



26-Sept-66

BENDIX SYSTEMS DIVISION ANN ARBOR, MICH., NO.

Experiment Electrical
Interface Definitions

ATM-483

REV. NO.

C

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This ATM defines the electrical interfaces, both internal and external, for each experiment. The Integration and Control Section of the Experiments Group will update the ATM by using amendments on a weekly basis, thereby confirming any hand carried information given by the Group. Experiment data used by other groups for design purposes should be verified by Integration and Control Section, who will ensure that the P.E. concerned is aware, and approves of the issues involved. Revision C is a complete re-issue of ATM-483, superseding the previous issue and revisions which should be destroyed.

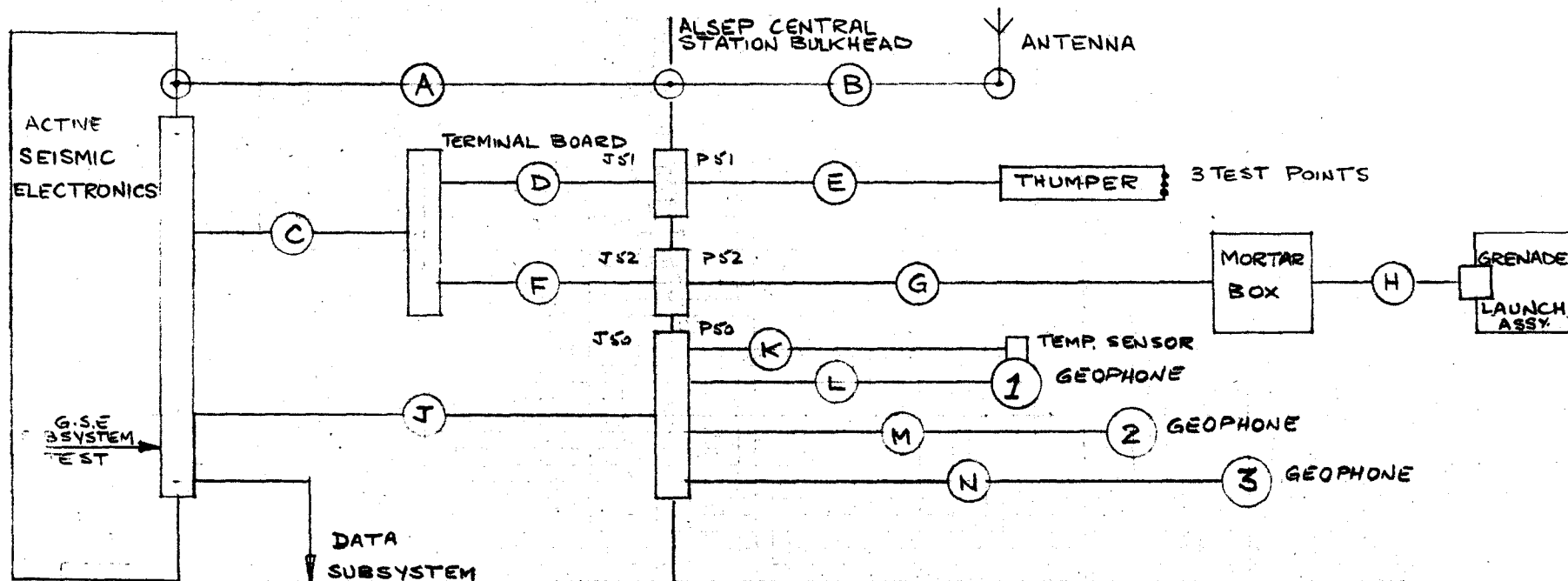
Prepared by: D Perkins

D. Perkins

Approved by: A B Collins

A. B. Collins

ACTIVE SEISMIC EXPERIMENT LINE DIAGRAM



ISSUE NUMBER									
DATE	9/2/66	9/26/66							
APPROVED	<i>[Signature]</i>	<i>[Signature]</i>							

ACTIVE SEISMIC EXPERIMENT CABLES

CABLE	MATING UNIT	CONNECTOR	CABLE TYPE	NUMBER OF WIRES	LENGTH	CONNECTOR	MATING UNIT
A	ACTIVE SEISMIC ELECTRONICS CONNECTOR	OSM 531/3 RIGHT ANGLE	COAXIAL RG188 A/U	1	3 FEET	OSM 636-3 FLANGE MOUNTING	ANTENNA CABLE CONNECTOR
B	CONNECTOR ON CENTRAL STATION	OSM 531/3	COAXIAL RG188 A/U	1	10 FEET		ANTENNA
C	ACTIVE SEISMIC ELECTRONICS CONNECTOR	WSW0088F 24 BNH01	24 AWG TEFLON COATED STRANDED WIRE MS18032-2409	22		HARDWIRE	TERMINAL BOARD
D	TERMINAL BOARD	HARDWIRE	MANGANIN 24 AWG	4	4 INCHES	2332144-4 Eng. Model only (J51)	CONNECTOR ON CABLE 'E' (P51)
E	CONNECTOR ON CENTRAL STATION (J51)	2332117-4 Eng. Model only (P51)	METHODE H FILM FLAT CONDUCTOR CABLE PD3004H	4	310 FEET	HARDWIRE	THUMPER
F	TERMINAL BOARD	HARDWIRE	MANGANIN 24 A.W.G	18	4 INCHES	2332144-1 Eng. Model only (J52)	CONNECTOR ON CABLE 'G' (P52)
G	CONNECTOR ON CENTRAL STATION (J52)	2332117-1 Eng. Model only (P52)	METHODE H FILM FLAT CONDUCTOR CABLE PD3020H	20	10 FEET	HARDWIRE	MORTAR BOX
H	MORTAR BOX	HARDWIRE		30		Amphenol 221-1160 With 220-802 30 pins plus end holes for fixing	GRENADE LAUNCHER ASSEMBLY
J	ACTIVE SEISMIC ELECTRONICS CONNECTOR	WSW0088F 24 BNH01	TWISTED PAIR ROUND WIRES, SHIELDED	11 & 4 SHIELDS		MD53-02E9-19S-N Eng. Model (J50)	CONNECTOR ON CABLES K, L, M, N. (P50)
K, L, M, N	CONNECTOR ON CENTRAL STATION (J50)	MD53-06E9-19P-N Eng. Model (P50)	TWISTED PAIR ROUND WIRE SHIELDED, RIBBON CABLE	2 PER CABLE & SHIELDS	K 10 FEET L 10 FEET M 160 FEET N 310 FEET	HARDWIRE	'K' TEMP SENSOR 'L', 'M', 'N' GEOPHONES



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BENDIX SYSTEMS DIVISION ANN ARBOR, MICH.

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Experiment Electrical
Interface Definitions

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Cable C Details

Active Seismic Experiment

Active Seismic Electronics

<u>Connector Pin</u>	<u>Terminal Board Pin</u>	<u>Function</u>
47	51-01	Thumper real time event
49	51-02	Electrical common
48	51-03	+29 volts supply
64	51-04	Thumper arm
10	52-01	+5v Telemetry
11	52-02	+24v arming
12	52-03	E-W Angle
13	52-04	+24v Sequential Arming
14	52-05	N-S Angle
15	52-06	Operational Power
16	52-07	GLA Temperature Sensor
17	52-08	Power/Signal Return
18	52-09	Range Start/Stop
35	52-10	+29v Heater Power
32	52-11	Fire Grenade #3
28	52-12	Fire Grenade #1
29	52-13	+5volts
30	52-14	Fire Grenade #2
31	52-15	Chassis Return
34	52-16	Fire Grenade #4
33	52-17	Mortar Box Temperature Sensor
36	52-18	Sequential Fire

Subsystem GSE Connector

Pins 54 through 62 and 71 through 78

Pin 78 carries the frame sync pulse



Active Seismic Experiment

Cable D Details

Connector Pins (J51)	Function	Terminal Board Pin
1	Thumper real time event	51-01
2	Electrical Common	51-02
3	+29 volts Supply	51-03
4	Thumper Arm	51-04

Cable E Details

Connector Pins (P51)	Function
1	Thumper Real Time Event
2	Electrical Common
3	+29 Volts Supply
4	Thumper Arm

Experiment Electrical Interface
Definitions

Active Seismic Experiment

Cable F

Connector J52	Terminal Board Pins	Functions
1	52-01	+ 5v Telemetry
2	52-02	+ 24v Arming
3	52-03	E-W Angle
4	52-04	+24v Sequential Arming
5	52-05	N-S Angle
6	52-06	Operational Power
7	52-07	G. L. A. Temperature Sensor
8	52-08	Power/Signal Return
9	52-09	Range Start/Stop
10	52-10	+ 29v Heater Power
11	52-11	Fire Grenade #3
12		Connected to pin 8 (J52)
13	52-12	Fire Grenade #1
14	52-13	+ 5 volts
15	52-14	Fire Grenade #2
16	52-15	Chassis Return
17	52-16	Fire Grenade #4
18	52-17	Mortar Box Temperature Sensor
19		Connected to pin 10 (J52)
20	52-18	Sequential Fire

Experiment Electrical Interface
Definitions

Active Seismic Experiment

Cable G Details

Connector Pin (P52)	Function
1	+5v Telemetry
2	+24v Arming STD
3	E-W Angle
4	24v Arming (SEQ)
5	N-S Angle
6	Operational Power
7	Grenade Launcher Assembly Temperature Sensor
8	Power/Signal Return
9	Range Start Stop
10	29v Survival Power
11	Fire Grenade #3
12	Power/Signal Return
13	Fire Grenade #1
14	Range Line Power +5v
15	Fire Grenade #2
16	Chassis Return
17	Fire Grenade #4
18	Mortar Box Temperature Sensor
19	29v Survival Power
20	Sequential Fire

Experiment Electrical
Interface Definitions

Active Seismic Experiment

Cable H Details

G. L. A. Connector Pin

Functions

1	Fire Grenade #1
2	Range Start #1
3	Arm #1, 2, 3, 4
4	Range Stop #1
5	Range Start #2
6	Spare
7	Range Stop #2
8	Fire Grenade #2
9	Chassis Common
10	+ 5v Telemetry
11	+ 5v Transducer Power
12	Heater Control Temperature Sensor
13	+29 v Heater Power
14	N-S Angle
15	+ 29 v Sensor Power
16	E-W Angle
17	+ 5v Range Line Power
18	Heater Control Temperature Sensor
19	Grenade Launcher Temperature
20	Heater Status G. S. E.
21	Range Stop #3
22	Electrical Common
23	Fire #3
24	Range Start #3
25	Spare
26	Spare
27	Range Stop #4
28	Spare
29	Range Start #4
30	Fire Grenade #4

Experiment Electrical Interface
Definitions

Active Seismic Experiment

Cable J Details

<u>Central Station Connector Pin</u>	<u>Seismic Electronic Connector Pin</u>	<u>Function</u>
1	70	Geophone 3 Signal "A"
2	88	Geophone 3 Signal "B"
3	87	Shield
4	68	Geophone 2 Signal "A"
5	86	Geophone 2 Signal "B"
6	69	Shield
7	85	Geophone 1 Signal "A"
8	66	Geophone 1 Signal "B"
9	67	Shield
10	83	Geophone Temperature
11	65	Geophone Temp. Sensor Return
12	84	Shield
13	52	Output Number 1 G.S.E.
14	51	Output Number 2 only
15	50	Output Number 3
16, 17, 18, 19		Spare

Cable K, L, M, N Details

<u>Central Station Connector Pin</u>	<u>Function</u>	<u>Cable</u>
1	Geophone 3 Signal "A"	K
2	Geophone 3 Signal "B"	K
3	Shield	K
4	Geophone 2 Signal "A"	L
5	Geophone 2 Signal "B"	L
6	Shield	L
7	Geophone 1 Signal "A"	M
8	Geophone 1 Signal "B"	M
9	Shield	M
10	Geophone Temperature Sensor	F
11	Temperature Sensor Ground	F
12	Shield	F
13		
14		
15		
16		
17		
18		
19		

Experiment Electrical
Interface Definitions

Active Seismic Electronics Connections to Data Subsystem

<u>Connector Pin</u>	<u>Function</u>
1	Experiment Data
2	RTG O/P voltage
3	Set Engineering Data mode
4	RTG O/P Current
5	Set Seismic Data Mode
6	RTG Temperature #1 hot
7	Geophone Calibrate
8	RTG Temperature #1 cold
9	Geophone Sequence
19	Central Electronics Temperature
20	Arm Grenades
21	Mortar Box Temperature
22	Fire Grenade #1
23	GLA Temperature
24	Fire Grenade #2
25	Geophone Temperature
26	Fire Grenade #3
27	Shunt Regulator Current
37	10.6 kc clock
38	+29v Survival Power
39	Fire Grenade #4
40	+29v Operational Power
41	Sequential Fire
42	+15 volts
43	+5 volts
44	-12 volts
45	Spare
46	Spare
53	Power/Signal Return
61	Spare
62	Spare
63	Spare
79	Spare
80	Spare
81	Spare
82	Spare

Experiment Electrical
Interface Definitions

Active Seismic Experiment Jumper Cables

Mortar Box to Central Station (2 interconnecting cables)

<u>Connectors (P52A, J52A)</u>	<u>Connectors (P52B, J52B)</u>	<u>Function</u>
1	f	+5v Telemetry
2	g	+24v Arming STD
3	h	E-W Angle
4	j	+24v Arming (SEQ)
5	a	N-S Angle
6	b	Operational Power
7	c	Grenade Launcher Assembly
		Temperature Sensor
8	d	Power/Signal Return
9	e	Range Start/Stop
10	U	29v Survival Power
11	V	Fire Grenade #3
12	W	Power/Signal Return
13	X	Fire Grenade #1
14	Y	Range Line Power +5v
15	Z	Fire Grenade #2
16	A	Chassis Common
17	B	Fire Grenade #4
18	C	Mortar Box Temp. Sensor
19	D	29v Survival Power
20	E	Sequential Fire

Thumper to Central Station (2 interconnecting cables)

<u>Connector (P51A, J51A)</u>	<u>Connector (P51B, J51B)</u>	<u>Function</u>
1	K	Thumper Real Time Event
2	J	Electrical Common
3	A	+29v Supply
4	B	Thumper Arm

Thumper Test Points to Simulator 1 Cable

<u>Test Point (P57B)</u>	<u>Connector (J57B)</u>	<u>Function</u>
1	A	Capacitor Volts Test
2	B	A.S.1 Test
3	C	Power Signal Return

Experiment Electrical
Interface Definitions

Active Seismic Experiment Jumper Cables

Geophone to Central Station (2 interconnecting cables)

<u>Connectors (P50A, J50A)</u>	<u>Connectors (J50B, P50C)</u>	<u>Function</u>
1	A	Geophone 3 'A'
2	B	Geophone 3 'B'
3	F	Shield
4	C	Geophone 2 'A'
5	D	Geophone 2 'B'
6	G	Shield
7	E	Geophone 1 'A'
8	S	Geophone 1 'B'
9	R	Shield
10	M	Geophone Temp. Sensor
11	L	Geophone Temperature Sensor Return
12	P	Shield
13	K	O/P #1
14	H	O/P #2
15	J	O/P #3
16	V	Spare
17	U	Spare
18	N	Spare
19	T	Spare

Experiment Electrical
Interface Definitions

Active Seismic Jumper Cables

Grenade Launcher Assembly to Simulator (2 interconnecting cables)

<u>Connectors (J56A, P56A)</u>	<u>Connectors (P56B, J56C)</u>	<u>Function</u>
1	A	Fire Grenade #1
2	B	Range Start #1
3	AA	Arm #1, 2, 3, 4
4	BB	Range Stop #1
5	D	Range Start #2
6	DD	Spare
7	CC	Range Stop #2
8	C	Fire Grenade #2
9	FF	Chassis Common
10	EE	+5v Telemetry
11	GG	+5v Transducer Power
12	HH	Heater Control Temp. Sensor
13	W	+29v Heater Power
14	X	N-S Angle
15	Y	+29v Sensor Power
16	Z	E-W Angle
17	J	+5v Range Line Power
18	K	Heater Control Temp. Sensor
19	L	Grenade Launch Temp.
20	M	Heater Status G. S. E.
21	N	Range Stop #3
22	P	Electrical Common
23	E	Fire #3
24	F	Range Start #3
25	R	Spare
26	S	Spare
27	T	Range Stop #4
28	U	Spare
29	H	Range Start #4
30	G	Fire Grenade #4

Experiment Electrical
Interface Definitions

Active Seismic Sub-System Test Jumper Cable

This cable set is required to connect the Active Seismic electronics to the mortar, thumper, geophones and subsystem test set during subsystem tests. The cable will mate with the jumper cable on each item.

<u>Connector to Central Electronics (P10D)</u>	<u>Connector Number</u>	<u>Pin</u>	<u>Function</u>
1	ETS	DD	Experiment Data
2	ETS	u	RTG O/P Volts
3	ETS	m	Set Engineering Data Mode
4	ETS	v	RTG O/P Current
5	ETS	k	Set Seismic Data Mode
6	ETS	w	RTG Temp. #1 Hot
7	ETS	c	Geophone Calibrate
8	ETS	x	RTG Temp. #1 Cold
9	ETS	a	Geophone Sequence
10	J52D	f	+5v Telemetry
11	J52D	g	+24v Arming
12	J52D	h	E-W Angle
13	J52D	j	+24v Sequential Arming
14	J52D	a	N-S Angle
15	J52D	b	Operational Power
16	J52D	c	GLA Temp. Sensor
17	J52D	d & W	Power Signal Return
18	J52D	e	Range Start/Stop
19	ETS	r	Central Electronics Temperature
20	ETS	b	Arm Grenades
21	ETS	s	Mortar Box Temperature
22	ETS	W	Fire Grenade #1
23	ETS	t	GLA Temperature
24	ETS	X	Fire Grenade #2
25	ETS	q	Geophone Temperature
26	ETS	Y	Fire Grenade #3
27	ETS	y	Shunt Regulator Current
28	J52D	X	Fire Grenade #1
29	J52D	Y	+5 volts
30	J52D	Z	Fire Grenade #2
31	J52D	A	Chassis Return
32	J52D	V	Fire Grenade #3

Experiment Electrical
Interface Definitions

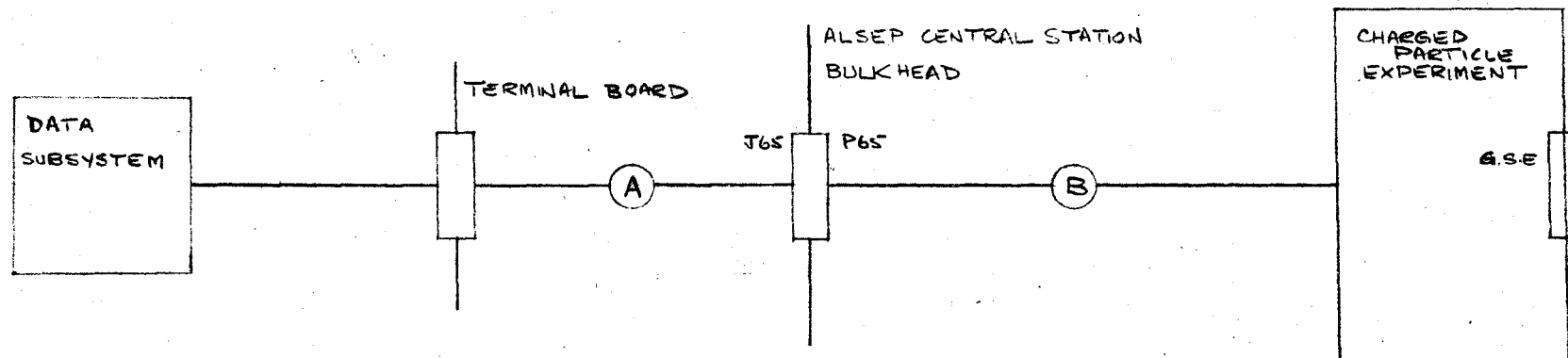
Active Seismic Subsystem Test Jumper Cable (continued)

Connector Connector P10D	Connector Number	Pin	Function
33	J52D	C	Mortar Box Temperature Sensor
34	J52D	B	Fire Grenade #4
35	J52D	U & D	+29v Heater Power
36	J52D	E	Sequential Fire
37	ETS	FF	10.6 Kc Clock
38	ETS	i	+29v Survival Power
39	ETS	Z	Fire Grenade #4
40	ETS	h	+29v Operational Power
41	ETS	n	Sequential Fire
42	ETS	f	+15 Volts
43	ETS	g	+5 Volts
44	ETS	j	-12 Volts
45	ETS	GG	Spare
46	ETS	BB	Spare
47	J51D	K	Thumper Real Time Event
48	J51D	A	+29 Volts Supply
49	J51D	J	Electrical Common
50	J50D	J	Output #3
51	J50D	H	Output #2
52	J50D	K	Output #1
53	ETS	d	Power/Signal Return
54	ETS	V	G. S. E.
55	ETS	A	G. S. E.
56	ETS	B	G. S. E.
57	ETS	C	G. S. E.
58	ETS	D	G. S. E.
59	ETS	E	G. S. E.
60	ETS	F	G. S. E.
61	ETS	CC	Spare
62	ETS	AA	Spare
63	ETS	p	Spare
64	J51D	B	Thumper Arm
65	J50D	L	Geophone Temperature Sensor Return
66	J50D	S	Geophone #1 'B'
67	J50D	R	Geophone #1 Shield
68	J50D	C	Geophone #2 'A'
69	J50D	G	Geophone #2 Shield
70	J50D	A	Geophone #3 'A'
71		H	G. S. E.

Experiment Electrical
Interface Definitions

<u>Connector P10D</u>	<u>Connector</u>		<u>Function</u>
	<u>Number</u>	<u>Pin</u>	
72	ETS	J	G. S. E.
73	ETS	K	G. S. E.
74	ETS	L	G. S. E.
75	ETS	M	G. S. E.
76	ETS	N	G. S. E.
77	ETS	P	G. S. E.
78	ETS	R	G. S. E.
79	ETS	EE	Spare
80	ETS	S	Spare
81	ETS	T	Spare
82	ETS	U	Spare
83	J50D	M	Geophone Temperature
84	J50D	P	Geophone Temperature Shield
85	J50D	E	Geophone #1 'A'
86	J50D	D	Geophone #2 'B'
87	J50D	F	Geophone #3 Shield
88	J50D	B	Geophone #3 'B'

CHARGED PARTICLE EXPERIMENT LINE DIAGRAM



CABLE	MATING UNIT	CONNECTOR	CABLE TYPE	NUMBER OF WIRES	LENGTH	CONNECTOR	MATING UNIT
A	TERMINAL BOARD	HARDWIRE	MANGANIN 24 AWG UNLESS SHOWN OTHERWISE COPPER WIRES	24		J65	CONNECTOR ON CABLE 'B' (P65)
B (W65)	CONNECTOR ON CENTRAL STATION J65	(P65)	METHODE H FILM FLAT CONDUCTOR CABLE PD3038H	37	10 FEET	HARDWIRE	EXPERIMENT

G.S.E. CONNECTOR:

ISSUE NUMBER	1								
DATE									
APPROVED	J. S. A. Robinson								

Experiment Electrical Interface
Definitions

Charged Particle Experiment

Cable A Details

<u>Connector Pin (J65)</u>	<u>Wire and Gauge</u>	<u>Terminal Board Pin</u>	<u>Function (J65)</u>
1	Manganin 24	TB65-01	Shield
2	Manganin 24	TB65-02	Data Line
3			Connected to Pin 1
4	Manganin 24	TB65-03	Shift Pulse
5			Connected to Pin 1
6	Manganin 24	TB65-04	Even Frame Mark
7			Connected to Pin 1
8	Manganin 24	TB65-05	Case Return
9	Manganin 24	TB65-06	Demand Line
10	Copper	TB65-07	Signal Return
11	Manganin 24	TB65-08	Command #1
12	Manganin 24	TB65-09	Command #2
13	Manganin 24	TB65-10	Command #3
14	Manganin 24	TB65-11	Command #4
15	Manganin 24	TB65-12	Command #5
16	Manganin 24	TB65-13	Command #6
17	Manganin 24	TB65-14	Command #7
18	Manganin 24	TB65-15	Command #8
19	Copper	TB65-16	Analog #1
20	Copper	TB65-17	Analog #2
21	Copper	TB65-18	Analog #3
22	Copper	TB65-19	Analog #4
23	Copper	TB65-20	Analog #5
24	Copper	TB65-21	Analog #6
25			Connected to Pin 1
26	Manganin 24	TB65-22	Operating & Heater Power
27			Connected to 26
28			Connected to 26
29			Connected to 26
30	Manganin 24	TB65-23	Power Return
31			Connected to Pin 30
32			Connected to Pin 30
33			Connected to Pin 30
34	Manganin 24	TB65-24	Survival Heater
35			Connected to 34
36			Connected to 34
37			Connected to 34



Charged Particle Experiment

Cable B Details

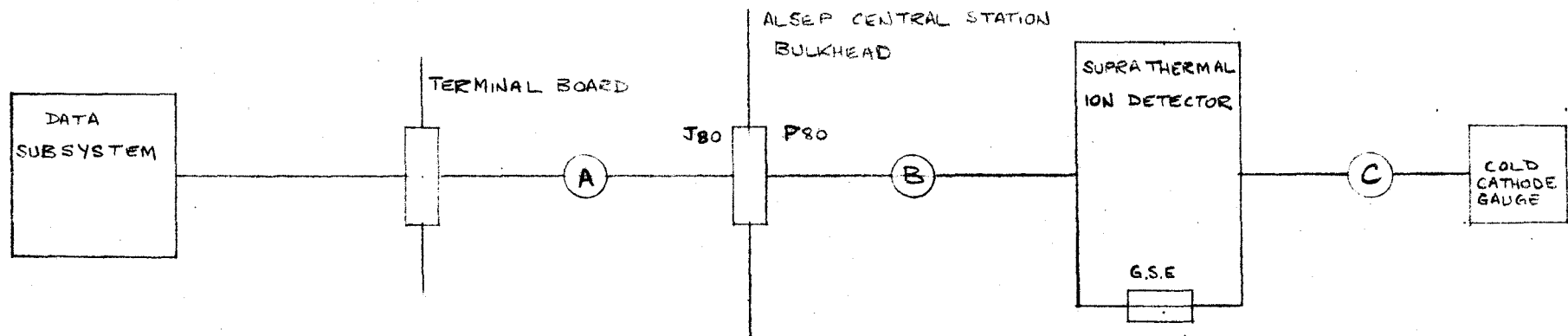
Connector pin (P65)	Function
1	Shield
2	Data Line
3	Shield
4	Shift Pulse
5	Shield
6	Even Frame Mark
7	Shield
8	Case Return
9	Demand Line
10	Signal Return
11	Command #1 Thermal control bypass ON
12	Command #2 Thermal control bypass OFF
13	Command #3 Dust cover removal
14	Command #4 Automatic voltage level sequencer ON
15	Command #5 Step voltage level
16	Command #6 Automatic voltage sequencer OFF
17	Command #7 Channeltron P.S. voltage increase ON
18	Command #8 Channeltron P.S. voltage increase OFF
19	Housekeeping #1 Switchable power supply voltage
20	Housekeeping #2 Channeltron P.S. #1 voltage
21	Housekeeping #3 Channeltron P.S. #2 voltage
22	Housekeeping #4 DC-DC converter voltage
23	Housekeeping #5 Temperature #1
24	Housekeeping #6 Temperature #2
25	Spare
26	Operating and Heater Power
27	Operating and Heater Power
28	Operating and Heater Power
29	Operating and Heater Power
30	Power Return
31	Power Return
32	Power Return
33	Power Return
34	Survival Heater Power
35	Survival Heater Power
36	Survival Heater Power
37	Survival Heater Power

Experiment Electrical
Interface Definitions

Charged Particle Experiment Jumper Cables

<u>Connectors (J65A, P65A)</u>	<u>Connectors (P65B, J65B)</u>	<u>Function</u>
1	j	Shield Wire 2
2	V	Data Line
3	s	Shield Wire 4
4	U	Shift Pulse
5	i	Shield Wire 6
6	T	Even Frame Mark
7	t	Shield Wire 9
8	S	Shield Wires 11 to 18
9	h	Demand Line
10	r	Signal Return
11	R	Command
12	g	Command
13	q	Command
14	P	Command
15	f	Command
16	e	Command
17	N	Command
18	M	Command
19	L	Analog Signal
20	K	Analog Signal
21	J	Analog Signal
22	d	Analog Signal
23	c	Analog Signal
24	H	Analog Signal
25	p	Spare
26	b	Operating and Heater Power
27	G	Operating and Heater Power
28	n	Operating and Heater Power
29	a	Operating and Heater Power
30	F	Power Return
31	m	Power Return
32	k	Power Return
33	Z	Power Return
34	E	Survival Heater Power
35	Y	Survival Heater Power
36	X	Survival Heater Power
37	D	Survival Heater Power

SUPRATHERMAL ION DETECTOR EXPERIMENT LINE DIAGRAM



CABLE	MATING UNIT	CONNECTOR	CABLE TYPE	NUMBER OF WIRES	LENGTH	CONNECTOR	MATING UNIT
A	TERMINAL BOARD	HARDWIRE	MANGANIN WIRES 24 AWG UNLESS OTHERWISE STATED	16		J 80	CONNECTOR ON CABLE 'B' P80
B (W80)	CONNECTOR ON CENTRAL STATION	P80	METHODE H FILM FLAT CONDUCTOR CABLE PD 3038 H	38	60 FEET	HARDWIRE	EXPERIMENT
C	S.I.D.E	HARDWIRE		7	4 FEET	HARDWIRE	COLD CATHODE GAUGE

G.S.E CONNECTOR

ISSUE NUMBER	DATE								
APPROVED	<i>Rm mager</i> 7/2/66	<i>Rm mager</i> 9/26/66							



Suprathermal Ion Detector

Cable A Details

Terminal Board Pin	Connector Pin (J80)	Pin Function
TB80-01	1	Shield
TB80-02	2	Digital data
	3	Connected to pin 1
TB80-03	4	Shift Pulse
	5	Connected to pin 1
TB80-04	6	Frame Mark
	7	Connected to pin 1
TB80-05	8	Even Frame Mark
	9	Connected to pin 1
TB80-06	10	Data Demand
TB80-07	11	Signal Return
TB80-08	12	Command
TB80-09	13	Command
TB80-10	14	Command
TB80-11	15	Command
TB80-12	16	Command
	17	Connected to pin 1
TB80-13	18	Low energy detector count rate
TB80-14	19	High Energy detector count rate
TB80-15	20	Operating Power
TB80-16	21	Power Return
	22	Connected to pin 20
	23	Connected to pin 21
	24	Connected to pin 20
	25	Connected to pin 21
	26	Connected to pin 20
	27	Connected to pin 21
	28	Connected to pin 20
	29	Connected to pin 21
	30	Connected to pin 20
	31	Connected to pin 21
TB80-17	32	Survival Heater Power
TB80-18	33	Survival Heater Power Return
	34	Connected to pin 32
	35	Connected to pin 33
	36	Connected to pin 32
	37	Connected to pin 33

Experiment Electrical Interface
Definitions

Suprathermal Ion Detector Experiment

Cable B Details (W 80)

Connector Pin (P80)

Function

1	Shield
2	Digital Data
3	Shield
4	Shift Pulse
5	Shield
6	Frame Mark
7	Shield
8	Even Frame Mark
9	Shield
10	Data Demand
11	Signal Return
12	Command
13	Command
14	Command
15	Command
16	Command
17	Spare
18	Low Energy Detector Count Rate
19	High Energy Detector Count Rate
20	Operating Power
21	Power Return
22	Operating Power
23	Power Return
24	Operating Power
25	Power Return
26	Operating Power
27	Power Return
28	Operating Power
29	Power Return
30	Operating Power
31	Power Return
32	Survival Power
33	Survival Power Return
34	Survival Power
35	Survival Power Return
36	Survival Power
37	Survival Power Return

$$\frac{1.88 \Omega / \text{FT} (@ 20^\circ \text{C}) \times 60}{6} = 1.88 \Omega \text{ OPERATE} + 1.88 \Omega \text{ RETURN} = 3.76 \Omega$$

6 ϕ FT.

- 3 SURVIVAL POWER LINES
- 3 SURVIVAL POWER RETURN LINES
- 6 OPERATE POWER LINES
- 6 OPERATE POWER RETURN LINES



Suprathermal Ion Detector Experiment

Cable C Details

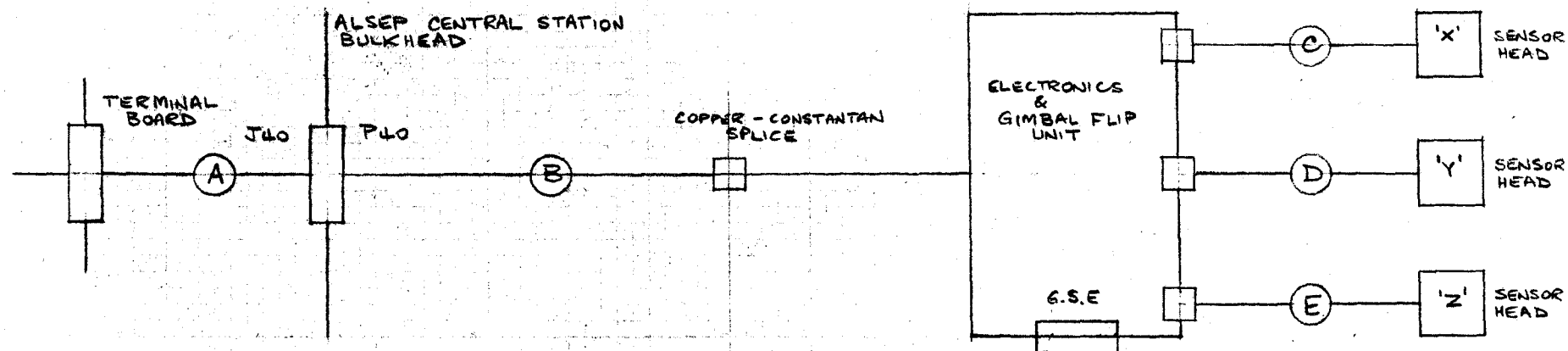
Wire No.

1	Anode Volts
2	Signal
3	Shield and Power Return
4	Fuze Supply Positive
5	Fuze Supply Negative
6	Temperature Sensor 1
7	Temperature Sensor 2

Suprathermal Ion Experiment Jumper Cables

Connector (J80A, P80A)	Connector (P80B, J80B)	Function
1	W	Shield Wire 2
2	V	Digital Data
3	j	Shield Wire 4
4	U	Shift Pulse
5	i	Shield Wire 6
6	T	Frame Mark
7	s	Shield Wire 8
8	h	Even Frame Mark
9	R	Shield Wire 10 & 12-16
10	S	Data Demand
11	r	Signal Return
12	g	Command
13	q	Command
14	P	Command
15	f	Command
16	e	Command
17	N	Spare
18	M	Low Energy Detector Count Rate
19	L	High Energy Detector Count Rate
20	K	Operating Power
21	J	Power Return
22	d	Operating Power
23	c	Power Return
24	H	Operating Power
25	p	Power Return
26	b	Operating Power
27	G	Power Return
28	t	Operating Power
29	n	Power Return
30	a	Operating Power
31	F	Power Return
32	m	Survival Power
33	Z	Survival Return
34	E	Survival Power
35	Y	Survival Return
36	X	Survival Power
37	D	Survival Return

LUNAR SURFACE MAGNETOMETER LINE DIAGRAM



CABLE	MATING UNIT	CONNECTOR	CABLE TYPE	NUMBER OF WIRES	LENGTH	CONNECTOR	MATING UNIT
A	TERMINAL BOARD	HARDWIRE	MANGANIN WIRES 24 AWG UNLESS OTHERWISE STATED	17		J40	CONNECTOR ON CABLE 'B' P40
B (W40)	CONNECTOR ON CENTRAL STATION J40	P40	METHODE H FILM FLAT CONDUCTOR CABLE PD3030H SPLICED TO FIVE INCHES OF 32 AWG CONSTANTAN RIBBON CABLE AT E.G.F.U. END	27	50 FEET	HARDWIRE	ELECTRONIC GIMBAL FLIP UNIT
C, D, E	E.G. F.U.	CABLE 'C' CABLE 'D' CABLE 'E'	TWISTED SHIELDED PAIRS COAX	21 PER SENSOR	3 FEET	HARDWIRE	SENSOR HEAD

G.S.E CONNECTOR

ISSUE NUMBER	1	2							
DATE									
APPROVED	E. J. Parker 7/2/66	E. J. Parker 7/26/66							



Lunar Surface Magnetometer Experiment

Cable A Details Terminal Board Pin	Connector Pin (J40)	Pin Function
TB40-01	1	Shield
TB40-02	2	Data
	3	Connected to pin 1
TB40-03	4	Frame Mark
	5	Connected to pin 1
TB40-04	6	Shift Pulse
	7	Connected to pin 1
TB40-05	8	Demand Pulse
	9	Connected to pin 1
TB40-06	10	Command 1
TB40-07	11	Command 2
TB40-08	12	Command 3
TB40-09	13	Command 4
TB40-10	14	Command 5
TB40-11	15	Command 6
TB40-12	16	Command 7
TB40-13	17	Command 8
TB40-14	18	Connected to Pin 1
TB40-15	19	Connected to Pin 1
TB40-16	20	Power Return
TB40-17	21	Operating Power
	22	Connected to pin 20
	23	Connected to pin 21
	24	Connected to pin 20
	25	Connected to pin 21
	26	Connected to pin 20
	27	Connected to pin 21



Lunar Surface Magnetometer Experiment

Cable B Details

Connector Pin P40Function

1	Shield
2	Data
3	Shield
4	Frame Mark
5	Shield
6	Shift Pulse
7	Shield
8	Demand Pulse
9	Shield
10	Command 1 Range Select
11	Command 2 Steady Field Offset
12	Command 3 Steady Field Hold
13	Command 4 Flip Calibrate Inhibit
14	Command 5 Flip Calibrate Initiate
15	Command 6 Filter Failure Bypass
16	Command 7 Site Survey
17	Command 8 Thermal Control Select
18	Data Return
19	Chassis Return
20	Power Return
21	Operating Power
22	Power Return
23	Operating Power
24	Power Return
25	Operating Power
26	Power Return
27	Operating Power



Lunar Surface Magnetometer

Cable C, D, E Details

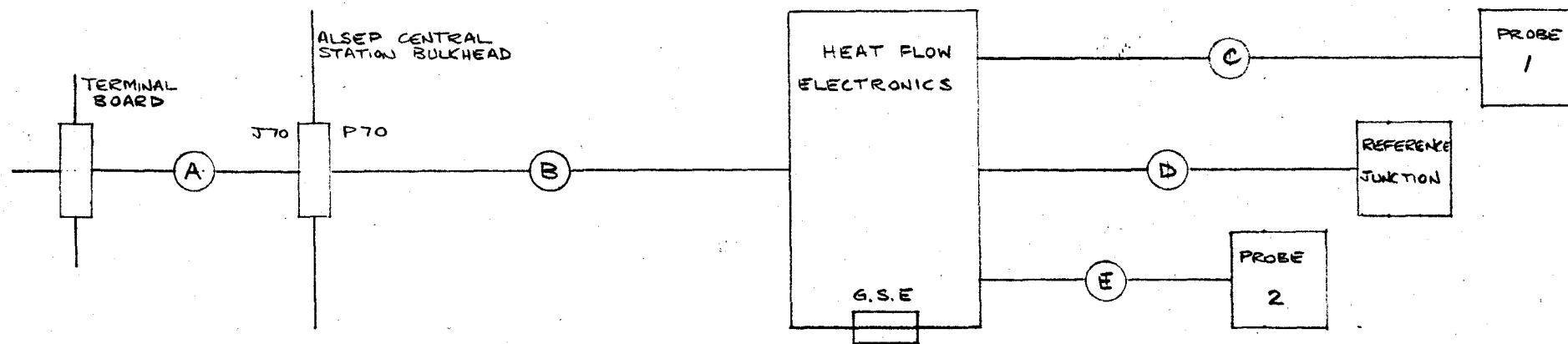
<u>Connector Pin</u>	<u>Wire Type & Gauge</u>	<u>Function</u>
1	Twisted shielded pair, 32	Sensor Excitation High
2		Sensor Excitation Return
3		Sensor Excitation Shield
4	Coax, 32	Sensor Output High
5		Sensor Output Return
6	Coax, 32	Sensor Feedback, High
7		Sensor Feedback, Return
8	Twisted shielded pair, 30	Temperature Detector, High
9		Temperature Detector Return
10		Temperature Detector Shield
11	Coax, 30	X ₁ Position Detector
		Capacitor, High
12		X ₁ position Detector
		Capacitor, Return
13	Coax, 30	X ₂ Position Detector
		Capacitor High
14		X ₂ Position Detector
		Capacitor Return
15	Coax, 30	X ₃ Position Detector
		Capacitor High
16		X ₃ Position Detector
		Capacitor Return
17	Coax, 30	Sensor Capacitor High
18		Sensor Capacitor Return
19	Twisted Pair, 30	Heater Connection, High
20		Heater Connection, Return
21	Single Conductor, 30	Case Ground



Magnetometer Experiment Jumper Cables

Connectors (J40A, P40A)	Connector (P40B, J40B)	Function
1	e	Shield Wire 2
2	S	Digital Data
3	d	Shield Wire 4
4	R	Frame Mark
5	j	Shield Wire 6
6	P	Shift Pulse
7	c	Shield Wire 8
8	N	Demand
9	h	Shield Wire 10-17
10	M	Command
11	L	Command
12	b	Command
13	K	Command
14	a	Command
15	J	Command
16	Z	Command
17	H	Command
18	Y	Signal Return
19	G	Chassis Return
20	F	Power Return
21	X	Operating Power
22	E	Power Return
23	g	Operating Power
24	f	Power Return
25	W	Operating Power
26	D	Power Return
27	V	Operating Power

HEAT FLOW EXPERIMENT LINE DIAGRAM



CABLE	MATING UNIT	CONNECTOR	CABLE TYPE	NUMBER OF WIRES	LENGTH	CONNECTOR	MATING UNIT
A	TERMINAL BOARD	HARDWIRE	COPPER AND MANGANIN WIRES	31		(J70)	CONNECTOR ON CABLE 'B'
B (W70)	CONNECTOR ON CENTRAL STATION (J70)	(P70)	METHODE N FILM FLAT CONDUCTOR CABLE	47	30 FEET	HARDWIRE	HEAT FLOW ELECTRONICS
C, E	HEAT FLOW ELECTRONICS	HARDWIRE	SHIELDED	34 EACH CABLE	30 FEET	HARDWIRE	'C' PROBE 1 'E' PROBE 2
D	HEAT FLOW ELECTRONICS	HARDWIRE				HARDWIRE	REFERENCE JUNCTION

G.S.E CONNECTOR 4 WAY.

ISSUE NUMBER	1								
DATE	25 May 66	26 Sep 66							
APPROVED	<i>ME</i> HIF ₁	<i>ME</i> HIF ₁							

Experiment Electrical
Interface Definitions

Heat Flow, Cable A Details,

<u>Connector (J70)</u>	<u>Function</u>	<u>Wire Type and A. W. G.</u>	<u>Terminal Board Pin</u>
1	Analog	Copper	70-01
2	Analog	Copper	70-02
3	Analog	Copper	70-03
4	Analog	Copper	70-04
5	Analog	Copper	70-05
6	Analog	Copper	70-06
7	Analog	Copper	70-07
8	Shield	Manganin	70-08
9	Data	Manganin	70-09
10	Connected to Pin 8		
11	Shift Pulse	Manganin	70-10
12	Connected to Pin 8		
13	Demand Line	Manganin	70-11
14	Connected to Pin 8		
15	Frame Mark	Manganin	70-12
16	Connected to Pin 8		
17	90 Frame Mark	Manganin	70-13
18	Signal Return	Copper	70-14
19	Connected to Pin 8		
20	Command 1	Manganin	70-15
21	Command 2	Manganin	70-16
22	Command 3	Manganin	70-17
23	Command 4	Manganin	70-18
24	Command 5	Manganin	70-19
25	Command 6	Manganin	70-20
26	Command 7	Manganin	70-21
27	Command 8	Manganin	70-22
28	Command 9	Manganin	70-23
29	Command 10	Manganin	70-24
30	Command 11	Manganin	70-25

Experiment Electrical
Interface Definitions

Heat Flow, Cable A Details, (continued)

<u>Connector (J70)</u>	<u>Function</u>	<u>Wire Type and A. W. G.</u>	<u>Terminal Board Pin</u>
31	Command Spare	Manganin	70-26
32	Command Spare	Manganin	70-27
33	Command Spare	Manganin	70-28
34	Power Return	Manganin	70-29
35	Power	Manganin	70-30
36	Connected to Pin 34		
37	Connected to Pin 35		
38	Connected to Pin 34		
39	Connected to Pin 35		
40	Connected to Pin 34		
41	Connected to Pin 35		
42	Connected to Pin 34		
43	Connected to Pin 35		
44	Heater Power	Manganin	70-31
45	Not Used		
46	Not Used		
47	Not Used		

Cable D Details

<u>Wire</u>	<u>Function</u>
1	Ref. Bridge Arm No. 1
2	Return
3	Ref. Bridge Arm No. 2
4	Return



Heat Flow Experiment

Cable C and E Details

Wire	Function
1	Ref. Junction
2	Thermocouple No. 1
3	Thermocouple No. 2
4	Thermocouple No. 3
5	Thermocouple No. 4
6	Heater Common
7	Heater No. 1 Return
8	Heater No. 2 Return
9	Heater No. 3 Return
10	Heater No. 4 Return
11	K Sensor Excitation No. 1
12	K Sensor Excitation No. 1 Return
13	K Sensor Excitation No. 1 Remote Lead
14	K Sensor Excitation No. 1 Remote Lead
15	K Sensor Excitation No. 2
16	K Sensor Excitation No. 2 Return
17	K Sensor Excitation No. 2 Remote Lead
18	K Sensor Excitation No. 2 Remote Lead
19	K Sensor No. 1 Offset Signal
20	K Sensor No. 1 Return
21	K Sensor No. 2 Offset Signal
22	K Sensor No. 2 Return
23	PT Bridge No. 1 Excitation
24	PT Bridge No. 1 Excitation Return
25	PT Bridge No. 1 Excitation Remote Lead
26	PT Bridge No. 1 Excitation Remote Lead
27	PT Bridge No. 1 Offset Signal
28	PT Bridge No. 1 Offset Signal Return
29	PT Bridge No. 2 Excitation
30	PT Bridge No. 2 Excitation Return
31	PT Bridge No. 2 Excitation Remote Lead
32	PT Bridge No. 2 Excitation Remote Lead
33	PT Bridge No. 2 Offset Signal
34	PT Bridge No. 2 Offset Signal Return

Experiment Electrical
Interface Definitions

Cable B Details

<u>Connector Pin (P70)</u>	<u>Function</u>
1 thru 7	Analog Line
8	Shield
9	Data
10	Shield
11	Shift Pulse
12	Shield
13	Data Demand
14	Shield
15	Frame Mark
16	Shield
17	90th Frame Mark
18	Signal Return
19	Chassis Return
20 thru 30	Command Lines
31, 32, 33	Command Spare Lines
34	Power Return
35	Experiment Power
36	Power Return
37	Experiment Power
38	Power Return
39	Experiment Power
40	Power Return
41	Experiment Power
42	Power Return
43	Experiment Power
44	Heater Power
45	Not Used
46	Not Used
47	Not Used

Experiment Electrical
Interface Definitions

Heat Flow Experiment Jumper Cables

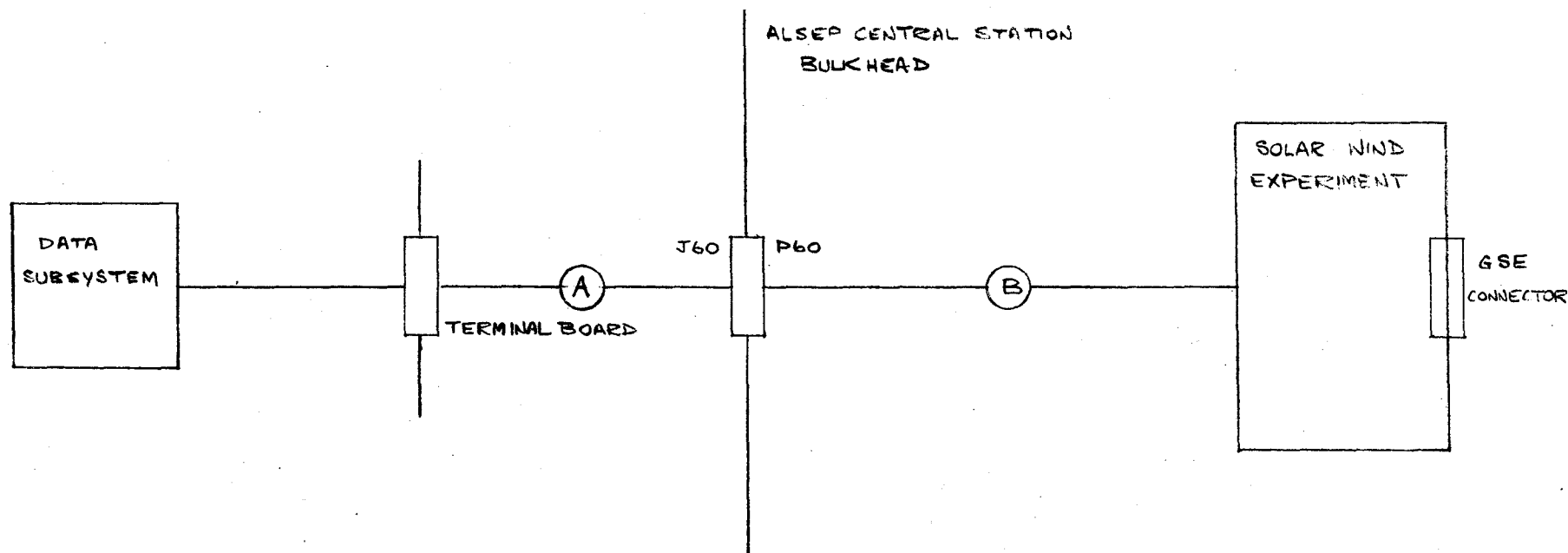
<u>Connectors (J70A, P70A)</u>	<u>Connectors (P70B, J70B)</u>	<u>Function</u>
1	F	Analog Signal
2	g	Analog Signal
3	G	Analog Signal
4	H	Analog Signal
5	h	Analog Signal
6	J	Analog Signal
7	i	Analog Signal
8	K	Shield Wire 9
9	j	Data
10	BB	Shield Wire 11
11	k	Shift Pulse
12	M	Shield Wire 13
13	N	Data Demand
14	m	Shield Wire 15
15	CC	Frame Mark
16	P	Shield Wire 17
17	n	90th Frame Mark
18	R	Signal Return
19	p	Shield Wires 20 to 30
20	DD	Command
21	S	Command
22	EE	Command
23	T	Command
24	q	Command
25	U	Command
26	NN	Command
27	r	Command
28	V	Command
29	FF	Command
30	s	Command
31	W	Command Spare
32	t	Command Spare
33	X	Command Spare
34	u	Power Return
35	Y	Power
36	Z	Power Return
37	a	Power
38	b	Power Return

Experiment Electrical
Interface Definitions

Heat Flow Experiment Jumper Cable (continued)

<u>Connectors (J70A, P70A)</u>	<u>Connectors (P70B, J70B)</u>	<u>Function</u>
39	A	Power
40	c	Power Return
41	B	Power
42	d	Power Return
43	C	Power
44	e	Heater Power
45	D	Spare
46	f	Spare
47	E	Spare

SOLAR WIND EXPERIMENT WIRE DIAGRAM



CABLE	MATING UNIT	CONNECTOR	CABLE TYPE	NUMBER OF WIRES	LENGTH	CONNECTOR	MATING UNIT
A	TERMINAL BOARD	HARDWIRE	MANGANIN 24 AWG UNLESS OTHERWISE STATED	9		(J60)	CONNECTOR ON CABLE (P60)
B (W60)	CONNECTOR ON CENTRAL STATION (J60)	(P60)	METHODE H FILM FLAT CONDUCTOR CABLE PD 3020H	20	15 FEET	HARDWIRE	SOLAR WIND EXPERIMENT

G.S.E CONNECTOR

ISSUE, NUMBER DATE	1	2							
APPROVED	N.L. Miller	N.L. Miller							

Experiment Electrical
Interface Definitions

Solar Wind Experiment

Cable A detailed

Terminal Board Pin	Connector Pin (J60)	Pin Function
TB60-01	1	Shield
TB60-02	2	Digital Data
	3	Connected to pin 1 (Shield)
TB60-03	4	Shift Pulse
	5	Connected to pin 1 (Shield)
T ^B 60-04	6	Demand Line
	7	Connected to pin 1 (Shield)
TB60-05	8	Command Spare
	9	Connected to pin 1 (Shield Spare)
TB60-06	10	Command (Dust Cover Removal)
TB60-07	11	Signal Return
TB60-08	12	Survival Return
TB60-09	13	Power Return
TB60-10	14	29 volt Experiment Power
	15	Connected to pin 13 (power return)
	16	Connected to pin 14 (29 volts)
	17	Connected to pin 13 (power return)
	18	Connected to pin 14 (29 volts)
	19	Connected to pin 13 (power return)
	20	Connected to pin 14 (29 volts)

Experiment Electrical
Interface Definitions

Solar Wind Experiment

Cable B Details (W60)

Connector Pin (P60)

Function

1	Shield
2	Digital Data
3	Shield
4	Shift Pulse
5	Shield
6	Demand Line
7	Shield
8	Spare Command Line
9	Spare Shield
10	Command Line (Dust Cover REmoval)
11	Signal Return
12	Survival Power
13	Power Return
14	29 volts Experiment Power
15	Power Return
16	29 volts Experiment Power
17	Power Return
18	29 volts Experiment Power
19	Power Return
20	29 volts Experiment Power



Solar Wind Experiment Jumper Cables

Connectors (J60A, P60A)	Connectors (P60B, J60B)	Function
1	N	Shield Wire 2
2	M	Data
3	a	Shield Wire 4
4	L	Shift Pulse
5	Z	Shield Wire 6
6	K	Demand Line
7	J	Shield Wire 8
8	Y	Command Spare
9	c	Shield Wire 10
10	X	Command (Dust Cover Remove)
11	H	Signal Ground
12	W	Survival Power
13	G	Power Return
14	V	Operating Power
15	F	Power Return
16	E	Operating Power
17	U	Power Return
18	D	Operating Power
19	T	Power Return
20	C	Operating Power



26-Sept-666

BENDIX SYSTEMS DIVISION ANN ARBOR, MICH.

NO.

REV.NO.

ATM-483

C

Experiment Electrical
Interface Definitions

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Connector
(J30A, P30A)
(J35A, P35A)

Connector
(P30B, J30B)
(P35B, J35B)

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