00	0.00	.00
HELIOSTAT 4461									475.	9.68

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1970 DOLLARS

10.05.10.

DATE 05/21/78

SENSOR/CALIB EQ 4462

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CRC	OVERHEAD	G&A		
70202.									
INSTALL	44621								
USE STANDARD ELECTRICIAN TOOLS TO		N H	0.00	0.00	.12	0.00	0.00	.12	.00
INSTALL DIGITAL EYE UNITS		LBR	.06	13.61	.76	1.00	1.70	1.29	.03
1 CHEM (1 PK.BASE) EACH:									
1 ELECTRICIAN									
EFFORT IS CONCURRENT AND IN ASSOCIATION WITH CALIBRATION.									
8.3 UNITS (6/FIELD).									
70203.									
CALIBRATE	44622								
ONE VOLT-OHM METER AND ONE		N H	0.00	0.00	.12	0.00	0.00	.12	.00
OCCILLOSCOPE TO CALIBRATE DIGITAL		LBR	.06	13.61	.76	1.00	1.70	1.29	.03
SENSOR/CALIB EQ 4462								3:	.06

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

ELECTRICAL/DISTRIB 4463

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
70302.								
INSTAL CABLE 44631								
EMPLOY VIBRATORY, DIESEL, PLOW TO	N H	0.00	0.00	13.99	0.00	0.00	13.99	.29
BUY ONE POWER/FIBEROPTICS CABLE.	LBR	3.42	13.61	46.60	1.00	1.70	79.22	1.62
3 CREWS (26,625 WK. BASE) EACH								
1 CABLE PLOW OPERATOR								
2 LABORERS								
70303.								
PMR TR/DISTRIB PNL 44632								
INSTALL POWER TRANSFORMER/	N H	0.00	0.00	.60	0.00	0.00	.60	.01
DISTRIBUTION PANELS USING	LBR	.07	13.61	.96	1.00	1.70	1.63	.03
1 TRUCK AND 1 FORKLIFT.								
1 CREW (2 WK BASE) EACH								
1 TRUCK DRIVER								
1 FORKLIFT OPERATOR								
1 ALLNIGHT								
2 LABORERS								
70304.								
CONN,C/O&CLOSE OUT 44633								
USE 1 SPECIAL TEST SET AND	N H	0.00	0.00	.96	0.00	0.00	.96	.02
STANDARD ELECTRICIAN TOOLS TO	LBR	2.28	13.61	31.07	1.00	1.70	52.81	1.08
ELECTRICAL/DISTRIB 4463							149.	3.04

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

ALIGN HELIOSTATS 4404

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CNC OVERHEAD G&A

TOTAL

\$/SM

ALIGN HELIOSTATS 4404

0. 0.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

FIELD SUPPORT 4405											
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CNC OVERHEAD G&A			TOTAL	\$/SM		
70501.											
INSTALLATION MGMT 44051											
OVERALL MANAGEMENT OF FIELD EFFORT. N R		0.00	0.00	.12	0.00	0.00	0.00	.12	.00		
1 FIELD MANAGER (28.46 MK BASE). LBR		.05 HRS	13.61	.65	1.00	1.70	1.00	1.10	.02		
7050201.											
SUPERVISION 44052-1											
1 LOGISTICS SUPERVISOR N R		0.00	0.00	.12	0.00	0.00	0.00	.12	.00		
(28.46 MK BASE). LBR		.05 HRS	13.61	.65	1.00	1.70	1.00	1.10	.02		
7050202.											
RECORDS 44052-2											
KEEP ACCOUNTABLE RECORDS FOR FIELD LBR		.05 HRS	13.61	.65	1.00	1.70	1.00	1.10	.02		
MATERIALS, COMPLETIONS TO SPEC., RECORDS, ETC.											
1 RECORDS CLERK (28.46 MK BASE).											
7050203.											
FIELD COORDINATION 44052-3											
COORDINATE MATERIAL HANDLING, LBR		.19 HRS	13.61	2.60	1.00	1.70	1.00	4.42	.09		
MOVEMENT AND SCHEDULES.											
4 FIELD COORDINATORS (28.46 MK BASE)											
7050204.											
PERSONNEL 44052-4											
KEEPS PERSONNEL FILES, ADMINISTERS LBR		.05 HRS	13.61	.65	1.00	1.70	1.00	1.10	.02		
HOUSING AND BENEFITS FOR FIELD PERSONNEL, TIME RECORDS, ETC.											
1 PERSONNEL CLERK (28.64 MK BASE).											
70503.											
QUALITY CONTROL 44053											
OVERSEE AND ASSURE QUALITY OF LBR		.03 HRS	13.61	.47	1.00	1.70	1.00	.79	.02		
INSTALLATIONS THROUGH FIELD INSPECTION, PRACTICES REVIEW, AND DECEPANT MATERIAL, FAILURE AND CORRECTIVE ACTION REPORTS.											
1 QUAL. ASSUR. REP. (26.625 MK BASE).											
70504.											
FIELD ENGINEERING 44054											
PROVIDE ENGINEERING SUPPORT DURING LBR		.07 HRS	13.61	.93	1.00	1.70	1.00	1.59	.03		
								11.	.23		
FIELD SUPPORT 4405											

AVERAGE PROTOTYPE HELIOSTAT COST - PILET PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

PACK & TRANSP 4400

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				CRC	OVERHEAD	G&A		
7060101.								
DRIVE 44661-1								
SPECIALIZED TRAILER BED WITH HACK ON ONE SIDE FOR PEDESTAL, DRIVE, SHORT MAIN BEAM ASSEMBLY TO LEAN AGAINST AND WITH 4 BY 4'S ATTACHED TO FLOOR FOR BRACING. QTY PER TRAILER BED = 12. REUSABLE SPECIALIZED TRAILER BEDS; MINIMUM QUANTITY NEEDED FOR 1 WEEK: 42.	P P	1.00 UNITS	.20	.20	1.00	0.00	0.00	.20 .00
7060102.								
REFLECTOR 44661-2								
SPECIALIZED PALLET FOR HOLDING REFLECTOR PANELS (ALREADY ATTACHED TO MINOR BACKING STRUCTURE) IN AN UPRIGHT POSITION, EACH BRACED ON A UNIX STRUCTURE WHICH IS MOUNTED ON THE PALLET. CUSHIONED W/DOOWN ASSEMBLY KEEPS THE TOPS OF THE PANELS SECURE. QTY PER PALLET = 4 PANELS. REUSABLE PALLETS; MINIMUM QTY. NEEDED FOR 1 WEEK = 250	P P	1.00 UNITS	.42	.42	1.00	0.00	0.00	.42 .01
7060103.								
DISTRUB ELECT 44661-3								
TRANSFORMERS STRAPPED TO REUSABLE PALLETS.	P P	1.00 UNITS	.05	.05	1.00	0.00	0.00	.05 .00
7060201.								
DRIVE 44662-1								
SPECIALIZED TRAILER BEDS REMAIN AT SITE UNTIL UNLOADED (1 WEEK'S INSTALLATION SUPPLY); ONE TRAILER, IS PULLED BY ONE TRUCK CAB. WEIGHT PER DRIVE ASSEMBLY = 1450 LBS 12 DRIVE ASSEMBLIES PER TRAILER BED 17,400 LBS. WEIGHT OF MODIFICATION TO TRAILER BED = 700 LBS. TOTAL WEIGHT OF ASSEMBLIES AND MOD. = 18,100 LBS.	N H LBR	0.00 .11 HRS	0.00 9.26	.04 1.01	0.00 1.00	0.00 2.63	0.00 1.45	.04 3.84 .00 .08
7060202.								
REFLECTOR 44662-2								
ONE LOMBOY PULLED BY ONE TRUCK CAB, N H ONE PALLET PER LOMBOY, PALLET LIFTED LBR FROM LOMBOY WITH FORKTRUCK. QTY: 4 PANELS WITH BACKING STRUCTURE PALLET. WEIGHT: 1374 LBS. EACH X 4 5490 LBS. PLUS WT. OF PALLET.	N H LBR	0.00 .65 HRS	0.00 9.26	.22 6.04	0.00 1.00	0.00 2.63	0.00 1.45	.22 23.04 .00 .47

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.10.

DATE 05/27/78

PACK & TRANSP 4466

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	
				CRS	OVERHEAD	G&A		\$/SM
7000203.								
DISTRIB ELECT								
TRANSFORMER WEIGHT: 2600 LBS.	N H	0.00	0.00	0.00	0.00	0.00	.06	.00
MAXIMUM OF 9 TRANSFORMERS/TRAILEN	LBN	.00 HRS	9.26	.01	1.00	2.63	.05	.00
PACK & TRANSP							28.	.57

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

DESIGN	4471									
DESCRIPTION			QTY/HRS/ ARR. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
						CHC	OVERHEAD	G&A		
80101. REFLECTIVE UNIT DESIGN	447101	N R	0.00	0.00	55.20	0.00	0.00	0.00	55.20	1.13
80102. DRIVE UNIT PROD DWGS, RELEASE PROCEDURES FOR ASSY, ADJUSTMENT, RUN-IN, ACCEPT- ANCE TESTING AND MAINTENANCE OF DRIVE UNIT.	447102	N R	0.00	0.00	80.00	0.00	0.00	0.00	80.00	1.63
80103. SENSOR/CAL EQ. DESIGN	447103	N R	0.00	0.00	80.40	0.00	0.00	0.00	80.40	1.64
80104. CONTROL EQUIP. DESIGN.	447104	N R	0.00	0.00	284.00	0.00	0.00	0.00	284.00	5.79
80105. FND/SITE PREP DESIGN	447105	N R	0.00	0.00	10.00	0.00	0.00	0.00	10.00	.20
DESIGN	4471								510.	10.39

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AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/21/78

SUSTAINING ENGR. 4472

DESCRIPTION

QTY/HRS/
ANN. FATE

REF UNIT
COST

SUB TOTAL

F A C T O R S
CRC OVERHEAD G&A

TOTAL

\$/SM

SUSTAINING ENGR. 4472

0. 0.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

PHE PROD UNIT 4473

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT SUB TOTAL
COST

F A C T O R S
CHC OVERHEAD G&A

TOTAL

\$/SM

PHE PROD UNIT 4473

0. 0.00

AVERAGE PROTOTYPE HELIOSTAT COST - PILOT PLANT (2500 UNITS) 1978 DOLLARS

10.05.16.

DATE 05/27/78

SITE ACTIVATION	4474	T							
DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CMC OVERHEAD G&A			TOTAL	\$/SM
SITE ACTIVATION	4474	T						0.	0.00

AVERAGE PROTOTYPE HELIOSTAT COST- PILOT PLANE (2500 UNITS) 1978 DOLLARS

11.43.44.

DATE 05/21/78

COLLECTOR 41311

DESCRIPTION		QTY/HRS/ ANAL. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CIRC OVERHEAD G&A			TOTAL	\$/SM
MOBILE CRANE ROADRUNNER 4 FT WIDE, 8 FT HIGH BOOM TIP 30 FT ABOVE GROUND AT CLOSEST RADIIUS CAPACITY: 10,000 LBS.	ME-1 P P	1.39 UNITS	18.46	25.65	1.00	0.00	0.00	25.65	.52
PICKUP TRUCK 3/4 TON LOW PRESSURE TIRES	ME-2 P P	1.39 UNITS	11.29	15.70	1.00	0.00	0.00	15.70	.32
FORKLIFT JOHN DEERE AND CO. MODEL JD 380 WITH 7 FT. 8 IN MAST LIFTING CAPACITY: 4000 LBS.	ME-3 P P	1.39 UNITS	7.98	11.09	1.00	0.00	0.00	11.09	.23
HOISTING SLING STANDARD SLING TO BE ATTACHED TO MOBILE CRANE	ME-4 LBN P P R M	.02 HRS 1.39 UNITS 1.39 UNITS	3.69 .13 .02	.06 .19 .03	1.00 1.00 1.00	2.63 0.00 0.00	1.45 0.00 0.00	.24 .19 .03	.00 .00 .00
VAN DODGE, CHEV, FORD, OR GMC W/AUX. AIR AND AC POWER GENERATOR (240V, 75 AMPS) WITH WINDOWS ALL AROUND LOW PRESSURE TIRES, 4 WHEEL DRIVE.	ME-51 P P	1.39 UNITS	10.38	14.42	1.00	0.00	0.00	14.42	.29
EQUIPT. PRINTER, TAPE READER, CRT SCREEN, KEYBOARD, RECORDERS, MEASUREMENT EQ.	ME-52 LBN P P R M	1.03 HRS 1.39 UNITS 1.39 UNITS	3.69 40.93 3.73	3.80 56.90 5.19	1.00 1.00 1.00	2.63 0.00 0.00	1.45 0.00 0.00	14.48 56.90 5.19	.30 1.16 .11
WASHING EQUIP. TWO TRUCKS IN TANDEM, ONE TO WASH WITH CB120D SOLUTION, ONE ONE TO RINSE WITH DEIONIZED WATER.	ME-6 P P	1.39 UNITS	36.28	50.43	1.00	0.00	0.00	50.43	1.03
COLLECTOR 41311								194.	3.96

AVERAGE PROTOTYPE HELIOSTAT COST- PILOT PLANT (2500 UNITS) 1970 DOLLARS

11.43.44.

DATE 05/27/78

INITIAL SPARES 4840

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CNC	OVERHEAD	G&A		
REFLECTIVE SURFACE 4841011									
BECAUSE ALL MODULES ARE DISCARDED	P P	1.39 UNITS	.02	.03	1.00	0.00	0.00	.03	.00
UPON FAILURE, A ONE YEAR SUPPLY	P P	1.39 UNITS	.23	.32	1.00	0.00	0.00	.32	.01
PLUS A 30-DAY CONTINGENCY SUPPLY	P P	1.39 UNITS	.02	.03	1.00	0.00	0.00	.03	.00
ARE REQUIRED.									
AZIMUTH 4841021									
BECAUSE AZIMUTH DRIVES ARE REPAIRED	P P	1.39 UNITS	.19	.26	1.00	0.00	0.00	.26	.01
ON SITE, A 30 DAY CONTINGENCY	P P	1.39 UNITS	.17	.23	1.00	0.00	0.00	.23	.00
PLUS A FIVE DAY PIPE LINE QUANTITY	P P	1.39 UNITS	.22	.30	1.00	0.00	0.00	.30	.01
ARE REQUIRED.									
JACK SCHEM 48410221									
BECAUSE JACK SCHEMS ARE REPAIRED	P P	1.39 UNITS	.42	.59	1.00	0.00	0.00	.59	.01
ON SITE, A 30 DAY CONTINGENCY PLUS									
A 5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
JACK SCHEM 48410221									
BECAUSE JACK SCHEMS ARE REPAIRED	P P	1.39 UNITS	.21	.29	1.00	0.00	0.00	.29	.01
ON SITE, A 30 DAY CONTINGENCY PLUS									
A 5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
AZIMUTH MOTOR 48410231									
BECAUSE AZIMUTH MOTORS ARE REPAIRED	P P	1.39 UNITS	.11	.16	1.00	0.00	0.00	.16	.00
ON SITE, A 30 DAY CONTINGENCY PLUS A									
5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
TRACKING MOTOR 48410232									
SAME AS AZIMUTH MOTOR.	P P	1.39 UNITS	.11	.15	1.00	0.00	0.00	.15	.00
STORAGE MOTOR 48410233									
SAME AS AZIMUTH AND TRACKING	P P	1.39 UNITS	.05	.08	1.00	0.00	0.00	.08	.00
MOTORS.									
TRANSFORMER 484102522									
BECAUSE TRANSFORMERS ARE REPAIRED	P P	1.39 UNITS	4.94	6.87	1.00	0.00	0.00	6.87	.14
OFF SITE, A 30 DAY CONTINGENCY									
PLUS A 5 DAY PIPE LINE QUANTITY									
ARE REQUIRED.									
BRANCH CIR BKN 484102524									
BECAUSE ALL ARE SPARED, AND NONE	P P	1.39 UNITS	.06	.09	1.00	0.00	0.00	.09	.00
REPAIRED, ONLY A 30 DAY CONTINGENCY									
IS REQUIRED.									
Cooler-Heater 484103124									
BECAUSE THE FAILURE RATE IS SO LOW	P P	1.39 UNITS	.01	.01	1.00	0.00	0.00	.01	.00
AND THE NUMBER PER FIELD IS SO LOW,									
ONLY THE PIPE LINE QTY IS REQUIRED.									

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AVERAGE PROTOTYPE HELIOSTAT COST- PILOT PLANT (2500 UNITS) 1978 DOLLARS

11.43.44.

DATE 05/21/78

INITIAL SPARES 4840

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S CHC OVERHEAD G&A	TOTAL	\$/SM
DATA DIST.INC 48410322							
BECAUSE THE DD: IS ALWAYS SPARED	P P	1.39 UNITS	.14	.20	1.00 0.00 0.00	.20	.00
AND NEVER REPAIRED, A 30 DAY	P P	1.39 UNITS	.52	.72	1.00 0.00 0.00	.72	.01
CONTINGENCY PLUS PIPE LINE QUANTITY	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
ARE REQUIRED.							
CNTRL/SIG EO 4841033							
BECAUSE THE CNTRL/SIG.EO. ARE	P P	1.39 UNITS	.11	.16	1.00 0.00 0.00	.16	.00
REPAIRED OFF SITE, A 30 DAY CON-	P P	1.39 UNITS	.31	.43	1.00 0.00 0.00	.43	.01
TINGENCY PLUS A 30 DAY PIPE LINE	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
QUANTITY ARE REQUIRED.							
REFLECTIVE SURFACE 4841111							
REFLECTIVE SURFACE WITH HAT SECTIONS	P P	1.39 UNITS	.04	.06	1.00 0.00 0.00	.06	.00
TRANSPORTED ON REUSABLE A-FRAME	P P	1.39 UNITS	.01	.01	1.00 0.00 0.00	.01	.00
MOUNTED ON TRUCK							
10 4X11 MODULES PER TRUCKLOAD							
MIRROR BACK STRUCT 4841112							
NO INITIAL SPNS REQUIRED	P P	1.00 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
AZIMUTH 4841121							
5.80/CWT TRANSPORTED IN COVERED WOOD	P P	1.39 UNITS	.04	.06	1.00 0.00 0.00	.06	.00
SKIDS	P P	1.39 UNITS	.01	.01	1.00 0.00 0.00	.01	.00
JACK SCHEM 48411221							
5.80/CWT STRAPPED TO PALLET	P P	1.39 UNITS	.00	.01	1.00 0.00 0.00	.01	.00
	P P	1.39 UNITS	.01	.02	1.00 0.00 0.00	.02	.00
JACK SCHEM 48411222							
5.80/CWT STRAPPED TO PALLET	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.01	.01	1.00 0.00 0.00	.01	.00
AZIMUTH MOTOR 48411231							
6.44/CWT SHIPPED IN CARDBOARD BOX	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.01	1.00 0.00 0.00	.01	.00
TRKING MOTOR 48411232							
6.44/CWT SHIPPED IN CARDBOARD BOX	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.01	1.00 0.00 0.00	.01	.00
STORAGE MOTOR 48411233							
6.44/CWT SHIPPED IN CARDBOARD BOX	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00 0.00 0.00	.00	.00
FEEDER CABLE 48411251							
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.03	.03	1.00 0.00 0.00	.03	.00
TRANSFORMER 48411252							
6.44/CWT STRAPPED TO PALLET	P P	1.39 UNITS	.07	.09	1.00 0.00 0.00	.09	.00
	P P	1.39 UNITS	.00	.01	1.00 0.00 0.00	.01	.00

AVERAGE PROTOTYPE HELIOSTAT COST- PILOT PLANT (2500 UNITS) 1978 DOLLARS

11.43.44.

DATE 05/27/78

INITIAL SPARES 4840

DESCRIPTION		QTY/INCS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					CMC	OVERHEAD	G&A		
DIST PANEL 484112523									
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
BRANCH CIR BKH 484112524									
6.44/CMT SHIPPED IN MIXED BOX	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
BRANCH CIR CABLE 484112525									
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
WIRE 484112531									
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
CIR BKH/HOLDER 484112532									
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
	P P	1.00 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
CAMERA 484113121									
6.44/CMT SHIPPED IN FIBRE BOARD BOX	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
COOLER-HEATER 484113124									
6.44/CMT SHIPPED IN FIBRE BOARD BOX	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
DATA DIST. INT 48411322									
6.44/CMT SHIPPED IN CARDBRD CONTAINER	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
CNTL/SIG EO 4841133									
6.44/CMT SHIPPED IN CARDBRD BOX	P P	1.39 UNITS	.00	.00	1.00	0.00	0.00	.00	.00
	P P	1.39 UNITS	.00	.01	1.00	0.00	0.00	.01	.00
HELIO SUPP STRUCT 4841151									
NO INITIAL SPARES REQUIRED	P P	1.00 UNITS	.01	.01	1.00	0.00	0.00	.01	.00
INITIAL SPARES 4840								11.	.23
INITIAL SPARES 4840								11.	0.00

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.51.03.

DATE 05/21/78

SPARES

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					ADJ	OVERHEAD	G&A		
REFLECTIVE SURFACE 4411 PANELS W/H WITH A MOBILE CHANE AND SLING, DISCARDED UPON FAILURE, FAILURE RATE/YM/I PANEL .0003207 ALWAYS SPARED (HOWEVER, MINOR CHACKS COULD BE REPAIRED BY ADHESIVE BOND) WOOD CHATE SHIPPING 9.12/CMT	N/L	7.10 FAIL	85.57	607.57	1.11	0.00	0.00	671.37	.01
AZIMUTH 4421 COMPLETE ASSEMBLY W/H UPON FAILURE BENCH REPR: REPLACE DEFECTIVE GEAR TRAIN COMPONENTS, LUBRICATE HARMONIC DR SECTION WITH HEAVY DUTY OIL, PACK GEAR WITH GREASE. FAILURE RATE: .00972 SPARES TRANS- PORTED IN COVERED WOODEN SKID.CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	17.50 FAIL	702.30	12288.42	.00	0.00	0.00	675.80	.01
JACK SCHEM 442201 JACK ASSEMBLY W/H UPON COMPONENT FAIL- URE, BENCH REPR: REPLACEMENT OF DE- FECTIVE COMPONENTS. FAILURE RATE: .009 SPARES STRAPPED TO PALLET CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	16.20 FAIL	530.94	8601.29	.06	0.00	0.00	473.07	.01
JACK SCHEM 442202 SAME AS ABOVE EXCEPT THAT FAILURE RATE IS .000444 BECAUSE THIS JACK SCHEM IS UTILIZED FEMER HRS/YH	N/L	.80 FAIL	530.94	424.33	.06	0.00	0.00	23.34	.00
AZIMUTH MOTOR 7537 DRIVE MOTOR ASSEMBLY W/H UPON COMPON- ENT FAILURE, BENCH REPR: REPLACE INCH- MENTAL ENCODER, DR. ELECTRONICS, MOTOR COMPONENTS. FAILURE RATE: .011167 SHIPPED IN CARBBD.BOX CMT/6.44 5 PERCENT OF FAILURES SPARED	N/L	67.14 FAIL	141.51	9500.60	.06	0.00	0.00	522.53	.00
TRKING MOTOR T540 SAME AS AZIMUTH MOTOR	N/L	67.33 FAIL	136.67	9202.27	.06	0.00	0.00	506.12	.00
STORAGE MOTOR T543 SAME AS AZIMUTH MOTOR EXCEPT THAT FAIL- URE RATE IS .000956 BECAUSE IT IS UTILIZED FEMER HOURS/YH.	N/L	3.34 FAIL	136.67	456.83	.06	0.00	0.00	25.13	.00
TRANSFORMER 225T(19)H TRANSFORMER W/H FOR INTERNAL ELECT. FAILURE WITH A FORKLIFT OR MOBILE CHANE AND SLING. FAILURE RATE: .00702 SHIP BY STRAPPING TO PALLET 6.44/CMT REPR OFF SITE 25 PERCENT ARE SPARED	N/L	.14 FAIL	12302.08	1739.11	.28	0.00	0.00	479.99	.00

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PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.51.03.

DATE 05/21/78

SPARES

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S ADJ OVERHEAD O&A	TOTAL	\$/SM
BRANCH CIR BKR SUD NO.FA-34040 ALL BRANCH CIR BKR SPARED FAILURE RATE: .0033 SHIPPED IN FIBRE BOARD BOX 6.44/CMT	N/L	.27 FAIL	154.64	41.85	.95 0.00 0.00	39.84 .00
CIR BKR/HOLDER T663 ALL CIRCUIT BKR'S SPARED FAILURE RATE: .0033 SHIPPED IN FIBRE BD. BOX 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	N/L	5.94 FAIL	138.72	823.97	1.25 0.00 0.00	1028.31 .01
COOLER-HEATER T650 COOLER-HEATER R/H, NEVER REPAIRED. SHIPPED IN FIBRE BOARD BOX CMT/6.44 FAILURE RATE: .00333	N/L	.02 FAIL	24.99	.50	1.25 0.00 0.00	.62 .00
DATA DIST.INT 443202 DOI CIRCUIT CARDS REPLACED UPON FAILURE ALWAYS SPARED: REPLACE DEFECTIVE COM- PONENTS DETECTED BY MOBILE TEST VAN AND BY DETECTION OF SOFTWARE BUGS. FAILURE RATE: .017544 SHIP IN CARDBOARD CONTAINER 6.44/CMT	N/L	1.37 FAIL	1619.10	2214.52	1.25 0.00 0.00	2763.72 .00
	N/L	0.00 FAIL	0.00	0.00	0.00 0.00 0.00	0.00 0.00
CNTNL/SIG EO 4433 CIRCUIT BOARD R/R UPON FAILURE DETECTED BY MOBILE TEST VAN AND OPERATIONAL IN- DICATIONS AND SOFTWARE BUGS BENCH REPR: REPLACEMENT OF DEFECT- IVE COMPONENTS FAILURE RATE: .00544 SHIP IN CARDBOARD BX CMT/6.44 5 PERCENT SPARED 95 PERCENT REPAIRED OFF SITE	N/L	127.30 FAIL	515.36	65603.57	.06 0.00 0.00	4133.03 .00
	N/L	0.00 FAIL	0.00	0.00	0.00 0.00 0.00	0.00 0.00

SPARES

11343. .04

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PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.54.25.

DATE 05/21/78

REPAIR PTS

DESCRIPTION		QTY/HRS/ ANAL. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	
					ADJ	OVERHEAD	G&A		\$/SM
MIRROR BACK STRUCT 4412 STRUCT ALWAYS REPR IN PLACE, NEVER SPARED FAILURE RATE/1000 REPAIR PARTS SHIPPED IN CARDBOARD BOX CMT/4.36	N/L	1.80 FAIL	12.03	21.65	1.11	0.00	0.00	23.93	.00
AZIMUTH 4421 COMPLETE ASSEMBLY R/W UPON FAILURE BENCH REPR: REPLACE DEFECTIVE GEAR TRAIN COMPONENTS, LUBRICATE HARMONIC DR SECTION WITH HEAVY DUTY OIL, PACK GEAR WITH GREASE. FAILURE RATE: .00972 SPARES TRANS- PORTED IN COVERED WOODEN SKID.CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	17.50 FAIL	69.96	1223.96	1.05	0.00	0.00	1285.16	.01
JACK SCREW 442201 JACK ASSEMBLY R/W UPON COMPONENT FAIL- URE, BENCH REPR: REPLACEMENT OF DE- FECTIVE COMPONENTS. FAILURE RATE: .009 SPARES STRAPPED TO PALLET CMT/5.80 5 PERCENT OF FAILURES ARE SPARED	N/L	16.20 FAIL	52.90	857.01	1.05	0.00	0.00	899.86	.01
JACK SCREW 442202 SAME AS ABOVE EXCEPT THAT FAILURE RATE IS .000444 BECAUSE THIS JACK SCREW IS UTILIZED FEWER HRS/YR	N/L	.80 FAIL	52.90	42.28	1.05	0.00	0.00	44.39	.00
AZIMUTH MOTOR T537 DRIVE MOTOR ASSEMBLY R/W UPON COMPON- ENT FAILURE, BENCH REPR: REPLACE INCH- MENTAL ENCODER, DR. ELECTRONICS, MOTOR COMPONENTS. FAILURE RATE: .01116/ SHIPPED IN CARBBD.BOX CMT/6.44 5 PERCENT OF FAILURES SPARED	N/L	67.14 FAIL	14.10	946.62	1.05	0.00	0.00	993.95	.00
TRACKING MOTOR T540 SAME AS AZIMUTH MOTOR	N/L	67.33 FAIL	13.62	916.89	1.05	0.00	0.00	962.74	.00
STORAGE MOTOR T543 SAME AS AZIMUTH MOTOR EXCEPT THAT FAIL- URE RATE IS .000556 BECAUSE IT IS UTILIZED FEWER HOURS/YR.	N/L	3.34 FAIL	13.62	45.52	1.05	0.00	0.00	47.79	.00
FEEDER CABLE CLX ALL FIELD POWER DATA CABLES REPR IN PLACE BY STANDARD ELECT. METHODS IN- CLUDING REPLACEMENT OF TERMINALS AND CONNECTIONS. FAILURE RATE: .0007199 SHIPPED IN FIBRE BOARD BOX 6.44/CMT	N/L	.00 FAIL	336.56	1.41	1.25	0.00	0.00	1.76	.00

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.54.25.

DATE 05/21/78

REPAIR PTS

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S ADJ OVERHEAD G&A			TOTAL	\$/SM
TRANSFORMER 225T(19)H TRANSFORMER W/H FOR INTERNAL ELECT. N/L FAILURE WITH A FORKLIFT OR MOBILE CRANE AND SLING. FAILURE RATE: .00702 SHIP BY STRAPPING TO PALLET 6.44/CMT REPH OFF SITE 25 PERCENT ARE SPARED	.14 FAIL	1235.31	173.78	.83	0.00	0.00	144.07	.00
DIST PANEL 50.0-H-4172-4N ALL DIST PANELS REPH IN PLACE N/L FAILURE RATE: .049332 SHIPPED IN WOOD BOX 6.44/CMT	.30 FAIL	127.81	37.83	1.25	0.00	0.00	47.21	.00
BRANCH CTR CABLE CLX-ALS ALL HELIOSTAT CABLES REPH IN PLACE N/L FAILURE RATE: .000367 REPH PARTS SHIPPING: 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	.66 FAIL	6.81	4.50	1.25	0.00	0.00	5.62	.00
WIRE CLX-16 ALL WIRE REPH IN PLACE BY STANDARD ELECTN/L METHODS FAILURE RATE: .002 FOR THE SUMATION OF THE 5 WIRES WITHIN THE PEDESTAL PARTS SHIPPED IN FIBRE BD. BOX 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	3.60 FAIL	1.50	5.41	1.25	0.00	0.00	6.75	.00
CAMERA TN2200 CAMERA W/H, ALL REPAIRED OFF SITE N/L SHIPPED IN FIBRE BOARD BOX CMT/6.44 FAILURE RATE: .01	.06 FAIL	294.37	17.66	1.11	0.00	0.00	19.52	.00
CNTRL/SIG EQ 4433 CIRCUIT BOARD W/H UPON FAILURE DETECTED N/L BY MOBILE TEST VAN AND OPERATIONAL IN- DICATIONS AND SOFTWARE BUGS BENCH REPH: REPLACEMENT OF DEFECT- IVE COMPONENTS FAILURE RATE: .00544 SHIP IN CARDBOY BOX CMT/6.44 5 PERCENT SPARED. 95 PERCENT REPAIRED OFF SITE	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HELIO SUPP STRUCT 4451 ALL PEDESTALS REPH IN PLACE USING STAND-N/L AND STRUCTURAL REPAIR PROCESSES FAILURE RATE: .001 REPAIR PARTS SHIPPED AT 4.36/CMT ASSUMES SHIPMENT IN ECONOMIC QTY'S	1.80 FAIL	4.58	8.24	1.11	0.00	0.00	9.11	.00

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.54.25.

DATE 05/21/78

REPAIR PTS

DESCRIPTION

QTY/HRS/
ANN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
ADJ OVERHEAD G&A

TOTAL

\$/SM

N/L

0.00 FAIL

0.00

0.00

0.00

0.00

0.00

0.00

0.00

REPAIR PTS

12347. .04

H-200

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.56.48.

DATE 05/21/78

OTHER

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	S/SM
					ADJ	OVERHEAD	G&A		
REFLECTIVE SURFACE 4411									
PANELS R/R WITH A MOBILE CHANE AND	N/L	7.10 FAIL	12.82	90.99	1.11	0.00	0.00	100.54	.00
SLING, DISCARDED UPON FAILURE,	N/L	7.10 FAIL	1.68	11.93	1.11	0.00	0.00	13.18	.00
ALWAYS SPARED (HOWEVER, MINOR CHACKS									
COULD BE REPAIRED BY ADHESIVE BOND)									
WOOD CHATE SHIPPING 9.12/CMT									
MIRROR BACK STRUCT 4412									
STRUCT ALWAYS REPR IN PLACE, NEVER	N/L	1.80 FAIL	.29	.53	.95	0.00	0.00	.50	.00
SPARED FAILURE RATE/10 .001	N/L	1.80 FAIL	.13	.23	.95	0.00	0.00	.21	.00
CMT/4.35									
AZIMUTH 4421									
COMPLETE ASSEMBLY R/R UPON FAILURE	N/L	17.50 FAIL	51.04	893.00	.06	0.00	0.00	49.34	.00
BENCH REPR: REPLACE DEFECTIVE GEAR	N/L	17.50 FAIL	10.00	174.96	.06	0.00	0.00	9.67	.00
TRAIN COMPONENTS, LUBRICATE HARMONIC DR	N/L	17.50 FAIL	5.10	89.30	1.05	0.00	0.00	93.74	.00
SECTION WITH HEAVY DUTY OIL, PACK GEAR	N/L	17.50 FAIL	1.00	17.50	1.05	0.00	0.00	18.37	.00
FAILURE RATE: .00972 SPARES TRANS-									
PORTED IN COVERED WOODEN SKID.CMT/5.80									
5 PERCENT OF FAILURES ARE SPARED									
JACK SCREW 442201									
JACK ASSEMBLY R/R UPON COMPONENT FAIL-	N/L	16.20 FAIL	4.64	75.17	.06	0.00	0.00	4.15	.00
URE, BENCH REPR: REPLACEMENT OF DE-	N/L	16.20 FAIL	15.00	243.00	.06	0.00	0.00	13.43	.00
FECTION COMPONENTS. FAILURE RATE: .009	N/L	16.20 FAIL	.46	7.52	1.05	0.00	0.00	7.89	.00
SPARES STRAPPED TO PALLET CMT/5.80	N/L	16.20 FAIL	1.50	24.30	1.05	0.00	0.00	25.51	.00
JACK SCREW 442202									
SAME AS ABOVE EXCEPT THAT FAILURE RATE	N/L	.80 FAIL	4.64	3.71	.06	0.00	0.00	.20	.00
IS .000444 BECAUSE THIS JACK SCREW IS	N/L	.80 FAIL	15.00	11.99	.06	0.00	0.00	.66	.00
UTILIZED FEWER HRS/YR	N/L	.80 FAIL	.46	.37	1.05	0.00	0.00	.39	.00
	N/L	.80 FAIL	1.50	1.20	1.05	0.00	0.00	1.26	.00
AZIMUTH MOTOR T537									
DRIVE MOTOR ASSEMBLY R/R UPON COMPON-	N/L	67.14 FAIL	1.09	73.50	.06	0.00	0.00	4.06	.00
ENT FAILURE, BENCH REPR: REPLACE INCHE-	N/L	67.14 FAIL	5.00	335.68	.06	0.00	0.00	18.55	.00
MENTAL ENCODER, DR.ELECTRONICS, MOTOR	N/L	67.14 FAIL	.11	7.35	1.05	0.00	0.00	7.72	.00
COMPONENTS. FAILURE RATE: .011167	N/L	67.14 FAIL	.50	33.57	1.05	0.00	0.00	35.24	.00
5 PERCENT OF FAILURES SPARED									

H-201

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.56.48.

DATE 05/21/78

OTHER

DESCRIPTION

QTY/HRS/
AMN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
ADJ OVERHEAD G&A

TOTAL

\$/SM

TURNING MOTOR T540
SAME AS AZIMUTH MOTOR

N/L	67.33 FAIL	1.09	73.72	.06	0.00	0.00	4.07	.00
N/L	67.33 FAIL	5.00	336.67	.06	0.00	0.00	18.60	.00
N/L	67.33 FAIL	.11	7.37	1.05	0.00	0.00	7.74	.00
N/L	67.33 FAIL	.50	33.67	1.05	0.00	0.00	35.34	.00

STOWAGE MOTOR T543
SAME AS AZIMUTH MOTOR EXCEPT THAT FAILURE RATE IS .000556 BECAUSE IT IS UTILIZED FEMER HOURS/YR.

N/L	3.34 FAIL	1.09	3.66	.06	0.00	0.00	.20	.00
N/L	3.34 FAIL	5.00	16.71	.06	0.00	0.00	.92	.00
N/L	3.34 FAIL	.11	.37	1.05	0.00	0.00	.38	.00
N/L	3.34 FAIL	.50	1.67	1.05	0.00	0.00	1.75	.00

FEEDER CABLE CLX
ALL FIELD POWER DATA CABLES REPH IN PLACE BY STANDARD ELECT. METHODS IN-CONNECTORS. FAILURE RATE: .0007199 SHIPPED IN FIBRE BOARD BOX 6.44/CMT

N/L	.00 FAIL	7.33	.03	.95	0.00	0.00	.03	.00
N/L	.00 FAIL	.63	.00	.95	0.00	0.00	.00	.00

TRANSFORMER 225T(19)II
TRANSFORMER N/H FOR INTERNAL ELECT. FAILURE WITH A FORKLIFT OR MOBILE CRANE AND SLING. FAILURE RATE: .00702 SHIP BY STRAPPING TO PALLET 6.44/CMT

N/L	.14 FAIL	167.44	23.56	.28	0.00	0.00	6.51	.00
N/L	.14 FAIL	10.00	1.41	.28	0.00	0.00	.39	.00
N/L	.14 FAIL	334.88	47.11	.83	0.00	0.00	39.04	.00
N/L	.14 FAIL	10.00	1.41	.83	0.00	0.00	1.17	.00

DIST PANEL SQ.D-H-4172-4N
ALL DIST PANELS REPH IN PLACE FAILURE RATE: .049332 SHIPPED IN WOOD

N/L	.30 FAIL	.64	.19	.95	0.00	0.00	.18	.00
N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BRANCH CIR BKN SQD NO. FA-34040
ALL BRANCH CIR BKN SPARED FAILURE RATE: .0033

N/L	.27 FAIL	.19	.05	.95	0.00	0.00	.05	.00
N/L	.27 FAIL	5.00	1.35	.95	0.00	0.00	1.29	.00

BRANCH CIR CABLE CLX-ALS
ALL HELIOSTAT CABLES REPH IN PLACE FAILURE RATE: .000367 ASSUMES SHIPMENT IN ECONOMIC QUANTITY

N/L	.66 FAIL	.12	.08	.95	0.00	0.00	.07	.00
N/L	.66 FAIL	.63	.41	.95	0.00	0.00	.39	.00

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.56.48.

DATE 05/27/78

OTHER

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				ADJ	OVERHEAD	G&A		
WIRE CLX-16								
ALL WIRE REPR IN PLACE BY STANDARD ELECTN/L	3.60 FAIL	.12	.42	.95	0.00	0.00	.40	.00
METHODS N/L	3.60 FAIL	.63	2.25	.95	0.00	0.00	2.14	.00
THE 5 WIRES WITHIN THE PEDESTAL								
PARTS SHIPPED IN FIBRE BD.BOX 3.44/CWT								
ASSUMES SHIPMENT IN ECONOMIC QUANTITY								
CIR BKR/HOLDER T603								
ALL CIRCUIT BKRS SPARED N/L	5.94 FAIL	.02	.11	.95	0.00	0.00	.11	.00
FAILURE RATE: .0033 N/L	5.94 FAIL	.50	2.97	.95	0.00	0.00	2.83	.00
ASSUMES SHIPMENT IN ECONOMIC QUANTITY								
CAMERA TN2200								
CAMERA N/R, ALL REPAIRED OFF SITE N/L	.06 FAIL	3.86	.23	.95	0.00	0.00	.22	.00
SHIPPED IN FIBRE BOARD BOX CWT/6.44 N/L	.06 FAIL	5.00	.30	.95	0.00	0.00	.29	.00
COOLER-HEATER T650								
COOLER-HEATER N/R, NEVER REPAIRED. N/L	.02 FAIL	.19	.00	1.25	0.00	0.00	.00	.00
SHIPPED IN FIBRE BOARD BOX CWT/6.44 N/L	.02 FAIL	5.00	.10	1.25	0.00	0.00	.12	.00
DATA DIST.INT 443202								
DDI CIRCUIT CARDS REPLACED UPON FAILURE N/L	1.37 FAIL	.13	.18	1.25	0.00	0.00	.22	.00
ALWAYS SPARED: REPLACE DEFECTIVE COM- N/L	1.37 FAIL	5.00	6.84	1.25	0.00	0.00	8.54	.00
AND BY DETECTION OF SOFTWARE BUGS.								
FAILURE RATE: .017544								
SHIP IN CARDBOARD CONTAINER 6.44/CWT								
N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CNTRL/SIG EQ 4433								
CIRCUIT BOARD N/R UPON FAILURE DETECTED N/L	127.30 FAIL	.13	16.40	.06	0.00	0.00	1.02	.00
BY MOBILE TEST VAN AND OPERATIONAL IN- N/L	127.30 FAIL	5.00	636.48	.06	0.00	0.00	39.72	.00
DICATIONS AND SOFTWARE BUGS N/L	127.30 FAIL	.03	3.28	1.19	0.00	0.00	3.89	.00
BENCH REPR: REPLACEMENT OF DEFECT- N/L	127.30 FAIL	5.00	636.48	1.19	0.00	0.00	754.61	.00
SHIP IN CARDBOARD BX CWT/6.44								
5 PERCENT SPARED								
95 PERCENT REPAIRED OFF SITE								

H-203

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.50.48.

DATE 05/27/78

OTHER

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					ADJ	OVERHEAD	G&A		
	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HELIO SUPP STRUCT 4451									
ALL PEDESTALS REPR IN PLACE USING STAND-N/L	N/L	1.80 FAIL	.55	.98	1.11	0.00	0.00	1.08	.00
AND STRUCTURAL REPAIR PROCESSES	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
REPAIR PARTS SHIPPED AT 4.36/CMT									
ASSUMES SHIPMENT IN ECONOMIC QTY									
WASHING SOLUTION 4M231									
MC GEAN CHEM.CO,DOWNY,CA.	N/L	1728.00 FAIL	3.25	5616.00	1.00	0.00	0.00	5616.00	.80
USED IN 5 PERCENT SOLUTION									
DEIONIZED ROSE WAT 4M232									
ARROWHEAD WATER	N/L	140409.00 FAIL	.05	6318.00	1.00	0.00	0.00	6318.00	.01
FUEL 4M233									
FUEL FOR WASH TRUCKS,PICK-UP TRUCKS,	N/L	3823.20 FAIL	.56	2140.99	1.00	0.00	0.00	2140.99	.14
LUBRICANT 4M234									
OIL FOR AZIMUTH DRIVE	N/L	18.00 FAIL	.31	5.63	1.00	0.00	0.00	5.63	.01
SOURCE: DAC, LONG BEACH									
	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N/L	0.00 FAIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OTHER

15419. .95

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT 2000 UNITS

11.59.53.

DATE 05/27/78

CORRECT

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					ADJ	OVERHEAD	G&A		
REFLECTIVE SURFACE 4411									
PANELS R/R WITH A MOBILE CRANE AND	LBR	35.50 HRS	15.00	532.49	2.21	1.00	1.00	1175.75	.01
SLING, DISCARDED UPON FAILURE,	LBR	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALWAYS SPARED (HOWEVER, MINOR CHACKS									
COULD BE REPAIRED BY ADHESIVE BOND)									
WOOD CRATE SHIPPING 9.12/CWT									
MIRROR BACK STRUCT 4412									
STRUCT ALWAYS REPR IN PLACE, NEVER	LBR	5.40 HRS	15.11	81.59	2.21	1.00	1.00	180.16	.00
REPAIR PARTS SHIPPED IN CARDBOARD BOX									
CWT/4.16									
AZIMUTH 4421									
COMPLETE ASSEMBLY R/R UPON FAILURE	LBR	335.92 HRS	15.00	5038.85	2.21	1.00	1.00	11125.78	.13
BENCH REPR: REPLACE DEFECTIVE GEAR	LBR	93.82 HRS	15.11	1417.65	1.30	1.00	1.00	1837.28	.02
SECTION WITH HEAVY DUTY OIL, PACK GEAR									
WITH GREASE.									
FAILURE RATE: .00972 SPANES TRANS-									
PORTED IN COVERED WOODEN SKID.CWT/5.80									
5 PERCENT OF FAILURES ARE SPARED									
JACK SCREW 442201									
JACK ASSEMBLY R/R UPON COMPONENT FAIL-	LBR	71.28 HRS	15.00	1069.20	2.21	1.00	1.00	2360.79	.03
URE, BENCH REPR: REPLACEMENT OF DE-	LBR	47.39 HRS	15.11	715.99	1.30	1.00	1.00	927.92	.01
SPANES STRAPPED TO PALLET CWT/5.80									
5 PERCENT OF FAILURES ARE SPARED									
JACK SCREW 442202									
SAME AS ABOVE EXCEPT THAT FAILURE RATE	LBR	3.52 HRS	15.00	52.75	2.21	1.00	1.00	116.47	.00
IS .000444 BECAUSE THIS JACK SCREW IS	LBR	.18 HRS	15.11	2.66	1.62	1.00	1.00	4.30	.00
AZIMUTH MOTOR T537									
DRIVE MOTOR ASSEMBLY R/R UPON COMPON-	LBR	228.26 HRS	15.00	3423.94	2.21	1.00	1.00	7560.05	.03
ENT FAILURE, BENCH REPR: REPLACE INCRE-	LBR	163.64 HRS	15.11	2472.66	1.30	1.00	1.00	3204.57	.01
COMPONENTS. FAILURE RATE: .011167									
SHIPPED IN CARDBD.BOX CWT/6.44									
5 PERCENT OF FAILURES SPARED									
TRKING MOTOR T540									
SAME AS AZIMUTH MOTOR	LBR	255.87 HRS	15.00	3838.06	2.21	1.00	1.00	8474.44	.03
	LBR	164.13 HRS	15.11	2479.97	1.30	1.00	1.00	3214.04	.01

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.59.53.

DATE 05/27/78

CORRECT

DESCRIPTION		QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
					ADJ	OVERHEAD	G&A		
STORAGE MOTOR T543									
SAME AS AZIMUTH MOTOR EXCEPT THAT FAILURE RATE IS .000556 BECAUSE IT IS	LBR	12.70 HRS	15.00	190.53	2.21	1.00	1.00	420.70	.00
	LBR	8.15 HRS	15.11	123.11	1.30	1.00	1.00	159.55	.00
FEEDER CABLE CLX									
ALL FIELD POWER DATA CABLES REPR IN CLUding REPLACEMENT OF TERMINALS AND CONNECTORS. FAILURE RATE: .0007199 SHIPPED IN FIBRE BOARD BOX 6.44/CMT	LBR	.03 HRS	15.11	.44	2.50	1.00	1.00	1.11	.00
TRANSFORMER 225T(19)H									
TRANSFORMER R/W FOR INTERNAL ELECT. FAILURE WITH A FORKLIFT OR MOBILE CRANE STRAPPING TO PALLET 6.44/CMT REPR OFF SITE 25 PERCENT ARE SPARED	LBR	1.18 HRS	15.00	17.73	2.21	1.00	1.00	39.14	.00
	LBR	1.23 HRS	15.11	18.60	1.30	1.00	1.00	24.11	.00
DIST PANEL 50.D-H-4172-4N									
ALL DIST PANELS REPR IN PLACE BOX 6.44/CMT	LBR	.95 HRS	15.11	14.31	2.21	1.00	1.00	31.60	.00
BRANCH CIR BKR SOD NO.FA-34040									
ALL BRANCH CIR BKR SPARED FAILURE RATE: .0033	LBR	.87 HRS	15.00	12.99	2.50	1.00	1.00	32.42	.00
	LBR	.87 HRS	15.11	13.08	2.50	1.00	1.00	32.66	.00
BRANCH CIR CABLE CLX-ALS									
ALL HELIOSTAT CABLES REPR IN PLACE REPR PARTS SHIPPING: 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	LBR	2.38 HRS	15.11	35.93	2.50	1.00	1.00	89.69	.00
WIRE CLX-16									
ALL WIRE REPR IN PLACE BY STANDARD ELECTLBH FAILURE RATE=.002 FOR THE SUMATION OF THE 5 WIRES WITHIN THE PEDESTAL PARTS SHIPPED IN FIBRE DD.BOX 6.44/CMT ASSUMES SHIPMENT IN ECONOMIC QUANTITY	LBR	12.96 HRS	15.11	195.83	2.50	1.00	1.00	488.78	.01
CIR BKR/HOLDER T663									
ALL CIRCUIT BKRS SPARED FAILURE RATE: .0033 ASSUMES SHIPMENT IN ECONOMIC QUANTITY	LBR	19.01 HRS	15.00	285.12	2.50	1.00	1.00	711.66	.01
	LBR	19.01 HRS	15.11	287.21	2.50	1.00	1.00	716.88	.01

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.59.53.

DATE 05/27/70

CORRECT

DESCRIPTION	QTY/HRS/ ANN. FAIL	REF UNIT COST	SUB TOTAL	F A C T O R S			TOTAL	\$/SM
				ADJ	OVERHEAD	G&A		
CAMERA IN2200								
CAMERA R/R, ALL REPAIRED OFF SITE	.18 HRS	15.00	2.70	2.21	1.00	1.00	5.96	.00
SHIPPED IN FIBRE BOARD BOX CMT/6.44	.18 HRS	15.11	2.72	1.30	1.00	1.00	3.52	.00
COOLER-HEATER T650								
COOLER-HEATER R/R, NEVER REPAIRED.	.06 HRS	15.00	.90	2.21	1.00	1.00	1.99	.00
SHIPPED IN FIBRE BOARD BOX CMT/6.44	.03 HRS	15.11	.45	2.21	1.00	1.00	1.00	.00
DATA DIST. INT 443202								
DUI CIRCUIT CARDS REPLACED UPON FAILURE	4.38 HRS	15.00	65.68	2.50	1.00	1.00	163.95	.00
ALWAYS SPARED. REPLACE DEFECTIVE COM- AND BY DETECTION OF SOFTWARE BUGS.	2.39 HRS	15.11	36.18	2.50	1.00	1.00	90.32	.00
FAILURE RATE: .017544								
SHIP IN CARDBOARD CONTAINER 6.44/CMT								
	LBR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CNTRL/SIG EQ 4433								
CIRCUIT BOARD R/R UPON FAILURE DETECTED	330.97 HRS	15.00	4964.54	2.50	1.00	1.00	12391.50	.01
BY MOBILE TEST VAN AND OPERATIONAL IN- BENCH REPR: REPLACEMENT OF DEFECT- IVE COMPONENTS FAILURE RATE: .00544	434.40 HRS	15.11	6563.75	1.46	1.00	1.00	9609.33	.01
SHIP IN CARDBOARD BX CMT/6.44								
5 PERCENT SPARED								
95 PERCENT REPAIRED OFF SITE								
	LBR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HELIO SUPP STRUCT 4451								
ALL PEDESTALS REPR IN PLACE USING STAND-LBR	3.60 HRS	15.11	54.40	2.21	1.00	1.00	120.11	.00
FAILURE RATE: .001								
REPAIR PARTS SHIPPED AT 4.36/CMT								
ASSUMES SHIPMENT IN ECONOMIC QTY'S								
CORRECTIVE MAINT. OM320								
ALLOCATED ABOVE								
VARIES BETWEEN LABOR ON SITE (ON LINE OR BENCH REPAIR) AND OFF SITE	LBR	12.00	180.00	1.00	1.00	1.00	180.00	.00
EFFECTENCY FACTOR OF ON LINE IS 2								
EFFECTENCY FACTOR OF BENCH REPR 1.176								

H-207

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

11.59.53.

DATE 05/27/78

CONNECT

DESCRIPTION

	QTY/HRS/ ANN. FAIL	REF UNIT	SUB TOTAL	F A C T O R S			TOTAL	
		COST		ADJ	OVERHEAD	G&A		\$/SM
L&H	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L&H	0.00 HRS	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CONNECT

65498. .33

PROTOTYPE HELIOSTAT OPERATIONS AND MAINTENANCE PILOT PLANT- 2500 UNITS

12.02.04.

DATE 05/27/79

SCHED

DESCRIPTION

QTY/HRS/
AMN. FAIL

REF UNIT
COST

SUB TOTAL

F A C T O R S
ADJ OVERHEAD G&A

TOTAL

\$/SM

WASHING LABOR OM311
TRUCK DRIVERS, ONLY, REQUIRED
1 FOR WASH SOLUTION TRUCK
1 FOR DEIONIZED RWSE WATER TRUCK

LBR

518.40 HRS

15.00

7776.00

1.17

1.00

1.00

9097.92

.09

CORROSION CONTRL OM312
INCLUDE:
VERIFY THAT GREASE AND OIL SEALS ARE
NOT LEAKING

LBR

144.72 HRS

15.00

2170.80

1.17

1.00

1.00

2539.84

.02

LBR

0.00 HRS

0.00

0.00

0.00

0.00

0.00

0.00

0.00

LBR

0.00 HRS

0.00

0.00

0.00

0.00

0.00

0.00

0.00

SCHED

11638. .11