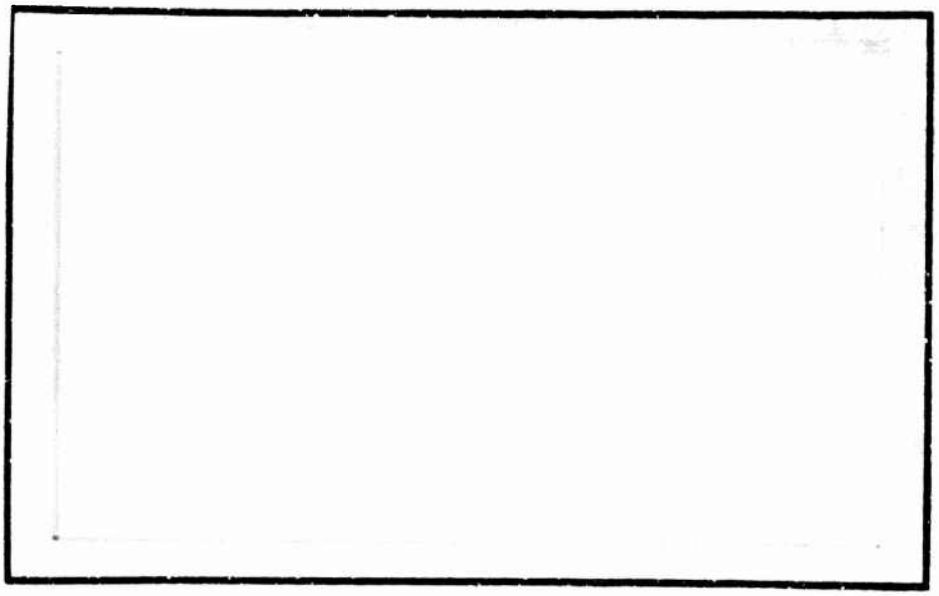

Bell Aerospace Company DIVISION OF textron

Unclassified

Security Classification

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5. AUTHOR(S) *(First name, middle initial, last name)*
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Murray A. Meldrum

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13. ABSTRACT

A triaxial accelerometer system was developed for flight on the Cannon Ball II satellite (OAR 901). This report provides the necessary operating and diagnostic instructions for this research equipment. Included are operation and calibration instructions, interconnection diagrams, logic diagrams, schematics and assembly drawings.

KEYWORDS: Accelerometer, Acceleration, Triaxial accelerometer,

DD FORM 1 NOV 65 1473

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REPORT NO. 6098-954002

R & D EQUIPMENT INFORMATION REPORT
3 AXIS ACCELEROMETER (MESA)
FOR
CANNONBALL II

June 15, 1971

CODE IDENTIFICATION 80070

W. W. Lange	6/15/71 Date		Date
[illegible]	[illegible]		

DATE	ISSUE	PAGE NO AFFECTED	AUTHORITY
			1

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POST OFFICE BOX ONE . BUFFALO, NEW YORK 14240

I. PURPOSE OF EQUIPMENT

The triaxial accelerometer is intended to measure extremely small forces along three mutually perpendicular axes when mounted in the Cannonball II satellite. Each axis will sense in two directions, normally referred to as plus and minus accelerations. The output signal from each axis is presented in both analog and digital form.

II. THEORY OF OPERATION

The tri-axial accelerometer for the Cannonball II satellite is identified as Bell Aerospace Company (BAC) part number 6176-300001.

In order to identify each component and its interconnections, reference should be made to BAC Drawing number 6176-300001. This drawing shows that each system is made up of 5 units and 6 interconnecting cables. The parts list identifies each piece by part number and title. All BAC drawings appearing on this parts list are included in the drawing folder.

The direction of the three axes are marked on the outside of the instrument package. Motion of the case along any one of these axis will cause the output signal to appear. Since these accelerometers are scaled to measure forces in the micro-g and milli-g region, they present special problems in handling and calibration when exposed to the one -g environment existing on the earth.

The nominal full scale ranges are listed below. Along with each is the maximum angle by which the sensitive axis may be tilted from horizontal without exceeding the range.

	± Input g's	Tilt Angle
Range A	1.2×10^{-2}	41'-20"
Range B	7×10^{-4} g	2'-25"
Range C	1.6×10^{-5} g	3.3"

A glance at this list shows that even on the least sensitive scale (Range A) the sensitive axis must be horizontal to wtihin 3/4 degree in order to stay on scale.

The output of each channel is proportional to input acceleration and is available in both digital and analog form.

The analog output appears as a zero to 5 volt d-c signal. It derived from the digital signal and its magnitude is proportional to the pulse output rate representing input acceleration. The same pulse rate and d-c output represent full scale on each range.

Typical values are as shown below:

Input Full Scale	Analog Output (Volts)	Digital Output Pulses/Second
0	.15	0
20%	1.0	1000
40%	2.0	2000
60%	2.8	3000
80%	3.7	4000
100%	4.5	5000

III. BENCH TESTS

Preliminary

Interconnect the system as shown on BAC drawing No. 6176-300001. Observe that power switches on the test set are in the following positions. Test set power - OFF, DC supply to - INT., System Power - OFF. Connect the test set power cord to any 115V - 60 cycle outlet. Disable channels X and Y by disconnecting both P3 (cable W2) plugs from the interface unit. Make sure that the 3 Axis instrument package is resting on a fairly stable flat surface and is level to within ½ degree. Turn the test set power - ON, and observe the system voltage meter indicates approximately 28 volts dc, and system current is zero. Place all three meter switches on INT.

Z Channel Tests

Place Z channel meter switch in analog output position. Turn system power - ON and observe that system current meter reads about 0.2 amps. Place both cross axis and sensitive axis range T/M meter selector switches in their A positions. Depress and hold the suspension command switch for approximately ½ second. Repeat until cross axis meter indicates about 40 micro amps (4 T/M volts). Depress and hold the sensitive axis command switch for approximately 1 second. Repeat until sensitive axis command meter indicates about 40 micro amps (4 T/M volts). Observe the Z channel float position meter while very gently tilting the Z axis back and forth through horizontal. The float position meter should follow by alternately going from 0 to 50 micro amps. This indicates proper suspension of the proof mass in the accelerometer. Rest the three axis package flat on the table and observe if analog output is less than 50 micro amps. If not, tilt

Z axis and shim appropriate end to give an on scale reading. Very slight adjustments in the tilt should now cause the analog output to vary between 0 and 5VDC. Tilting the base to reduce the analog output will cause the float position meter to go to approximately 25 micro amps (2.5 T/M volts) when the analog output is minimum. This is the null or zero g input condition. As long as the analog output is less than 50 micro amps, the float position meter will indicate a fairly steady value of either 10 or 40 micro amps depending on the polarity of the input g's.

Switch the meter selector switch to ELECT. TEMP and note the reading. At room temperature this should indicate approximately 20 micro amps. (2 T/M volts). Switch the meter selector to ACCEL-TEMP. The reading should again be approximately 20 micro amps.

Overrange Circuit Test

Place the sensitive axis command meter in position B and depress the range command observing that meter reads about 40 micro amps. Tilt the sensitive axis to cause the analog output to saturate at 50 micro amps; this activates the overrange circuit. The analog output should now drop to near zero for about 20 seconds, then return momentarily (2 seconds) to 50 micro amps, and then back to near zero. Switch the command meter selector switch back to A and depress the sensitive axis command two times. The meter should again read 40 micro amps and the analog output should be near zero. This completes bench test of the Z channel. Turn system power - OFF and proceed to the Y channel tests.

Y Channel Tests

Connect P3 (cable W2) to J3, channel Y, on the signal conditioner. Place Y channel meter switch in analog output position. Turn system power ON and observe that system current increases to about 0.4 amps. Note that both Sensitive Axis and Cross Axis command meters indicate about 40 micro amps corresponding to Range A. Observe the Y channel float position meter while gently tilting the Y axis back and forth through horizontal. The float position meter should follow by alternately going from 0 to 50 micro amps, indicating suspension of the Y accelerometer. Rest the three axis package flat on the table and observe if analog output is less than 50 micro amps. If not, tilt and shim appropriate mounting lug to obtain an on scale reading. The indications of float position and analog output should be the same as described for the Z channel. Check the Elect. and Accel. Temp readings by means of the selector switch. The readings should be approximately 20 micro amps at room temperature.

Overrange Circuit Test

Place the sensitive axis command meter in position B and depress the range command observing that meter reads about 40 micro amps. Tilt the sensitive axis to cause the analog output to saturate at 50 micro amps; this activates the overrange circuit. The analog output should now drop to near zero for about 20 seconds, then return momentarily (2 seconds) to 50 micro amps, and then back to near zero. Switch the command meter selector switch back to A and depress the sensitive axis command two times. The meter should again read 40 micro amps and the analog output should be near zero. This completes bench test of the Y channel. Turn system power - OFF and proceed to check the X channel.

X Channel Tests

Connect P3 (cable W2) to J3 channel X on the signal conditioner. Place X channel meter switch in the analog output position. Turn system power - ON and observe that system current increases to about 0.6 amps. Note that both command indicators read about 40 micro amps corresponding to Range A. Observe the X channel float position meter while gently tilting the X axis back and forth through horizontal. Note that the 3 axis mount must be turned on its side in order to get the X axis horizontal. Continue tests on X channel as described for Y channel above. This completes the X channel tests. Turn system power - OFF and place the three axis package on its three mounting pads.

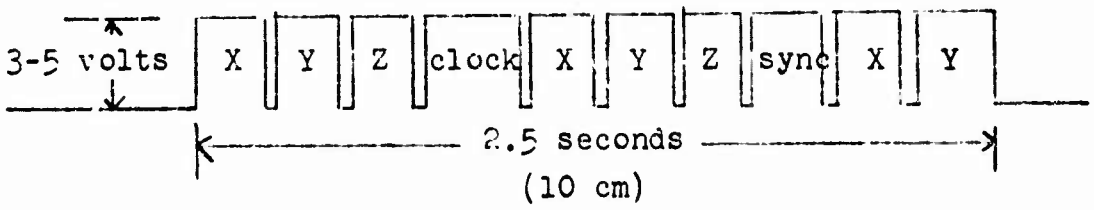
Command Tests

Turn system power - ON and observe that both command meters indicate about 40 micro amps (4 T/M volts = Range A). Depress the suspension command, hold for 1 second and release. The cross axis meter should go to about 2 micro amps (0 T/M volts). Switch the cross axis meter selector switch to B; meter should again read 40 micro amps. Depress sensitive axis command, hold for 1 second and release. The sensitive axis meter should go to about 2 micro amps (0 T/M volts). Switch sensitive axis meter selector switch to B; meter should again read 40 micro amps. Turn system power switch - OFF. Leave off for about 5 seconds. Turn system power - ON and note that both command meters read about 40 micro amps. Depress each switch, hold for 1 second and release. Switch both meter selectors to C range. Both meters should indicate about 40 micro amps. Turn system power - OFF for 5 seconds and then ON again. Command meters should again read about 40 micro amps. Depress each command switch, hold for 1 second and release. Both command meters should indicate about 20 micro amps (0 T/M volts). Switch both meter selectors to the A range. Both

should indicate 40 micro amps. This completes the command tests

Digital Signal Conditioner Tests

Connect an oscilloscope to either the bnc connector or the binding posts labeled "digital output." Set the scope time base to about 250 msec/cm (assuming a 10 cm viewing area). Sync the scope sweep generator and observe the presence of the channel words, sync word, and clock word as shown below. Note that the amplitude of the output pulse train is +4 ±1 volt.



IV. INSTALLATION TESTS

Install each of the five units which make up the system in their respective places in the satellite. Connect cables W1, and W2. Make sure that all units of a particular channel are mated to the connectors with that channel marking. Connect test cable to J5 on the interface unit. Temporarily disconnect P3 channels Y and Z. Connect the test set to 115V - 60 cycle power. Turn test set power - ON. Voltage should be 28V. Turn all meter switches to INT., and all meter selector switches to analog output. Turn system power - ON and check each channel using the same procedure as described in the bench tests. In this case, however, it will be necessary to have the satellite mounted in a manner that will enable each of the three axis to be tilted through horizontal and held there to within ±½ degree. Perform the Command and

Digital Signal Conditioner Tests as described in the Bench tests. Turn system power - OFF. Turn Test Set power - OFF. Remove Test Set Cable and disconnect power cord to test set. This completes installation tests. The system may now be connected to the various satellite systems by way of J5 on the signal conditioner.

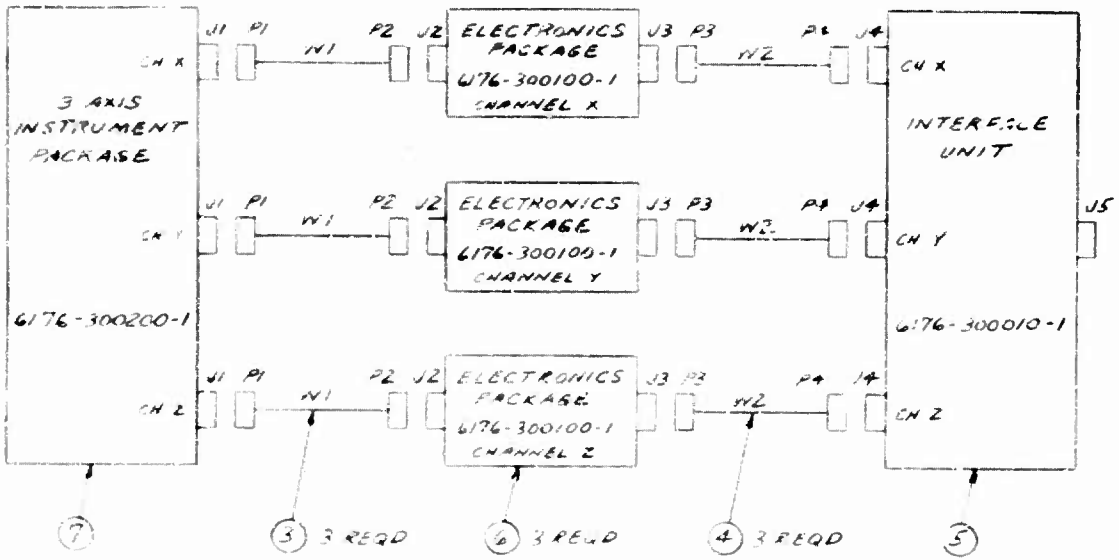
V. SATELLITE TESTS

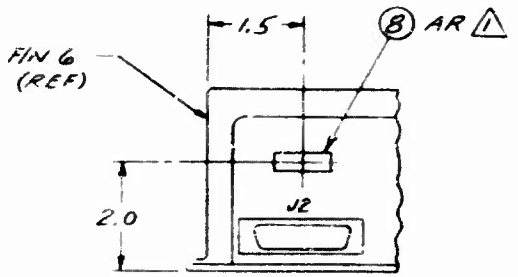
Connect the system to the satellite power, telemetry, and command systems by means of J5 on the signal conditioner. Apply power to the system and command both Sensitive and Cross Axis into Range A. Again the satellite must be horizontal to within ½ degree. Perform the check of each channel as described in the bench tests. Perform the Command and Digital Signal Conditioner tests also as described in the bench tests. This time the voltages will have to be read at the output of the telemetry. This completes the satellite tests.

VI. CHANNEL REPLACEMENT

In the event a channel becomes defective either due to a faulty accelerometer or electronics, both units must be replaced. Remove the three axis instrument package, the defective channel electronics, and the interface unit from the satellite. All three packages, plus the associated W1 and W2 cables should be returned to the manufacturer (Bell Aerospace Company) for repair.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED





QTY REQD	FIND NO	CODE IDENT	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	DRAWING OR SPECIFICATION	MATERIAL OR NOTE	DIA	THK	WD	LG	TS 1000 PSI	ZONE
AR	8	11224		3/8" SOLID BLACK EMBOSSING TAPE								
1	7		6176-300200-1	3 AXIS INSTRUMENT PKG								
3	6		100-1	ELECTRONICS PKG								
1	5		010-1	INTERFACE UNIT								
3	4		006-1	CABLE W2								
3	3		005-1	CABLE W1								
REF	2		002-1	INTER CABLE DIAGRAM								
1	1		6176-300001-1	SYSTEM								

PARTS LIST

REV STATUS OF SHEETS: REV | SHEET

2. TEST PER TEST PROCEDURE 6176-928001

1 WIRE CHANNEL (X, Y OR Z) AT TIME OF SYSTEM TEST. EXAMPLE: CH X

NOTES:

NUMBER	APPLICATION	DASH NO	NEXT ASSY	USED ON	NEXT ASSY QTY REQD	FINAL ASSY QTY REQD
6176-928001	TEST PROCEDURE	-1	FINAL	CRL (CBII)		

APPLICABLE SPECIFICATIONS / APPLICATION

HOLE TOLERANCES EXCEPT AS SHOWN

.913 TO .938	+.004 -.001
.846 TO .178	+.005 -.001
.130 TO .250	+.006 -.001
.251 TO .485	+.005 -.001
.486 TO .735	+.010 -.001
.735 TO .985	+.012 -.001
.986 AND LARGER	±.015

NO TO COMPLETE PRINT: .90 min | .96 min | .98 min | .99 min

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON DECIMALS

.X	.XX	.XXX	ANGLES
± .1	± .03	± .010	± 0° 30'

UNLESS OTHERWISE SPECIFIED:
- BREAK EDGES .015 MAX RAD OR CHAMFER
- DIMENSIONING IS PER USAS Y14.5
- MACHINED SURFACES ✓

DWN	HAILAND 2 JAN 70
GR	
APVD	
WT	
CHK	
STRESS	
RLSE	
CONTR	

BELL AEROSYSTEMS COMPANY
POST OFFICE BOX 1036 BUFFALO, NEW YORK 14240
DIVISION OF BELL AEROSPACE CORPORATION - A TEXTRON COMPANY

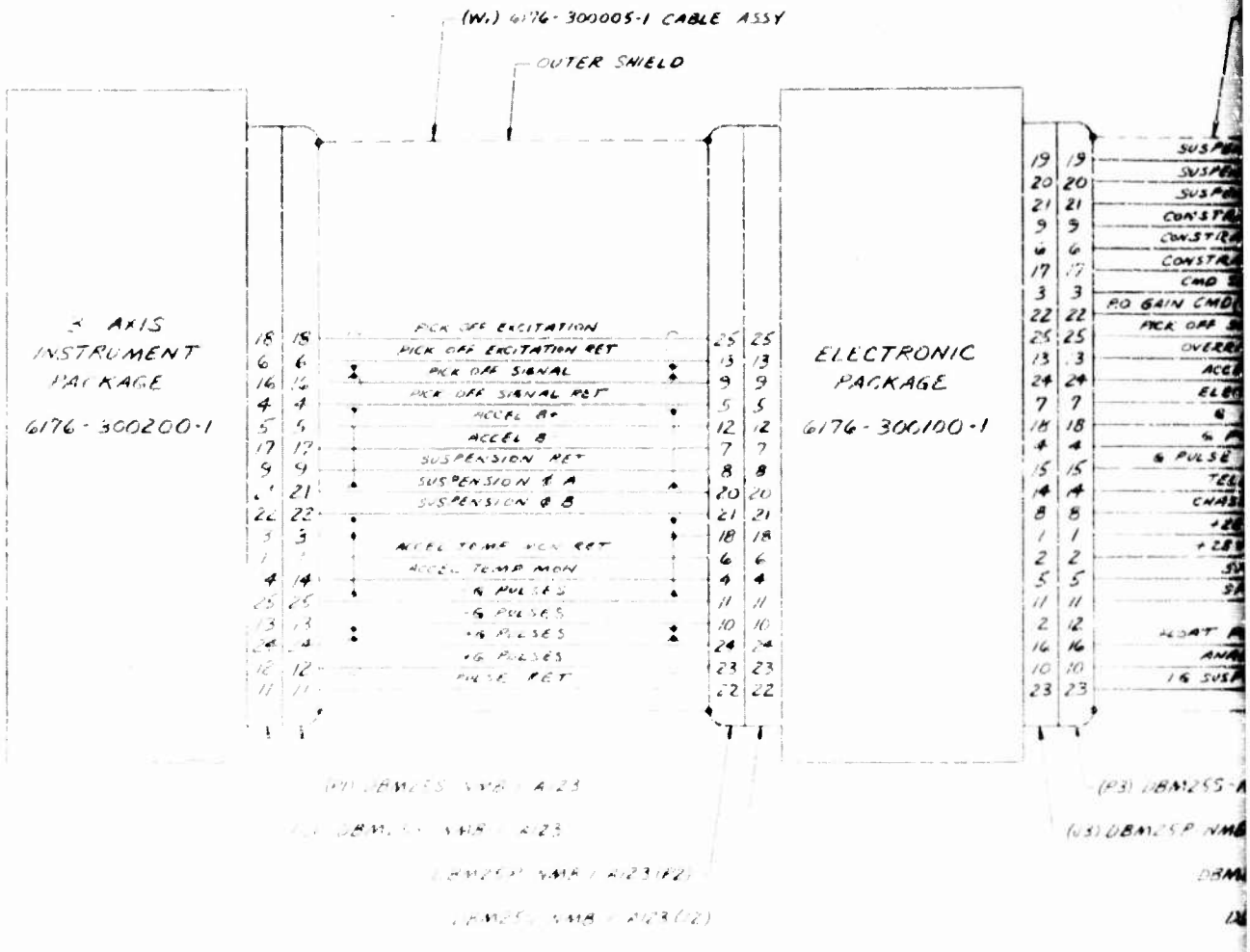
THREE AXIS MINIATURE ELECTROSTATIC ACCELEROMETER (MESA) SYSTEM

SIZE	CODE IDENT NO	DRAWING NO
C	80070	6176-300001

SCALE NONE | 1 SHEET

6176-300001

01



(P1) DBM25S VMB - A23

(P2) DBM25S VMB - A23

(P2) DBM25P VMB - A23(P2)

(P2) DBM25S VMB - A23(P2)

(P3) DBM25S-A

(J3) DBM25P VMB

DBM

(J3

⚠ NOT USED IN SATELLITE CABLE

NOTES

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED AN "LOS" OUTPUT A TCB AT P5 PIN 14, 15 VIA PIN 10 ON P4 AND 10 ON 16 WIRE REMOVED LINE FROM P4 TO P8 12. CANCELED NOTE 4.	26 JUN 1970	

(W2) 6176-300006-1 CABLE ASSY

OUTER SHIELD

19	19	SUSPENSION CMD A	19	19
20	20	SUSPENSION CMD B	20	20
21	21	SUSPENSION CMD C	21	21
9	9	CONSTRAINMENT CMD A	9	9
6	6	CONSTRAINMENT CMD B	6	6
17	17	CONSTRAINMENT CMD C	17	17
3	3	CMD SIGNAL RET	3	3
22	22	PO GAIN CMD (CONST RANGE 4 V/1.4)	22	22
25	25	PACK OFF SIG (FLOAT POSITION)	25	25
13	13	OVERRANGE SIGNAL	13	13
24	24	ACCEL TEMP	24	24
7	7	ELECT TEMP	7	7
18	18	G PULSES	18	18
4	4	G POLARITY	4	A
15	15	G PULSE & POLARITY RET	15	15
14	14	TELEM RET	14	14
8	8	CHASSIS GROUND	8	8
1	1	+28V POWER	1	1
2	2	+28V POWER RET	2	2
5	5	SPARE	5	5
11	11	SPARE	11	11
12	12	FLOAT POSITION MON T/M	10	10
16	16	ANALOG OUTPUT	16	16
10	10	16 SUSPENSION TEST	12	12
23	23		23	23

INTERFACE UNIT

6176-300010-1

(P3) DBM25S-NMB-1-A123

(J3) DBM25P-NMB-1-A123

DBM25P-NMB-1-A123 (P4)

DBM25S-NMB-1-A123 (J4)

1	1	+28V POWER	
2	2	+28V POWER	
3	3	28V POWER RET	
4	4	28V POWER RET	
48	48	ANALOG OUTPUT X	
22	22	CONSTRAINMENT CMD	
23	23	CONSTRAINMENT CMD RET	
24	24	SUSPENSION CMD	
25	25	SUSPENSION CMD RET	
28	28	CONST RANGE A T/M	
27	27	CONST RANGE B T/M	
26	26	CONST RANGE C T/M	
17	17	SUSP RANGE A T/M	
18	18	SUSP RANGE B T/M	
19	19	SUSP RANGE C T/M	
20	20	RANGE T/M RET	
7	7	DATA RETURN	
5	5	DATA OUTPUT	
6	6	SHIFT PULSE	
49	49	ANALOG OUTPUT Y	
36	36	CHASSIS GROUND	
50	50	ANALOG OUTPUT Z	
37	37	16 TEST	
21	21	SPARE (2)	
38	38	FLOAT POSITION MON X T/M	
39	39	FLOAT POSITION MON Y T/M	
40	40	FLOAT POSITION MON Z T/M	
41	41	ACCEL TEMP X T/M	
42	42	ACCEL TEMP Y T/M	
43	43	ACCEL TEMP Z T/M	
44	44	ELECT TEMP X T/M	
45	45	ELECT TEMP Y T/M	
46	46	ELECT TEMP Z T/M	
47	47	EP MONITOR TEST OUTPUT (1)	
16	16	CLOCK RET	
15	15	CLOCK LSB (1 SEC)	
14	14	CLOCK BIT 2	
13	13	CLOCK BIT 3	
12	12	CLOCK BIT 4	
11	11	CLOCK BIT 5	
10	10	CLOCK BIT 6	
9	9	CLOCK BIT 7	
8	8	CLOCK BIT 8	
29	29	CLOCK BIT 9	
30	30	CLOCK BIT 10	
31	31	CLOCK BIT 11	
32	32	CLOCK BIT 12	
33	33	CLOCK BIT 13	
34	34	CLOCK BIT 14	
35	35	CLOCK BIT 15	

(P5) DBM50S-NMB-1-A123

(J5) DBM50P-NMB-1-A123

QTY REQD	FIND NO	CODE IDENT	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL OR NOTE	COMMERCIAL DESIGNATION	SPECIFICATION	DH	TYP	M	LS	ITEM	QTY	ITEM

PARTS LIST

DO NO	DO IN QTY	NUMBER	APPLICATION
TO COMPLETE PART		APPLICABLE SPECIFICATIONS	

DASH NO	NEXT ASSY	USED ON	NEXT ASSY QTY	USED ON QTY REQD
	APPLICATION			

HOLE TOLERANCES EXCEPT AS SHOWN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS

3 PL	2 PL	XXX	ANGLES
± 1	± .03	± .010	30'

UNLESS OTHERWISE SPECIFIED BREAK ALL SHARP EDGES APPROX .015 R OR CHAMFER

MACHINED SURFACES EXCEPT AS NOTED ✓

SURFACES | SURFACES

DESIGN	AAR AND JS JAN 70
GROUP	
APPD	
QT	
CHECK	
STRESS	
PEL	
CONTROL	

BELL AEROSYSTEMS COMPANY
A TEXTRON COMPANY
POST OFFICE BOX 1001 BUFFALO, NEW YORK 14240

INTERCONNECTING CABLE DIAGRAM - 3 AXIS MESA SYSTEM (CBII)

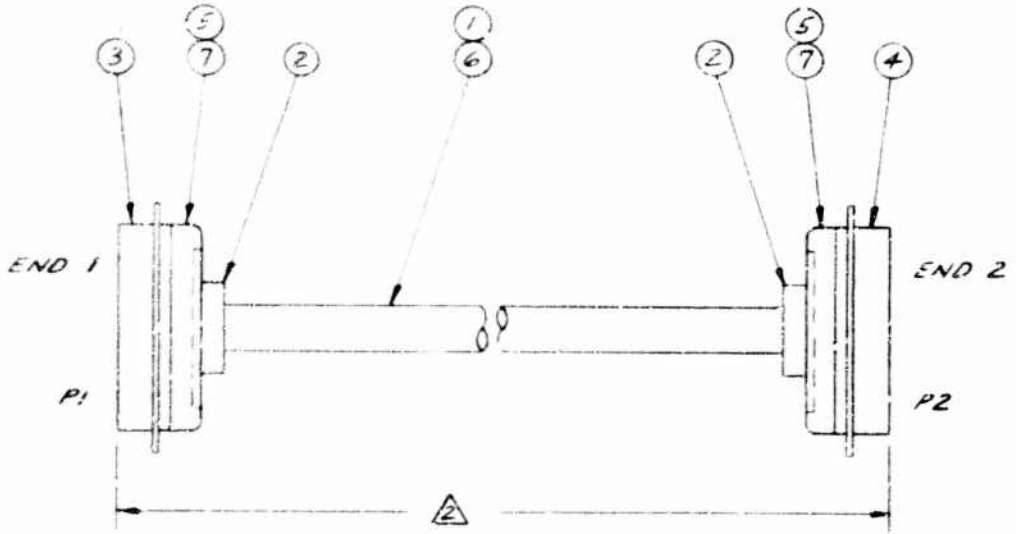
SIZE	CAGE IDENT NO	DRAWING NO
F	80070	6176-300002

SCALE —

SHEET 1 OF 3

6176-300002

REVISIONS				
ZCN #	LTR	DESCRIPTION	DATE	APPROVED



12

	REF	12		6176-300008	WIRE LIST										
	AR	11	81348	SN 60-WR-P2	SOLDER	QQ-S-571	60/40								
	AR	10	05689	61-26-00	WIRE										
	AR	9	05689	6E-24-09	WIRE										
	AR	8	05689	2C-6E-24-09-09	STJ-14 WIRE										
	AR	7	04552	2741-STYCAST	POTTING COMPOSITION										
	AR	6	02134	2173	TUBULAR BRAIDING										
	2	5	74868	88156-8 (AN6)	POTTING SHELL										
	1	4	74868	[illegible]	CONNECTOR										
	1	3	74868	[illegible]	CONNECTOR										
	2	2		6038-300163-1	POTTING FORM										
		1		6176-300006-1	INTERCONNECTING CABLE										
	-/	FIND NO	SPEC SHEET	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	DRAWING OR SPECIFICATION	MATERIAL OR NOTE	DIA	THK	WD	LG	TC SEE PER	ZONE		
QTY REQD															

PARTS LIST

REV STATUS OF SHEETS

△2 LENGTH TO BE DETERMINED AT FIRST INSTALLATION / FABRICATION IN ACCORDANCE WITH 6038-300189

NOTES:

6038-300189	CABLE FAB	-1	6176-300001	CRL (C&E)	3		
NUMBER	APPLICATION	DASH NO	NEXT ASSY	USED ON	QTY REQD	ITEM WEIGHT	FIGURE ZONE
APPLICABLE SPECIFICATIONS			APPLICATION				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON DECIMALS: .X ±.1, .XX ±.04, .XXX ±.010, ANGLES ±0° 15'

UNLESS OTHERWISE SPECIFIED:
- BREAK EDGES .010 MAX RAD OR CHAMFER
- [illegible] PER
- USE [illegible]
- MACHINED SURFACES ✓

DWN MAILAND M JAN 70
CH [illegible] 11 JAN 70
APVD [illegible]
WT
CHK [illegible] 1-14-70
STRESS
RLSD [illegible] 1-14-70
DWNTR

BELL AEROSYSTEMS COMPANY
BUFFALO, NEW YORK

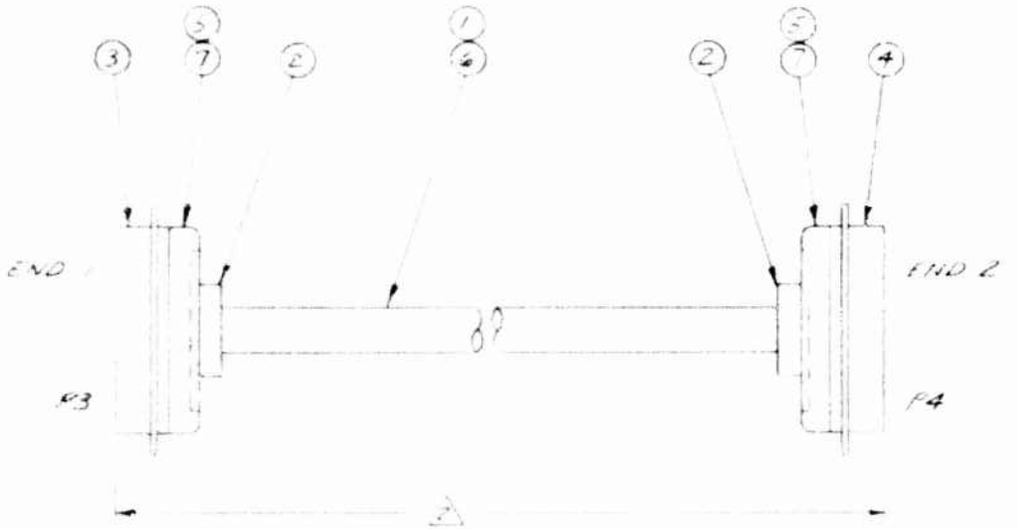
INTERCONNECTING CABLE-ELEC/3 AXIS MOUNT W1

SIZE	CODE IDENT NO	DRAWING NO
C	80070	6176-300005

SCALE NONE | SHEET

6176-300005

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	(1) CHANGED NOTE 3 WAS 3 RUN 25 WIRES BETWEEN P3 & P4 PIN TO PIN	SEPT 1, 70	



3 RUN 24 WIRES BETWEEN P3 & P4 EXCEPT CONNECT PIN 10 WITH P4 PIN 12 AND OMITTING ANY LEAD BETWEEN P3 & P4 PIN 12. (A1)

2 LENGTH TO BE DETERMINED AT FIRST INSTALLATION

1 FABRICATION IN ACCORDANCE WITH 6098-300189

NOTES

QTY REQD	FIND NO	CODE IDENT	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	DRAWING OR SPECIFICATION	MATERIAL OR NOTE	DIA	THK	WD	LG	TS 1000 PSI	ZONE
AR	9	81348	24GO WR P2	SOLDER	QQ-S-571	60/40						
AR	8	05689	GE-24 CO	WIRE								
AR	7	01295	2741-STYCAST	POTTING COMPOSITION								
AR	6	81044	2173	TUBULAR BRAIDING								
2	5	71400	189678 1 (MOD)	POTTING SHELL								
1	4	71400	DAM-25P NMB A123	CONNECTOR								
1	3	71400	DAM-25S NMB A123	CONNECTOR								
2	2		6098-306153-1	POTTING FOR #1								
	1		6176-300006-1	INTERCONNECTING CABLE								

PARTS LIST

NUMBER	APPLICATION	DASH NO	NEXT ASSY	USED ON	NEXT ASSY QTY	FINAL ASSY QTY
6098 300189	CABLE ASSY	-1	6176 300001	CPL (GBII)	3	
APPLICABLE SPECIFICATIONS			APPLICATION			QTY REQD

HOLE TOLERANCES EXCEPT AS SHOWN

.013 TO .039	+.004	.001
.040 TO .129	+.005	.001
.130 TO .250	+.006	.001
.251 TO .485	+.008	.001
.486 TO .735	+.010	.001
.736 TO .985	+.012	.001
.986 AND LARGER	± .010	

ED TO COMPLETE PRINT

BD NO	BD NO	BD NO	BD NO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS

X	XX	XXX	ANGLES
±	± .03	± .010	± 0° 30'

UNLESS OTHERWISE SPECIFIED BREAK EDGES .015 MAX RAD OR CHAMFER DIMENSIONING IS PER USAS Y14.5 MACHINED SURFACES

DWN	[illegible] JAN 70
CHK	[illegible] JAN 70
APVD	[illegible] JAN 70
WT	
STRESS	
RLSE	
CONTR	

SEV STATUS OF SHEETS: REV | SHEET

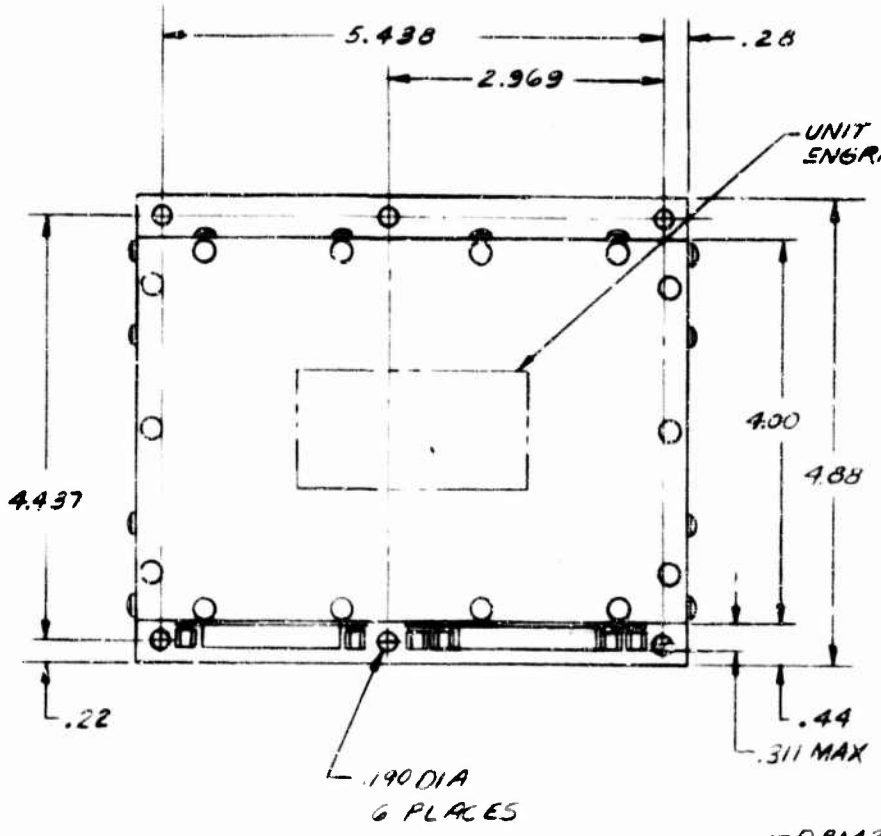
BELL AEROSYSTEMS COMPANY
POST OFFICE BOX ONE BUFFALO, NEW YORK 14240
DIVISION OF BELL AEROSPACE CORPORATION - A TEXTRON COMPANY

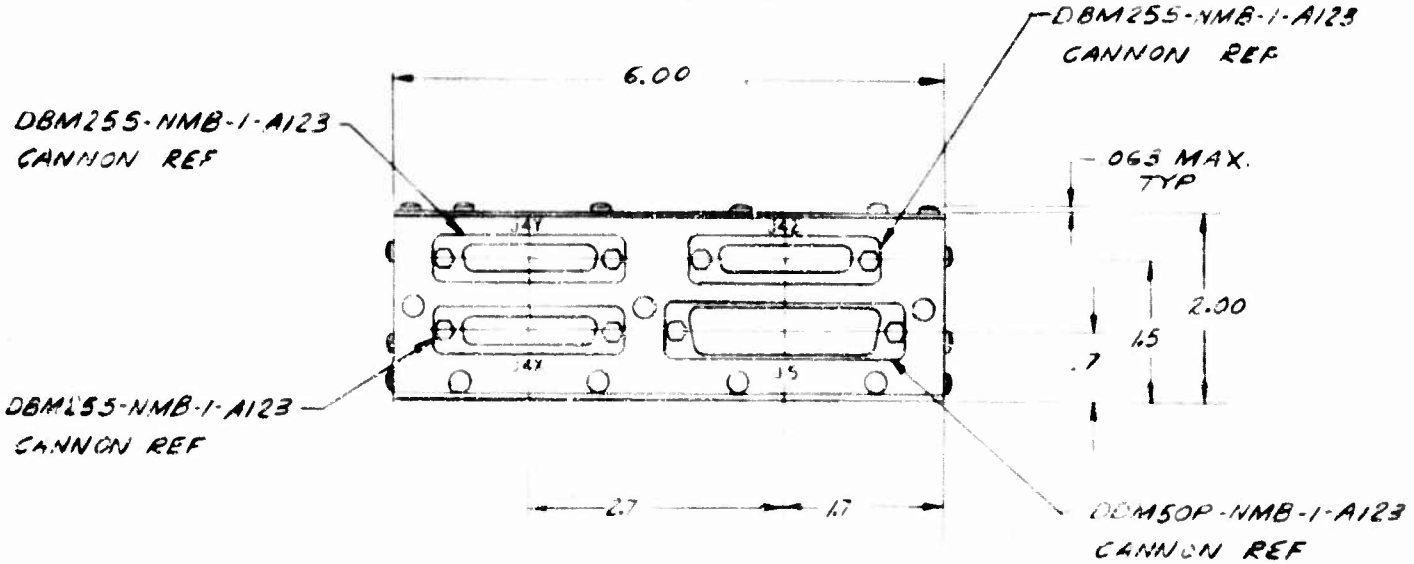
INTERCONNECTING CABLE - ELEC / INTERFACE N2

SIZE	CODE IDENT NO	DRAWING NO
C	80070	6176-300006

SCALE NONE SHEET

6176-300006





4 PROTECTIVE FINISH IRIDITE, YELLOW, PER MIL C 5541, TYPE I, GRADE C, CLASS 3

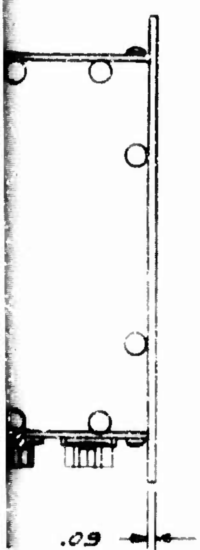
3 TOLERANCES .XX-±.020
.XXX-±.005

2 SEE SPECIFICATION 6176-947 C10 FOR REQUIREMENTS

1 PURCHASE FROM ADCOLE CORP, 330 BEAR HILL RD WALTHAM, MASS. CODE IDENT. 18150 THEIR PART NO 15294

NOTES

		MIL-C-5541 PROT FINISH P/N 24000 MS4N SEE 1	
ED NO.	DI OF DR	NUMBER	APPLICATION
ED TO DUPLICATE PRINT		APPLICABLE SPECIFICATIONS	



REVISIONS	
LTR	DESCRIPTION
A	REDRAWN [illegible] ADDED [illegible] GEN. NOTES

QTY REQD		FIND NO.	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL OR NOTE	COMMERCIAL DESIGNATION	SPECIFICATION
				6176-300010-1	INTERFACE UNIT	△1 △2		

PARTS LIST

HOLE TOLERANCES EXCEPT AS SHOWN
.040 TO .125 + .003 - .000
.126 TO .250 + .004 - .000
.251 TO .400 + .005 - .000
.406 TO .750 + .010 - .000
.756 TO .000 + .012 - .000
.000 AND LARGER ± .010

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON DECIMALS .R ±.1 ANGLES ±0°30'

UNLESS OTHERWISE SPECIFIED BREAK ALL SHARP EDGES APPROX .015 R OR CHAMFER

MACHINED SURFACES EXCEPT AS NOTED ✓

SUPERSEDES	SUPERSEDED BY
6176-300010 W.LANE 8-22-69	

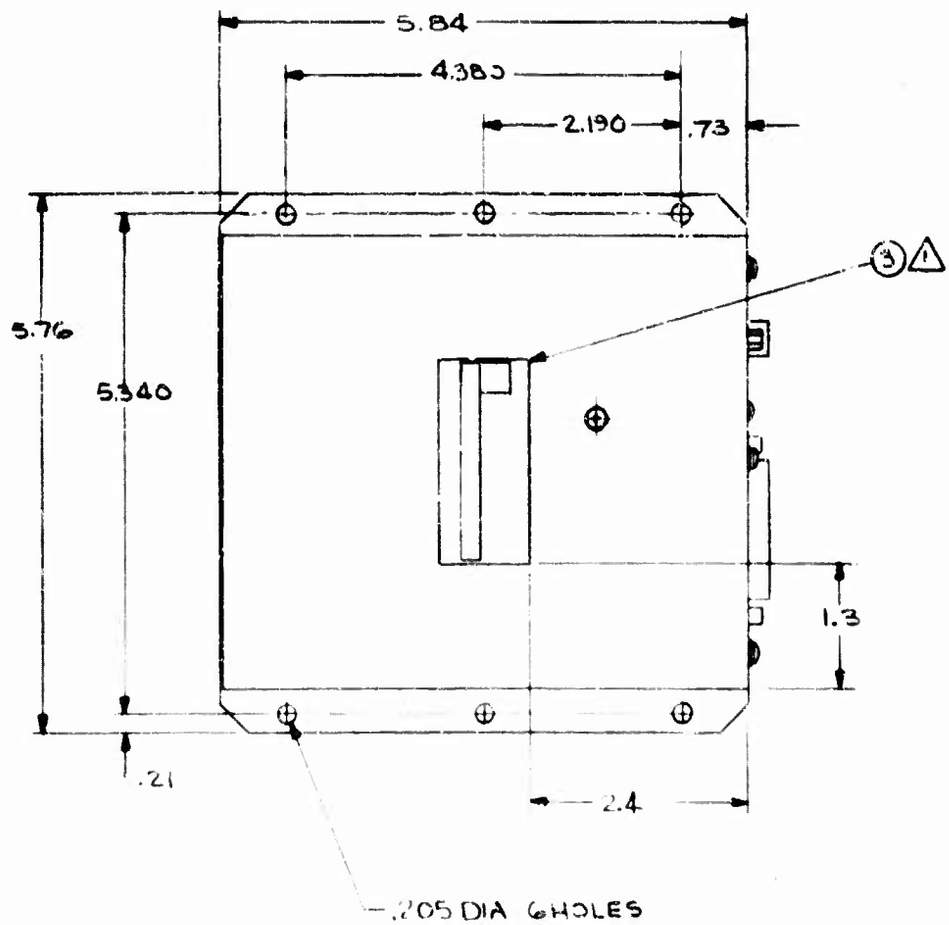
FINISH					
SPEC	-1	6176-300000	CRL CB II	1	
APPLICATION	DASH NO	NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
REVISIONS		APPLICATION		QTY REQD	

DESIGN [illegible]
GROUP [illegible]
APPD B NOWAKOWSKI [illegible] 64
WT
CHECK S. DREWNIAK [illegible]
STRESS
REL A. PAWLAK [illegible] 8-26-69
CONTRACT NO.

INTERFACE UNIT CB II

SIZE	CODE IDENT NO.	
D	80070	6176-300010

SCALE [illegible] SHEET [illegible]

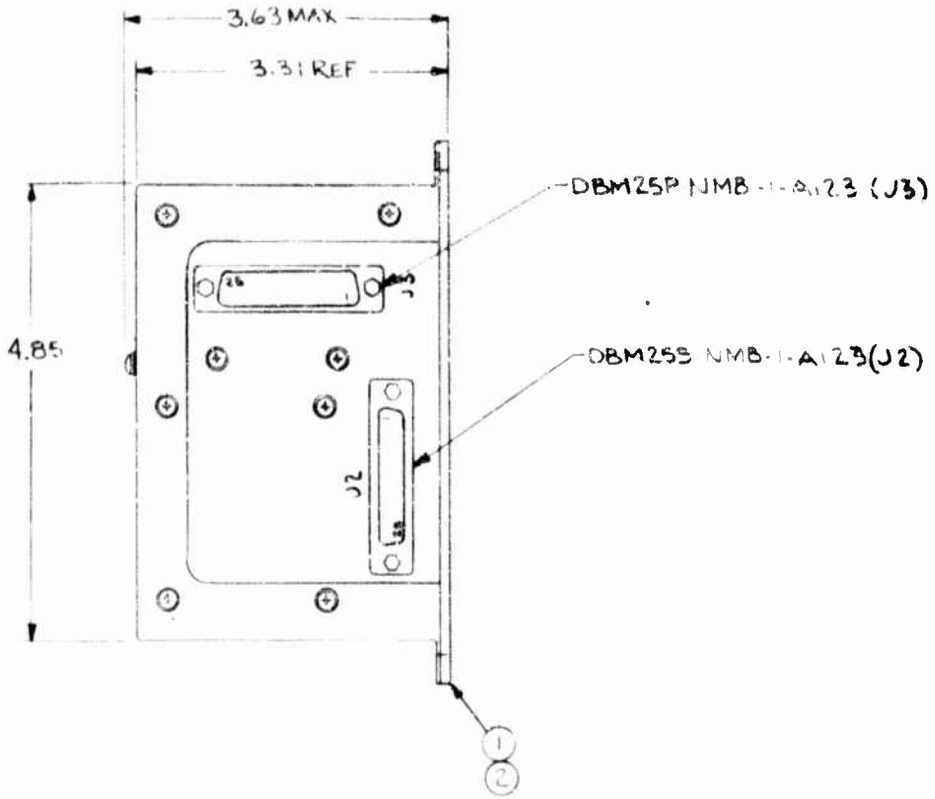


⚠ APPLY PER BPS4168

NOTES: 15

			BPS 4168	TOOLING DATA & INSTALLATION	-1
ED NO.	SH OF SH		NUMBER	APPLICATION	
ED TP COMPLETE POINT			APPLICABLE SPECIFICATIONS		

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



QTY REQD	FIND NO	CODE IDENT	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL OR NOTE	COMMERCIAL DESIGNATION	SPECIFICATION
	3		6176 300106-1	NAMEPLATE			
	2		6176 300101-1	ELECTRONICS PACKAGE			
	1		6176 300100-1	OUTLINE			

PARTS LIST

HOLE TOLERANCES EXCEPT AS SHOWN
.040 TO .129 ± .005 .000
.130 TO .250 ± .004 .000
.251 TO .484 ± .004 .000
.485 TO .735 ± .010 .000
.736 TO .985 ± .015 .000
.986 AND LARGER ± .020

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS

X	XX	XXX	ANGLES
± 1	± .03	± .010	± 0°30'

UNLESS OTHERWISE SPECIFIED BREAK ALL SHARP EDGES APPROX .015 R OR CHAMFER

MACHINED SURFACES EXCEPT AS NOTED ✓

SUPERSEDES | SUPERSEDED BY

DESIGN
GROUP
APPD
EXT
CHKR
STRESS
REL
CONTRACT NO

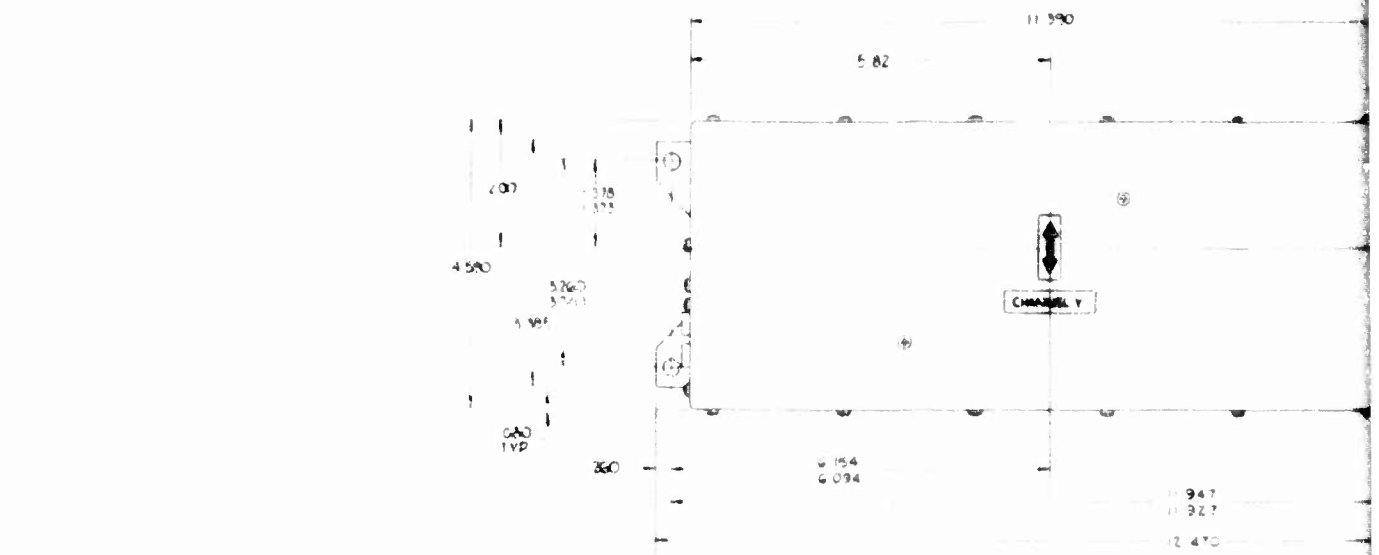
BELL AEROSYSTEMS

OUTLINE-ELECTRONICS PACKAGE, CRL II MESA

SIZE	CODE IDENT NO.	
D	80070	6176-300100

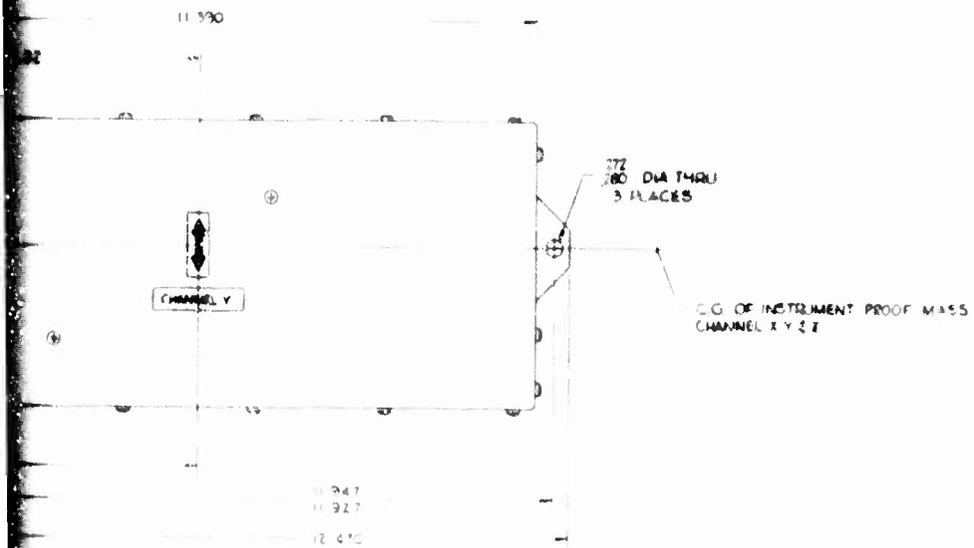
SCALE 1/1 SHEET 1 of 2

NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
6176 300000	CRL II	1	
DASH NO	APPLICATION	QTY REQD	
1			



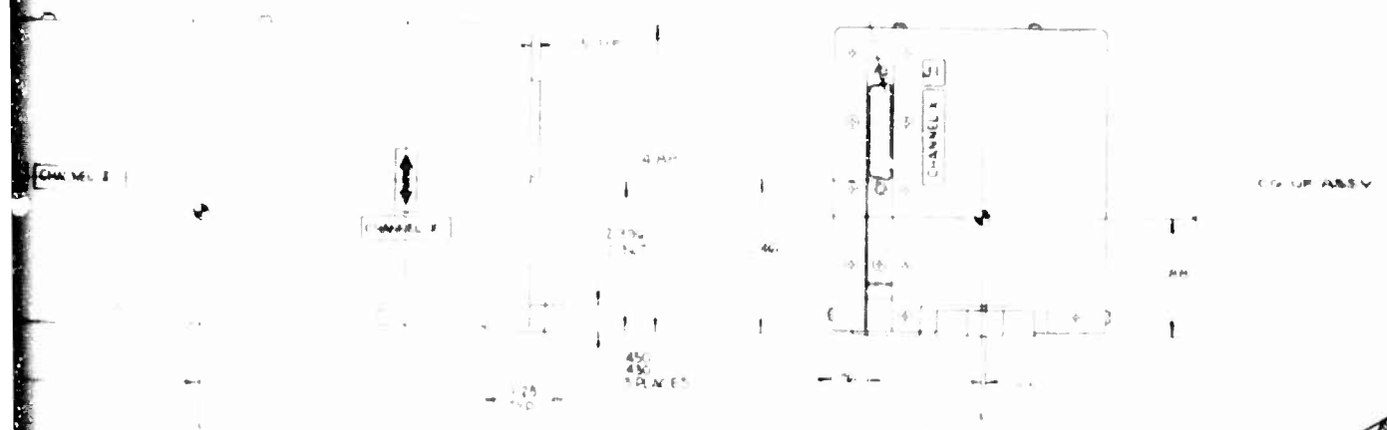
NOTES

1. DIMENSIONS SHOWN DEFINE MAXIMUM OUTLINE OF UNIT, UNLESS OTHERWISE SPECIFIED



C.G. OF INSTRUMENT PROOF MASS
CHANNEL Y

C.G. OF INSTRUMENT PROOF MASS
CHANNEL Y



PARTS LIST

OUTLINE DRAWING,
3 AXIS ACCELEROMETER -
MESA II

169

6172 -300200