

1348

File 4.1.20  
1348

COST PROPOSAL

HAVERHILL SOLAR ENERGY PROJECT

COLUMBIA GAS SYSTEM SERVICE CORPORATION  
1600 Dublin Road, Columbus, Ohio 43215

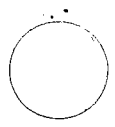
PROPOSED SOLAR SYSTEM MODIFICATION TO REPLACE SOLAR COLLECTOR FLEXIBLE HOSES AND PURCHASE SPARE PARTS FOR THE HAVERHILL SOLAR INDUSTRIAL PROCESS HEAT SYSTEM AT THE USS CHEMICALS HAVERHILL, OHIO PLANT.

Proposed Duration 9 Months  
Requested Starting Date January 1, 1984

Name of Project Manager Edward A. Reid, Jr.  
Position and Title Manager, Utilization Research  
Telephone Number (614) 481-1278  
Department Affiliation Research Department

Authorized Officials

Name	<u>D. L. Bell, Jr.</u> <i>2/19</i>	<u>W. F. Morse</u>
Signature	<u><i>[Signature]</i></u>	<u><i>[Signature]</i></u>
Title	<u>Senior Vice President</u>	<u>Director of Research</u>
Date	<u>12/15/83</u>	<u>12/13/83</u>



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## I. INTRODUCTION

Under Cooperative Agreement DE-FC03-79CS30310, the U.S. Department of Energy, the Columbia Gas System Service Corporation and the USS Chemicals Division of United States Steel Corporation are jointly funding a project to design, construct, operate and evaluate a large scale solar energy system that will provide industrial process steam for the production of chemicals at the USS Chemicals plant near Haverhill, Ohio.

Several months ago design deficiencies in the original equipment solar collector flexible hoses (located at the inlet and outlet of each solar collector row) were identified. A final report on a failure analysis of the flexible hose was prepared by Dr. R. T. Jones, Senior Corrosion Engineer, U.S. Steel Corporation and submitted to U.S. DOE and Sandia Laboratories on June 1, 1983.

These flexible hoses are now beginning to fail, with the consequent loss of expensive heat transfer fluid and with a potential oil spill pollution problem.

The USS Chemicals plant management is very concerned about any contamination of the land or the Ohio River that might occur from an oil spill from the Haverhill solar system. The solar system contains 3000 gallons of Monsanto Therminol 60, a polyaromatic hydrocarbon.

DOE has requested a cost proposal for the replacement of the original equipment flexible hoses with a new long-life-design

flexible hose that has been qualified with accelerated life cycle testing. DOE has also requested a cost proposal to modify the DOE/Columbia agreement to include the purchase of a small quantity of spare parts that will allow timely maintenance of the solar system.

## II. COST SUMMARY

U. S. DOE requested Columbia to prepare a cost estimate for the flexible hose upgrade and the spare parts purchase. We have prepared an estimate of costs to make these changes. The material costs to complete these changes were determined from actual quotations (which are included) from vendors. The material prices include no mark-up or material overhead charges by Columbia. Total material costs are \$96,316.

An engineering estimate of labor hours has been prepared and is included. The direct labor rate/hour is based on actual current labor rates for the engineers and technicians that will be assigned to the project. Labor overhead rates are negotiated annually with the Defense Contract Audit Agency. Mr. George Batory is in charge of the Columbus, Ohio office of DCAA, which audits charges to this project and negotiates the overhead rates. Total direct labor, overhead and travel costs are estimated to be \$22,537.

The total estimated cost to complete the above changes is \$118,853. If DOE elects to proceed with these changes, the estimated cost of the work under Phase III of the Agreement would increase from \$432,287 to \$551,140.

The proposed cost sharing arrangement for the solar system improvements is the same as for Phases I, II and III of the project. They are as follows:

	<u>Percentage Cost Share</u>	<u>Dollar Cost Share For Improvements</u>	<u>New Phase III Dollar Cost Ceiling</u>
Columbia	12.5%	14,857	68,893
USS Chemicals	12.5%	14,857	68,892
U. S. DOE	75.0%	89,139	413,355
Total	<u>100.0%</u>	<u>118,853</u>	<u>551,140</u>

**CONTRACT PRICING PROPOSAL**  
**(RESEARCH AND DEVELOPMENT)**

Office of Management and Budget  
Approval No. 29-RO184

This form is for use when (i) submission of cost or pricing data (see FPR 1-3.807-3) is required and (ii) substitution for the Optional Form 59 is authorized by the contracting officer.

PAGE NO.

NO. OF PAGES

NAME OF OFFEROR  
**Columbia Gas System Service Corporation**

SUPPLIES AND/OR SERVICES TO BE FURNISHED  
**Haverhill Solar Energy Project Upgrade,  
Modification and Maintenance of Haverhill  
Solar Energy System**

HOME OFFICE ADDRESS  
**20 Montchanin Road  
Wilmington, Delaware 19807**

DIVISION(S) AND LOCATION(S) WHERE WORK IS TO BE PERFORMED  
**1600 Dublin Rd. Columbus, Ohio 43215**

TOTAL AMOUNT OF PROPOSAL  
**\$ 118,853**

GOVT SOLICITATION NO.  
**PON-03-79-CS31021**

**DETAIL DESCRIPTION OF COST ELEMENTS**

1. DIRECT MATERIAL (Itemize on Exhibit A)				EST COST (\$)	TOTAL EST COST <sup>1</sup>	REFER- ENCE <sup>2</sup>
a. PURCHASED PARTS				96,316		
b. SUBCONTRACTED ITEMS						
c. OTHER—(1) RAW MATERIAL						
(2) YOUR STANDARD COMMERCIAL ITEMS						
(3) INTERDIVISIONAL TRANSFERS (At other than cost)						
<b>TOTAL DIRECT MATERIAL</b>					<b>96,316</b>	
2. MATERIAL OVERHEAD <sup>3</sup> (Rate %X\$ base=)						
3. DIRECT LABOR (Specify)				ESTIMATED HOURS	RATE/HOUR	EST COST (\$)
Engineers				80	20.67	1,654
Technicians				360	14.51	5,224
<b>TOTAL DIRECT LABOR</b>						<b>6,878</b>
4. LABOR OVERHEAD (Specify Department or Cost Center) <sup>3</sup>				O.H. RATE	X BASE=	EST COST (\$)
Research Department Overhead				1,578	6,878	10,853
<b>TOTAL LABOR OVERHEAD</b>						<b>10,853</b>
5. SPECIAL TESTING (Including field work at Government installations)				EST COST (\$)		
<b>TOTAL SPECIAL TESTING</b>						
6. SPECIAL EQUIPMENT (If direct charge) (Itemize on Exhibit A)				EST COST (\$)		
7. TRAVEL (If direct charge) (Give details on attached Schedule)				EST COST (\$)		
a. TRANSPORTATION				1,756		
b. PER DIEM OR SUBSISTENCE				3,050		
<b>TOTAL TRAVEL</b>						<b>4,806</b>
8. CONSULTANTS (Identify—purpose—rate)				EST COST (\$)		
<b>TOTAL CONSULTANTS</b>						
9. OTHER DIRECT COSTS (Itemize on Exhibit A)				EST COST (\$)		
<b>TOTAL DIRECT COST AND OVERHEAD</b>						<b>118,853</b>
11. GENERAL AND ADMINISTRATIVE EXPENSE (Rate % of cost element Nos. ) <sup>3</sup>				EST COST (\$)		
12. ROYALTIES <sup>4</sup>				EST COST (\$)		
<b>TOTAL ESTIMATED COST</b>						<b>118,853</b>
14. FEE OR PROFIT				EST COST (\$)		
<b>TOTAL ESTIMATED COST AND FEE OR PROFIT</b>						<b>118,853</b>

This proposal is submitted for use in connection with and in response to (Describe RFP, etc.)

and reflects our best estimates as of this date, in accordance with the Instructions to Offerors and the Footnotes which follow.

TYPED NAME AND TITLE  
Daniel L. Bell, Jr.  
Senior Vice President

SIGNATURE

NAME OF FIRM  
Columbia Gas System Service Corporation

DATE OF SUBMISSION  
12/24/83

EXHIBIT A—SUPPORTING SCHEDULE (Specify. If more space is needed, use reverse)

COST EL NO.	ITEM DESCRIPTION (See footnote 5)	EST COST (\$)
1a	Solar Kinetics (Itemized List Attached)	79,312
1a	Monsanto (5 ea. 55 gal. drums of Therminol 60)	4,606
1a	ITT Barton (752-1 dP transmitter)	750
1a	Yellow Springs Inst (3 ea. Model 1260 Temp Transmitters)	1,017
1a	Honeywell (5 ea. Collector controller boards)	4,505
1a	Honeywell (1 ea. Master Controller board)	1,067
1a	Flow Technology (Model FT-64CX1250 Flowmeter)	2,840
1a	Flow Technology (Model PRA-104K Pulse Rate Amp)	155
1a	3M Corp (900 sq. ft. ECP-244)	1,500
1a	Cherry (260 ea. SPDT Snap Action Switches)	564

I. HAS ANY EXECUTIVE AGENCY OF THE UNITED STATES GOVERNMENT PERFORMED ANY REVIEW OF YOUR ACCOUNTS OR RECORDS IN CONNECTION WITH ANY OTHER GOVERNMENT PRIME CONTRACT OR SUBCONTRACT WITHIN THE PAST TWELVE MONTHS?

YES  NO (If yes, identify below.)

NAME AND ADDRESS OF REVIEWING OFFICE AND INDIVIDUAL  
Mr. George Batory  
Defense Contract Agency; 85 Marconi Blvd., Columbus, OH

TELEPHONE NUMBER/EXTENSION  
614/469-6764

II. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS PROPOSED CONTRACT?

YES  NO (If yes, identify on reverse or separate page)

III. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT?

YES  NO (If yes, identify.):  ADVANCE PAYMENTS  PROGRESS PAYMENTS OR  GUARANTEED LOANS

IV. DO YOU NOW HOLD ANY CONTRACT (Or, do you have any independently financed (IR&D) projects) FOR THE SAME OR SIMILAR WORK CALLED FOR BY THIS PROPOSED CONTRACT?

YES  NO (If yes, identify.):

V. DOES THIS COST SUMMARY CONFORM WITH THE COST PRINCIPLES SET FORTH IN AGENCY REGULATIONS?

YES  NO (If no, explain on reverse or separate page)





SOLAR KINETICS INC. MAILING ADDRESS • P.O. BOX 47045 DALLAS, TX 75247  
STREET ADDRESS • 3300 CENTURY CIRCLE IRVING, TX 75060 (214) 721-1070

December 9, 1983

Mr. J. P. Dechow  
Columbia Gas System  
P. O. Box 2318  
Columbus, OH 43215

Dear Phil:

Per your letter of December 6, 1983, please find enclosed our current price quotation for spare parts.

Most of the parts are in stock at this time. Six to eight weeks from the time of order should be an adequate lead time for manufacturing of the remaining parts. However, the lead time will depend on the production schedule at the time the order is received.

Please contact me if I can help you further, concerning this quotation.

Sincerely,

SOLAR KINETICS, INC.

Rick Brooks  
Controller

RB/ebh

Enclosures



# QUOTATION

**SOLAR KINETICS INC.**

MAILING ADDRESS • P.O. BOX 47045 DALLAS, TX 75247  
STREET ADDRESS • 3300 CENTURY CIRCLE IRVING, TX 75060 (214) 721-1070

Sheet 1 of 2

To Mr. J. P. Dechow  
Columbia Gas System  
P. O. Box 2318  
Columbia, OH 43216

Prices quoted are  
F.O.B. SKI, Irving, TX

Delivery 6-8 weeks

DATE December 9, 1983

VALID UNTIL February 29, 1984

TERMS See reverse side

10% deposit, Net 15 days

We are pleased to quote as follows. Your inquiry

Quantity	Description	Price	Amount
5	70453 Flow valve	38.00	190.00
5	70476 Relay	13.00	65.00
1	70452 Bypass valve	47.00	47.00
5	70448 Coil, Delta Cart. valve	32.00	160.00
1	70479 Valve, Vickers	163.00	163.00
5	70447 Coil, 4-way valve Vickers	37.00	185.00
10	70302 Pressure switch	140.00	1400.00
14	06-382C Receiver tube assembly - short	170.00	2380.00
14	70735 Glass tube - short	47.00	658.00
3	00-125C-1 Receiver tube & glass crate - short (1 per 8 tubes)	26.00	78.00
10	06-381C Receiver tube assembly - long	175.00	1750.00
10	70734 Glass tube - long	47.00	470.00
3	00-125C-2 Receiver tube & glass crate - long (1 per 8 tubes)	27.00	81.00
4	06-434C-1 Drive arm receiver tube assembly	28.00	112.00
2	06-433C-1 Receiver tube stand assembly mirror	28.00	56.00
6	06-435C-1 Receiver stand assembly - center	32.00	192.00
1	06-368C-2 Sensor - 525°F assembly	177.00	177.00
1	06-248C Standard support pylon	152.00	152.00
5	06-299B Bearing assembly	30.00	150.00

By \_\_\_\_\_



# QUOTATION

SOLAR KINETICS INC. MAILING ADDRESS • P.O. BOX 47045 DALLAS, TX 75247  
STREET ADDRESS • 3300 CENTURY CIRCLE IRVING, TX 75060 (214) 721-1070

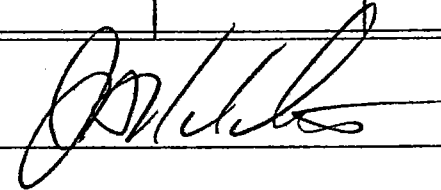
Sheet 2 of 2

To Mr. J. P. Dechow  
Columbia Gas System  
P. O. Box 2318  
Columbia, OH 43216

Prices quoted are  
F.O.B. SKI, Irving, TX  
  
Delivery 6-8 weeks  
DATE December 9, 1983  
VALID UNTIL February 29, 1984  
TERMS See reverse side  
10% deposit, Net 15 days

We are pleased to quote as follows. Your inquiry

Quantity	Description	Price	Amount
2	P06-289C End shaft arm assembly	52.00	104.00
128	06-370C End hose high temp. assembly	495.00	63360.00
16	Split clamp assembly	12.00	192.00
4	P06-288C Intermediate arm assembly	129.00	516.00
1	06-197D-3 Drive pylon assembly w/o control box	3300.00	3300.00
2	70451 Accumulator	247.00	494.00
1	06-081D-1 Power unit assembly	1382.00	1382.00
3	06-018B Hydraulic cylinder	486.00	1458.00
5	70331 Limit switch	8.00	40.00
Total			<u>79312.00</u>

By 

# Monsanto

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MONSANTO INDUSTRIAL CHEMICALS CO.  
800 N. Lindbergh Boulevard  
St. Louis, Missouri 63167  
Phone: (314) 694-1000

March 15, 1983

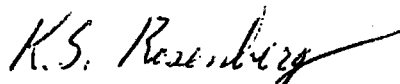
MAY WE CALL YOUR ATTENTION TO SOME FORTHCOMING PRICE CHANGES --

Effective April 1, 1983, Monsanto is increasing the price of Therminol® 44, Therminol® 55, Therminol® 60, Therminol® 66, Therminol® 88, and Therminol® VP-1.

A copy of the revised "Price and Shipping Information" schedule is attached for your reference. These price increases are required to offset the manufacturing cost increases incurred during the last twelve months.

It is Monsanto's policy to remain fully competitive in the supply of heat transfer fluids while providing our customers with the highest quality fluid and technical support. We sincerely appreciate the confidence you have placed with Monsanto in the past and look forward to continuing our relationship.

Sincerely,



K. S. Rosenberg  
Business Manager  
Heat Transfer and Process

KSR/nkd

Attachment

® Registered Trademark of Monsanto Company

THERMINOL 44

<u>BULK TC/TT</u>	<u>CL/TL 60 DRUM MIN.</u>	<u>LESS THAN TRUCKLOAD</u>			<u>5 GALLON CAN</u>
		<u>10 DRUM MIN.</u>	<u>1 DRUM MIN.</u>		
19.50	20.60	21.10	21.95	40.00	

BULK: F.O.B. St. Louis, Missouri

DRUMS: F.O.B. St. Louis, Missouri

CONTAINERS: 55 gallon drum: Net-419 lbs.; Gross-459 lbs.; 10.715 ft.<sup>3</sup>5 gallon drum: Net- 38 lbs.; Gross- 43 lbs.; 1 ft.<sup>3</sup>SHIPPING CLASSIFICATION: Heat transfer agent or media, NOIBNTEMPERATURE RANGE: -50°F to 425°FWEIGHT PER GALLON AT 75-77°F: 7.62 lbs./gallonTHERMINOL 55

<u>BULK TC/TT</u>	<u>CL/TL 60 DRUM MIN.</u>	<u>LESS THAN TRUCKLOAD</u>			<u>5 GALLON CAN</u>
		<u>10 DRUM MIN.</u>	<u>1 DRUM MIN.</u>		
4.60	5.70	6.00	6.50	23.50	

BULK: F.O.B. Chocolate Bayou, Texas, and St. Louis, Missouri

DRUMS: F.O.B. St. Louis, Missouri

NOTES: 1) Add \$0.15/gal. for bulk shipments from St. Louis.

2) Add \$0.30/gal. for LTL shipments ex-Los Angeles warehouse.

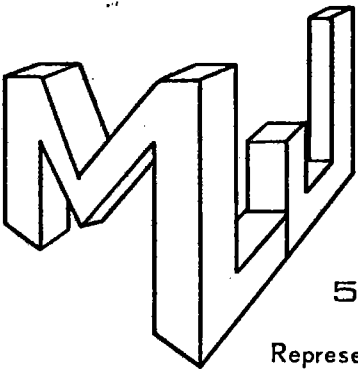
CONTAINERS: 55 gallon drum: Net-400 lbs.; Gross-440 lbs.; 10.715 ft.<sup>3</sup>5 gallon drum: Net- 37 lbs.; Gross- 42 lbs.; 1 ft.<sup>3</sup>SHIPPING CLASSIFICATION: Heat transfer agent or media, NOIBNTEMPERATURE RANGE: 0°F to 600°FWEIGHT PER GALLON AT 75-77°F: 7.4 lbs./gallonTHERMINOL 60

<u>BULK TC/TT</u>	<u>CL/TL 60 DRUM MIN.</u>	<u>LESS THAN TRUCKLOAD</u>			<u>5 GALLON CAN</u>
		<u>10 DRUM MIN.</u>	<u>1 DRUM MIN.</u>		
14.96	15.64	16.15	16.75	31.00	

BULK: F.O.B. Bridgeport, New Jersey

DRUMS: F.O.B. Bridgeport, New Jersey

CONTAINERS: 55 gallon drum: Net-455 lbs.; Gross-495 lbs.; 10.715 ft.<sup>3</sup>5 gallon drum: Net- 41 lbs.; Gross- 46 lbs.; 1 ft.<sup>3</sup>SHIPPING CLASSIFICATION: Heat transfer agent or media NOIBNTEMPERATURE RANGE: -60°F to 600°FWEIGHT PER GALLON AT 75-77°F: 8.28 lbs./gallon.



**QUOTATION**  
FROM  
**M. L. JOHNSON CO.**

4740R Interstate Drive  
Cincinnati, Ohio 45246  
513/874-8445

Date December 9, 1983

Quotation  
Number 83/1209/1

Representing ITT BARTON

Reference Telcon 12/7/83

Columbia Gas System Service Corp.  
1600 Dublin Road  
Columbus, Ohio 43215

Attn: Mr. Phil Dechow

All Quotations Subject to Manufacturers Warranty

ITEM	QUAN.	DESCRIPTION	UNIT PRICE	TOTAL
1	1	ITT Barton Model 6001 dP Transmitter  Input: 0-250" W.C. Output: 4-20mA Housing: Carbon Steel, 2000 Lb. Diaphragms: 316 St. Stl. Accessories: Universal Mtg. Bkt.  NOTE: For 316 St. Steel Housing, ADD -----	\$750.00	\$750.00
				50.00
		NOTE: ALL QUOTATIONS ARE SUBJECT TO WARRANTY, TERMS AND CONDITIONS OF THE MANUFACTURERS OF THE EQUIPMENT QUOTED. COPIES WILL BE SUPPLIED UPON REQUEST.	PRICES QUOTED INCLUDE ONE SET OF INSTRUCTIONS. ADDITIONAL COPIES AND/OR OTHER SPECIAL DATA MAY INVOLVE ADDITIONAL CHARGES.	

Shipment Approximately 2-4 Weeks  
From Receipt of Authorization to Fabricate

F.O.B. Factory, City of Industry, CA

Terms: Net 30 Days

Thank you for your inquiry. If we can further assist you please contact us. Please address your order to:

ITT BARTON  
c/o M. L. Johnson Co.

By P. Michael Haumesser  
P. Michael Haumesser/jb



Prices are subject to change without notice.

**SECTION I. THERMISTOR PRODUCTS**

**Precision Interchangeable Thermistors**

YSI P/N	DESCRIPTION	QUANTITY	PRICE
44001A, 44002A, <sup>2</sup> 44003A, 44011, 44014, 44015	Standard 1% (0.2°C) Precision Interchangeable Thermistors	1-29	\$9.50
44004, 44005, <sup>2</sup> 44006, 44007, 44008	Standard 1% (0.2°C) Precision Interchangeable Thermistors	1-29	7.90
44030-44035 <sup>1</sup>	Standard 0.5% (0.1°C) Precision Interchangeable Thermistors (44035 is 1K, 1%, -50 to +50°C)	1-29	15.15
44101A-44115* <sup>1</sup>	Standard Teflon Covered 1% (0.2°C) Precision Interchangeable Thermistors	1-29	18.15
<b>QUANTITY DISCOUNT      UNIT PACK      BULK PACK (100's)</b>			
30-99	15%	.....	
100-999	30%	35%	
1000-2999	35%	47.5%	
3000-9999	40%	52.5%	
10,000 up	50%	55%	

\*Available in Unit Pack only.  
<sup>1</sup>Quantities 1-29 available only from distributors or stocking reps.  
<sup>2</sup>Quantities 1-99 available only from distributors or stocking reps.

**Space-Qualified Thermistors**

YSI P/N	DESCRIPTION	QUANTITY	PRICE
44901, 44903, 44905, 44907, 44909	Standard 1% (0.2°C) Precision Interchangeable Thermistors Acceptance Tested to NASA GSFC Spec. S-311-P-1801	1-29	\$56.20
44902, 44904, 44906, 44908, 44910	Standard 0.5% (0.1°C) Precision Interchangeable Thermistors Acceptance Tested to NASA GSFC Spec. S-311-P-1801	1-29	68.90
<b>QUANTITY DISCOUNT      UNIT PACK</b>			
30-99	15%		
100-999	30%		
1000-2999	35%		
3000-9999	40%		
10,000 up	50%		

**46000 Series Super-Stable Thermistors**

YSI P/N	DESCRIPTION	QUANTITY	PRICE
46004 46005 46007	Super-Stable 0.2°C Interchangeability	1-29	\$15.90
46033 46030 46034	0.1°C Interchangeability		31.80
46043 46040 46044	0.05°C Interchangeability		47.70

**Thermilinear® Components**

YSI P/N	DESCRIPTION	QUANTITY	PRICE
44201 to 44211A <sup>2</sup>	Thermilinear Component (Including Resistor Set)	1-29	\$19.20
44212* <sup>1</sup>	Thermilinear Component (Including Resistor Set)	1-29	36.10
44018 & 44019A <sup>2</sup>	Thermilinear Composite	1-29	14.50
44020* <sup>1</sup>	Thermilinear Composite	1-29	28.35
44301 to 44311A <sup>2</sup>	Resistor Set	1-29	6.25
44312* <sup>1</sup>	Resistor Set	1-29	7.75
<b>QUANTITY DISCOUNT      UNIT PACK      BULK PACK (100's)</b>			
30-99	15%	.....	
100-999	30%	35%	
1000-2999	35%	42.5%	
3000-9999	40%	45%	
10,000 up	42.5%	47.5%	

\*Available in Unit Pack only.  
<sup>1</sup>Quantities 1-29 available only from distributors or stocking reps.  
<sup>2</sup>Quantities 1-99 available only from distributors or stocking reps.

**YSI 700 Series Probes**

YSI P/N	DESCRIPTION	QUANTITY	PRICE
701	General Purpose Flexible	1-9	\$47.30
702A	Small Flexible General Purpose	1-9	65.50
703	Tubular Stainless Steel	1-9	68.05
704	Tubular Pyrex Glass	1-9	68.70
705	Air Temperature	1-9	73.05
708	Banjo Surface Temperature	1-9	98.25
709A	Attachable Surface Temperature	1-9	80.15
709B	Attachable Surface Temperature	1-9	59.60
710	Tubular with Fitting	1-9	73.25
729	Small Surface Temperature	1-9	78.15
731	General Purpose	1-9	54.95
PH09	Holder for 709A and 709B	1-9	14.85
7010	10' Extension Lead	1-9	27.05
7025	25' Extension Lead	1-9	34.05
7050	50' Extension Lead	1-9	44.65
Longer Probe Cables		\$21.00 + 35¢/ft. over std length	
<b>QUANTITY      DISCOUNT</b>			
10-29	10%		
30-99	15%		
100-up	20%		
100/scheduled release	25%		

NOTE: Add \$16.00 for standard probe modifications described in Thermistor Section of the catalog, except YSI 703 and 710 length from 15" to 36", add \$25.50.

**47000 Series Super-Stable Thermistors**

YSI P/N	DESCRIPTION	QUANTITY	PRICE
47004 47005 47006 47007	Lot Screened Super-Stable 0.2°C Interchangeability	1-29	10.60
47033 47030 47031 47034	0.1°C Interchangeability		21.20

## SECTION IX. TRANSMITTERS, SIGNAL CONDITIONERS

### RTD Line-Powered Temperature Transmitters

DESCRIPTION	PRICE
Model 1250 (Enclosed, 115 or 230 VAC)	\$276.00
Model 1350 (PC Board, 115 or 230 VAC)	202.00
<u>QUANTITY</u>	<u>DISCOUNT</u>
1-9	List
10-29	10%
30-99	15%

### Thermistor Temperature Transmitters

DESCRIPTION	PRICE
Model 1252 Temperature Transmitter (Enclosed) 115 and 230 VAC	\$286.00
Model 1352 Temperature Transmitter (PC Board) 115 and 230 VAC	212.00
<u>QUANTITY</u>	<u>DISCOUNT</u>
1-9	List
10-29	10%
30-up	15%

Above prices are for standard ranges only.

### Pressure Transmitters

DESCRIPTION	PRICE
1254 Transmitter (Enclosed) All Ranges	\$276.00
1354 Transmitter (PC Board) All Ranges	202.00
<u>QUANTITY</u>	<u>DISCOUNT</u>
1-9	List
10-29	10%
30-up	15%

### Dissolved Oxygen Transmitters

DESCRIPTION	PRICE
1255 Dissolved Oxygen Transmitter (enclosed)	345.00
1355 Dissolved Oxygen Transmitter (PC Board)	270.00

### Dew Point Transmitters

DESCRIPTION	PRICE
Model 1256 (Enclosed) 115 and 230 VAC	\$451.00
Model 1294 (Enclosed) 115 and 230 VAC	635.00
Model 1394 (PC Board) 115 and 230 VAC	477.00
1301 Mating Connector (Cinch 50-18A-20)	10.50
1395 Terminal Board	48.00
<u>Quantity</u>	<u>Discount</u>
1-9	List
10-29	10%
30-up	15%

### Thermicycle® Transmitters

DESCRIPTION	PRICE
1265-A PC	\$127.00
1265-B TS	138.00
1265-C PSP	159.00
1265-D PTS	159.00

### Two-Wire RTD Transmitters

DESCRIPTION	PRICE
Model 1260 Transmitter	\$339.00
Model 1270 Transmitter: Head-Mounted Version	424.00
Model 1270 Transmitter: Dust-Cover Version	488.00
Model 1203 Power Supply (115 and 230 VAC)	105.00
SYSCAL 17511 Two Wire ΔT Sensor System Calibration	83.00
SYSCAL 17512 Two-Wire ΔT Sensor System Calibration	119.00
SYSCAL 17513 Two-Wire ΔT Sensor System Calibration	149.00
Additional Span Networks for Field Calibration (See Instruction Manual or Catalog for Part Numbers.)	32.00
<u>QUANTITY</u>	<u>DISCOUNT</u>
1-9	List
10-29	10%
30-99	25%

### Thermilinear Signal Conditioners

DESCRIPTION	PRICE
Model 740A Thermivolt (Enclosed) 115 and 230 VAC	\$244.00
Model 750A Thermivolt (PC Board) 115 and 230 VAC	193.00
50-18A Cinch Connector for 750A	10.00
<u>QUANTITY</u>	<u>DISCOUNT</u>
1-9	List
10-29	10%
30-up	15%

### RTD Signal Conditioners

DESCRIPTION	PRICE
760C/115 VAC (Enclosed Model)	\$281.00
760C/230 VAC (Enclosed Model)	281.00
760F/115 VAC (Enclosed Model)	281.00
760F/230 VAC (Enclosed Model)	281.00
770C (115 and 230 VAC, PC Board)	228.00
770F (115 and 230 VAC, PC Board)	228.00
143-012-01 Amphenol Connectors for Model 770	7.00
<u>QUANTITY</u>	<u>DISCOUNT</u>
1-9	List
10-29	10%
30-99	15%

### Accessories

DESCRIPTION	PRICE
L & N 316569 Positive Intrinsic Safety Barrier (YSI 17290)	\$173.00
L & N 316747 Negative Intrinsic Safety Barrier (YSI 17291)	173.00
L & N 225135 Bus Bar (YSI 17292)	119.00
Model 1201 NEMA 4 Housing for Line Powered Transmitters	122.00
Model 1202 NEMA 4 Housing for Two-Wire Transmitters	122.00
Model 1203 24-Volt Power Supply	105.00
Model 15467-1350 Rack Mount for 10 cards	525.00
Model 1301 Mating Connector (Cinch 50-18A-20 plus polarizing key) for any 1350 Series Transmitter	10.00



HONEYWELL

COLUMBIA GAS SPARE PARTS

- 5 ea. Collector Controller electronic board and tracker heads  
Part No. 23000690-106
- 1 ea. Field Controller electronic board  
Part No. 23000865-101

I. Collector Controller electronic board with tracker head  
and cable, Part No. 2300690-106 Rev. D. Cost Breakdown:

	<u>EA.</u>	<u>5</u>
- Material 28,650 ÷ 60	\$ 477.50	
Enclosure 20.82		
Switch 5.48		
Bracket 4.10		
	<u>30.40</u>	<u>(30.40)</u>
	\$ 447.10	
7.12% Acq.	<u>31.83</u>	
	\$ 478.93	
- Warranty	80.00	
- Eng. Coordination and Tech.	<u>134.00</u>	
	\$ 693.00	\$ 3,465.00
30% G&A	<u>208.00</u>	<u>1,040.00</u>
	\$ 901.00	\$ 4,505.00

II. Field Controller electronics board  
Part No. 23000865-101 Cost Breakdown:

- Material	\$ 260.00	
7.12% Acq.	<u>18.51</u>	
	\$ 279.00	
- Warranty	80.00	
- Eng. Coordination and Tech.	<u>462.00</u>	
	\$ 821.00 (LBM)	
30% G&A	<u>246.00</u>	
	\$1,067.00	

HONEYWELL

SUMMATION

5 Ea.	Collector Controller electronic board with tracker head and cable Part No. 23000690-106 Rev. D	\$ 4,505
1 Ea.	Field Controller electronic board Part No. 23000865-101	<u>1,067</u>
		\$ 5,572

TECHNOLOGY ACHIEVED

## Flow Technology, Inc.

4250 EAST BROADWAY ROAD ■ P.O. BOX 21346 ■ PHOENIX, ARIZONA 85036 ■ TELEPHONE (602) 268-8776 ■ TELEX 668-344

December 7, 1983

Columbia Gas  
1600 Dublin Road  
Columbus, OH 43215

Attention: Phil Dechow

Dear Mr. Dechow:

As per our telephone of today, please find enclosed price lists pertaining to the FT-64CX1250-LB (300# RF Flange) and PRA-104KZT Pulse Rate Amplifier.

If you require a formal quotation, or have any questions pertaining to this equipment, or any other that Flow Technology, Inc. manufactures, please do not hesitate to contact either the factory, or our representative, listed below.

Thank you for your interest in Flow Technology, Inc. We look forward to working with you in the future.

Sincerely,

FLOW TECHNOLOGY, INC.

*Barbara Wilson*

Barbara Wilson  
Western Regional Sales Technician

Enclosures

CC: WKM Associates  
7913 S. Suburban Road  
Dayton, OH 45459  
(513) 434-7500

PRESIDENT'S AWARD FOR



EXCELLENCE IN EXPORT

FLOW MEASUREMENT INSTRUMENTS ■ CONTROL SYSTEMS ■ CALIBRATORS

AUGUST 15, 1982  
(Revised)

**STANDARD LINE TURBINE FLOWMETER**  
10 POINT CALIBRATION 10-1 RANGE

MODEL NUMBER PREFIX	NOMINAL END FITTING SIZE (INCH)	WAFER	150#	300#	600#	900#	SPECIAL BEARING ADD TO BASE PRICE		SPARE		
							GRAPHITE JOURNAL	CARBIDE JOURNAL	ROTOR	COMPLETE INTERNALS (BALL BEARING)	BALL BEARING KIT
FT-4-8	1/2	\$ 665	\$ 970	\$ 1070	\$ 1170	\$ 1290	N/A	N/A	\$ 232	\$ 565	\$ 33
FT-6-8	1/2	\$ 665	\$ 970	\$ 1070	\$ 1170	\$ 1290	\$60	\$ 155	\$ 232	\$ 565	\$ 33
FT-8-8	1/2	\$ 665	\$ 970	\$ 1070	\$ 1170	\$ 1290	\$60	\$ 155	\$ 232	\$ 565	\$ 33
FT-8	1/2	\$ 665	\$ 970	\$ 1070	\$ 1170	\$ 1290	\$60	\$ 155	\$ 232	\$ 565	\$ 33
FT-10	3/4	\$ 665	\$1030	\$ 1130	\$ 1245	\$ 1355	\$60	\$ 155	\$ 232	\$ 565	\$ 33
FT-12	3/4	\$ 665	\$1030	\$ 1130	\$ 1245	\$ 1355	\$60	\$ 155	\$ 232	\$ 565	\$ 33
FT-16	1	\$ 725	\$1070	\$ 1160	\$ 1260	\$ 1390	\$60	\$ 220	\$ 255	\$ 615	\$ 35
FT-20	1 1/4	\$ 785	\$1110	\$ 1220	\$ 1340	\$ 1510	\$60	\$ 220	\$ 275	\$ 670	\$ 35
FT-24	1 1/2	\$ 785	\$1110	\$ 1220	\$ 1340	\$ 1510	\$65	\$ 275	\$ 275	\$ 670	\$ 40
FT-32	2	\$ 945	\$1245	\$ 1350	\$ 1500	\$ 1695	\$65	\$ 275	\$ 330	\$ 805	\$ 40
FT-40	2 1/2	\$1430	\$1495	\$ 1945	\$ 2145	\$ 2380	N/A	\$ 330	\$ 550	\$1215	\$ 70
FT-48	3	\$1795	\$2030	\$ 2250	\$ 2520	\$ 2810	N/A	\$ 330	\$ 630	\$1525	\$ 90
FT-64	4	\$2430	\$2600	\$ 2840	\$ 3100	\$ 3390	N/A	\$ 330	\$ 850	\$2065	\$120
FT-80	5	\$3205	\$3400	\$ 3810	\$ 4275	\$ 4735	N/A	\$ 385	\$1120	\$2725	\$160
FT-96	6	\$4055	\$4370	\$ 4980	\$ 5555	\$ 6110	N/A	\$ 385	\$1420	\$3445	\$200
FT-128	8	\$5870	\$6100	\$ 7760	\$ 9470	\$10870	N/A	\$ 605	\$2055	\$4990	\$295
FT-160	10	\$6920	\$7530	\$ 9635	\$12010		N/A	\$ 935	\$2420	\$5880	\$345
FT-192	12	\$8370	\$9030	\$11080	\$13305		N/A	\$1155	\$2930	\$7115	\$420

Standard Line

1. OPTION: 316 S.S. Body & Supports/17-4 PH S.S. Rotor increase base Wafer/Flange price 40%.
2. NOTE: Flow Technology, Inc. will not guarantee ball bearing life in water service.
3. NOTE: JEWEL SAPPHIRE BEARING NOT AVAILABLE ON STANDARD LINE TURBINE FLOWMETER.
4. OPTION: Bi-direction flow capability: Add 50% to base wafer price. (This additional price includes two standard pickoffs and a standard calibration in each direction. Phase detection electronics are required to indicate flow direction.)

DOMESTIC PRICE LIST

(10)

AUGUST 15, 1982  
(Revised)

SECTION 7

APRIL 21, 1983 (Revised)

ELECTRONICS

MAGNETIC PRE-AMPLIFIERS

**PRA-103XD** 5-30 VDC Power, Explosion-Proof (Class 1, Division 1, ..... \$ 75  
Group A,B,C,D)

NO OPTIONS - CSA APPROVED

**PRA-104** ..... \$155

Options:

ADD TO BASE PRICE

- A - 115 VAC..... \$ 65
- J - 220 VAC..... \$ 65
- K - 22-32 VDC..... N/C
- ZT - JIC Box, Conduit Hubs..... N/C
- ZM - JIC Box, MS Connectors..... N/C
- XD - Explosion-Proof Enclosure (Class 1, Division 1, Group D)..... \$ 65
- XB - Explosion-Proof Enclosure (Class 1, Division 1, Group B)..... \$300

MODULATED CARRIER (RF) AMPLIFIERS

**LFA-303** ..... \$195

Options:

ADD TO BASE PRICE

- E - 10-14 VDC..... N/C
- K - 22-32 VDC..... N/C
- L - Low Temperature RF Pickoff Input..... N/C
- H - High Temperature RF Pickoff Input..... N/C
- N - Exotic Materials..... \$ 50
- XB - Explosion-Proof (Class 1, Division 1, Group B)...Standard..... N/C

**LFA-307** ..... \$220

Options:

ADD TO BASE PRICE

- A - 115 VAC..... \$ 65
- J - 220 VAC..... \$ 65
- K - 22-32 VDC..... N/C
- E - 10-18 VDC..... N/C
- L - Low Temperature (RF) Pickoff Input..... N/C
- H - High Temperature (RF) Pickoff Input..... N/C
- N - Exotic Materials..... \$ 50
- ZT - JIC Box (6" x 4" x 3")..... N/C
- ZM - JIC Box, MS Connectors..... N/C
- XD - Explosion-Proof (Class 1, Division 1, Group D)..... \$ 65
- XB - Explosion-Proof (Class 1, Division 1, Group B)..... \$300
- F - 330mH Coil (compatible with Cox RF Pickoff)..... \$ 45

**CAUTION:** NOTE: DO NOT MOUNT ELECTRONICS ON FLOWMETER IF  
TEMPERATURE IS ABOVE 165° F.

## Solar Collection Products

### ECP-244 Solar Collection Film

#### Description:

3M Brand ECP-244 is a highly specular .004 inch thick (0.10mm) acrylic film. It has a spectral reflectance of 86% and is specifically designed for use on focusing parabolic trough collectors. A pressure-sensitive adhesive backing facilitates application to recommended smooth substrates.

Product No.	Size*	Square Feet	Suggested Consumer Price Per Sq. Foot			
			300	5000	10,000	50,000
ECP-244	24" x 150 Ft.	300	\$1.67	\$1.56	\$1.46	\$1.34
ECP-244	24" x 300 Ft.	600	\$1.67	\$1.56	\$1.46	\$1.34

\*48" width available on special order.

Sample Roll Size - 24" x 50 Ft. \$200.00.

The above product is not assortable with other products.

All Quantity Prices: Apply to a Single Shipment only. Prices subject to change without notice.

#### Terms and Conditions of Sale

The following is made in lieu of all warranties, express or implied: Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith.

Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.



# PRICE LIST SS-666

January 2, 1981

**NOTICE:** Due to unstable market conditions on precious metals which are used for contact surfaces on switches and printed circuit boards, most prices shown herein are subject to an adder. Quantity discounts do not apply to precious metal adders. Adders are fixed as of the day shipment is made. Contact the factory for additional information about precious metal adders on high volume o.e.m. orders. Precious metal adder tables are at end of price list on page 6.

## **NOTES:** Apply to all products in this Price List

1. Cash terms - ½% 10 days, net 30 days.
2. Shipments - F.O.B. Shipping Point, Waukegan, Ill.
3. Prices and Discounts - Effective from date shown and are subject to change without notice.
4. Multiplier - Net price can be determined by multiplying list price and multiplier shown in discount schedule.
5. Discounts - Are offered on basis of volume production. To warrant discount, each shipment must consist of 2000 pieces minimum, or complete order if less than 2000 pieces.
6. Minimum order - All orders subject to a minimum billing charge of \$150.00 net.
7. Quantity orders for 999 pieces or less of snap action switches listed in this price list will be automatically forwarded to the nearest Cherry Distributor. See page 8 for Distributor listing.

Cherry has a representative or distributor near you. Their names, addresses, and phone numbers are shown at the back of this price list. Don't hesitate to contact them, or the Cherry factory direct, if you need assistance.

## PREFIX "B"

Part numbers starting with "B" denote Keyboards, Keyboard Switches, and Keycap Kits. See separate price list.

## PREFIX "C"

Part numbers starting with "C" denote Matrix Selector Switches. See separate price list TW-815.

## PREFIX "E"

### PRECISION SWITCHES

Precision switches in quantities of 4999 and fewer are offered in SPDT and DPDT versions only. Larger quantities are offered in normally open and normally closed versions on special order. Contact factory for prices.

Orders for precision switches in quantities of 999 pieces and fewer will be automatically referred to your local Cherry distributor. See last page for name, address, and phone number of distributors near you.

### DISCOUNT SCHEDULE FOR SNAP-ACTION SWITCHES ONLY

QUANTITY	DISCOUNT	MULTIPLIER
1 to 99	List	1.00
100 to 499	37%	0.63
500 to 999	43%	0.57
1000 to 1999	48%	0.52
2000 to 4999	54%	0.46

For quantities greater than those shown consult factory or nearest representative for quotation.

E10 series:  
contact factory

### E13-SERIES GENERAL PURPOSE (SPDT)

*E13-00E	\$1.42
*E13-00H	\$1.95
*E13-50H	\$1.95
*E13-00K	\$2.38
*E13-50K	\$2.38
*E13-00J	\$1.59
*E13-00M	\$2.02
*E13-00R	\$2.52

Precious Metal Adders Table G

### E14-SERIES GENERAL PURPOSE (SPDT)

*E14-00A	\$1.90
*E14-00H	\$2.43
*E14-50H	\$2.43
*E14-00K	\$2.86
*E14-50K	\$2.86
E14-00J	\$2.07
E14-00M	\$2.50

Precious Metal Adders Table E

### E15-, E16-, E18-Series: Contact Factory

### E-19 SERIES GENERAL PURPOSE (DPDT)

*E19-00A	\$2.96
*E19-00H	\$3.50
*E19-50H	\$3.50
*E19-00K	\$3.92
*E19-50K	\$3.92
*E19-00J	\$3.14
*E19-00M	\$3.56
*E19-00R	\$3.71

Precious Metal Adders Table H

### E20-SERIES GENERAL PURPOSE (DPDT)

*E20-00A	\$4.39
E20-00H	\$4.93
E20-50H	\$4.93
*E20-00K	\$5.35
E20-50K	\$5.35
*E20-00J	\$4.57
E20-00M	\$4.99

Precious Metal Adders Table F

### E21-SERIES MINIATURE STANDARD FORCE

*E21-00A	\$2.70
E21-00H	\$2.94
*E21-50H	\$2.94
E21-50HL	\$2.94
E21-50N	\$2.91
*E21-00K	\$3.24
*E21-50K	\$3.24
E21-50KL	\$3.24
E21-90N	\$2.91
E21-00P	\$3.78
E21-50P	\$3.78
E21-50PL	\$3.78

Precious Metal Adders Table B

### E21-SERIES MINIATURE LIGHT FORCE

*E21-00AX	\$2.86
E21-00HX	\$3.10
*E21-50HX	\$3.10
E21-55HX	\$3.10
*E21-85HX	\$3.10
E21-50NX	\$3.07
E21-00KX	\$3.39
E21-50KX	\$3.39
E21-75KX	\$3.39
E21-90NX	\$3.07

Precious Metal Adders Table B

### E22-SERIES MINIATURE STANDARD FORCE

*E22-00A	\$1.53
*E22-00H	\$1.77
E22-50H	\$1.77
E22-50HL	\$1.74
E22-50N	\$1.74
*E22-00K	\$2.06
*E22-50K	\$2.06
E22-90N	\$1.74
E22-00P	\$2.61
E22-50P	\$2.61
E22-50PL	\$2.61

Precious Metal Adders Table E

### E22-SERIES MINIATURE LIGHT FORCE

*E22-00AX	\$1.80
E22-00HX	\$2.04
*E22-50HX	\$2.04
*E22-55HX	\$2.04
*E22-75HX	\$2.04
*E22-85HX	\$2.04
E22-50NX	\$2.02
E22-00KX	\$2.34
E22-75KX	\$2.34
E22-90NX	\$2.02

Precious Metal Adders Table E

### E-23 SERIES MINIATURE STANDARD FORCE

*E23-00A	\$1.53
E23-00H	\$1.77
*E23-50H	\$1.77
*E23-50HL	\$1.74
E23-50N	\$1.74
*E23-00K	\$2.06
*E23-50K	\$2.06
E23-90N	\$1.74
E23-00P	\$2.61
*E23-50P	\$2.61
E23-50PL	\$2.61

Precious Metal Adders Table K

### E23-SERIES MINIATURE LIGHT FORCE

*E23-00AX	\$1.80
E23-00HX	\$2.04
*E23-50HX	\$2.04
*E23-55HX	\$2.04
E23-75HX	\$2.04
*E23-85HX	\$2.04
E23-50NX	\$2.02
E23-00KX	\$2.34
*E23-75KX	\$2.34
E23-90NX	\$2.02
E23-50PX	\$2.88
E23-75PX	\$2.88

Precious Metal Adders Table K

### E33-SERIES MINIATURE STANDARD FORCE

*E33-00A	\$1.53
*E33-00H	\$1.77
*E33-50H	\$1.77
E33-50HL	\$1.74
E33-50N	\$1.74
*E33-00K	\$2.06
*E33-50K	\$2.06
E33-90N	\$1.74
E33-00P	\$2.61
*E33-50P	\$2.61
E33-50PL	\$2.61

Precious Metal Adders Table K

### E33-SERIES MINIATURE LIGHT FORCE

*E33-00AX	\$1.80
E33-00HX	\$2.04
*E33-50HX	\$2.04
*E33-55HX	\$2.04
*E33-75HX	\$2.04
*E33-85HX	\$2.04
E33-50NX	\$2.02
E33-00KX	\$2.34
*E33-75KX	\$2.34
E33-90NX	\$2.02
E33-50PX	\$2.88
E33-75PX	\$2.88

Precious Metal Adders Table K

### E34-SERIES MINIATURE STANDARD FORCE

*E34-00A	\$1.53
*E34-00H	\$1.77
*E34-50H	\$1.77
E34-50HL	\$1.74
E34-50N	\$1.74
*E34-00K	\$2.06
*E34-50K	\$2.06
*E34-90N	\$1.74
E34-00P	\$2.61
*E34-50P	\$2.61
E34-50PL	\$2.61

Precious Metal Adders Table K

### E34-SERIES MINIATURE LIGHT FORCE

*E34-00AX	\$1.80
E34-00HX	\$2.04
*E34-50HX	\$2.04
*E34-55HX	\$2.04
*E34-75HX	\$2.04
*E34-85HX	\$2.04
E34-50NX	\$2.02
E34-00KX	\$2.34
*E34-75KX	\$2.34
E34-90NX	\$2.02
E34-50PX	\$2.88
E34-75PX	\$2.88

Precious Metal Adders Table K



ESTIMATE OF LABOR HOURS TO  
COMPLETE HAVERHILL SOLAR ENERGY SYSTEM CHANGES

	<u>Engineer- Supervisor Man-Hours</u>	<u>Technician Man-Hours</u>
Quality control measures for new flex hose design	16	
Review of certification of new flex hose materials	4	
In-process acceptance inspection of new flex hose	24	
Remove pylon covers		24
Mount new limit switches	2	40
Wire new limit switches	2	24
Reinstall pylon covers		24
Solar system draindown		32
Remove old flex hoses		64
Dispose of old flex hoses		24
Install new flex hoses		96
In-process inspection of flex hose installation procedure	32	
Refill solar collector loop		24
Bleed and purge solar collector loop and set-up nitrogen blanket		8
Total	80	360

TABLE 1

HAVERHILL SOLAR ENERGY PROJECT  
 PHASE III COLUMBIA TRAVEL  
 SUPPLEMENTARY INFORMATION

<u>Person</u>	<u>Number of Trips</u>	<u>From</u>	<u>To</u>	<u>Days Each Trip</u>	<u>Transportation</u>	<u>Per Diem</u>
G. H. Kerr	5	Columbus, OH	Haverhill, OH	3	338 (1)	750
R. P. Colburn	5	Columbus, OH	Haverhill, OH	3	(2)	750
L. E. Herchline	5	Columbus, OH	Haverhill, OH	3	(2)	750
J. P. Dechow	5	Columbus, OH	Haverhill, OH	2	338	500
J. P. Dechow	2	Columbus, OH	Dallas, TX	1.5	1080	300

- (1) Columbus, Ohio to Haverhill, Ohio, 125 miles one-way, 250 miles round trip @ 25¢/mile
- (2) Will ride in same truck with G. H. Kerr

TABLE 2