

**INSTRUMENTATION
AND DATA ACQUISITION MANUAL**

VOLUME III - SHIP 2 INSTRUMENTATION

(NASA-CR-166349) V/STOL TILT ROTOR RESEARCH
AIRCRAFT. VOLUME 3: SHIP 2 INSTRUMENTATION
(Textron Bell helicopter) 579 p
PC 325/HF A01

N82-24196

CSSL 01C

Unclass
63/05 21548

V/STOL TILT ROTOR RESEARCH AIRCRAFT

301-099-022



Bell Helicopter TEXTRON

Division of Textron Inc

POST OFFICE BOX 482 • FORT WORTH, TEXAS 76101

VOLUME III - SHIP NO. 2 RESEARCH INSTRUMENTATION

This volume contains information covering sensor cables, sensor installation and sensor calibration for XV-15 Aircraft No. 2. The information contained herein is organized into sections according to junction box (J-box) designation. For each J-box designation, there is a section containing a schematic of the J-box disconnect harness, instrumentation worksheets which show sensor installation, and calibration data sheets for each sensor associated with that J-box.

An index of measurement item codes to J-box location is given in Table III-I. A cross-reference of sensor location, J-box designation, disconnect wiring harness diagram, sensor installation worksheet, calibration data sheet, sensor part number and serial number is given in Table III-II.

TABLE III-I. ITEM CODE TO J-BOX INDEX.

MEASUREMENT ITEM CODE	MEASUREMENT DESCRIPTION	ASSOCIATED J-BOX	J-BOX DISCONNECT

Use or disclosure of data on this page is
subject to the restriction on the title page

TABLE III-II. MEASUREMENT CROSS-REFERENCE.

AREA	J-BOX	DESCRIPTION	ITEM CODE	DISCONNECT HARNESS	SENSOR INSTALLATION	CALIBRATION SHEET	SENSOR PART NO.	SENSOR S/N

Use or disclosure of data on this page is subject to the restriction on the title page

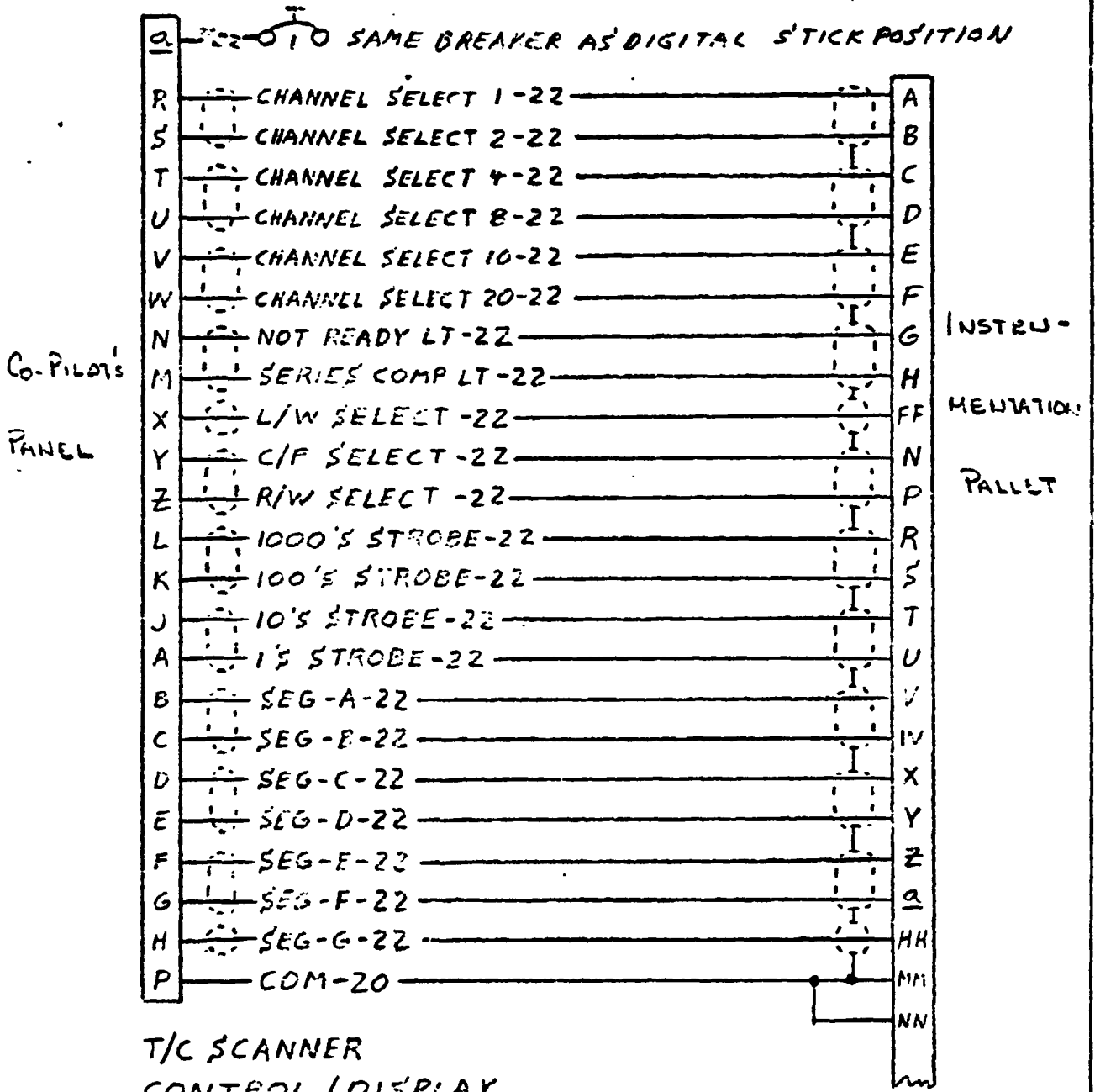
4-2879

279

(b) 192 279

ORIGINAL PAGE IS
OF POOR QUALITY

TEMP SCANNER SYSTEM



T/C SCANNER
CONTROL / DISPLAY
PANEL
PLUG A
KPT06-16-265

EQUIPMENT PACKAGE
PLUG E
KPT06-24-61P
(SEE SKTASW138-1
PAGE 2 OF 11 + SKTASW138-2
FOR COMPLETION OF THIS PLUG)

7847 88888888 100

BY H. D. WINNIFORD
CHECKED [Signature]

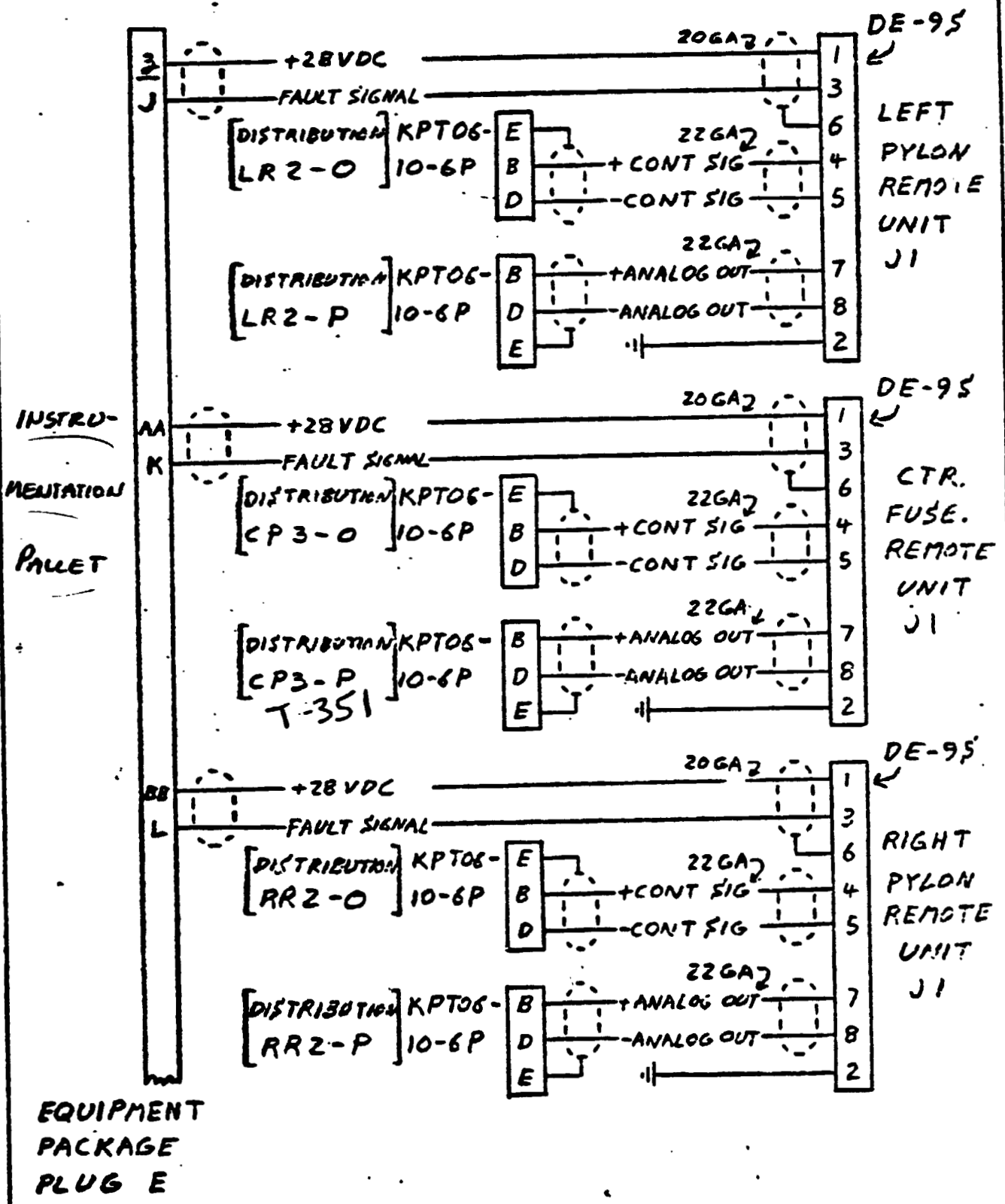
BELL HELICOPTER COMPANY

MODEL 301 PAGE 20P 11
HELI. 1F2 RPT SKTASW/38-1

ORIGINAL PAGE IS
OF POOR QUALITY

TEMP SCANNER SYSTEM

~~OBsolete~~
6-23-78



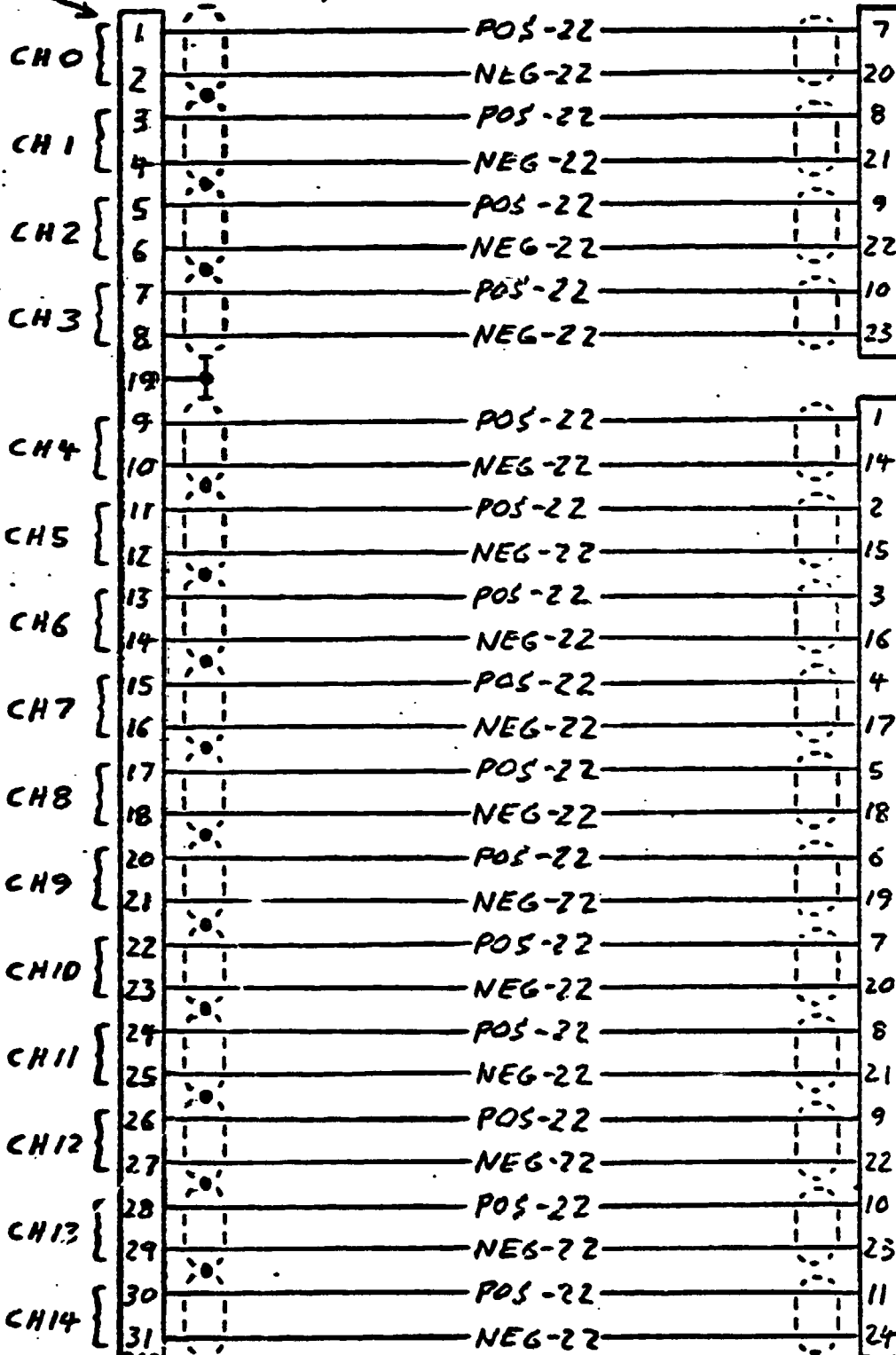
7245 000REV 100

(Signature)

TEMP SCAN SYSTEM RIGHT PYLON

ORIGINAL PAGE IS
OF POOR QUALITY

DC-37P



DB25P



OUTPUT
INPUT
13-24
(J4)

DB25P



OUTPUT
INPUT
1-12
(J2)

J2

TEMP SCANNER REMOTE UNIT

VALIDYNE T/C REF
JUNCTION *1

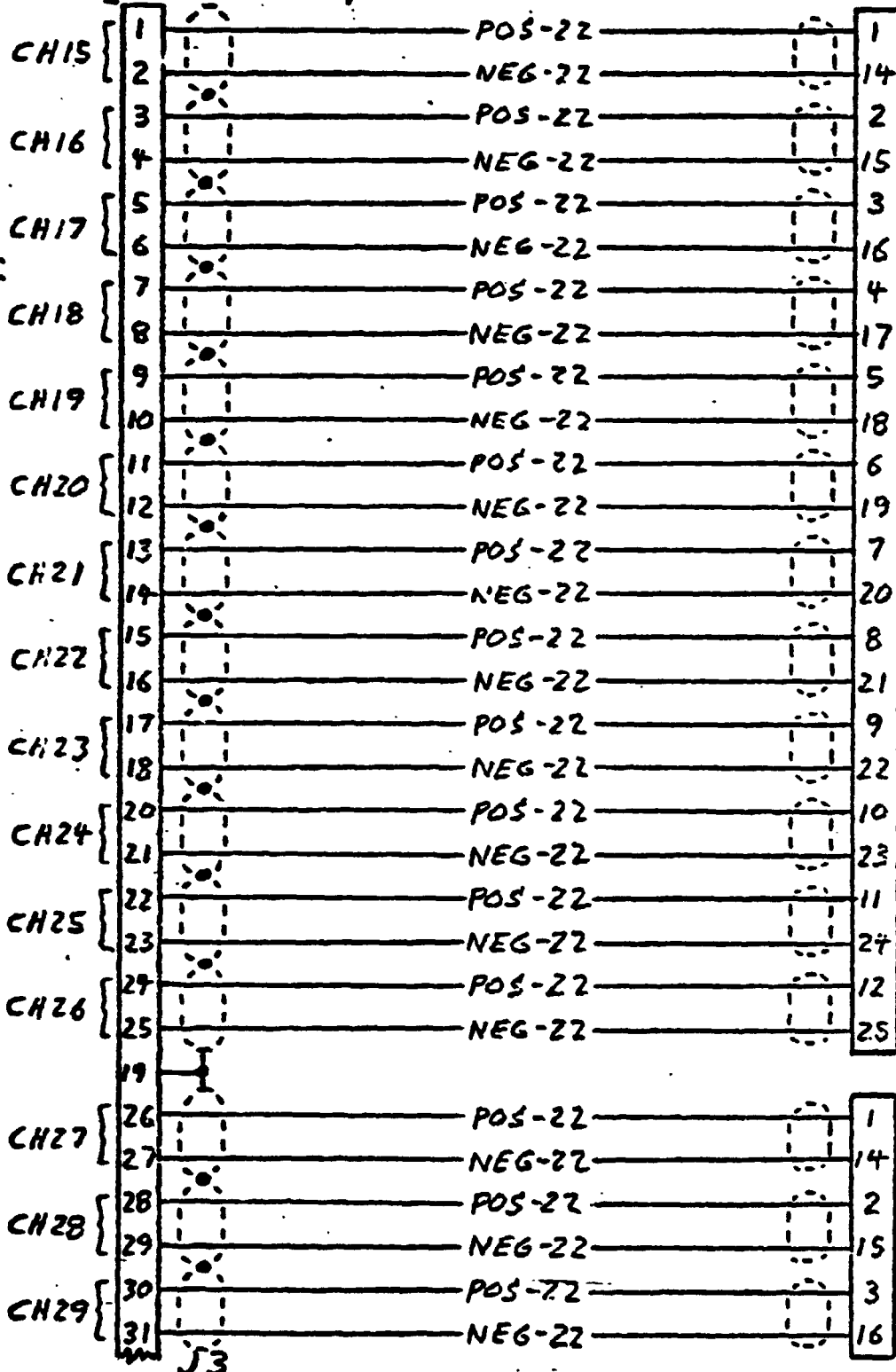
901 A3 JB0000 0003

TEMP SCAN SYSTEM RIGHT PULON

ORIGINAL PAGE IS
OF POOR QUALITY

DC-37P

DB25P



OUTPUT
INPUT

1-12

(J2)

DB25P

OUT PUT
INPUT

13-24

(J4)

TEMP SCANNER REMOTE UNIT

VALIDYNE T/C
REF JUNCTION
2

7240 000REV 100

BY H. D. WINNIFORD

BELL HELICOPTER COMPANY

MODEL 301 PAGE 5 OF 11

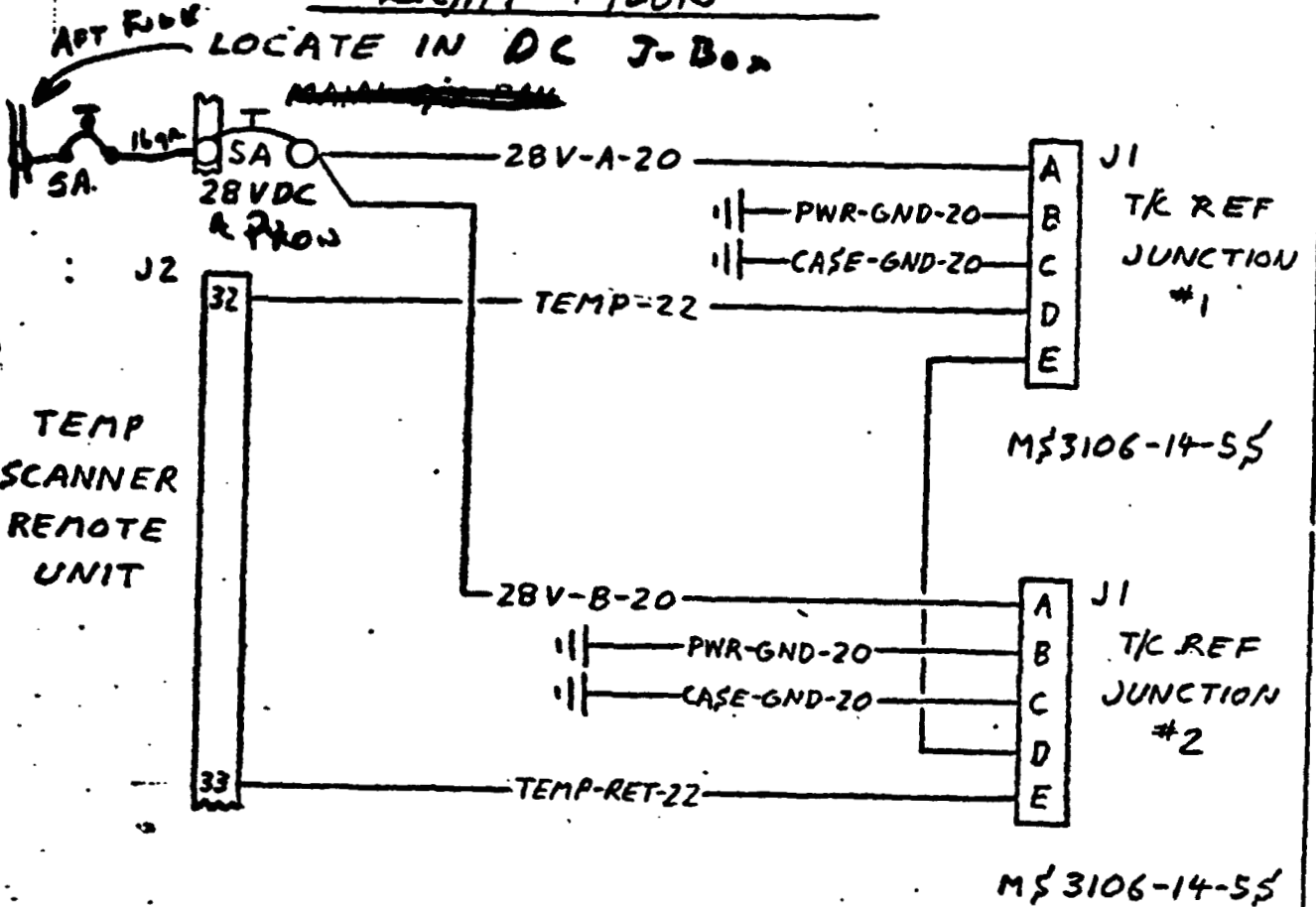
CHECKED [Signature]

HELI. 1&Z RPT SKTASW138-1

TEMP SCAN SYSTEM

ORIGINAL PAGE IS OF POOR QUALITY

RIGHT PYLON



BY H.D. WINNIFORD

BELL HELICOPTER COMPANY

MODEL 301 PAGE 6 OF 11

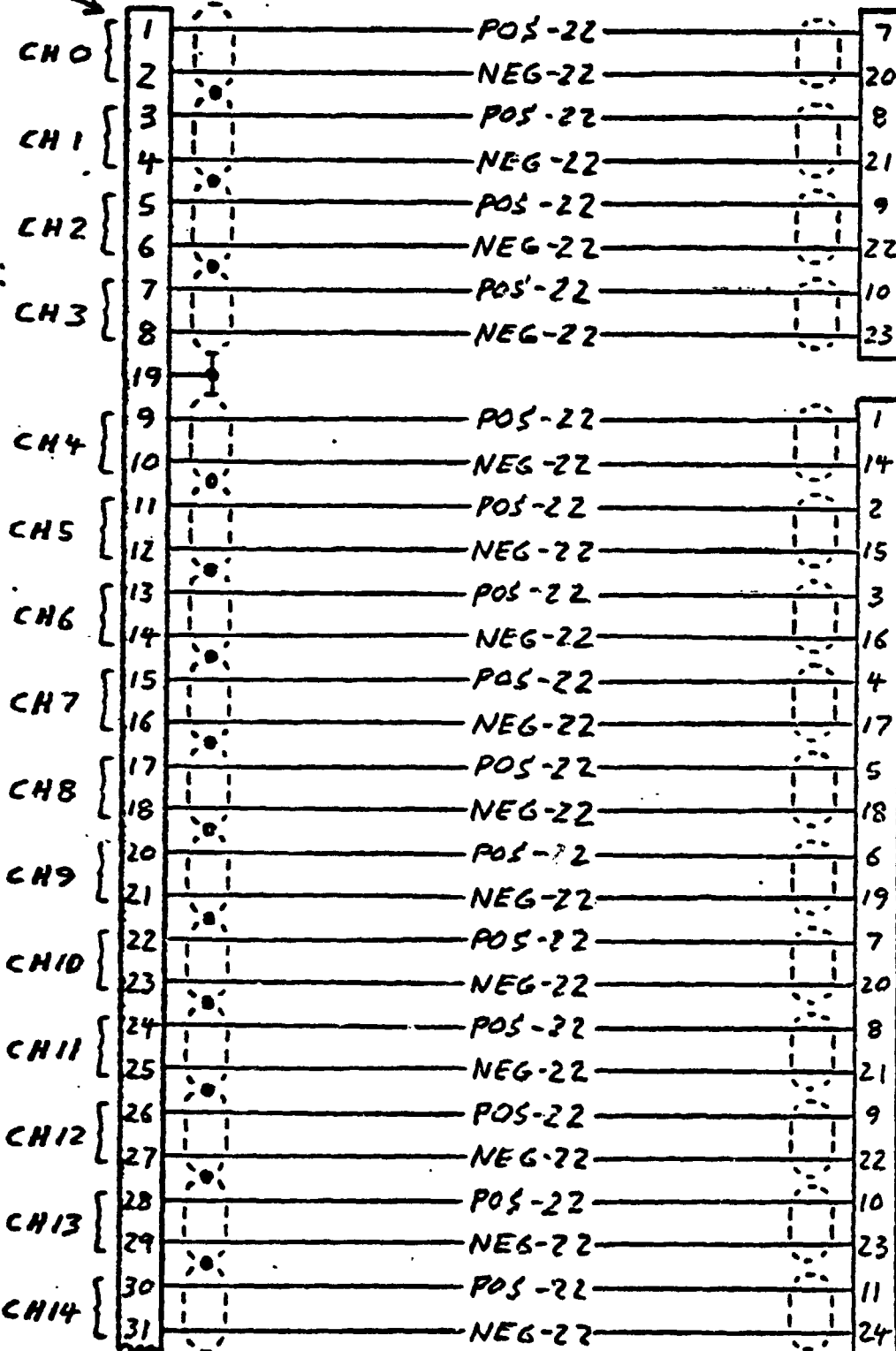
CHECKED (Signature)

HELI. 152 RPT SKTASU139-1

ORIGINAL PAGE IS
OF POOR QUALITY

TEMP SCAN SYSTEM AFT CENTER FUSELAGE

DC-37P



DB25P



OUTPUT
INPUT
13-24
(J4)

DB25P



OUTPUT
INPUT
1-12
(J2)

J2

TEMP SCANNER REMOTE UNIT

VALIDYNE T/C REF
JUNCTION #1

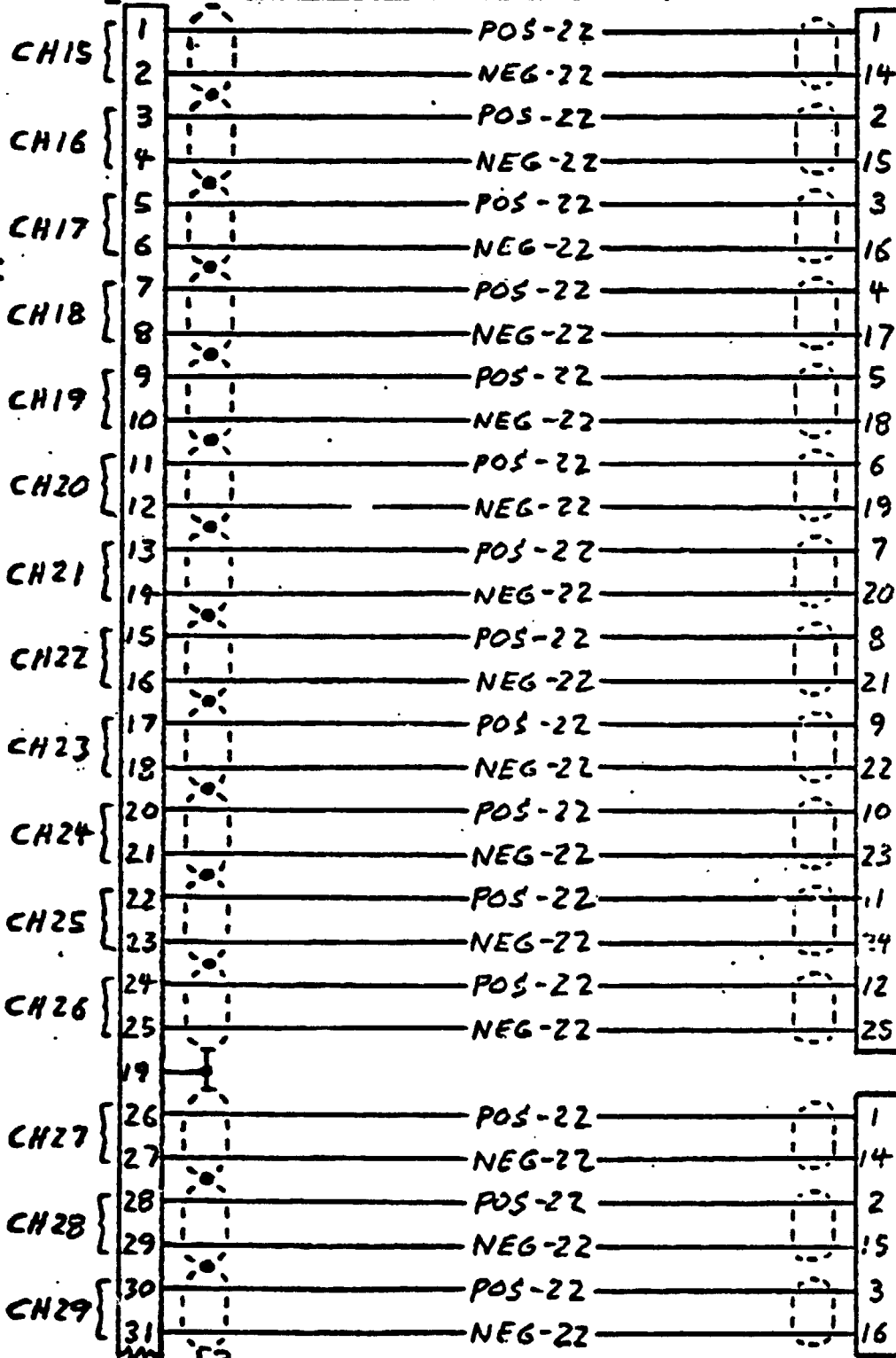
7245 5000000

TEMP SCAN SYSTEM AFT CENTER FUSELAGE

ORIGINAL PAGE IS
OF POOR QUALITY

DC-37P

DB25P



OUTPUT INPUT
1-12
(J2)

DB25P
OUTPUT INPUT
13-24
(J4)

TEMP SCANNER REMOTE UNIT

VALIDYNE T/C
REF JUNCTION
#2

7048 00000000 100

BY N. D. WINNIFORD

BELL HELICOPTER COMPANY

MODEL 301 PAGE 8 OF 11

CHECKED AW

HELI. 152 RPT SKTASW/38-1

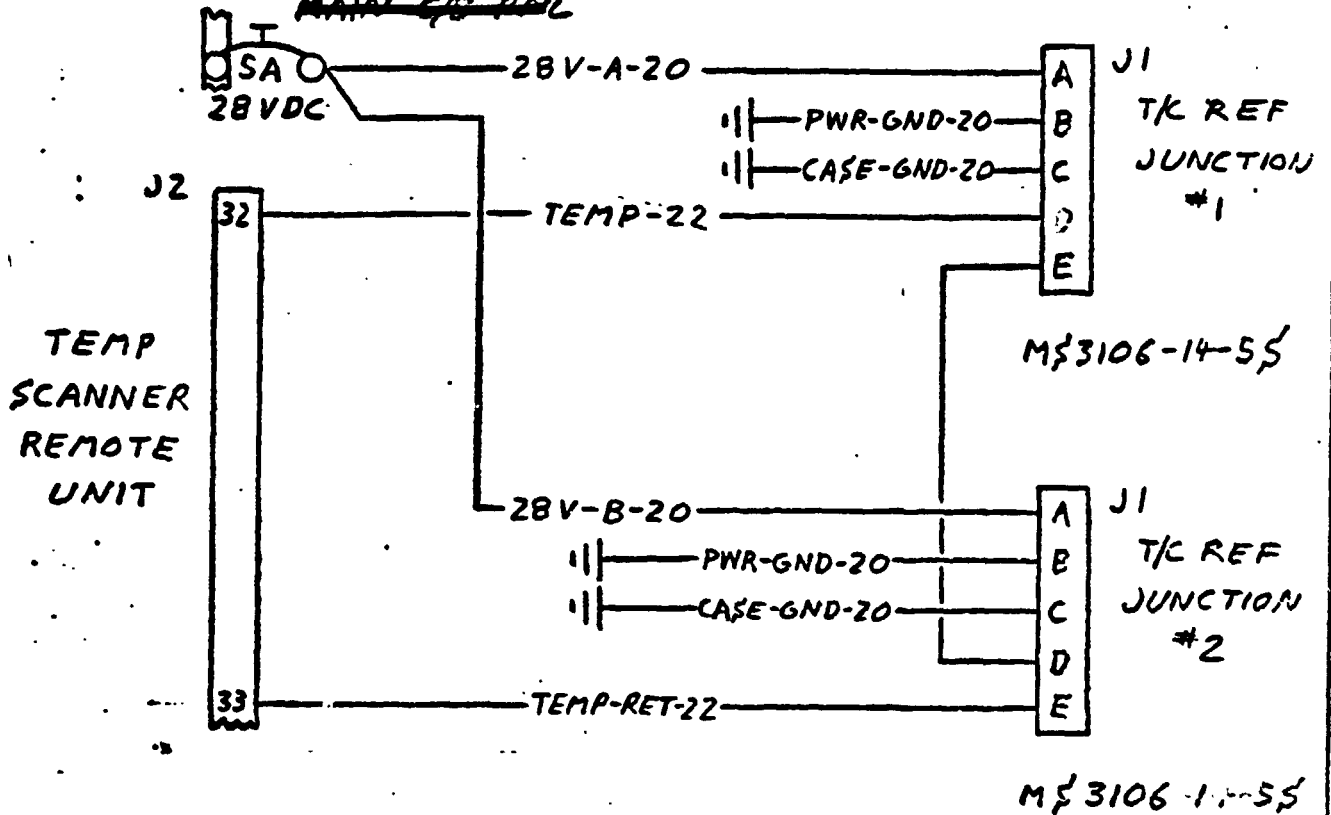
TEMP SCAN SYSTEM

ORIGINAL PAGE IS
OF POOR QUALITY

AFT CENTER FUSELAGE

LOCATE IN D.C. J-Box

~~MAIN GND RAIL~~



BY H.D. WINNIFORD

BELL HELICOPTER COMPANY

MODEL 301 PAGE 9 OF 11

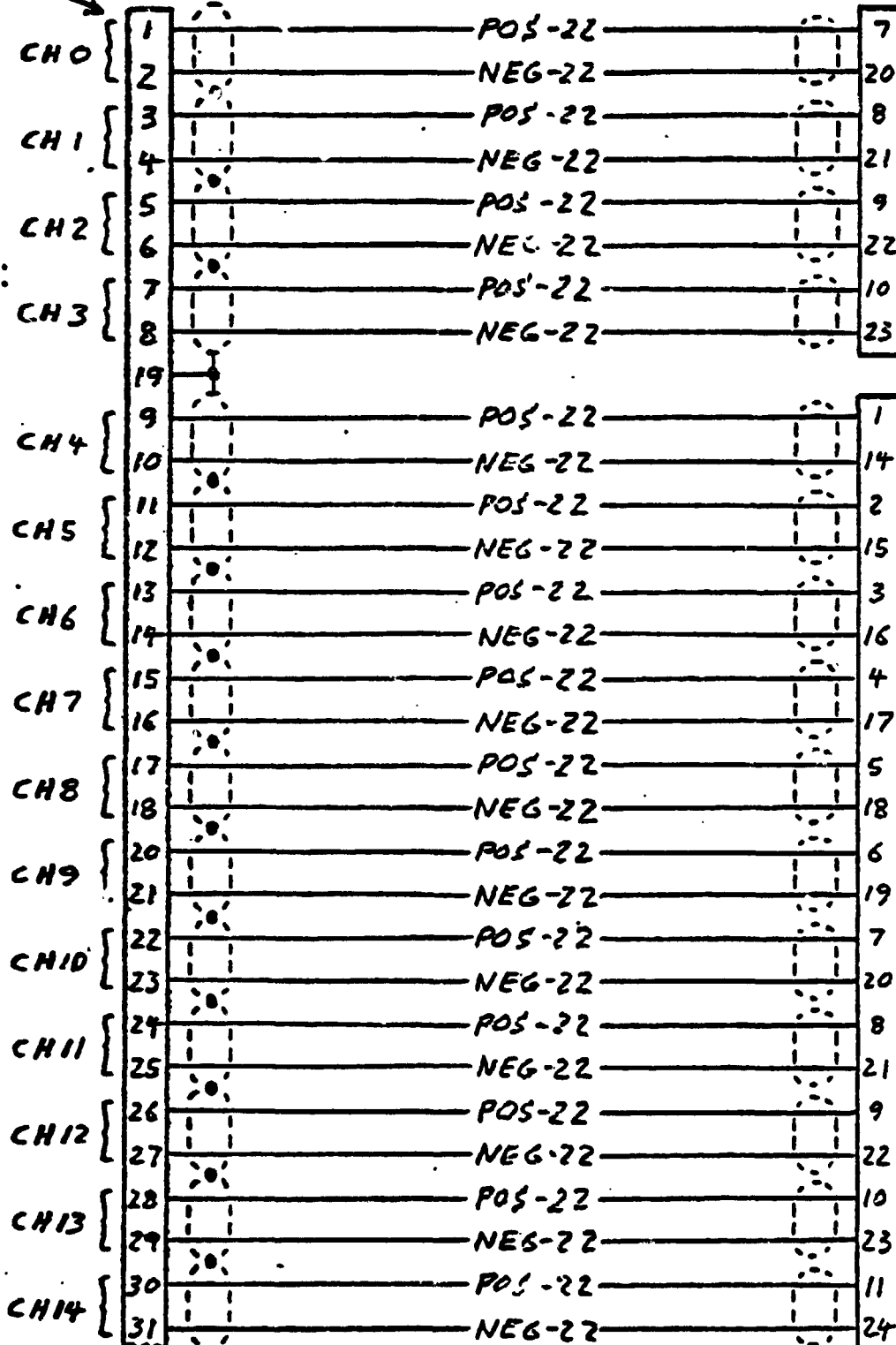
CHECKED (Signature)

HELI. 152 RPT SKTASW139-1

TEMP SCAN SYSTEM LEFT PYLON

ORIGINAL PAGE IS
OF POOR QUALITY

DC-37P



DB25P



OUTPUT
INPUT
13-24
(J4)

DB25P



OUTPUT
INPUT
1-12
(J2)

J2

TEMP SCANNER REMOTE UNIT

VALIDYNE T/C REF
JUNCTION #1

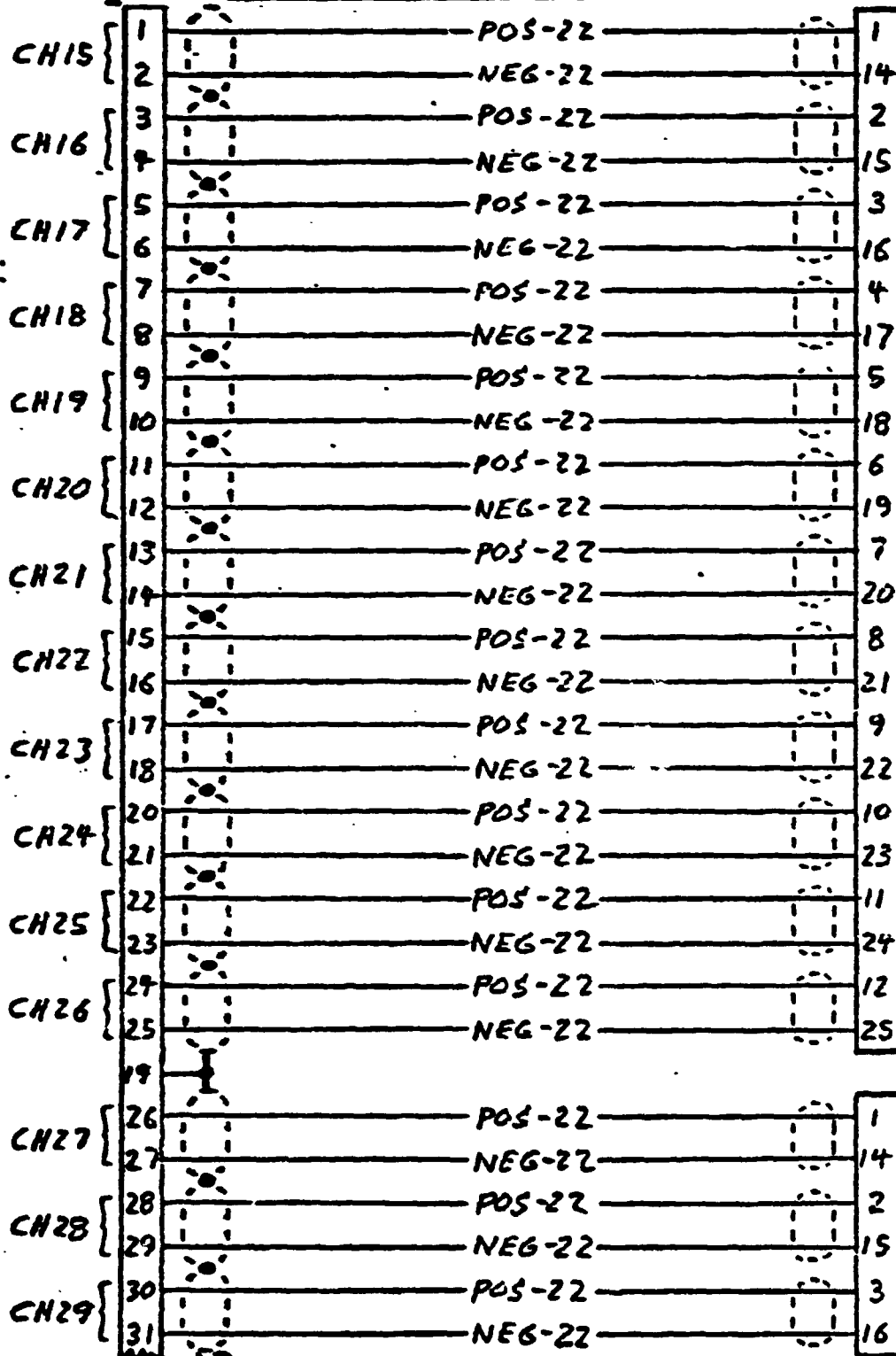
9408 99000REV

TEMP SCAN SYSTEM LEFT PYLON

ORIGINAL PAGE IS
OF POOR QUALITY

DC-37P

DB25P



OUTPUT
INPUT
1-12
(12)

DB25P
OUTPUT
INPUT
13-24
(14)

TEMP SCANNER REMOTE UNIT

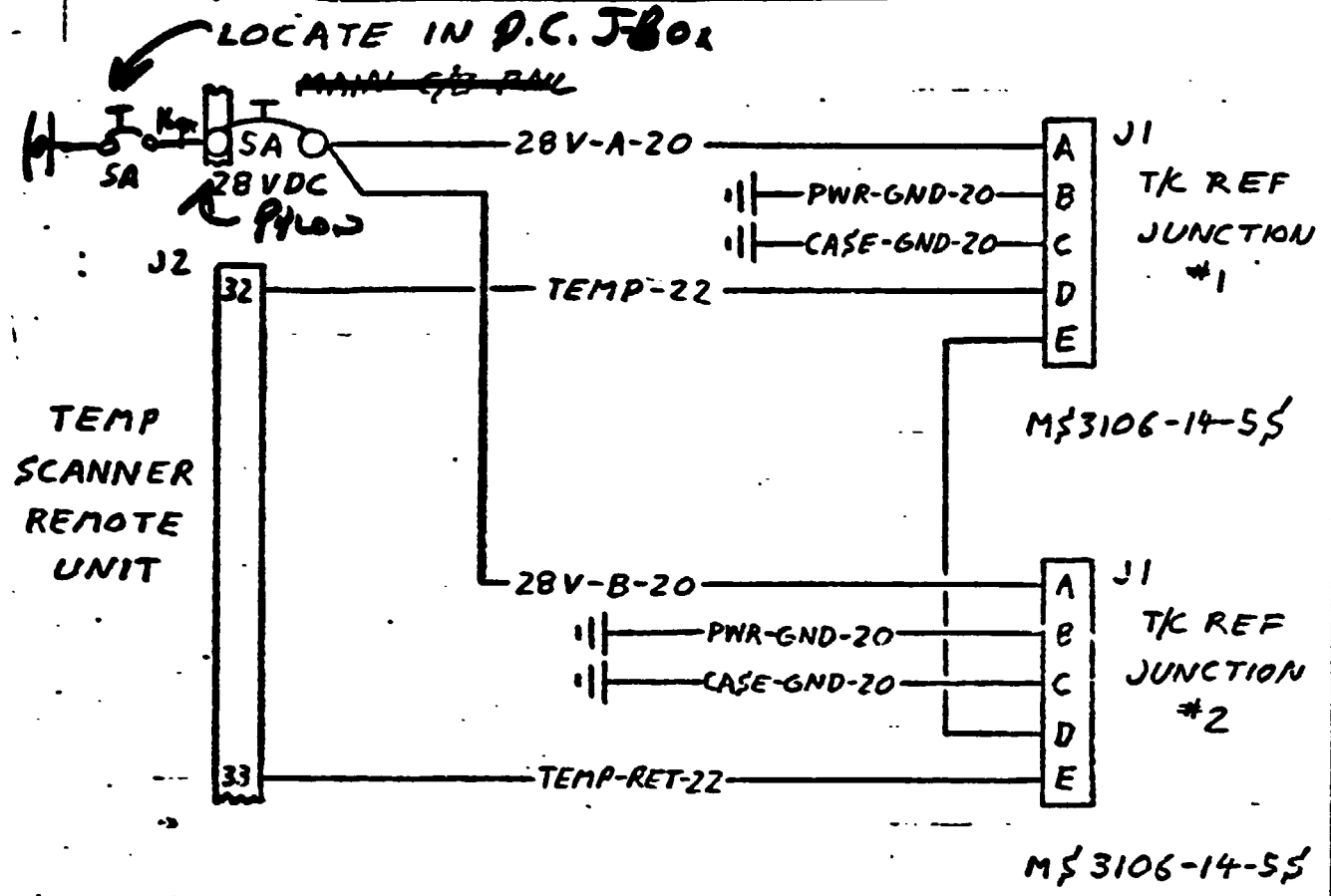
VALIDYNE T/C
REF JUNCTION
2

7048 0000REV 100

TEMP SCAN SYSTEM

ORIGINAL PAGE IS
OF POOR QUALITY

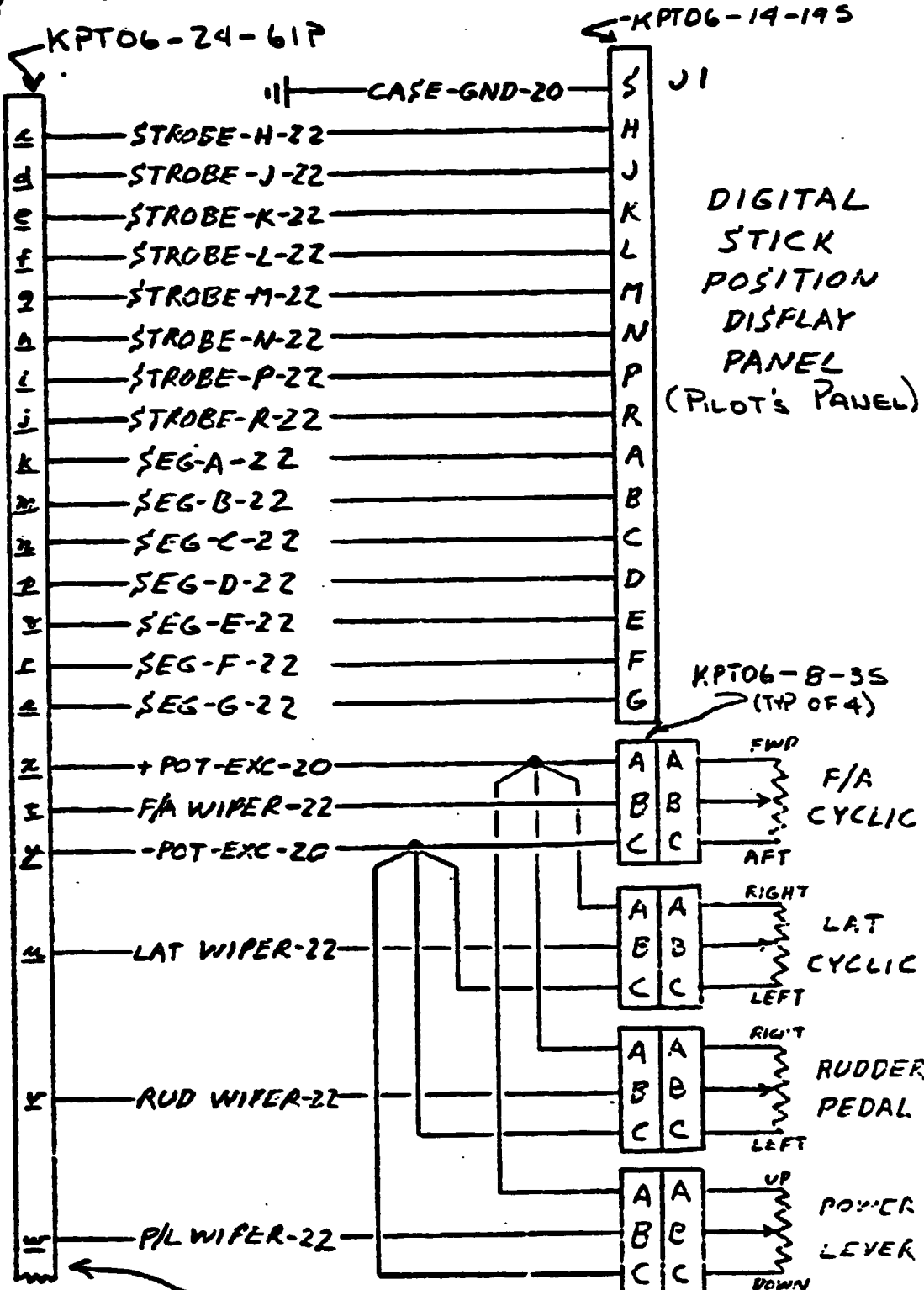
LEFT PYLON



ORIGINAL PAGE IS OF POOR QUALITY

DIGITAL STICK POSITION SYSTEM

28 28 28 (28) 279



INSTRUMENTATION PALLET

EQUIPMENT PACKAGE PLUG E

* NOTE - SEE SKTASW138-1 SHEETS 1+2 OF 11 FOR COMPLETION OF THIS PLUG

100 000000000000

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE

CHECKED _____

HELI. 142 RPTSKASW05575-12

ORIGINAL PAGE IS
OF POOR QUALITY

Auth: 4-8-79
DR 279

FUEL QUANT WIRING

INSTRUMENTATION
PALLET

FUEL FLOW
TRANSDUCER
IN COCKPIT

DPX2HA-675
(TOP OF 2)

KPT06-29-61P

COMMON	40	COMM - R - B - 20	K
DATA VALID	41	DATA - R - M - 22	M
BIT 1	42	BIT - 1 - R - N - 22	N
2	43	BIT - 2 - R - P - 22	P
3	44	BIT - 3 - R - Q - 22	Q
4	45	BIT - 4 - R - S - 22	R
5	46	BIT - 5 - R - T - 22	T
6	47	BIT - 6 - R - U - 22	U
7	48	BIT - 7 - R - V - 22	V
8	49	BIT - 8 - R - W - 22	W
9	50	BIT - 9 - R - X - 22	X
10	51	BIT - 10 - R - Y - 22	Y
11	52	BIT - 11 - R - Z - 22	Z
BIT 12	53	BIT - 12 - R - AA - 22	AA
COMMON	40	COMM - L - AA - 20	AA
DATA VALID	41	DATA - L - BB - 22	BB
BIT 1	42	BIT - 1 - L - CC - 22	CC
2	43	BIT - 2 - L - DD - 22	DD
3	44	BIT - 3 - L - EE - 22	EE
4	45	BIT - 4 - L - FF - 22	FF
5	46	BIT - 5 - L - GG - 22	GG
6	47	BIT - 6 - L - HH - 22	HH
7	48	BIT - 7 - L - II - 22	II
8	49	BIT - 8 - L - JJ - 22	JJ
9	50	BIT - 9 - L - KK - 22	KK
10	51	BIT - 10 - L - LL - 22	LL
11	52	BIT - 11 - L - MM - 22	MM
BIT 12	53	BIT - 12 - L - NN - 22	NN
			PP

PLUG

B

R516

R517

R

L

FORM 8000REV 100

BY **A. W. RHEINER**

BELL HELICOPTER COMPANY

MODEL **301** PAGE _____

CHECKED _____

HELI. **142** RPT. **SKASWOESTS-10**

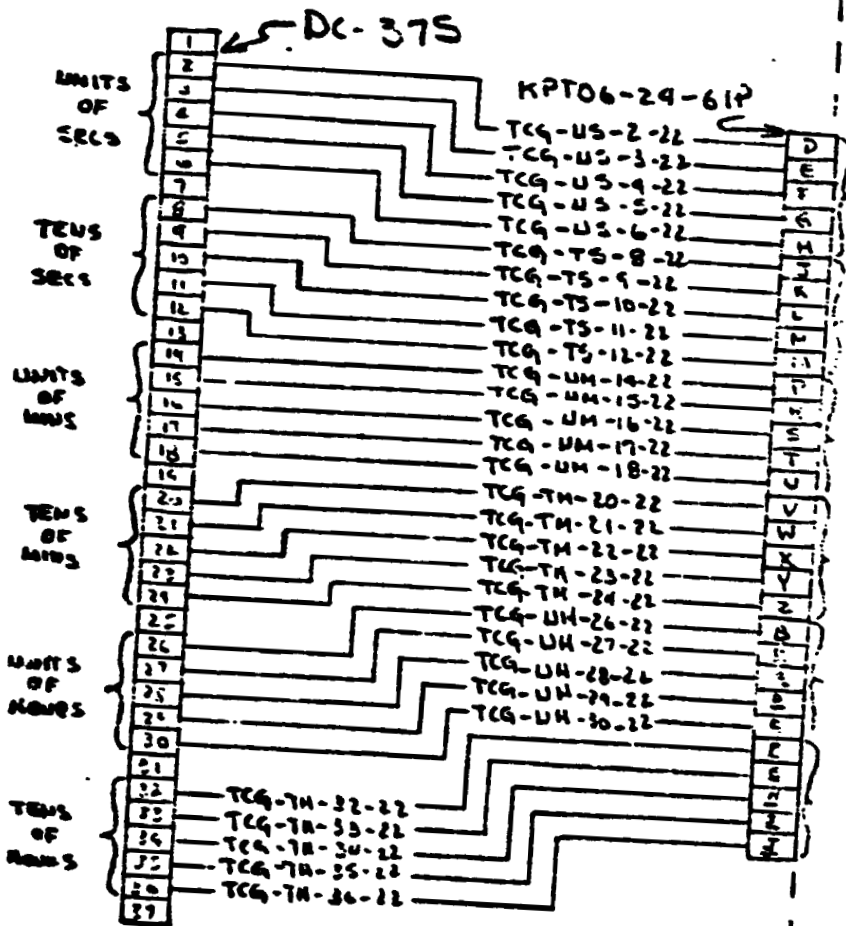
PILOT'S TCG DISPLAY

Rev.
+28-78
(6h 182) 279

PILOT'S
DISPLAY

ORIGINAL PAGE IS
OF POOR QUALITY

INSTRUMENTATION
PALLET



PLUG
B
ON INSTR.
PALLET

ORIGINAL PAGE IS OF POOR QUALITY

PILOT'S INFO PANEL

KPT02-18-32P

279
68
182

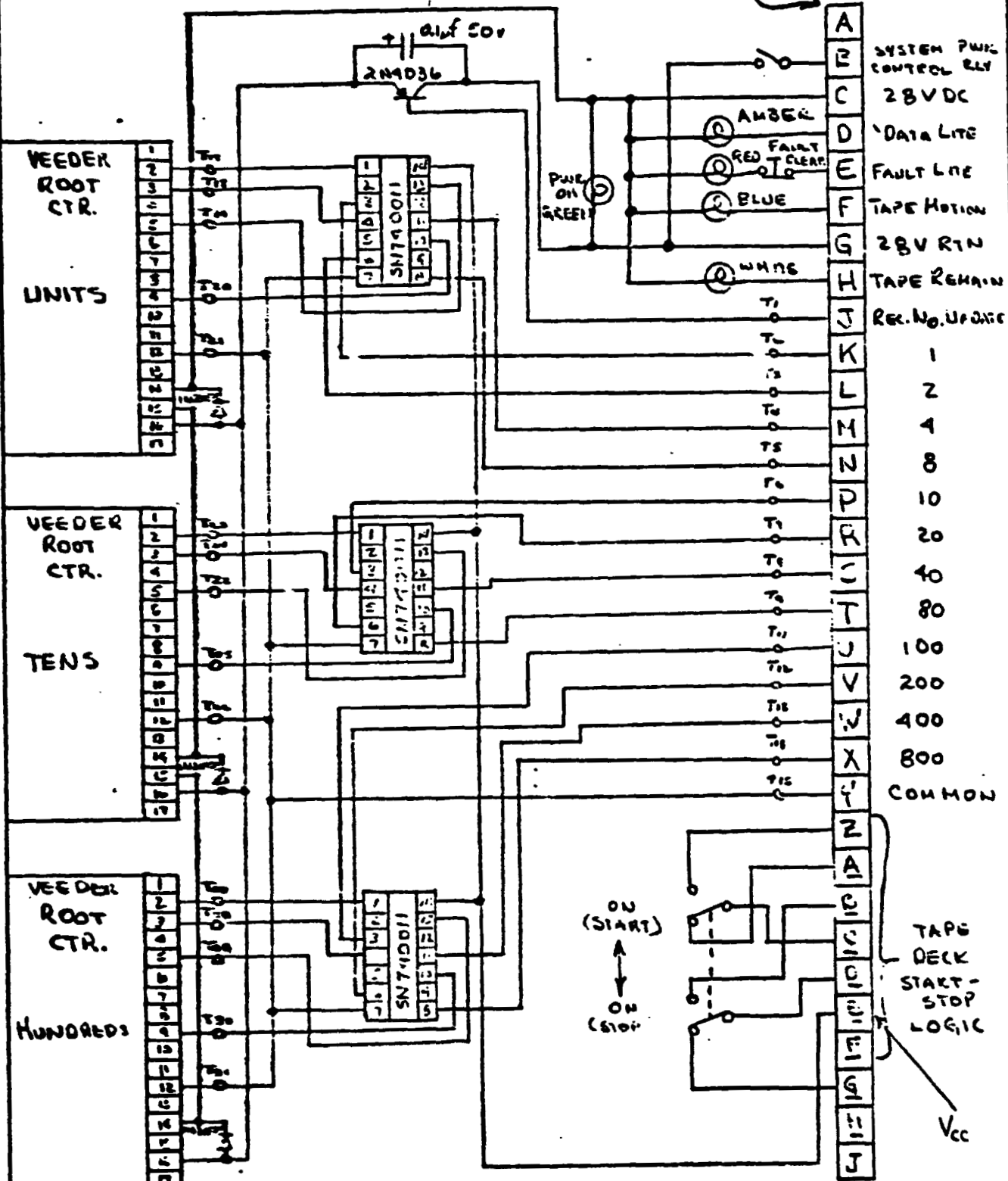


FIGURE 28

7042 0000REV 100

BY A. WHITEIER
 CHECKED (initials)

BELL HELICOPTER COMPANY

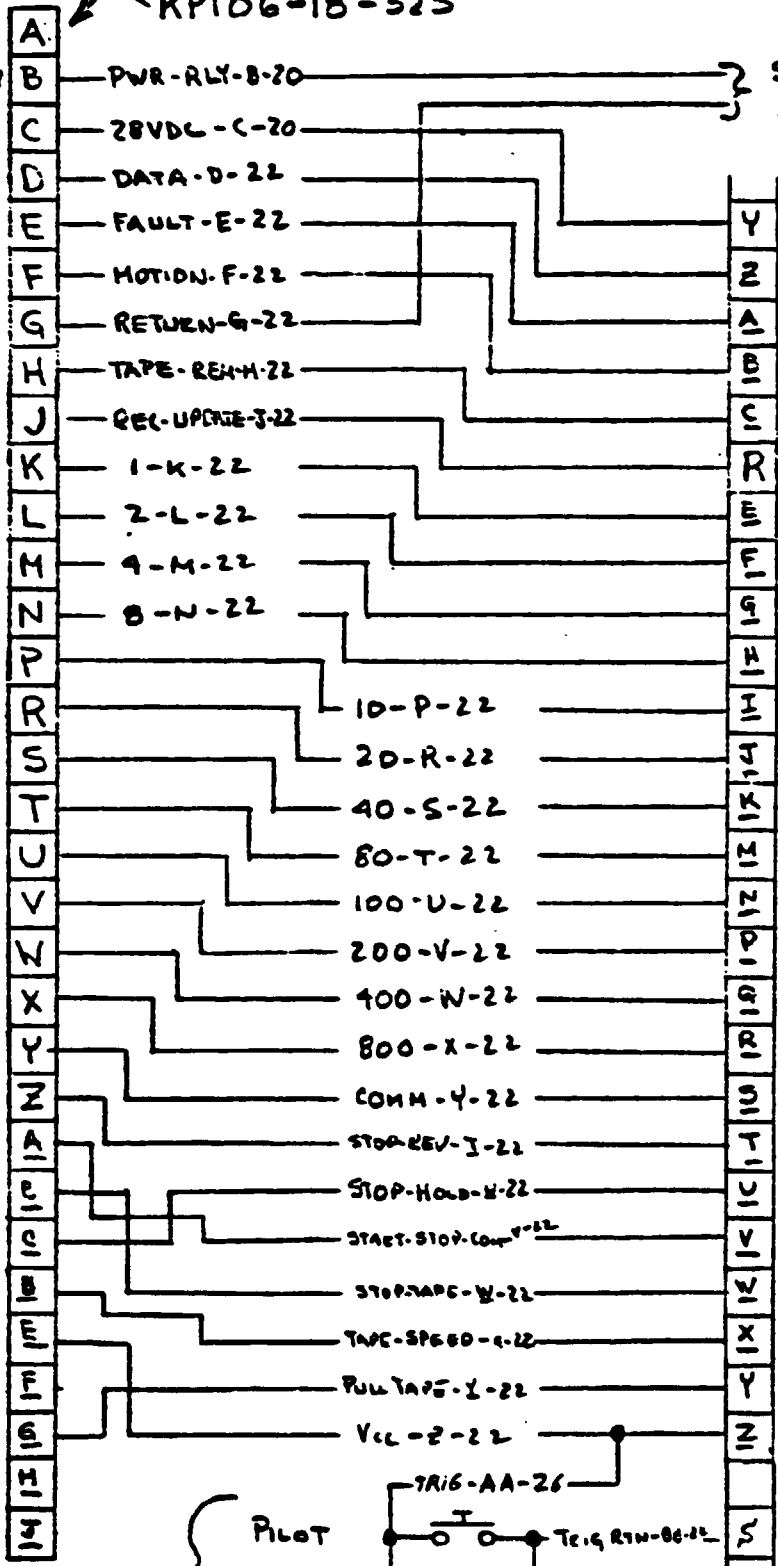
MODEL 301 PAGE _____
 HELI. 142 RPT SKASWJ05575-9

PILOT INFO HARNESS

REV 18-79
 (BR 182) 279

ON PILOT'S PANEL

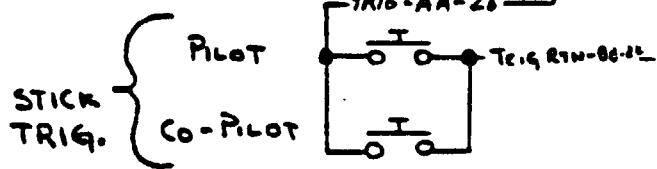
- SYSTEM CONTROL REV
- 28 VDC
- DATA LITE
- FAULT LITE
- TAPE MOTION
- 28VDC RTN
- TAPE REMAN
- REC. NO. UPDATE
- 1
- 2
- 4
- 8
- 10
- 20
- 40
- 80
- 100
- 200
- 400
- 800
- COMMON
- NCC(1)
- NO(1)
- NCC(2)
- CENTER (1)
- CENTER (2)
- Vcc
- NO(2)



SEE SKT ASW05575-8

KPT06-29-61P
 (SEE SKT

PLUG
 A
 INSTR.
 PALLET



ORIGINAL PAGE IS OF POOR QUALITY

7048 0000REV 100

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE _____

CHECKED AW

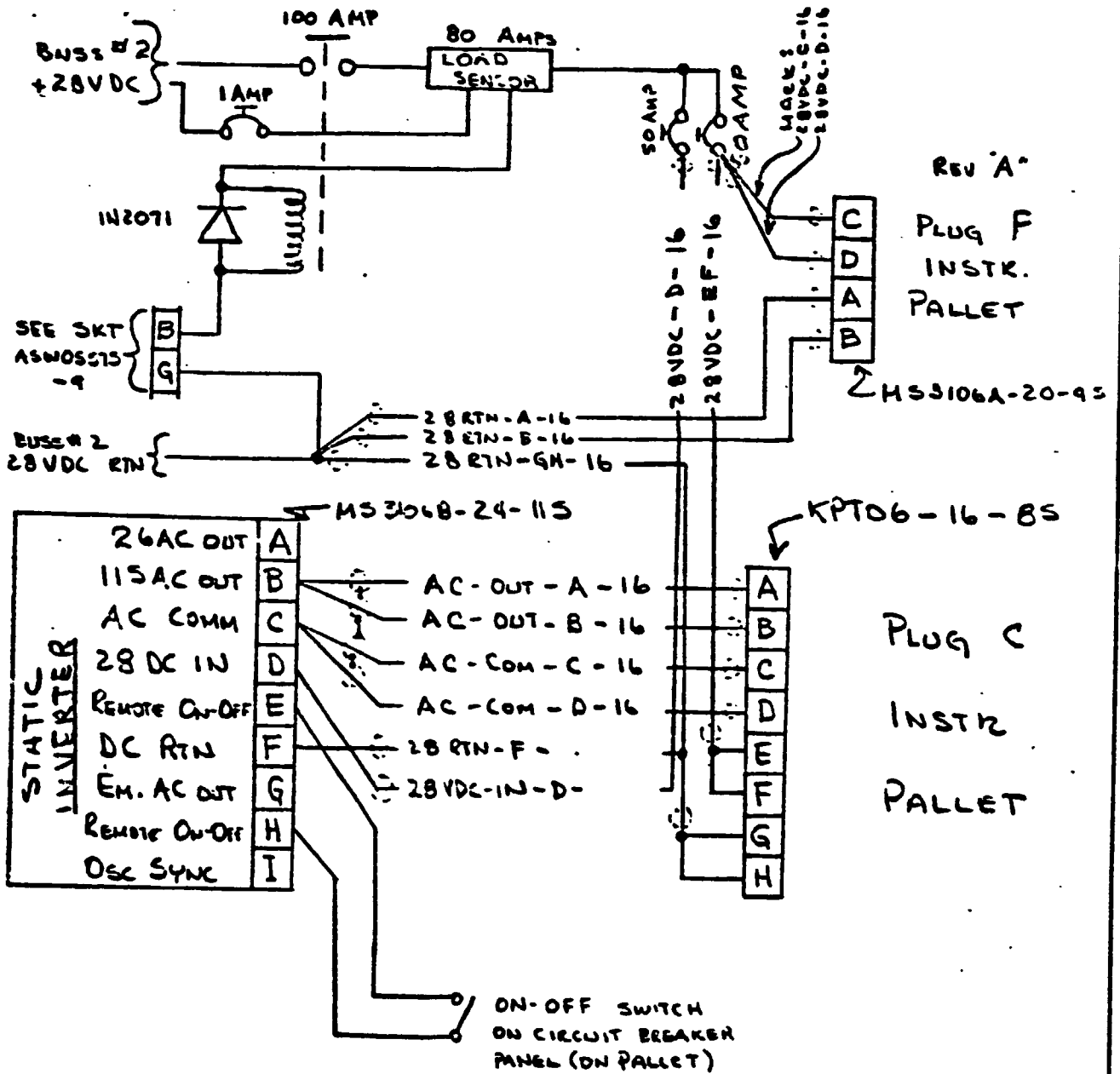
HELI: 1+2 RPT SKASW05575-2

REV A 8-13-76 AW

ORIGINAL PAGE IS OF POOR QUALITY

INSTRUMENTATION POWER WIRING

REV A
43E.98
(BH 182) 279



1. EQUIPMENT MOUNTED ON AUX. PALLET AT AFT END OF CABIN AREA.

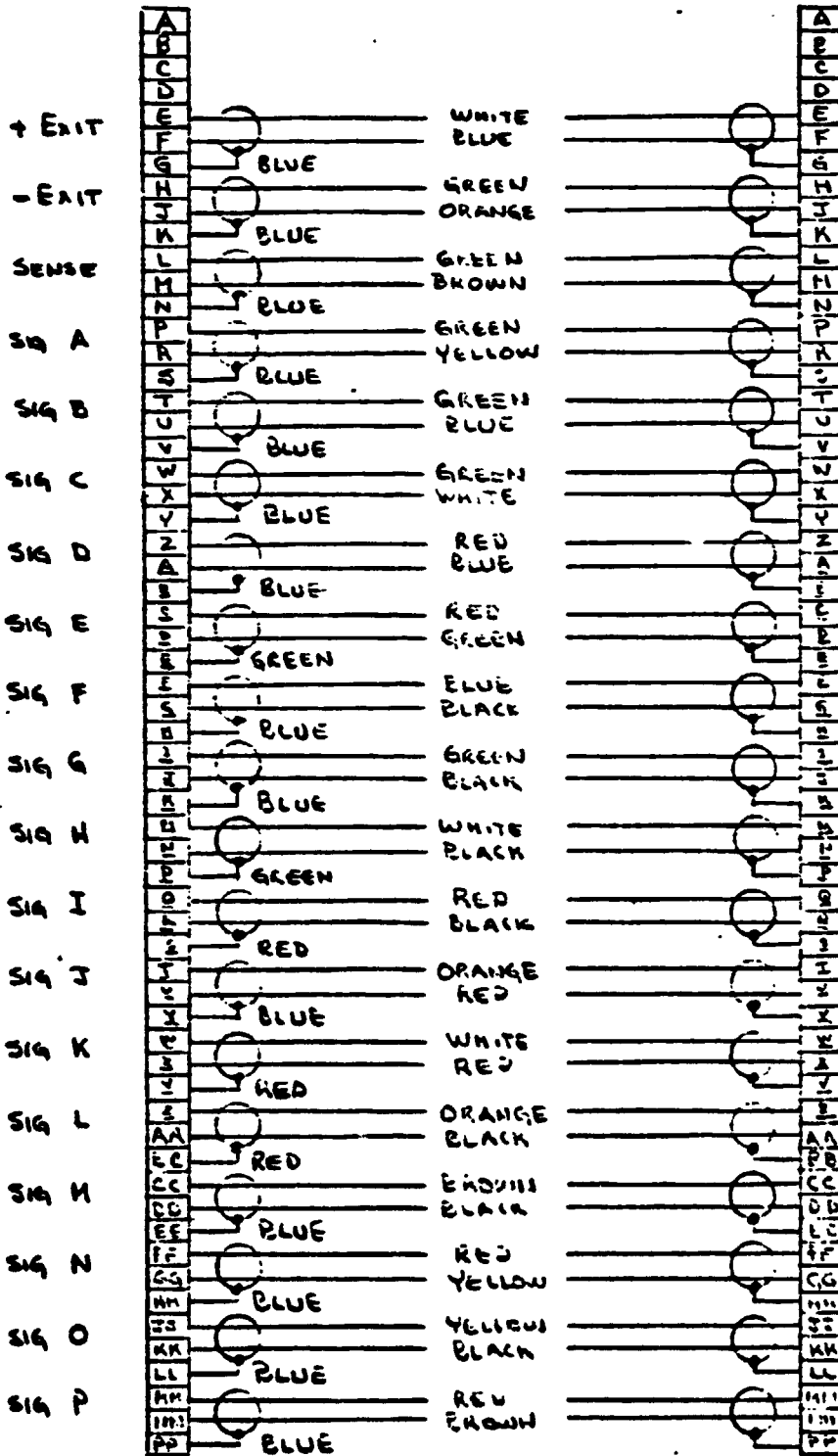
7000 SECURITY 100

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL 301 SIGNAL CABLE

Rev 76
ch-24
BFL 1R2 **279**

TYP OF 8 → LP-1, LP-2, LR-1, LR-2, RP-1, RP-2, RR-1, RR-2)



J-Box
CONNECTOR

* NOTE 1
RR-1, RR-2,
LR-1, LR-2
SHOULD HAVE
KPT02-24-615

← KPT06-24-61P

KPT06-24-61S →

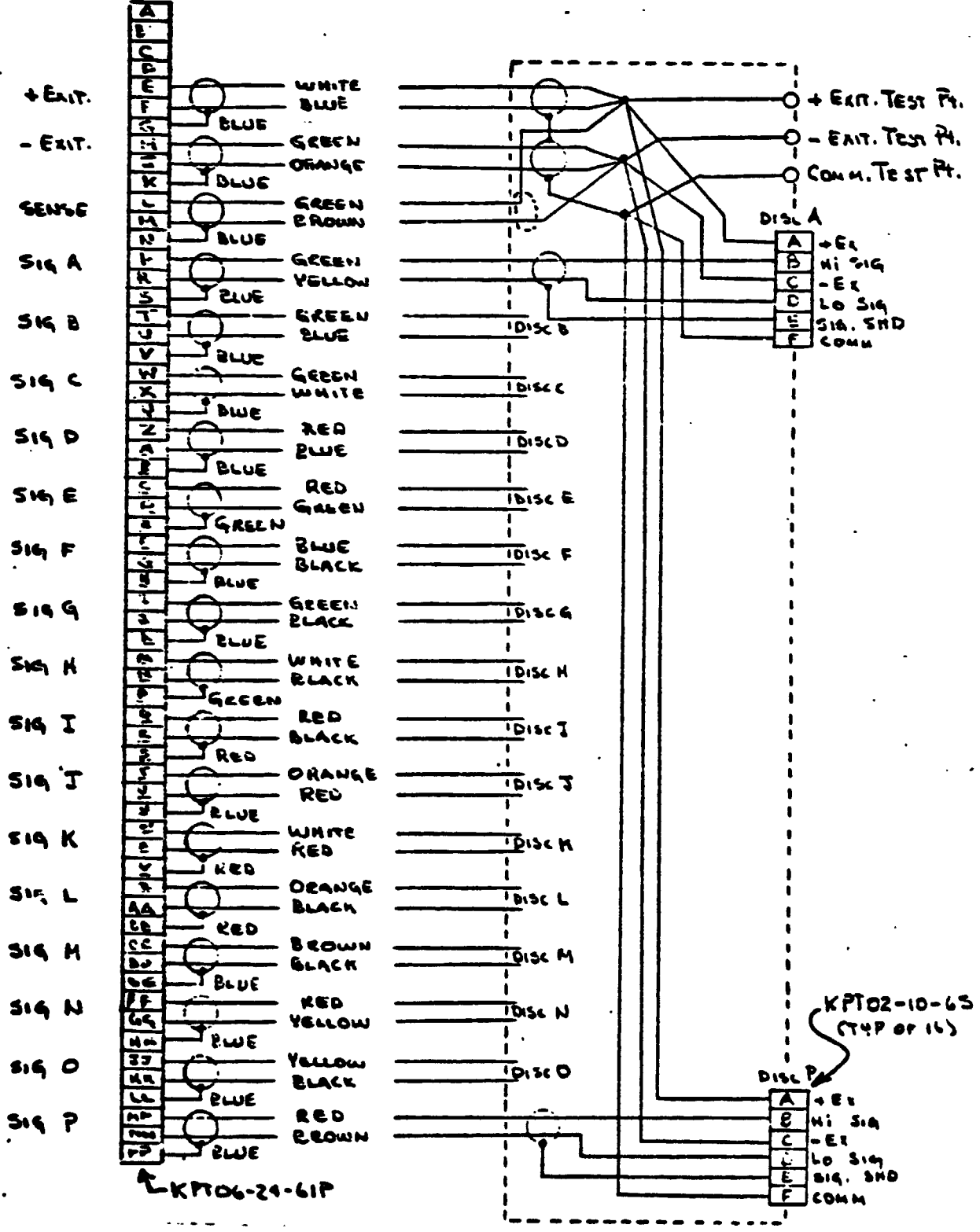
* NOTE 1

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL 301 SIGNAL CABLE AND J-BOX

4-28-76
bh 279
1A2

(TYP OF 12 → LW-1, RW-1, RW-2, CAB-1, EMP-1, EMP-2, CP-1, CP-2, CP-3, N-1, RUG-1, LMG-1)



100-100000-000

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE _____

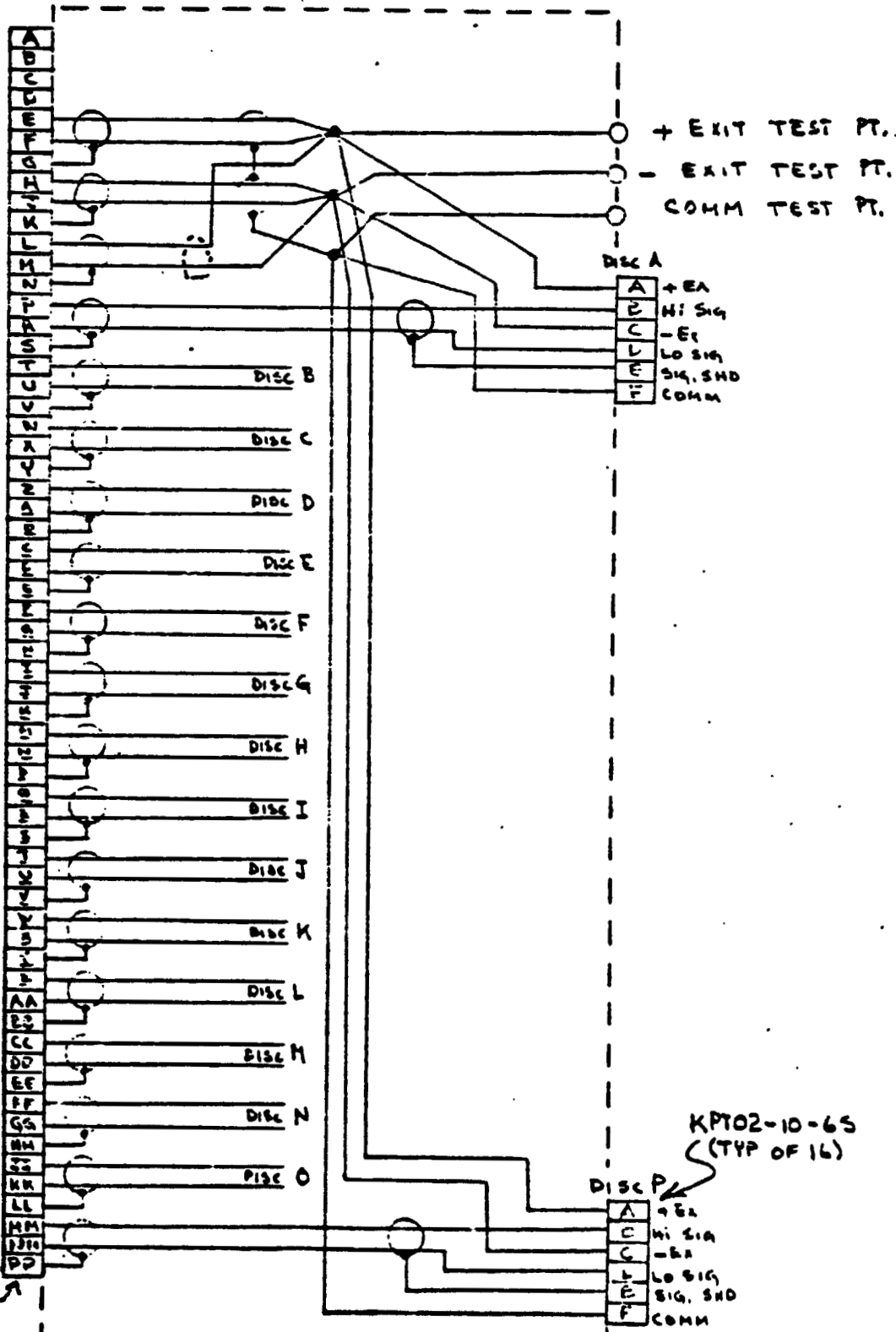
CHECKED _____

HELI. 1+2 RPT SKTASW041-7

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL 301 PYLON J-BOX (TYP OF 4 → LP-1, LP-2, RP-1, RP-2)

679
(b1) 182



KPT02-29-61P

KPT02-10-65
(TYP OF 16)

1042 9300REV 106

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE _____

CHECKED _____

HELI. 142 RPT SKTASW041-3

Rev. A 12-8-76
DCC

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL 301 NON-ROTATING SLIP RING HARNESS

REV
4-28-76
DH 182 279

(TYP OF 2 → LR-2, PR-2)

WIRES ROUTED FROM
SLOT AT BASE OF
COLLECTIVE ACTUATOR

A			51
E			38
C			
D			
G			52
F			66
H			47
I			
J			28
K			74
L			
M			
N			56
P			37
R			
S			19
T			81
U			
V			62
W			46
X			
Y			27
Z			11
AA			9
BB			3
CC			2
DD			1
EE			10
FF			8
GG			
HH			7
II			
JJ			6
KK			18
LL			17
MM			16
NN			
OO			15
PP			14
QQ			
RR			72
SS			25
TT			
UU			36
VV			64
WW			
XX			45
YY			26
ZZ			
AAA			54
BBB			25
CCC			
DDD			62
EEE			44

- CONN. J1-E

PLUG
MOUNTED
ON
PYLON

PLUG
LOCATED
AT
THE TOP
OF ROTOR
MAST
(MATES WITH
SLIP RING
PLUG)

KPT06-24-61P →

MIK97331-1

7043 SECURITY 100

BY A. WHITENER
 CHECKED _____

BELL HELICOPTER COMPANY

MODEL 301 PAGE _____
 HELI. 142 RPT SETASW041-4

MODEL 301
 'NON-ROTATING SLIP RING HARNESS

Rev. A 12-876

ORIGINAL PAGE IS
 OF POOR QUALITY

(TYP OF 2 → LR-1, RR-1)

4 28-78
 (bh) 182 279

WIRES ROUTED FROM
 SLOT AT BASE OF
 COLLECTIVE ACTUATOR

A			24
B			48
C			24
D			30
E			30
F			58
G			12
H			30
I			49
J			67
K			5
L			21
M			40
N			54
O			75
P			82
Q			83
R			84
S			85
T			76
U			77
V			78
W			79
X			80
Y			68
Z			64
AA			70
BB			71
CC			75
DD			19
EE			21
FF			80
GG			22
HH			91
II			60
JJ			32
KK			51
LL			23
MM			92
NN			
PP			

COMM J14

PLUG
 MOUNTED
 ON
 PYLON

PLUG
 LOCATED
 AT
 THE TOP
 OF ROTOR
 MAST
 (MATES WITH
 SLIP RING
 PLUG)

KPT06-24-61P →

MIKH97331-1

7042 BUREAU 100

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE _____

CHECKED [Signature]

HELI. 1+2 RPT SMAS:1001-1

REISSUE 8-17-77

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL 301 ROTATING SLIP RING HARNESS (J-1) ^{2/11} RR-1

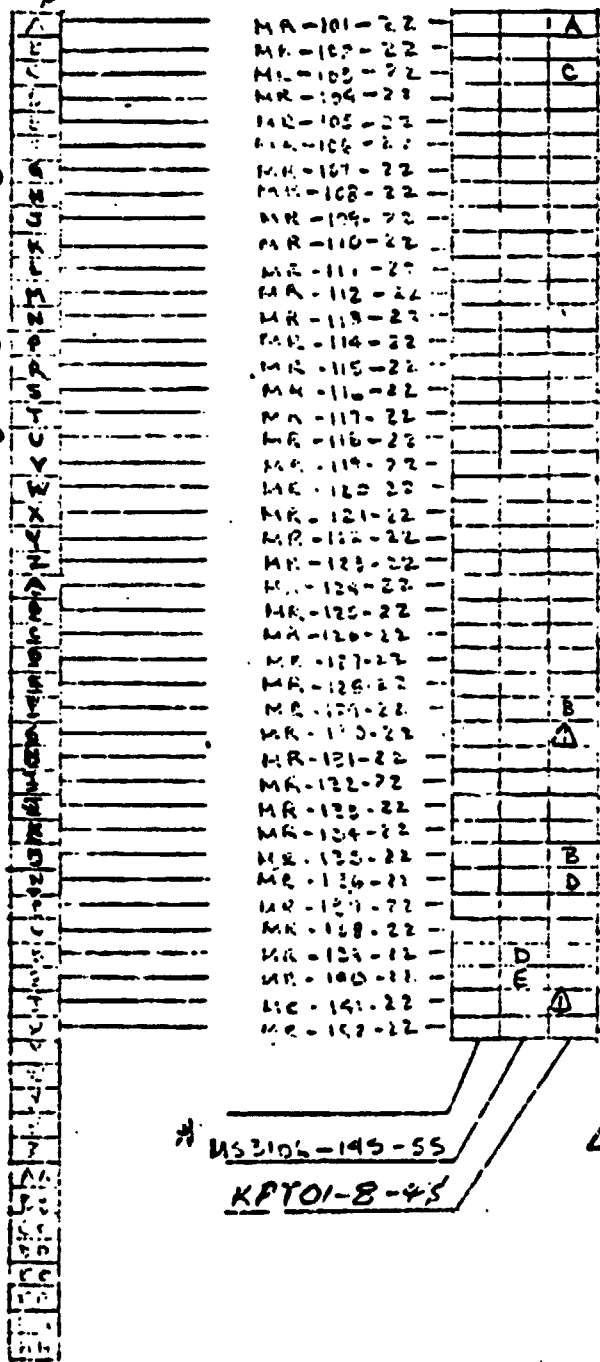
679

KPT06-22-55P

PLUG
J-1
ON
SLIP RING

B120
B122
B124
B126
B123
B125
B127
MB129
MB128
S143
S146

D111
B112
B113
F103



+ VOLTAGE	
- VOLTAGE	
VOLT SENSE	
(A)	REC BLADE BM STA 22.8
(B)	52.5
(C)	75.0
(D)	BM 112.5
(E)	CM 52.5
(F)	75.0
(G)	CM 112.5
(H)	TORQ 52
(I)	TORQ STA 112.5
(J)	STRESS L.E. STA 95
(K)	STRESS T.E. STA 95
(L)	BLADE FEATHERING POS
(M)	HUB SPINDLE BM
(N)	HUB SPINDLE CM
(O)	REC PITCH LINK
(P)	512 + 1/REV Power
RR2 - COMMON RR1 - COMMON	

MS3106-143-55
KPT01-B-43

△ CONNECT THESE
WIRES AT RR2
COMMON SPLICE

* SEE SHEET #6 FOR REMAINDER OF WIRING

001 AUGUST 1977

BY _____

BELL HELICOPTER COMPANY
POST OFFICE BOX 402 • FORT WORTH, TEXAS

MODEL _____ PAGE _____

CHECKED _____

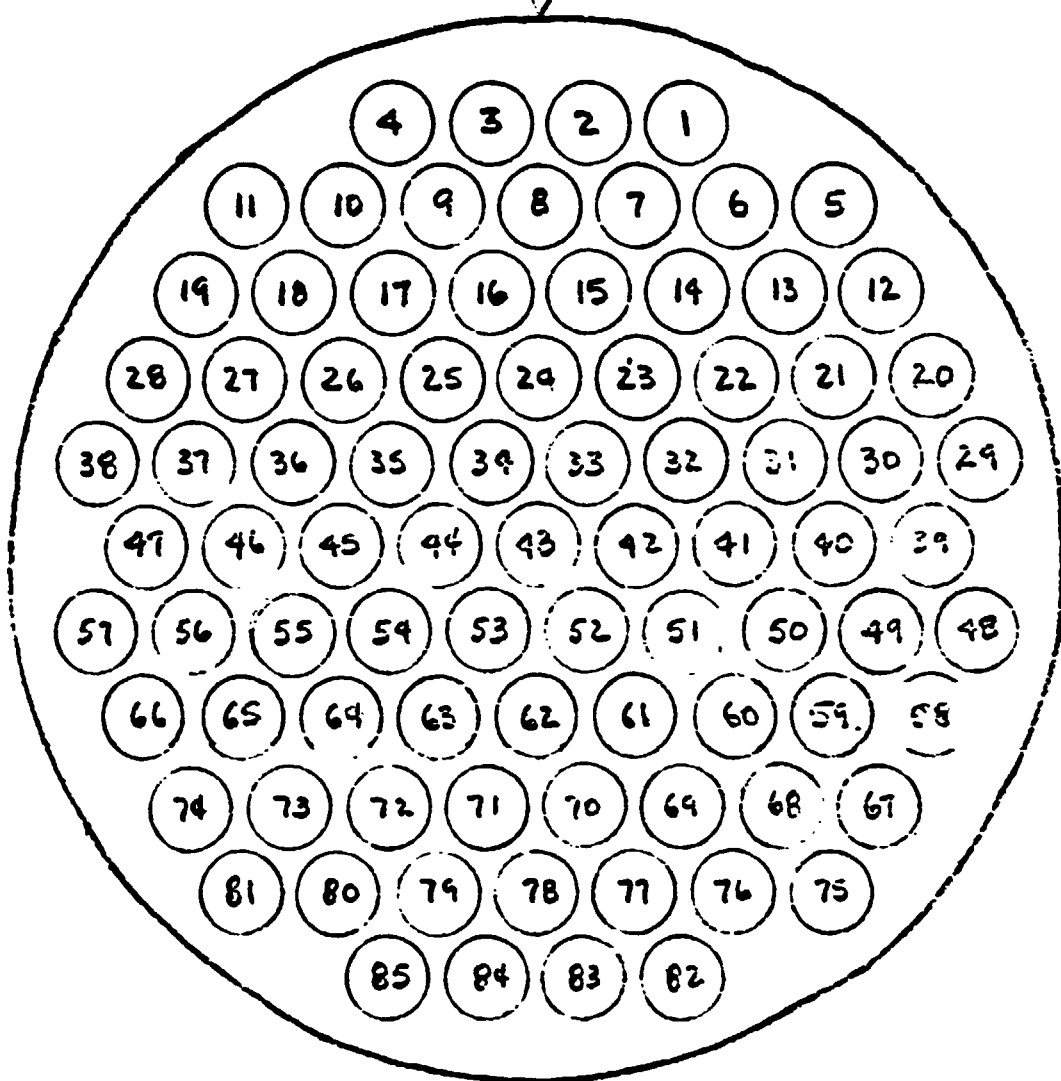
RPT _____

1744
4-24-58

br
182 279

ORIGINAL PAGE IS
OF POOR QUALITY

1



COLL. MA T CONNECTOR

BELL HELIO PLANT #6

ORIGINAL PAGE IS
OF POOR QUALITY

614
4-28-78
bh
182
279

MK11 85 INSERT

LAYOUT SHOWING
CONTACT NUMBERING
SEQUENCE

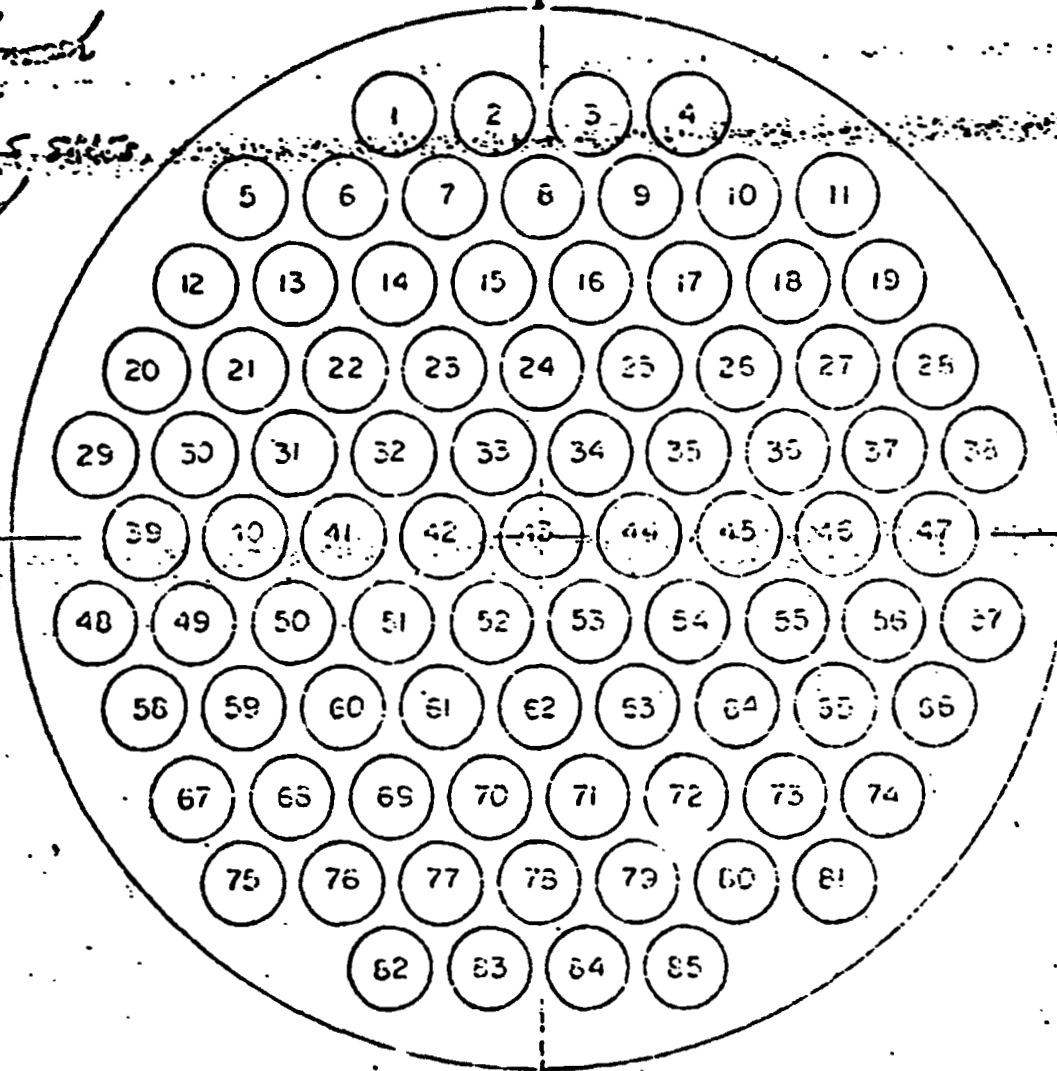
Symbol

ITTC

DELTA S

5/1/74

TOP
KEYWAY



FACE VIEW PIN INSERT

SLIP RING CONNECTOR

301 #2

MIR BLADE WIRE

ORIGINAL PAGE IS
OF POOR QUALITY

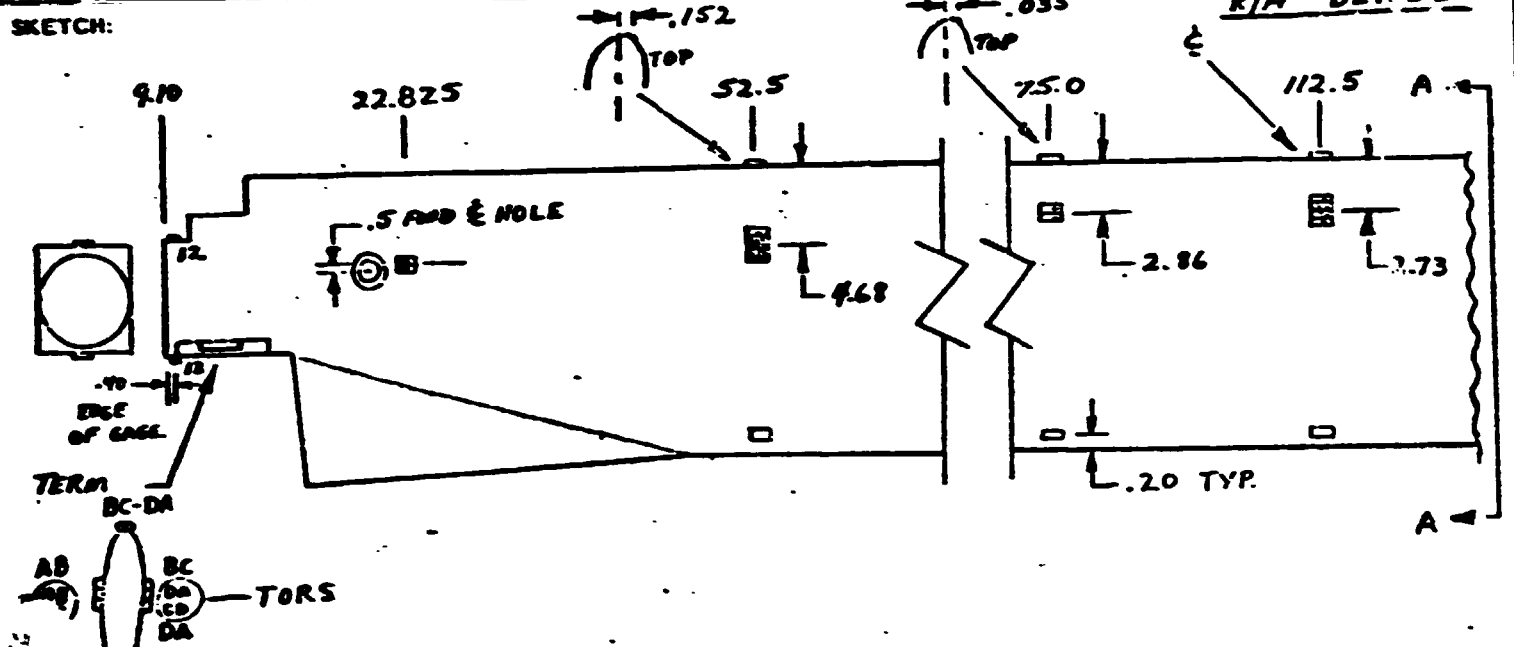
J-BOX R2-1

PART	TYPE	STA	LINE NO.	ITEM CODE	TERMINAL	WIRE NO.	
RED BLADE	EM	22.5	11689A 02	B120	B	M2 - 107-22	
					B	- 108	
	Bm	52.5	04	B122	B	- 109	
					D	- 110	
	Bm	75	06	B124	B	- 111	
					D	- 112	
	Bm	112.5	08	B126	B	- 113	
					D	- 114	
	CH	52.5	03	B123	B	- 115	
					D	- 116	
	CH	75	05	B125	B	- 117	
					D	- 118	
RED BLADE	CH	112.5	07	B127	B	- 119	
					D	- 120	
	TOSS	52	09	M129	B	- 121	
					D	- 122	
	TOSS	112.5	10	M128	B	- 123	
					D	- 124	
	LE. ST.	9.5	12	S145	B	- 125	
					D	- 126	
	RED BLADE	TE. ST.	9.5	13	S146	B	- 127
					D	- 128	
	VOLTAGE (CONTINUED)	—	—	—	—	A	- 101
					C		M2 - 102 - 22

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	RESISTANCE 350	FLIGHT NO. 693509
EWA NO. A427-	GAGE FACTOR 2.06 ± 0.05	LAD. NO. 11689A
ORDER A427	LOT NO. Q-ASSADID G-ASSED00	PART NO. 300-010-000
REQUESTED BY: A. WHITENER		SERIAL NO. A2-07017

TITLE OF TEST: **MODEL 301 FLIGHT TEST**



INSTALL CHORD-BEAM & TORSION BRIDGES AS SHOWN. USE BR-600 CEMENT. COMPLETE BRIDGE IN GAGE AREA USING FLAT TERMINALS. MAIN TERMINAL IS IN AREA SHOWN. COVER WITH SHELL 9309.

ORIGINAL PAGE IS OF POOR QUALITY

5145 5146

STRESS	STRESS
12	13
-4.6	5.5

BRIDGE	B120 02	B123 03	B122 04	B125 05	B124 06	B127 07	B124 08	MES 09	MES 10	MES 11
BRIDGE	BM 22.825	CN 52.5	BM 52.5	CN 75.0	BM 75.0	CN 112.5	BM 112.5	TORS 52.5	TORS 112.5	TORS 112.5
BALANCE	2.6	-2.1	3.4	-3.4	3.7	-1.9	1.3	2.7	1.2	
TO GROUND	100 MEG	100 MEG	100 MEG	100 MEG	100 MEG	100 MEG	100 MEG	100 MEG	100 MEG	100 MEG
DATE ASSIGNED	9-15-77			TECHNICIAN C.C.U. - 56			EST. HRS.		APPROVED BY	
DATE COMPLETED				ENGINEER			ACT. HRS.			

CALIBRATION DATA SHEET

DATE 9-21-77

DIN. 693809

MODEL 301

LAB. NO. 11689A

EWA. 1427

PROJECT 301 FLIGHT TEST

SERIAL NO. 112-03017

VO. 1427

TITLE R/H BLADE

PART NO. 300-010-001-000

ENGINEER A. WHITTNER

ORIGINAL PAGE IS
OF POOR QUALITY

TECHNICIAN	INSTRUMENTS	SERIAL NO.
<u>J. Kneak</u>	H.P. CALCULATOR <u>7830A</u>	<u>183257</u>
	<u>4K L/C</u>	<u>1004562 EP 01</u>
<u>Caldwell</u>	<u>10" cyl</u>	<u>111-A-23</u>

NOTES:
<u>227</u>

LOAD STATION: 03 05 07 02 04 06 08

Bridge	03	05	07	02	04	06	08
Gen. Type	<u>EA-06</u>	<u>2500</u>	<u>0-2500</u>				
Gen. Fac.	<u>2.09 ±</u>	<u>0.57 ±</u>					
Gen. Res.	<u>250.0</u>						
Lot No.	<u>Q-A25 AD11</u>						
Act. Arm	<u>4.0</u>						
Cal. Chan.	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Bridge Type	<u>REINFORCED</u>						
Config.	<u>52.5"</u>	<u>75.0"</u>	<u>117.5"</u>	<u>52.5"</u>	<u>75.0"</u>	<u>117.5"</u>	
Bridge Voltage	<u>6.0 Volts</u>						
Lever Arm	<u>95.92"</u>	<u>73.42"</u>	<u>35.925"</u>	<u>125.67"</u>	<u>96.0"</u>	<u>72.5"</u>	<u>86.0"</u>

LOAD LBS							
0							
55							
110							
165							
220							
275							
330							
3							

P. M. C. G. U. N. O. T. E. T. O. T. A. L. T. E. N. S. I. O. N.
 P. M. C. G. U. N. O. T. E. T. O. T. A. L. T. E. N. S. I. O. N.

CALIBRATION DATA SHEET

DATE 8-21-77

DIN. 693809
EWA. A427-
IO. A427

MODEL 301
PROJECT 301 FLIGHT TEST
TITLE R/H BLADE

LAB. NO. 11689A
SERIAL NO. A2-07017
PART NO. _____

ENGINEER A. WHITENER

TECHNICIAN	INSTRUMENTS	SERIAL NO.
<u>M. J. D. COY</u>	H.V. CALIBRATION <u>9830A</u>	<u>FB3257</u>
<u>Caldwell</u>	<u>LEAD WEIGHTS</u>	<u>_____</u>

NOTES:

LOAD STATION

	<u>M12A</u>	<u>M12B</u>	<u>S1A5</u>	<u>S1A6</u>
Bridge No.	<u>09</u>	<u>10</u>	<u>12</u>	<u>13</u>
Gage Type	<u>EA-06-262UD-350W</u>	<u>→</u>	<u>EA-06-300G-350F</u>	<u>→</u>
Gage Fac.	<u>2.045 ±</u>	<u>0.590</u>	<u>2.08 ±</u>	<u>0.590</u>
Gage Res.	<u>2500</u>	<u>→</u>	<u>→</u>	<u>→</u>
Lot No.	<u>G-A37-8000</u>	<u>→</u>	<u>G-A37-110</u>	<u>→</u>
Act. Arm	<u>3.29</u>	<u>→</u>	<u>5.00</u>	<u>→</u>
Cal Chan.	<u>8</u>	<u>9</u>	<u>→</u>	<u>→</u>
Bridge Type	<u>TP5500</u>	<u>→</u>	<u>ST0500</u>	<u>→</u>
Config.	<u>TOP 52.5</u>	<u>TOP 112.5</u>	<u>→</u>	<u>→</u>
Bridge Voltage	<u>6.0V</u>	<u>→</u>	<u>→</u>	<u>→</u>
Lever Arm	<u>16.25" couple</u>	<u>→</u>	<u>→</u>	<u>→</u>

LOAD LBS/PSI									
									ORIGINAL PAGE IS OF POOR QUALITY
<u>0</u>									
<u>25</u>									
<u>50</u>									
<u>75</u>									
<u>100</u>									
<u>125</u>									
<u>150</u>									
<u>0</u>									

No calibration on
Tension Chan's, 8 & 9

Pos. T. Jony Cal L.F. Torqued "UP"

CHAN 4

CAL DATE = 9-21-77
BRIDGE TYPE=BEAM
LAB-BR NUMBER=11689A-03
BRIDGE VOLT= C
BRIDGE STA.= 22.825

03-07 pull

0(MV) OFFSET= -32056.9
UNITY CAL= 79647.92385

100K CE= 64346.9

LOAD(IN-LB)	OUTPUT (MV)	LINEARITY
95.1	2.620	OK
7607.5	3.230	OK
15738.0	3.900	OK
24106.4	4.580	OK
32331.9	5.240	OK
40367.4	5.900	OK
-95.1	2.600	OK

(3.2) B120

ORIGINAL PAGE IS OF POOR QUALITY

CHAN 5

TYPE PULL =BEAM
CAL DATE =9-21-77
BRIDGE TYPE=BEAM
LAB-BR NUMBER=11685A-04
BRIDGE VOLT= E
BRIDGE STA.= 52.5

DATA

0(MV) OFFSET= -7249.4
UNITY CAL= 16251.61150

100K CE= 14199.2

LOAD(IN-LB)	OUTPUT (MV)	LINEARITY
72.6	2.690	OK
5811.2	4.920	OK
12021.9	7.130	OK
18414.2	9.470	OK
24697.5	11.790	OK
30875.7	14.150	OK
-72.6	2.600	OK

(11.37) B122

CHAN 6

TYPE PULL =BEAM
CAL DATE =9-21-77
BRIDGE TYPE=BEAM
LAB-BR NUMBER=11689A-06
BRIDGE VOLT= E
BRIDGE STA.= 75

DATA

0(MV) OFFSET= -7381.9
UNITY CAL= 13209.5804

100K CE= 11541.2

LOAD(IN-LB)	OUTPUT (MV)	LINEARITY
27.8	3.350	OK
4449.2	5.390	OK
9371.1	7.590	OK
14154.0	9.790	OK
18909.1	11.940	OK
23719.9	14.130	OK
-27.8	3.360	OK

(10.77) B124

CHAN 7

TYPE PULL =BEAM
CAL DATE =9-21-77
BRIDGE TYPE=BEAM
LAB-BR NUMBER=11689A-08
BRIDGE VOLT= E
BRIDGE STA.= 112.5

DATA

0(MV) OFFSET= -1071.7
UNITY CAL= 6983.96427

100K CE= 6014.6

LOAD(IN-LB)	OUTPUT (MV)	LINEARITY
13.6	1.180	OK
2179.2	3.090	OK
4589.9	5.190	OK
6938.6	7.290	OK
9261.6	9.390	OK
11617.8	11.290	OK
-13.6	1.200	OK

(10.11) B126

TYPE PULL = CHORD
 CAL DATE = 9-21-77
 BRIDGE TYPE = CHORD
 LAB-BR NUMBER = 11689A-03
 BRIDGE VOLT = 6
 BRIDGE STA. = 52.5

DATA

0(MV) OFFSET = 19171.2
 UNITY CAL = 39209.73056

100K CE = 34257.8

LOAD (IN LB)	OUTPUT (MV)	LINEARITY
36.3	-1.540	OK
5342.3	-0.770	OK
10537.1	0.040	OK
15750.3	-0.850	OK
20976.5	1.060	OK
26202.5	2.450	OK
31138.2	3.220	OK
-36.3	-1.540	OK

4.76

B123

ORIGINAL PAGE IS
 OF POOR QUALITY

TYPE PULL = CHORD
 CAL DATE = 9-21-77
 BRIDGE TYPE = CHORD
 LAB-BR NUMBER = 11689A-05
 BRIDGE VOLT = 6
 BRIDGE STA. = 75

DATA

0(MV) OFFSET = 22156.0
 UNITY CAL = 40341.31646

100K CE = 35246.6

LOAD (IN LB)	OUTPUT (MV)	LINEARITY
27.8	-3.280	OK
4028.0	-2.710	OK
8111.5	-2.110	OK
12056.1	-1.500	OK
16056.3	-0.900	OK
20056.5	-0.310	OK
23534.5	0.250	OK

3.28
 1.64
 3.53

B125

TYPE PULL = CHORD
 CAL DATE = 9-21-77
 BRIDGE TYPE = CHORD
 LAB-BR NUMBER = 11689A-07
 BRIDGE VOLT = 6
 BRIDGE STA. = 112.5

DATA

0(MV) OFFSET = 5911.7
 UNITY CAL = 30925.39448

100K CE = 27013.8

LOAD (IN LB)	OUTPUT (MV)	LINEARITY
13.5	-1.750	OK
1970.2	-1.370	OK
3955.2	-0.980	OK
5917.2	-0.510	OK
7774.4	-0.240	OK
9718.0	0.100	OK
11634.4	0.510	OK
27.2	-1.740	OK

1.75
 .57
 2.26

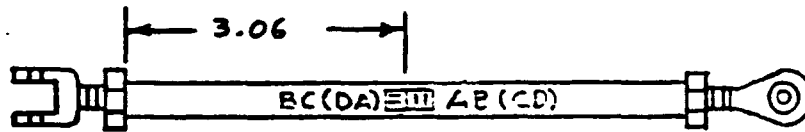
B127

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-357 E	SHEET NO. DLN (A. 7. 5. 77)
EWA NO. A427-25	RESISTANCE 300Ω	LAB. NO. 11819A
WORK ORDER A427	GAGE FACTOR 2.12 ± 1%	PART NO. 300-010-411-11
REQUESTED BY: A. WHITENER	LOT NO. Q.A. 18AF56	SERIAL NO. 11819A

TITLE OF TEST
301 FLIGHT TEST

SKETCH:



PITCH LINK

F103

279

ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE **MB-500** CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
COVER WITH **9309**. ATTACH FOUR WIRE TWELVE
INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL
SLEEVING AND TERMINATE WITH **KPT-06-8-4P** PLUG.

F103
01

BRIDGE	AXIAL					
BALANCE	±1.8					
RES. TO GROUND	10KΩ					
DATE ASSIGNED	TECHNICIAN			EST. HRS.	APPROVED BY:	
DATE COMPLETED 12-1-77	ENGINEER			ACT. HRS.		

CALIBRATION DATA SHEET

DATE 12-6-77

DLN. 671577

MODEL 201

LAB. NO. 11819A

EWA. 1427-25

PROJECT 301 SLOTTED

SERIAL NO. 219-00018

W.O. 0427

TITLE Pylon Load

PART NO. 300-010-411-11

ENGINEER A. WHITTNER

ITEM CONC: F103

TECHNICIAN	INSTRUMENTS	SERIAL NO.
Z. Dorsch	TI 930A	SVST
Z. Dorsch	"A" CYL	176-A-20.

NOTES:	RR10
	45-1-1
ORIGINAL PAGE IS OF POOR QUALITY	

LOAD STATION

Bridge No.	01							
Gage Type	EP-13	10000	MODE					
Gage Fac.	2.52	1.05						
Gage Res.	350-7							
Lot No.	Q-237	2556						
Act. Arm	2.6							
Cal. Chan.	181							
Bridge Type	AXIAL							
Config.	FLANGE	X						
Bridge Voltage	6.042	72						
Lever Arm	2.71							

LOAD (P.S.I.)								
0								
220								
540								
810								
1080								
1350								
0								

X-TALK CHECK O.K.

A. Whittner 12-6-77

Pos. 1-1 and 1000-ton load

ORIGINAL PAGE IS
OF POOR QUALITY

PAGE 01
(770140--2532)
(YY0000--HHMM)
(YY0000--HHMM)
(YY0000--HHMM)

PULL DATE
FULL DATE
FULL DATE
FULL DATE

AXIAL
BEND
CHORD
TORSION

ALUMINUM 2024-T3 CHEMICAL CHARACTERISTICS

TEST FILE: WPCW LINK
PROJECT: 301 FLIGHT TEST
ENGINEER: A. WINTERER
TECHNICAL: GFE30F

*** FULL DATA ***
PAGE

--FULL-- -STATION-- -FACTOR-- -CHANNEL-- -UNITY CAL- -LOAD TYPE-
AXIAL + 0000E+00 + 1500E+01 1XX

*** PART # 300-010-411-11 SERIAL # A19-000127
LAB # 1111111111

--CHANNEL-
-RD- -TYPE-
181 AXIAL
182 AXIAL

---GAGE---
-FACTOR-
+ .2120E+01 + .3500E+03 01
+ .2120E+01 + .3500E+03 01

-RESISTANCE--NUMBER-
+ .0000E+00
+ .0000E+00

-LOCATION--
+ .0000E+00
+ .0000E+00

LOAD CELL

ORIGINAL PAGE IS
OF POOR QUALITY

18 (11/21/78)

TEST TITLE: 22210-22211 LOADS AND LINEARITY

PROJECT: PITCH LINK
ENGINEER: W. WINTERER
TECHNICAL: 65E24P
TEST CHANNEL: 181 - AXIAL

ACTUAL FULL DATE (170740--2333)
FROM FULL DATE (170600--1444)
CHECK FULL DATE (170600--1444)
TORSION FULL DATE (170600--1444)

LINEARITY UC SLOPE

-FULL- AXIAL		---LOADS---		---VARIATION---		LINEARITY UC		SLOPE	
FS1	LBS	OUTPUT (MV)	(MV)	LBS	(MV)				
+ 0000E+00	+ 0000E+00	+ 6567E+01	+ 3024E-02	+ 2722E+00	N/A	+ 9074E+03	+ 7405E-02		
+ 5000E+03	+ 1500E+02	+ 6522E+01	- 3354E-01	- 3470E+01	+ 2871E+01	+ 9074E+03	+ 7405E-02		
+ 5400E+03	+ 2500E+02	+ 1953E+02	- 2225E-01	- 2597E+01	+ 1000E+02	+ 9074E+03	+ 7405E-02		
+ 3100E+03	+ 5400E+03	+ 1254E+02	- 1715E-01	- 1724E+01	+ 1004E+02	+ 9074E+03	+ 7405E-02		
+ 1000E+04	+ 7500E+03	+ 1452E+02	+ 3204E-01	+ 2884E+01	+ 1011E+02	+ 9074E+03	+ 7405E-02		
+ 1350E+04	+ 9000E+03	+ 1255E+02	+ 5125E-02	+ 4613E+00	+ 1005E+02	+ 9074E+03	+ 7405E-02		
+ 0000E+00	+ 0000E+00	+ 6613E+01	+ 4941E-01	+ 4447E+01	+ 0000E+00	+ 9074E+03	+ 7405E-02		

10.0

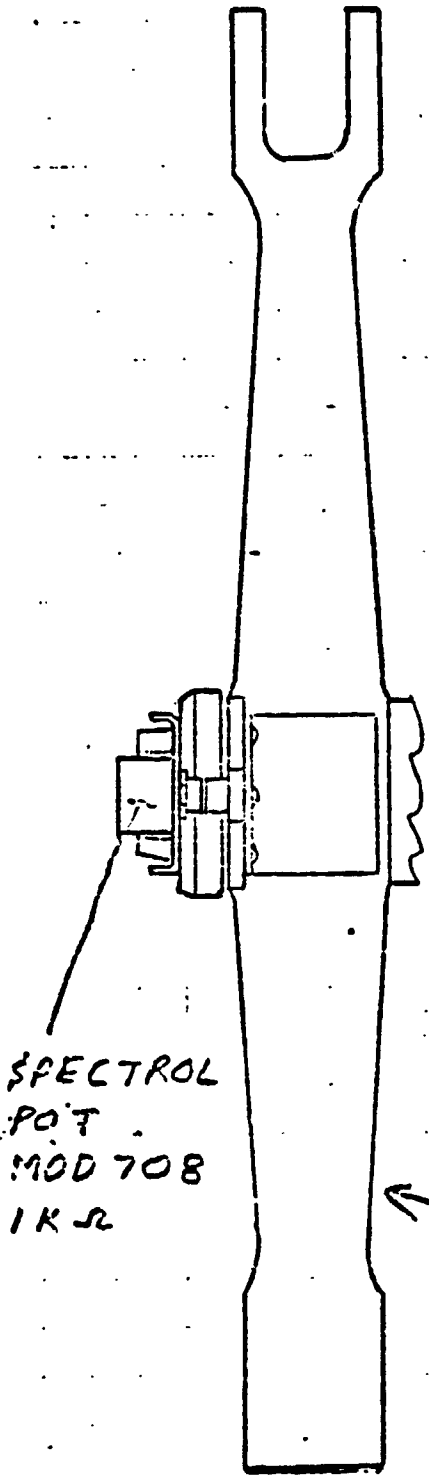
8.52	10.53	14.59	16.56
<u>6.56</u>	<u>10.53</u>	<u>12.54</u>	<u>14.56</u>
	2.01	2.01	1.97

301 RED BLADE FEATHERING POSITION BRACKET

ORIGINAL PAGE IS
OF POOR QUALITY

ALL
4-28-78
DIN 279

DIII



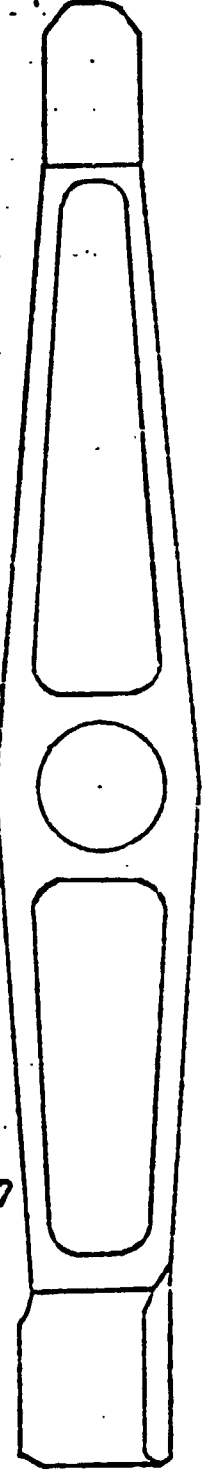
SPECTROL
POT
MOD 708
1KR

TOP VIEW

1/2" GEAR

3" DIA
GEAR
SEGMENT

RED WALKING
BEAM



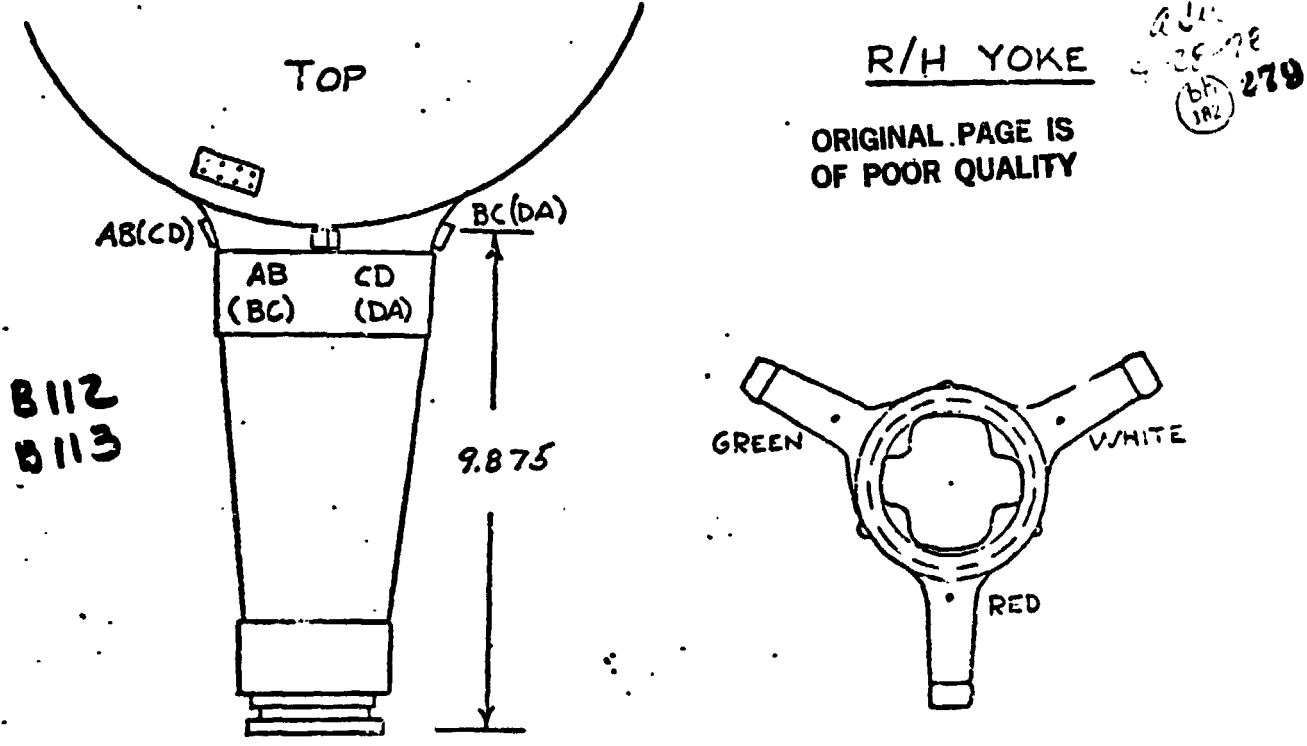
LOOKING OUTWARD
FROM MAST

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-05-25011Q-350W	SHEET NO. D.N 688512
EWA NO. A427 IIB	RESISTANCE 350 Ω	LAB. NO. 10595 B
RDR A427	GAGE FACTOR 2.13 \pm 0.5%	PART NO. 300-010-101-21
REQUESTED BY: A. WHITENER	LOT NO. Q-A21AD142	SERIAL NO.

TITLE OF TEST: **301 FLIGHT TEST-SHIP-1**

SKETCH:



REMARKS:

VIEW LOOKING AFT

COLOR CODE

CLEAN GAGE AREA PER TITANIUM INSTRUCTIONS. INSTALL BEAM AND CHORD BRIDGES ON THREE SPINDLES. USE BR-600 CEMENT. COMPLETE BRIDGE AT POST TYPE TERMINALS ON TOP SURFACE. COVER WITH SHELL 9309.

B112 B113
01 RED 02

B171 B172
03 WHITE 04

B173 B174
05 GREEN 06

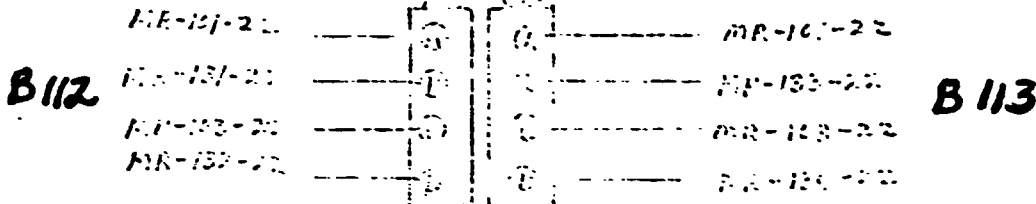
BRIDGE	CHORD	BEAM	CHORD	BEAM	CHORD	BEAM
BEAM	4.55	4.00	5.15	4.65	5.79	4.35
TO GROUND	10K Ω	10K Ω	10K Ω	10K Ω	10K Ω	10K Ω

DATE ASSIGNED	TECHNICIAN C.C.W.	EST. HRS.	APPROVED BY:
DATE COMPLETED 9-27-76	ENGINEER	ACT. HRS.	

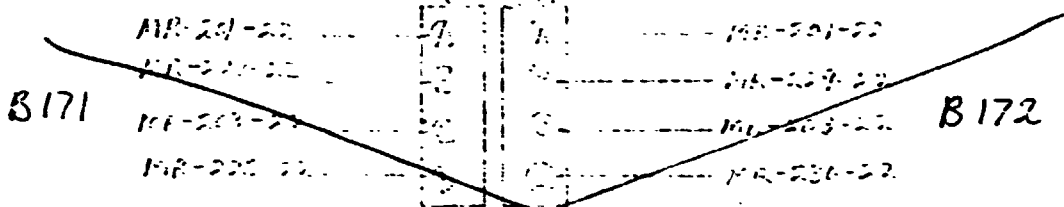
301 #2
HUB SWITCH WIRING
R/H RETEN
RR-1

ORIGINAL PAGE IS
OF POOR QUALITY

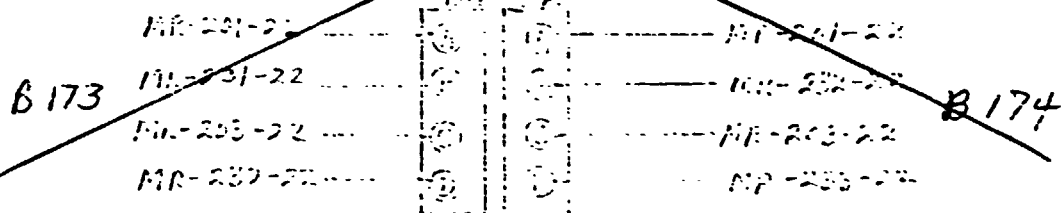
HUB SWITCH Red Terminal Block



HUB SWITCH White Terminal Block



HUB SWITCH Green Terminal Block



1) Terminal blocks located on under surface of HUB.

2) Wire No. "MR151-22", "MR-201-22", "MR-163-22", + "MR-203-22"
ARE Parallel Voltage Wires

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: MEKNADEZ

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10593802
CAL DATE: 10-22-76
SERIAL NO: NONE
P/N: 300-010-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND ROTOP YOKE
CHANNEL: 04 - RED BEAM BENDING, STATION 8.5

B112

CALIBRATE EQUIVALENT: 100K = 26582 IN-LBS
UNIT CAL = 32522 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 0.00
PRE CAL. : 5.27
POST CAL. : 5.23

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 8.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.016	-86
0.00	0.00	0.000	0.016	83
360.00	5024.63	0.900	-0.011	-59
720.00	10049.26	1.830	-0.008	-44
1080.00	15073.89	2.760	-0.005	-26
1440.00	20098.52	3.690	-0.002	-13
1800.00	25123.15	4.630	0.010	57

MAXIMUM CALIBRATION LOAD: 25123 IN-LBS

BMC PROGRAM FCCR33 - RUN DATE: 11-10-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: HERNANDEZ

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10593801
CAL DATE: 10-22-76
SERIAL NO: NONE
P/N: 300-010-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND ROTOR YOKE
CHANNEL: 03 - RED CHORD BENDING, STATION 8.5

B113

CALIBRATE EQUIVALENT: 100K = 19722 IN-LBS
UNIT CAL = 22415 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.28
POST CAL. : 5.28

JACK FAC. : 0.2870 PSI/LB
LEVER ARM : 8.500 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.007	25
0.00	0.00	0.000	-0.007	-25
338.00	10010.45	2.660	-0.027	-100
676.00	20020.91	5.410	0.043	162
1014.00	30031.36	8.050	0.003	12
1352.00	40041.82	10.730	0.003	12
1690.00	50052.27	13.390	-0.017	-62

MAXIMUM CALIBRATION LOAD: 50052 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

ITEM CODE = [redacted] / S146 = Stress

ORIGINAL PAGE IS OF POOR QUALITY

R = 350 Ω
Y = 29 × 10⁶
N = 1
G.F. = 2.08
R_{sk} = 500K

$$500KCE = \frac{(350)(29)10^6}{(1)(2.08)(500350)}$$

= _____

ITEM CODE = S147/S148 = Stress

R = 350 Ω
Y = 29 × 10⁶
N = 1
GF = 2.13
R_{sk} = 500K

$$500KCE = \frac{(350)(29)10^6}{(1)(2.13)(500350)}$$

9524 PSI stress

ITEM CODE = S609/S610/S628/S629 = stress

R = 350 Ω
Y = 10.7 × 10⁶
N = 1
GF = 2.13
R_{sk} = 115K

$$115KCE = \frac{(350)(10.7)10^6}{(1)(2.13)(115350)}$$

= 15242 PSI stress

ITEM CODE = S630/S631/S632/S633 = shear
S634/S635/S636/S637

R = 350 Ω
G = 4.0 × 10⁶
N = 2
G.F. = 2.075
R_{sk} = 115K

$$115KCE = \frac{(350)(2)(4.0)10^6}{(2)(2.075)(115350)}$$

= 5849 PSI shear

ITEM CODE = S145/~~S146~~ = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$\begin{aligned} R &= 350 \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.08 \\ R_{sh} &= 500K \end{aligned}$$

$$\begin{aligned} 500K CE &= \frac{(350)(29) 10^6}{(1)(2.08)(500350)} \\ &= \blacksquare \end{aligned}$$

ITEM CODE = S147/S148 = Stress

$$\begin{aligned} R &= 350 \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sh} &= 500K \end{aligned}$$

$$\begin{aligned} 500K CE &= \frac{(350)(29) 10^6}{(1)(2.13)(500350)} \\ &= 9524 \text{ PSI stress} \end{aligned}$$

ITEM CODE = S609/S610/S628/S629 = Stress

$$\begin{aligned} R &= 350 \Omega \\ Y &= 10.7 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sh} &= 115K \end{aligned}$$

$$\begin{aligned} 115K CE &= \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)} \\ &= 15242 \text{ PSI stress} \end{aligned}$$

ITEM CODE = S630/S631/S632/S633 = Shear
S634/S635/S636/S637

$$\begin{aligned} R &= 350 \Omega \\ G &= 4.0 \times 10^6 \\ N &= 2 \\ G.F. &= 2.075 \\ R_{sh} &= 115K \end{aligned}$$

$$\begin{aligned} 115K CE &= \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)} \\ &= 5849 \text{ PSI shear} \end{aligned}$$

BY: MARJORY
CHECKED:

BELL HELICOPTER COMPANY

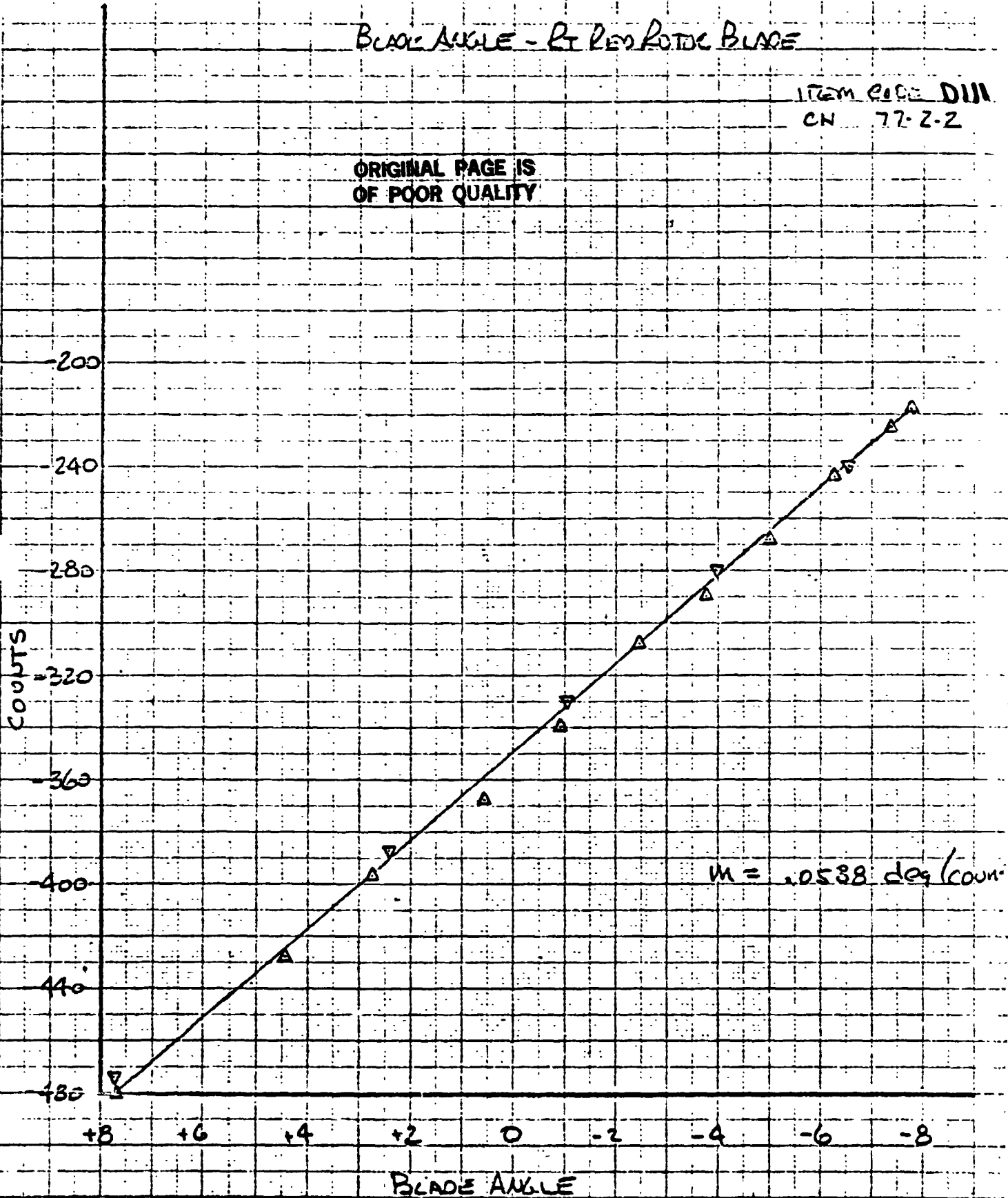
MODEL: 301 PAGE
HELL #2 RPT

BLADE ANGLE - RT RED ROTOR BLADE

ITEM CODE D111
CN 77-2-2

ORIGINAL PAGE IS
OF POOR QUALITY

Counts



BY A. WHITENER

DELL HELICOPTER COMPANY

MODEL 301

PAGE

CHECKED U.M.

HELI. 1+2 RPT SKP/SM/01-2

RE REV 9-17-77

MODEL 301 ROTATING SLIP RING HARNESS (J-2)

RR-2

KPT06-22-55F

279

ORIGINAL PAGE IS
OF POOR QUALITY

B108
 B109
 PLUG M107
 B052
 J-2 D110
 ON F104
 FOSS
 SLIP
 RING
 B171
 B172
 B173
 B174
 DISB

A	MR-201-22	A	+ VOLTAGE
F	MR-202-22		
C	MR-203-22	A	- VOLTAGE
F	MR-204-22		
F	MR-205-22	C	VOLT SENSE
S	MR-206-22		
H	MR-207-22		(A) MAST PWR BEND
K	MR-208-22		(B) ↑ PERP BEND
L	MR-209-22		(C) MAST TORQ (05)
M	MR-210-22		(D) SWASH PLATE DRIVER FORCE
N	MR-211-22		(E) SIMPLE FLAPPING POS.
P	MR-212-22	B	(F)
R	MR-213-22	B	(G) WHITE FITZ LINK
S	MR-214-22	B	(H) GREEN FITZ LINK
S	MR-215-22	B	(I) MAST TORQ (04)
S	MR-216-22	D	(J)
S	MR-217-22		(K) WHITE HUB SPINDLE BM
S	MR-218-22		(L) WHITE ↑ CH
S	MR-219-22		(M) GREEN ↓ BL
S	MR-220-22		(N) GREEN HUB SPINDLE CH
S	MR-221-22		(O) COLL. ACT. POS.
S	MR-222-22		(P)
S	MR-223-22		
S	MR-224-22		
S	MR-225-22		
S	MR-226-22		
S	MR-227-22		
S	MR-228-22		
S	MR-229-22		
S	MR-230-22		
S	MR-231-22		
S	MR-232-22		
S	MR-233-22		
S	MR-234-22		
S	MR-235-22		
S	MR-236-22	B	
S	MR-237-22	A	
S	MR-238-22		
S	MR-239-22		
S	MR-240-22	A	S12 / REV SIG
S	MR-241-22	C	1 / REV SIG
S	MR-242-22	E	

MS2106-195-55
 KPT01-8-1-5

Δ CONNECT THESE
 WIRES AT RR2
 COMMON SPICE

* SEE SHEET #1 FOR REMAINDER OF
 WIRING

7848 9889824 100

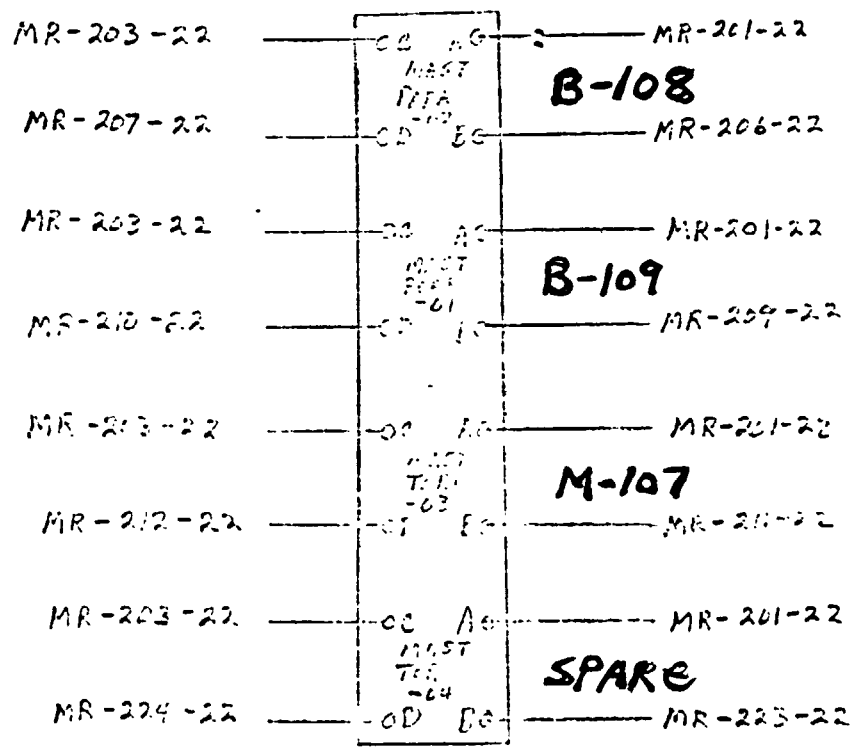
BY Smith, A. J.
CHECKED _____

Gen Helicopter **TEST ROOM**
POST OFFICE BOX 489 - FORT WORTH, TEXAS 76101

MODEL XV-15 PAGE 1
RPT 6-22-78

301 #2
M/R MAST WIRING
R/H ROTOR
RR-2

**ORIGINAL PAGE IS
OF POOR QUALITY.**



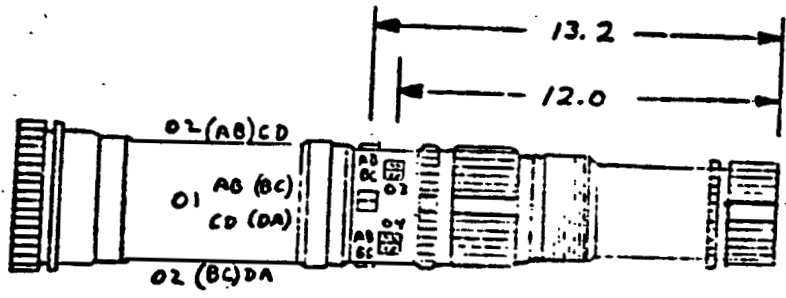
- 1) Terminal block located on upper surface of Hub.
- 2) Wires No. "MR-201-22" & "MR-203-22" ARE PARALLEL WIRES supplying voltage

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-02-250MQ-350 ^w	SHEET NO. 678984
EWA NO. A427-11A	RESISTANCE 350Ω	LAB. NO. 10496 A
WORK ORDER A427	GAGE FACTOR 2.13 ± 0.5%	PART NO. 300-040-180
REQUESTED BY: D. GLASS	LOT NO. QAZIADI42	SERIAL NO. QA35BP 01
TITLE OF TEST MODEL 301 FLIGHT TEST		113 - P725

SKETCH:

$$\begin{array}{r} 13.2 \\ 12.025 \\ \hline 1.175 \end{array}$$



MAST

M107
B108
B109

ORIGINAL PAGE IS
OF POOR QUALITY

279

REMARKS:

INSTALL BENDING AND TORSION BRIDGES AS SHOWN.
 USE BA-600 CEMENT. MAKE BRIDGE AT FLAT
 TERMINAL AS INDICATED. COVER WITH 9309.

	B109 13.2	B108 13.2	M107 12.0	12.0
BRIDGE	PERP-01	PARA-02	TORS-03	TORS-04
BALANCE	4.73	4.72	4.95	5.2C
RES. TO GROUND	10KmA	10KmA	10KmA	10KmA
DATE ASSIGNED	1-16-76		TECHNICIAN	EST. HRS.
DATE COMPLETED			ENGINEER CHUCK	APPROVED BY:
			ACT. HRS.	

CALIBRATION SHEET
LAB ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS BROGDON
LAB TECHNICIAN: KINSON

LAB NO. : 10496A01
CAL DATE: 1-26-76
SERIAL NO: 113-P725
P/N: 300-040-180

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: ROTOR MAST

CHANNEL: 03 - PERPENDICULAR BENDING, STATION 13.2

B 109

CALIBRATE EQUIVALENT: 100K = 26392 IN-LBS
UNIT CAL = 30027 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT.: 10.01
PRE CAL. : 8.85
POST CAL. : 8.79

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 12.250 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.002	7
0.00	0.00	0.000	-0.002	-7
300.00	6034.48	2.000	-0.014	-42
600.00	12068.95	4.040	0.014	43
900.00	18103.45	6.060	0.022	67
1200.00	24137.93	8.030	-0.019	-58
1500.00	30172.41	10.060	-0.001	-3

MAXIMUM CALIBRATION LOAD: 30172 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 01-30-76

CALIBRATION SHEET
LAB ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS BROGDON
LAB TECHNICIAN: KINSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10496A02
CAL DATE: 1-28-76
SERIAL NO: 113-P725
P/N: 300-040-180

PROJECT: 301 FLIGHT TEST

B108

PART NAME: ROTOR MAST
CHANNEL: 04 - PARALLEL BENDING, STATION 13.2

CALIBRATE EQUIVALENT: 100K = 26457 IN-LBS
UNIT CAL = 30147 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 10.01
PRE CAL. : 8.78
POST CAL. : 8.79

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 12.250 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.011	-33
0.00	0.00	0.000	0.011	33
300.00	6034.48	1.960	-0.033	-99
600.00	12068.96	4.000	0.004	11
900.00	18103.45	6.020	0.020	60
1200.00	24137.93	8.030	0.026	79
1500.00	30172.41	9.980	-0.028	-83

MAXIMUM CALIBRATION LOAD: 30172 IN-LBS

BMC PROGRAM FCCR33 - RUN DATE: 01-30-76

FORSHAME, YOU FORGOT THE CAL RESIST. FOR CHANNEL05 LAB NO.10496A03
HOWEVER I WILL SET IT TO 100 OHMS AND CONTINUE

FORSHAME, YOU FORGOT THE CAL RESIST. FOR CHANNEL06 LAB NO.10496A04
HOWEVER I WILL SET IT TO 100 OHMS AND CONTINUE

CALIBRATION SHEET
LAB ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS BROGDON
LAB TECHNICIAN: KINSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10496A03
CAL DATE: 1-28-76
SERIAL NO: 113-P725
P/N: 300-040-180

PROJECT: 301 FLIGHT TEST

PART NAME: ROTOR MAST

CHANNEL: 05 - TORSION. STATION 12.0

M107

CALIBRATE EQUIVALENT: 100K = 49626 IN-LBS
UNIT CAL = 56194 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.045
BRIDGE VOLT. : 10.01
PRE CAL. : 8.85
POST CAL. : 8.83

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 42.000 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.023	-131
0.00	0.00	0.000	0.023	131
435.00	30000.00	5.320	-0.001	-4
870.00	60000.00	10.650	-0.015	-82
1305.00	90000.00	15.960	-0.049	-273
1740.00	120000.00	21.380	0.027	154
2175.00	150000.00	26.710	0.013	75

MAXIMUM CALIBRATION LOAD: 150000 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 01-30-76

CALIBRATION SHEET
LAB ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS BROGDON
LAB TECHNICIAN: KINSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10496A04
CAL DATE: 1-28-76
SERIAL NO: 113-P725
P/N: 300-040-160

PROJECT: 301 FLIGHT TEST

PART NAME: ROTOR MAST
CHANNEL: 06 - TORSION, STATION 12.0

SPARE

CALIBRATE EQUIVALENT: 100K = 50009 IN-LBS
UNIT CAL = 56533 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.045
BRIDGE VOLT. : 10.01
PRE CAL. : 8.86
POST CAL. : 8.85

JACK FAC. : 0.6096 PSI/LB
LEVER ARM : 42.000 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.020	-113
0.00	0.00	0.000	0.020	113
435.00	30000.00	5.300	0.008	45
870.00	60000.00	10.590	-0.014	-79
1305.00	90000.00	15.860	-0.050	-316
1740.00	120000.00	21.250	0.022	124
2175.00	150000.00	26.560	0.020	113

MAXIMUM CALIBRATION LOAD: 150000 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 01-30-76

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-25Ω, 1Q-350W	SHEET NO. DLN 678787
NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10957A
WORK ORDER A427	GAGE FACTOR 2.11 ± 0.5%	PART NO. 300-010-451-1
REQUESTED BY: A. WHITTAKER	LOT NO. Q-A1BAF56	SERIAL NO. A14-00009

TITLE OF TEST **301 FLIGHT TEST**

SKETCH:

ORIGINAL PAGE IS OF POOR QUALITY

DRIVER ASSY.

B-052

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH M4P PLUG.

B052
01

BRIDGE	BEND					
LEN	5.38					
TO GROUND	10KΩ					
DATE ASSIGNED	6-15-76	TECHNICIAN	C.C.W.	EST. HRS.	APPROVED BY:	
DATE COMPLETED	6-16-76	ENGINEER		ACT. HRS.		

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE
OF POOR QUALITY

LAB NO. : 10985A01
CAL DATE: 7-7-76
SERIAL NO: A14-00009
P/N: 300-910-431-1

PROJECT: 301 FLIGHT TEST

PART NAME: DRIVER ASSEMBLY
CHANNEL: C3 - BENDING, BRIDGE 01

B052

CALIBRATE EQUIVALENT: 10JK = 2469 IN-LBS
UNIT CAL = 2813 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.110
BRIDGE VOLTS : 19.01
PRE CAL. : 8.76
POST CAL. : 8.79

JACK FAC. : NONE
LEVER ARM : 3.220 IN.
CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0.00	0.00	0.000	0.001	0
45.00	128.80	0.460	-0.001	-0
80.00	257.60	0.920	0.001	0
120.00	386.40	1.375	0.002	1
160.00	515.20	1.840	-0.006	-2
200.00	644.00	2.290	0.006	2
			-0.002	-1

MAXIMUM CALIBRATION LOAD: 644 IN-LBS

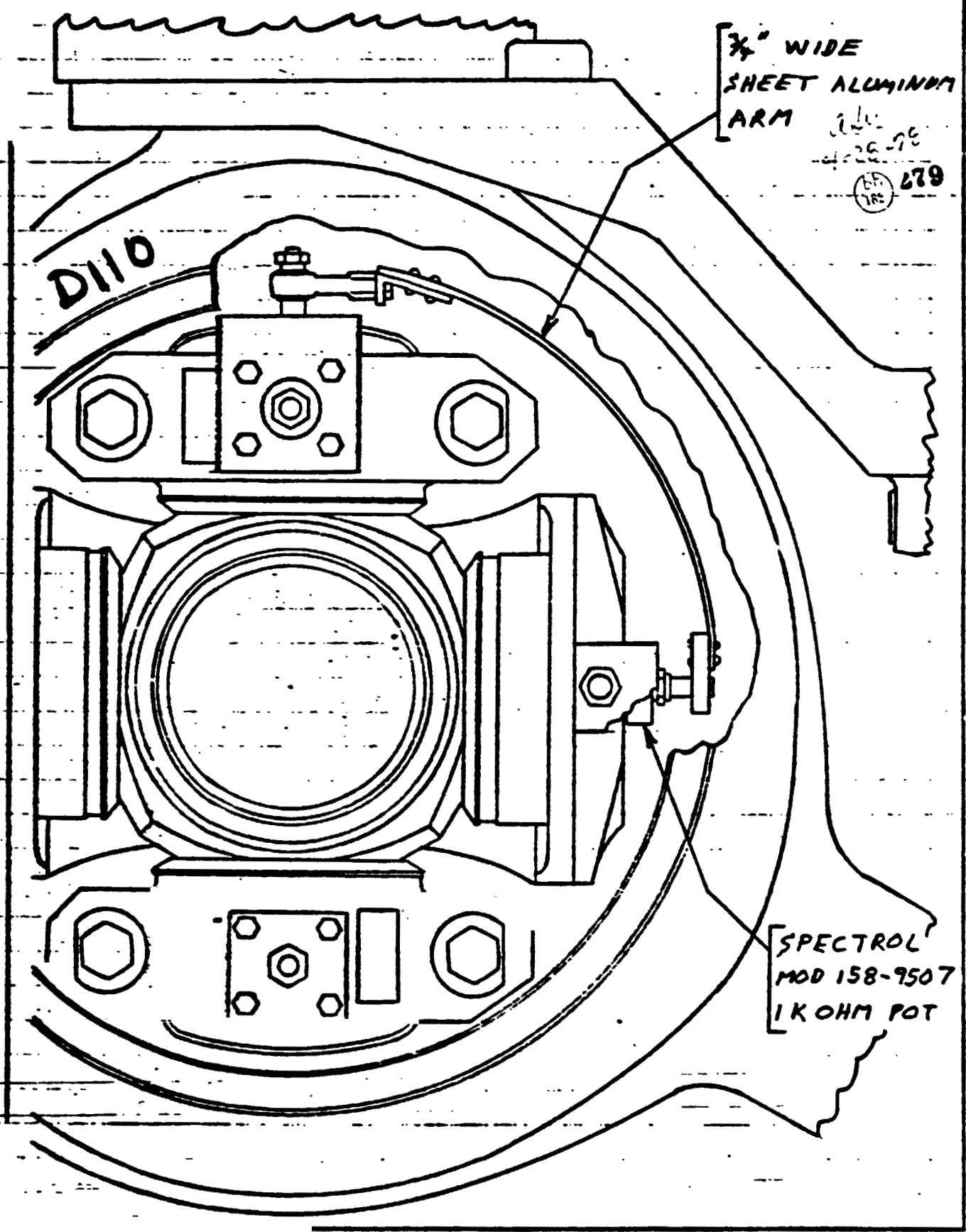
BMC PROGRAM FCCR33 - RUN DATE: 07-09-76

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

301 ROTOR GIMBAL TRUNNION FLAPPING POSITION



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-13-78

Lot. No. _____

Serial No. _____

Part No. _____

Engineer SMITH

Project GROUND TIEDOWN TESTS

Title REPAIR GROUND TIEDOWN POINTS

L. T. R. _____ EWA _____

W. O. _____

ITEM CODE: D110

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>SMITH</u>					
<u>SMITH</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>BRIDGE "A" - 72-2-1</u>				
Bridge	<u>21811</u>				
Config.					
Cal. Res.					
Lever Arm					

NOTE: DISCONNECT POT FOR CALIBRATION

Load	Output	Load	Output
PCT (DEF)	(DEF)	PCT (DEF)	(DEF)
0	-921	30	635
2	-812	26	430
4	-706	22	226
6	-603	18	17
8	-502	14	-195
10	-393	10	-395
12	-295	6	-500
14	-191	2	-215
16	-92	0	-921
17	17		
20	120		
22	227		
24	228		
26	429		
28	536		
30	636		
32	743		
34	845		
36	946		

GPA (92.9-7) = 9
LLC (92.0-7) = 749

ORIGINAL PAGE IS
OF POOR QUALITY

BY D. P. Smith

Bell Helicopter TEST

NO. 301

PAGE

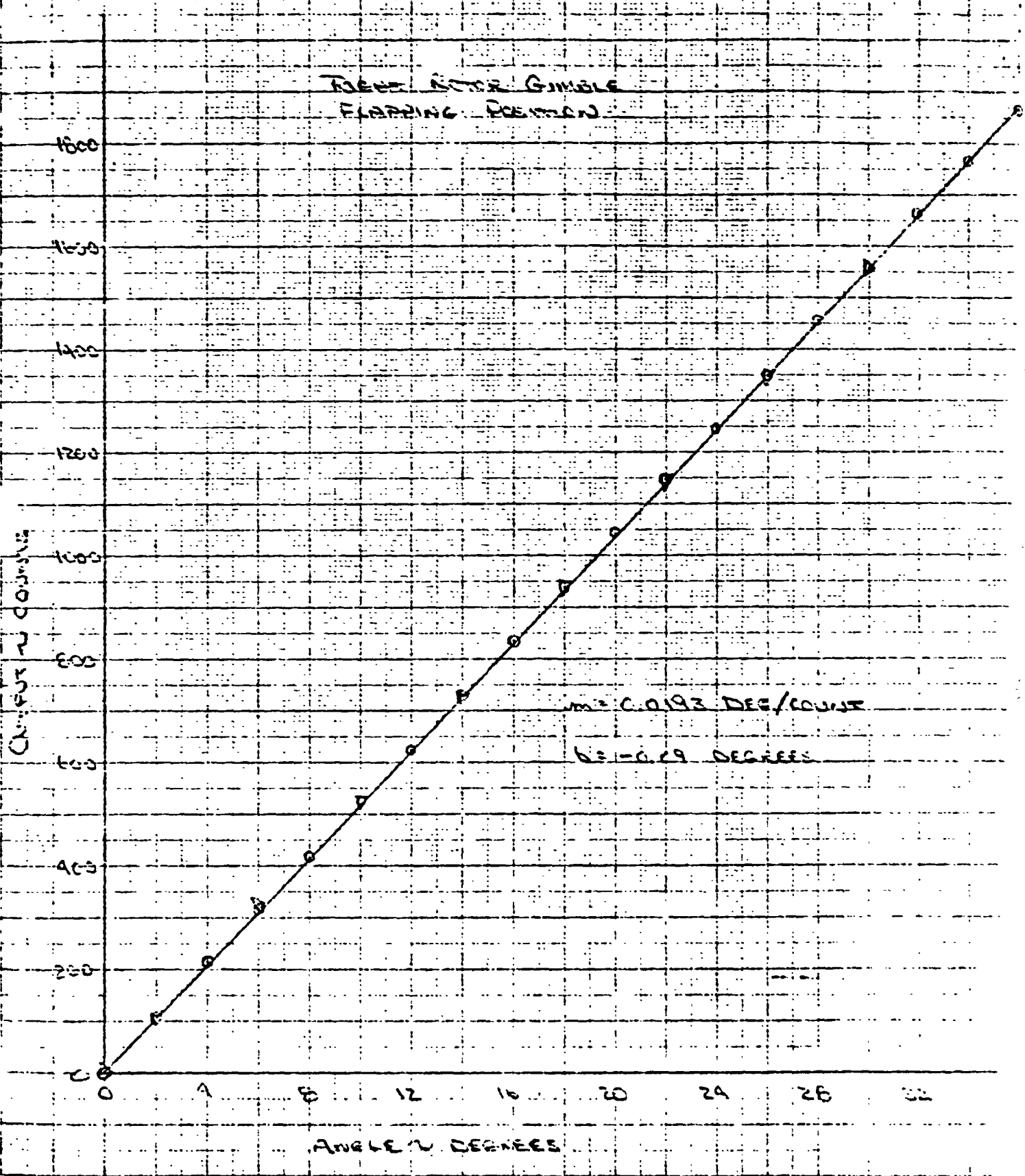
SPECIES

NO. 22

SPT

ITEM CODE: 0110

TEST FOR GIMBLE
FLAPPING FREQUENCY

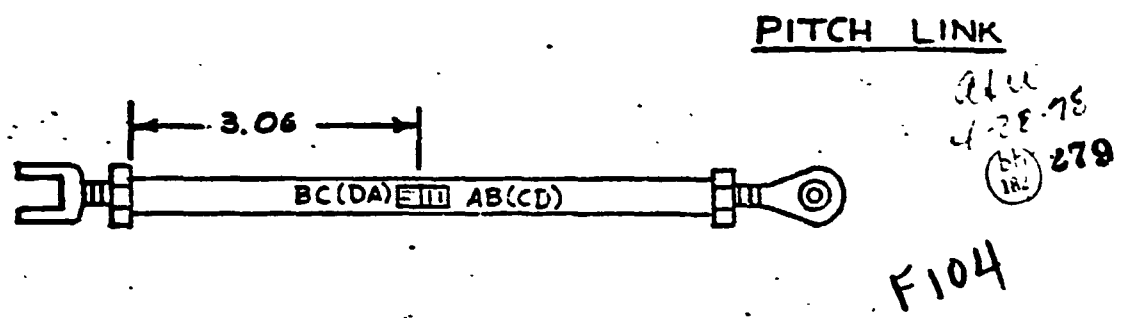


INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 678754
WA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAD. NO. 10987A
WORK ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 300-010-411-11
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF56	SERIAL NO.

TITLE OF TEST
301 FLIGHT TEST

SKETCH:



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
 COVER WITH 9309. ATTACH FOUR WIRE SIX
 INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL
 SLEEVING AND TERMINATE WITH M4P PLUG.

F104
01

BRIDGE	AXIAL						
BALANCE	4.03						
RES. TO GROUND	1Km						
DATE ASSIGNED	6-8-76	TECHNICIAN	C. C. W.	EST. HRS.	APPROVED BY:		
DATE COMPLETED	6-8-76	ENGINEER		ACT. HRS.			

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: ANDERSON

LAB NO. : 10987A01
CAL DATE: 6-16-76
SERIAL NO: NONE
P/N: 300-010-411-11

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: PITCH LINK
CHANNEL: 04 - AXIAL LOADING

F104

CALIBRATE EQUIVALENT: 100K = 784 POUNDS
UNIT CAL = 694 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.120
BRIDGE VOLTS : 10.00
PRE CAL. : 8.77
POST CAL. : 8.77

JACK FAC. : 1.5200 PSI/LB
LEVER ARM : NONE
CAL RES. : 100

LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	-0.031	-3
0.00	0.00	0.000	0.031	3
270.00	180.00	1.970	-0.015	-1
540.00	360.00	3.970	-0.026	-2
810.00	540.00	6.000	-0.010	-1
1080.00	720.00	8.020	-0.004	-0
1350.00	900.00	10.060	0.022	2

MAXIMUM CALIBRATION LOAD: 900 POUNDS

BHC PROGRAM FCCR33 - RUN DATE: 06-18-76

***** END OF JOB *****

***** END OF JOB *****

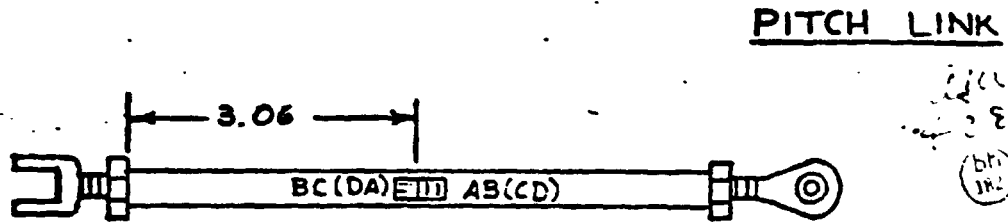
***** END OF JOB *****

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 678954
TA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAD. NO. 10985A
WORK ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 300-010-411-11
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF56	SERIAL NO.

TITLE OF TEST
301 FLIGHT TEST

SKETCH:



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
COVER WITH 9309. ATTACH FOUR WIRE SIX
INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL
SLEEVING AND TERMINATE WITH M4P PLUG.

FOSS
01

BRIDGE	AXIAL					
WAVELENGTH	3.55					
RES. TO GROUND	None					
DATE ASSIGNED	6-8-76	TECHNICIAN	Hollis		EST. HRS.	APPROVED BY:
DATE COMPLETED	6-8-76	ENGINEER			ACT. HRS.	

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: ANDERSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10985A01
CAL DATE: 6-16-76
SERIAL NO: NONE
P/N: 300-610-411-11

PROJECT: 301 FLIGHT TEST

PART NAME: PITCH LINK
CHANNEL: 04 - AXIAL LOADING

FOSS

CALIBRATE EQUIVALENT: 100K = 792 POUNDS
UNIT CAL = 891 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.120
BRIDGE VOLT. : 10.51
PRE CAL. : 8.73
POST CAL. : 8.77

JACK FAC. : 1.5000 PSI/LB
LEVER ARM : NONE
CAL RES. : 100

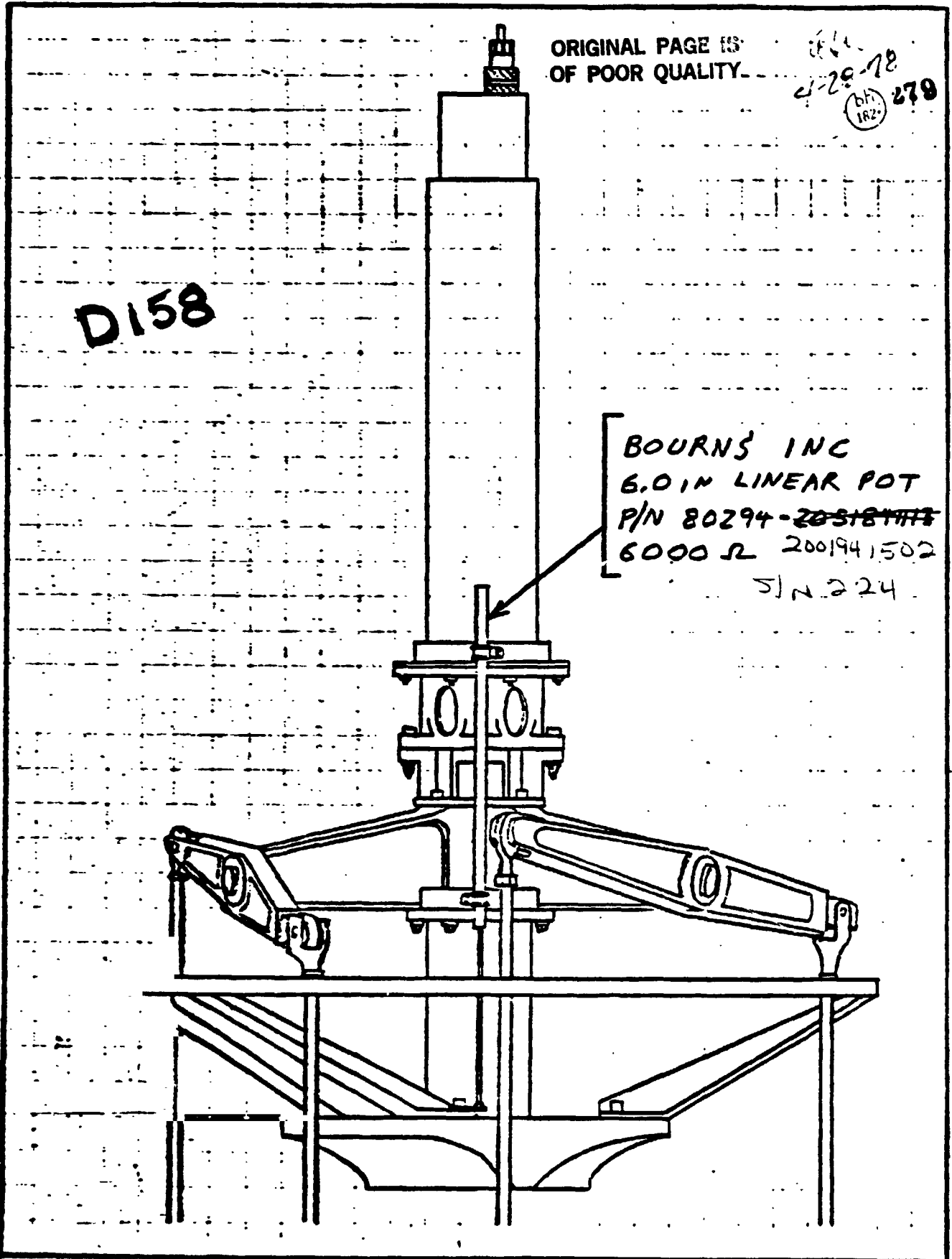
LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	-0.031	-3
0.00	0.00	0.000	0.031	3
270.00	180.00	1.970	-0.019	-2
540.00	360.00	3.990	-0.016	-2
810.00	540.00	6.020	-0.008	-1
1080.00	720.00	8.040	-0.008	-1
1350.00	900.00	10.090	0.022	2

MAXIMUM CALIBRATION LOAD: 900 POUNDS

BMC PROGRAM FCCR33 - RUN DATE: 06-18-76

FORSHAME, YOU FORGOT THE CAL RESIST. FOR CHANNEL 04 LAB NO. 10987A01
HOWEVER I WILL SET IT TO 100 OHMS AND CONTINUE

301 COLLECTIVE ACTUATOR POSITION POT



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-10-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer SMITH

Project GROUND TIEDOWN TESTS

W. O. 301#2

Title RT. Pylon Collective Action of Rotation

L. T. R. EWA

ITEM CODE: D150

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>W. J. R. JAMES</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>TRMDU "E" - 82-6-9</u>				
Bridge	<u>C157</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

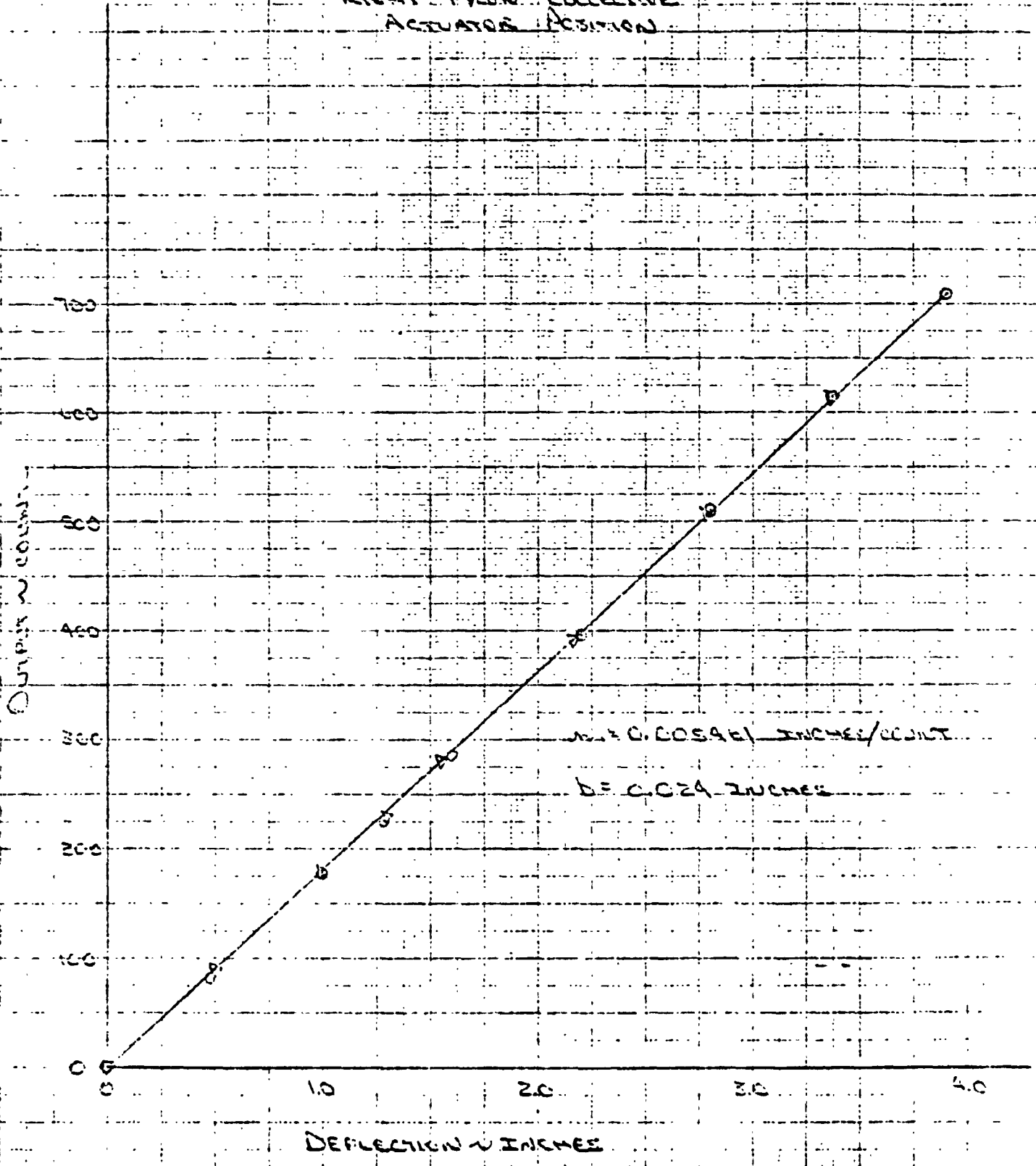
Load	Output	DEFLECTION (INCHES)	OUTPUT (CTS)	
Coll. P.C.S. (7)	COVERING PRECISION (%)			
0	13	0	-256	← RED BLADE $\theta = 10^{\circ}43'$ DEGREES
50	13	.48	-174	
100	13	.99	-79	
150	13	1.27	-30	
100	20	1.59	+30	
100	40	2.14	139	
100	60	2.91	256	
100	80	3.37	359	
100	100	3.91	454	← RED BLADE $\theta = 71^{\circ}50'$ DEGREES
100	80	3.36	360	
100	60	2.76	250	
100	40	2.16	135	
100	20	1.55	26	
100	13	1.29	-26	
100	13	1.02	-77	
50	13	.52	-166	
0	13	.02	-256	

GPA_0 (82-6-7) = -5
LLC (82-5-7) = 743

ORIGINAL PAGE IS
OF POOR QUALITY

ITEM CODE: D158

RIGHT PRON COLLECTIVE
ACTUATOR POSITION



BY Smith/est
CHECKED _____

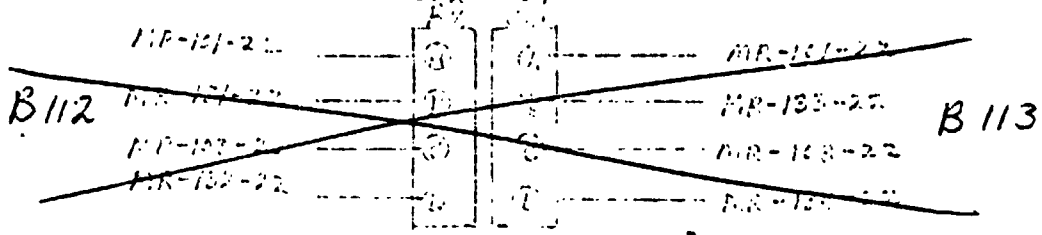
POST OFFICE BOX 427 • 1001 NORTH 11TH STREET
MEMPHIS, TENNESSEE 38101

MODEL W-15 PAGE _____
RPT 6-22-71

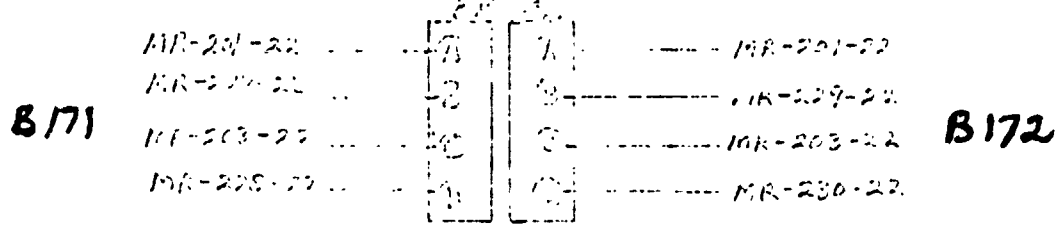
301 #2
HUB SPINDLE WIRING
R/H ROTOR
RR-2

ORIGINAL PAGE IS
OF POOR QUALITY

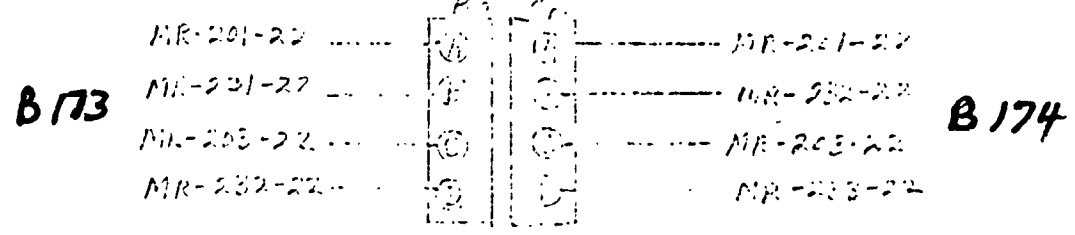
Hub Spindle Red Terminal Block



Hub Spindle White Terminal Block



Hub Spindle Green Terminal Block



1) TERMINAL BLOCKS LOCATED ON UPPER SURFACE
OF HUB.

2) WIRE NO. "MR-101-22", "MR-201-22", "MR-103-22", & "MR-203-22"
ARE PARALLEL VOLTAGE WIRES

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIANS: HERNANDEZ

ORIGINAL FACE IS
OF POOR QUALITY

LAB NO. : 10693603
CAL DATE: 10-22-76
SERIAL NO: NONE
P/N: 300-010-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND ROTOR YOKE
CHANNEL: 05 - WHI CHORD BENDING, STATION 8.5

B172

CALIBRATE EQUIVALENT: 100K = 19947 IN-LBS
UNIT CAL = 22646 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.25
POST CAL. : 5.29

JACK F/C. : 0.2870 P-SI/LB
LEVER ARM : 8.500 IN.

CAL R.S. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FRGM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.070	0.044	167
0.00	0.00	0.000	-0.044	-167
338.00	10010.45	2.720	0.023	88
675.00	20020.91	5.380	0.031	118
1014.00	30031.36	8.020	0.019	71
1352.00	40041.82	10.650	-0.003	-13
1690.00	50052.27	13.280	-0.026	-97

MAXIMUM CALIBRATION LOAD: 50052 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: HERNANDEZ

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10593604
CAL DATE: 10-22-76
SERIAL NO: NONE
P/N: 300-010-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND ROTCR YOKE
CHANNEL: 06 - WHT BEAM BENDING, STATION 8.5

8171

CALIBRATE EQUIVALENT: 100K = 29907 IN-LBS
UNIT CAL = 36082 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.27
POST CAL. : 5.26

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 8.500 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.038	-216
0.00	0.00	0.000	0.058	216
360.00	5024.03	0.840	-0.006	-37
720.00	10049.26	1.700	-0.031	-176
1080.00	15073.89	2.550	-0.036	-202
1440.00	20098.52	3.500	-0.000	-1
1800.00	25123.15	4.420	0.035	200

MAXIMUM CALIBRATION LOAD: 25123 IN-LBS

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: HERNANDEZ

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10593805
CAL DATE: 10-22-76
SERIAL NO: NONE
P/N: 300-010-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND ROTOR YOKE
CHANNEL: 07 - GRN CHRC BENDING. STATION 8.5

B174

CALIBRATE EQUIVALENT: 100K = 19355 IN-LBS
UNIT CAL = 21998 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.28
POST CAL. : 5.28

JACK FAC. : 0.2670 PSI/LB
LEVER ARM : 8.500 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE IN-LBS
0	0	0.000	-0.000	-2
0.00	0.00	0.000	0.000	2
338.00	10010.45	2.720	-0.010	-36
676.00	20020.91	5.480	0.019	69
1014.00	30031.36	8.190	-0.032	-8
1352.00	40041.82	10.910	-0.013	-47
1690.00	50052.27	13.660	0.005	23

MAXIMUM CALIBRATION LOAD: 50052 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: HERNANDEZ

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10593606
CAL DATE: 10-22-76
SERIAL NO: NONE
P/N: 300-010-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND ROTGR YOKE

CHANNEL: 08 - GRN BEAM BENDING. STATION 8.5

B173

CALIBRATE EQUIVALENT: 100K = 28606 IN-LBS
UNIT CAL = 32507 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.28
POST CAL. : 5.28

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 8.500 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.005	26
0.00	0.00	0.000	-0.005	-26
360.00	5024.63	0.930	-0.002	-12
720.00	10049.26	1.870	0.010	56
1080.00	15073.99	2.790	0.003	16
1440.00	20098.52	3.710	-0.004	-24
1800.00	25123.15	4.640	-0.002	-10

MAXIMUM CALIBRATION LOAD: 25123 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

BY A. WHITENER
CHECKED (Signature)

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2
HELI. 1x2 RPT SKASW04375-1

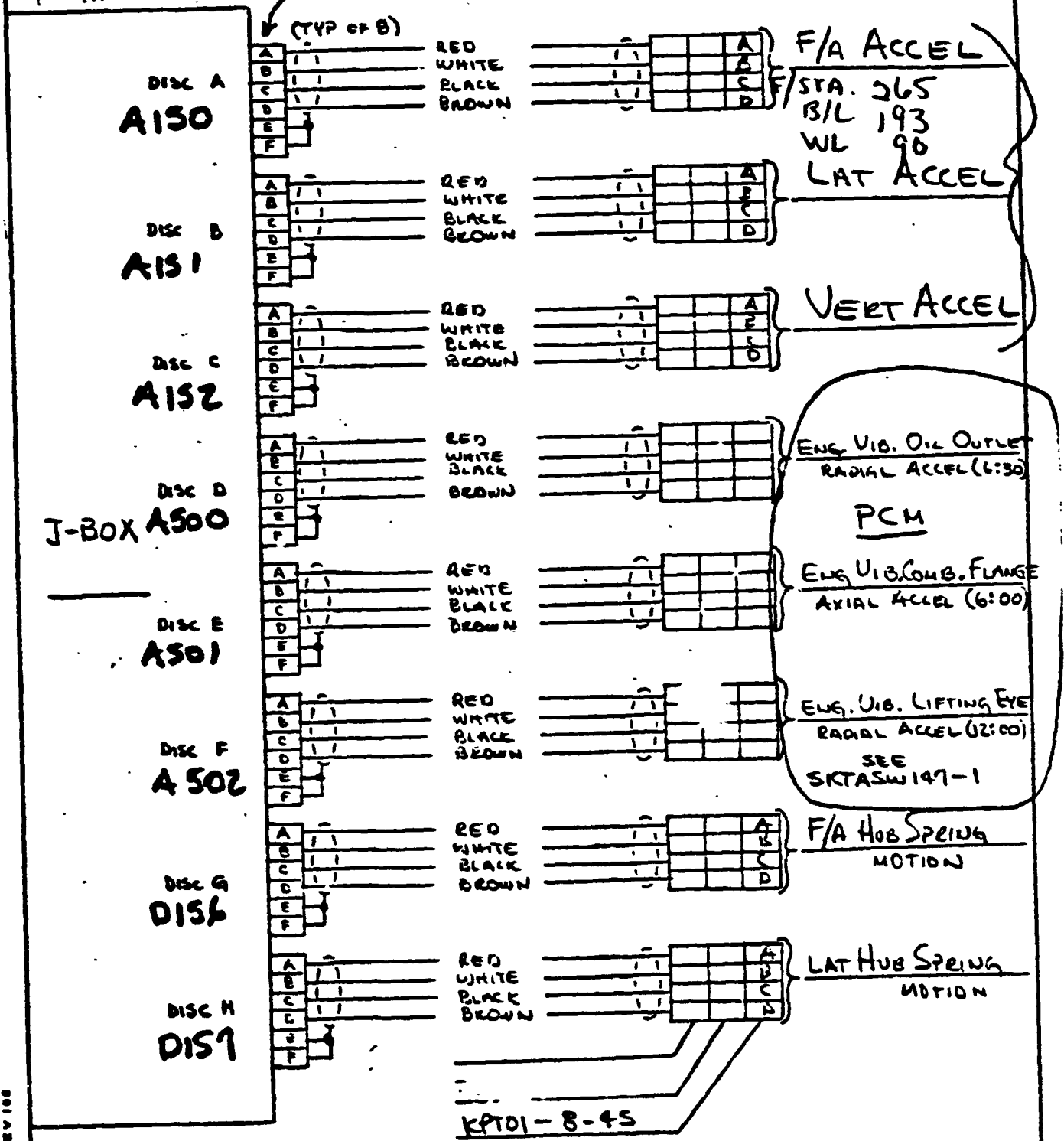
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

REV. 12
4 30
679
182

J-Box LOCATION RP-1

KPT06-D-67



7045 800REV 100

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 2 OF 2

CHECKED ADW

HELI. 142 RPT SKASW04375-1

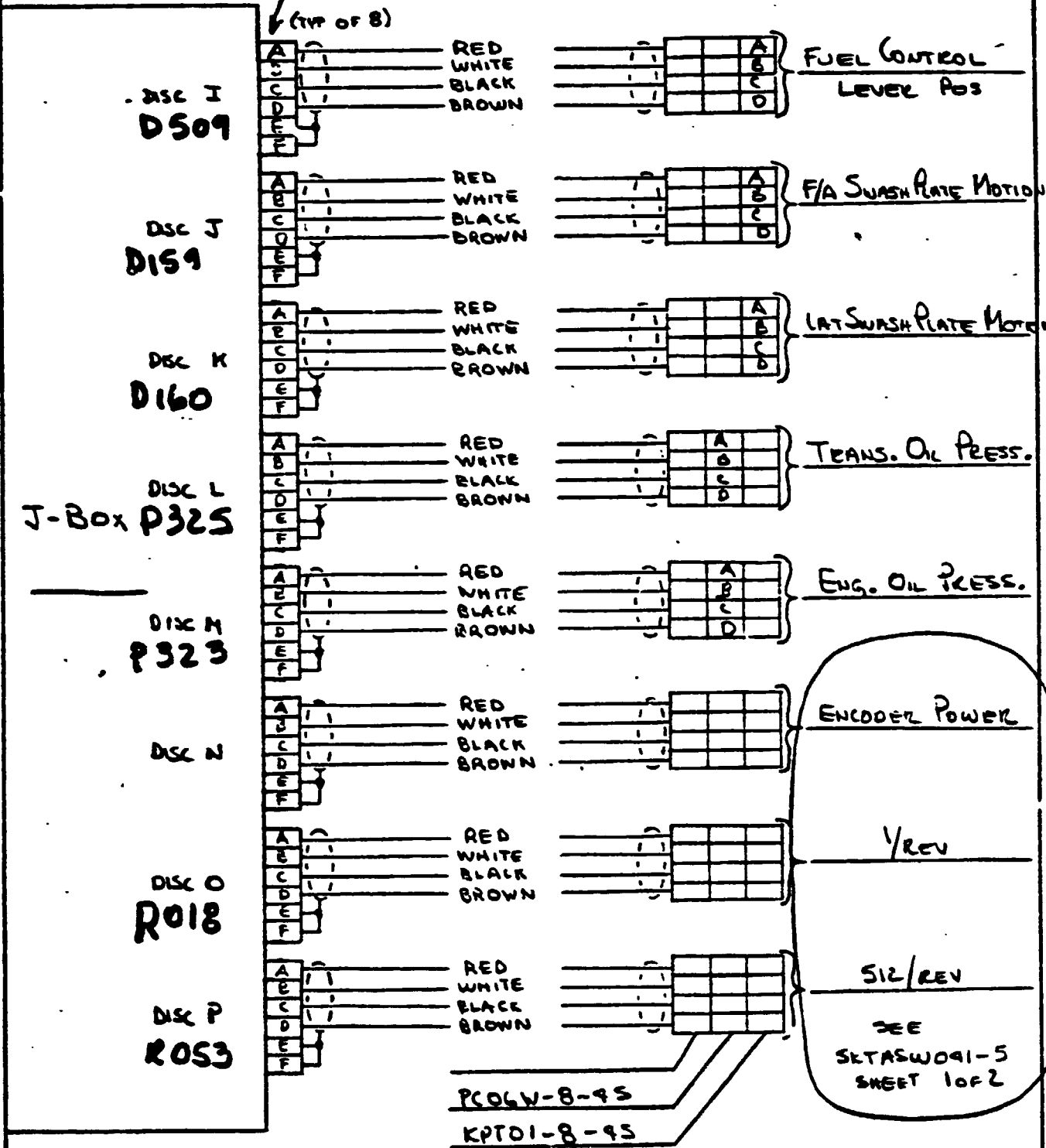
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

279
182

J-Box LOCATION RP-1

KPTOG-10-6P



ORIGINAL PAGE IS OF POOR QUALITY

ENGINE VIB. AND TACK GEN.

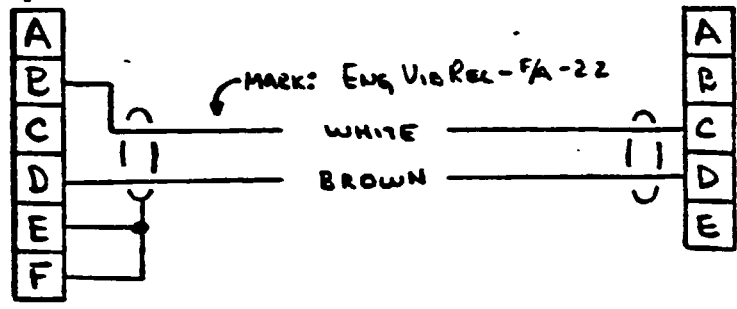
(LOW FREQ) PCM

J-Box RP-1

TYPE OF 3 EXISTING PULSES (VPS/4AGIS) FROM PAGE 1

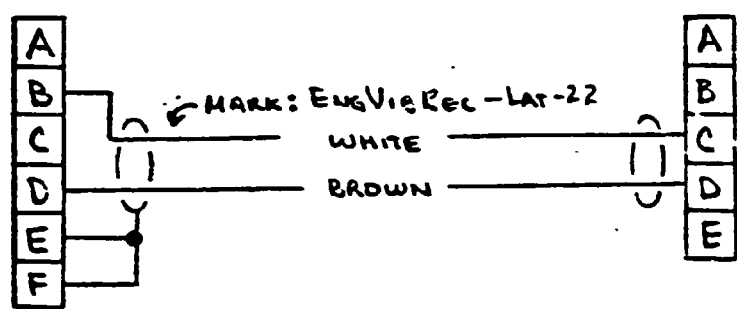
KPTOL-10-6P (TYPE OF 3)

Disc # D



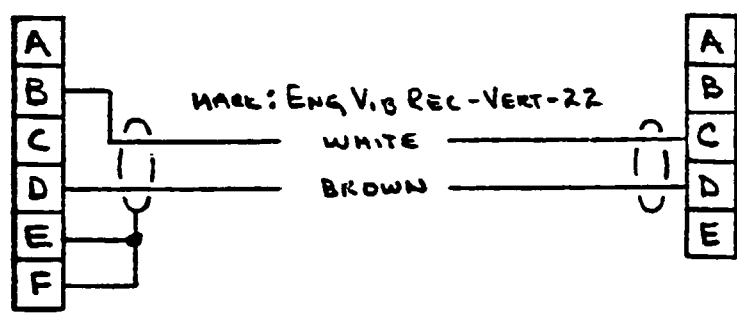
ENG. VIB. OIL OUTLET RADIAL ACCEL (6:30)
AS00

Disc # E



ENG. VIB. COMBUSTION FLANGE AXIAL ACCEL (6:00)
AS01

Disc # F



ENG. VIB. LIFTING EYE RADIAL ACCEL (12:00)
AS02

MAKE FROM 2 CONDUCTOR SHIELD (ORANGE)

279

RP-14
AS-1
AS-2

PIEZOELECTRIC ACCELEROMETER CALIBRATION

MANUF. 7700000 TYPE 2-2-212 DATE 05-015-25
 CAPACITANCE PF PROPERTY # TECH

MOUNTING METHOD -

CHARGE AMPLIFIER
5/2 2R 47

REMARKS -

DC OUT PUT OF AMPLIFIER.

NOMINAL CHARGE SENSITIVITY

272.1 1/2 peb/G

ORIGINAL PAGE IS OF POOR QUALITY

PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

FREQUENCY (HERTZ)

10000
1000
100
10

PIEZOELECTRIC ACCELEROMETER CALIBRATION

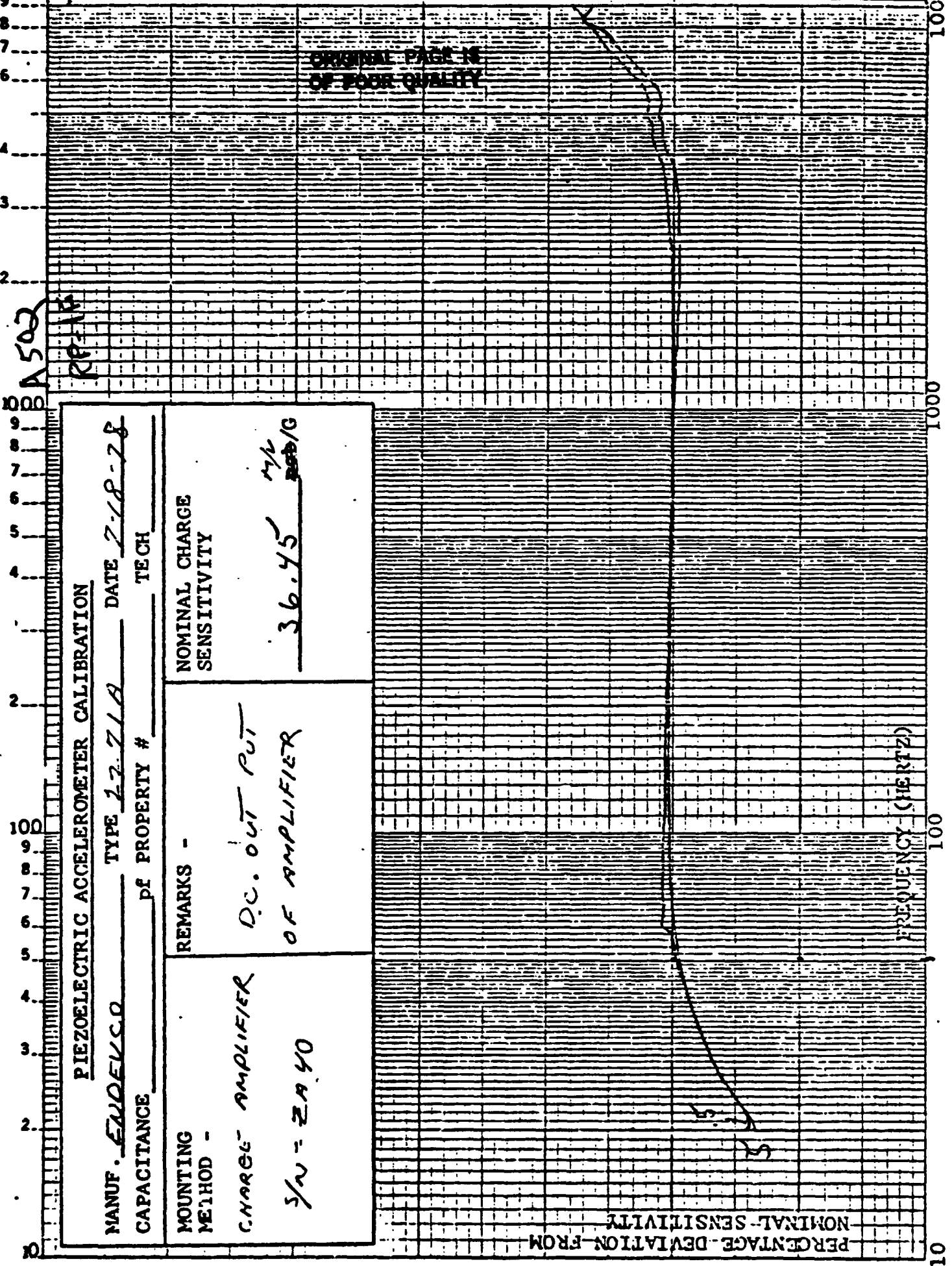
MANUF. EMDELCO TYPE 22-71A DATE 7-18-78
CAPACITANCE _____ PF PROPERTY # _____ TECH _____

MOUNTING METHOD -
CHARGE AMPLIFIER DC. OUT PUT
SN - ZA 40
NOMINAL CHARGE SENSITIVITY 36.45 ^{mV}/_g

ORIGINAL PAGE IS OF POOR QUALITY

PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

FREQUENCY (HERTZ)



A 503

RF-116

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 of 2

CHECKED _____

HELI. 142 RPT SKTASW091-5

ORIGINAL PAGE IS
OF POOR QUALITY.

MODEL 301

Alvin
4-28-78

② 279

SHAFT ENCODER WIRING (NON-ROTATING)

(TYP OF 2 → RIGHT ← LEFT ROTOR)

J-BOX
INPUTS

RP-1N

(512/REV)

R018

RP-10

(1/REV)

R053

RP-1P

(ENCODER
POWER)

A
B
C
D
E
F

A
B
C
D
E
F

A
B
C
D
E
F

WIRES ROUTED FROM
BASE OF COLLECTIVE
ACTUATOR

25
53
34
62
61
33
52
24

PLUG AT

TOP OF

ROTOR MAST

(MATES WITH
SLIP RING
PLUG)

← KPT06-10-6P

IDENT. NO. 07400
PRIORITY FOR CHANGE

A. NO.

W.A. NO. AAA

E.T.A.R. NO. D111

REASON:

3 AXIS ACCELEROMETER MOUNT FOR VIBRATION SURVEY

4-28-68 (182) 279

CHANGE

RELEASE

PROCESS

TEST

HES

SEIL NO.

~~24-115-311~~

CLASS OF CHANGE

ED IN RESUL LTR.

SHEET

OF

1

ENG'G WORK ORDER

DRAWINGS AFFECTED

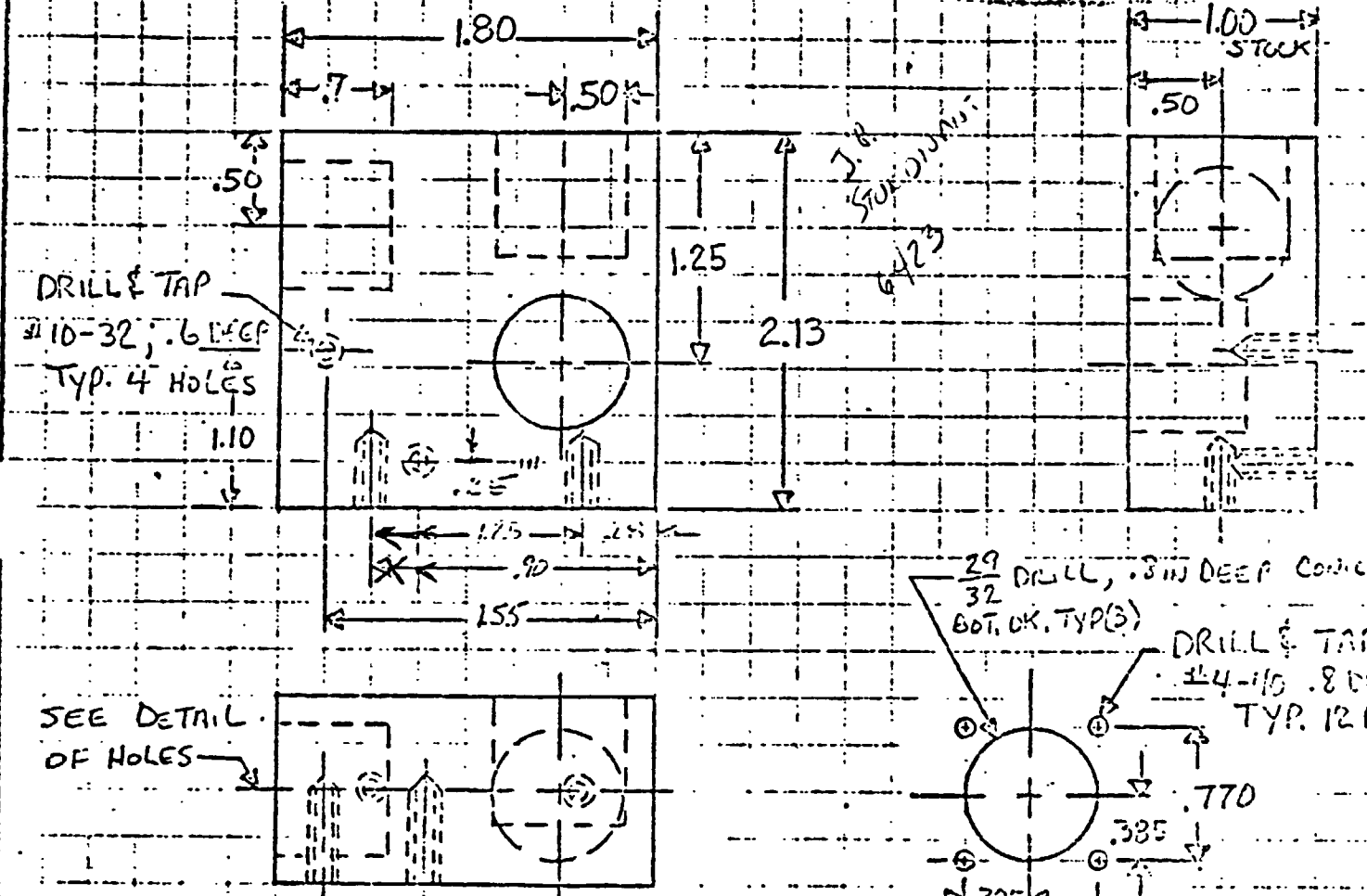
DRAWING CHANGE LTR.

ED NOT INCORP.

ED INCORP.

DRAWING TITLE

FOR REFERENCE



SEE DETAIL OF HOLES

12 MAKE: 12 DELIVERY TO A. WHITENER 4882 12-770

MATERIAL: 2024 AL. ALY. OR EQUIV.

SURFACE FINISH: PAINT INTL. ORANGE

DETAIL OF HOLES

STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION	
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE
PREPARED BY <u>H. H. H. H.</u>	<u>7-6-7</u>	STRUCTURES				MET. DES.
GROUP ENGR. <u>H. H. H. H.</u>	<u>7-6-7</u>	CUSTOMER				WEIGHTS
CHECKED BY <u>N. D. S.</u>	<u>7-6-7</u>	D.E.R.				APPROL. ENG.
MANUFACTURING EFFECTIVITY	NONE		ENGINEERING EFFECTIVITY		NONE	

ORIGINAL PAGE IS OF POOR QUALITY

BY A. WHITENER

BELL HELICOPTER COMPANY
POST OFFICE BOX 400 • FORT WORTH, TEXAS

MODEL 301 PAGE 10E1

CHECKED _____

RPT SKASW 348-1

ENGINE VIBRATION ACCELEROMETER
MOUNT

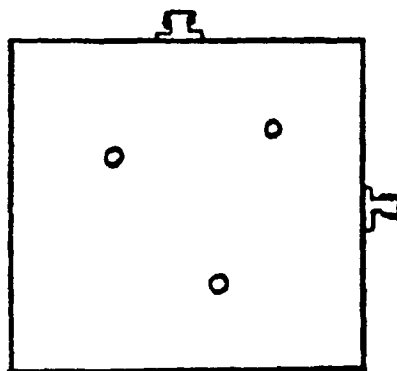
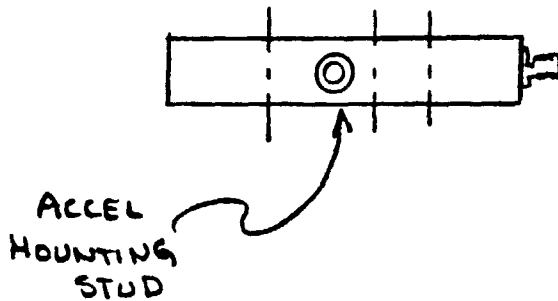
POWER TURBINE OIL EXIT TUBE

A502

ORIGINAL PAGE IS
OF POOR QUALITY

celh
1-29-78

(bh
182) 278



DRILL TO MATCH FITTING

NOTE: USE LYCOMING DRWG 1-000-094-14
FOR THESE LOCATIONS

BY A. WHITENER
CHECKED _____

BELL HELICOPTER COMPANY

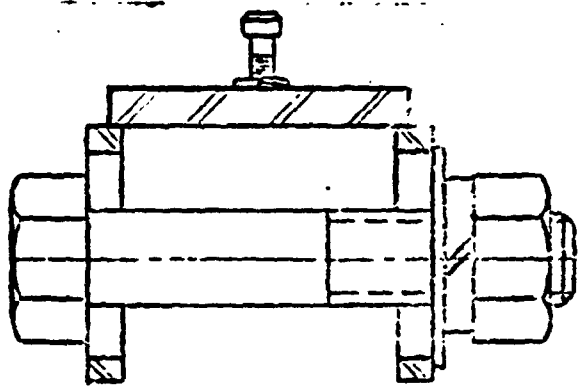
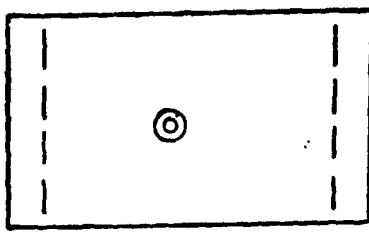
MODEL 301 PAGE _____
SKASN348-2

ENGINE LIFTING LUG
ACCELEROMETER MOUNT

AW
4-28-78
182
678

A502

ORIGINAL PAGE IS
OF POOR QUALITY.



NOTE: USE LYCOMING DRAWG 1-000-044-14
FOR THESE LOCATIONS

CODE ID VT. NO. 97499
 AUTHORITY FOR CHANGE
 P.C.A. NO.
 V.A. NO. **A427**

CHANGE
 RELEASE
 PROCESS
 TEST
 HES

SER. NO. **301HES-118** SHEET **1**
 CLASS OF CHANGE _____ EQ RESERVE LTR. _____ OF **1**
 ENG'R'S WORK ORDER **A427**

L.T.A.R. NO.

REASON: **HUB SPRING MOTION DISPLACEMENT TRANSDUCER MOUNT FOR XV-15 NC 142**

DRAWINGS AFFECTED

DRAWING CHANGE LTR.
 NOT INCORP. INCORP.

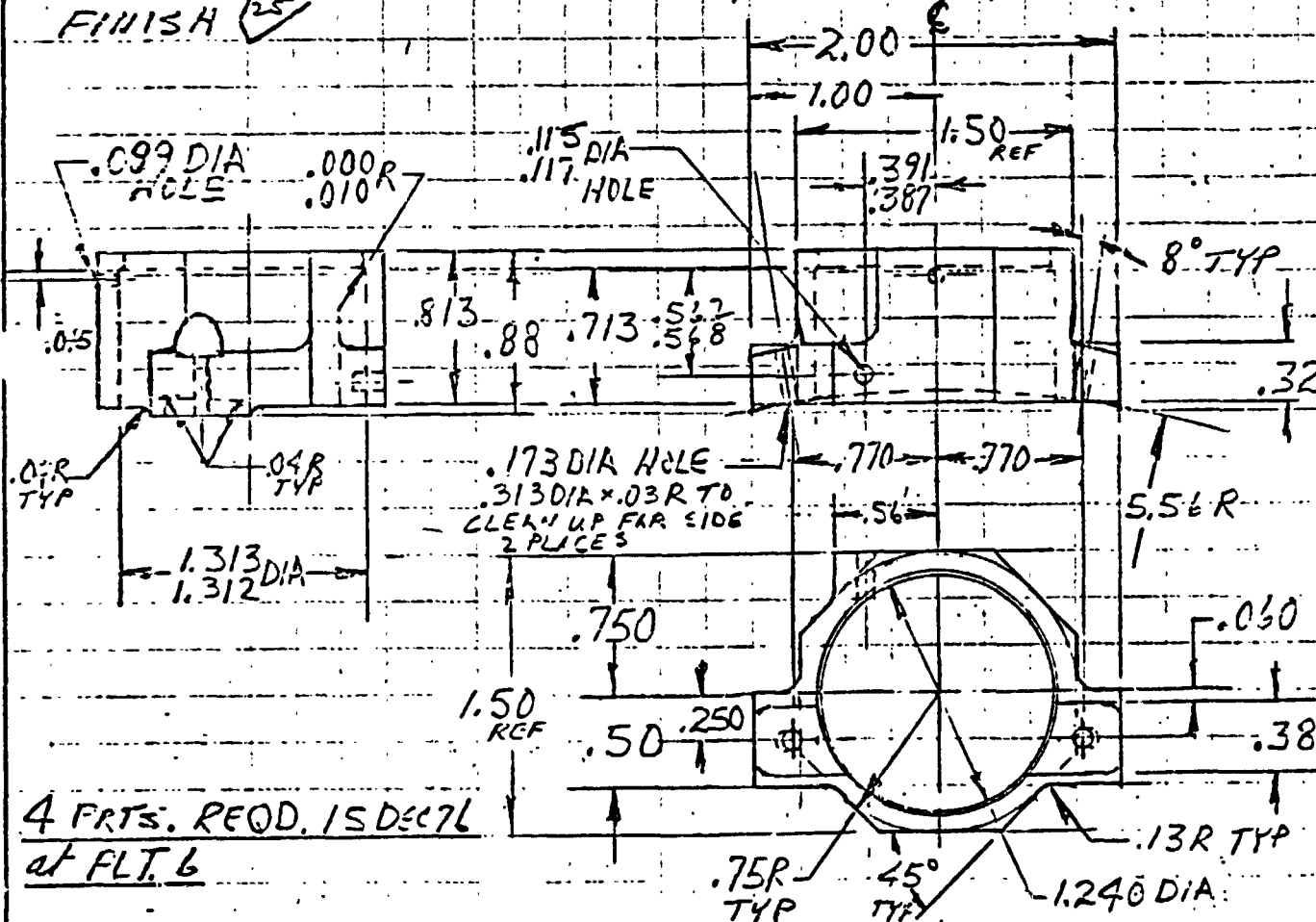
DRAWING TITLE

THIS E.O. IS ENGINEERING AUTHORITY TO MFG 8 (EIGHT) 301HES-118 -1 MOUNT

ORIGINAL PAGE IS OF POOR QUALITY

4-28-78
 (BR) 279

MATL. **1.0 x 1.8 x 2.3 2024 AL, QQA-250/4, T351 CHEM. A FINISH**



4 FRTS. REQD. 15 DEC 76 at FLT. 6

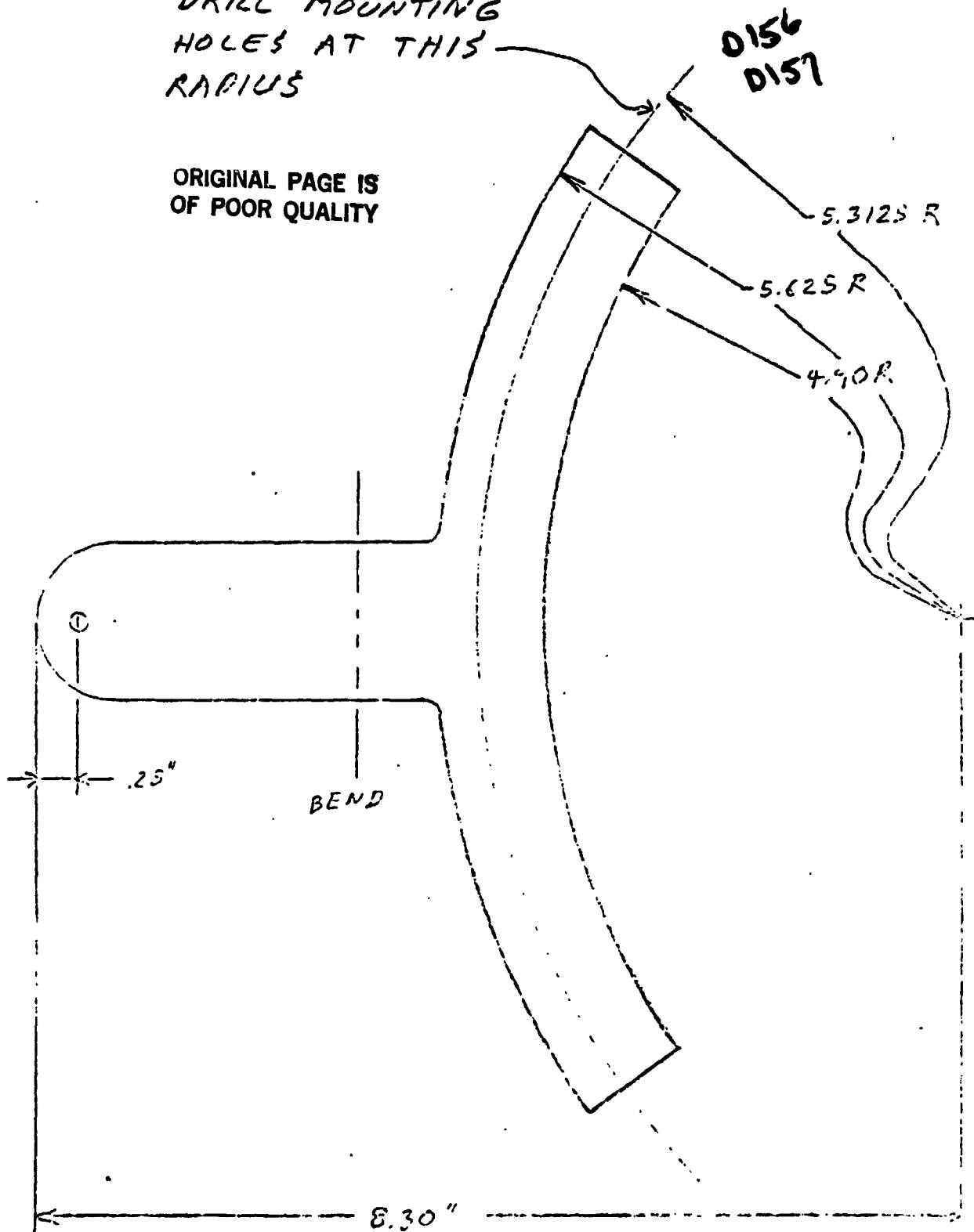
STATUS	PART/ASS'Y NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION			
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	
PREPARED BY <i>SCHULMASE</i>	12-11-76	STRUCTURES				MET. DES.		
GROUP ENG'R <i>[Signature]</i>	12-11-76	CUSTOMER				WEIGHTS		
CHECKED BY		D.E.R.				PROJ. ENG. <i>Cutler, ELS</i>	12-11-76	
MANUFACTURING EFFECTIVITY				ENGINEERING EFFECTIVITY				
				TEST				

HUB SPRING MOTION BRACKET

RLM
7-28-78
(b1)
182 679

DRILL MOUNTING
HOLES AT THIS
RADIUS

ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/4/79

Lab. No. _____

Serial No. _____

Part No. _____

Engineer S. J. ...

Project GROUND TIEDOWN TEST

Title RT. ROW HOLE SPRING F/A MOTION

el 301 #2

W. O. _____

L. T. R. _____

EWA _____

Item Code: D156

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>LA JORGE</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chem.	<u>RWU - 1 - E2-4-2</u>				
Bridge	<u>C/S 7</u>				
Config.					<u>NOTE: DISCONNECT POT FOR CALIBRATION</u>
Col. Res.	<u>N/A</u>				
Lever Arm					

Load	Output				
<u>DEFLECTION</u>	<u>CUT POINT</u>				
<u>(0.05-0.01)</u>	<u>(0.0001)</u>				
0	607				
.3	527				
.6	435				
.9	349				
1.2	259				
1.5	166				
1.8	75				
2.1	-16				
2.4	-107				
2.7	-199				
3.0	-290				
3.3	-351				
2.7	-199				
2.1	-20				
1.5	166				
.9	349				
.3	527				
0	607				
GAA (E2-E7)=					
LLC (E3-E7)=					

ORIGINAL PAGE IS
OF POOR QUALITY

BY D. J. Smith
CHECKED

HELL HELICOPTER COMPANY
17-5000 17-5000 17-5000

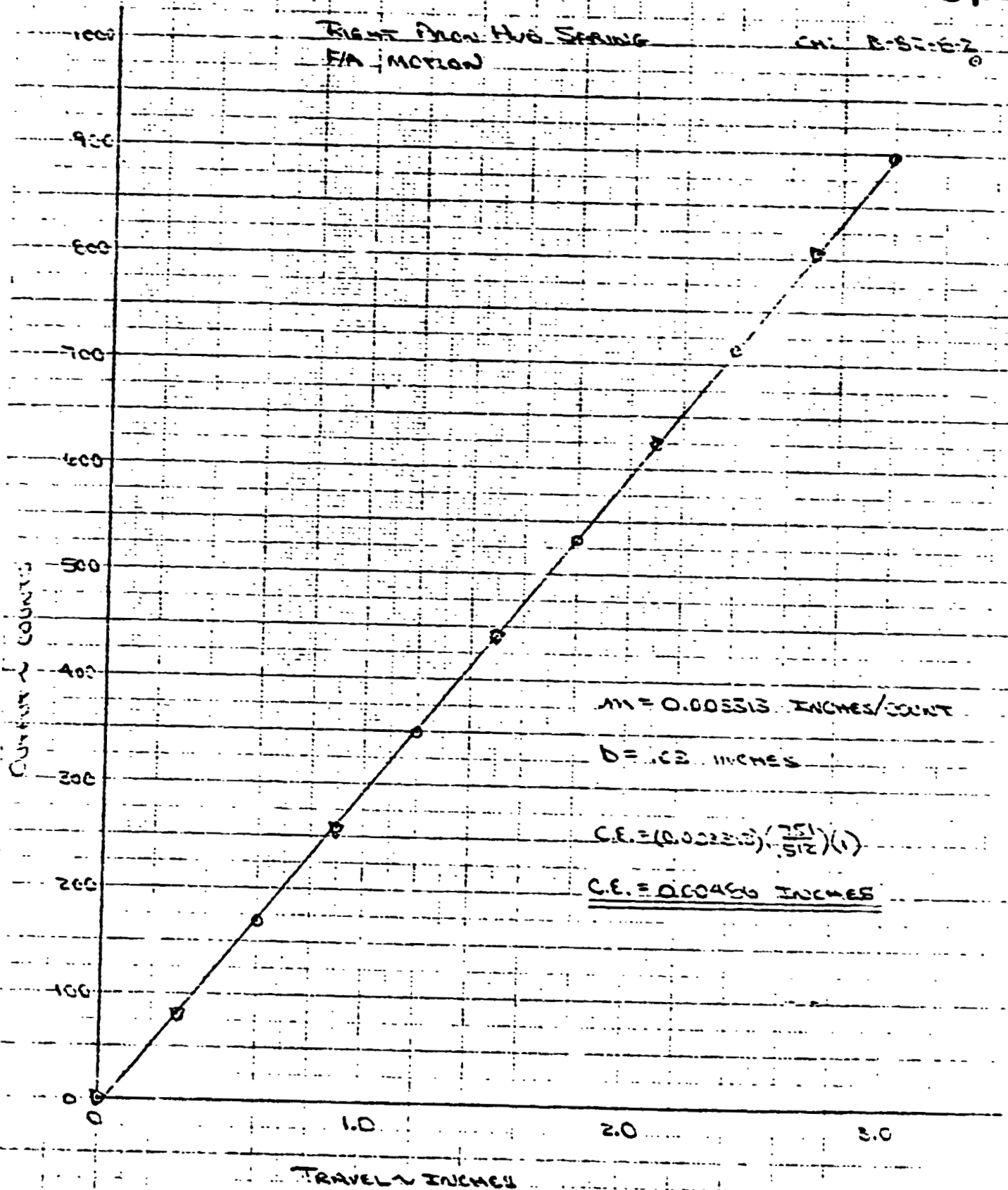
MODEL 501
HELL #2

PAGE
281

Item Code: D156

CH: D-57-62

RIGHT FROM HUB SPRING
F/A MOTION



CALIBRATION DATA SHEET

Date 5/9/75

Lc. No. _____

Project GROUND TIE-DOWN TESTS

Serial No. _____

301-2

Title Re. River Hill Spring Lat. Motion

Part No. _____

W. O. _____

L. T. R. _____

EWA _____

Engineer Smith

Item CODE: D157

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvs.
<u>Smith</u>					
<u>Smith</u>					

Velts					
ORIGINAL PAGE IS OF POOR QUALITY					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chen. <u>RAILWAY "P" - 82-A-2</u>					
Bridge <u>C/E 7</u>					
Config. <u>NOTE: DISCONNECT POT FOR CALIBRATION</u>					
Cal. Res. <u>1.12</u>					
Leve. Arm					

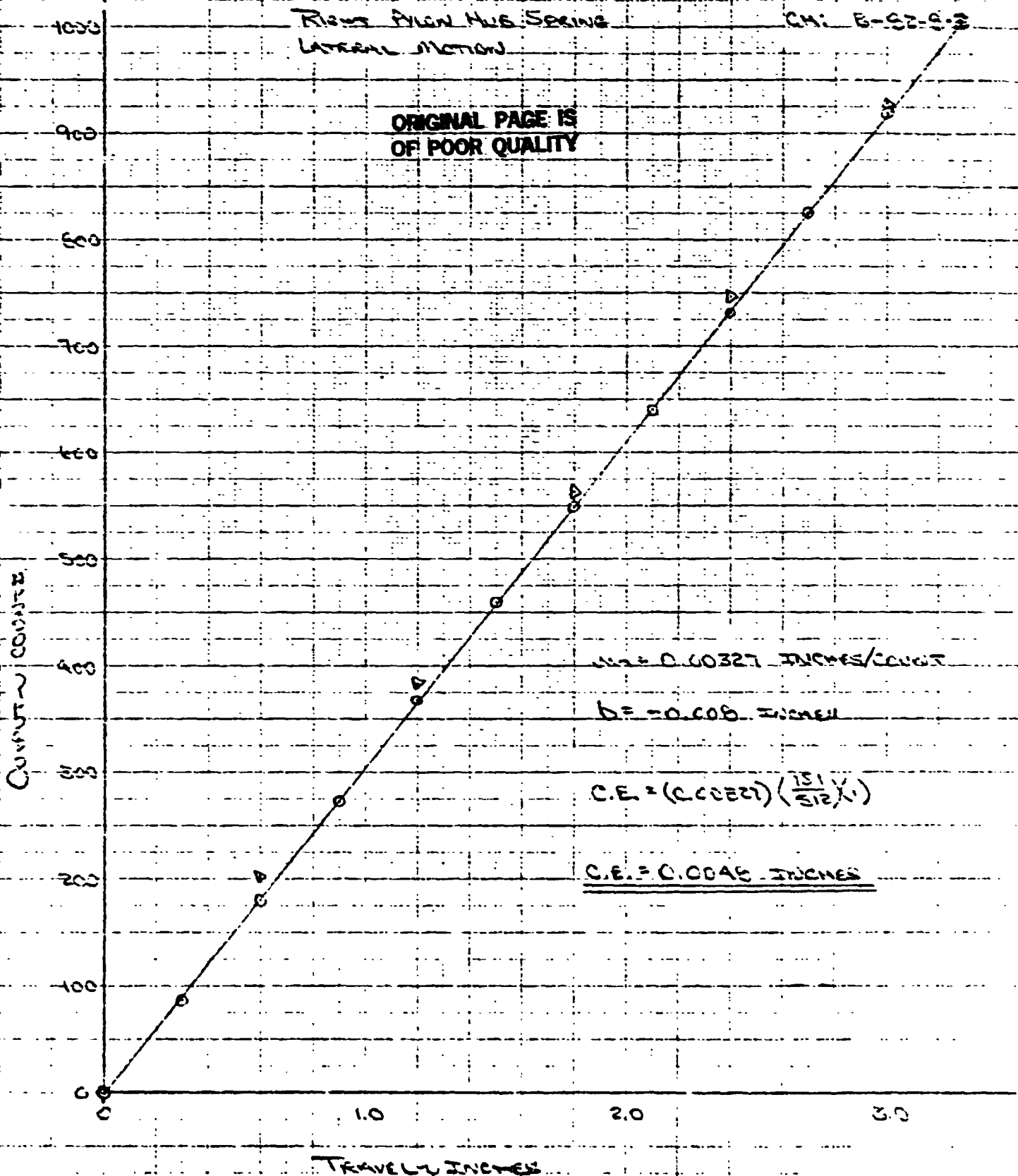
Load	Output	
DEFLECTION (INCHES)	OUTPUT (COUNTS)	
0	607	
.3	530	
.6	427	
.9	339	
1.2	239	
1.5	147	
1.8	55	
2.1	-33	
2.4	-125	
2.7	-214	
3.0	-312	
3.3	-402	
3.6	-495	
3.9	-581	
2.4	-139	
1.8	142	
1.2	222	
.6	405	
0	607	
GDA. (82.8-7) =	-0009	
LLC. (82.8-7) =	10792	

ITEM CODE: 0157

RIGHT AXON HUB SPRING
LATERAL MOTION

CH: B-SZ-S-2

ORIGINAL PAGE IS
OF POOR QUALITY



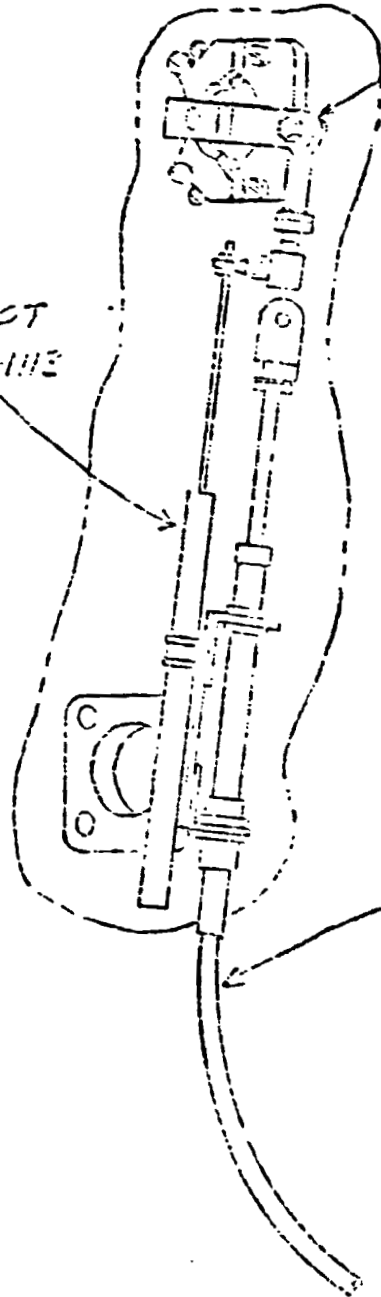
SKHD121176-1

301 FUEL CONTROL LEVER POSITION BRACKET

ORIGINAL PAGE IS
OF POOR QUALITY

4-28-78
(b7c) 279

EGURNS INC
6.0 IN LINEAR POT
P/N 20294-20517-1113
5000 04115



THROTTLE LEVER
ON THE ENGINE

THROTTLE CABLE

BY H.D. WINNIFORD

BELL HELICOPTER COMPANY
POST OFFICE BOX 602 • FORT WORTH, TEXAS

MODEL 301 PAGE _____

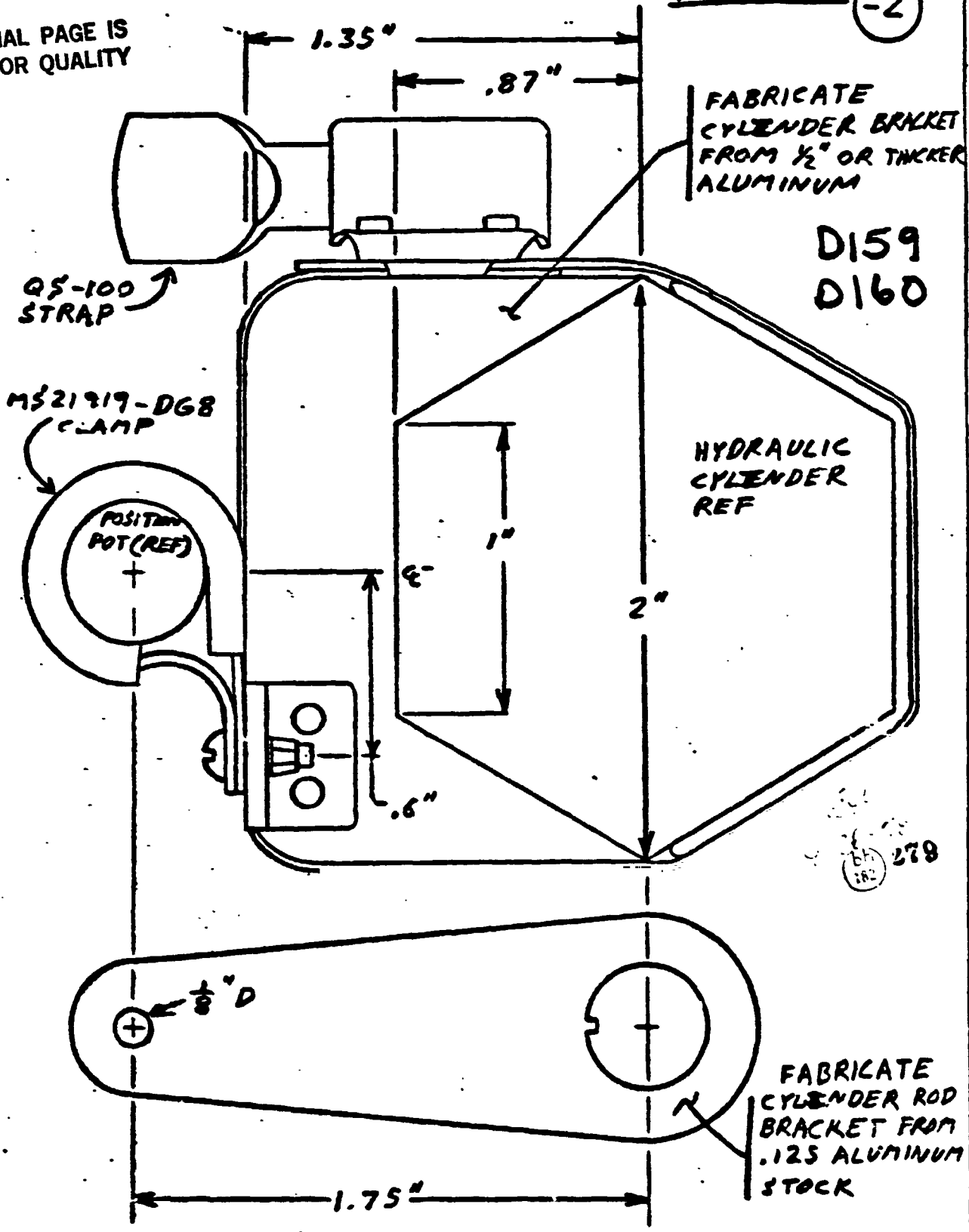
CHECKED _____

RPT SHIP #1

HYDRAULIC CYLINDER POSITION BRACKETS

SKHDG-1-76 -2

ORIGINAL PAGE IS
OF POOR QUALITY



FABRICATE
CYLINDER BRACKET
FROM 1/2" OR THICKER
ALUMINUM

D159
D160

HYDRAULIC
CYLINDER
REF

FABRICATE
CYLINDER ROD
BRACKET FROM
.125 ALUMINUM
STOCK

279

5875 5885

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-10-76

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GROUND TIEDOWN TESTS

Title RT. PAV. SUBGRADE FA MOTOR

301 * 2

L. T. R. _____ EWA _____

W. O. _____

Item CODE: D 159

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
W. O. Smith					

Volts					
Gage Type			NOTE: CONVERT INCHES TRAVEL TO		
Gage Fac.			DEGREES PER R. HALL FACTOR		
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMD 1 "B" - 82-6-5</u>				
Bridge	<u>C/S 7</u>				
Config.					
Col. Res.	<u>N/A</u>				
Lever Arm					

Loc.	Output					
FA STRUCK POS. (17)	FEDAL REC. REFLECTION (%)	OUTPUT (GPA)				
0	Full Right	0	-125			
10	50	35	-55		PLCT 50% PEDAL POS. ONLY	
20	50	66	-12			
30	50	99	79			
40	50	125	91			
50	50	159	190			
60	50	175	191			
70	50	2.16	292			
80	50	2.46	299			
90	50	2.72	339			
100	Full Left	2.19	415			
80	50	2.39	292			
60	50	1.99	190			
40	50	1.22	59			
20	50	1.65	-19			
0	Full Right	1.1	-125			
GPA ₀ (82-6-7) = -6						
LCC (82-8-7) = 799						

BY D. P. Smith
CHICAGO

Bell Helicopter LABOR

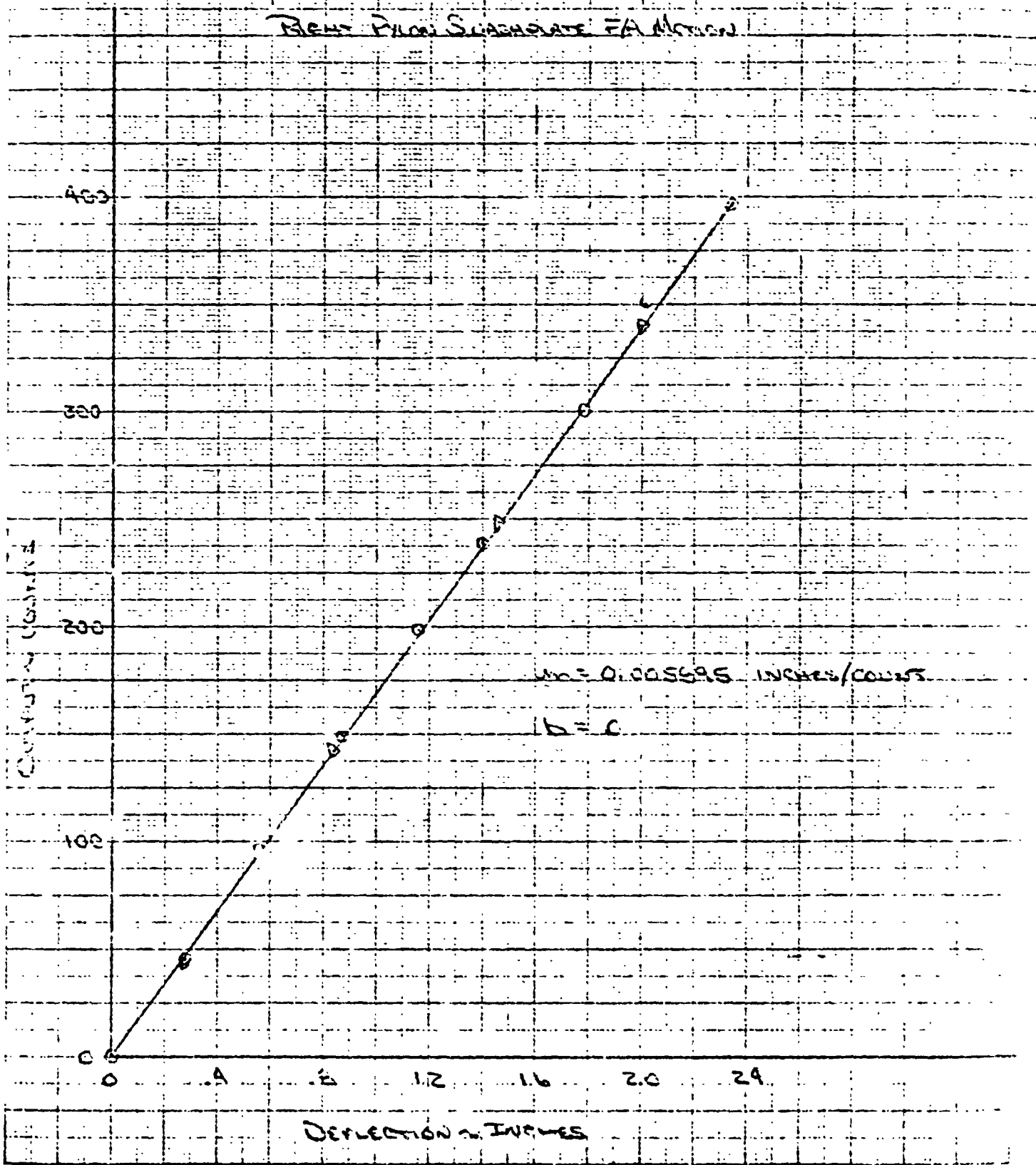
MODEL 301
SERIAL 22

PAGE
21

ORIGINAL PAGE IS
OF POOR QUALITY

ITEM CODE: D159

Beam Pylon Slab-on-Grade FA Motion



STANDARD PAPER CO. NO. 518 MILLIMETER 210 BY 297 DIVISIONS

**ORIGINAL PAGE IS
OF POOR QUALITY**

CALIBRATION DATA SHEET

Date 6-13-78

Lab. No. _____

Project GROUND TIEDOWN TESTS

Serial No. _____

Lot 3C1-2

Title RT. BLOW SWAMPPLATE LATERAL MOVEMENT

Part No. _____

W. O. _____

L. T. R. EWA

Engineer S. M. ...

Item code: D160

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>TRMDU "A" - 72-2-2</u>				
Bridge	<u>C/S "</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

NOTE: CONVERT INCHES TO DEGREES
PER R. HALL

Lead	Output				
<u>DEFLECTION</u> <u>(INCHES)</u>	<u>OUTPUT</u> <u>(MICRO)</u>				
0	116				
.12	181				
.24	257				
.36	330				
.48	415				
.60	498				
.72	559				
.84	614				
.96	682				
1.08	752				
1.20	812				
1.32	872				
1.44	932				
1.56	992				
1.68	1052				
1.80	1112				
1.92	1172				
2.04	1232				
2.16	1292				
2.28	1352				
2.40	1412				
2.52	1472				
2.64	1532				
2.76	1592				
2.88	1652				
3.00	1712				

$GPA (92.5-7) = 5$
 $LCC (41.5-9) = 742$

BY: D.P. Smith
CHECKED

Gell Helicopter SECTION

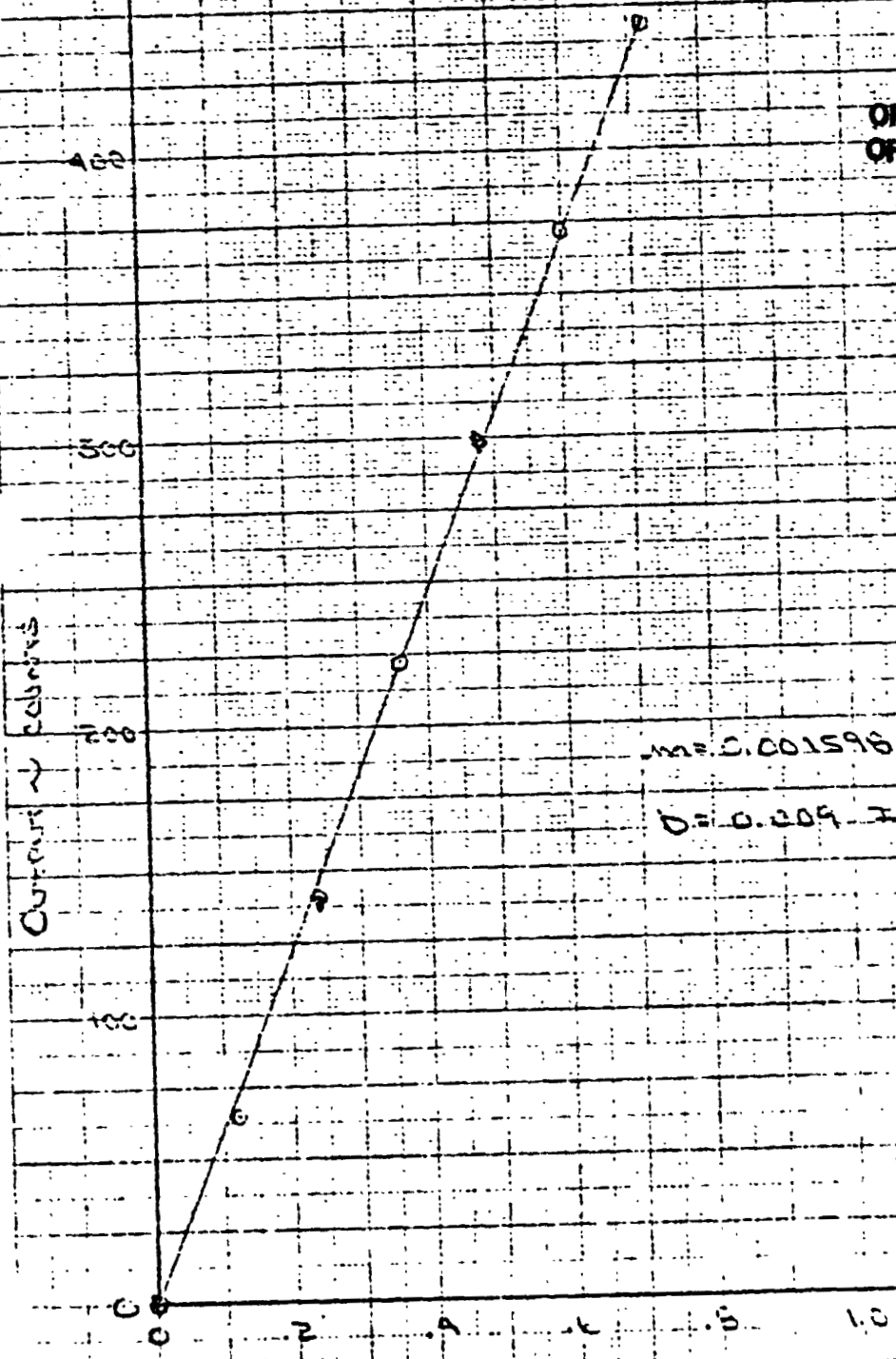
MODEL 301
HELL 42

PAGE
REF

ITEM CODE: D160

RIGHT PROJ SQUARE PLATE LATERAL MOTION

ORIGINAL PAGE IS
OF POOR QUALITY



$M = 0.001598$ INCHES/COUNT

$D = 0.209$ INCHES

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6/7/76

Lab. No. _____

Serial No. _____

Part No. _____

Engineer S. J. ...

Project GROUND TIEDOWN TESTS

Title RIGHT THROTTLE POSITION

Lab. 301 #2

W. O. _____

L. T. R. _____ EWA _____

ITEM CODE: D509

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>S. J. ...</u>					
<u>W. F. ...</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chon.	<u>TRAVEL "A" - 75-B-6</u>				
Bridge	<u>C/S 7</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

NOTE: WORK IN CONSTRUCTION WITH LEFT THROTTLE POSITION (W/ED AIR-6-1).

Load	Output		
TRAVEL (INCHES)	OUTPUT (OZS)		TRAVEL (%)
<u>CLOSED</u>	<u>4.85</u>	<u>-169</u>	<u>0</u>
<u>FT. TRAVEL</u>	<u>4.05</u>	<u>-23</u>	<u>29.1</u>
<u>1</u>	<u>3.17</u>	<u>126</u>	<u>60</u>
<u>2</u>	<u>2.55</u>	<u>185</u>	<u>71.2</u>
<u>3</u>	<u>2.53</u>	<u>249</u>	<u>82.5</u>
<u>FULL OPEN</u>	<u>2.02</u>	<u>391</u>	<u>100</u>
<u>3</u>	<u>2.97</u>	<u>278</u>	<u>84.6</u>
<u>2</u>	<u>2.55</u>	<u>190</u>	<u>71.2</u>
<u>1</u>	<u>3.17</u>	<u>127</u>	<u>60</u>
<u>FT. TRAVEL</u>	<u>3.95</u>	<u>-8</u>	<u>32.6</u>
<u>CLOSED</u>	<u>4.85</u>	<u>-169</u>	<u>0</u>

BY D. R. Smith
CHECKER

Sold Helicopter 13-3000

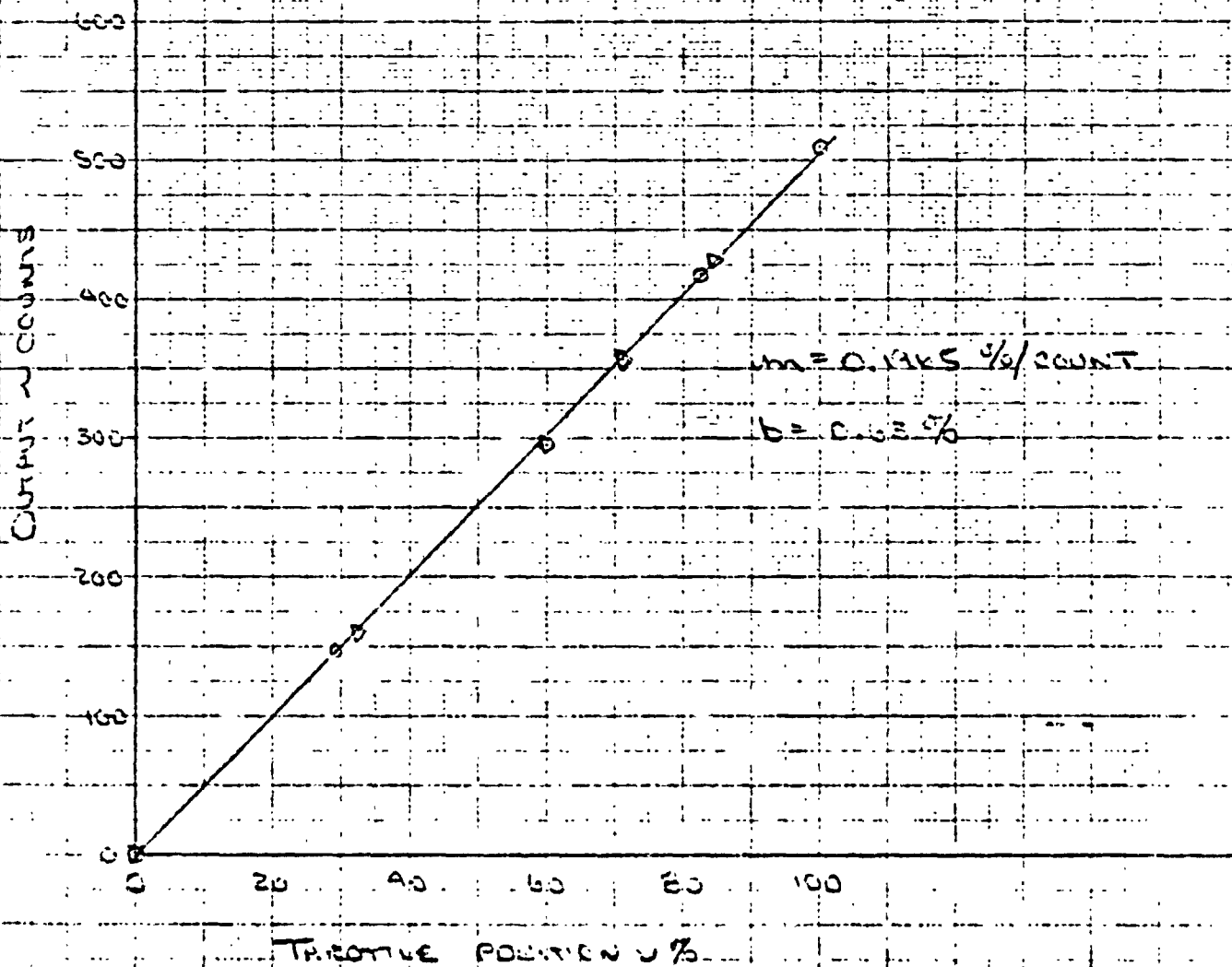
MODEL 301
SERIAL 7

PAGE
981

Item Code: 0589

ORIGINAL PAGE IS
OF POOR QUALITY

Right Throttle Posman



ENGINEERING LABORATORIES

Calibration Data Sheet

Description <u>TRANSDUCER PRESSURE</u>		Date Calibrated:
Model/Type <u>PL 722 TC-150-350</u>		<u>4-17-78</u>
Range <u>0-150 P.S.I.D.</u>		Calibration Period:
Mfg. <u>STATHAM</u>		<u>6 MO.</u>
Serial No. <u>11819</u>		LEP No. <u>04-017-08</u>
Lab No.	Calibrated by: <u>T. GOSCINSKI</u>	

**ORIGINAL PAGE IS
OF POOR QUALITY**

Remarks:

p323

STD.	OUT PUT	OUT PUT		
P.S.I.	M/V	M/V		
0		<u>-04</u>		
<u>100K CAL</u>	<u>4.95</u>	<u>4.99</u>		
10	<u>1.51</u>	<u>—</u>		
20	<u>3.07</u>	<u>3.03</u>		
30	<u>4.53</u>	<u>—</u>		
40	<u>6.19</u>	<u>6.14</u>		
50	<u>7.76</u>	<u>—</u>		
60	<u>9.33</u>	<u>9.26</u>		
70	<u>10.89</u>	<u>—</u>		
80	<u>12.44</u>	<u>12.39</u>		
90	<u>14.00</u>	<u>—</u>		
100	<u>15.55</u>	<u>15.51</u>		
110	<u>17.10</u>	<u>—</u>		
120	<u>18.64</u>	<u>18.62</u>		
130	<u>20.19</u>	<u>—</u>		
140	<u>21.72</u>	<u>21.70</u>		<u>A+D</u>
150	<u>23.23</u>	<u>—</u>		<u>B+C</u>
				<u>332-8-58</u>
				<u>VERIFY 6.001</u>

7862-6411 Rev. 6

BY D.P. Smith
CHECKED

BELL HELICOPTER COMPANY
MAY 20 1964

MODEL
BELL

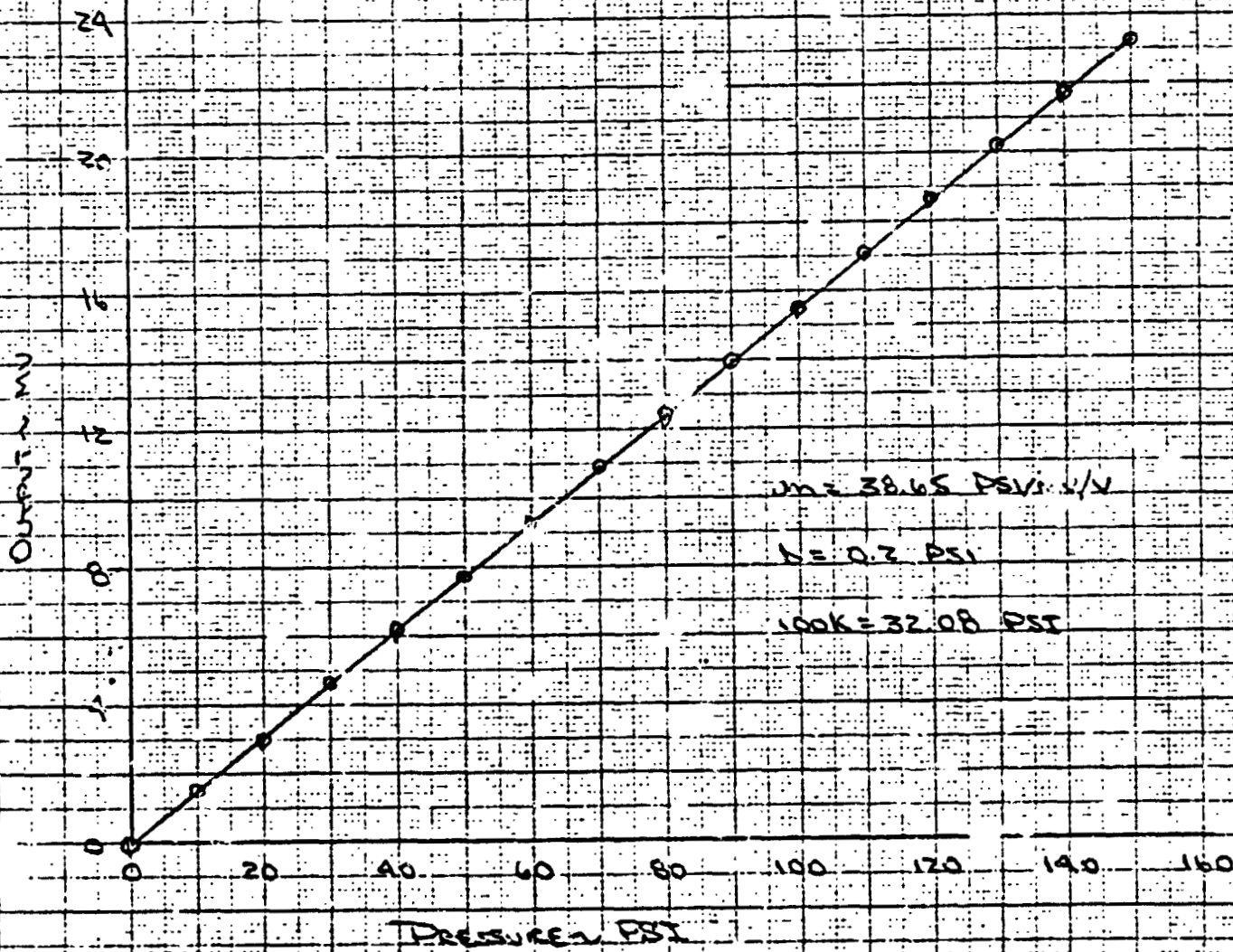
PAGE
PPT

Form Code: P 323

RIGHT ENGINE OIL PRESSURE
TRANSDUCER CALIBRATION
S/N 11519

CH: A-61-2-

ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL COPY

ENGINEERING LABORATORIES
Calibration Data Sheet

Description <u>TRANSDUCER PRESSURE</u>	Date Calibrated:
Model/Type <u>PL 722 TC-150-350</u>	<u>4-17-78</u>
Range <u>0-150 P.S.I.D.</u>	Calibration Period:
Mfg. <u>STRATHMORE</u> ORIGINAL PAGE IS OF POOR QUALITY	<u>6 MO.</u>
Serial No. <u>1181</u>	LEP No. <u>04-017</u>
Lab No.	Calibrated by: <u>T. GASCIONE</u>

Remarks: p325

STD.	OUT PUT	OUT PUT			
P.S.I.	m/V	m/V			
0	0	0			
100K. CAL.	4.91	4.91			
10	1.48	—			
20	3.00	3.01			
30	4.52	—			
40	6.04	6.08			
50	7.59	—			
60	9.13	9.15			
70	10.67	—			
80	12.22	12.23			
90	13.76	—			
100	15.30	15.30			
110	16.84	—			
120	18.35	18.37			
130	19.88	—			
140	21.39	21.39			A+D
150	22.88	—			B+P 325
					1/2000 500

7862 6411 Rev. 1

BY: D.P. Smith

BELL HELICOPTER COMPANY

MODEL

PAGE

CHECKED:

HELL

PT

ITEM CODE: P325

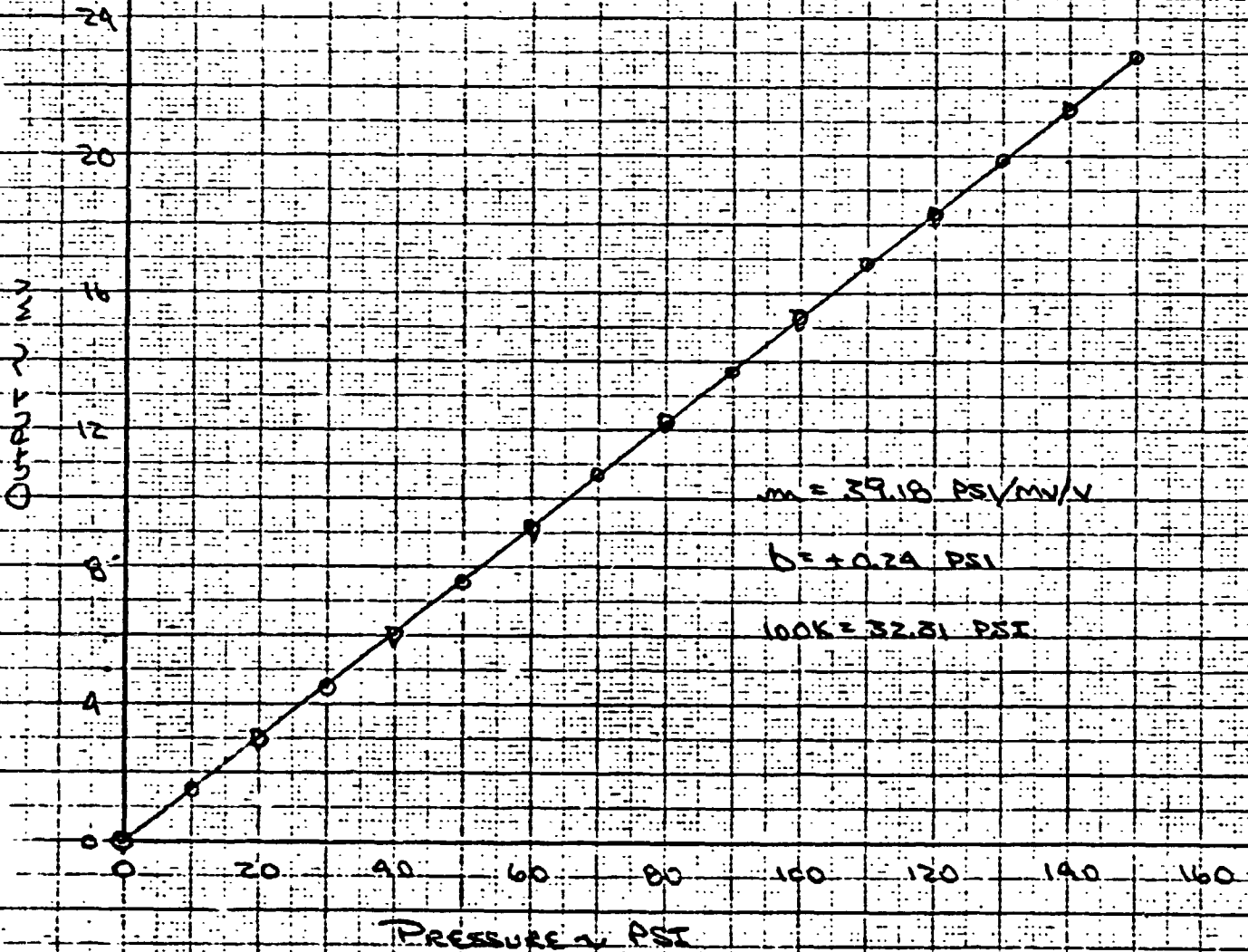
RIGHT TRANSMISSION OIL PRESSURE

CH: A-161-2-2

TRANSDUCER CALIBRATION

9/21 1986

ORIGINAL PAGE IS
OF POOR QUALITY

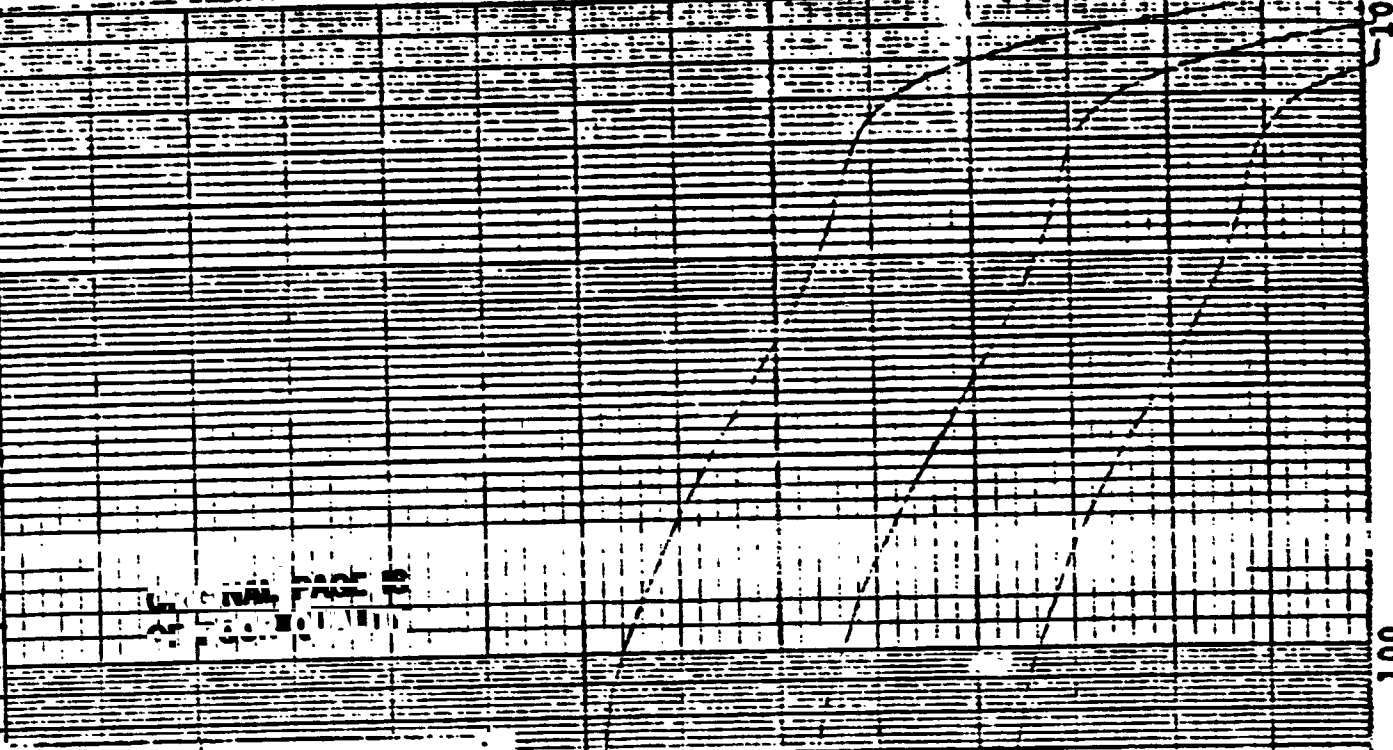


GRAPHIC CENTER

Model 40
 KEUFFEL & ESSER CO.
 MADE IN U.S.A.
 70 DIVISIONS
 3 CYCLES

Issue Date 4-10-78 To SMITHAST S.N 15868

ANSI
 Z39-18
 1968



ACCELEROMETER CALIBRATION
 MODEL 40-25-350 RANGE 25 G DATE 4-7-78
 SENSITIVITY (V) 6.012 NOMINAL SENS (S) 796 (mv/G)
 RESISTANCE, A-C 426.7 ohm, B-D 327.9 ohm, Tech. T.G.

SHUNT CAL		UNITY CAL	
INVERSION (V)			
100K C.E. = $\frac{4.88 \text{ mv}}{S}$		U.C. = $\frac{V}{S}$	
100K C.E. = 6.130 G		U.C. = 7.553 G	

0.82 (mv/G)

PERCENTAGE DEVIATION FROM NORMAL SENSITIVITY

FREQUENCY (CYCLES/SEC)

ACCELEROMETER CALIBRATION

PE A697C-J-350 RANGE 25 G DATE 4-7-78
 CITATION (V) 6.011 NOMINAL SENS (S) .908 (mv/G)
 DISTANCE, A-C 381.3 ohm, B-D 324.6 ohm, Tech. 708

INVERSION REF ONLY

-.93 mv
-.95 mv

SHUNT CAL

100K C.E. = $\frac{4.90 \text{ mv}}{S}$

UNITY CAL

U.C. = $\frac{V}{S}$

.94 (mv/G)

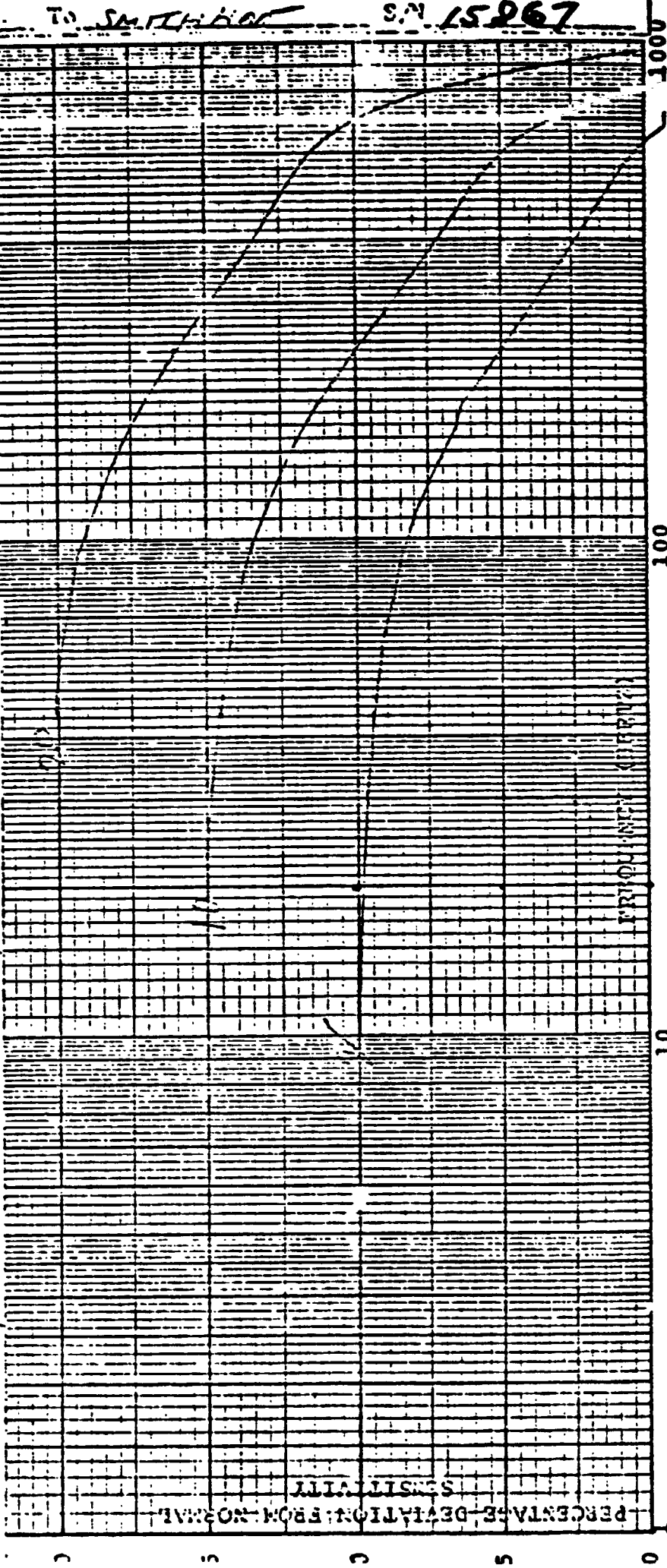
100K C.E. = 5.396G

U.C. = 6.620 G (mv/v)

ORIGINAL PAPER IS OF POOR QUALITY

AISI
ERP-18

Issue Date 4-10-78 To SMITHSONIAN S.N. 15267



10

100

1000

RP-10
 B
 A152

Issue Date 7-1-76 To WHITENER SN 19645

ACCELEROMETER CALIBRATION

TYPE AG9TC-25-350 RANGE DATE 4-14-76
 EXCITATION (V) 5.79 NOMINAL SENS (S) 1.213 (mv/G)
 RESISTANCE, A-C 412.4 ohm, B-D 321.7 ohm, Tech. J. TRAVIS

2G INVERSION
 (REF ONLY)

+1 1.20 mv
 -1 -1.22 mv

SHUNT CAL

100K C.E. = $\frac{5.05 \text{ mv}}{S}$

Avg 1.21 (mv/G)

100K C.E. = 4.106 G

UNITY CAL

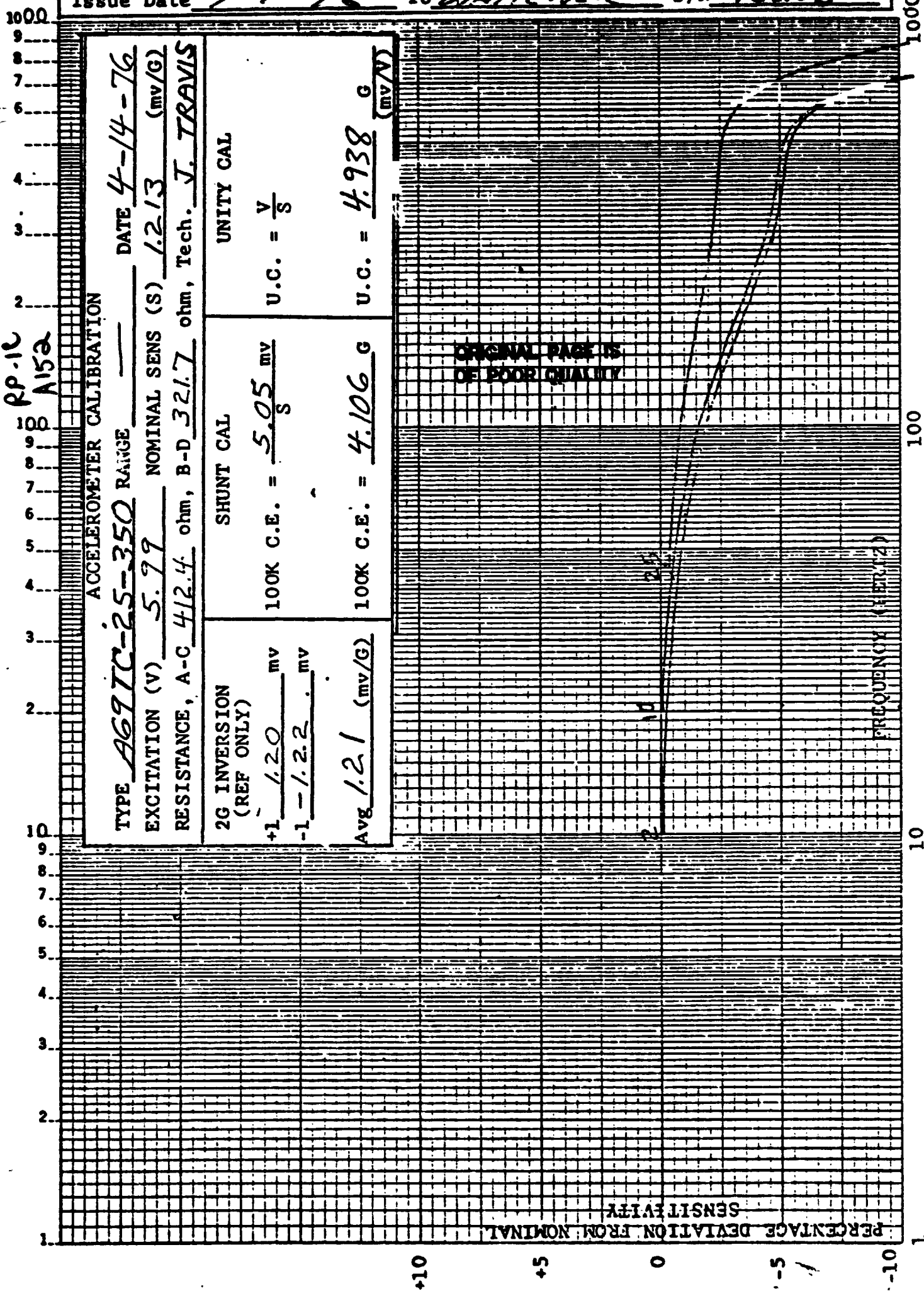
U.C. = $\frac{V}{S}$

U.C. = 4.938 G (mv/V)

ORIGINAL PAGE IS
 OF POOR QUALITY

PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

FREQUENCY (HERTZ)



BY A. WHITENER

DELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED A. (u)

HELL. 1+2 RPT SKASW04375-1

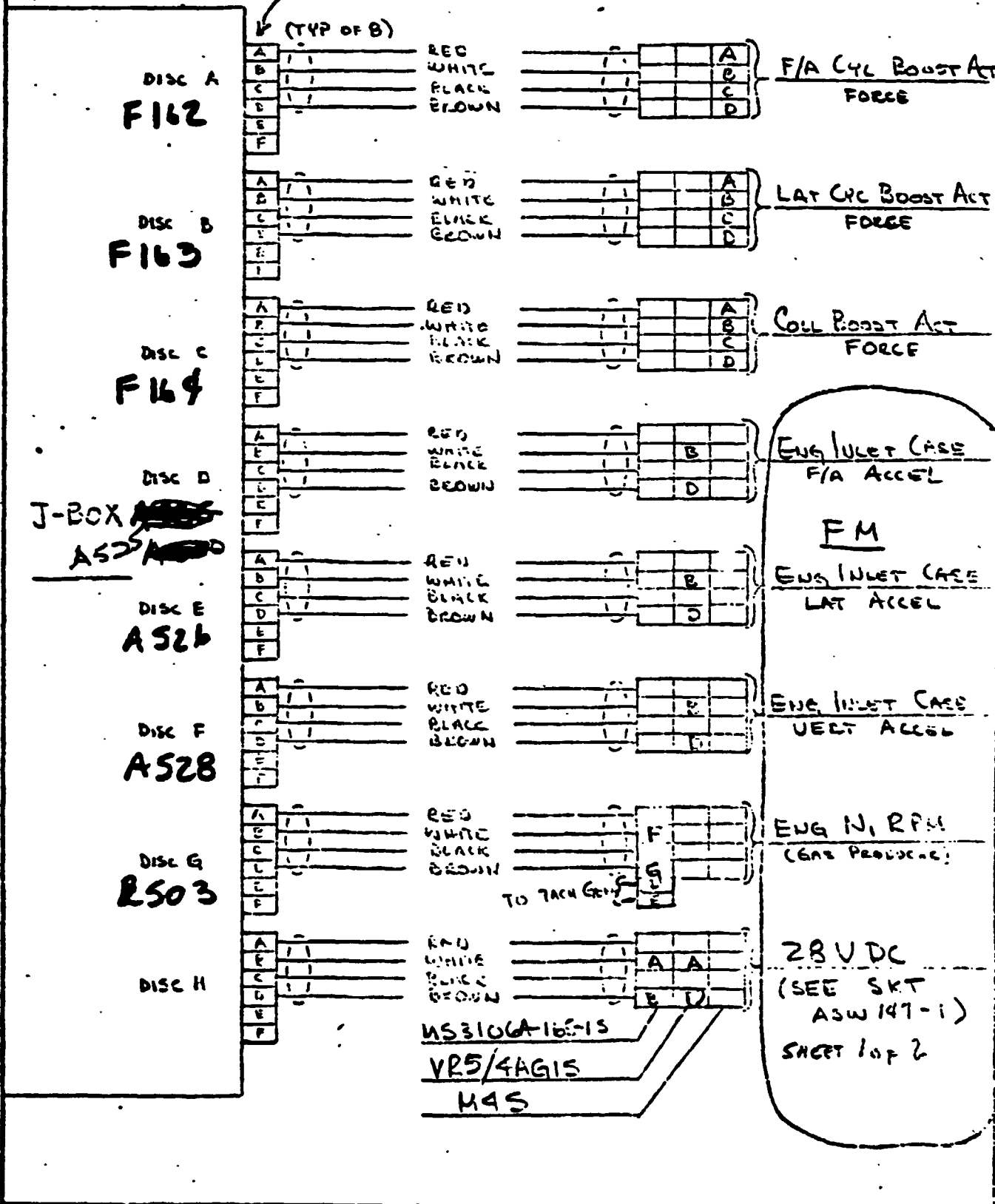
ORIGINAL PAGE IS OF POOR QUALITY

DISCONNECT HARNESS

(Handwritten)
4-28
(b1) 182 279

J-Box LOCATION RP-2

KPT06-10 6P



BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301

PAGE 2 OF 2

CHECKED ASW

HELI. 142 RPT SKASW04375-1

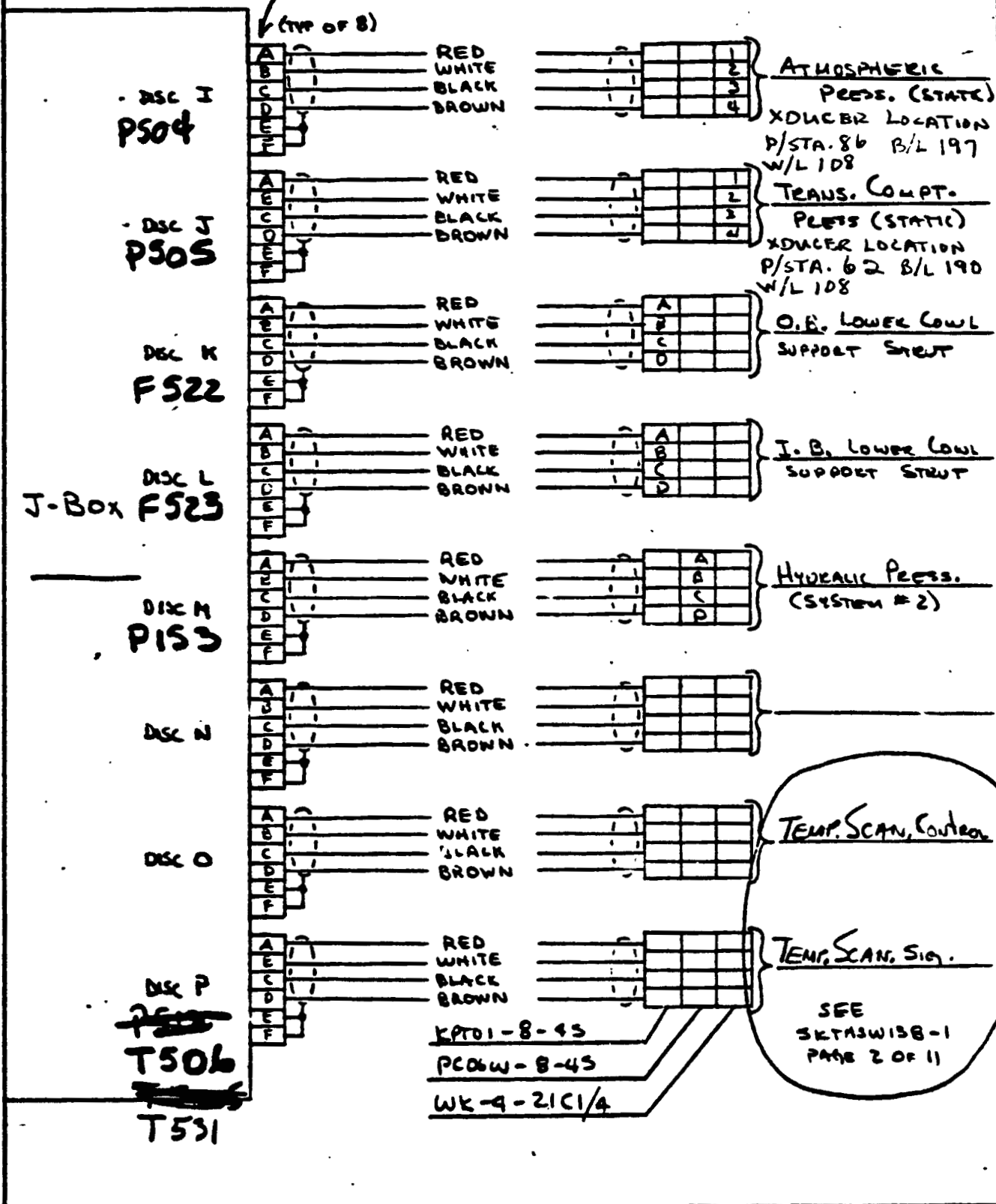
ORIGINAL PAGE IS OF POOR QUALITY

DISCONNECT HARNESS

26 79
b11 112 279

J-Box LOCATION RP-2

KPT06-10-6P



7422 8806REV 100

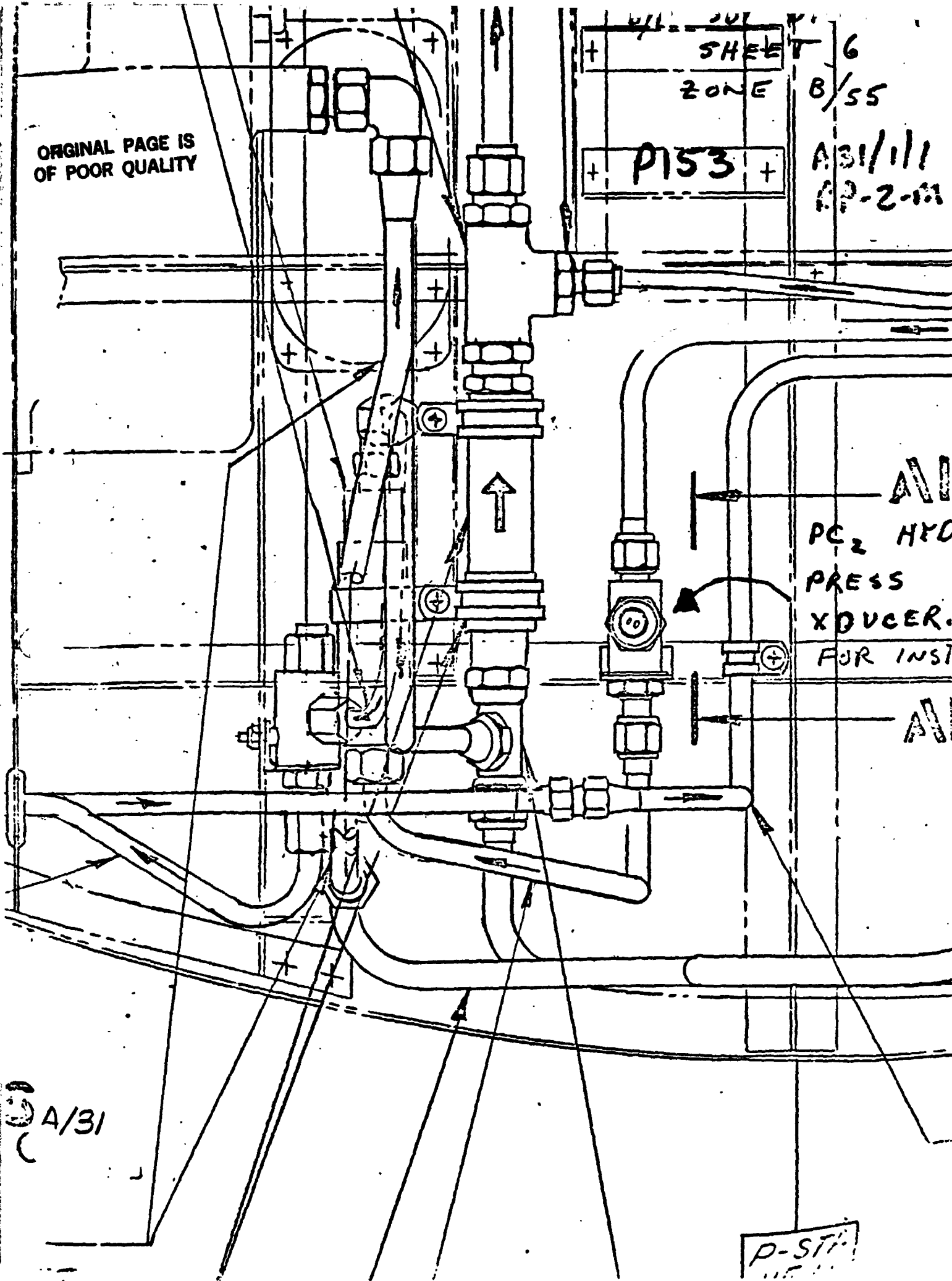
ORIGINAL PAGE IS
OF POOR QUALITY

SHEET 6

ZONE B/55

P153

A31/111
AP-2-11



AI
PC₂ HYD
PRESS
XDU CER.
FOR INST

AI

A/31

P-57

ENGINEERING LABORATORIES
Calibration Data Sheet

Description <u>TRANSducer PRESSURE</u>	Date Calibrated:
Model/Type <u>PL 722-TC-5M-350</u>	<u>4-18-78</u>
Range <u>0-5000 P.S.I.D.</u>	Calibration Period:
Mfg. <u>STATHEM</u>	<u>6 MO.</u>
Serial No. <u>11824</u>	LEP No. <u>04-018-08</u>
Lab No.	Calibrated by: <u>T. GOSKINSKI</u>

Remarks: • 153

STD	OUT PUT	OUT PUT			
P.S.I.	MIV	MIV			
0	0	-0.2			
100K CAL	4.93	+4.91		ORIGINAL PAGE IS OF POOR QUALITY	
500	2.34	—			
1000	4.67	4.64			
1500	7.00	—			
2000	9.28	9.24			
2500	11.62	—			
3000	13.90	13.80			
3500	16.16	—			
4000	18.41	18.34			
4500	20.66	—			
5000	22.91	22.91			
			A & C		SHORTED
			B & D	337.7 -2	
			V. LINE	5.998	

7862-6411 REV. 5

BY D.P. Smith
CHECKED _____

BELL HELICOPTER COMPANY

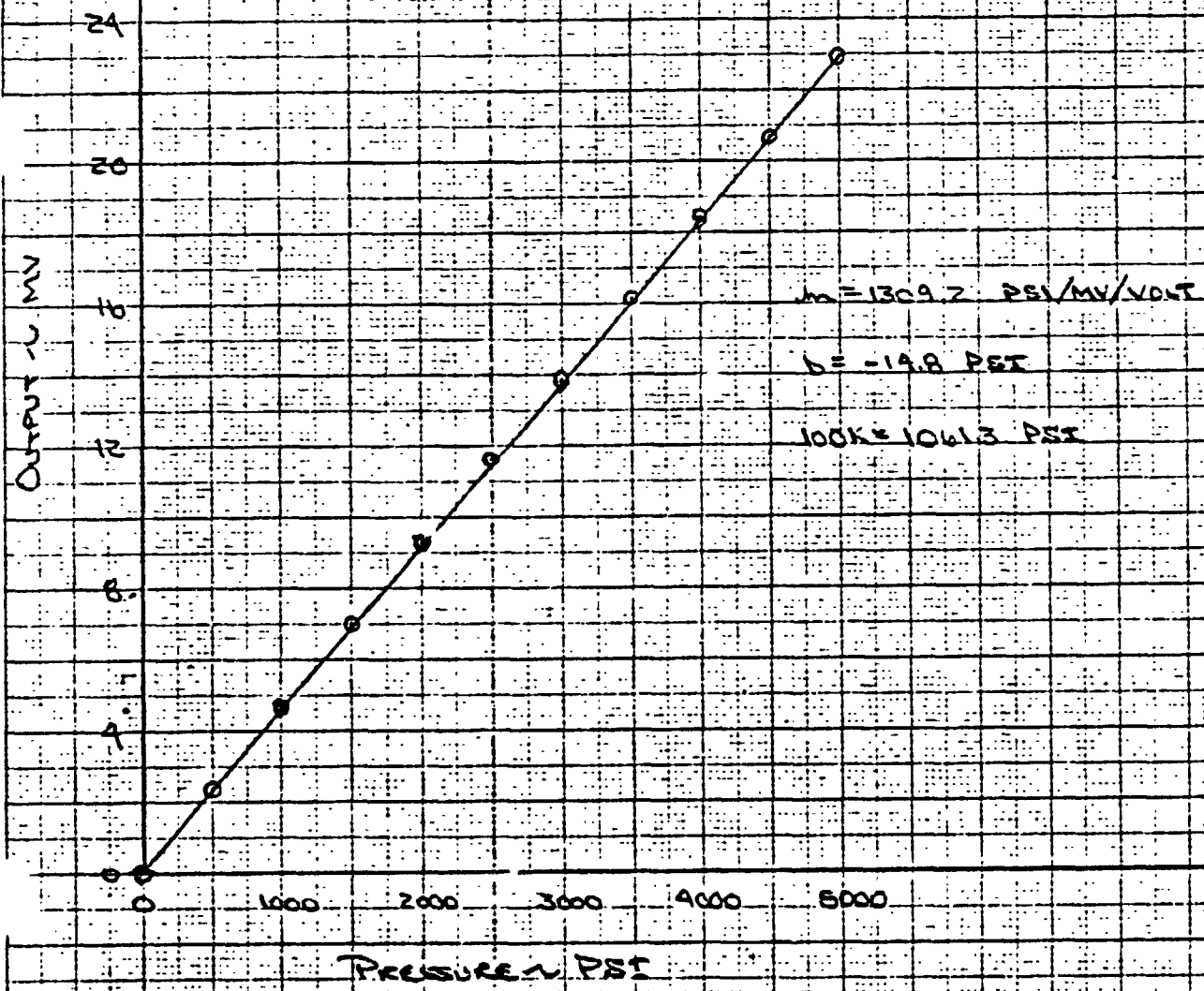
MODEL
HELL

PAGE
RPT

ITEM CODE: P153

HYDRAULIC SYSTEM #2
PRESSURE TRANSDUCER CALIBRATION CH: A-31-1-1
S/N 11824

ORIGINAL PAGE IS
OF POOR QUALITY

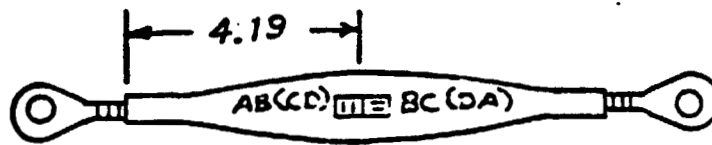


INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 678957
QWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11003A
WORK ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 301-001-352-1
REQUESTED BY: A. WHITENER.	LOT NO. Q-A13AF47	SERIAL NO.
TITLE OF TEST 301 FLIGHT TEST		

SKETCH:

TUBE FORE & AFT CYCLIC



JH
6-28-76
bfi 182 279

F162

ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN...USE BR-600 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER
WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX
LEADS. ENCASE LEADS IN VINYL SLEEVING AND
TERMINATE WITH M4P PLUG.

F162
01

BRIDGE	AXIAL				
LANCE	4.26				
RES. TO GROUND	10K _{min} -V				
DATE ASSIGNED	6-15-76	TECHNICIAN	C. C. W.		EST. HRS.
DATE COMPLETED	6-16-76	ENGINEER			APPROVED BY:
					ACT. HRS.

TYPE PULL = AXIAL (Pos)
BRIDGE TYPE = AXIAL
LAB-OR NUMBER = 11003A-01
BRIDGE VOLT = 10
BRIDGE STA. = 0

DATA
0(MV) OFFSET = -792.6
UNITY CAL = 1123.148365

100% CE = 981.3

UTPH (MM)	LINEARITY (MUC)
7.100	0.0
10.290	0.2
13.560	0.1
16.870	0.0
20.120	0.0
23.400	0.0
16.830	0.1
10.290	0.2
7.080	0.0

16.3
F 162

ORIGINAL PAGE IS
OF POOR QUALITY

INSTRUMENTATION LABORATORY WORK SHEET

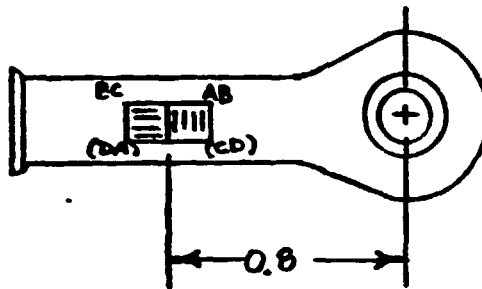
MODEL NO. 301	GAGE TYPE EA-06-062TZ-350	SHEET NO. DLN 673352
EWA NO. A427-26	RESISTANCE 350 Ω	LAB. NO. 12036 AF
IRK ORDER A427	GAGE FACTOR 2.07 ± 1%	PART NO. 300-001-621-1
REQUESTED BY: A. WHITENER	LOT NO. 0.A34BD00	SERIAL NO. 115 A150009
TITLE OF TEST 301 FLIGHT TEST		

SKETCH:

LATERAL ACTUATOR

ORIGINAL PAGE IS
OF POOR QUALITY

F163



679

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE MB-600 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH 9309. ATTACH FOUR TEN INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH KPT-06-8-4P PLUG.

F163
01

BRIDGE	AXIAL						
BALANCE	-0.05						
RES. TO GROUND	100 Ω						
DATE ASSIGNED	TECHNICIAN CCW				EST. HRS.	APPROVED BY:	
DATE COMPLETED 4-19-78	ENGINEER				ACT. HRS.		

214NT

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
AS TECHNICIAN: DOBIS

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 12168FB1
CAL DATE: 6-16-78
SERIAL NO: A1900083
P/N: 300-001-321-1

7163

PROJECT: 301 FLIGHT TEST

PART NAME: LATERAL ACTUATOR
CHANNEL: 03 - AXIAL LOADING(TENSION)

CALIBRATE EQUIVALENT: 100K = 3382 POUNDS
UNIT CAL = 3848 POUNDS/KV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.070
BRIDGE VOLT. : 10.00
PRE CAL. : 6.79
POST CAL. : 8.79

JACK FAC. : 0.0078 PSI/LB
LEVER ARM : NONE
CAL RES. : 100

LOADS-MILLIVOLTS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	0.029	11
0.00	0.00	0.000	-0.029	-11
2.63	338.48	0.910	0.001	0
5.31	683.40	1.820	0.015	6
7.99	1028.31	2.720	0.018	7
10.67	1373.23	3.630	0.032	12
13.38	1722.01	4.500	-0.035	-2
15.97	2055.34	5.340	-0.031	-12

MAXIMUM CALIBRATION LOAD: 2055 POUNDS

BMC PROGRAM FCCR33 - RUN DATE: 06-20-78

RIGHT

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
AB TECHNICIAN: DOBIS

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 120368E01
CAL DATE: 8-16-78
SERIAL NO: A1400003
P/N: 300-001-321-1

F163

PROJECT: 301 FLIGHT TEST

PART NAME: LATERAL ACTUATOR
CHANNEL: 03 - AXIAL LOADING (COMPRESSION)

CALIBRATE EQUIVALENT: 100K = 2982 POUNDS
UNIT CAL = 3443 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.670
BRIDGE VOLT. : 10.00
PRE CAL. : 0.66
POST CAL. : 0.66

JACK FAC. : NONE
LEVER ARM : NONE

CAL RES. : 100

LOADS-POUNDS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	0.043	15
50.00	0.00	0.600	-0.043	-15
100.00	100.00	0.340	0.006	2
200.00	200.00	0.670	0.046	16
300.00	300.00	0.450	0.015	5
400.00	400.00	1.220	0.015	5
500.00	500.00	1.480	-0.015	-5
600.00	600.00	1.760	-0.026	-9
700.00	700.00	2.070	-0.006	-2
800.00	800.00	2.380	0.013	5
900.00	900.00	2.640	-0.017	-6
1000.00	1000.00	2.960	0.012	4

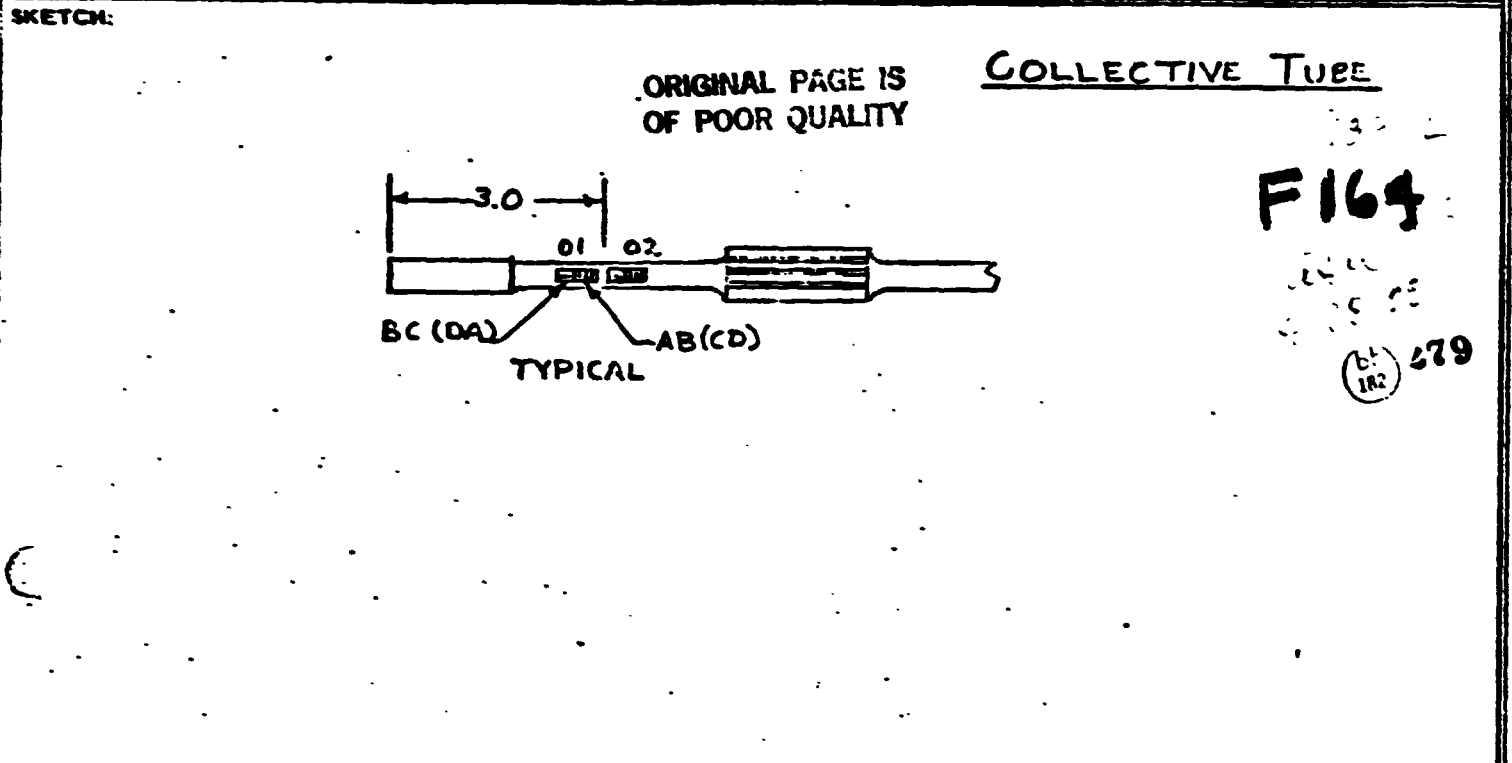
MAXIMUM CALIBRATION LOAD: 1000 POUNDS

BMC PROGRAM FCCR33 - RUN DATE: 06-20-78

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EAO6-125 TB-550	SHEET NO. 678984
A427-11A	RESISTANCE 350Ω ± 0.4%	LAB. NO. 10990A
WORK ORDER A427	GAGE FACTOR 2.07 ± 0.5%	PART NO. 300-010-417-1
REQUESTED BY: A. WHITENER	LOT NO. Q-A35AD13	SERIAL NO.

TITLE OF TEST
301 FLIGHT TEST



REMARKS:

INSTALL AXIAL BRIDGES AS SHOWN. USE BR-600 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH SHELL 9309.

F164
01 02

BRIDGE	AXIAL	AXIAL						
CE	4.57	5.03						
NLS. TO GROUND	2 km	1 km						
DATE ASSIGNED		TECHNICIAN <i>Hollis</i> ENGINEER			EST. MRS.		APPROVED BY:	
DATE COMPLETED 6-16-76					ACT. MRS.			

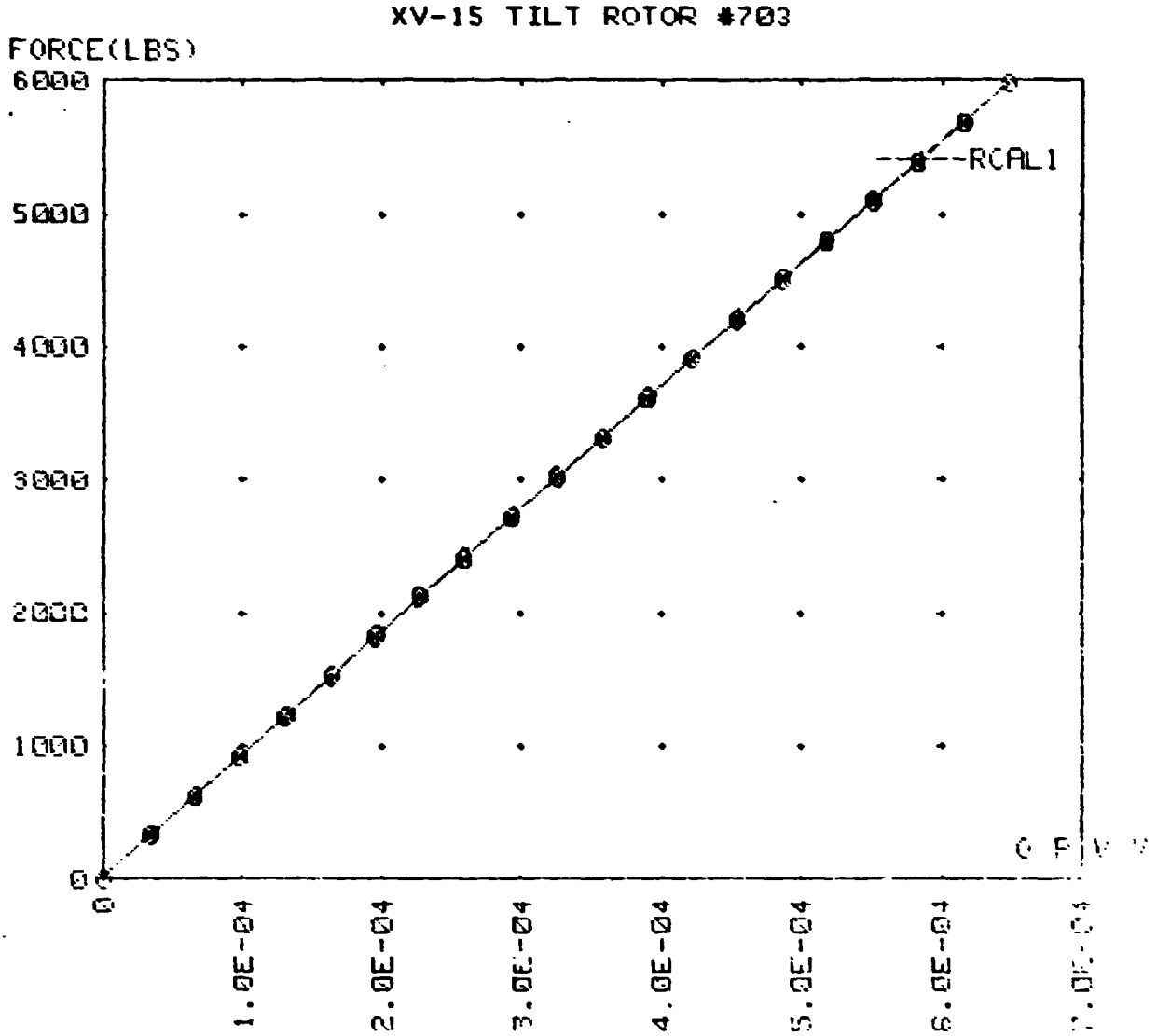
ORIGINAL PAGE IS
OF POOR QUALITY

OR

XV-15 TILT ROTOR #703
TENSION FORCE CALIBRATION
SERIAL # :003 GAGE02
MODEL # :300-010-417-1 CHG.1
TARE WEIGHT : 0 lbs
FULL-SCALE LOAD : 6000 lbs

T.O. :D-706
DATE :1-7-82

F166 RA COL. E005 T020



↑ SIGN INDICATES FIRST HALF OF THE LOADING CYCLE

RESISTOR = 150.1 OHMS

PICL #1 = .000500 V/V

I A RMS = 351.5

NO LOAD V/V
-.000152

PCAL V/V
.000404

SIG FWP
- -

G P OHMS = 331.7

ORIGINAL PAGE IS
OF POOR QUALITY

XV-15 TILT ROTOR #703
TENSION FORCE CALIBRATION
SERIAL # :003 GAGE02
MODEL # :300-010-417-1 CHG.1
TARE WEIGHT : 0 lbs
FULL-SCALE LOAD : 6000 lbs

T.O. :D-706
DATE :1-7-82

RUN #	O/P V	V1	EXCIT.V2	(V1-Vo)/V2	STD LOAD	CALC. LOAD	DEV.	ACCU.
	V	V	V	V/V	lbs	lbs	lbs	%(F.S.)
1	-.001094	6.00160	0.000000		0.00	15.90	15.90	.265
2	-.000892	6.00163	.0000337		326.43	325.96	-.47	-.008
3	-.000697	6.00164	.0000661		618.79	625.28	6.49	.108
4	-.000505	6.00164	.0000981		917.93	919.99	2.06	.034
5	-.000313	6.00164	.0001301		1217.11	1214.70	-2.41	-.040
6	-.000113	6.00164	.0001635		1516.24	1521.69	5.45	.091
7	.000080	6.00163	.0001956		1822.17	1817.94	-4.23	-.070
8	.000268	6.00163	.0002269		2114.47	2106.51	-7.96	-.133
9	.000460	6.00162	.0002589		2400.04	2401.23	1.19	.020
10	.000664	6.00163	.0002929		2712.77	2714.36	1.59	.027
11	.000856	6.00162	.0003249		3011.88	3009.07	-2.80	-.047
12	.001053	6.00161	.0003577		3310.86	3311.47	.61	.010
13	.001240	6.00160	.0003889		3603.06	3598.51	-4.55	-.075
14	.001435	6.00161	.0004214		3902.12	3897.82	-4.30	-.072
15	.001627	6.00161	.0004534		4194.38	4192.54	-1.85	-.031
16	.001828	6.00161	.0004869		4507.10	4501.06	-6.04	-.101
17	.002016	6.00161	.0005182		4792.44	4789.64	-2.80	-.047
18	.002216	6.00160	.0005515		5098.30	5096.64	-1.66	-.028
19	.002410	6.00161	.0005838		5390.45	5394.41	3.96	.066
20	.002602	6.00161	.0006158		5682.72	5689.13	6.41	.107
21	.002794	6.00160	.0006478		5981.69	5983.85	2.16	.036
22	.002607	6.00160	.0006167		5682.73	5696.81	14.08	.235
23	.002407	6.00159	.0005833		5383.72	5389.83	6.10	.102
24	.002214	6.00160	.0005512		5091.57	5093.57	2.00	.033
25	.002020	6.00160	.0005189		4792.42	4795.79	3.36	.056
26	.001826	6.00160	.0004865		4507.02	4498.00	-9.02	-.150
27	.001637	6.00160	.0004550		4207.99	4207.89	-.10	-.002
28	.001442	6.00160	.0004226		3908.96	3908.57	-.38	-.006
29	.001250	6.00160	.0003906		3616.64	3613.86	-2.78	-.048
30	.001059	6.00160	.0003587		3310.82	3320.68	9.86	.151
31	.000862	6.00160	.0003259		3025.41	3018.29	-7.11	-.119
32	.000670	6.00160	.0002939		2733.06	2723.58	-9.48	-.150
33	.000467	6.00160	.0002601		2413.68	2411.98	-1.70	-.028
34	.000273	6.00160	.0002278		2121.28	2114.20	-7.08	-.110
35	.000086	6.00159	.0001966		1835.76	1827.16	-8.59	-.141
36	-.000109	6.00158	.0001641		1529.90	1527.85	-2.05	-.034
37	-.000304	6.00159	.0001316		1230.72	1228.53	-2.19	-.037
38	-.000509	6.00160	.0000975		917.93	913.86	-4.08	-.060
39	-.000696	6.00158	.0000663		618.76	626.82	8.06	.114
40	-.000888	6.00158	.0000343		333.15	332.10	-1.05	-.016
41	-.001092	6.00158	.0000003		13.58	18.97	5.39	.080

BEST FIT STRAIGHT LINE EQUATION : Y=A(0.+A(1))*X
Y-INTERCEPT = A(0) = 15.8992300034 lbs
SLOPE = A(1) = 9812295.50937 lbs (V/V)

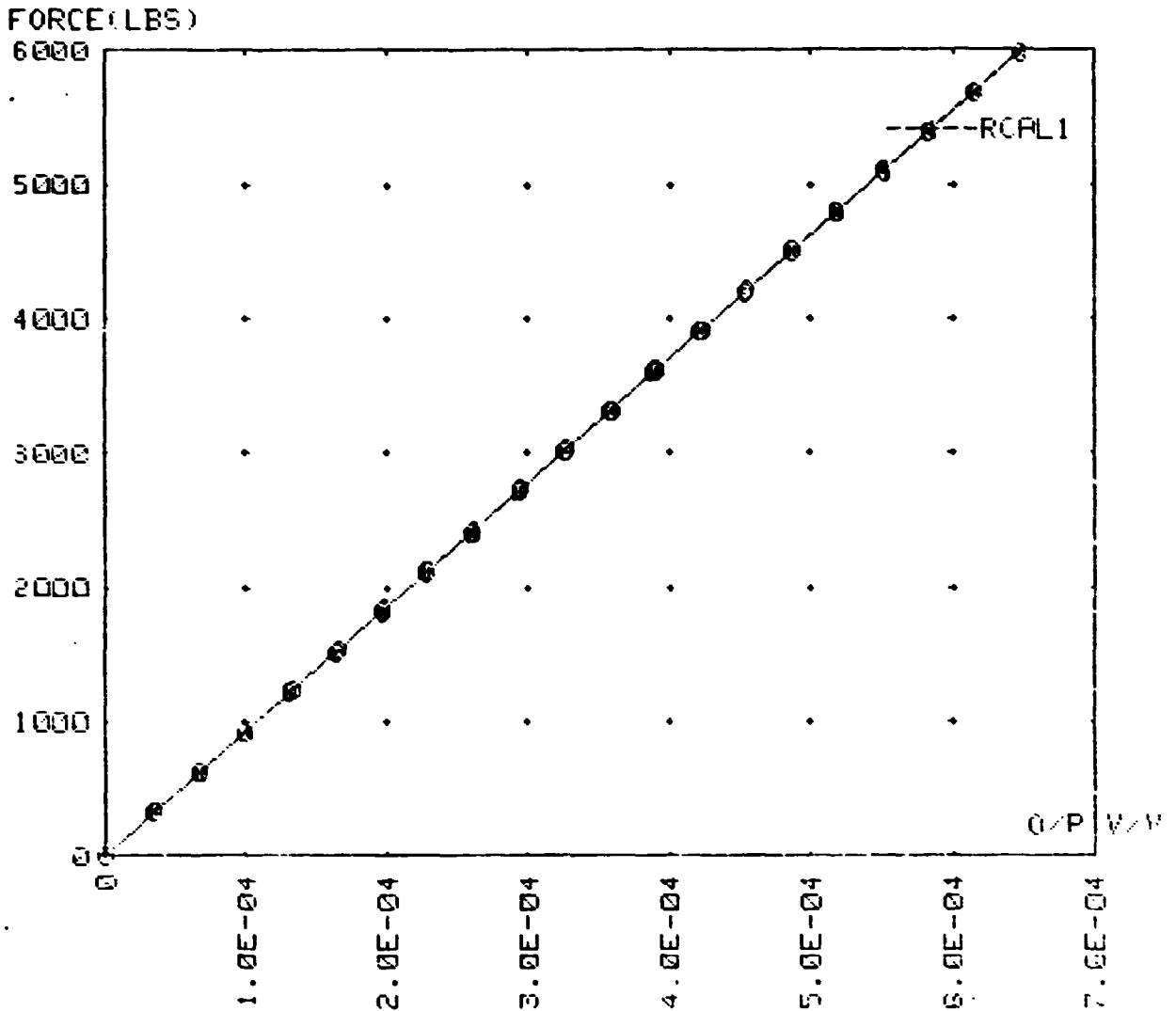
STANDARD DEVIATION = 5.65 lbs
MINIMUM DEVIATION = 15.97 lbs
CORRELATION COEFF. = .999889

XV-15 TILT ROTOR #703
 TENSION FORCE CALIBRATION
 SERIAL # : 003 GAGE01
 MODEL # : 300-010-417-1 CHG.1
 TARE WEIGHT : 0 lbs
 FULL-SCALE LOAD : 6000 lbs

T.O. : D-706
 DATE : 1-7-82

ORIGINAL PAGE IS
 OF POOR QUALITY

XV-15 TILT ROTOR #703



* SIGN INDICATES FIRST HALF OF THE LOADING CYCLE

RESISTOR = 150 ± OHMS

RCAL #1 = .000586 V/V

I-P OHM= 351.3

NO LOAD V/V
-.000049

O-P OHM= 352.4

RCAL V/V
.000037

SIG PPM
-

ORIGINAL PAGE IS
OF POOR QUALITY

XV-15 TILT ROTOR #703
TENSION FORCE CALIBRATION
SERIAL # :003 GAGE01
MODEL # :300-010-417-1 CHG.1
TARE WEIGHT : 0 lbs
FULL-SCALE LOAD : 6000 lbs

T.O. :D-706
DATE :1-7-82

RUN #	O/P V	V1	EXCIT. V2	(V1-Vo)/V2	STD LOAD	CALC. LOAD	DEV.	ACCU.
			V	V/V	lbs	lbs	lbs	%(F.S.)
1	-.000294		6.00147	0.0000000	0.00	5.39	5.39	.090
2	-.000090		6.00150	.0000340	326.43	319.15	-7.28	-.121
3	.000105		6.00151	.0000665	618.79	619.07	.29	.005
4	.000299		6.00150	.0000988	917.93	917.46	-.48	-.008
5	.000490		6.00150	.0001306	1217.11	1211.22	-5.89	-.098
6	.000692		6.00150	.0001643	1516.24	1521.91	5.67	.095
7	.000885		6.00150	.0001965	1822.17	1818.76	-3.41	-.057
8	.001072		6.00149	.0002276	2114.47	2106.38	-8.09	-.135
9	.001265		6.00149	.0002598	2400.04	2403.22	3.18	.053
10	.001467		6.00149	.0002934	2712.77	2713.91	1.14	.019
11	.001661		6.00149	.0003258	3011.88	3012.29	.42	.007
12	.001856		6.00148	.0003582	3310.86	3310.22	1.36	.023
13	.002041		6.00147	.0003891	3603.06	3596.77	-6.29	-.105
14	.002238		6.00148	.0004219	3902.12	3899.76	-2.36	-.039
15	.002427		6.00148	.0004534	4194.38	4190.45	-3.93	-.065
16	.002629		6.00148	.0004870	4507.10	4501.14	-5.96	-.099
17	.002816		6.00147	.0005182	4792.44	4788.77	-3.67	-.061
18	.003014		6.00147	.0005512	5098.30	5093.31	-4.99	-.083
19	.003209		6.00147	.0005837	5390.45	5393.23	2.78	.046
20	.003398		6.00147	.0006152	5682.72	5683.92	1.21	.020
21	.003592		6.00147	.0006475	5981.69	5982.31	.61	.010
22	.003403		6.00146	.0006160	5682.73	5691.62	8.69	.140
23	.003206		6.00145	.0005832	5383.72	5388.63	4.91	.092
24	.003013		6.00146	.0005510	5091.57	5091.78	.21	.003
25	.002819		6.00146	.0005187	4792.42	4793.39	.97	.016
26	.002628		6.00147	.0004869	4507.02	4499.61	-7.41	-.124
27	.002437		6.00146	.0004551	4207.99	4205.85	-2.14	-.036
28	.002246		6.00146	.0004232	3908.96	3912.08	3.12	.052
29	.002053		6.00146	.0003911	3616.64	3615.23	-1.41	-.024
30	.001864		6.00146	.0003596	3310.82	3324.54	13.72	.229
31	.001668		6.00147	.0003269	3025.41	3023.07	-2.34	-.039
32	.001476		6.00146	.0002949	2733.06	2727.77	-5.29	-.088
33	.001276		6.00146	.0002616	2413.68	2420.15	6.47	.109
34	.001080		6.00146	.0002289	2121.28	2118.69	-2.59	-.043
35	.000895		6.00145	.0001981	1835.76	1834.15	-1.60	-.027
36	.000701		6.00144	.0001658	1529.90	1535.77	5.87	.090
37	.000506		6.00145	.0001333	1230.72	1235.84	5.13	.085
38	.000302		6.00145	.0000993	917.93	922.00	4.11	.069
39	.000110		6.00144	.0000673	610.76	626.77	16.01	.133
40	-.000084		6.00144	.0000350	333.15	328.39	-4.77	-.090
41	-.000281		6.00144	.0000005	13.58	10.00	-3.58	-.059

BEST FIT STRAIGHT LINE EQUATION : $Y = A(X) + B(1) + X$
Y-INTERCEPT = $B(0) = 5.390207371.3$ lbs
SLOPE = $A(1) = 92.00047.34041$ lbs (V/V)

STANDARD DEVIATION = 4.96 lbs
MAXIMUM RESIDUAL = 13.72 lbs
CORRELATION COEFF. = .999952

LEFT NEXT PAGE

TYPE FULL = AXIAL (pos)
BRIDGE TYPE = AXIAL
LAB-BE NUMBER = 1090A 01
BRIDGE VOLT = 10
BRIDGE STA. = 0

DATA
OHMV OFFSET = -3767.4
UNITY CAL = 9275.280275

100% CE = 8103.9

LOAD (LB)	OUTPUT (MV)	LINEARITY (%/100)
0.0	4.090	0.0
1002.1	5.190	0.4
2004.2	6.550	0.1
3006.3	7.930	0.1
4008.4	9.280	-0.0
5010.5	10.550	0.0
6012.6	11.930	0.1
7014.7	13.320	0.5
8016.8	14.690	0.0

+ 6.46

F16A

CHAN 2

TYPE FULL = AXIAL (pos)
BRIDGE TYPE = AXIAL
LAB-BE NUMBER = 1090A 02
BRIDGE VOLT = 10
BRIDGE STA. = 0

DATA
OHMV OFFSET = 470.4
UNITY CAL = 9188.32291

100% CE = 8027.9

LOAD (LB)	OUTPUT (MV)	LINEARITY (%/100)
0.0	-0.560	0.0
1002.1	0.790	0.1
2004.2	2.160	0.1
3006.3	3.420	0.0
4008.4	4.730	0.0
5010.5	6.040	0.0
6012.6	7.390	0.1
7014.7	8.770	0.0
8016.8	10.150	0.0

+ 6.54

ORIGINAL PAGE IS
OF POOR QUALITY

Handwritten notes:
OK, see also
on 1-7-62

ENGINE VIB. AND N₂ TACK GEN. (HIGH FREQ) FM

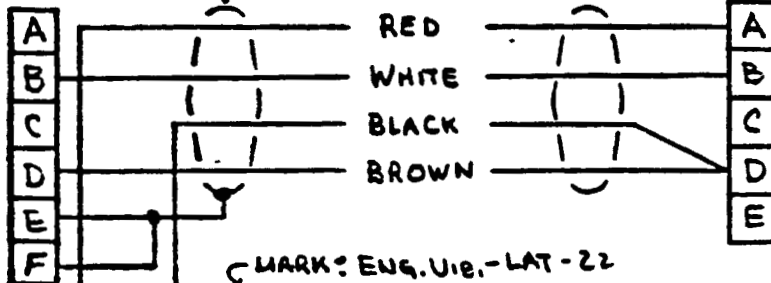
J-Box RP-2

KPT06-10-6P
TYP OF 5

VP5/4A915
TYP OF 3

DISC # D
MARK:

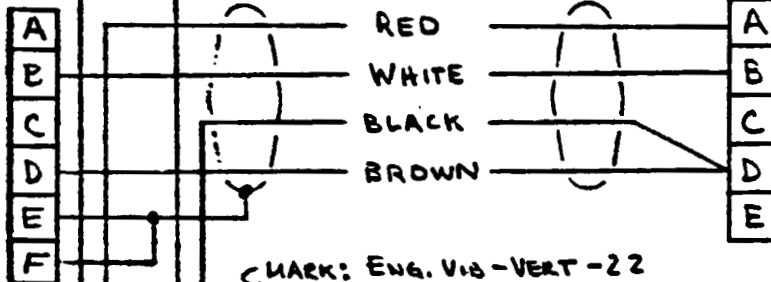
MARK: ENG. VIB - F/A - 22



ENG. VIB.
OIL OUTLET
RADIAL ACCEL
(6:30)

DISC # E
MARK:

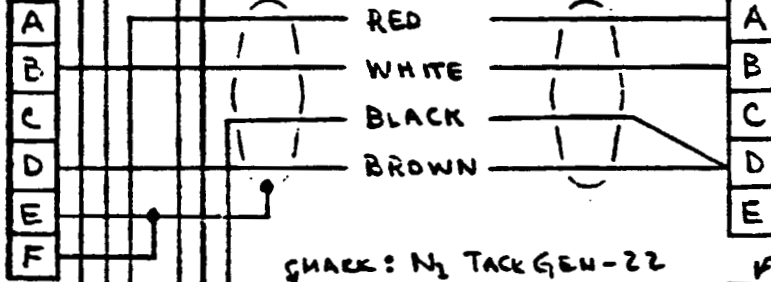
MARK: ENG. VIB. - LAT - 22



ENG. VIB.
COMBUSTION FLANGE
AXIAL ACCEL
(6:00)

DISC # F
MARK:

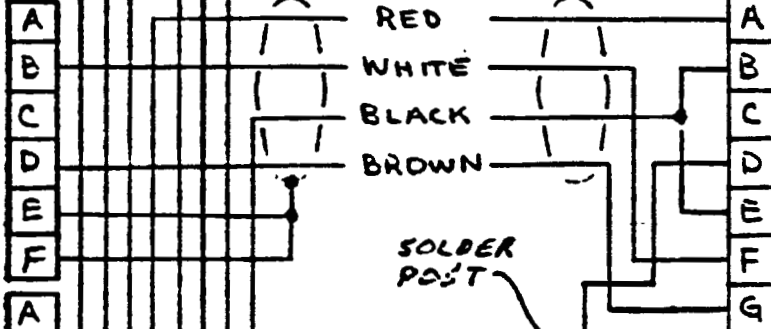
MARK: ENG. VIB - VERT - 22



ENG. VIB.
LIFTING EYE
RADIAL ACCEL
(12:00)

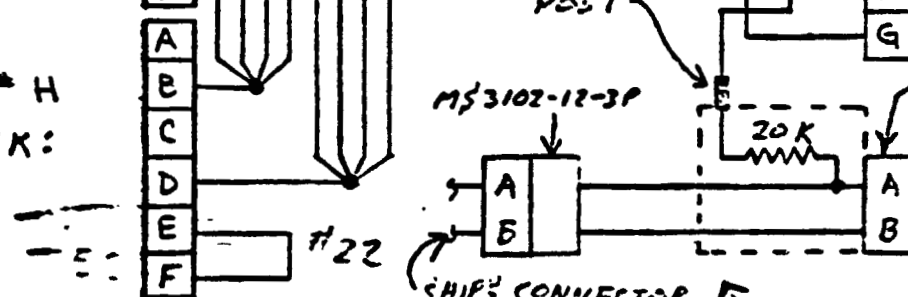
DISC # G
MARK:

MARK: N₂ TACK GEN - 22



N₂ TACK GEN
(GAS PRODUCER)

DISC # H
MARK:



ENGINE
N1 TACH
GENERATOR

ORIGINAL PAGE IS
OF POOR QUALITY

SHIP'S CONNECTOR
& WIRING
REMOVED FROM
N1 TACH GEN

INSTRUMENTATION
MODULE & JUMPER
CABLE

000

Issue Date 5-18-78

To: J. H. HART

S/N CP 44

10000

A501

A526

300

9

8

7

6

5

4

3

2

100

9

8

7

6

5

4

3

2

10

9

8

7

6

5

4

3

2

10

9

8

7

6

5

4

3

2

10

9

8

7

6

5

4

3

1000

100

10

PIEZOELECTRIC ACCELEROMETER CALIBRATION

MANUF. TECHNICO. TYPE 22-710 DATE 05-01-78

CAPACITANCE pf PROPERTY # TECH

NOMINAL CHARGE SENSITIVITY mV/gcc

REMARKS - DC OUT PUT OF AMPLIFIER.

MOUNTING METHOD -
CHARGE AMPLIFIER S/N ZA 47

ORIGINAL PAGE IS OF POOR QUALITY

FREQUENCY (HERTZ)

PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-6-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GROUND TIEDOWN TESTS

Title W/E RPM - RIGHT ENGINE

L. T. R. _____ EWA _____

301 #2

ITEM CODE: R503

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>SMITH</u>		<u>MAGNETRON</u>			
<u>WEINHEIMER</u>		<u>FREQ. COUNTER</u>			

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "A" - 73-2-1</u>	<u>NOTE: DRIVE SYSTEM A-D SET SWIP'S</u>			
Bridge	<u>C/S 11</u>	<u>INSTRUMENT TO READ POINTS</u>			
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Lead	Output				
<u>SWIP'S 2:0</u>	<u>FREQ. FREQ</u>	<u>OUTPUT</u>			
<u>(%)</u>	<u>(HZ)</u>	<u>(COUNTS)</u>			
<u>10</u>	<u>5.7</u>	<u>60</u>			
<u>20</u>	<u>12.6</u>	<u>133</u>			
<u>40</u>	<u>26.6</u>	<u>272</u>			
<u>60</u>	<u>40.5</u>	<u>410</u>			
<u>70</u>	<u>47.9</u>	<u>460</u>			
<u>75</u>	<u>50.8</u>	<u>515</u>			
<u>80</u>	<u>54.9</u>	<u>551</u>			
<u>85</u>	<u>58.0</u>	<u>597</u>			
<u>90</u>	<u>61.3</u>	<u>620</u>			
<u>95</u>	<u>65.0</u>	<u>656</u>			
<u>100</u>	<u>68.4</u>	<u>691</u>			
<u>90</u>	<u>61.5</u>	<u>621</u>			
<u>80</u>	<u>54.4</u>	<u>551</u>			
<u>70</u>	<u>47.7</u>	<u>482</u>			
<u>60</u>	<u>40.6</u>	<u>411</u>			
<u>40</u>	<u>26.5</u>	<u>270</u>			
<u>20</u>	<u>12.8</u>	<u>133</u>			
<u>10</u>	<u>5.6</u>	<u>62</u>			

$GPA_0 (62.8-7) = 5$

$LCR (61.8-4) = 736$

BY D. P. Smith
CHECKED

Bell Helicopter 10701

MODEL 201

DATE

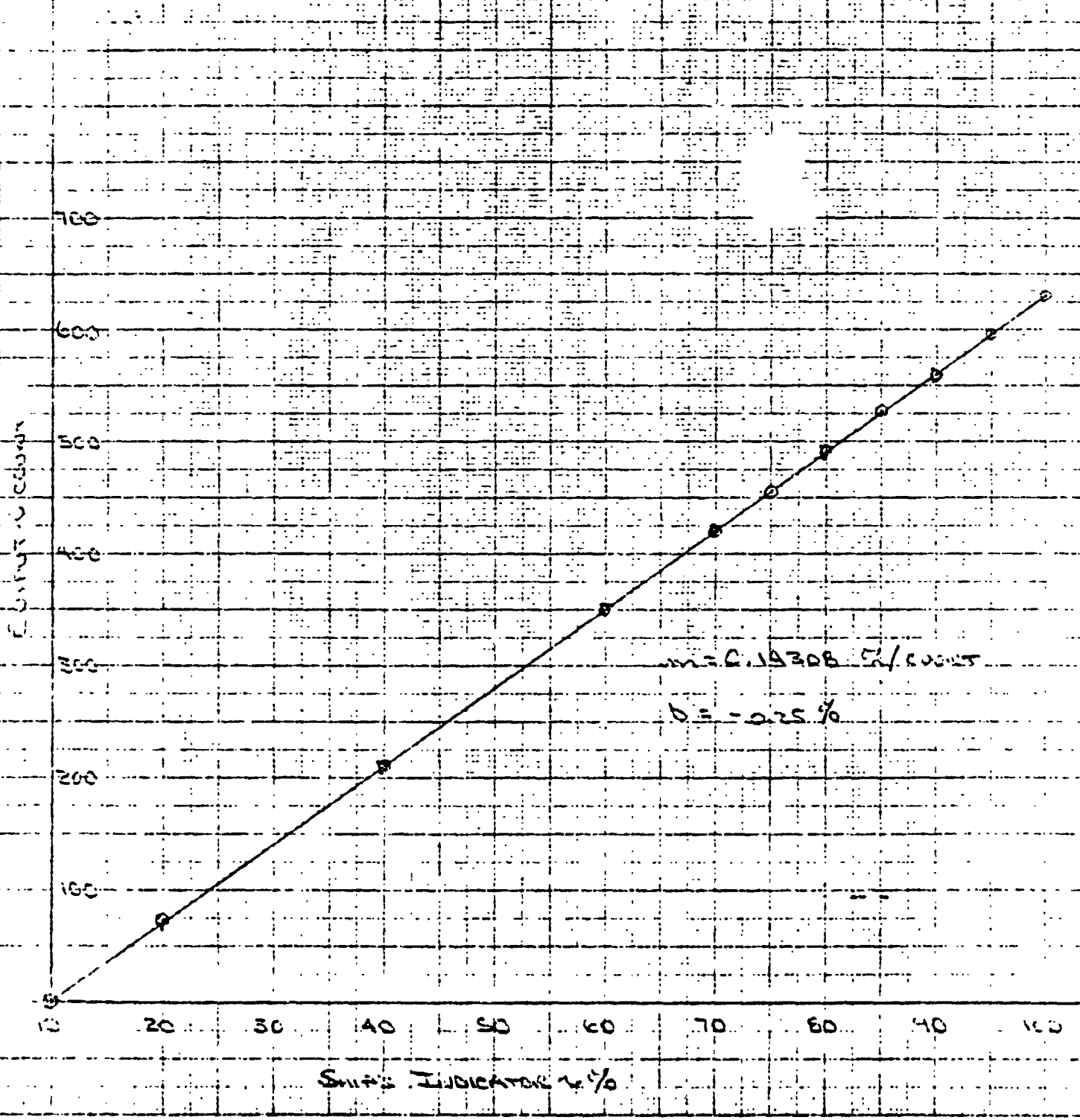
NO. 2

PP1

ITEM CODE: R50

RIGHT ENGINE NI RPM

ORIGINAL PAGE IS
OF POOR QUALITY

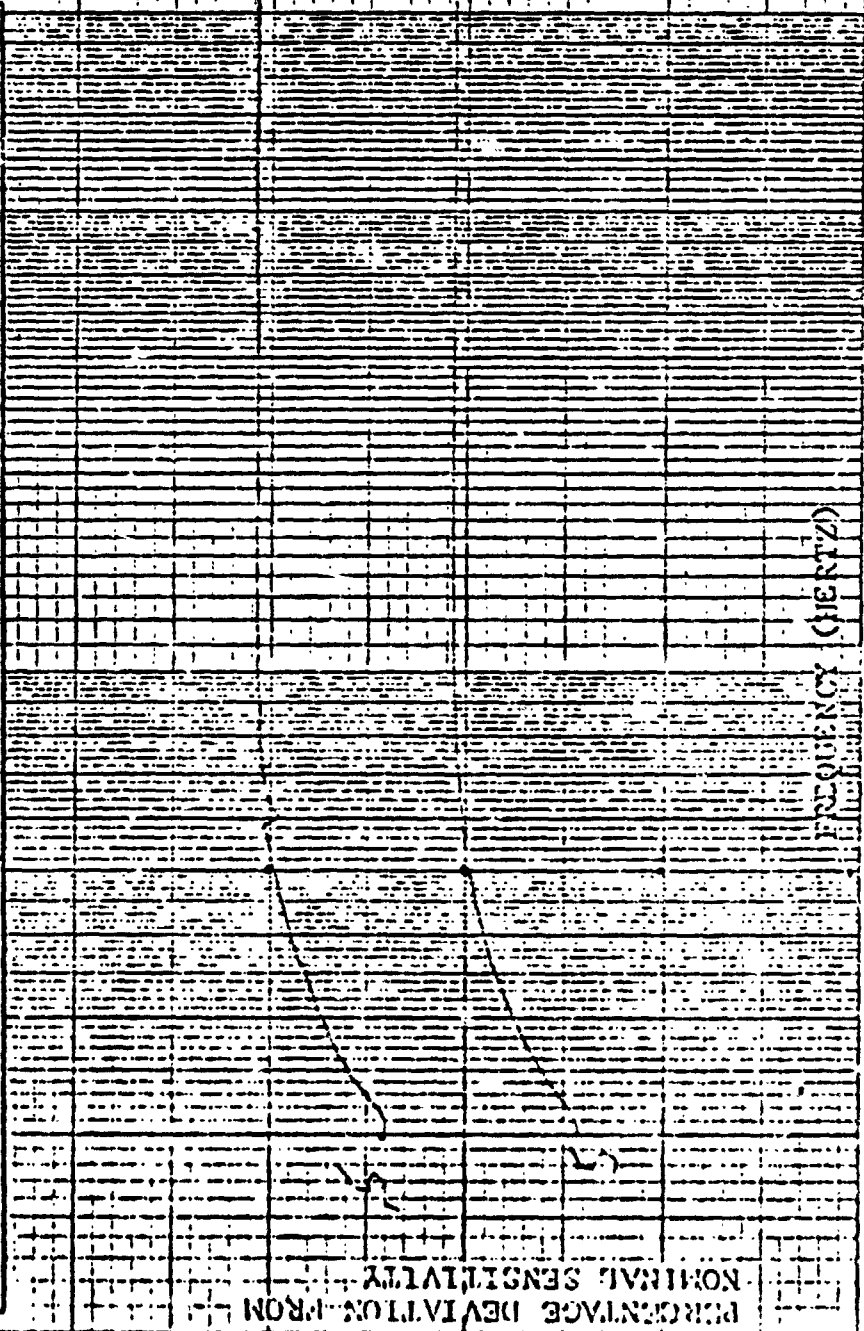


10.000
9
8
7
6
5
4
3
2
1
0
1000
9
8
7
6
5
4
3
2
1
0
100
9
8
7
6
5
4
3
2
1
0
10
9
8
7
6
5
4
3
2
1
0

Issue Date 5-18-78 TO: MTD/MRS S/N CP62

RF-10
A500
RF-10
A500
ORIGINAL PAGE IS
OF POOR QUALITY

PIEZOELECTRIC ACCELEROMETER CALIBRATION	
MANUF. <u>EMPIRICA</u>	DATE <u>05-08-78</u>
CAPACITANCE <u>---</u>	TECH <u>TC</u>
MOUNTING METHOD <u>---</u>	REMARKS -
CHARGE AMPLIFIER	DC. OUT PUT
S/N <u>EA45</u>	OF AMPLIFIER
	NOMINAL CHARGE SENSITIVITY
	<u>257.4</u> <u>mV</u> <u>pcb/g</u>



10000
1000
100
10

ENGINEERING LABORATORIES
Calibration Data Sheet

ORIGINAL PAGE IS
OF POOR QUALITY

Description <u>TRANSDUCER PRESSURE</u>	Date Calibrated:
Model/Type <u>PM 6TC ± 2.5-350</u>	<u>5-24-78</u>
Range <u>± 2.5 P.S.I.D.</u>	Calibration Period:
Mfg. <u>STATIMM</u>	<u>6 MO.</u>
Serial No. <u>15935</u>	Lab No. <u>05-024-08</u>
Lab No.	Calibrated by: <u>T. GOSCINSKI</u>

Remarks: Q.M. READING BASED ON MENSOR CALIBRATION 11-28-77

Q.M.	STD.	INT. P.S.I.	OUT. P.S.I.		
	P.S.I.	MIN	MIN		
0	0	0	0		
—	100K CAL	+5.25	5.25		
3.158	+0.5	+5.45	—		
6.314	+1.0	10.89	10.89		
9.476	+1.5	16.33	—		
12.625	+2.0	21.79	21.79		
15.772	+2.5	27.23	—		
		↓	↑		
0	0	0	0		
—	100K CAL	-5.25	-5.25		
3.158	-0.5	-5.46	—		
6.314	-1.0	-10.90	-10.91		
9.476	-1.5	-16.35	—		
12.625	-2.0	-21.80	-21.81		
15.772	-2.5	-27.26	—		
				1 + 3	SHORTED
				2 + 4	355.45
				VOLTAGE	1.000

P504

RP-21

78 5411 Rev 6

ENGINEERING LABORATORIES
Calibration Data Sheet

ORIGINAL PAGE IS
OF POOR QUALITY

Description <u>TRANSDUCER PRESSURE</u>	Date Calibrated:
Model/Type <u>PMETC ± 2.5-250</u>	<u>5-24-78</u>
Range <u>± 2.5 P.S.I.D.</u>	Calibration Period:
Mfg. <u>STATHAM.</u>	<u>6 MO.</u>
Serial No. <u>15931</u>	EPN No. <u>05-024-08</u>
Lab No.	Calibrated by: <u>T. GOSCINSKI</u>

Remarks: Q.M. READING BASED ON SENSOR CALIBRATION 11-22-77

P 505

O.M.	STD	OUT. PUT	OUT PUT		
	P.S.I.	M/V	M/V		RP-2J
0	0	0	0		
—	100K CAL	+5.31	+5.31		
3.158	+0.5	+5.36	—		
6.314	+1.0	10.71	10.72		
9.476	+1.5	16.07	—		
12.625	+2.0	21.42	21.43		
15.772	+2.5	26.77	—		
		↓	↑		
0	0	0	0		
—	100K CAL	+5.31	5.31		
3.158	-0.5	-5.36	—		
6.314	-1.0	-10.71	-10.72		
9.476	-1.5	-16.08	—		
12.625	-2.0	-21.43	-21.44		
15.772	-2.5	-26.79	—		
				1*3	SHORTED
				2*4	353.0
				VOLTAGE	5.999

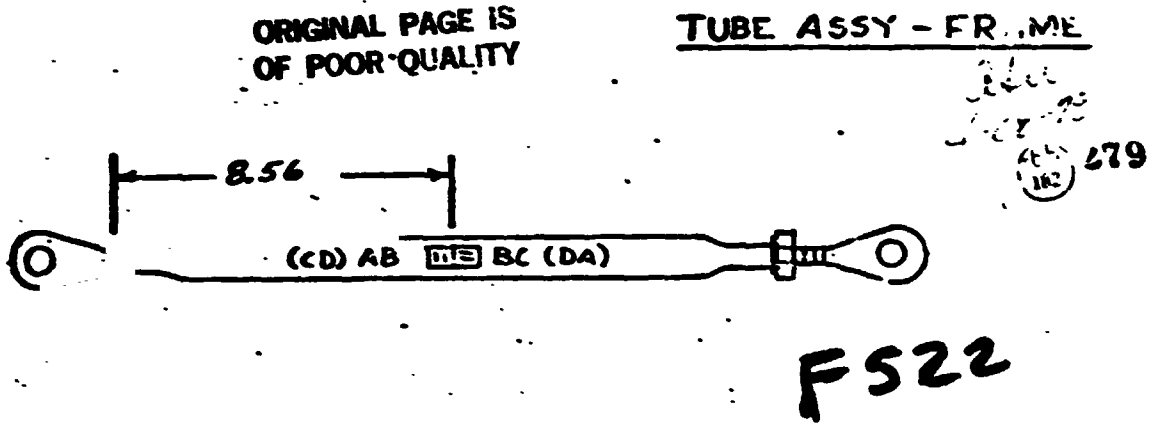
786 411 Rev66

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 67895A
FVA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11079A
K ORDER A427	GAGE FACTOR 2.14 ± 1.0%	PART NO. 301-860-934-1
REQUESTED BY: A. WHITENER	LOT NO. Q-A32 AF06	SERIAL NO.

TITLE OF TEST : **301 FLIGHT TEST**

SKETCH:



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.

COVER

WITH 9309. ATTACH SIX WIRE SIX INCH SUPERFLEX

LEADS. ENCASE LEADS IN VINYL SLEEVING AND

TERMINATE WITH KPT-06-B-4P PLUS.

FS22

01

BRIDGE	AXIAL						
LANCE	5.04						
Ω TO GROUND	5K Ω						
DATE ASSIGNED	TECHNICIAN <i>Hollis</i>				EST. HRS.	APPROVED BY:	
DATE COMPLETED	ENGINEER				ACT. HRS.		

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: KINSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11079A21
CAL DATE: 8-10-76
SERIAL NO: NONE
P/N: 301-860-934-3

PROJECT: 301 FLIGHT TEST

PART NAME: TUBE ASSEMBLY FRAME
CHANNEL: 04 - AXIAL LOADING

F522

CALIBRATE EQUIVALENT: 100K = 724 POUNDS
UNIT CAL = 823 POUNDS/MV/V

BRIDGE RES. : 350.00 JACK FAC. : NONE
GAGE FACTOR : 2.140 LEVER ARM : NONE
BRIDGE VOLT. : 10.00
PRE CAL. : 8.79 CAL RES. : 100
POST CAL. : 8.80

LOADS-POUNDS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	0.010	1
0.00	0.00	0.000	-0.010	-1
120.00	120.00	1.460	0.012	1
240.00	240.00	2.930	0.004	0
360.00	360.00	4.350	-0.004	-0
480.00	480.00	5.840	-0.002	-0
600.00	600.00	7.300	0.000	0

MAXIMUM CALIBRATION LOAD: 600 POUNDS

BHC PROGRAM FCCR33 - RUN DATE: 08-11-76

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

INSTRUMENTATION LABORATORY WORK SHEET

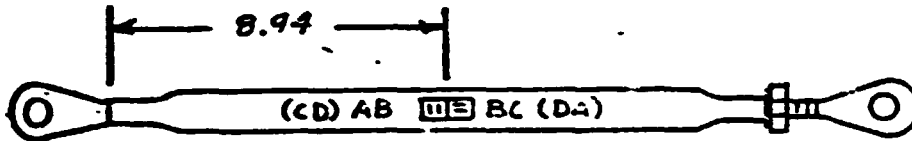
MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 678954
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11078A
ORDER A427	GAGE FACTOR 2.14 ± 1.0%	PART NO. 301-860-934-3
REQUESTED BY: A. WHITENER	LOT NO. 607E 2 AF06	SERIAL NO.

TITLE OF TEST **301 FLIGHT TEST**

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

TUBE ASSY - FRAME



F523

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
COVER
WITH 9309. ATTACH SIX WIRE SIX INCH SUPERFLEX
LEADS. ENCASE LEADS IN VINYL SLEEVING AND
TERMINATE WITH KPT-06-B-4P PLUG.

F523
01

BRIDGE	AXIAL							
ANCE	3.56							
TO GROUND	2K ML							
DATE ASSIGNED	TECHNICIAN HOLLIS				EST. HRS.	APPROVED BY:		
DATE COMPLETED	ENGINEER				ACT. HRS.			

CALIBRATION SHEET
LAS ENGINEER: WHITENER
DATA ANALYST: MARY LOJ WRIGHT
LAS TECHNICIAN: KINSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11078A01
CAL DATE: 8-10-76
SERIAL NO: NONE
P/N: 301-860-934-3

PROJECT: 301 FLIGHT TEST

PART NAME: TUBE ASSEMBLY FRAME
CHANNEL: 03 - AXIAL LOADING

FS23

CALIBRATE EQUIVALENT: 100K = 724 POUNDS
UNIT CAL = 825 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.140
BRIDGE VOLT. : 10.00
PRE CAL. : 8.78
POST CAL. : 8.77

JACK FAC. : NONE
LEVER ARM : NONE
CAL RES. : 100

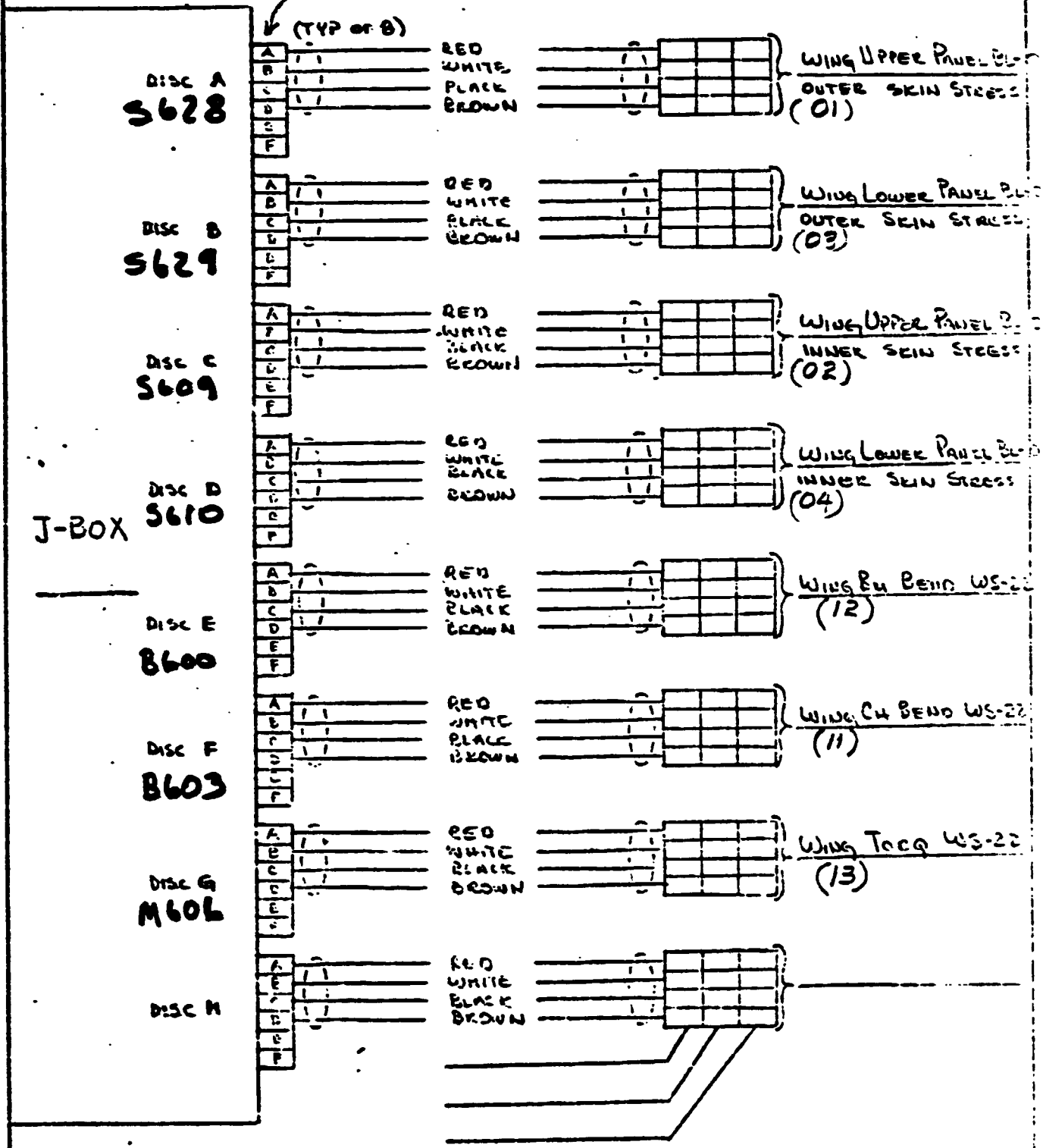
LOADS-POUNDS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	0.005	0
0.00	0.00	0.000	-0.005	-0
120.00	120.00	1.470	0.010	1
240.00	240.00	2.910	-0.004	-0
360.00	360.00	4.370	0.001	0
480.00	480.00	5.820	-0.004	-0
600.00	600.00	7.280	0.002	0

MAXIMUM CALIBRATION LOAD: 600 POUNDS

BHC PROGRAM FCCR33 - RUN DATE: 08-11-76

ORIGINAL PAGE IS OF POOR QUALITY DISCONNECT HARNESS
 J-Box LOCATION RW-1 (182) 278

KPT06-10-6P



BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301

PAGE 2 OF 2

CHECKED

ASW

HELI. 1+2 RPT SKASW04375-1

ORIGINAL PAGE IS OF POOR QUALITY

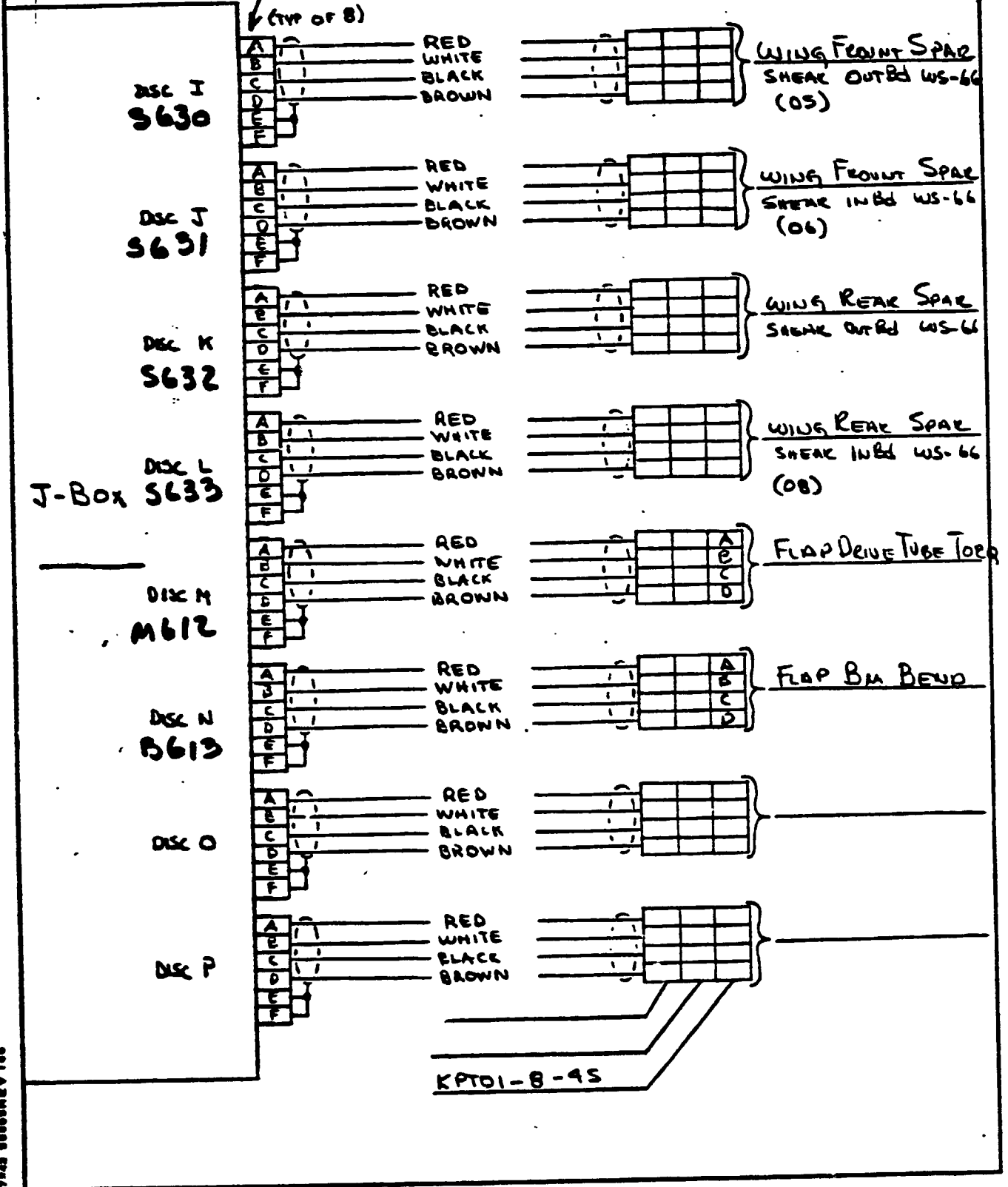
DISCONNECT HARNESS

J-Box LOCATION: RW-1

l.t.h.
4-25-68

(B7) 279
(182)

KPTOG-10-6P

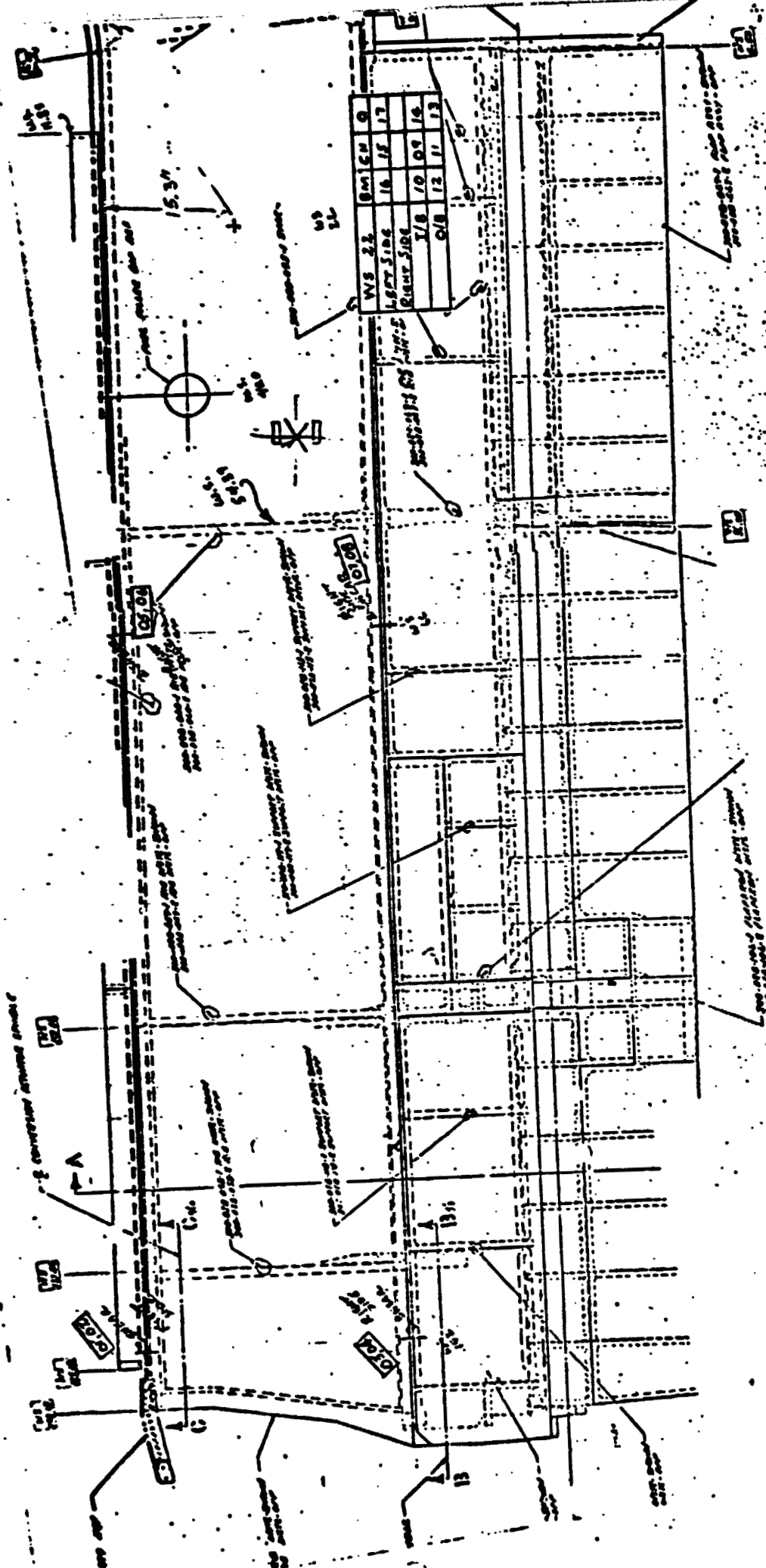


7948 0000029 100

LAB No. 11234A

Part No. 500-028-001-1

ORIGINAL PAGE IS
OF POOR QUALITY



301 WING

ORIGINAL PAGE IS
OF POOR QUALITY

301 SHIP #2 WING

BOG No.				STA OF P.L.	BALANCE	BAL WITH 30K REINFOR.	RESI TO GNL
<u>FUSELAGE SECTION</u>							
01	UPPER PANEL - OUTER SKIN	STRESS	0.0		4.00		10K
02	UPPER PANEL - INNER SKIN	STRESS	0.0		4.19		
03	LOWER PANEL - OUTER SKIN	STRESS	0.0		4.25		
04	LOWER PANEL - INNER SKIN	STRESS	0.0		4.47		
<u>R/H WING</u>							
01'	LEADING EDGE	OUTB'D SHEAR	142		4.37		
02'	LEADING EDGE	INB'D SHEAR	142		4.48		
03'	TRAILING EDGE	OUTB'D SHEAR	139		4.88		
04'	TRAILING EDGE	INB'D SHEAR	139		4.19		
05	LEADING EDGE	OUTB'D SHEAR	66		4.04		
06	LEADING EDGE	INB'D SHEAR	66		5.25		
07	TRAILING EDGE	OUTB'D SHEAR	66		5.11		
08	TRAILING EDGE	INB'D SHEAR	66		3.90		
09	CHORD BENDING	INB'D BEND	22		2.75	5.48	
10	BEAM BENDING (INSIDE)	BEND	22		5.19		
11	CHORD BENDING	OUTB'D BEND	22		2.43	5.11	
12	BEAM BENDING (OUTSIDE)	BEND	22		5.27		
13	TORSION	OUTB'D TORQUE	22		4.09		
14	TORSION	INB'D TORQUE	22		5.10		
<u>L/H WING</u>							
15	CHORD BENDING	BEND	22		3.24	6.70	
16	BEAM BENDING	BEND	22		7.10		
17	TORSION	TORQUE	22		6.59		10K

GAGE TYPES.

SHEAR & TORSION GAGES

EA-13-062 VD -350W

850 ± 0.4%

2.076 ± 0.5%

Q-A12BF61

BEAM & CHORD GAGES

EA-13-250 M9 -350W

350 ± 0.4%

2.14 ± 0.5%

Q-A32AF04

ITEM CODE = S145/S146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sh} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ PSI stress}$$

ITEM CODE = S147/S148 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sh} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ PSI stress}$$

ITEM CODE = ~~XXXX~~ S610/S628/S629 = stress

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sh} = 115K$$

$$115KCE = \frac{(350)(10.7)10^6}{(1)(2.13)(115350)}$$

$$= 11525$$

ITEM CODE = S630/S631/S632/S633 = shear
S634/S635/S636/S637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sh} = 115K$$

$$115KCE = \frac{(350)(2)(4.0)10^6}{(2)(2.075)(115350)}$$

$$= 5849 \text{ PSI shear}$$

ITEM CODE = 5145/5146 = STRESS

ORIGINAL PAGE IS
OF POOR QUALITY

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = STRESS

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODE = 5609/5628/5629 = STRESS

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(10.7)10^6}{(1)(2.13)(115350)}$$

$$= \text{stress}$$

ITEM CODE = 5630/5631/5632/5633 = SHEAR
5634/5635/5636/5637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(2)(4.0)10^6}{(2)(2.075)(115350)}$$

$$= 5849 \text{ psi shear}$$

ITEM CODE = 5145/5146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29) 10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODE = 5609/5610/5629 = stress

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)}$$

ITEM CODE = 5630/5631/5632/5633 = shear
5634/5635/5636/5637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)}$$

$$= 5849 \text{ psi shear}$$

ITEM CODE = 5145/5146 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sk} = 500K$$

$$500K CE = \frac{(350)(29) 10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 500K$$

$$500K CE = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODE = 5609/5610/5628/ ~~5629~~ = stress

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 115K$$

$$115K CE = \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)}$$

$$= \text{~~stress~~}$$

ITEM CODE = 5630/5631/5632/5633 = shear
5634/5635/5636/5637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sk} = 115K$$

$$115K CE = \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)}$$

$$= 5849 \text{ psi shear}$$

ITEM CODE = 5145/5146 = stress

ORIGINAL PAGE IS OF POOR QUALITY

$$R = 350 \text{ }\Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sk} = 500 \text{ K}$$

$$500 \text{ K CE} = \frac{(350)(29) 10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = stress

$$R = 350 \text{ }\Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 500 \text{ K}$$

$$500 \text{ K CE} = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODE = 5609/5610/5628/5629 = stress

$$R = 350 \text{ }\Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 115 \text{ K}$$

$$115 \text{ K CE} = \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)}$$

$$= 15242 \text{ psi stress}$$

ITEM CODE = ~~5631/5632/5633~~ / ~~5634/5635/5636/5637~~ = shear

$$R = 350 \text{ }\Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sk} = 115 \text{ K}$$

$$115 \text{ K CE} = \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)}$$

$$= \underline{\underline{\text{shear}}}$$

ITEM CODE = S145/S146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$\begin{aligned} R &= 350 \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.08 \\ R_{sk} &= 500K \end{aligned}$$

$$\begin{aligned} 500KCE &= \frac{(350)(29) 10^6}{(1)(2.08)(500350)} \\ &= 9752 \text{ psi stress} \end{aligned}$$

ITEM CODE = S147/S148 = Stress

$$\begin{aligned} R &= 350 \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sk} &= 500K \end{aligned}$$

$$\begin{aligned} 500KCE &= \frac{(350)(29) 10^6}{(1)(2.13)(500350)} \\ &= 9524 \text{ psi stress} \end{aligned}$$

ITEM CODE = S609/S610/S628/S629 = Stress

$$\begin{aligned} R &= 350 \Omega \\ Y &= 10.7 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sk} &= 115K \end{aligned}$$

$$\begin{aligned} 115KCE &= \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)} \\ &= 15242 \text{ psi stress} \end{aligned}$$

ITEM CODE = S630/~~S631~~/S632/S633 = Shear
S634/S635/S636/S637

$$\begin{aligned} R &= 350 \Omega \\ G &= 4.0 \times 10^6 \\ N &= 2 \\ G.F. &= 2.075 \\ R_{sk} &= 115K \end{aligned}$$

$$\begin{aligned} 115KCE &= \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)} \\ &= \end{aligned}$$

ORIGINAL PAGE IS
OF POOR QUALITY

ITEM CODE = 5145/5146 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODE = 5609/5610/5628/5629 = Stress

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(10.7)10^6}{(1)(2.13)(115350)}$$

$$= 15242 \text{ psi stress}$$

ITEM CODE = 5630/5631/~~5632~~/5633 = Shear
5634/5635/5636/5637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(2)(4.0)10^6}{(2)(2.075)(115350)}$$

$$= \underline{\underline{\hspace{2cm}}}$$

ITEM CODE = 5145/5146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODES = 5609/5610/5628/5629 = stress

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(10.7)10^6}{(1)(2.13)(115350)}$$

$$= 15242 \text{ psi stress}$$

ITEM CODES = 5630/5631/5632/~~5633~~ = shear
5634/5635/5636/5637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sk} = 115K$$

$$115KCE = \frac{(350)(2)(4.0)10^6}{(2)(2.075)(115350)}$$

$$= \text{--- shear ---}$$

CALIBRATION DATA SHEET

Date 12-6-77

ORIGINAL PAGE IS
OF POOR QUALITY

Lab. No. 11235A

Project 301" 2 Wing

Serial No. _____

Model 301

Title Wing Cal (Bar)

Part No. _____

O. _____

L. T. R. EWA

Engineer Wentworth / Lewis

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<i>Wentworth</i>					
<i>Lewis</i>					

Volts	6.05		6							
Gage Type										
Gage Fac.	Wing Cal X 16									
Gage Res.										
Act. Arm	ATTN. HY HY HY HB HB HE HB HE HE									
Chan.	Sta 225									
Bridge	10	12	16	0?	11	15	13	14	12	11
Config.	1425									
Cal. Res.	1000									
Lever Arm	C (100000)									

Lead PSI	Output	✓	✓							
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.5	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
5.0	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
7.5	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
10.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5	1.250	1.250	1.250	1.250	1.250	1.250	1.250	1.250	1.250	1.250
15.0	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500
17.5	1.750	1.750	1.750	1.750	1.750	1.750	1.750	1.750	1.750	1.750
20.0	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
22.5	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250
25.0	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
27.5	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750
30.0	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
32.5	3.250	3.250	3.250	3.250	3.250	3.250	3.250	3.250	3.250	3.250
35.0	3.500	3.500	3.500	3.500	3.500	3.500	3.500	3.500	3.500	3.500
37.5	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750
40.0	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
42.5	4.250	4.250	4.250	4.250	4.250	4.250	4.250	4.250	4.250	4.250
45.0	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500
47.5	4.750	4.750	4.750	4.750	4.750	4.750	4.750	4.750	4.750	4.750
50.0	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
52.5	5.250	5.250	5.250	5.250	5.250	5.250	5.250	5.250	5.250	5.250
55.0	5.500	5.500	5.500	5.500	5.500	5.500	5.500	5.500	5.500	5.500
57.5	5.750	5.750	5.750	5.750	5.750	5.750	5.750	5.750	5.750	5.750
60.0	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
62.5	6.250	6.250	6.250	6.250	6.250	6.250	6.250	6.250	6.250	6.250
65.0	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
67.5	6.750	6.750	6.750	6.750	6.750	6.750	6.750	6.750	6.750	6.750
70.0	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000
72.5	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250
75.0	7.500	7.500	7.500	7.500	7.500	7.500	7.500	7.500	7.500	7.500
77.5	7.750	7.750	7.750	7.750	7.750	7.750	7.750	7.750	7.750	7.750
80.0	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000
82.5	8.250	8.250	8.250	8.250	8.250	8.250	8.250	8.250	8.250	8.250
85.0	8.500	8.500	8.500	8.500	8.500	8.500	8.500	8.500	8.500	8.500
87.5	8.750	8.750	8.750	8.750	8.750	8.750	8.750	8.750	8.750	8.750
90.0	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000
92.5	9.250	9.250	9.250	9.250	9.250	9.250	9.250	9.250	9.250	9.250
95.0	9.500	9.500	9.500	9.500	9.500	9.500	9.500	9.500	9.500	9.500
97.5	9.750	9.750	9.750	9.750	9.750	9.750	9.750	9.750	9.750	9.750
100.0	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000

NOTE: Load applied at center of 1" x 1" post (S/A 193)

Wentworth
OK Ray Schultz
3-15-78

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 12-6-77

Lab. No. 11234A

Project 301 # 2 WING

Serial No. _____

Model 301

Title WING CAL (TORQ)

Part No. 300-028-001-1

O. _____

L. T. R. _____ EWA _____

Engineer Whitner / G. ...

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Whitner</u>					

Volts	<u>6.090</u>								
Gage Type									
Gage Fac.									
Gage Res.									
Lot No. ATTN.	<u>HY</u>	<u>HY</u>	<u>HY</u>	<u>HE</u>	<u>HE</u>	<u>HE</u>	<u>HE</u>	<u>HE</u>	<u>HE</u>
Act. Arm									
Chon.									
Bridge	<u>10</u>	<u>12</u>	<u>16</u>	<u>09</u>	<u>11</u>	<u>15</u>	<u>13</u>	<u>14</u>	<u>17</u>
Config.									
Cal. Res.	<u>100</u>								
Lever Arm	<u>"B"</u>							<u>53.0</u>	

Load (PSI)	Output						✓	✓	✓
	Chan. 1	Chan. 2	Chan. 3	Chan. 4	Chan. 5	Chan. 6	Chan. 7	Chan. 8	Chan. 9
0	0.000	0.020	-0.001	-0.076	0.002	-0.057	0.587	-0.049	0.251
300	-0.118	-0.054	-0.085	-0.066	-0.011	-0.081	0.081	0.175	0.000
600	-0.197	-0.153	-0.171	-0.069	+0.034	-0.090	0.400	0.207	0.000
900	-0.277	-0.229	-0.256	-0.040	+0.043	-0.002	0.400	0.451	0.000
1200	-0.347	-0.377	-0.342	-0.032	+0.052	+0.028	0.504	0.500	0.000
1500	-0.423	-0.417	-0.429	-0.031	+0.058	+0.058	0.507	0.700	0.000
1800	-0.487	-0.503	-0.260	-0.095	-0.019	-0.005	0.500	0.500	0.000
2100	-0.500	+0.070	-0.087	-0.118	-0.007	-0.059	0.500	0.500	0.000
2400	-0.519	0.000	-0.000	-0.100	-0.047	-0.074	0.500	0.500	0.000
2700	-0.014	+0.001	+0.000	-0.118	-0.044	-0.075	0.500	0.000	0.000
3000									
3300									
3600									
3900									
4200									
4500									
4800									
5100									
5400									
5700									
6000									

for Chan nomenclature per Chan field
OK Ray Schilly 3-15-78

Note: Load applied in F.S. 240 in ...

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 12-7-78

Lab. No. 11234A

Project 301 # 2 wiring

Serial No. _____

Model _____

Title wiring, (12 (PHOTO))

Part No. 300-5028-001-1

O. _____

L. T. R. _____ EWA _____

Engineer WHITENR.

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
HILLIN					

Volts	6.102								
Gage Type									
Gage Fac.									
Gage Res.									
Lot No.	ACT 11: HY			412					
Act. Arm									
Char.				2/A 22 5					
Bridge	10	12	16	07	11	15	13	10	10
Config.	1.5K 100K	100K	100K	100K	100K	100K	100K	100K	100K
Cal. Res.	100K								
Lever Arm	"A" Chamber			← 142.5 →					

Lead (psi)	Output			✓	✓	✓			
	#1	2	3	4	5	6	7	8	9
0	+0.021	+0.022	+0.022	-0.019	+0.020	-0.014	+0.066	-0.026	+0.022
300	+0.028	+0.024	+0.004	+0.121	+0.190	+0.062	+0.047	-0.022	+0.022
600	+0.025	+0.024	+0.004	+0.275	+0.319	+0.215	+0.063	-0.076	+0.022
900	+0.026	+0.023	+0.003	+0.432	+0.505	+0.379	+0.067	-0.074	+0.022
1200	+0.022	+0.023	+0.002	+0.591	+0.662	+0.527	+0.067	-0.016	+0.022
1500	+0.025	+0.022	+0.001	+0.748	+0.821	+0.702	+0.067	-0.025	+0.022
1800	+0.022	+0.021	+0.000	+0.905	+0.952	+0.867	+0.067	-0.024	+0.022
2100	+0.028	+0.022	+0.002	+0.609	+0.681	+0.556	+0.066	-0.021	+0.022
2400	+0.024	+0.024	+0.001	+0.128	+0.197	+0.067	+0.066	-0.022	+0.022
0	+0.022	+0.019	+0.005	-0.021	+0.046	-0.054	+0.065	-0.020	+0.022
100K	-0.245	-0.205	-0.268	-2.672	-2.600	-2.655	-2.594	-2.801	-2.606
<p># Note: Lead 100K, 100K, 100K, 100K, 100K, 100K, 100K, 100K, 100K, 100K</p>									
<p>OK Ray Schiltz 3-15-78</p>									

BY
CHECKED

BELL HELICOPTER COMPANY
PART NUMBER 001 001 1007 0010 01 001

MODEL
HELL

PAGE
RPT

LAB. NO. 11234A09
LAB CALIBRATION: 12-7-77
PART NO. 300-028-001-1
SER. NO. _____
JACK FACTOR: 1.5 PSI = 10 LB
LEVER ARM: 142.5 INCHES
LOAD CELL: 402.125 INCHES

$$500 \text{ KD} = 1015 \div 15 \times 142.5 = 96,425 \text{ IN-LBS}$$

$$100 \text{ KD} = \frac{500 \text{ KD}}{5} = 100 \text{ KD} \times 96,425 = 482,125 \text{ IN-LBS}$$

B603

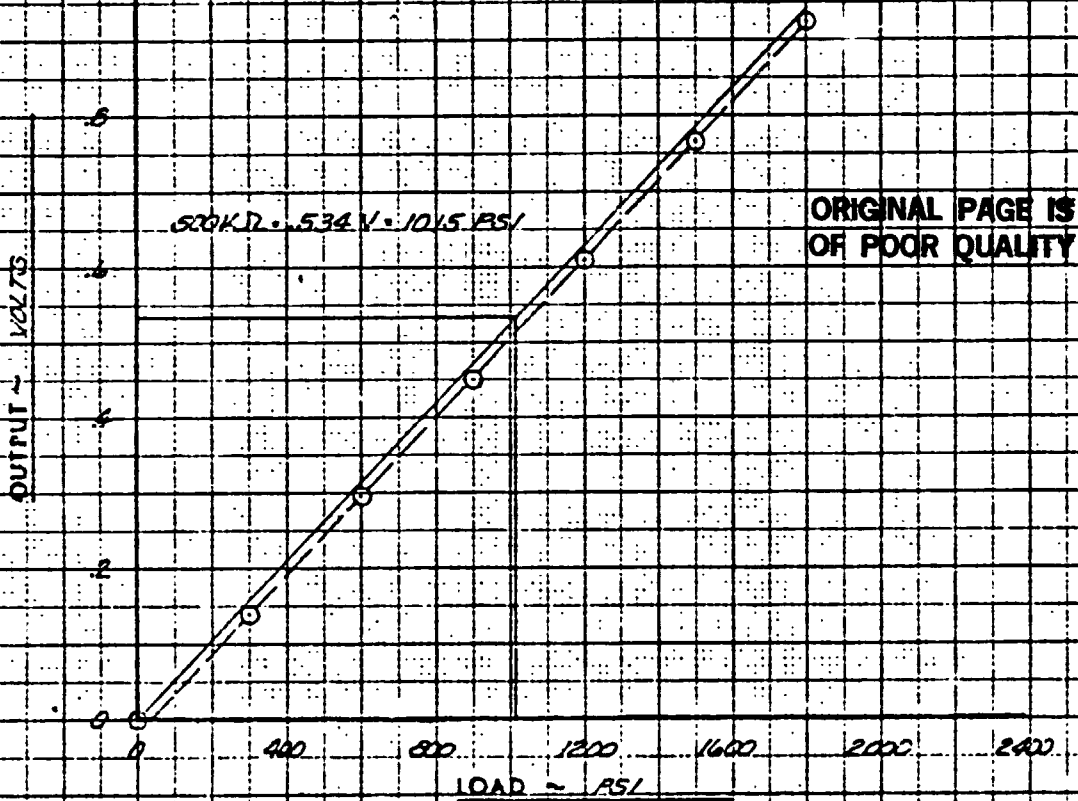


FIG. CALIBRATION OF RIGHT HAND WING
FOR INSIDE CHORD BENDING, SECTION 22.5

FWL 9-8-78

BY
CHECKED

BELL HELICOPTER COMPANY
PART NUMBER 000 000 000 000 000 000 000 000

MODEL
HELL

PAGE
RPT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 11234A10
LAB CALIBRATION: 12-6-77
PART NO. 302-028-001-1
SER. NO. _____
JACK FACTOR: 0.287 PSI = 10 LB
LEVER ARM: 142.5 INCHES
100K D.C.E. = 238,325 IN-LBS

B600

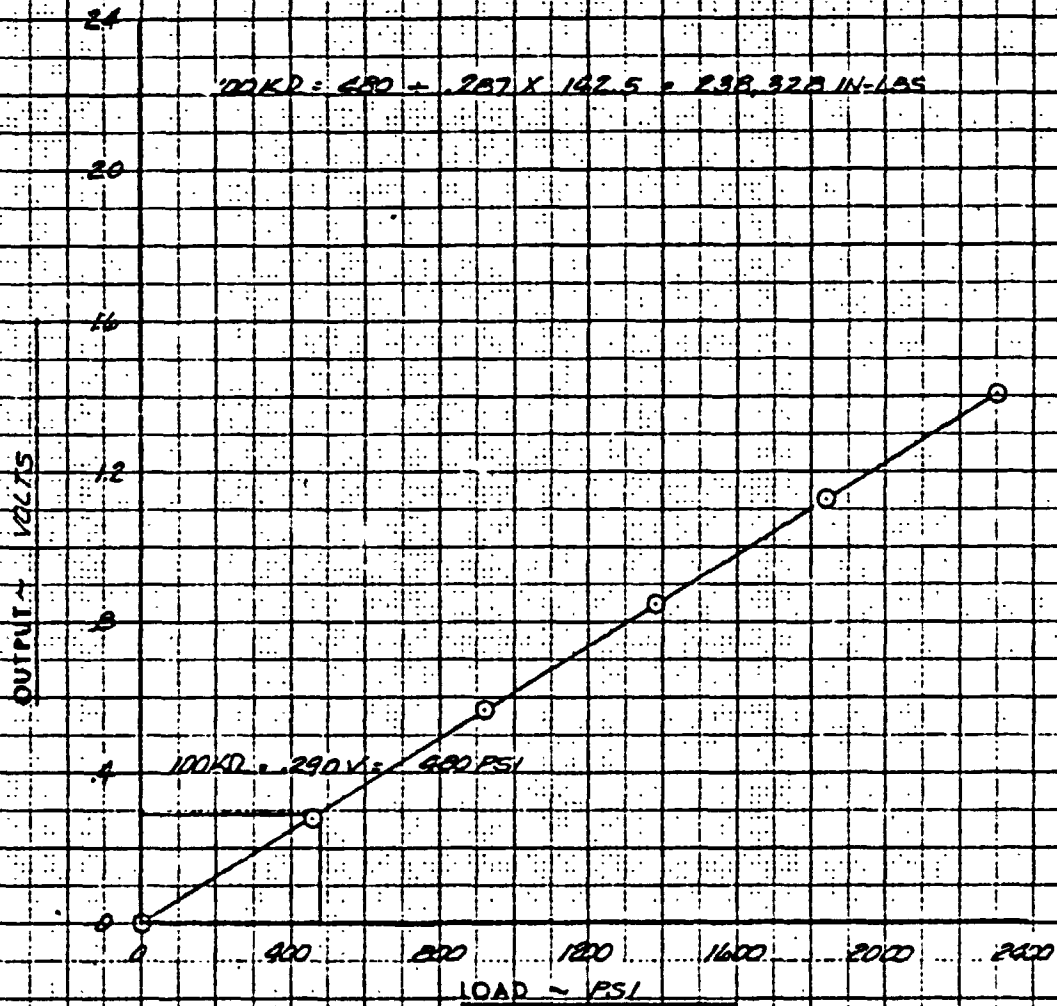


FIG. CALIBRATION OF RIGHT HAND WING
FOR INSIDE BEAM BENDING, STATION 22.5

REV 3-D-74

BY
CHECKED

DELL HELICOPTER COMPANY
PROY 0128 001 001 • PROY 0128 01280

MODEL
HELI

PAGE
001

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 11234911
LAB CALIBRATION 12-7-77
PART NO. 1300-028-001-1
SER. NO. _____
JACK FACTOR 1.5 PSI = 10 LB
LEVER ARM 142.5 INCHES
LOAD CELL 265,500 IN-LBS

$500KR = 900 + 1.5 \times 142.5 = 93,100 \text{ IN-LBS}$

$100KR = \frac{500K}{100K} \times 93,100 = 465,500 \text{ IN-LBS}$

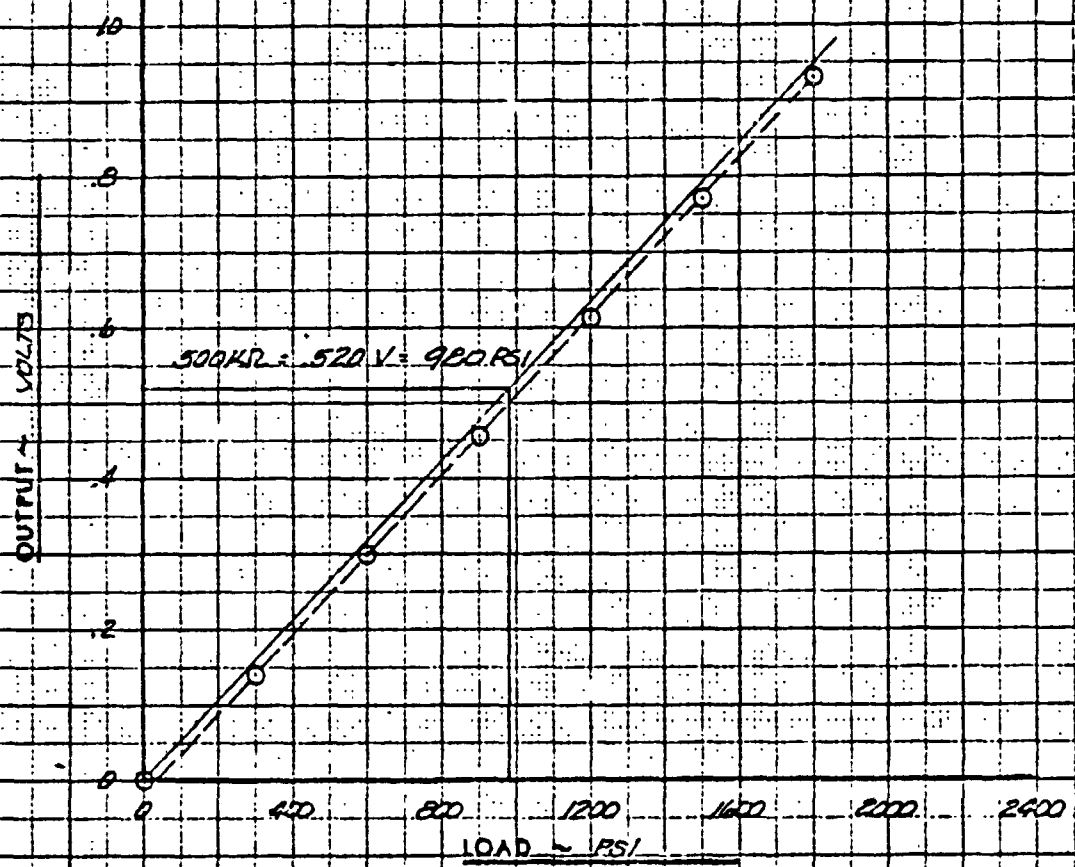


FIG. CALIBRATION OF RIGHT HAND WING
FOR CHORD BENDING, STATION 22.5

BY
CHECKED

BELL HELICOPTER COMPANY
PART NUMBER 201 401

MODEL
HELI

PAGE
RPT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB. NO. 11234012

LAB. CALIBRATION 12-6-77

PART NO. 300-025-101-1

SER. NO.

JACK FACTOR 0.287 PSI = 1.0 LB

LEVER ARM 142.5 INCHES

100K OCF = 198,606 IN-LBS

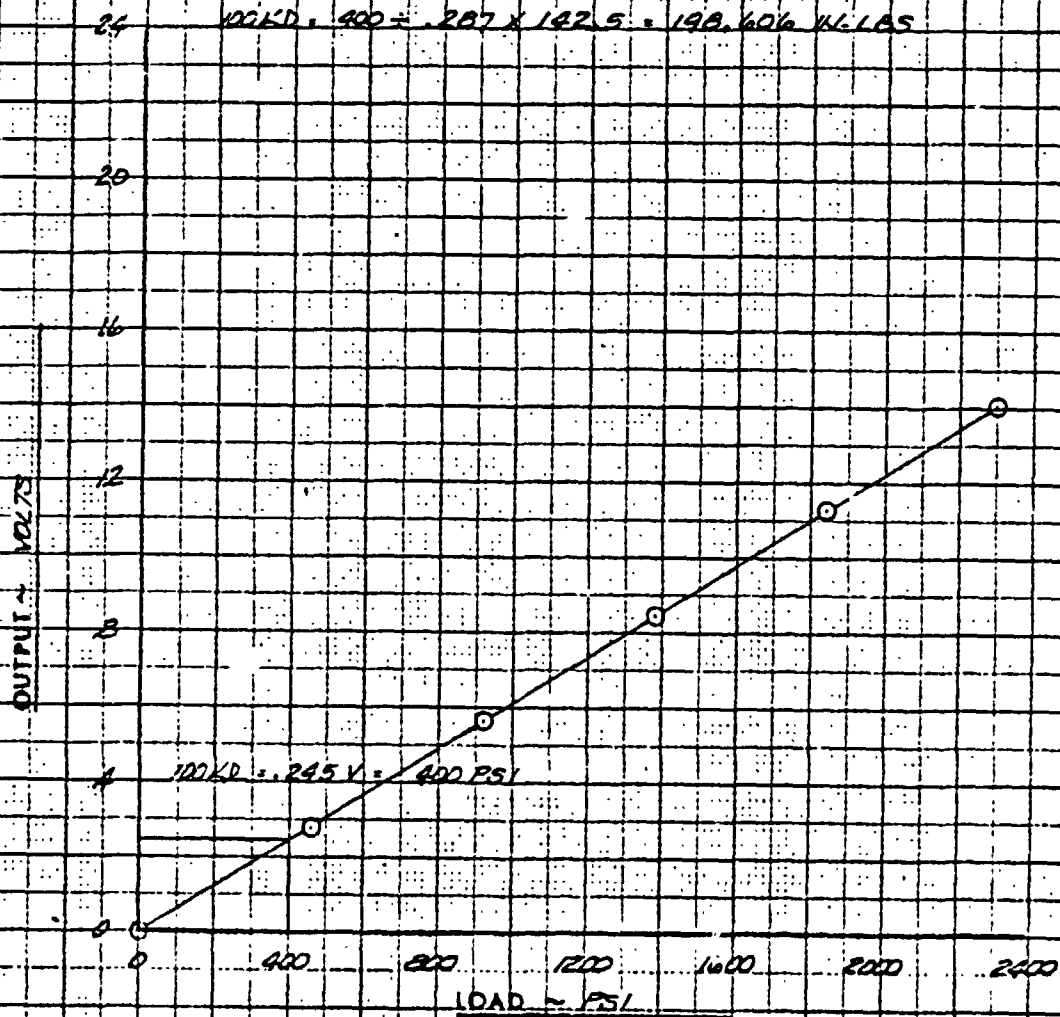


FIG. CALIBRATION OF RIGHT HAND KING
FOR OUTSIDE BEAM BENDING, STATION 22.5

BY
CHECKED

BELL HELICOPTER COMPANY
PART 00001 401 001 PART 00010 00000

MODEL
HELI

PAGE
RPT

LAB NO. 112349.13
LAB CALIBRATION: 12-6-77
PART NO. 300-028-001-1
S/R NO. _____
JACK FACTOR 0.609 PSI = 1.0 LB
LEVER ARM 53.0 INCHES
100K O.C.E. = 47.736 IN LBS.

ORIGINAL PAGE IS
OF POOR QUALITY

12
 $500KD = 960 + 609 \times 53.0 = 89,547 \text{ IN-LBS}$
 $\frac{500K}{100K} = \frac{500K}{100K} \times 89,547 = 47,736 \text{ IN-LBS}$

M606

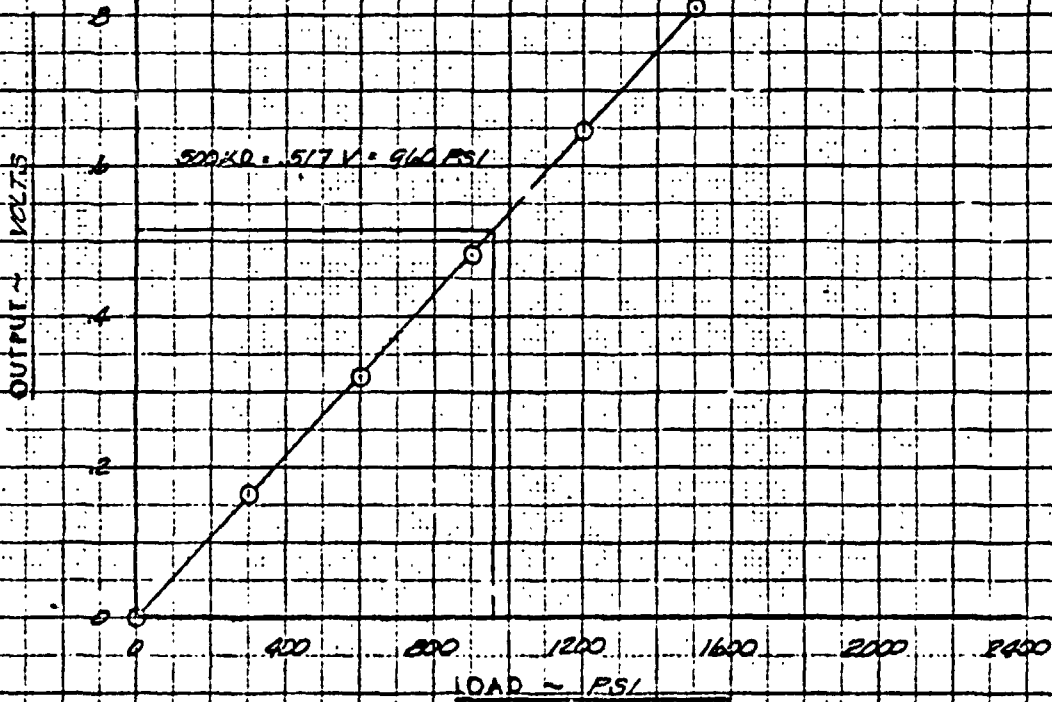


FIG. CALIBRATION OF RIGHT HAND WING
FOR OUTBOARD TORSION, STATION 22.5

BY
CHECKED

BELL HELICOPTER COMPANY
1001 BIRCH ST. CHICAGO, ILL. 60606

MODEL
HELI

PAGE
8PT

ORIGINAL PAGE IS
OF POOR QUALITY

TAB NO. 11234A14

TAB CALIBRATION: 12-6-77

PART NO. 300-023-001-1

SER. NO.

JACK FACTOR: 609 PSI/10 LBS.

LEVER ARM: 53.0 INCHES

100K D.C.E. = 235,140 IN-LBS

$$500 \text{ KD} = 1000 \times 609 \times 53.0 = 37,028 \text{ IN-LBS}$$

$$100 \text{ KD} = \frac{500 \text{ KD}}{5} = \frac{37,028}{5} = 7,405.6 \text{ IN-LBS}$$

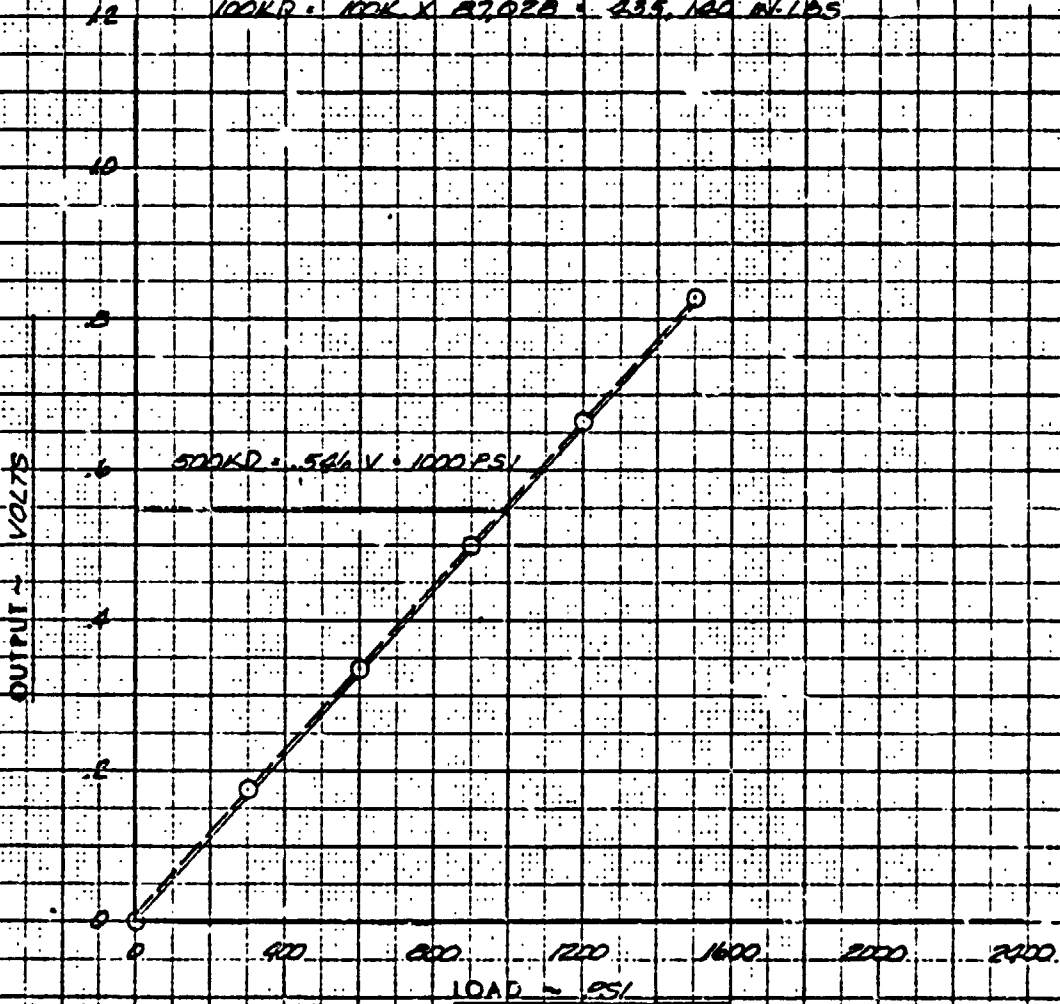


FIG. CALIBRATION OF RIGHT HAND WING
FOR INWARD TORSION, STATION 22.5

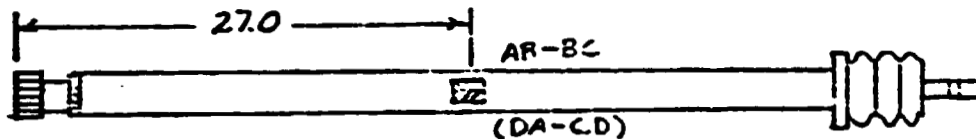
INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. A427	GAGE TYPE EA 13 - 062VD-350V1	SHEET NO. DLN 675957
FWA NO. A427-11A	RESISTANCE 350.2	LAB. NO. 10991A
WORK ORDER A427	GAGE FACTOR 2.075 ± 0.5%	PART NO. BHF 50622
REQUESTED BY: A. WHITENER	LOT NO. J-A:2 BF 61	SERIAL NO. 102

TITLE OF TEST 111
301 FLIGHT TEST 279

SKETCH:

R/H FLAP DRIVE TUBE



11612

ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL TORSION BRIDGE AS SHOWN. USE ER-600 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. ATTACH FOUR 6 FOOT SUPERFLEX WIRES. ENCASE WIRES IN VINYL LEEVINGS AND COIL AROUND SHAFT FOR SIX REVOLUTIONS.

BRIDGE	01 TORSION					
ALIGNMENT	4.88					
RES. TO GROUND	102.00					
DATE ASSIGNED	TECHNICIAN <i>Hollis</i>			EST. HRS.	APPROVED BY:	
DATE COMPLETED	ENGINEER			ACT. HRS.		
	6-18-76					

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10991AC1
CAL DATE: 7-12-76
SERIAL NO: 102
P/N: BHF-50622

PROJECT: 301 FLIGHT TEST

PART NAME: R/H FLAP CRIVE TUBE
CHANNEL: 03 - TORSIGN. BRIDGE 01

M612

CALIBRATE EQUIVALENT: 100K = 174 IN-LBS
UNIT CAL = 197 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.75
BRIDGE VOLT. : 10.00
PRE CAL. : 8.85
POST CAL. : 8.85

JACK FAC. : NONE
LEVER ARM : 12.000 IN.
CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN : INE MILLIVOLTS	IN-LBS
0	0	0.000	-0.008	-0
0.00	0.00	0.000	0.008	0
10.00	120.00	6.100	0.006	0
20.00	240.00	12.200	0.004	0
30.00	360.00	18.230	-0.008	-1
40.00	480.00	24.460	0.001	1
50.00	600.00	30.490	-0.011	-0

MAXIMUM CALIBRATION LOAD: 600 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 07-15-76

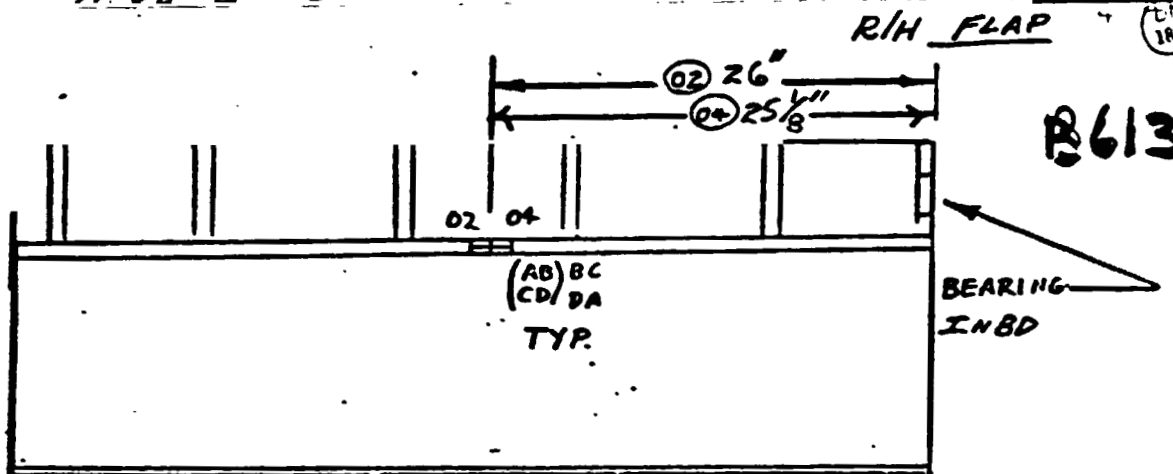
INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-250MQ-350E	SHEET NO. 178984
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11012A
WORK ORDER A427	GAGE FACTOR 2.14 ± 0.5%	PART NO. 300-028-067-2
REQUESTED BY: A WHITTNER	LOT NO. D-A32AF04	SERIAL NO. —

TITLE OF TEST

MODEL 301 FLIGHT TEST - SHIP-2

SKETCH:



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

**INSTALL TWO BENDING BRIDGES AS SHOWN.
USE 910 CEMENT. RUN WIRES PER INSTRUCTIONS
TO FLAT TYPE TERMINAL ON INBOARD END.
COVER WITH 9309.**

BRIDGE	BND-02	BND-04			
BALANCE	4.55	5.63			
TO GROUND	10KΩ	10KΩ			
DATE ASSIGNED	6-21-76		TECHNICIAN	EST. HRS.	APPROVED BY:
DATE COMPLETED	6-22-76		CHUCK	ACT. HRS.	

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 11012A02
CAL DATE: 11-2-76
SERIAL NO: NONE
P/N: 300-028-067-2

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST SHIP 2

PART NAME: RIGHT HAND FLAP
CHANNEL: 03 - BEAM BENDING, STATION 26.0

B613

CALIBRATE EQUIVALENT: 100K = 8514 IN-LBS
UNIT CAL = 9712 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.140
BRIDGE VCLT.: 6.00
PRE CAL. : 5.26
POST CAL. : 5.26

JACK FAC. : NONE
LEVER ARM : NONE
CAL RES. : 100

LOADS-IN-LBS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.018	30
0.00	0.00	0.000	-0.018	-30
779.00	779.00	0.470	-0.030	-48
1559.00	1559.00	0.990	0.008	14
2338.00	2338.00	1.510	0.047	76
3118.00	3116.00	1.980	0.035	57
3897.00	3897.00	2.420	-0.006	-10
4677.00	4677.00	2.890	-0.018	-29
5456.00	5456.00	3.370	-0.019	-31

MAXIMUM CALIBRATION LOAD: 5456 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

CALIBRATION SHEET
 LAB ENGINEER: WHITENER
 DATA ANALYST: MARY LOU WRIGHT
 LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
 OF POOR QUALITY

LAB NO. : 11012A04
 CAL DATE: 11-2-76
 SERIAL NO: NCNE
 P/N: 300-028-067-2

PROJECT: 301 FLIGHT TEST SHIP 2

PART NAME: RIGHT HAND FLAP

CHANNEL: 04 - BEAM BENDING, STATION 25.125

 CALIBRATE EQUIVALENT: 100K = 8846 IN-LBS
 UNIT CAL = 10053 IN-LBS/MV/V

BRIDGE RES. : 350.00
 GAIN FACTOR : 2.140
 BRIDGE VOLT. : 6.00
 PRE CAL. : 5.28
 POST CAL. : 5.28

JACK FAC. : NONE
 LEVER ARM : NONE
 CAL RES. : 100

LOADS-IN-LBS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.053	-89
0.00	0.00	0.000	0.053	89
779.00	779.00	0.410	-0.002	-3
1559.00	1559.00	0.850	-0.027	-46
2338.00	2338.00	1.330	-0.012	-20
3118.00	3118.00	1.780	-0.028	-47
3897.00	3897.00	2.230	-0.045	-72
4677.00	4677.00	2.730	-0.008	-14
5456.00	5456.00	3.270	0.067	112

MAXIMUM CALIBRATION LOAD: 5456 IN-LBS

BMC PROGRAM FCCR33 - RUN DATE: 11-10-76

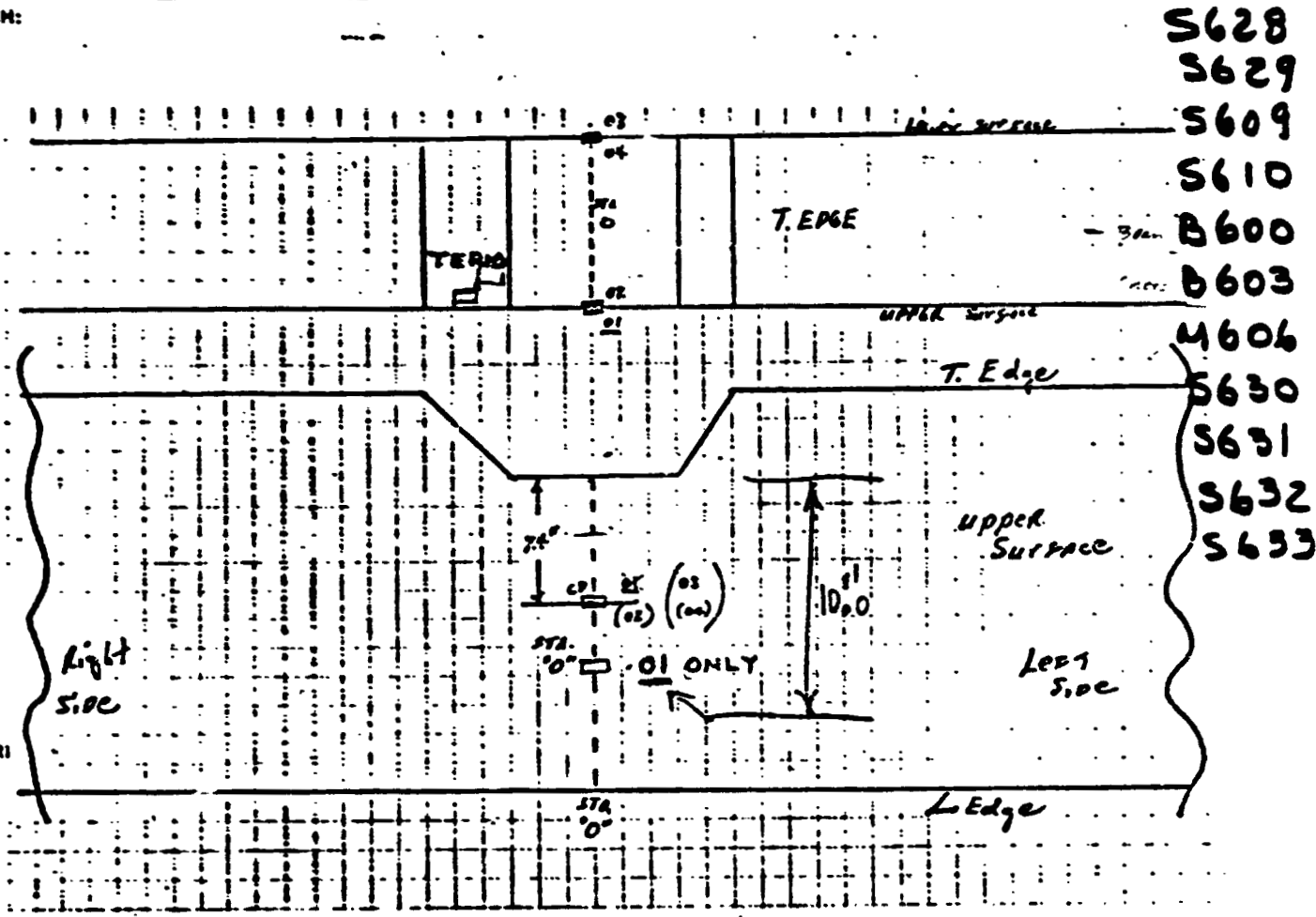
CHUCK

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE FA-13-250BF-350W	SHEET NO. DLN 688512
NO. A427-11B	RESISTANCE 350.0 ± 0.3%	LAB. NO. 11234 A
WORK ORDER A427	GAGE FACTOR 2.13 ± 0.5%	PART NO. 4-28-78
REQUESTED BY: A. WHITENER	LOT NO. Q-A32AF01	SERIAL NO. (b1 182) 279

TITLE OF TEST: **301 FLIGHT TEST - SHIP 2**

SKETCH:



WING

FUSELAGE SECTION

ORIGINAL PAGE IS OF POOR QUALITY

	01	02	03	04		
RIDGE						
STRESS						
STRESS						
STRESS						
STRESS						
ALANCE	4.03	4.16	4.25	4.47		
RES. TO GROUND	1.1Kinn	1.1Kinn	1.1Kinn	1.1Kinn		
DATE ASSIGNED	TECHNICIAN			EST. HRS.	APPROVED BY:	
DATE COMPLETED	ENGINEER			ACT. HRS.		
	10-14-76					

C. C. W. - U. V. F.

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED RLW

HELI. 1+2 RPT SKASW04375-1

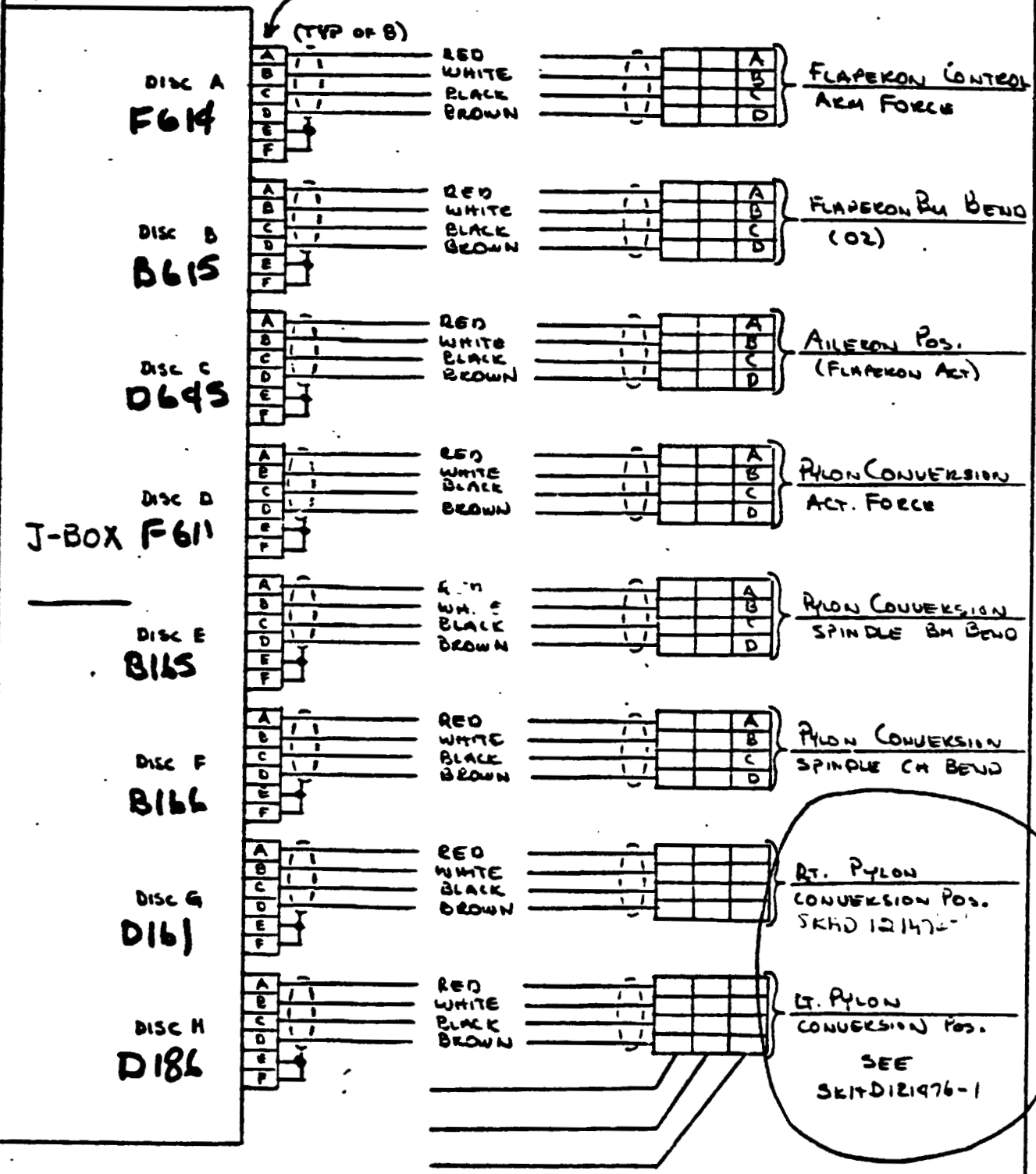
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

278
181

J-Box Location RW-2

KPT06-10-67



FORM 8888REV 100

ORIGINAL PAGE IS OF POOR QUALITY

DISCONNECT HARNESS

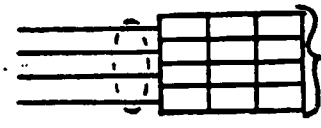
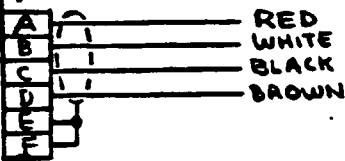
J-Box LOCATION RW-2

ASW
4-25-76
bf 182
278

KPTOG-10-6P

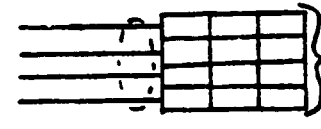
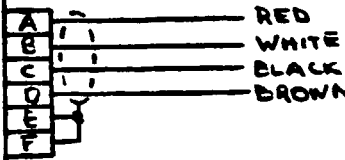
(TYP OF 8)

DISC I
5634



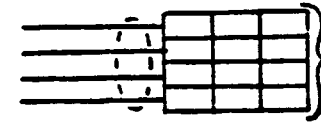
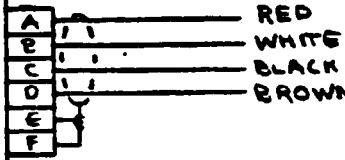
WING FRONT SPAR
SHEAR OUTBD WS-192
(01)

DISC J
5635



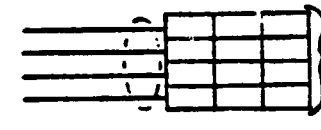
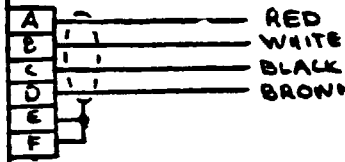
WING FRONT SPAR
SHEAR INBD WS-192

DISC K
5636



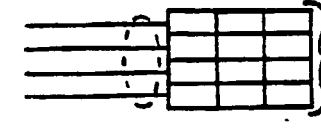
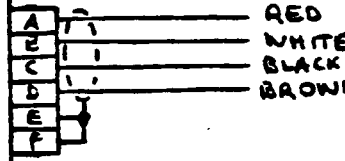
WING REAR SPAR
SHEAR OUTBD WS-199

DISC L
J-Box **5637**

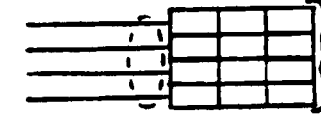
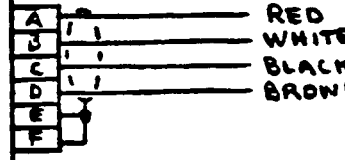


WING REAR SPAR
SHEAR INBD WS-199

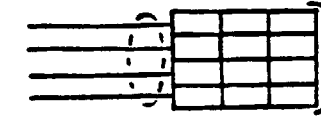
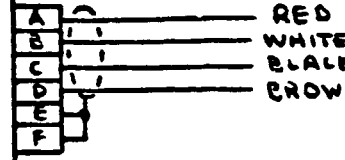
DISC M



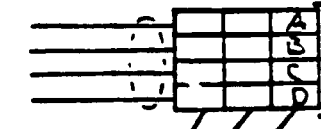
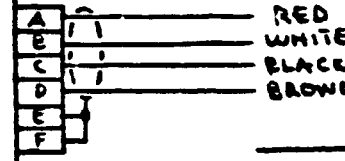
DISC N



DISC O



DISC P
D617



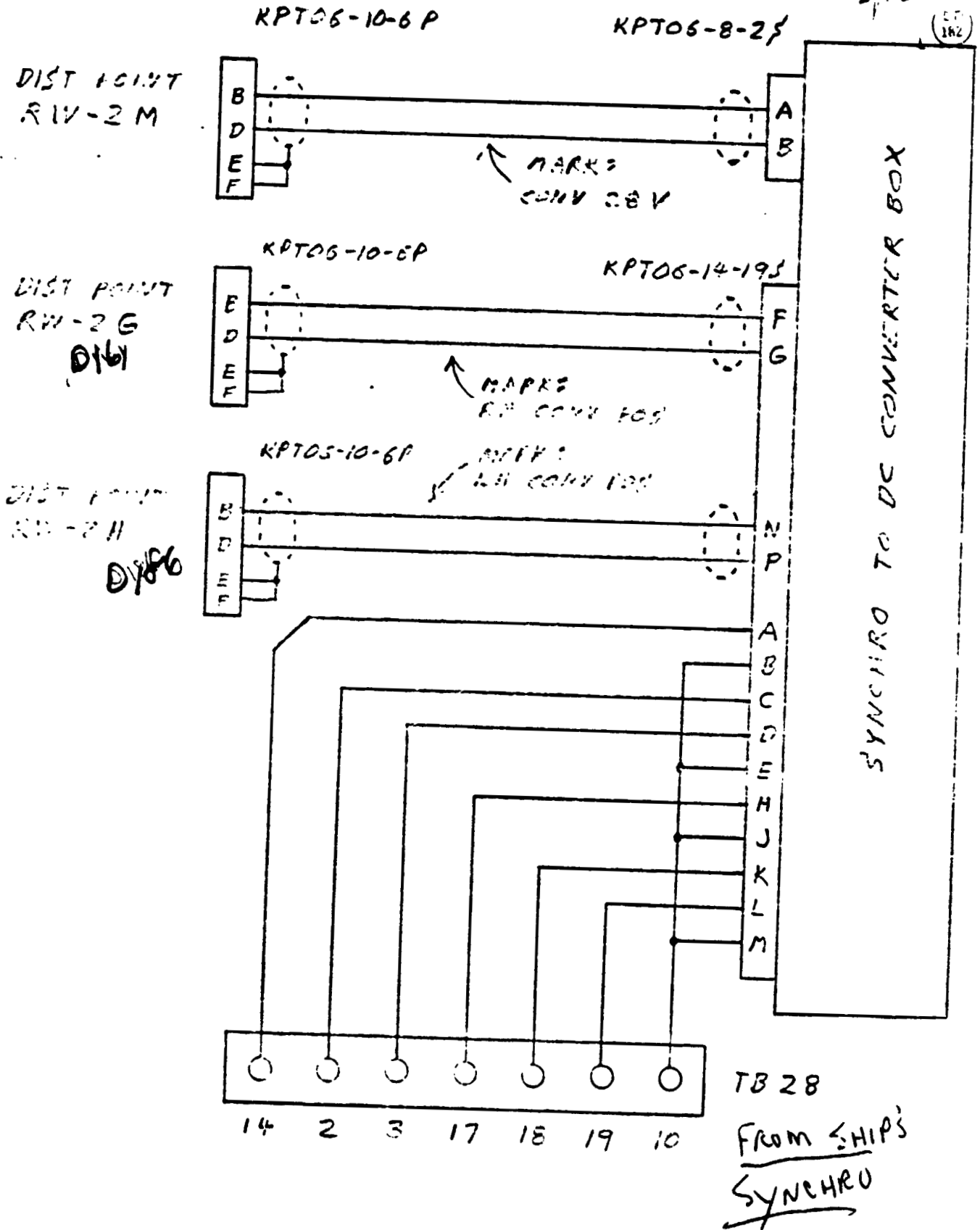
FLAP POS.

KPTOI-8-95

301 CONVERSION POSITION SYNCHRO TO DC CIRCUIT

Q11
4-28-78

279



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6/5/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer SMITH

Project GROUND TIEDOWN TESTS

Title RIGHT Pylon CONVERSION ANGLE

W. O. 201 2

L. T. R. _____ EWA _____

ITEM CODE: D16

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
SMITH					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>5120°E" - 82-8-6</u>				
Bridge	<u>C/S 7</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Load	Output		
<u>1000 lbs.</u>	<u>ALLOW 5 (RES)</u>	<u>CURRENT (ACT)</u>	
96	96°25'	390	FULL AFT
90	91°05'	330	HELICOPTER MODE
80	80°10'	209	
70	70°20'	101	
60	60°40'	-9	
STOP	59°10'	-29	
50	50°10'	-123	
40	40°25'	-233	
30	30°30'	-342	
20	20°20'	-454	
10	11°13'	-555	
0	1°59'	-663	
-	0°0'	-684	DOWN & LOCKED/AIRPLANE MODE
20	20°30'	-454	
40	40°20'	-233	
60	60°30'	-11	
80	80°20'	213	
96	96°30'	390	FULL AFT
CPA (42-8-7)		-009	
LLC (42-8-7)		-792	

BY D. R. Smith

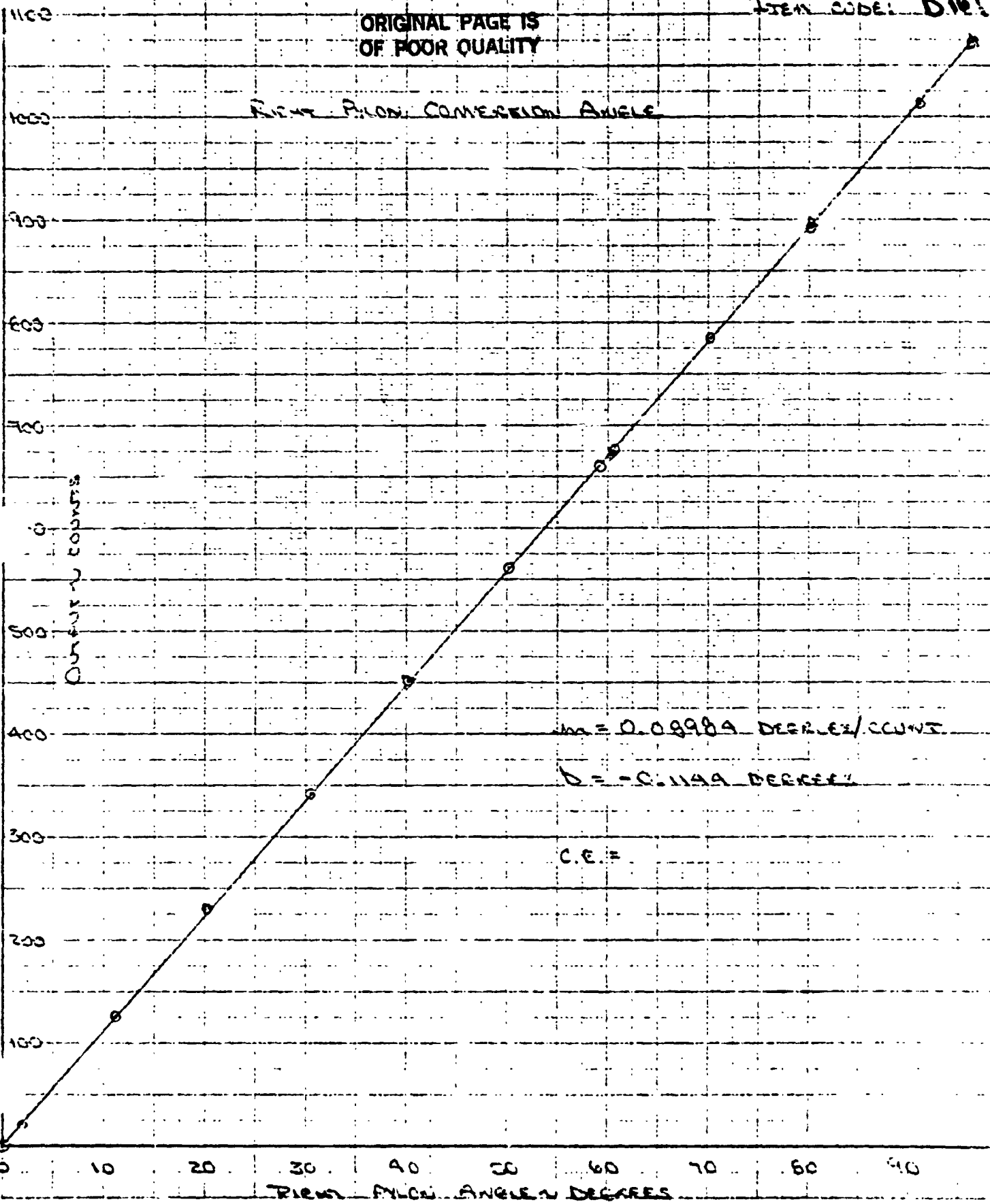
SELL HELICOPTER COMPANY
MEMPHIS, TENN. MILWAUKEE, WIS.

MODEL 301 PAGE 1
REVISION *2 251

ITEM CODE: 0161

ORIGINAL PAGE IS
OF POOR QUALITY

RIGHT AXON CONVERSION ANGLE



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6/5/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GROUND THERMAL TESTS

Title LEFT PYLON CONVERSION ANGLE

W. O. _____

L. T. R. _____ EWA _____

Item Code: D186

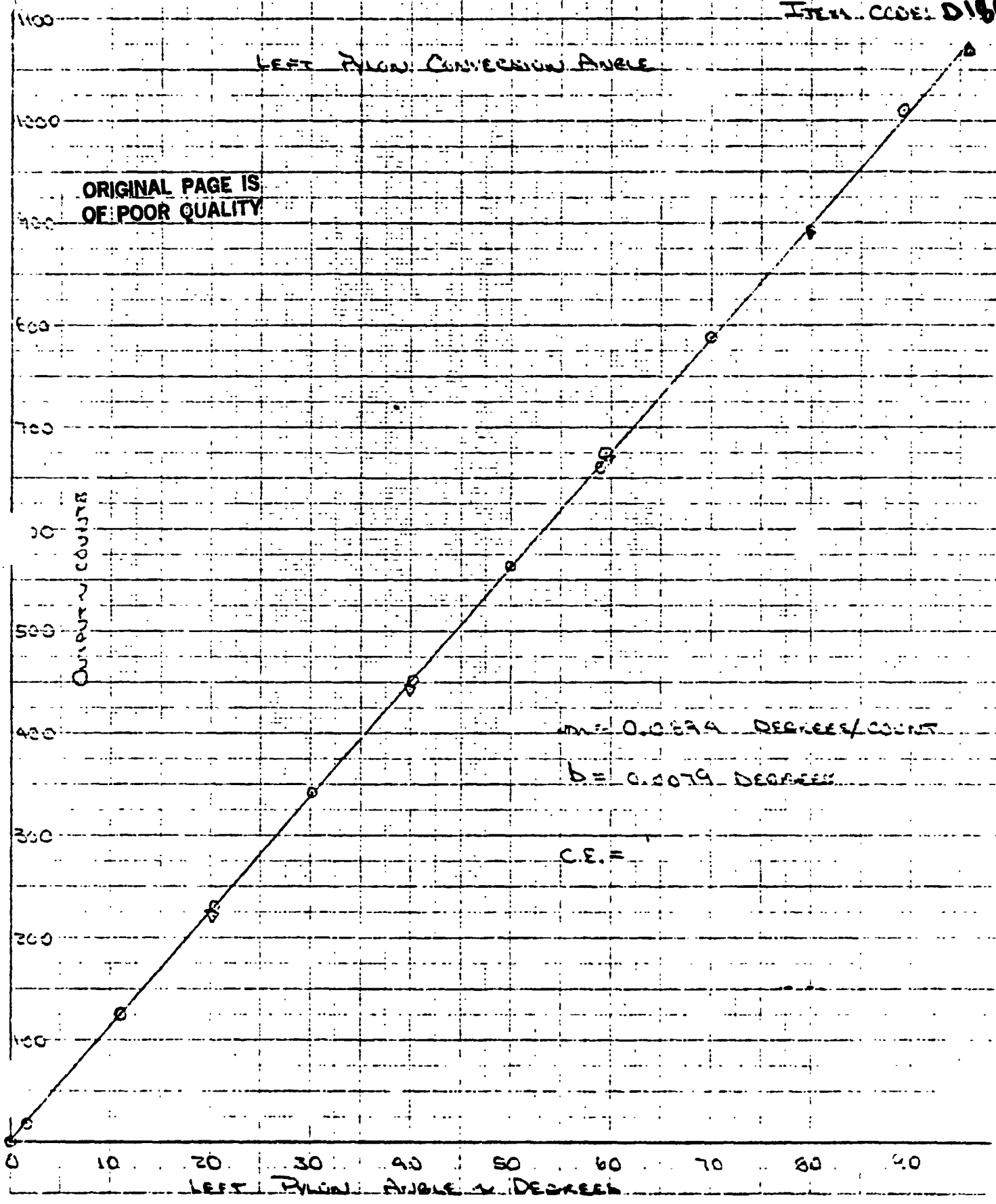
Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Smith</u>		<u>ENCLOSURE</u>			

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>TPMDU "P" - 80-5-5</u>				
Bridge	<u>CIS 7</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Load	Output				
<u>100 LBS.</u>	<u>pylon & (DEC)</u>	<u>OUTPUT (GTS)</u>			
<u>96</u>	<u>96° 0'</u>	<u>406</u>	<u>FULL ATT</u>		
<u>90</u>	<u>89° 20'</u>	<u>349</u>	<u>HELICOPTER MODE</u>		
<u>80</u>	<u>80° 00'</u>	<u>232</u>			
<u>70</u>	<u>69° 55'</u>	<u>127</u>			
<u>60</u>	<u>59° 32'</u>	<u>14</u>			
<u>STOP</u>	<u>59° 0'</u>	<u>1</u>			
<u>52</u>	<u>50° 5'</u>	<u>-97</u>			
<u>40</u>	<u>40° 15'</u>	<u>-210</u>			
<u>30</u>	<u>30° 20'</u>	<u>-319</u>			
<u>20</u>	<u>20° 22'</u>	<u>-430</u>			
<u>10</u>	<u>11° 0'</u>	<u>-536</u>			
<u>0</u>	<u>1° 50'</u>	<u>-649</u>			
<u>-</u>	<u>0° 0'</u>	<u>-661</u>	<u>DOWN & LOCKED/AIRPLANE MODE</u>		
<u>20</u>	<u>20° 20'</u>	<u>-441</u>			
<u>40</u>	<u>40° 10'</u>	<u>-216</u>			
<u>60</u>	<u>60° 15'</u>	<u>7</u>			
<u>80</u>	<u>80° 15'</u>	<u>230</u>			
<u>96</u>	<u>96° 0'</u>	<u>406</u>	<u>FULL ATT</u>		

LEFT PYLON CONVERSION ANGLE

ORIGINAL PAGE IS OF POOR QUALITY

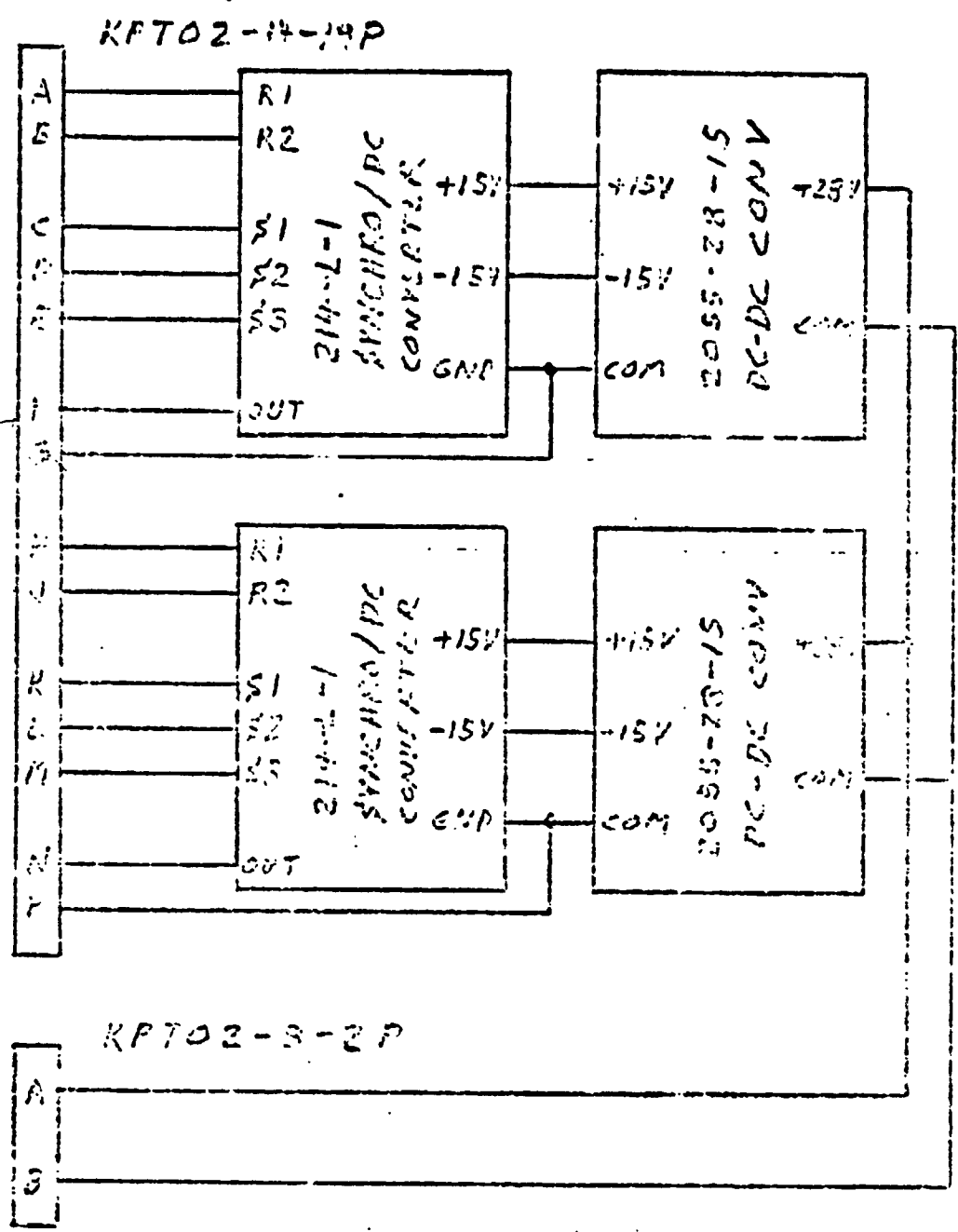


301 SYNCHRO TO DC CONVERTER BOX

PYLON CONVERSION POS SIGNAL BOX

ORIGINAL PAGE IS
OF POOR QUALITY

AM
4-28-78
1 (67 112) 279



INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	PAGE TYPE EA-06-125TB-350W	SHEET NO. DLN 678984
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11072A
TRK ORDER A427	GAGE FACTOR 2.07 ± 0.5%	PART NO. 300-001-615-1
REQUESTED BY: A. WHITENER	LOT NO. Q-A55AD13	SERIAL NO. <i>44-15</i>

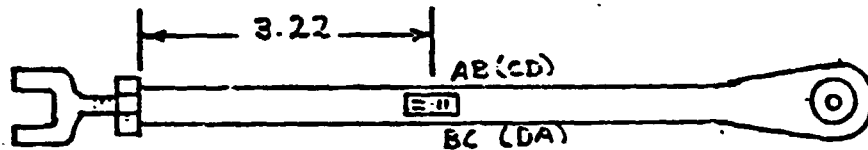
TITLE OF TEST (b1) 279
182
301 FLIGHT TEST

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

TUBE ASSY - CONTROL

F 614



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
 COVER WITH 9309. ATTACH FOUR WIRE SIX
 INCH SUPERFLEX LEADS. ENCASE LEADS IN
 VINYL SLEEVING AND TERMINATE WITH KPT 06-8-4P PLUG.

01

BRIDGE	AXIAL						
BALANCE	+B.5						
RES. TO GROUND	10K _{min}						
DATE ASSIGNED	7-13-76	TECHNICIAN	C. C. U.		EST. HRS.	APPROVED BY:	
DATE COMPLETED	7-14-76	ENGINEER			ACT. HRS.		

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: ANDERSON

LAB NO. : 11072AG1
CAL DATE: 11-1-76
SERIAL NO: NONE
P/N: 300-001-015-1

PROJECT: 301 FLIGHT TEST

ORIGINAL PAGE IS
OF POOR QUALITY

PART NAME: CONTROL TUBE ASSEMBLY
CHANNEL: 04 - AXIAL LOADING

F614

CALIBRATE EQUIVALENT: 100K = 2070 POUNDS
UNIT CAL = 2355 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.070
BRIDGE VOLT.: 6.00
PRE CAL. : 5.28
POST CAL. : 5.27

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : NONE

CAL RES. : 100

LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	-0.012	-5
0.00	0.00	0.000	0.012	5
400.00	656.81	1.670	0.008	3
600.00	1313.63	3.310	-0.025	-10
1200.00	1970.44	5.000	-0.008	-3
1600.00	2627.26	6.680	-0.002	-1
2000.00	3284.07	8.370	0.015	6

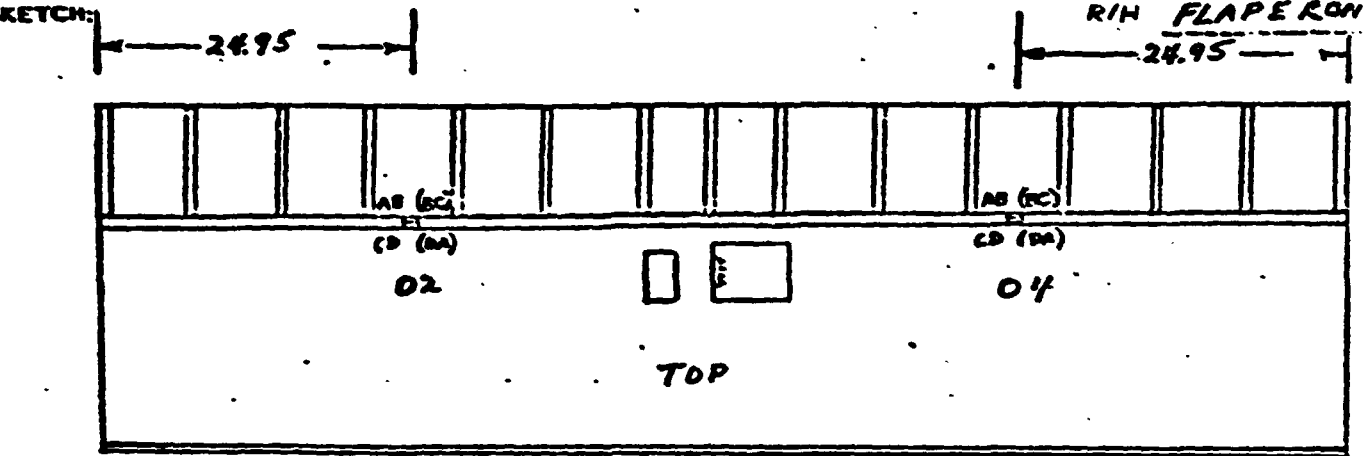
MAXIMUM CALIBRATION LOAD: 3284 POUNDS

BHC PROGRAM FCCR33 - RUN DATE: 11-02-7

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-250BF-350-W	BILL NO. 678984
A 427-11A	RESISTANCE 350.0 ± 0.3%	LAB. NO. 11074 A
ONE ORDER A 427	GAGE FACTOR 2.13 ± 0.5%	PART NO. 300-028-106-2
REQUESTED BY: A. WHITENER	LOT NO. Q-A32AFO1	SERIAL NO. 1-22

TITLE OF TEST (b) 279
MODEL 301 FLIGHT TEST



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS: **INSTALL TWO BENDING BRIDGES AS SHOWN.
 USE 910 CEMENT. RUN WIRES PER INSTRUCTIONS
 TO POST TYPE TERMINAL IN ACCESS HOLE.
 COVER WITH 9309.**

BRIDGE	BID-02	BID-04			
WICE	4.31	4.07			
REFS. TO GROUND	3-0-0-0	7-0-0-0			
DATE ASSIGNED	7-21-76		TECHNICIAN	EST. INGS.	
DATE COMPLETED	8-15-76		ENGINEER	APPROVED BY:	
			C.L.W.		
				ACT. INGS.	

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LEU WRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 11074A02
CAL DATE: 11-3-76
SERIAL NO: NONE
P/N: 300-028-106-2

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND FLAPERON
CHANNEL: 03 - BEAM ENDING, STATION 24.958

B615

CALIBRATE EQUIVALENT: 100K = 6346 IN-LBS
UNIT CAL = 7220 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.28
POST CAL. : 5.27

JACK FAC. : NONE
LEVER ARM : 24.200 IN.

CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.003	-3
0.00	0.00	0.000	0.003	3
10.00	242.00	0.190	-0.008	-10
20.00	484.00	0.400	0.001	1
30.00	725.00	0.610	0.009	11
40.00	966.00	0.800	-0.002	-2
50.00	1210.00	1.000	-0.003	-3

MAXIMUM CALIBRATION LOAD: 1210 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11074A04
CAL DATE: 11-3-76
SERIAL NO: NONE
P/N: 300-028-106-2

PROJECT: 301 FLIGHT TEST

PART NAME: RIGHT HAND FLAPERON
CHANNEL: 04 - BEAM ENDING, STATION 24.958

CALIBRATE EQUIVALENT: 100K = 6687 IN-LBS
UNIT CAL = 7615 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.27
POST CAL. : 5.27

JACK P/C. : NONE
LEVER ARM : 24.200 IN.
CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.002	-2
0.00	0.00	0.000	0.002	2
20.00	484.00	0.380	0.000	1
40.00	968.00	0.760	-0.001	-1
60.00	1452.00	1.140	-0.002	-3
80.00	1936.00	1.520	-0.004	-5
100.00	2420.00	1.910	0.005	6

MAXIMUM CALIBRATION LOAD: 2420 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

BY H.D. WINNIFORD

BELL HELICOPTER COMPANY
POST OFFICE BOX 602 • DORT 00076 L USAA

MODEL 301 PAGE _____

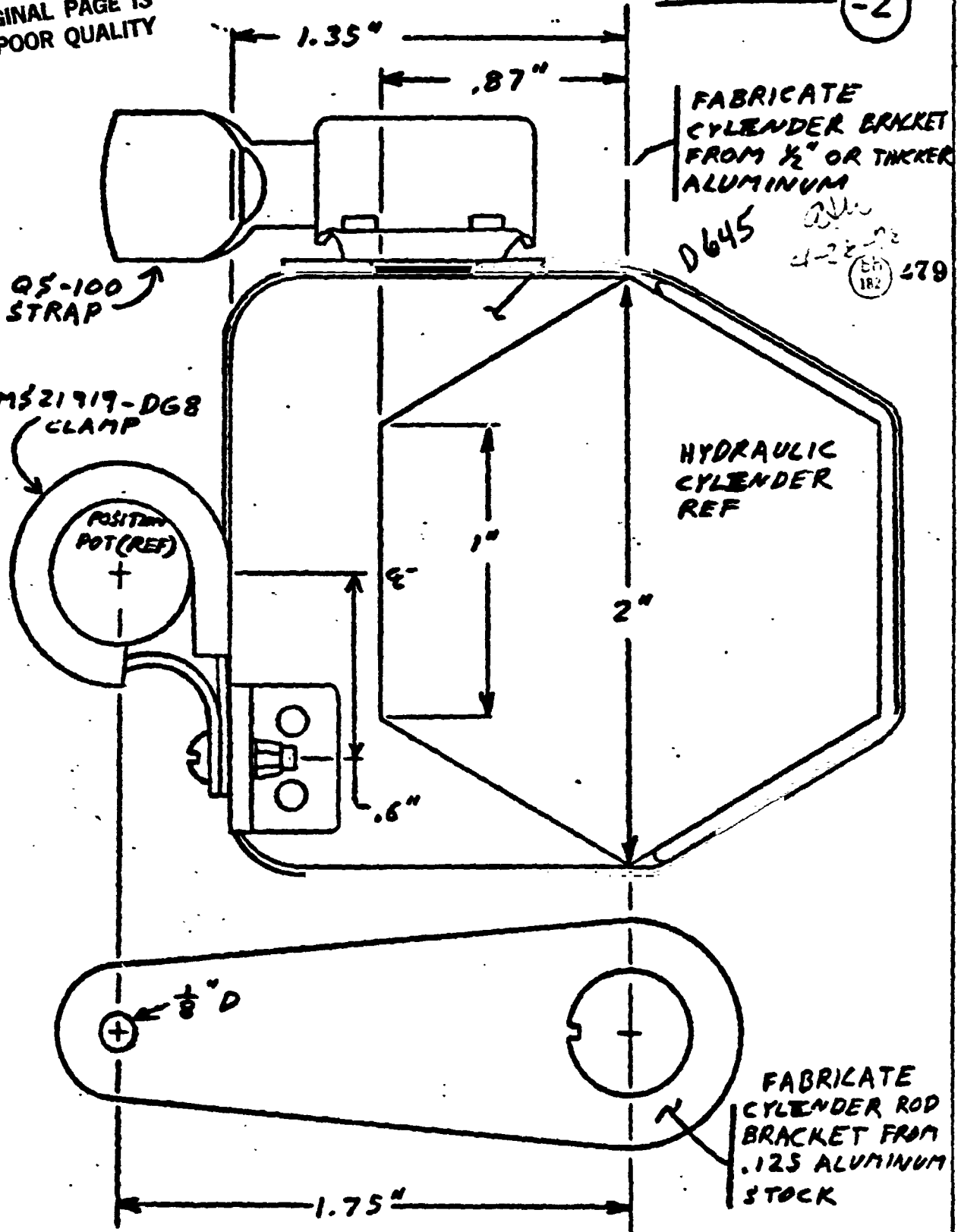
CHECKED _____

RPT. SHIP #1

HYDRAULIC CYLINDER POSITION BRACKETS

SKADS-1-76 (2)

ORIGINAL PAGE IS
OF POOR QUALITY



FABRICATE
CYLINDER BRACKET
FROM 1/2" OR THICKER
ALUMINUM

D645
4-22-76
182 479

QS-100
STRAP

MS21919-DG8
CLAMP

POSITION
POT (REF)

HYDRAULIC
CYLINDER
REF

FABRICATE
CYLINDER ROD
BRACKET FROM
.125 ALUMINUM
STOCK

7676 00076

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6/6/78

Lab. No. _____

Serial No. POT S/N 226

Part No. _____

Engineer Smith

ITEM CODE. D645

Project GROUND TIEDOWN TESTS

Title ST. MINE AIRFLOW POSITION

301-2

W. O. _____

L. T. R. EWA

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Smith</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "A" - 78-8-1</u>				
Bridge	<u>C/S 7</u>				
Config.		<u>NOTE: AIRPLANE MODE REQD. READ BOTH SIDES</u>			
Cal. Res.	<u>N/A</u>	<u>(SEE RMDU "B" 6-6-2)</u>			
Lever Arm					

Load	Output				
LAT. MICK PCS. (1/2)	PCS. AIRFLOW (1/2)	OUTPUT (1/2)			
0	32° 7'	-320			
10	31° 1'	-306			
20	28° 26'	-272			
30	26°	-234			
40	23° 10'	-192			
50	20° 4'	-146			
60	17°	-95			
70	13° 35'	-42			
80	9° 31'	+20			
90	4° 58'	89			
100	-6° 5'	246			
80	9° 55'	17			
60	17° 2'	-95			
40	23° 46'	-196			
20	29° 59'	-275			
0	32° 23'	-325			

BY D.P. Smith
CHECKER

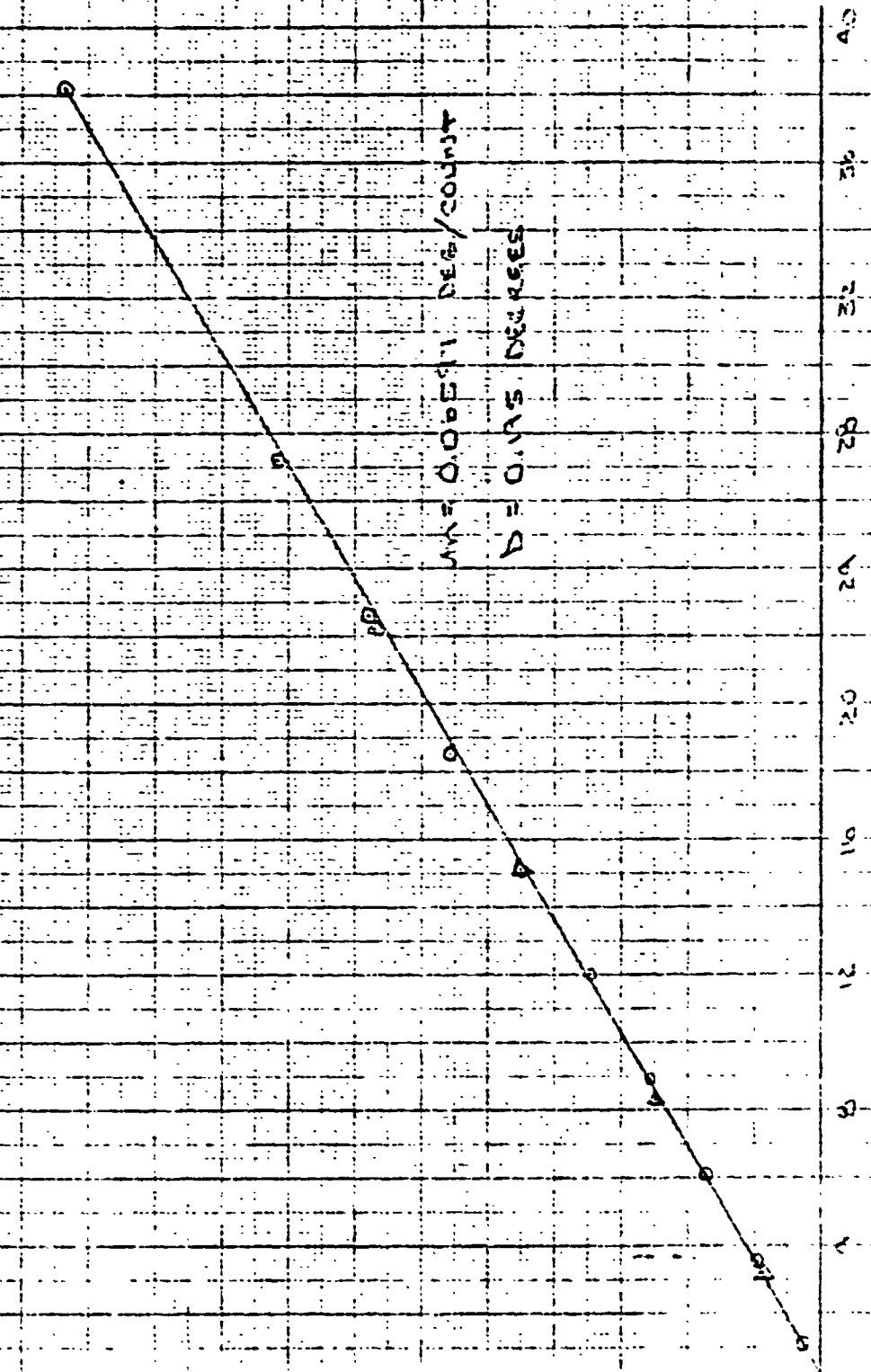
Sci Helicopter 1234567 MODEL 301 PAGE
BILL # 2 251

ITEM CODE: D GAS

ORIGINAL PAGE IS
OF POOR QUALITY

Right Wing Assembly Drawing

Output in CC/HR



Y = 0.0851 DEG/CC/HR
D = 0.175 DEGREES

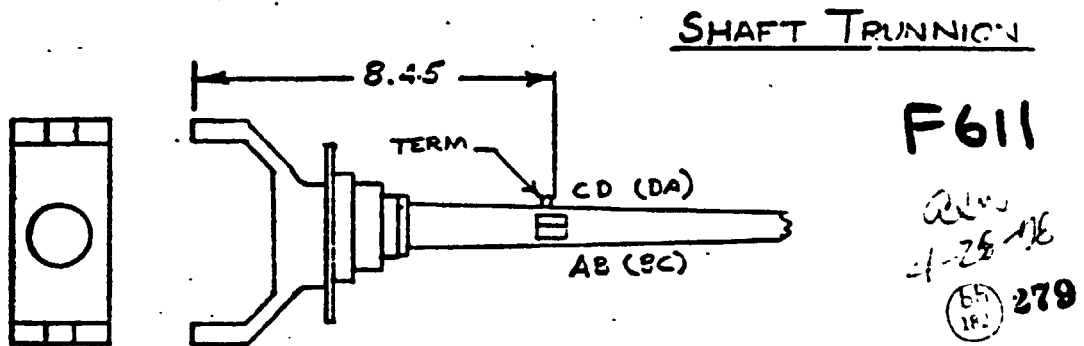
Inlets (Temperature) Degrees

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE FA-06-250MQ-350W	SHEET NO. 678964
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11067A
WORK ORDER A427	GAGE FACTOR 2.08 ± 0.5%	PART NO. BHV200-95-1
REQUESTED BY: A. WHITNER	LOT NO. Q-A35AD16	SERIAL NO. R/H

TITLE OF TEST
301 FLIGHT TEST

SKETCH:



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL BENDING BRIDGE AS SHOWN. USE
BR-600 CEMENT. MAKE BRIDGE AT FLAT
TERMINAL AS INDICATED. COVER WITH 9309.
ATTACH FOUR 6 FOOT SUPERFLEX WIRES TO
TERMINAL. ENCASE WIRES IN VINYL SLEEVING.

01

BRIDGE	SEAD						
ALANCE	4.83						
RES. TO GROUND	10KMS						
DATE ASSIGNED	TECHNICIAN <i>Hollis</i>			EST. HRS.		APPROVED BY:	
DATE COMPLETED 7-14-76	ENGINEER			ACT. HRS.			

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: ANDERSON

LAB NO. : 11067A01
CAL DATE: 10-20-70
SERIAL NO: 824
P/N: BMV200595-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

F611

PART NAME: SHAFT TRUNNION

CHANNEL: 03 - BENDING, BRIDGE 01

CALIBRATE EQUIVALENT: 100K = 12490 IN-LBS
UNIT CAL = 14186 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.080
BRIDGE VOLTS : 6.00
PRE CAL. : 5.26
POST CAL. : 5.28

JACK FAC. : NONE
LEVER ARM : 3.100 IN.

CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.072	171
0.00	0.00	0.000	-0.072	-171
1600.00	4960.00	2.170	-0.000	-0
3200.00	9920.00	4.240	-0.028	-66
4800.00	14880.00	6.320	-0.046	-105
6400.00	19840.00	8.440	-0.024	-56
8000.00	24799.99	10.590	0.029	68
1600.00	4960.00	2.280	0.110	260
3200.00	9920.00	4.320	0.052	123
4800.00	14880.00	6.360	-0.006	-14
6400.00	19840.00	8.440	-0.024	-56
8000.00	24799.99	10.570	0.009	20

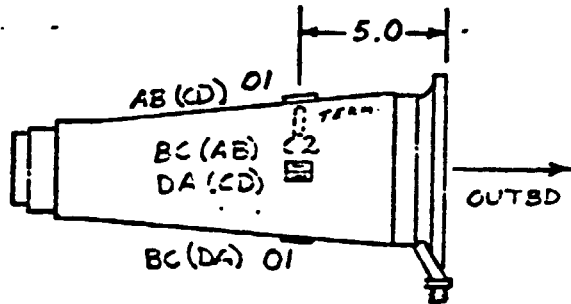
MAXIMUM CALIBRATION LOAD: 24800 IN-LBS

INSTRUMENTATION LABORATORY WORK SHEET

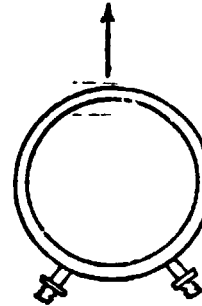
MODEL NO. 301	GAGE TYPE EA-06-250MQ-350W	SHEET NO. DLN 678984
NO. A427-11	RESISTANCE 350.0 ± 0.4%	LAD. NO. 11069A
WORK ORDER A427	GAGE FACTOR 2.08 ± 0.5%	PART NO. 300-040-325-2
REQUESTED BY: A. V. VITENCE	LOT NO. Q-A35AD16	SERIAL NO. A12-0000 ±
TITLE OF TEST 301 FLIGHT TEST		

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY



R/H SPINDLE ASSY
UP AIR MODE



B165
B166

279

VIEW LOOKING FORWARD

REMARKS:

INSTALL BENDING BRIDGES AS SHOWN. USE BR-600 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH
SHELL 9309. ATTACH FOUR WIRE SIX FOOT SUPPLEMENTARY
LEADS TO TERMINAL.

	01	02					
BRIDGE	BEND	EXTD					
LANCE	4.67	3.94					
TO GROUND	10KΩ	10KΩ					
DATE ASSIGNED	7-14-70		TECHNICIAN	EST. HRS.		APPROVED BY:	
DATE COMPLETED	7-16-70		ENGINEER	ACT. HRS.			

CALIBRATION SHEET
 LAB ENGINEER: WHITENER
 DATA ANALYST: MARY LOU WRIGHT
 LAB TECHNICIAN: SMALLWOOD

ORIGINAL PAGE IS
 OF POOR QUALITY

LAB NO. : 11069A01
 CAL DATE: 7-21-76
 SERIAL NO: A12-00004
 P/N: 30J-C40-320-2

PROJECT: 301 FLIGHT TEST

PART NAME: R/H SPINDLE ASSEMBLY
 CHANNEL: 03 - BENDING, BRIDGE 01 (CM)

B166

 CALIBRATE EQUIVALENT: 100K = 147653 IN-LBS
 UNIT CAL = 167937 IN-LBS/MV/V

BRIDGE RES. : 350.00
 GAGE FACTOR : 2.083
 BRIDGE VOLT. : 10.01
 PRE CAL. : 6.80
 POST CAL. : 3.80

JACK FAC. : 0.1180 PSI/LB
 LEVER ARM : 17.000 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
	0	0.000	-0.014	-227
0.00	3.50	0.000	0.014	227
270.00	38898.31	2.310	0.015	77
540.00	77796.63	4.630	0.026	94
810.00	116694.94	7.050	0.057	950
1080.00	155593.25	9.350	0.088	1471
1350.00	194491.56	11.740	0.159	2602
270.00	38898.31	2.290	-0.015	-258
540.00	77796.63	4.600	-0.024	-409
810.00	116694.94	6.910	-0.033	-559
1080.00	155593.25	9.160	-0.152	-1716
1350.00	194491.56	11.430	-0.151	-2538

MAXIMUM CALIBRATION LOAD: 194492 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 08-09-76

CALIBRATION SHEET
LAB ENGINEER: W. ITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: SMALLWOOD

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11069A02
CAL DATE: 7-21-76
SERIAL NO: A12-00004
P/N: 300-040-320-2

PROJECT: 301 FLIGHT TEST

PART NAME: R/H SPINDLE ASSEMBLY
CHANNEL: 04 - BENDING. BRIDGE 02(BM)

B165

CALIBRATE EQUIVALENT: 100K = 143648 IN-LBS
UNIT CAL = 163307 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.080
BRIDGE VULT.: 10.01
PRE CAL. : 8.81
POST CAL. : 8.80

JACK FAC. : 0.1180 PSI/LB
LEVER ARM : 17.000 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0.00	0	0.000	-0.018	-295
270.00	38898.31	2.333	0.018	295
540.00	77796.63	4.710	-0.036	-591
810.00	116694.94	7.100	-3.041	-661
1080.00	155593.25	9.440	-0.035	-568
1350.00	194491.56	11.730	-0.079	-1290
270.00	38898.31	2.360	-0.173	-2629
540.00	77796.63	4.770	-0.006	-101
810.00	116694.94	7.220	0.019	318
1080.00	155593.25	9.640	0.085	1390
1350.00	194491.56	12.030	0.121	1973
			0.127	2066

MAXIMUM CALIBRATION LOAD: 194492 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 08-09-76

ORIGINAL PAGE IS
OF POOR QUALITY

301 SHIP # 2 WING

RW
4-28-78
279

LAB. NO. 11234

12--76

Bdg No.				STA. OR P.L.	BALANCE	BAL WITH 50K REINFOR.	RESI - TC 6N:
<u>FUSELAGE SECTION</u>							
01	UPPER PANEL - OUTER SKIN			STRESS	0.0	4.00	101
02	UPPER PANEL - INNER SKIN			STRESS	0.0	4.19	
03	LOWER PANEL - OUTER SKIN			STRESS	0.0	4.25	
04	LOWER PANEL - INNER SKIN			STRESS	0.0	4.47	
<u>R/H WING</u>							
01'	LEADING EDGE		OUTB'D	SHEAR	142	4.37	
02'	LEADING EDGE		INB'D	SHEAR	142	4.48	
03'	TRAILING EDGE		OUTB'D	SHEAR	139	4.88	
04'	TRAILING EDGE		INB'D	SHEAR	139	4.19	
05	LEADING EDGE		OUTB'D	SHEAR	66	4.01	
06	LEADING EDGE		INB'D	SHEAR	66	5.25	
07	TRAILING EDGE		OUTB'D	SHEAR	66	5.11	
08	TRAILING EDGE		INB'D	SHEAR	66	3.90	
09	CHORD BENDING		INB'D	BEND	22	2.75	5.48
10	BEAM BENDING (INSIDE)			BEND	22	5.19	
11	CHORD BENDING		OUTB'D	BEND	22	2.43	6.11
12	BEAM BENDING (OUTSIDE)			BEND	22	5.27	
13	TORSION		OUTB'D	TORQUE	22	4.09	
14	TORSION		INB'D	TORQUE	22	5.10	
<u>L/H WING</u>							
15	CHORD BENDING			BEND	22	3.24	6.70
16	BEAM BENDING			BEND	22	7.10	
17	TORSION			TORQUE	22	6.59	101

GAGE TYPES

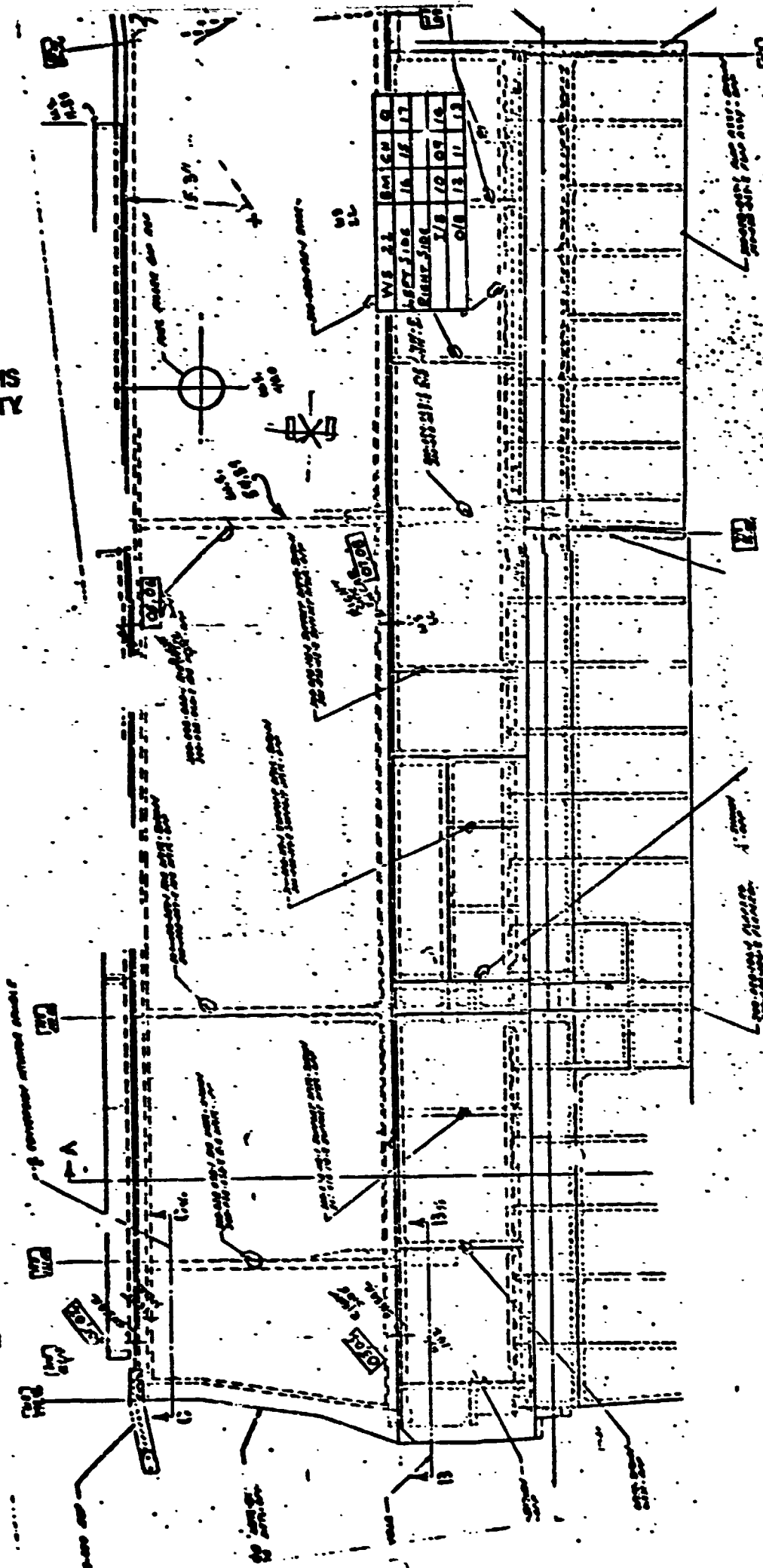
SHEAR & TORSION GAGES EA-13-062 VD-350W
 $850 \pm 0.4\%$
 $2.076 \pm 0.5\%$
 Q-A128F61

BEAM & CHORD GAGES EA-13-250 M9-350W
 $350 \pm 0.4\%$
 $2.14 \pm 0.5\%$
 Q-A1328F04

LAS No. 11234A

Part No. 300-028-001-1

ORIGINAL PAGE IS
OF POOR QUALITY



301 WING

ITEM CODE = S145/S146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$\begin{aligned} R &= 350 \text{ } \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.08 \\ R_{sk} &= 500 \text{K} \end{aligned}$$

$$\begin{aligned} 500 \text{KCE} &= \frac{(350)(29) 10^6}{(1)(2.08)(500350)} \\ &= 9752 \text{ psi stress} \end{aligned}$$

ITEM CODE = S147/S148 = Stress

$$\begin{aligned} R &= 350 \text{ } \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sk} &= 500 \text{K} \end{aligned}$$

$$\begin{aligned} 500 \text{KCE} &= \frac{(350)(29) 10^6}{(1)(2.13)(500350)} \\ &= 9524 \text{ psi stress} \end{aligned}$$

ITEM CODES = S609/S610/S628/S629 = stress

$$\begin{aligned} R &= 350 \text{ } \Omega \\ Y &= 10.7 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sk} &= 115 \text{K} \end{aligned}$$

$$\begin{aligned} 115 \text{KCE} &= \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)} \\ &= 15242 \text{ psi stress} \end{aligned}$$

ITEM CODES = S630/S631/S632/S633 = shear
~~S634/S635/S636/S637~~

$$\begin{aligned} R &= 350 \text{ } \Omega \\ G &= 4.0 \times 10^6 \\ N &= 2 \\ G.F. &= 2.075 \\ R_{sk} &= 115 \text{K} \end{aligned}$$

$$\begin{aligned} 115 \text{KCE} &= \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

ITEM CODE = 5145/5146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sh} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sh} = 500K$$

$$500KCE = \frac{(350)(29)10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODE = 5609/5610/5628/5629 = stress

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sh} = 115K$$

$$115KCE = \frac{(350)(10.7)10^6}{(1)(2.13)(115350)}$$

$$= 15242 \text{ psi stress}$$

ITEM CODE = 5630/5631/5632/5633 = shear
5634/5636/5637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sh} = 115K$$

$$115KCE = \frac{(350)(2)(4.0)10^6}{(2)(2.075)(115350)}$$

~~_____~~

ITEM CODE = 5145/5146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.08$$

$$R_{sh} = 500K$$

$$500K CE = \frac{(350)(29) 10^6}{(1)(2.08)(500350)}$$

$$= 9752 \text{ psi stress}$$

ITEM CODE = 5147/5148 = Stress

$$R = 350 \Omega$$

$$Y = 29 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sh} = 500K$$

$$500K CE = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$$

$$= 9524 \text{ psi stress}$$

ITEM CODE = 5609/5610/5628/5629 = stress

$$R = 350 \Omega$$

$$Y = 10.7 \times 10^6$$

$$N = 1$$

$$G.F. = 2.13$$

$$R_{sh} = 115K$$

$$115K CE = \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)}$$

$$= 15242 \text{ psi stress}$$

ITEM CODE = 5630/5631/5632/5633 = shear
5634/5635/5636/5637

$$R = 350 \Omega$$

$$G = 4.0 \times 10^6$$

$$N = 2$$

$$G.F. = 2.075$$

$$R_{sh} = 115K$$

$$115K CE = \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)}$$

$$= \text{shear}$$

ITEM CODE = 5145/5146 = Stress

ORIGINAL PAGE IS
OF POOR QUALITY

$$\begin{aligned} R &= 350 \text{ } \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.08 \\ R_{sk} &= 500K \end{aligned}$$

$$\begin{aligned} 500KCE &= \frac{(350)(29) 10^6}{(1)(2.08)(500350)} \\ &= 9752 \text{ psi stress} \end{aligned}$$

ITEM CODE = 5147/5148 = Stress

$$\begin{aligned} R &= 350 \text{ } \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ GF &= 2.13 \\ R_{sk} &= 500K \end{aligned}$$

$$\begin{aligned} 500KCE &= \frac{(350)(29) 10^6}{(1)(2.13)(500350)} \\ &= 9524 \text{ psi stress} \end{aligned}$$

ITEM CODE = 5609/5610/5628/5629 = Stress

$$\begin{aligned} R &= 350 \text{ } \Omega \\ Y &= 10.7 \times 10^6 \\ N &= 1 \\ GF &= 2.13 \\ R_{sk} &= 115K \end{aligned}$$

$$\begin{aligned} 115KCE &= \frac{(350)(10.7) 10^6}{(1)(2.13)(115350)} \\ &= 15242 \text{ psi stress} \end{aligned}$$

ITEM CODE = 5630/5631/5632/5633 = Shear
5634/5635/5636/

$$\begin{aligned} R &= 350 \text{ } \Omega \\ G &= 4.0 \times 10^6 \\ N &= 2 \\ G.F. &= 2.075 \\ R_{sk} &= 115K \end{aligned}$$

$$\begin{aligned} 115KCE &= \frac{(350)(2)(4.0) 10^6}{(2)(2.075)(115350)} \\ &= \del{15242 \text{ psi stress}} \end{aligned}$$

BY A. WHITENER
CHECKED _____

Bell Helicopter **TEXTRON**
Division of Textron Inc.
POST OFFICE BOX 482 - FORT WORTH, TEXAS 76101

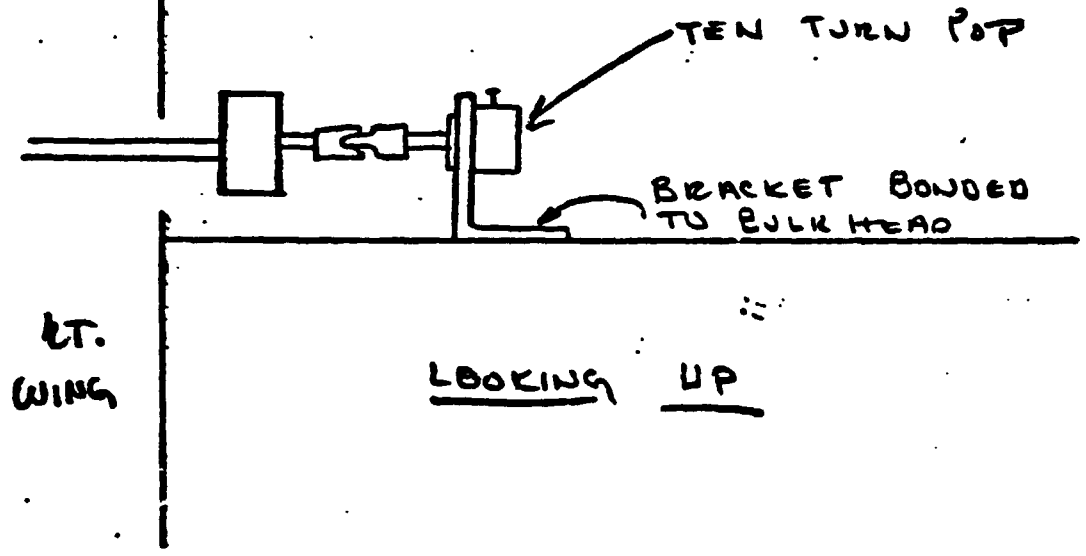
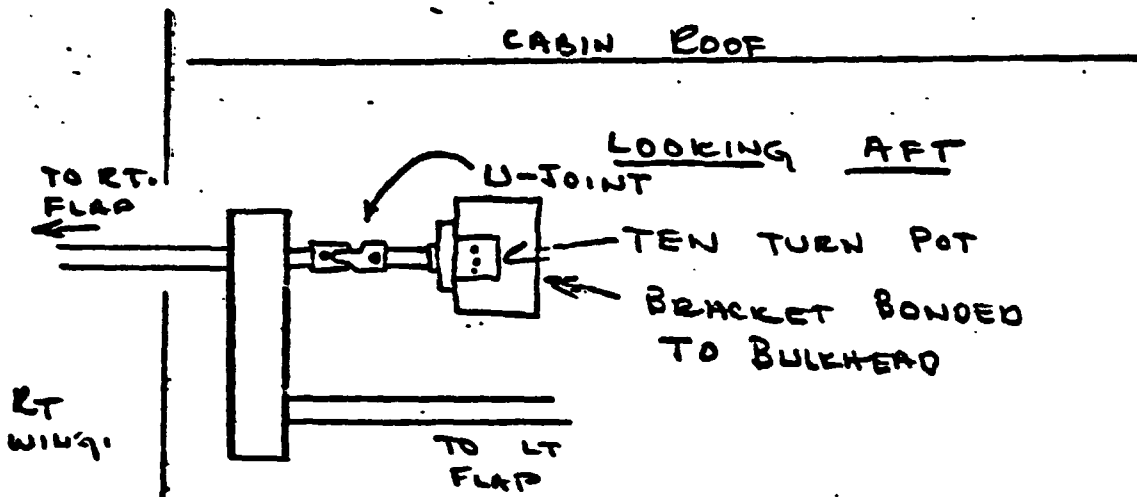
MODEL 301 PAGE 1
RPT ASW5977-2

ORIGINAL PAGE #1
OF POOR QUALITY

FLAP POS

3/11/78
4-28-78
bh
1R2
279

D617



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-14-78

Project GROUND TIEDOWN TESTS

Lab. No. _____

Serial No. PAT 51N 708

Title FLAG POSITION -

Part No. _____

W. O. _____

L. T. R. _____ EWA _____

Engineer Smith

Item Code: D617

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>SMITH</u>					
<u>NEINMEIER</u>					

Vols					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>R.M.D.U. - 70-2-2</u>				
Bridge	<u>C/S II</u>				
Config.					
Cal. Res.	<u>NA</u>				
Lever Arm					

REFERENCE RMDU-A-91-8-2 AND
CERTAIN BODIES CALIBRATION
SHOULD BE CAREFULLY

NOTE: NO MUST BE LEVELLED PRIOR TO CALIBRATION

Load	Output		Output (Kilograms)	
	RIGHT FLAP (-) (DEC.)	LEFT FLAP (+) (DEC.)		
<u>UP</u>	<u>17°</u>	<u>17°</u>	<u>-362</u>	
<u>20</u>	<u>35°21'</u>	<u>35°39'</u>	<u>-158</u>	
<u>40</u>	<u>59°20'</u>	<u>59°21'</u>	<u>40</u>	
<u>75</u>	<u>93°31'</u>	<u>93°39'</u>	<u>365</u>	
<u>40</u>	<u>55°16'</u>	<u>55°19'</u>	<u>30</u>	
<u>20</u>	<u>37°</u>	<u>37°</u>	<u>-173</u>	
<u>UP</u>	<u>17°</u>	<u>17°</u>	<u>-360</u>	

SHIP'S ATTITUDE = 0°9' NOSE UP

$GPA_0 (E2-6-7) = 7$

$LRC (E1-5-6) = 140$

BY: D.P. Smith
CHECKED:

S-6B Helicopter TEST/ROM

MODEL: 301

PAGE: 1

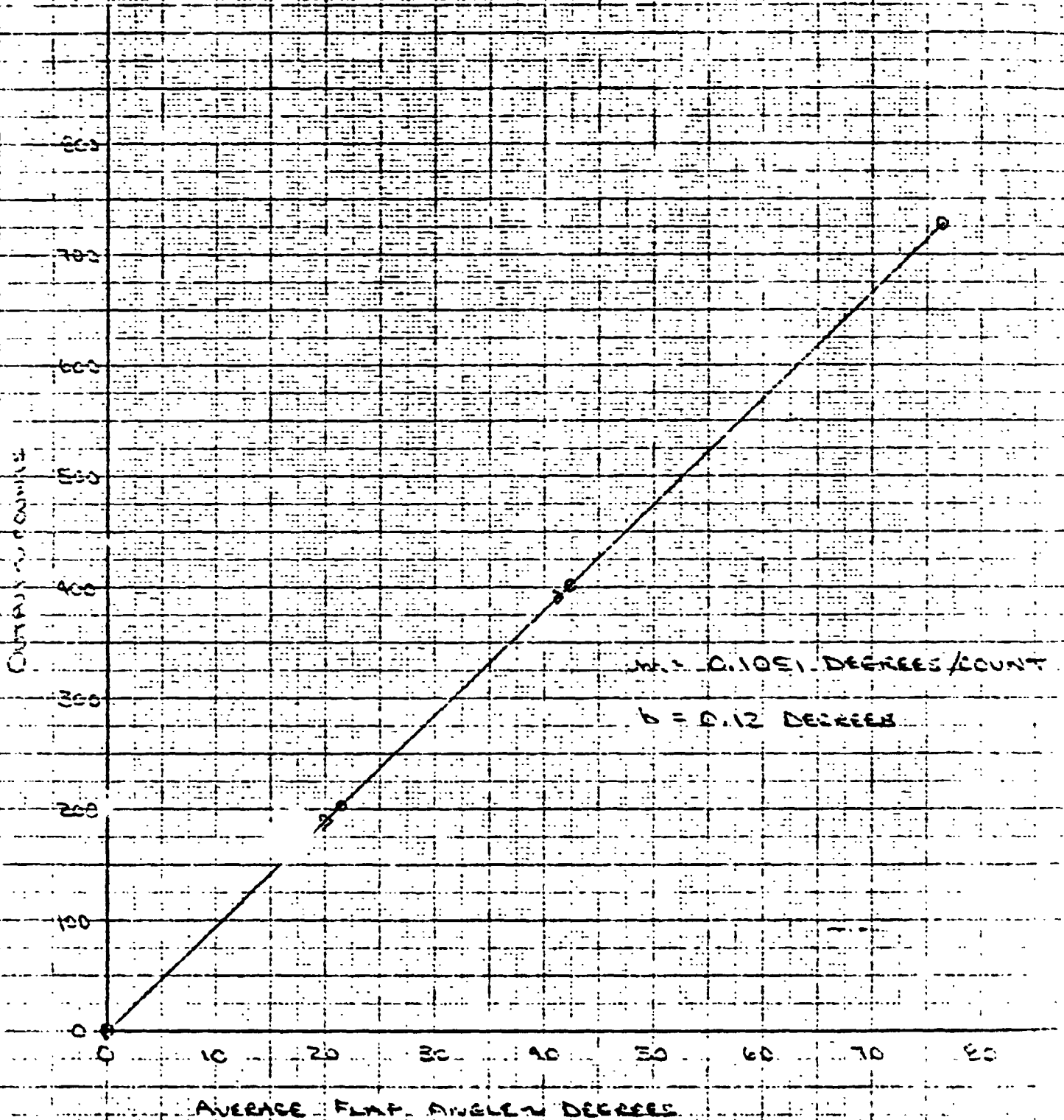
SERIAL: 4111

2

DATE: 1971

ITEM CODE: 0617

FLAP POSITION



ORIGINAL PAGE IS
OF POOR QUALITY

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED [Signature]

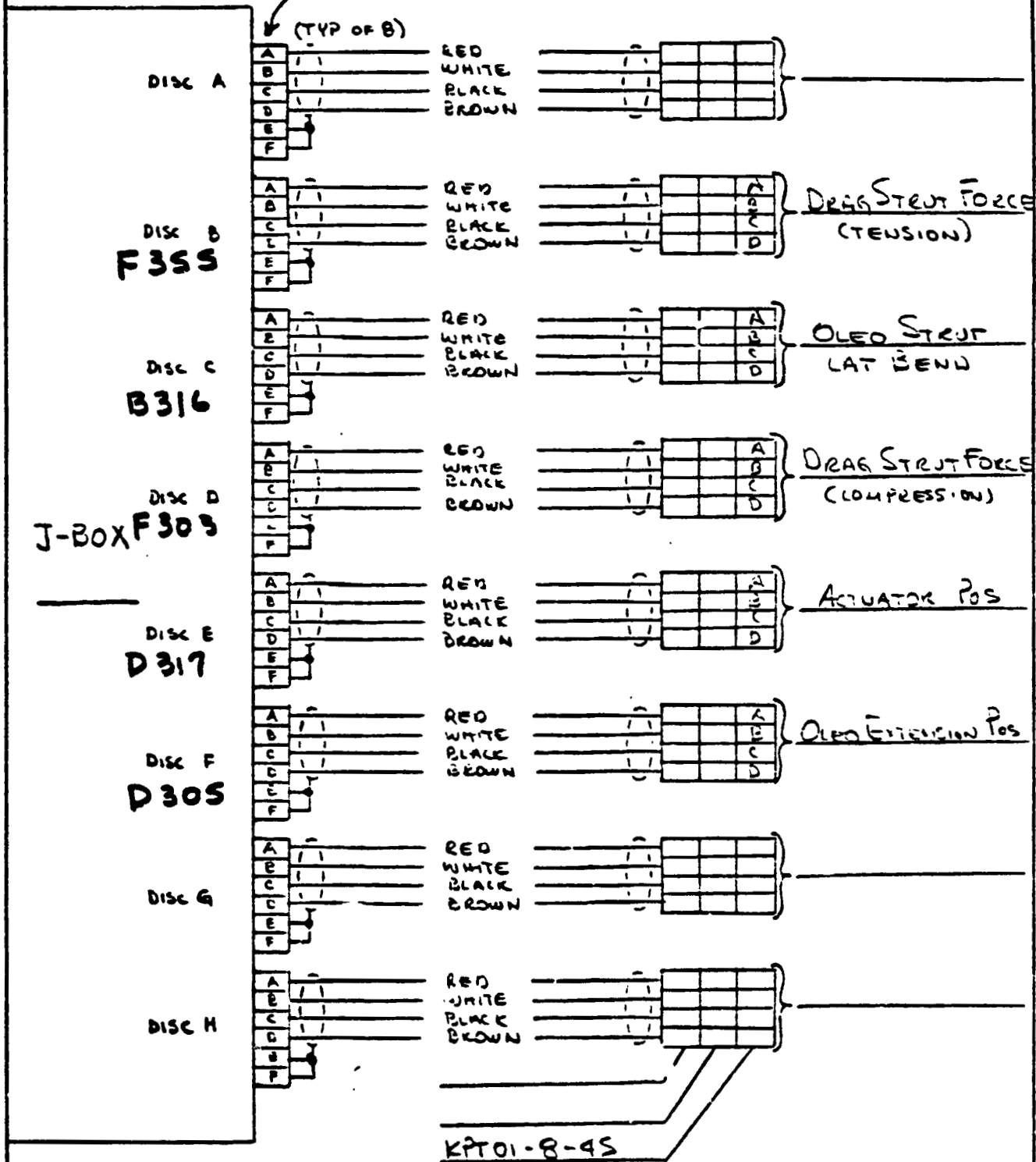
HELI. 1+2 RPT SKASW0475-1

ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box Location RUG-1

KPTO-10-6P



INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA 06-125 TR -250	ID. NO. 693911
ITEM NO. 1435-34	RESISTANCE 350.0 ± 0.4%	LAB NO. 11346A
WORK ORDER A435	GAGE FACTOR 2.12 ± 0.2%	PART NO.
REQUESTED BY A. WITTENBERG	LOT NO. Q-2188F13	SERIAL NO.

TITLE OF TEST: **301 FLIGHT TEST**

SKETCH:

ROD END-HYD. ACTUATOR

RIGHT MAIN GEAR

F355

F303

ORIGINAL PAGE IS OF POOR QUALITY

REMARKS:

MB. 420

INSTALL AXIAL BRIDGES AS SHOWN. USE EASTMAN EM-210 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH SHELL 9309. ATTACH FOUR WIRE TEN INCH SUPRENTANT LEADS. ENCASE LEADS IN VINYL SLEEVEING - AND TERMINATE WITH KPT-06-B-4P PLUG.

	04 PRIMARY	05 SECONDARY			
BRIDGE					
TOLERANCE	-0.35	±0.72			
RES TO GROUND	10K M	10K M			
DATE ASSIGNED	TECHNICIAN CCW		EST. HRS	APPROVED BY	
DATE COMPLETED 1-12-78	ENGINEER		ACT. HRS		

CALIBRATION SHEET
 LAB ENGINEER: MATHEW
 DATA ANALYST: WARD LDU WRIGHT
 LAB TECHNICIAN: ANDERSON

LAB NO. : 11346107
 CAL DATE: 7-10-72
 SERIAL NO: NONE
 P/N: NONE

ORIGINAL PAGE IS
 OF POOR QUALITY

PROJECT: J08 FLIGHT TEST

PART NAME: R08 END
 CHANNEL: 03 - RES AXIAL LOADING

F303

CALIBRATE EQUIVALENT: 100% = 9151 POUNDS
 UNIT CAL = 1040 POUNDS/MV/V

BRIDGE RES. : 350.00
 GAGE FACTOR : 2.120
 BRIDGE VOLTS : 5.00
 PRE CAL. : 5.25
 POST CAL. : 5.20

JACK F.C. : NONE
 LEVER ARM : NONE
 CAL RES. : 100

LOADS-POUNDS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	-0.107	-211
2400.00	2400.00	0.000	0.197	345
7900.00	7900.00	1.850	0.104	306
7300.00	7300.00	2.070	-1.447	-2112
9500.00	9500.00	4.000	0.246	655
12500.00	12500.00	5.510	0.333	614
		7.000	0.462	863

MAXIMUM CALIBRATION LOAD: 12500 POUNDS

ENC PROGRAM FCCR33 - RUN DATE: 02-02-70

CALIBRATION SHEET
LAB NO. : 11306A01
CAL DATE: 1-18-78
SERIAL TO: NONE
P/N: NONE

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11306A01
CAL DATE: 1-18-78
SERIAL TO: NONE
P/N: NONE

2/- 11306

PROJECT: 301 FLIGHT TEST

PART NAME: RUD, LND
CHANNEL: 04 - POS AXIAL LOADING

F 355

CALIBRATE EQUIVALENT: 1000 = 10173 POUNDS
UNIT CAL = 14904 POUNDS/MV/V

EDGE MOD. : 500.00
GAGE FACTOR : 0.1120
D. TONE VOLT. : 0.000
P/N CAL. : 0.428
RNT CAL. : 0.428

JACK FAC. : 0.0014 PSI/LB
LEVER ARM : NONE
CAL RES. : 100

LOADS-STD-PI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MILLIVOLTS	WEIGHT LINE POUNDS
0	0	0.000	0.417	1188
0.00	0.00	0.000	-0.467	-1101
0.02	2487.01	1.590	0.100	100
0.03	4974.02	2.180	0.594	800
10.40	7461.03	3.770	0.500	700
17.00	9948.04	4.360	0.500	100
20.45	12435.05	5.000	-0.400	-1000

OUTPUT CALIBRATION LOAD: 14905 POUNDS

END PROGRAM PCORE - RUN DATE: 02-11-78

BY A. WHITENER

CHECKED _____

Bell Helicopter **TESTRON**
Division of Testron Inc.

POST OFFICE BOX 488 • FORT WORTH, TEXAS 76101

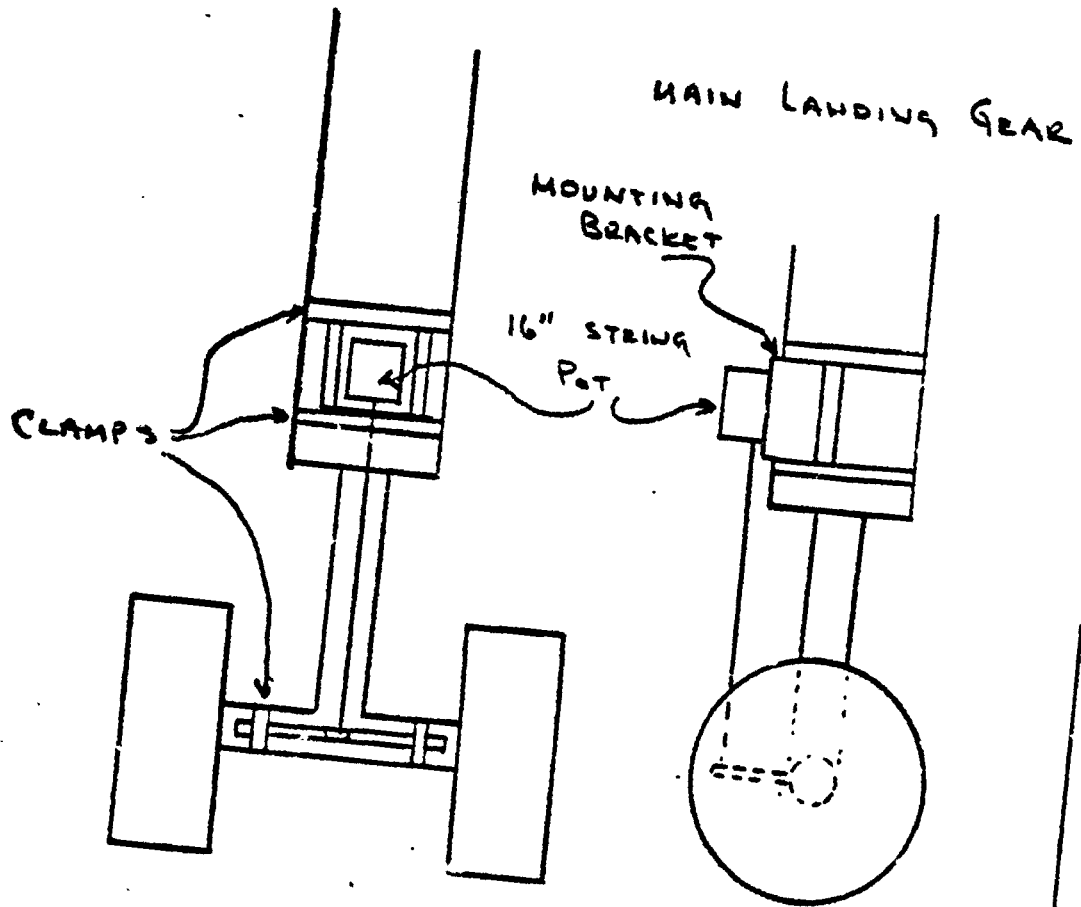
MODEL 301 PAGE 1

RPT ASWS377-1

MAIN LANDING GEAR OLEO EXTENTION POS

ORIGINAL PAGE IS
OF POOR QUALITY

D305



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/2/76

Lab. No. _____

Project GROUND TIE DOWN TESTS

Serial No. _____

W. O. 321 #2

Title REPAIR WORK LOG. EXPOSED TO TEST WORK. PARTIAL

Part No. _____

L. T. R. _____ EWA _____

Engineer J. J. J.

Item Code: D305

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

Volts	<u>57976</u>				
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>71121 A - 106-2-2</u>				
Bridge	<u>51211</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

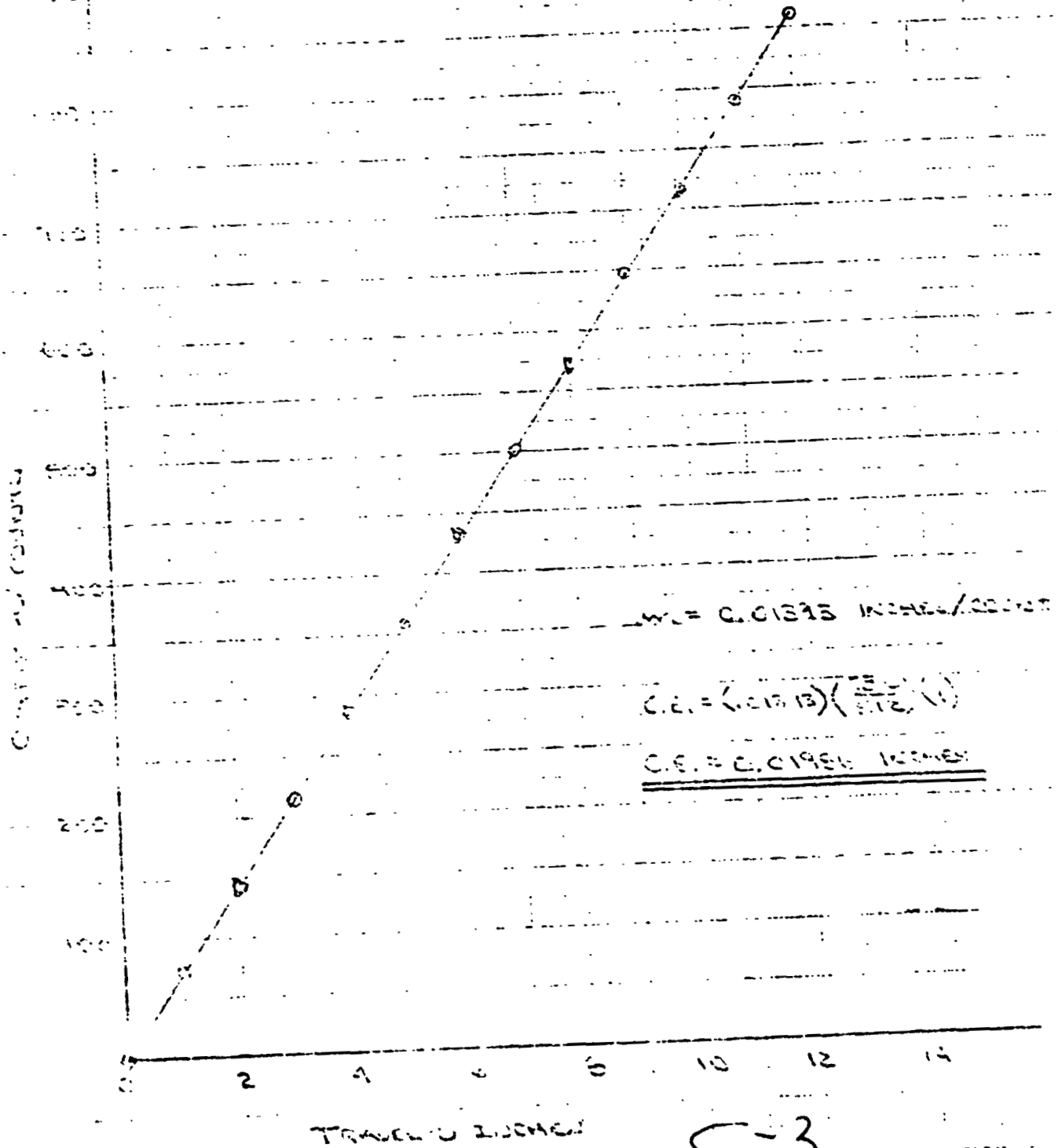
Load	Output	
<u>DELETED</u>	<u>DELETED</u>	
<u>0</u>	<u>-012</u>	
<u>1</u>	<u>-540</u>	
<u>2</u>	<u>-140</u>	<u>C.E. = (10) (1000) (57976)</u>
<u>3</u>	<u>-247</u>	
<u>4</u>	<u>-326</u>	
<u>5</u>	<u>-384</u>	
<u>6</u>	<u>-420</u>	
<u>7</u>	<u>-441</u>	
<u>8</u>	<u>-439</u>	
<u>9</u>	<u>+032</u>	
<u>10</u>	<u>106</u>	
<u>11</u>	<u>176</u>	
<u>12</u>	<u>249</u>	
<u>0</u>	<u>107</u>	
<u>5</u>	<u>-225</u>	
<u>6</u>	<u>-170</u>	
<u>7</u>	<u>-234</u>	
<u>8</u>	<u>-148</u>	
<u>0</u>	<u>-012</u>	
<u>Σ(F) = 6662</u>		
<u>Σ(F) = 732</u>		

Form Code: D305

TACTIC MISSILE LAUNCHER GEAR
USED EXTENSION POSITION

CH 2 A-10-2-2

ORIGINAL PAGE IS
OF POOR QUALITY



INSTRUMENTATION LABORATORY WORK SHEET

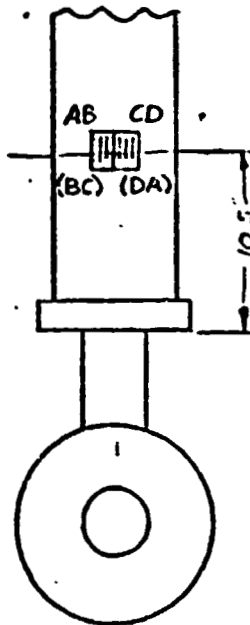
MODEL NO. 301	GAGE TYPE EA-06-250MQ-350	688512
EWA NO. A427-11B	RESISTANCE 350 ± 0.1 %	LAD. NO. 11347A
ORDER A427	GAGE FACTOR 2.13 ± 0.5 %	PART NO. 10565-200
REQUESTED BY: A. WHITENER	LOT NO. A21AD142	SERIAL NO.

TITLE OF TEST
301 FLIGHT TEST

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

RIGHT MAIN GEAR



B.316

SIDE VIEW

REMARKS:

INSTALL BENDING BRIDGE AS SHOWN. USE EASTMAN 910 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH
SHELL 9309. ATTACH FOUR TEN INCH SUPRENT LEADS. ENCASE
LEADS IN VINYL SLEEVING AND TERMINATE WITH
KPT-06-8-4P PLUG.

06

BRIDGE	BENDING						
PLANCE	558						
RES. TO GROUND							
DATE ASSIGNED	TECHNICIAN CCW -				EST. HRS.	APPROVED BY:	
DATE COMPLETED 11-18-76	ENGINEER				ACT. HRS.		

CALIBRATION DATA SHEET

Date 3-7-78

Model 301

Project MAIN LANDING GEAR CPL

Title M.L.G. Cal Slip 301st 2

L. T. R. EWA

Lab. No. 11345A / 11347A

Serial No. MM-05 MM-000

Part No. 10650-1 10650-2

Engineer Whitcomb

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Smithhart</u>		<u>D.V.M</u> <u>"B" Cylinder</u>			

B316 B319

Volts	<u>6.06</u>		<u>6.06</u>		
Gage Type					
Gage Fec.					
Gage Res.					
Lot. No.					
Act. Arm	<u>KH 57F17</u>		<u>4H STRUT</u>		
Chan.	<u>11347A</u>		<u>11345A</u>		
Bridge	<u>06</u>		<u>03</u>		
Config.					
Col. Res.	<u>100K</u>		<u>100K</u>		
Lever Arm	<u>27.375"</u>		<u>27.375"</u>		

ORIGINAL PAGE IS
OF POOR QUALITY

Load	HW Output Volts	0	HW Volts	0			
0	<u>-2.276</u>	<u>0</u>	<u>-2.286</u>	<u>0</u>			
1 K	<u>-.941</u>	<u>1.337</u>	<u>-.949</u>	<u>1.337</u>			
0	<u>-2.276</u>	<u>0</u>	<u>-2.286</u>	<u>0</u>			
300 PSI	<u>-1.365</u>	<u>.911</u>	<u>-1.414</u>	<u>.872</u>			
600	<u>-.382</u>	<u>1.894</u>	<u>-.478</u>	<u>1.808</u>		<u>OK</u>	<u>ROB 3-15-78</u>
700	<u>+1.582</u>	<u>2.858</u>	<u>+1.440</u>	<u>2.726</u>			
1200	<u>+1.530</u>	<u>3.806</u>	<u>+1.342</u>	<u>3.628</u>			
1500 PSI	<u>+2.480</u>	<u>4.756</u>	<u>+2.250</u>	<u>4.536</u>			
900	<u>+1.607</u>	<u>2.883</u>	<u>+1.456</u>	<u>2.742</u>	<u>RMG</u>		<u>LMG</u>
500 PSI	<u>-1.380</u>	<u>.896</u>	<u>-1.429</u>	<u>.872</u>	<u>---</u>	<u>GAGE</u>	<u>---</u>
0	<u>-2.279</u>	<u>.003</u>	<u>-2.288</u>	<u>-.002</u>			

27.375" 27.375"



Load is zero applied through center of eye
with "B" cylinder

BY _____
CHECKED _____

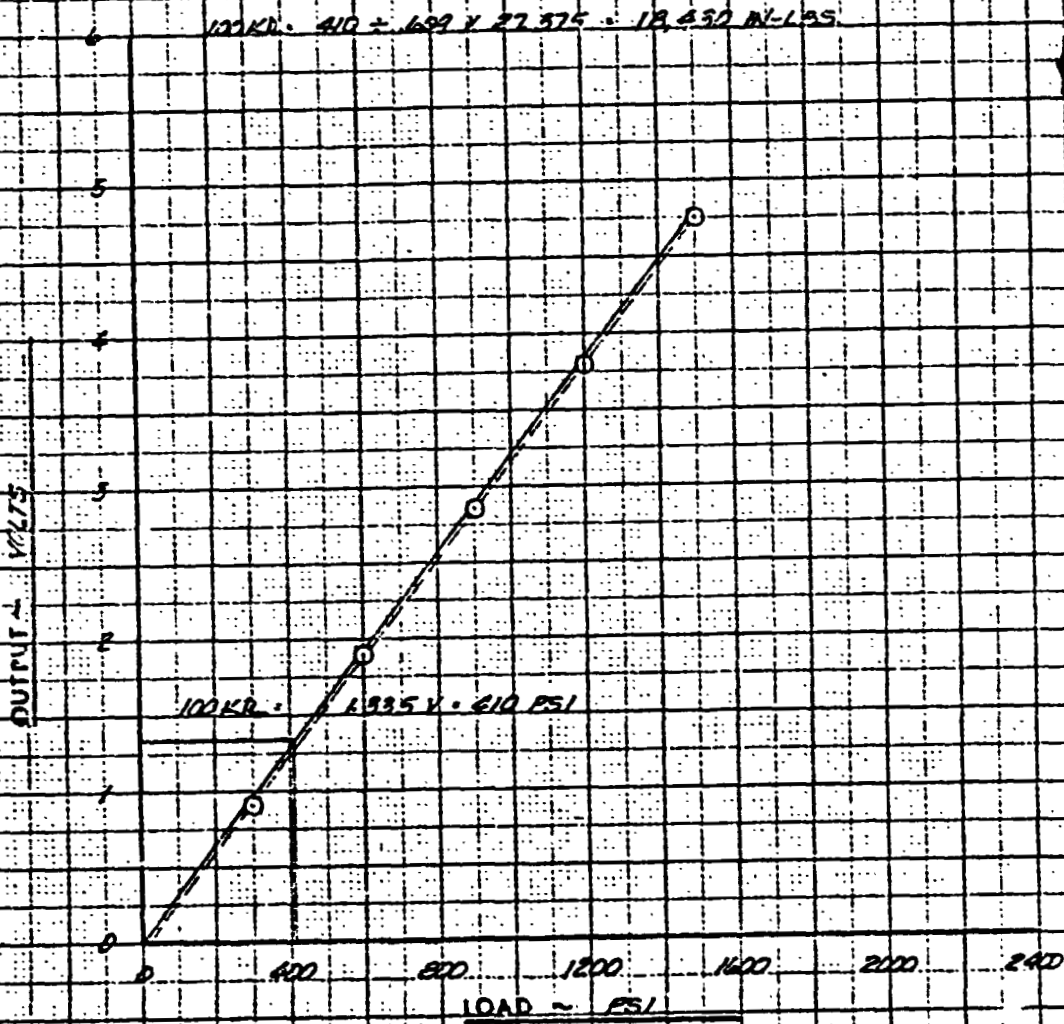
BELL HELICOPTER COMPANY
1001 BIRNEY DR. APT. 1001 BOSTON 1 MASS.

MODEL _____
REV. _____

PAGE _____
RPT _____

ORIGINAL PAGE IS
OF POOR QUALITY

LAB. NO. 11347A.06
LAB. CALIBRATION: 3-7-78
PART NO. 10650-2
SER. NO. MPG-004
JACK FACTOR 0.609 PSI - 1.0 LB.
LEVER ARM 27.375 INCHES
LOCK OFF 10,430 IN-LBS.



B316

FIG. _____ CALIBRATION OF RIGHT HAND STRUT
FOR BENDING

BY A. WHITEHER

Bell Helicopter **TEXTRON**
Division of Textron Inc

MODEL 321 PAGE 1

CHECKED _____

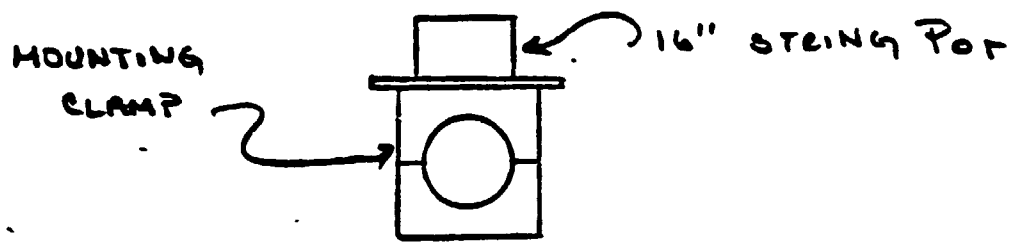
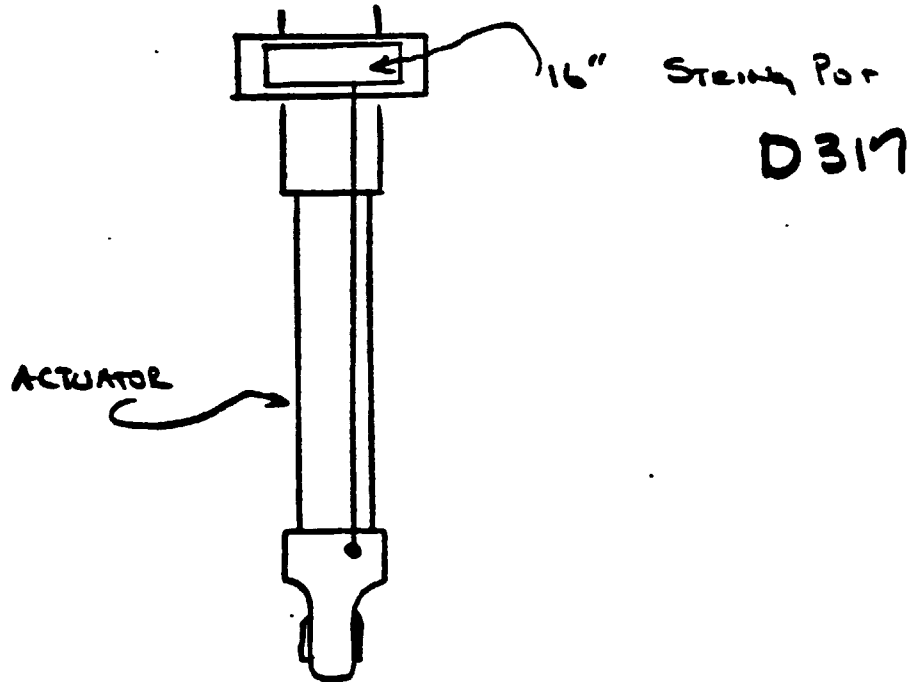
POST OFFICE BOX 400 • FORT WORTH, TEXAS 76101

RPT ASW5377-2

Nose + MAIN LANDING GEAR

ACT POS

ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5-5-78

Lab. No. _____

Project U.S. THERMAL TEST

Serial No. _____

Title RT. LOAD CELL CALIBRATION

Part No. _____

A.O. _____

L.T.R. _____ EWA _____

Engineer Smith

Item Code: D 317

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

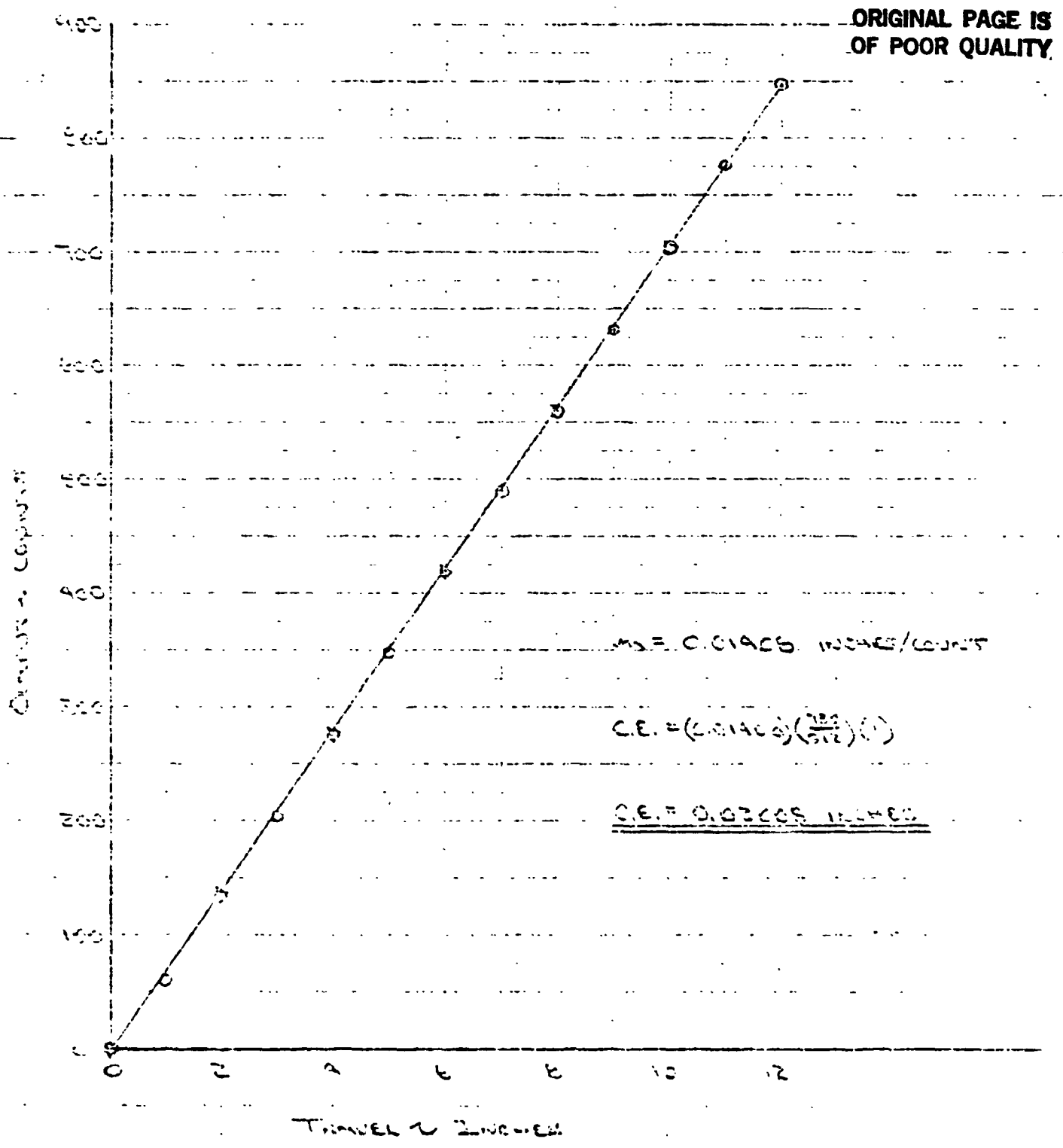
Volts	
Gage Type	
Gage Fac.	
Gage Res.	
Lot No.	
Act. Am.	
Chan.	<u>Channel A - 60-2-1</u>
Bridge	<u> </u>
Config.	
Cal. Res.	
Lever Arm	

Load	Output
0	-605
1	-543
2	-470
3	-401
4	-327
5	-257
6	-180
7	-115
8	-43
9	+27
10	+100
11	+172
12	+243
13	+302
14	+370
15	+430
16	+490
17	+550
18	+605
19	+665
20	+725
21	+785
22	+845
23	+905
24	+965
25	+1025
26	+1085
27	+1145
28	+1205
29	+1265
30	+1325
31	+1385
32	+1445
33	+1505
34	+1565
35	+1625
36	+1685
37	+1745
38	+1805
39	+1865
40	+1925
41	+1985
42	+2045
43	+2105
44	+2165
45	+2225
46	+2285
47	+2345
48	+2405
49	+2465
50	+2525
51	+2585
52	+2645
53	+2705
54	+2765
55	+2825
56	+2885
57	+2945
58	+3005
59	+3065
60	+3125
61	+3185
62	+3245
63	+3305
64	+3365
65	+3425
66	+3485
67	+3545
68	+3605
69	+3665
70	+3725
71	+3785
72	+3845
73	+3905
74	+3965
75	+4025
76	+4085
77	+4145
78	+4205
79	+4265
80	+4325
81	+4385
82	+4445
83	+4505
84	+4565
85	+4625
86	+4685
87	+4745
88	+4805
89	+4865
90	+4925
91	+4985
92	+5045
93	+5105
94	+5165
95	+5225
96	+5285
97	+5345
98	+5405
99	+5465
100	+5525

Trans. No. D 317

Percent of Landing Gear
Accuracy Required

CH: 100-12-1



BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED RLW

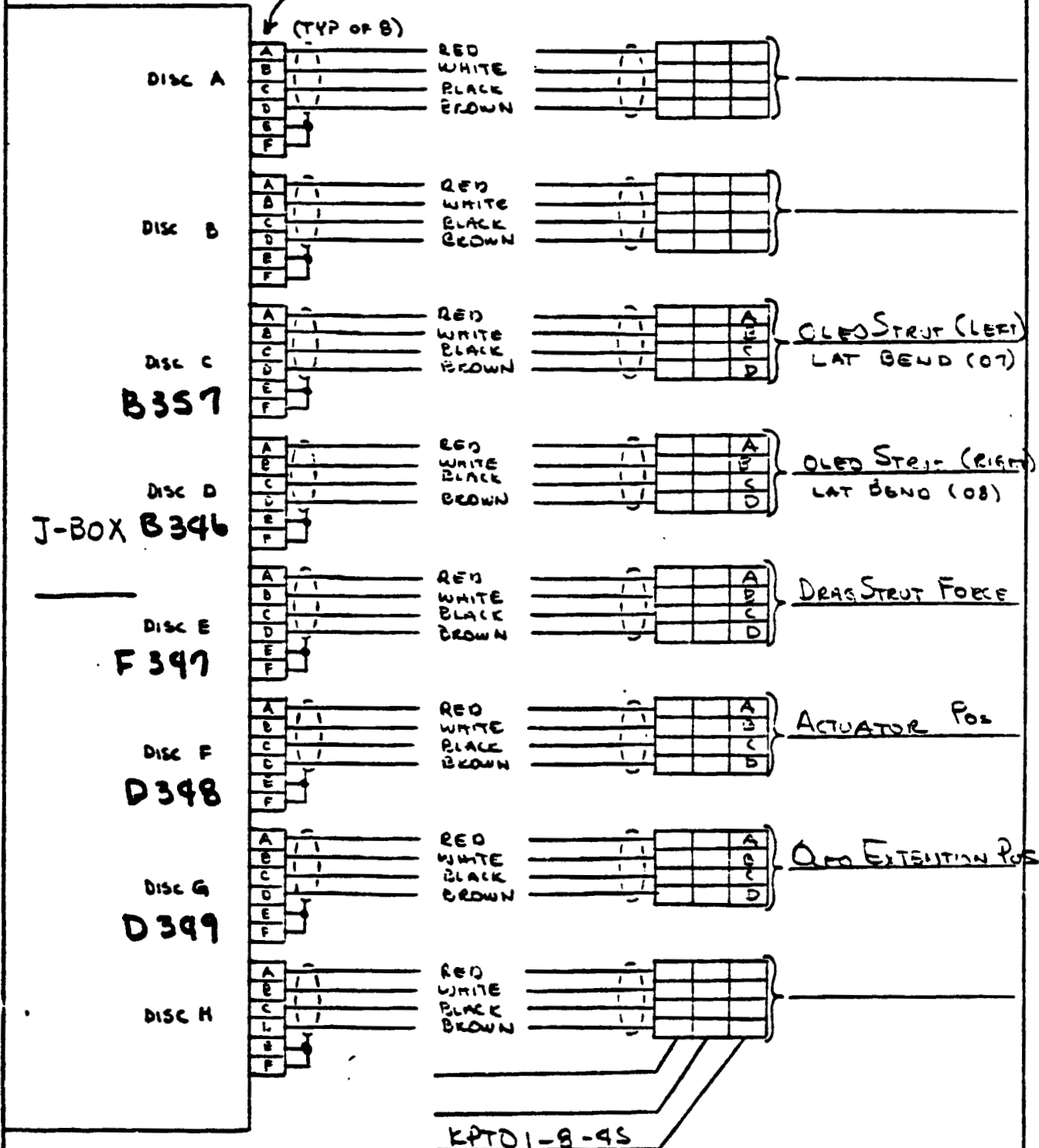
HELI. 1+2 RPT SKASW0475-1

ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box LOCATION N-1

KPT06-10-67



9842 0000 1 100

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 2 of 2

CHECKED AW

HELI. 142 RPT SKASW06375-1

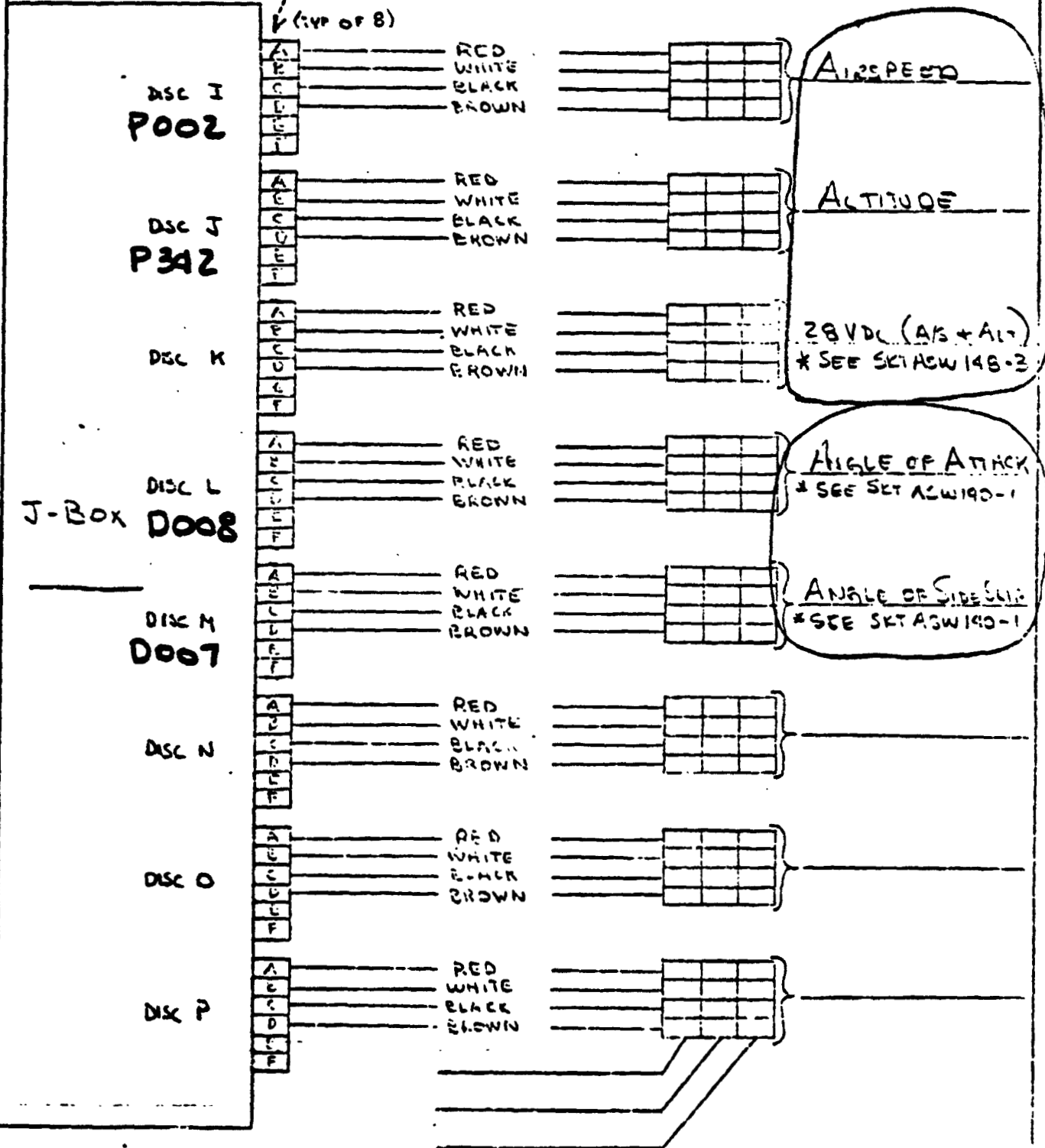
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box LOCATION N-1

KPT06-10-6P

(typ of 8)



BY A. WHITEHEAD

HELL HELICOPTER COMPANY

MODEL 301 PAGE 1

CHECKED AW

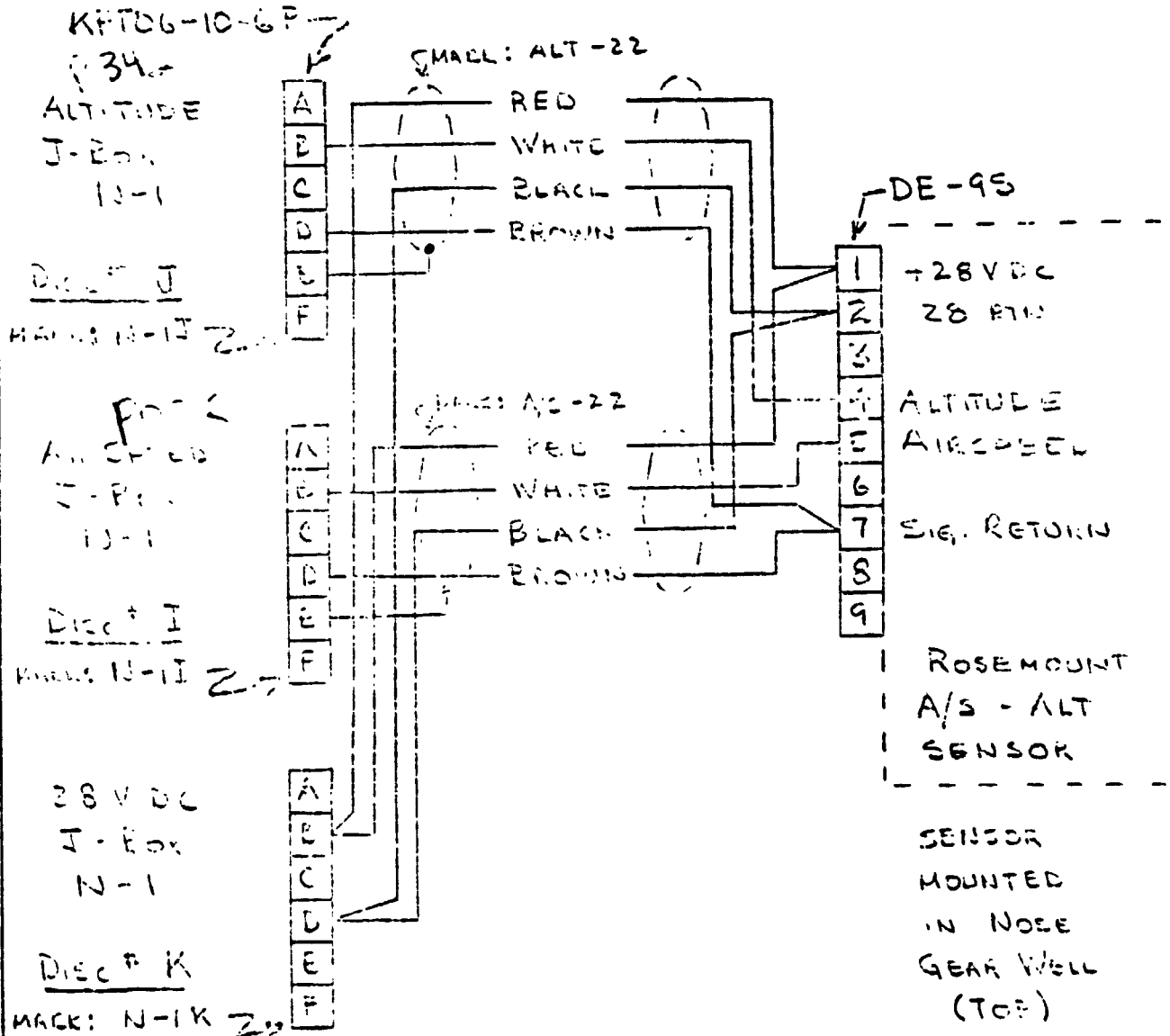
HELI. 142 RPT KTASW 143-3

AIR SPEED - ALTITUDE WIRING

279

N-1 J-Box

ORIGINAL PAGE IS OF POOR QUALITY



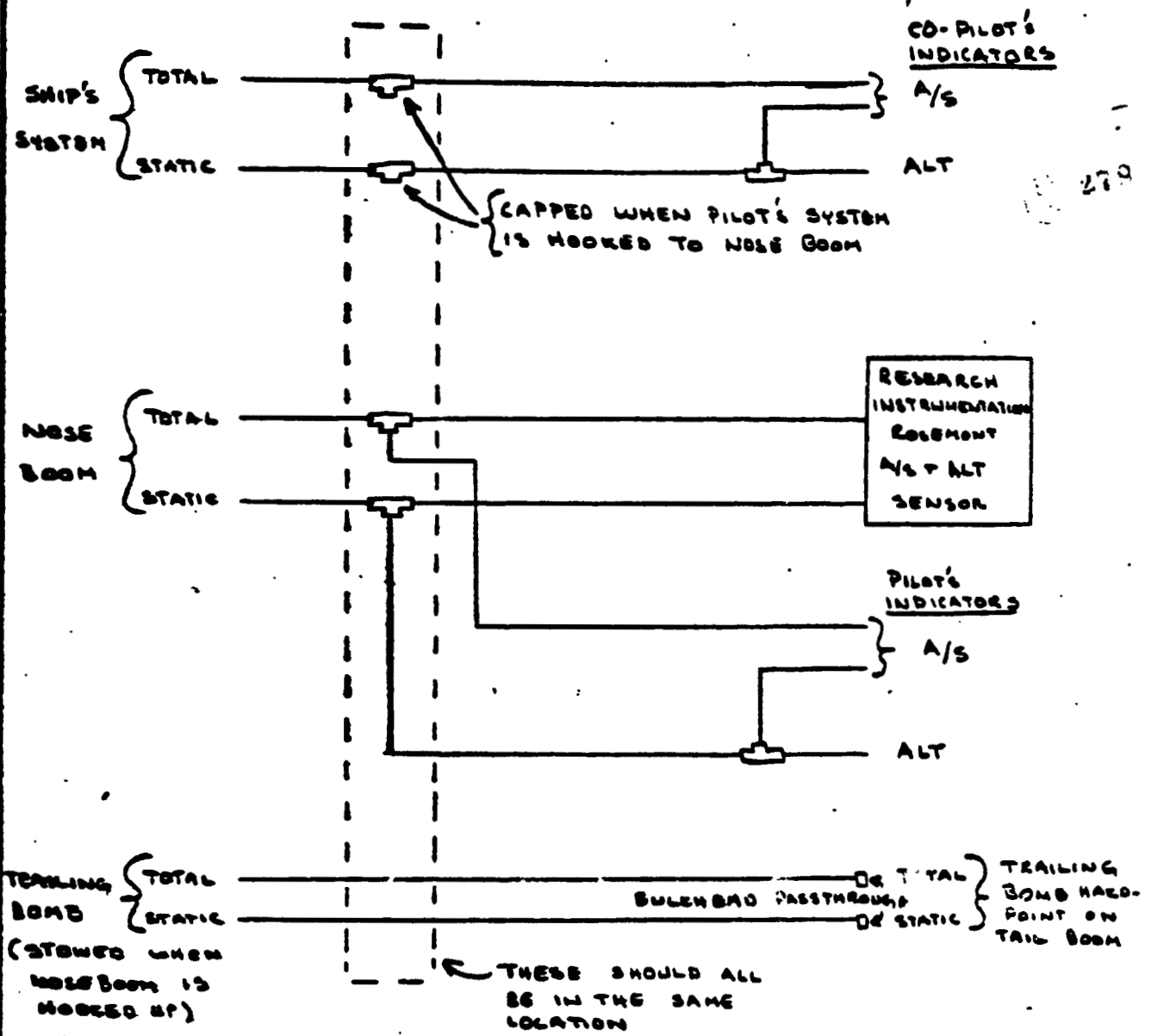
NOTE: SEE OUTACWIRING REF N-1 J-BOX

3101 580000 V 103

P002
P 342

ORIGINAL PAGE IS
OF POOR QUALITY

SHIP'S A/S + ALT. CONNECTIONS



1. NOSE BOOM AND TRAILING BOMB INPUTS WILL BE EXCHANGED (OR CAN BE EXCHANGED) AT VARIOUS TIME DURING TESTS.
2. ALL TUBES WILL BE RED (TOTAL) + YELLOW (STATIC) 1/4" POLYFLOW TUBING
3. PILOT'S SYSTEM CAN BE CONNECTED TO EITHER NOSE BOOM, TRAILING BOMB OR SHIP'S SYSTEM

FORM 8000000 100

ENGINEERING LABORATORIES
Calibration Data Sheet

Description <u>TRANSFORMER NO SPEED</u>		Date Calibrated:
Model Type <u>542 K 2</u>		<u>5-23-78</u>
Range <u>75 TO 350 KILOGS</u>		Calibration Period:
Mfg. <u>ROEFMATH INC.</u>		<u>LMO</u>
Serial No. <u>29</u>		LCP No. <u>05-012-01</u>
Lab No.	Calibrated by: <u>J. G. SLOSKI</u>	

Remarks: Q.M. BASED ON MENSOR CAL. REPORT 11-28-77

D602
N-11

O. I. C.	STD.	DET. POT.	DET. POT.	
	KILOGS	VOLTS	VOLTS	
<u>5.23</u>	<u>75</u>	<u>+1.497</u>	<u>—</u>	
<u>5.54</u>	<u>80</u>	<u>-1.599</u>	<u>1.611</u>	ORIGINAL PAGE IS OF POOR QUALITY
<u>1.208</u>	<u>90</u>	<u>-1.538</u>	<u>—</u>	
<u>1.492</u>	<u>100</u>	<u>1.904</u>	<u>2.010</u>	
<u>1.709</u>	<u>110</u>	<u>2.122</u>	<u>—</u>	
<u>2.154</u>	<u>120</u>	<u>2.290</u>	<u>2.427</u>	
<u>2.534</u>	<u>130</u>	<u>2.527</u>	<u>—</u>	
<u>2.942</u>	<u>140</u>	<u>2.734</u>	<u>2.864</u>	
<u>3.374</u>	<u>150</u>	<u>2.952</u>	<u>—</u>	
<u>3.857</u>	<u>160</u>	<u>3.172</u>	<u>3.291</u>	
<u>4.352</u>	<u>170</u>	<u>3.376</u>	<u>—</u>	
<u>4.804</u>	<u>180</u>	<u>3.544</u>	<u>3.598</u>	
<u>5.291</u>	<u>190</u>	<u>3.702</u>	<u>—</u>	
<u>6.075</u>	<u>200</u>	<u>3.967</u>	<u>3.842</u>	
<u>6.714</u>	<u>210</u>	<u>4.164</u>	<u>—</u>	
<u>7.225</u>	<u>220</u>	<u>4.365</u>	<u>4.285</u>	
<u>7.694</u>	<u>230</u>	<u>4.564</u>	<u>—</u>	
<u>8.122</u>	<u>240</u>	<u>4.764</u>	<u>4.674</u>	
<u>8.515</u>	<u>250</u>	<u>4.961</u>	<u>—</u>	

736. 411 REVS.

ENGINEERING LABORATORIES
Calibration Data Sheet

**ORIGINAL PAGE IS
OF POOR QUALITY**

Description <i>THERMISTOR RESISTOR</i>		Date Calibrated:
Model Type <i>542R-2</i>		<i>5-22-77</i>
Range <i>-1000 TO 11000 FT.</i>		Calibration Period:
Mfg. <i>ROSEMOUNT INC.</i>		<i>6 M</i>
Serial No. <i>29</i>		ICP No. <i>10-200-04</i>
Lab No.	Calibrated by: <i>T. B. ...</i>	

Remarks: *O.I. - PASSED ON PREVIOUS CALIBRATION 11-28-77*

*P342
NFS*

<i>O.I.</i>	<i>STD</i>	<i>ACT. RES</i>	<i>THE. RES</i>		
	<i>FT.</i>	<i>Volts</i>	<i>Volts</i>		
<i>93.817</i>	<i>0</i>	<i>+ .199</i>	<i>+ .200</i>		
<i>92.121</i>	<i>500</i>	<i>- .297</i>	<i>—</i>		
<i>40.366</i>	<i>1000</i>	<i>- .398</i>	<i>- .390</i>		
<i>58.150</i>	<i>1500</i>	<i>- .499</i>	<i>—</i>		
<i>84.986</i>	<i>2000</i>	<i>+ .509</i>	<i>+ .600</i>		
<i>85.224</i>	<i>2500</i>	<i>- .600</i>	<i>—</i>		
<i>82.700</i>	<i>3000</i>	<i>- .799</i>	<i>+ .800</i>		
<i>82.767</i>	<i>3500</i>	<i>+ .900</i>	<i>—</i>		
<i>82.714</i>	<i>4000</i>	<i>+ 1.000</i>	<i>+ 1.001</i>		
<i>79.279</i>	<i>4500</i>	<i>- 1.100</i>	<i>—</i>		
<i>42.852</i>	<i>5000</i>	<i>+ 1.200</i>	<i>+ 1.201</i>		
<i>74.421</i>	<i>5500</i>	<i>- 1.301</i>	<i>—</i>		
<i>74.974</i>	<i>6000</i>	<i>- 1.402</i>	<i>+ 1.403</i>		
<i>69.510</i>	<i>8000</i>	<i>+ 1.800</i>	<i>—</i>		
<i>64.376</i>	<i>10000</i>	<i>+ 2.197</i>	<i>+ 2.198</i>		
<i>59.477</i>	<i>11000</i>	<i>- 2.595</i>	<i>—</i>		
<i>51.951</i>	<i>14000</i>	<i>+ 2.995</i>	<i>+ 2.995</i>		
<i>37.684</i>	<i>15000</i>	<i>+ 3.197</i>	<i>—</i>		
<i>30.173</i>	<i>16000</i>	<i>+ 3.195</i>	<i>+ 3.195</i>		

786
411
KOV5

BY A. WHITEISER

HELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 1

CHECKED (Signature)

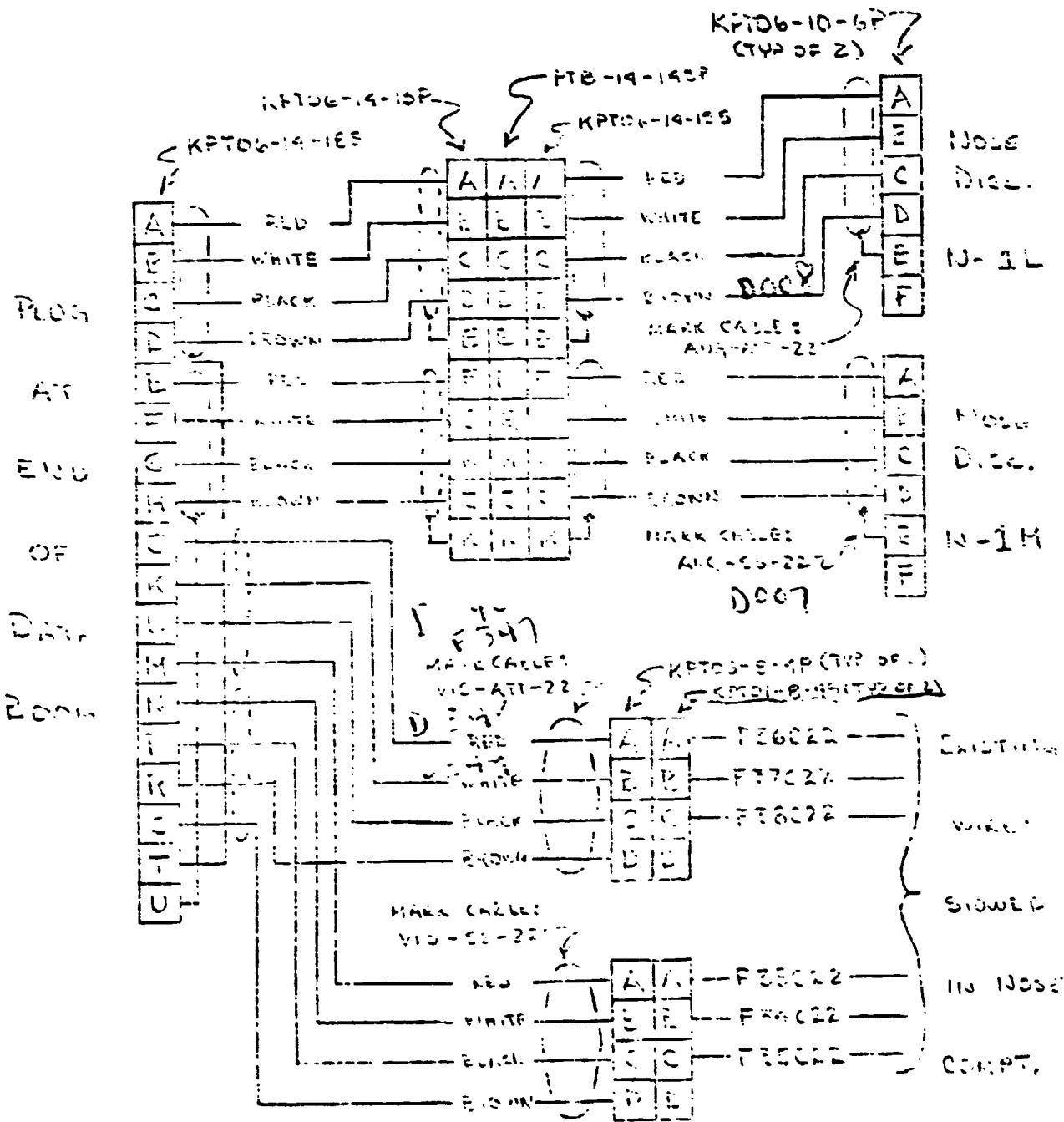
HELI. 142 RPT SKTAS.M.140-1

DATA ROOM WIRING

ORIGINAL PAGE IS
OF POOR QUALITY

J-Box NOSE - 1

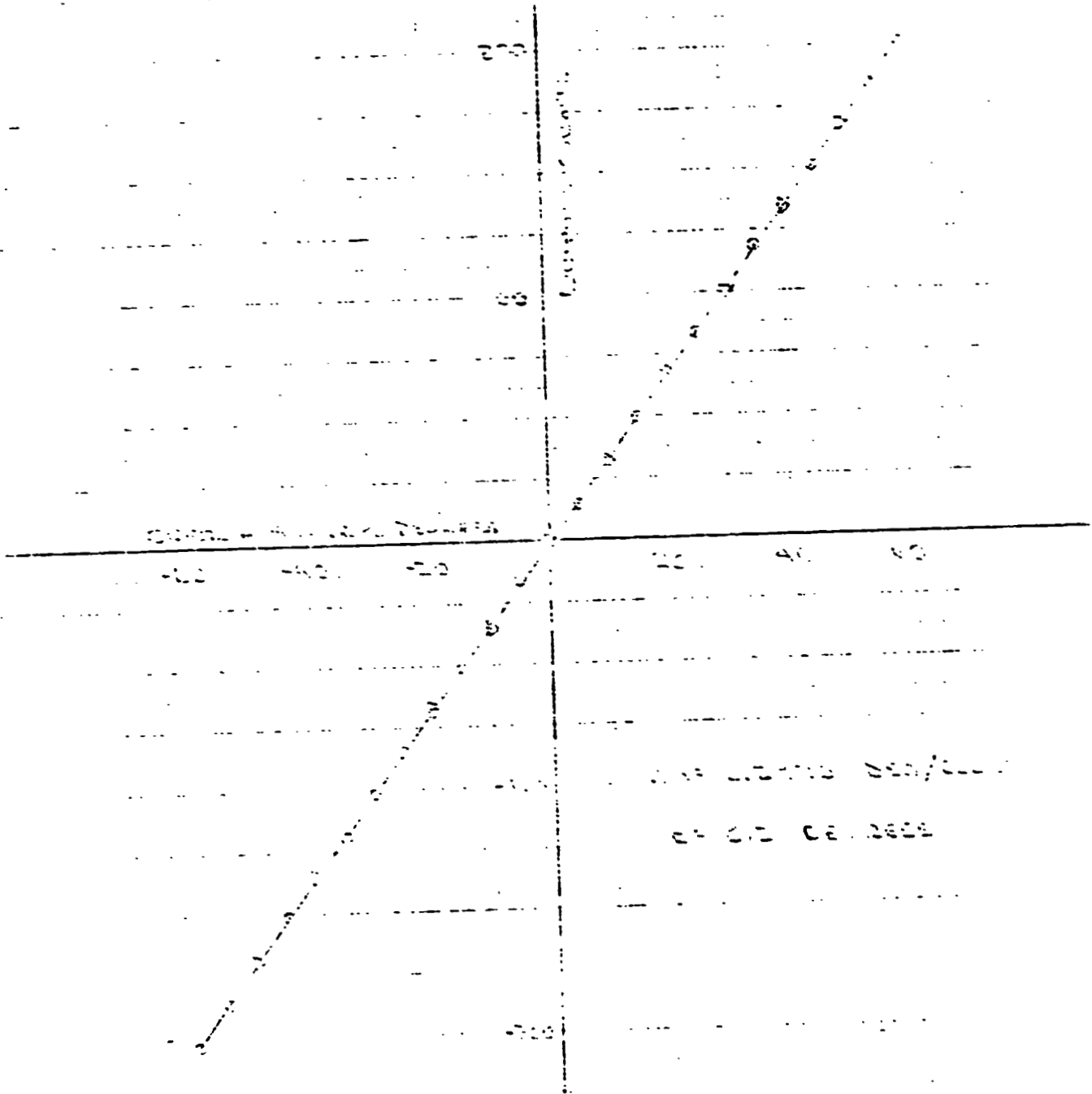
273



PRECEDING PAGE BLANK NOT FILMED

0001

A



... ..
... ..

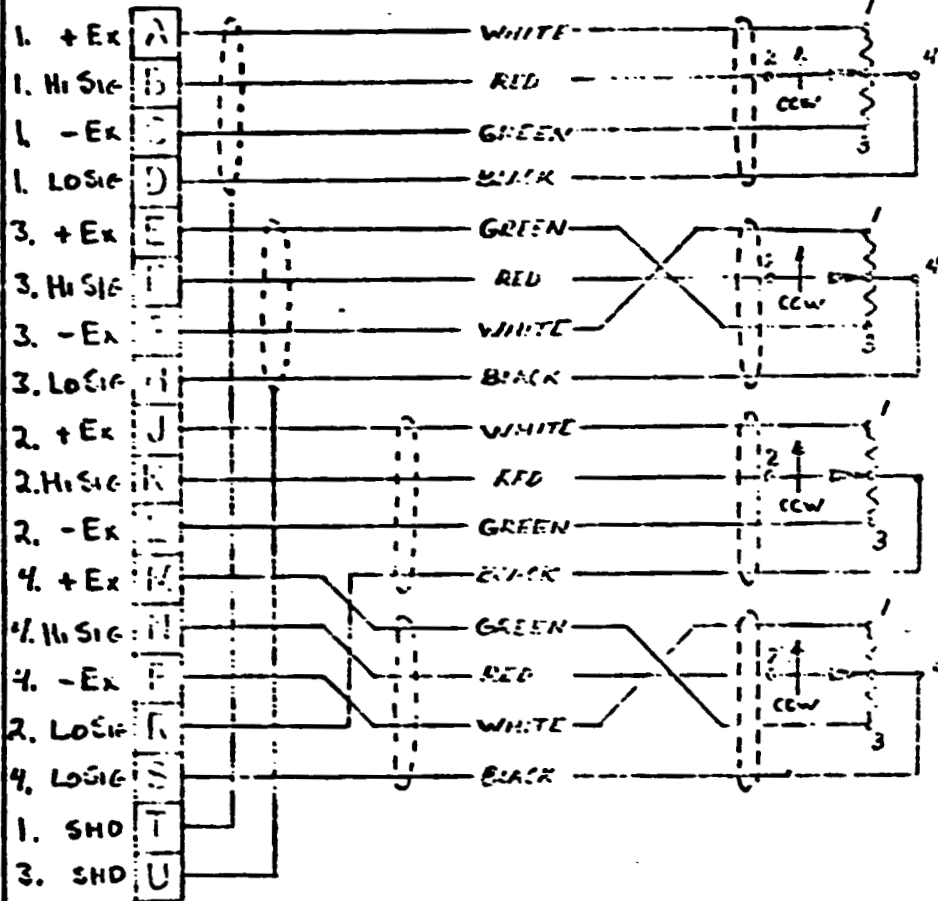
ORIGINAL PAGE IS
OF POOR QUALITY

DATA BOOM WIRING

SPACE AGE CONTROLS SWIVEL NOSE

P/N 100510-1

279



CABLE 1
 ANGLE OF ATTACK
 AFT HORIZONTAL SHFT
 RECORDER - OUTER POT

CABLE 3
 ANGLE OF SIDESLIP
 FWD VERTICAL SHFT
 RECORDER - OUTER POT

CABLE 2
 ANGLE OF ATTACK
 AFT HORIZONTAL SHFT
 VISUAL - INNER POT

CABLE 4
 ANGLE OF SIDESLIP
 FWD VERTICAL SHFT
 VISUAL - INNER POT

KPT01-14-18P

1. SIGN CONVENTION - UPSCALE, POSITIVE VOLTAGE
 ANGLE OF ATTACK - NOSE OF HORIZONTAL VANE MOVES DOWN
 ANGLE OF SIDESLIP - NOSE OF VERTICAL VANE MOVES RIGHT
2. MECHANICAL ROTATION - 360°
3. ELECTRICAL ROTATION - ± 170° ± 5° FROM CENTER TAP
4. POT - VANE ASSEMBLIES INSTALLED WITH 3 POT TERMINALS AFT

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 10-1-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer W. J. ...

Project 2. 2000 THERMAL ...

Title W. J. ... (1000 ...)

L. I. R. _____ EWA _____

M. C. _____

Time 1:00 008

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

Volts _____

Gage Type _____

Gage Fac. _____

Gage Res. _____

Lot. No. _____

Act. Arm _____

Chan. 2000

Bridge 207

Config. _____

Col. Res. _____

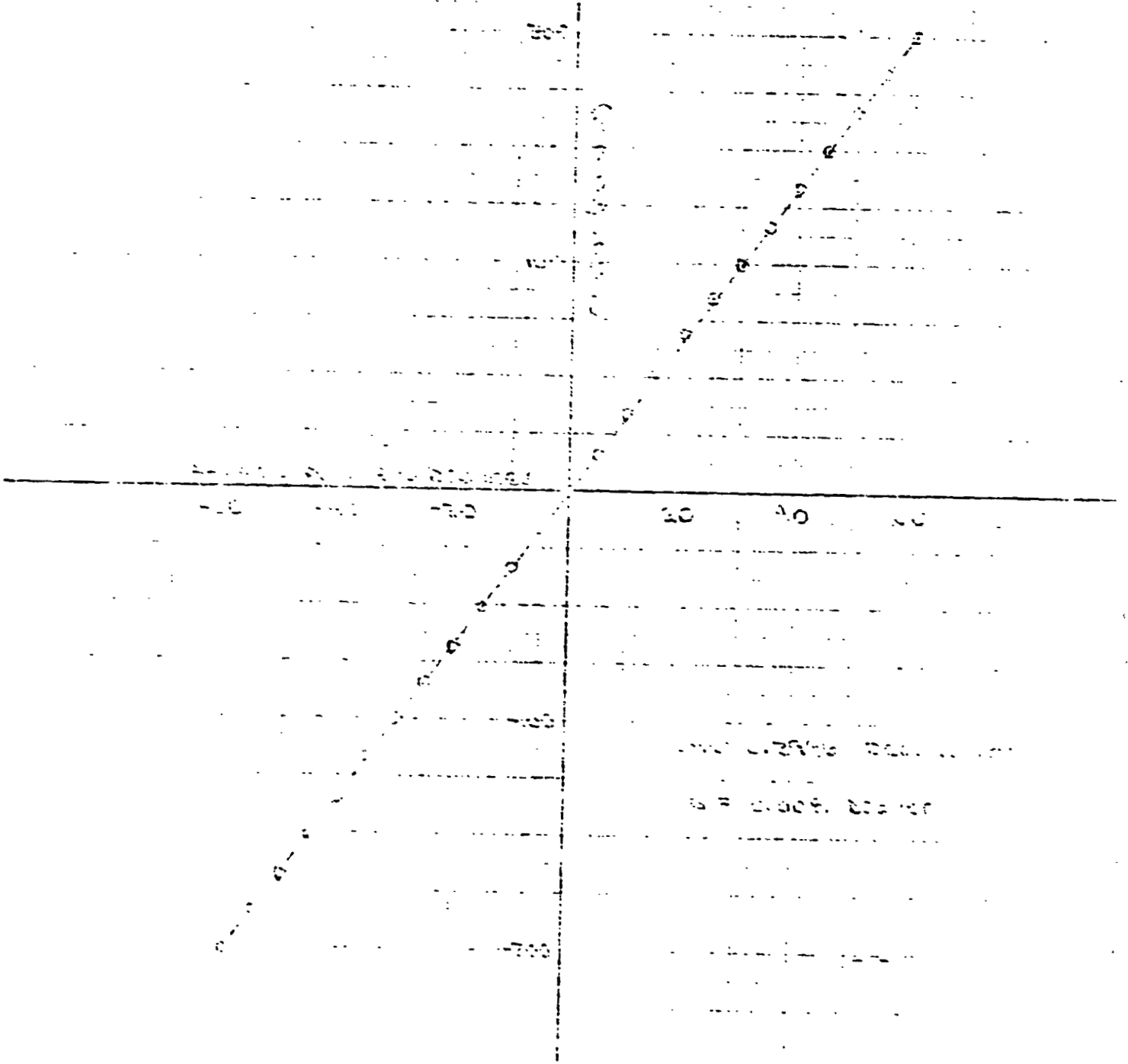
Lever Arm _____

Load	Output		
0	0	-15	-56
5	11	-20	-72
10	22	-25	-87
15	33	-30	-102
20	44	-35	-117
25	55	-40	-132
30	66	-45	-147
35	77	-50	-162
40	88	-55	-177
45	99	-60	-192
50	110	-65	-207
55	121	-70	-222
60	132	-75	-237
65	143	-80	-252
70	154	-85	-267
75	165	-90	-282
80	176	-95	-297
85	187	-100	-312
90	198	-105	-327
95	209	-110	-342
100	220	-115	-357
		GPA (92.5-7) = -7	
		LGC (93-97) = 7.3	

ORIGINAL PAGE IS
OF POOR QUALITY

Trans. 0001 0008

State of Texas



THE STATE OF TEXAS

COUNTY OF ...

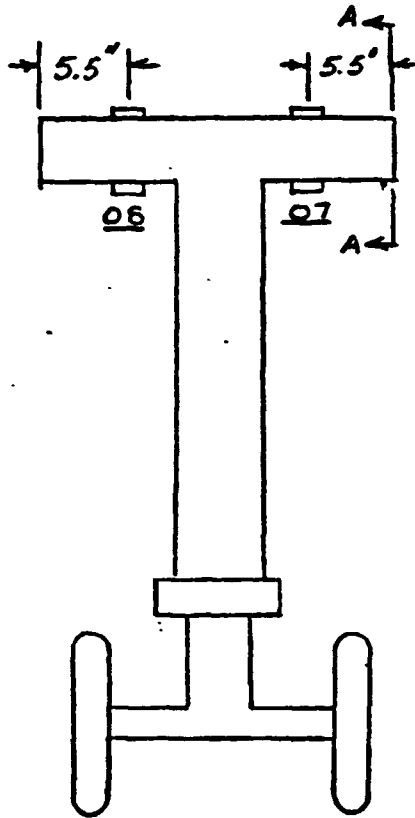
INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-250MQ-350	688512
EWA NO. A427-11B	RESISTANCE 350 ± 0.4 %	LAB. NO. 11348A
WORK ORDER A427	GAGE FACTOR 2.13 ± 0.5 %	PART NO. 21800-200
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF56	SERIAL NO.

TITLE OF TEST
301 FLIGHT TEST

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY



NOSE GEAR

AB-CD
BC-DA
A-A

B 346

FRONT VIEW

REMARKS:

INSTALL BENDING BRIDGES AS SHOWN. USE EASTMAN 910 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH
SHELL 9309. ATTACH FOUR TEN INCH SUPRENTANT LEADS.
ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH
KPT-06-8-4P PLUG.

	07	08					
BRIDGE	BENDING	BENDING					
BALANCE <i>WINS</i>	420	413					
RES. TO GROUND							
DATE ASSIGNED	TECHNICIAN CCW- WVF				EST. HRS.	APPROVED BY:	
DATE COMPLETED 11-18-76	ENGINEER				ACT. HRS.		

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 3-15-75

Lab. No. 11768A

Serial No. YMC-601

Part No. 21501

Engineer W. J. ...

Project NASA ...

Title ...

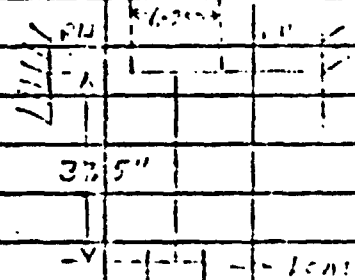
L. T. R. EWA

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
		DV. 111			

Volts	6.00		6.00		
Gage Type					B357
Gage Fac.					B396
Gage Res.					
Lot. No.					
Act. Arm					
Chon.	12.0		12.0		
Bridge	20		07		
Config.					
Cal. Res.	100 K		100 K		
Lever Arm					

Load	Output				
0	-0.000	0		12.0	0
1	+1.572	2.63		12.0	2.63
0	-2.059	0		+2.059	0
50 LSI	+1.290	799		+1.290	-75
100	+0.480	1.609		+1.609	-1.557
150	+1.310	2.399		-2.01	-2.367
180	+1.122	3.211		-1.802	-3.168
2250 PSI	+1.705	3.994		-1.810	-3.938
1750	+1.342	2.451		-2.06	-2.372
1500 PSI	-1.257	832		+1.401	-745
0	-0.065	0.24		+2.107	+0.03

OK ADJ 3-15-75



2 ...
1 ...

ORIGINAL PAGE IS
OF POOR QUALITY

BY _____	BOEING HELICOPTER COMPANY	MODEL _____	PAGE _____
CHECKED _____	PO BOX 310000 98000 0000	HELI _____	RPT _____

LAB. NO. 11325-202
 LAB. CALIBRATION: 3-7-78
 PART. NO. 21550-1
 SER. NO. 2170-001
 JACK FACTOR 15 PSI/INCH
 LEVER ARM _____
 LOAD CE. 217 POUNDS

B-357

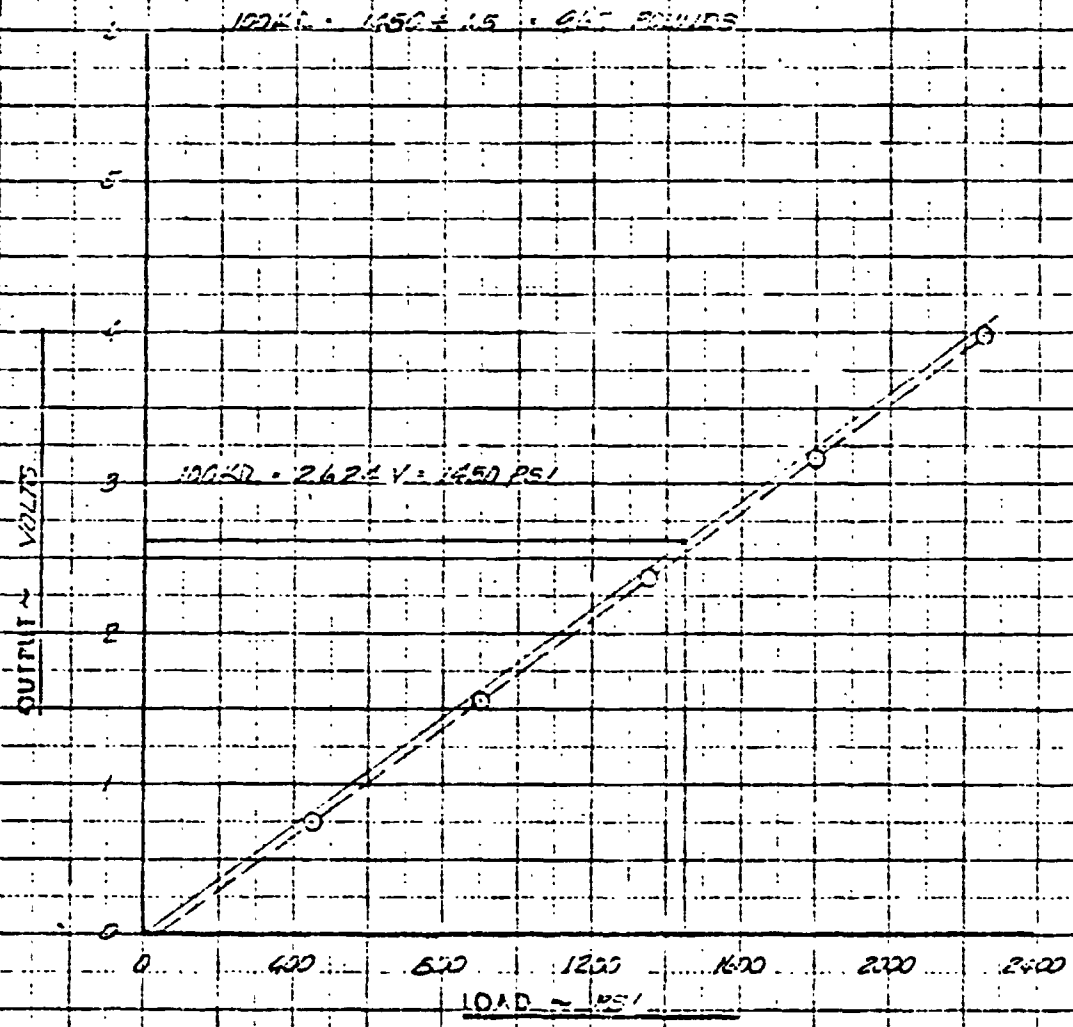


FIG. CALIBRATION OF L/H SIDE NOSE LANDING GEAR
FOR BENDING

BY _____
CHECKED _____

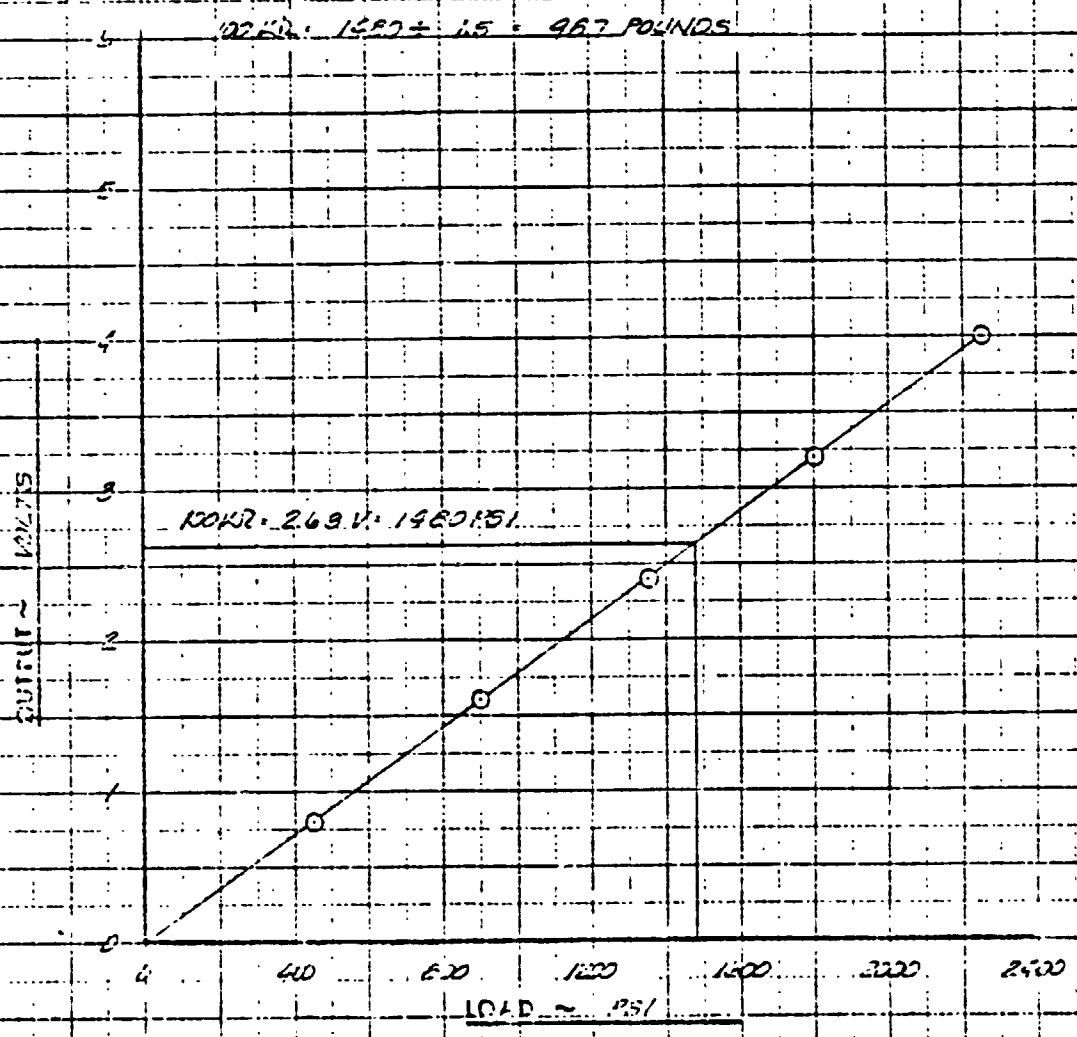
SIEMENS HELICOPTER COMPANY
PART NO. 001 401 PART NO. 1000

MODEL _____
HELI _____

PAGE _____
RPT _____

ORIGINAL PAGE IS
OF POOR QUALITY

TAP NO. 11848008
TAP CALIBRATION: 3-7-75
PART NO. 01801-1
SER NO. 11111111
TAP FACTOR: 1.5751 ± 0.0001
LEVER APM: _____
MORSE: 587 100015



B346

FIG. CALIBRATION OF R/L SIDE NOSE LANDING GEAR
FOR BENDING

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-125TB-350	693941
EWA NO. A435-34	RESISTANCE 350.0 ± 0.4 %	LAB NO. 11349A
RK ORDER A435	GAGE FACTOR 2.12 ± 0.5%	PART NO. 11349A
REQUESTED BY: A. WHITENER	LOT NO. Q-2192543	SERIAL NO.

TITLE OF TEST 273
301 FLIGHT TEST

SKETCH:

ORIGINAL PAGE IS OF POOR QUALITY

REMARKS: 17B-623
 INSTALL AXIAL BRIDGE AS SHOWN. USE EASTMAN-910 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER
 WITH SHELL 9307. ATTACH FOUR WIRE TERMINALS TO LEADS.
 ENCASE LEADS IN VINYL SLEEVING AND TERMINATE
 WITH KPT-06-8-4P PLUG.

BRIDGE	AXIAL						
BALANCE	-0.14						
TO GROUND	10KM						

DATE ASSIGNED	TECHNICIAN CEV. - MH	EST. HRS	APPROVED BY:
DATE COMPLETED 1-12-78	ENGINEER	ACT. HRS	

CALIBRATION SHEET
LAB DESIGNER: WHITMAN
DATA ANALYST: PAUL LEO WRIGHT
LAB TECHNICIAN: ANDERSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAP NO. : 11369A01
CAL DATE: 1-10-70
SERIAL NO: NONE
P/N: NONE

PROJECT: 301 FLIGHT TEST

PART NAME: ROD END

CHANNEL: 03 - POS AXIAL LOADING

F 347

CALIBRATE EQUIVALENT: 1011 = 25100 POUNDS
UNIT CAL = 24930 POUNDS/MV/V

SPRNG FAC. : 350.00
GAGE FAC. : 2.125
OFFSG. CORR. : 0.00
PRE CAL. : 5.25
POST CAL. : 5.25

JACK FAC. : 0.0018 PSI/LB
LEVER ARM : NONE
CAL RES. : 100

LOADS-MV	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	-0.005	-20
0.05	0.05	0.000	0.000	20
1.05	1011.12	0.010	0.002	10
3.01	1070.34	0.030	-0.015	-40
5.02	2010.37	0.050	-0.004	-20
7.04	4010.45	0.070	-0.005	-20
9.01	5120.60	1.000	0.009	40

MAXIMUM CALIBRATION LOAD: 5124 POUNDS

LHC PROGRAM FCCR33 - RUN DATE: 02-03-

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

CALIBRATION SHEET
 LAB ENGINEER: WHITNER
 DATA ANALYST: MARY LEO WRIGHT
 LAB TECHNICIAN: ANDERSON

LAB NO.: 1134901
 CAL DATE: 1-16-78
 SERIAL NO: NONE
 P/N: NONE

ORIGINAL PAGE IS
 OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

F 347

PART NAME: ROD END
 CHANNEL: D3 - NEG AXIAL LOADING

CALIBRATE EQUIVALENT: 1000 = 10000 POUNDS
 UNIT CAL = 20000 POUNDS/MV/V

BRIDGE RES. : 350.00
 GAGE FAC. : 2.120
 BRIDGE SENS. : 0.00
 PRE CAL. : 5.29
 POST CAL. : 5.28

JACK FAC. : 1
 LEVER ARM : 1
 CAL RES. : 10.

LOADS-POUNDS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	0.005	0
1000.00	1000.00	0.000	-0.005	10
2000.00	2000.00	0.000	-0.005	20
3000.00	3000.00	0.000	-0.005	30
4000.00	4000.00	1.000	-0.002	40
5000.00	5000.00	1.350	-0.002	50

MAXIMUM CALIBRATION LOAD: 5000 POUNDS

BHC PROGRAM FCC33 - RUN DATE: 02-02-

BY A. WHITENER

Bell Helicopter **TESTRON**

MODEL 301 PAGE 1

CHECKED _____

POST OFFICE BOX 428 • FORT WORTH TEXAS 76101

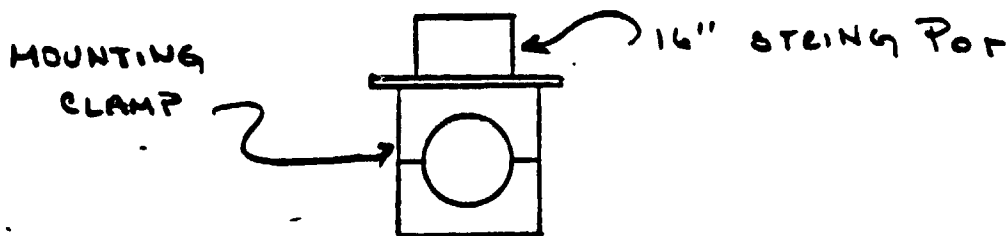
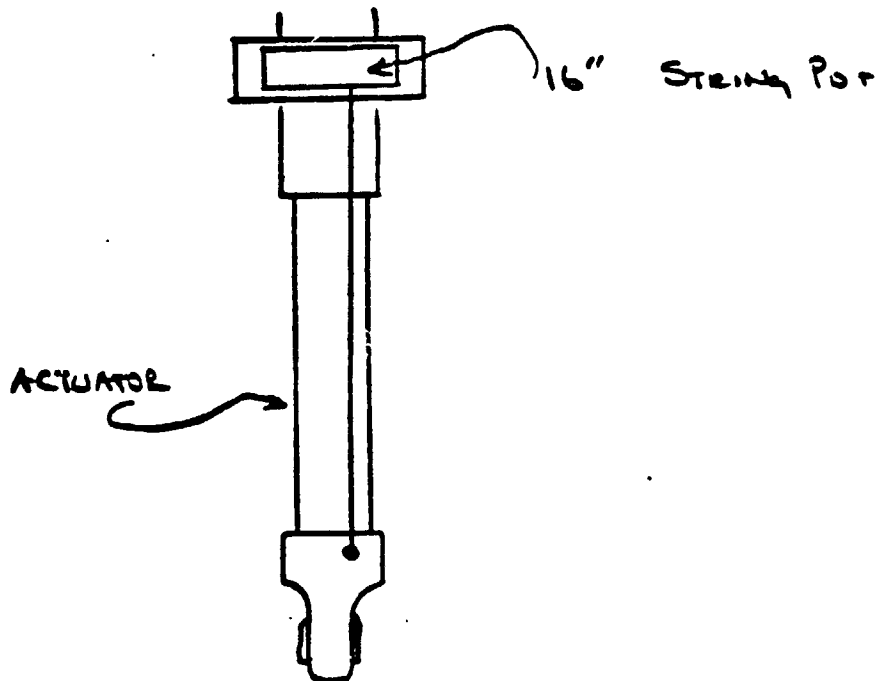
RPT ASW5377-2

Nose + MAIN LANDING GEAR

ACT POS

D398

ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/2/75

Lot. No. _____

Project Gravel Trench Test

Serial No. _____

Title Gravel Test. General Purpose

Part No. _____

L. T. R. _____ EWA _____

Engineer Sm

Item 3000: 2500

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvs.

Value	
Geom. Type	
Geom. Fac.	
Geom. Res.	
Lot. No.	
Act. Arm	
Chon.	
Bridge	
Config.	
Col. Res.	
Lever Arm	

Load	Output
0	0.00
1	0.05
2	0.10
3	0.15
4	0.20
5	0.25
6	0.30
7	0.35
8	0.40
9	0.45
10	0.50
11	0.55
12	0.60
13	0.65
14	0.70
15	0.75
16	0.80
17	0.85
18	0.90
19	0.95
20	1.00

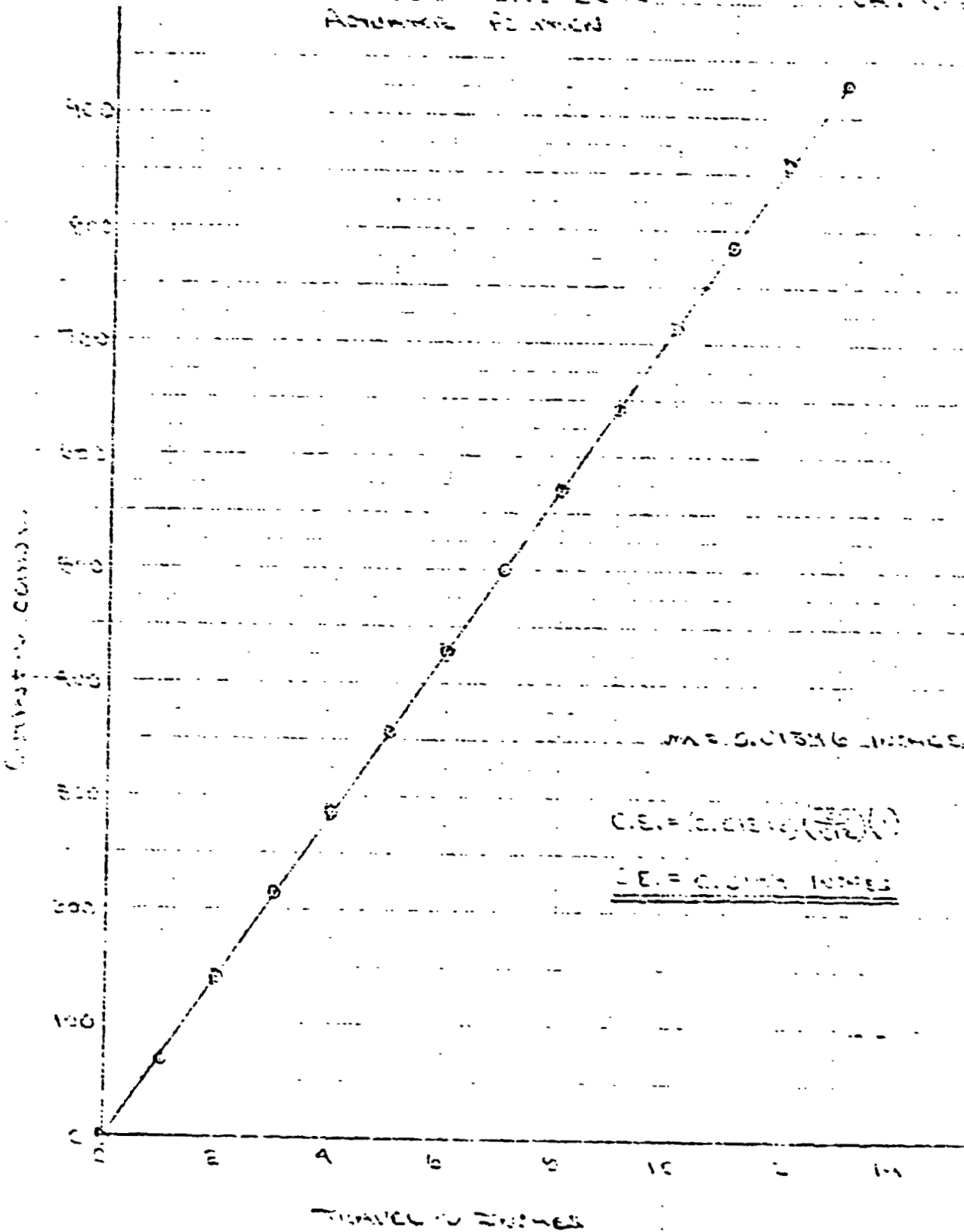
$3000(0.000) = 0.002$
 $100(0.000) = -0.001$
 RECALC
 USE RECALC
 FROM DATA

ORIGINAL PAGE IS
OF POOR QUALITY

Item No: D348

NOSE LANDING GEAR
ADVANCE FEET

CR: 100-100



BY: WHITENER

Bell Helicopter **EXTRON**
Division of Textron

MODEL 301 PAGE 1

CHECKED _____

FOR OFFICE USE ONLY - NOT VALID BEYOND THIS

RPT ASW5377-3

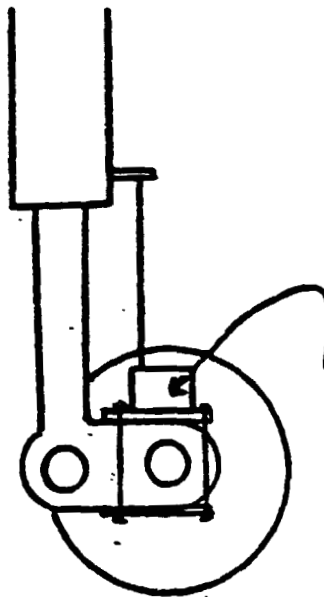
Nose Landing Gear

OLEO EXTENSION POS

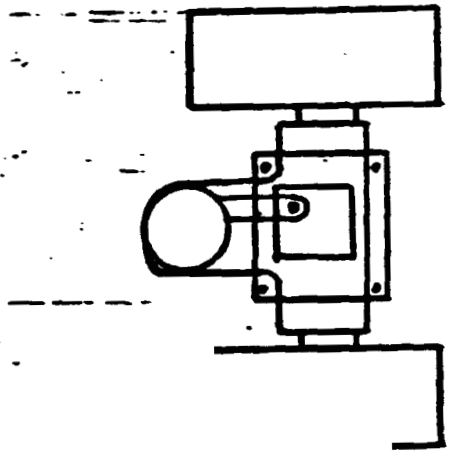
67112 279

D 349

ORIGINAL PAGE IS
OF POOR QUALITY



16" STRUT POS



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/3/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer S. J. [Signature]

Project GROUND TIEDOWN TESTS

Title JOSE LDC GEAR CLEO EXTENSION POSITION

L. T. R. _____ EWA _____

W. O. 301 #2

ITEM CODE: D349

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>DEWIER</u>					
<u>LA SINDI</u>					

Volts	<u>5.1552</u>				
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chen.	<u>RMDU "A" - 7A-2-2</u>				
Bridge	<u>C/S II</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Load	Output	
<u>DEFLECTION (INCHES)</u>	<u>OUTPUT (COARSE)</u>	
<u>0</u>	<u>-611</u>	<u>GMA (27.5) = 10003</u>
<u>1</u>	<u>-536</u>	<u>LLC (41.5) = 10736</u>
<u>2</u>	<u>-468</u>	
<u>3</u>	<u>-394</u>	
<u>4</u>	<u>-323</u>	
<u>5</u>	<u>-250</u>	<u>C.E. = 1/11 * ((LLC - GMA) / 512) * (GMA GAIN)</u>
<u>6</u>	<u>-177</u>	
<u>7</u>	<u>-115</u>	
<u>8</u>	<u>-64</u>	
<u>9</u>	<u>1029</u>	
<u>10</u>	<u>101</u>	
<u>11</u>	<u>172</u>	
<u>12</u>	<u>243</u>	
<u>13</u>	<u>315</u>	
<u>12</u>	<u>244</u>	
<u>10</u>	<u>101</u>	
<u>8</u>	<u>-243</u>	
<u>6</u>	<u>-165</u>	
<u>4</u>	<u>-350</u>	
<u>2</u>	<u>-470</u>	
<u>0</u>	<u>-619</u>	

ORIGINAL PAGE IS
OF POOR QUALITY

D. P. Smith

Gen Helicopter

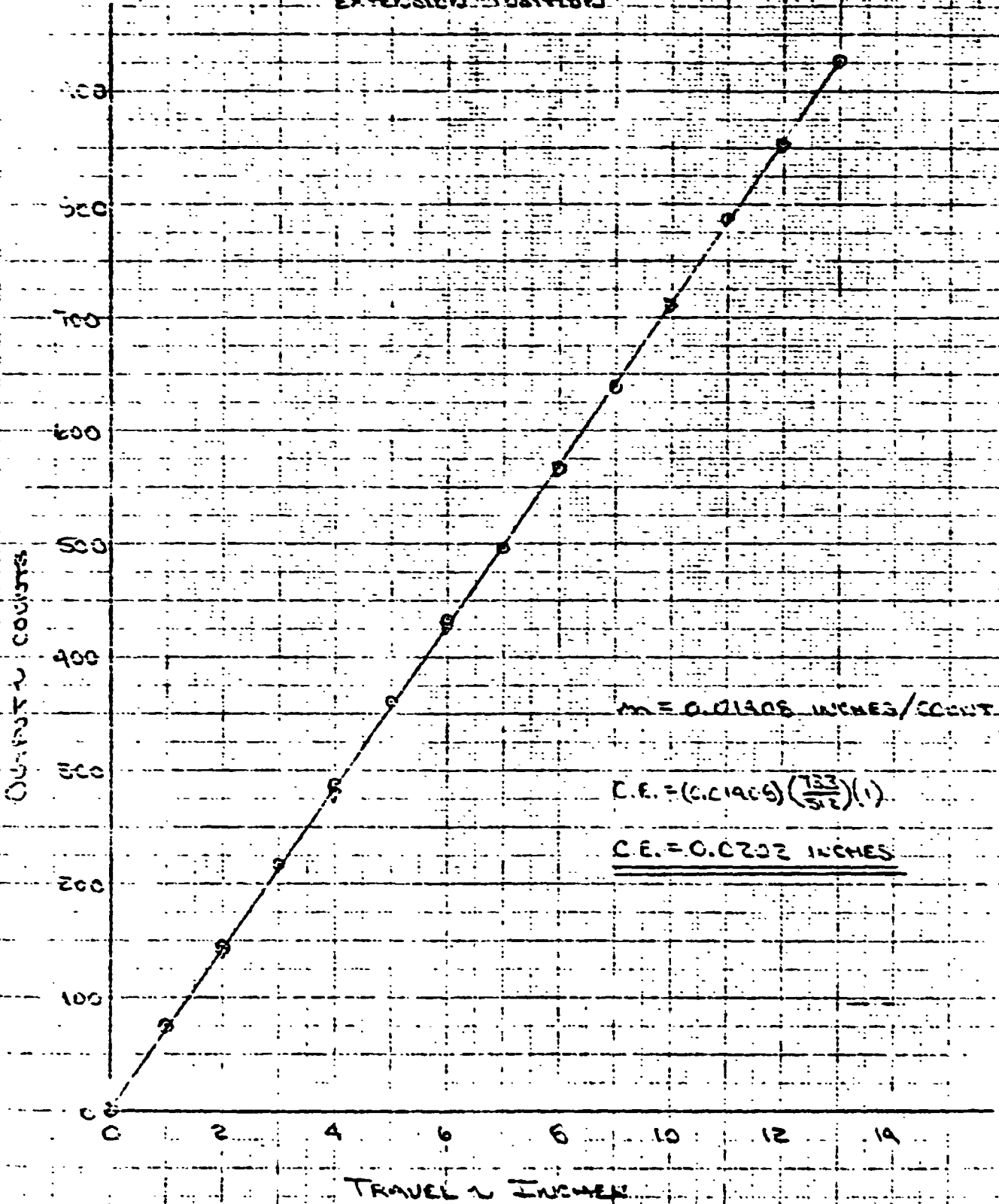
SUBJECT: 01
HELL: 2

PAGE: 1

ITEM CODE: D349

NEE LANDING GEAR CLOS
EXTENSION POSITION

CH. A-7A-2-2



ENGINEERING ORDER

SER. NO. 301 HES 03	SHEET 1
NO. OF CHANGES	NO. REVISED LVS. OF 5
ENGR'S WORK ORDER	

CHANGE
 RELEASE
 PROCESS

TEST
 HES

CA NO.
 LNO. **452-15**
5-2533

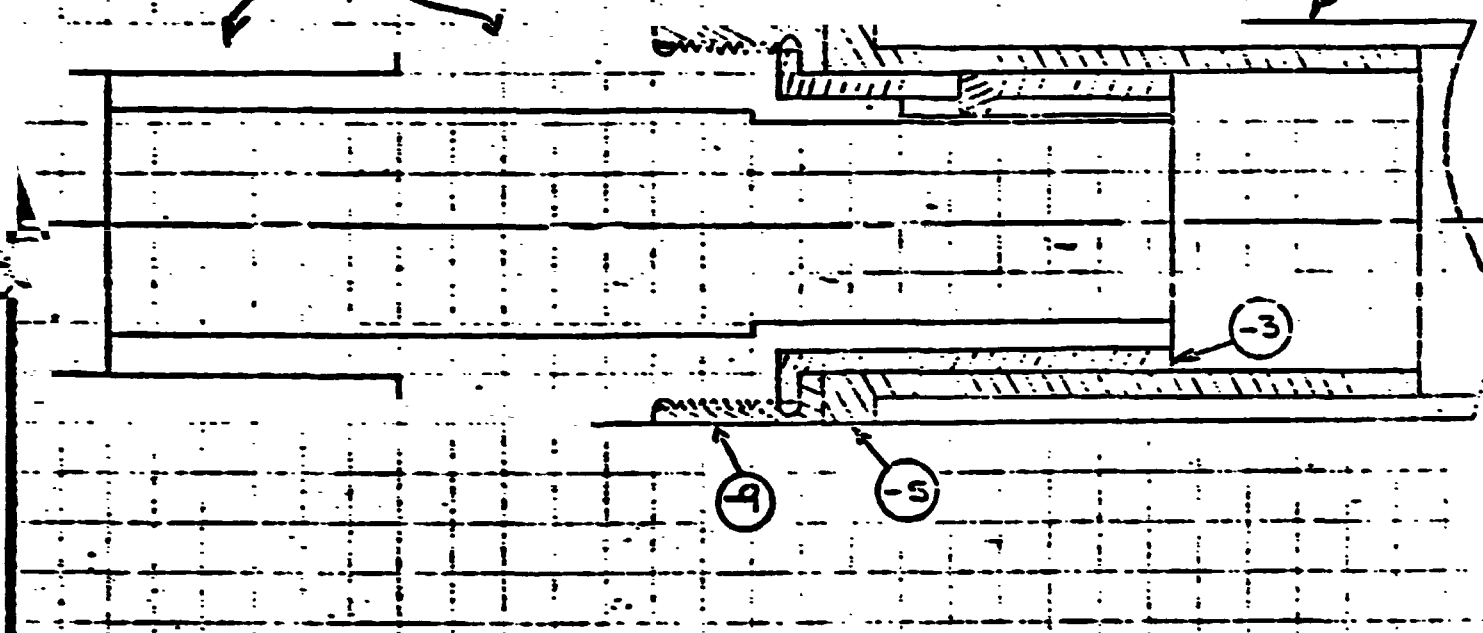
LETAL. NO.
 REASON: **YAW AND PITCH ADAPTER**

Handwritten notes:
 2-26-68
 (12) 279

DRAWINGS AFFECTED	DRAWING CHANGE LTR. (SHEET NO.) (SHEET NO.)	ORIGINAL PAGE IS OF POOR QUALITY	DRAWING TITLE 7/2
-------------------	--	-------------------------------------	-----------------------------

0008
0007

YAW HEAD REF. → **YAW HEAD ADAPTER REF.** **BOOM REF.** →



(-1) ASSY (FINAL ASSY ON NC INSTALLATION)

MAKE 2 EACH (-1) ASSEMBLIES PER THIS E.O.
DELIVER TO A. WARRNER (4522) TO PLANT # 6

STATUS	PART/ASSY NO.	ADD	REL	CHG.	ENGINEERING DISPOSITION			
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE			
DESIGNED BY: W. H. ...	2-2-68	STRUCTURES		MET. DES.				
DESIGNED BY: ...	1/1/68	CUSTOMER		WEIGHTS				
DESIGNED BY: ...	1/1/68	D.E.R.		PROJ. ENG.				
MANUFACTURING EFFECTIVITY					ENGINEERING EFFECTIVITY			
NONE					NONE			

JOB IDENT. NO. 87419
PRIORITY FOR CHANGE

REA. NO. _____
A. NO. A-77-15

R. NO. _____
REASON:

YAW AND PITCH ADAPTER

- CHANGE
- RELEASE
- PROCESS
- TEST
- HES

SER. NO. 301 HES 03	SHEET 2
CLASS OF CHANGE	NO. REVISED LTR.
OF 5	
ENGR'S WORK ORDER	

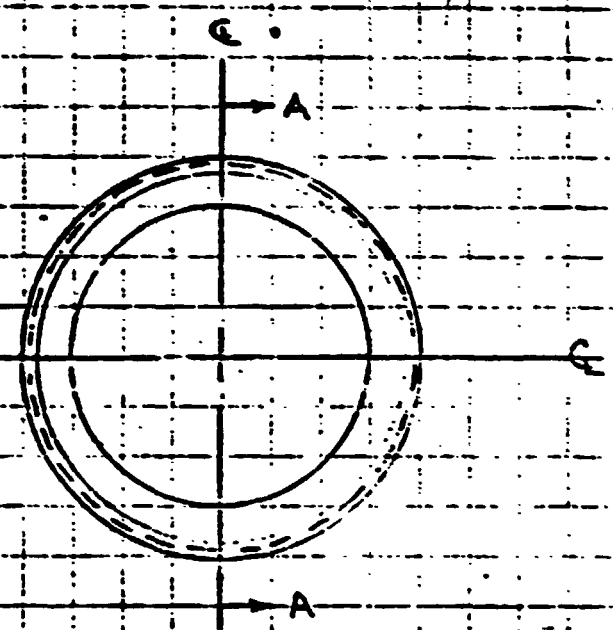
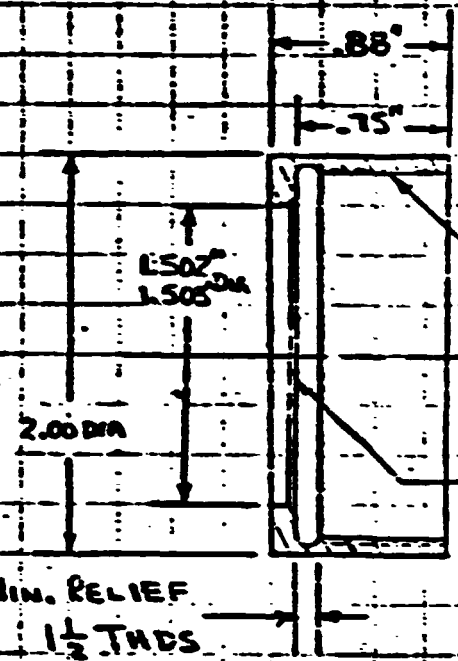
ORIGINAL PAGE IS
OF POOR QUALITY

DRAWINGS AFFECTED _____
DRAWING CHANGE LTR. _____

DRAWING TITLE

9 NUT

THREAD: $1\frac{1}{8}$ -20 NEF-2B



SECTION A-A

NOTE 1: LIGHT KNURL ON OUTER DIAMETER

NOTE 2: BREAK ALL SHARP EDGES

MATERIAL: STEEL CORR. RES. MIL. SPEC. S-7720 OR EQUIVALENT

SURFACE FINISH: PASSIVATE

MAKE: 2 PARTS

STATUS	PART/ASSY NO.	ADD.	REM.	ENG.	ENGINEERING DISPOSITION						
SIGNATURE		DATE		SIGNATURE		DATE		SIGNATURE		DATE	
REPAIRED BY	A. W. HILL	2/20/64	STRUCTURES		MET. DES.						
ENGR			CUSTOMER		WEIGHTS						
BY	D. D. W. M.	2/20/64	D.E.A.		PROJ. ENG.						
ACTUING EFFECTIVITY						ENGINEERING EFFECTIVITY					
NONE						NONE					

JDE IDENT. NO. 57499
 AUTHORITY FOR CHANGE

SER. NO. 301 HES 03	SHEET 3
CLASS OF CHANGE	NO. REMOVE LTR. OF 5
ENG'R'S WORK ORDER	

- CHANGE
- RELEASE
- PROCESS
- TEST
- HES

P.C.A. NO.
 A. NO. **A-117-15**

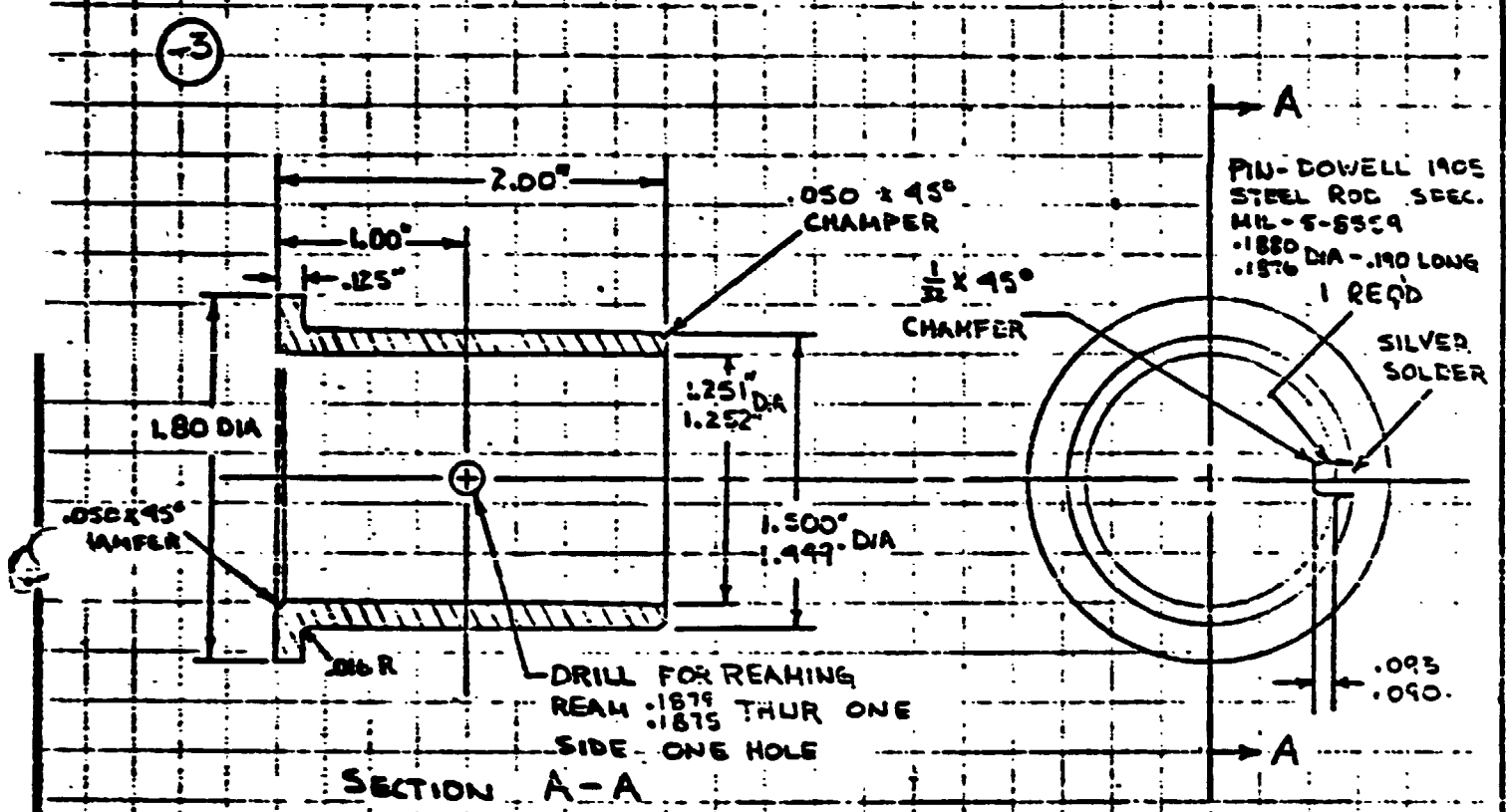
L.E.T.A.R. NO.
 REASON: **YAW AND PITCH ADAPTER**

ORIGINAL PAGE IS
 OF POOR QUALITY

DRAWINGS AFFECTED

DRAWING CHANGE L.T.P.
 TO NOT INCORP. | DO INCORP.

DRAWING TITLE



MAKE: 2 ASSY
 MATERIAL: STEEL COAR. REC. MIL. SPEC. S-7720 OR EQUIVALENT
 SURFACE FINISH: PASSIVATE

NOTE: BREAK ALL SHARP EDGES

PART/ASBY NO.			ADD.	REM.	CHG.	ENGINEERING DISPOSITION		
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	
<i>A. H. ...</i>	4/20/76	STRUCTURES				MET. DES.		
		CUSTOMER				WEIGHTS		
		D.E.R.				PROJ. ENG.		
ENGINEERING EFFECTIVITY			ENGINEERING EFFECTIVITY					
NONE			NONE					

JOB IDENT. NO. 67493
 AUTHORITY FOR CHANGE

P.C.A. NO.

C. NO. A1-27-15

C. A.R. NO.

REASON:

YAW AND PITCH ADAPTER

CHANGE

RELEASE

PROCESS

TEST

HES

SER. NO.

301 HES 03

SHEET

4

CLASS OF CHANGE

ED REVISE LTR.

CF

5

ENG'R'S WORK ORDER

ORIGINAL PAGE IS
 OF POOR QUALITY

DRAWINGS AFFECTED

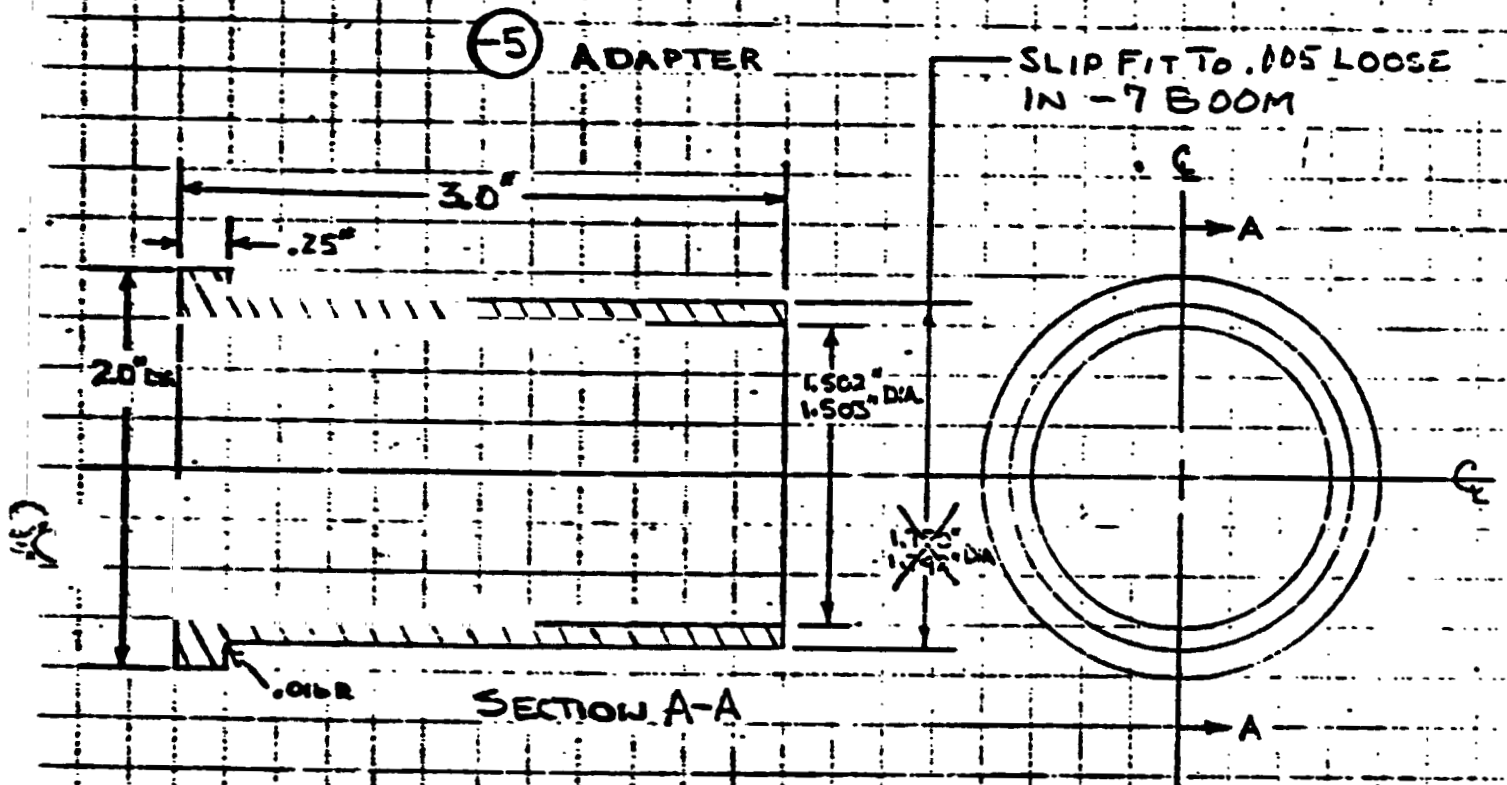
DRAWING CHANGE LTR.

ED REVISE LTR. ED CHANGE

DRAWING TITLE

(5) ADAPTER

SLIP FIT TO .005 LOOSE
 IN -7 BOOM



MAKE: 2 PARTS

MATERIAL: STEEL CORR. RES. MIL SPEC S-7720
 OR EQUIVALENT

SURFACE FINISH: PASSIVATE

NOTE: BREAK ALL SHARP EDGES

STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION			
SIGNATURE	DATE	SIGNATURE		DATE	SIGNATURE		DATE	
PREPARED BY A. WHITEHEAD	2/22/75	STRUCTURES			MET. DES.			
ENGR.		CUSTOMER			WEIGHTS			
ED BY S. P. WILSON	2/10/75	D.E.R.			PROJ. ENG.			

MANUFACTURING EFFECTIVITY

ENGINEERING EFFECTIVITY

NONE

ENGINEERING ORDER

CODE IDENT. NO. 3749
 AUTHORITY FOR CHANGE
 P.C.A. NO.
 I.A. NO. 4177-15
 L.E.T.A.R. NO.
 REASON:

- CHANGE
- RELEASE
- PROCESS
- TEST
- HES

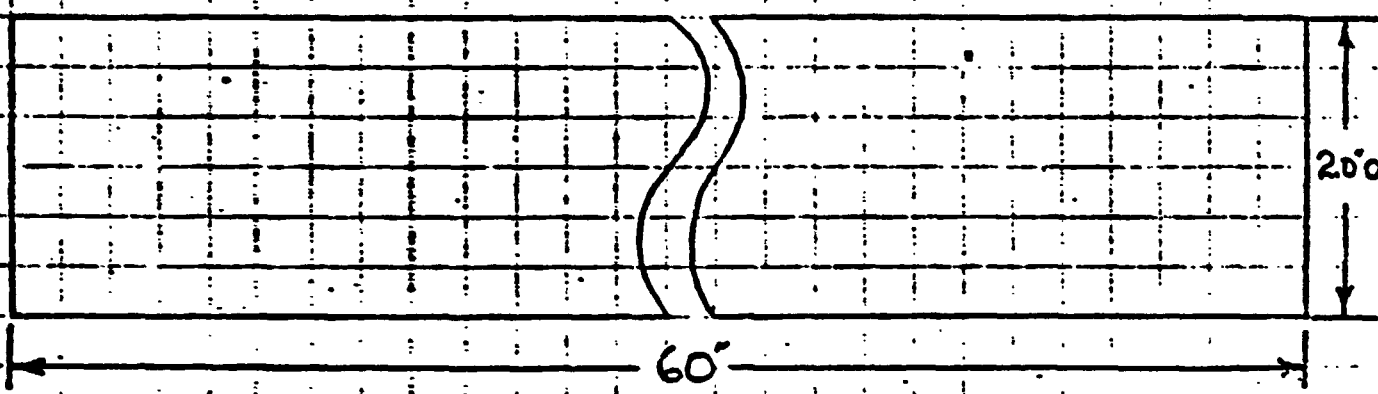
SER. NO. 301 HES 02 SHEET 5
 CLASS OF CHANGE AS REVISED LTR. OF 5
 ENG'R'S WORK ORDER

REASON: **YAW AND PITCH ADAPTER (BOOM)**

ORIGINAL PAGE IS OF POOR QUALITY

DRAWINGS AFFECTED DRAWING CHANGE LTR. (DO NOT INCORP.) AS INCORP. DRAWING TITLE

(7) BOOM



MAKE: 2 PARTS

MATERIAL: 2" O.D (0.12" WALL THICKNESS) ALUM. TUBE
 WWT 700 / TYPE 1 2024 T3
 MATERIAL CODE 1030-47101

FINISH: ALODINE

CONTACT E. SCHELLHASE (EXT 3994) OR A. WHITENIEZ (EXT 4822) FOR TUBING

TR: 551277 A427

STATUS	PART/REV. NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION			
SIGNATURE		DATE		SIGNATURE		DATE		
DESIGNED BY	A. WHITENIEZ	7-16-57	STRUCTURES			MET. DES.		
GROUP ENGR			CUSTOMER			WEIGHTS		
CHECKED BY	D. SODHAM	7-16-57	DER.			PROJ. ENG.		
ACTUING EFFECTIVITY				ENGINEERING EFFECTIVITY				
NONE				NONE				

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED [Signature]

HELI. 1+2 RPT SKASW04375-1

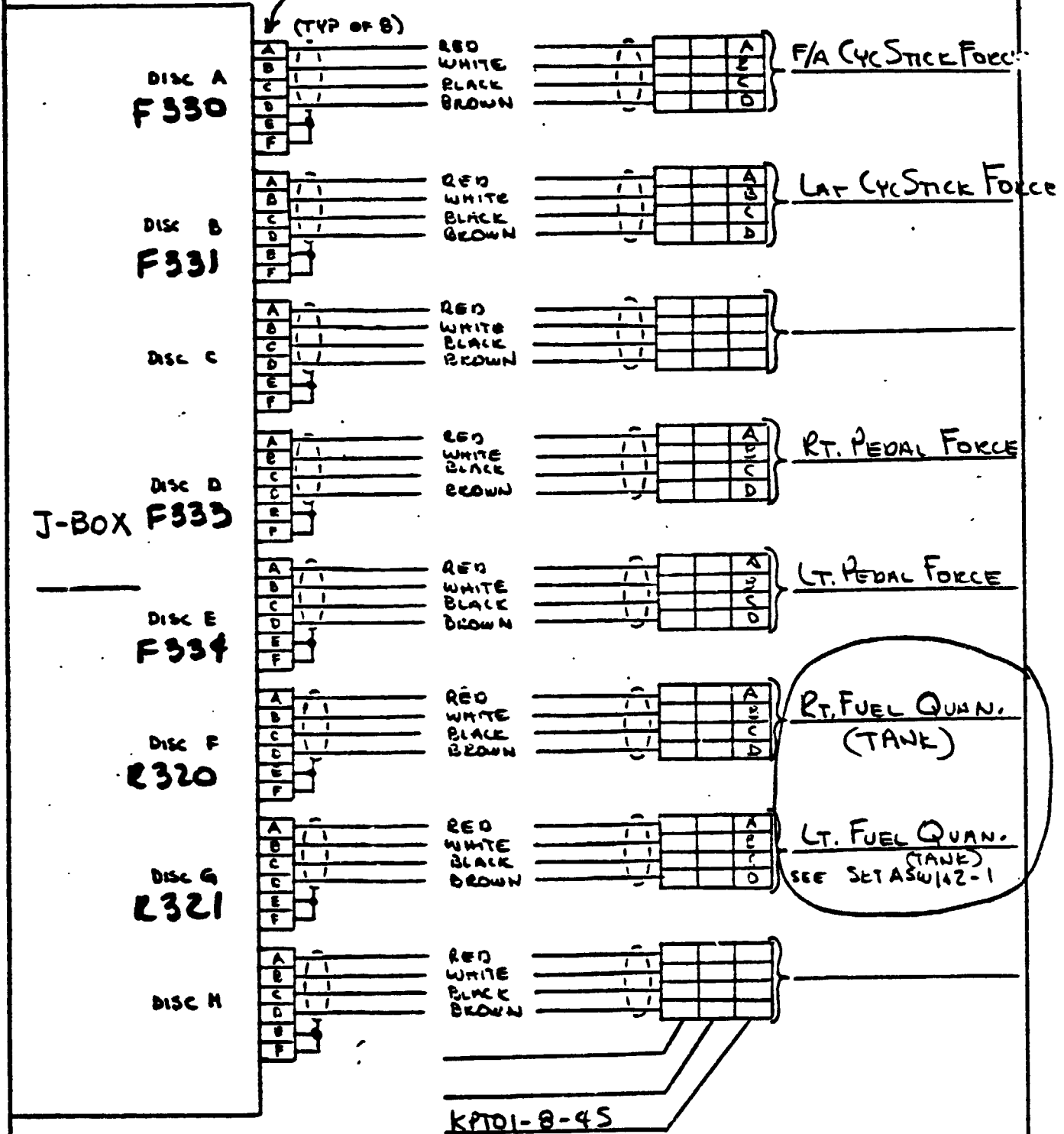
ORIGINAL PAGE IS OF POOR QUALITY

DISCONNECT HARNESS

[Handwritten notes]
6/11/75
182
279

J-Box LOCATION CP-1

KPT06-10-67



7942 8000REV 100

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 2 of 2

CHECKED ASW

HELI. 142 RPT SKASW04375-1

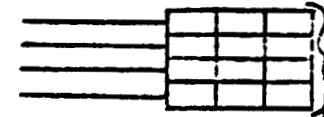
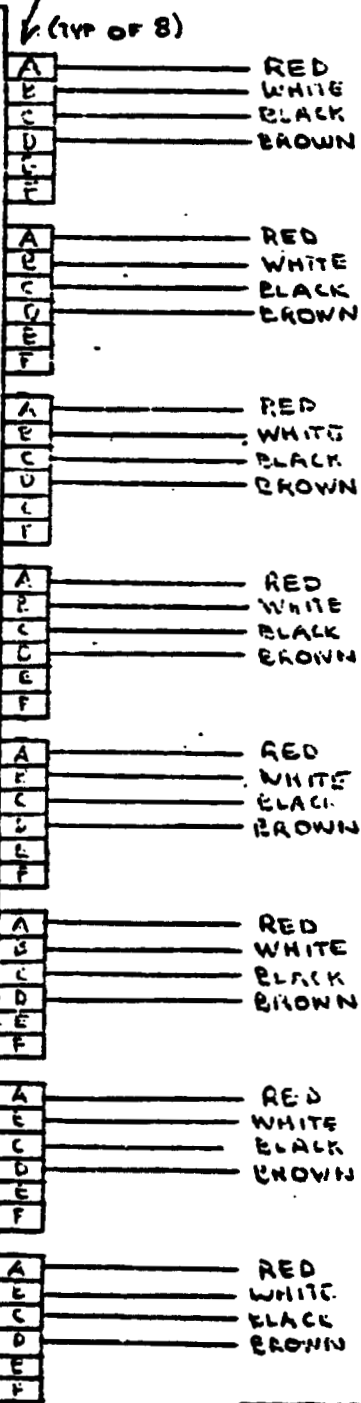
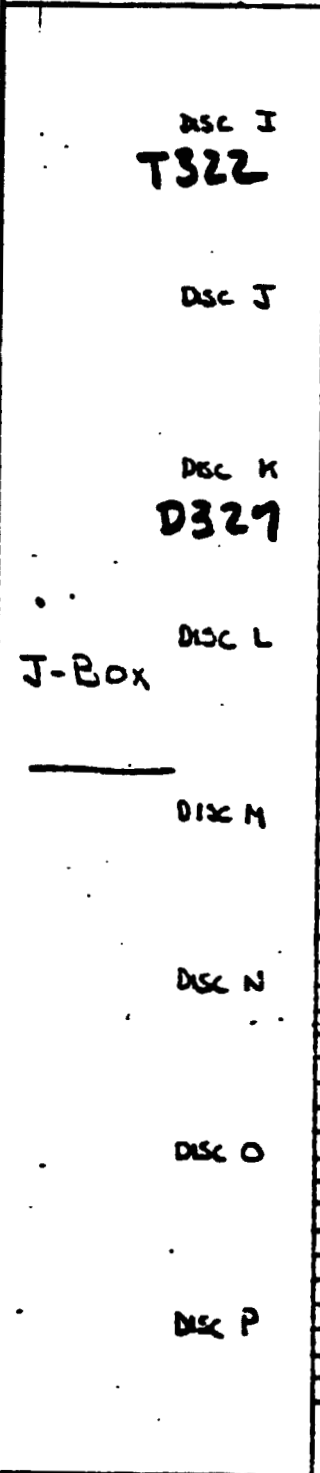
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

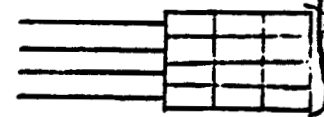
ASW
4-25-75
bh
1A2
279

J-Box LOCATION CP-1

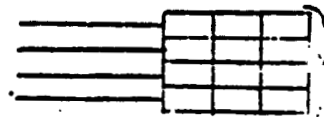
KPT06-10-6P



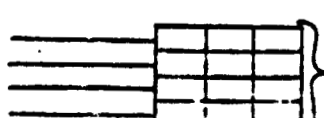
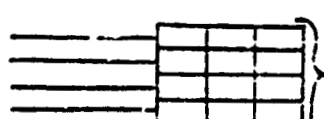
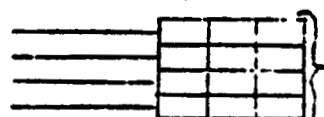
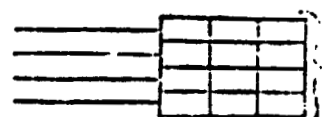
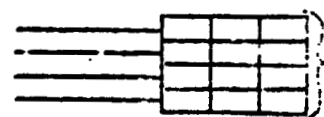
INSTR PANEL OAT
SEE SKASW 148-1



28V (OAT)



RADAR ALTIMETER
SEE SKASW 148-1



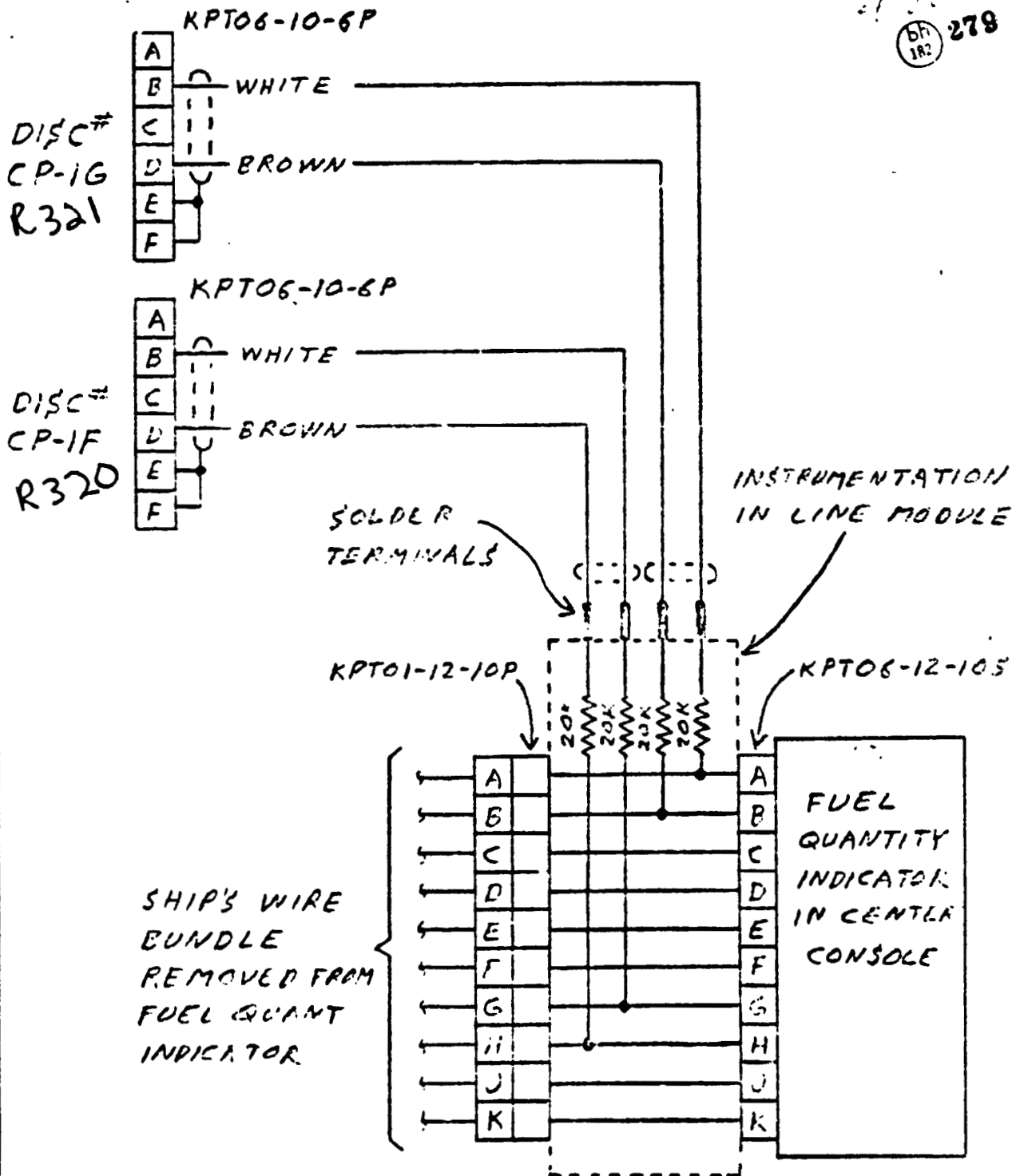
ORIGINAL PAGE IS
OF POOR QUALITY

FUEL QUANTITY WIRING

REV A
94.8.72
12-17-76

J-BOX CP-1

100
12-21-76
279
BH 182



BY: MAHAJEN

CHECKED

BELL HELICOPTER COMPANY

MODEL 301 PAGE

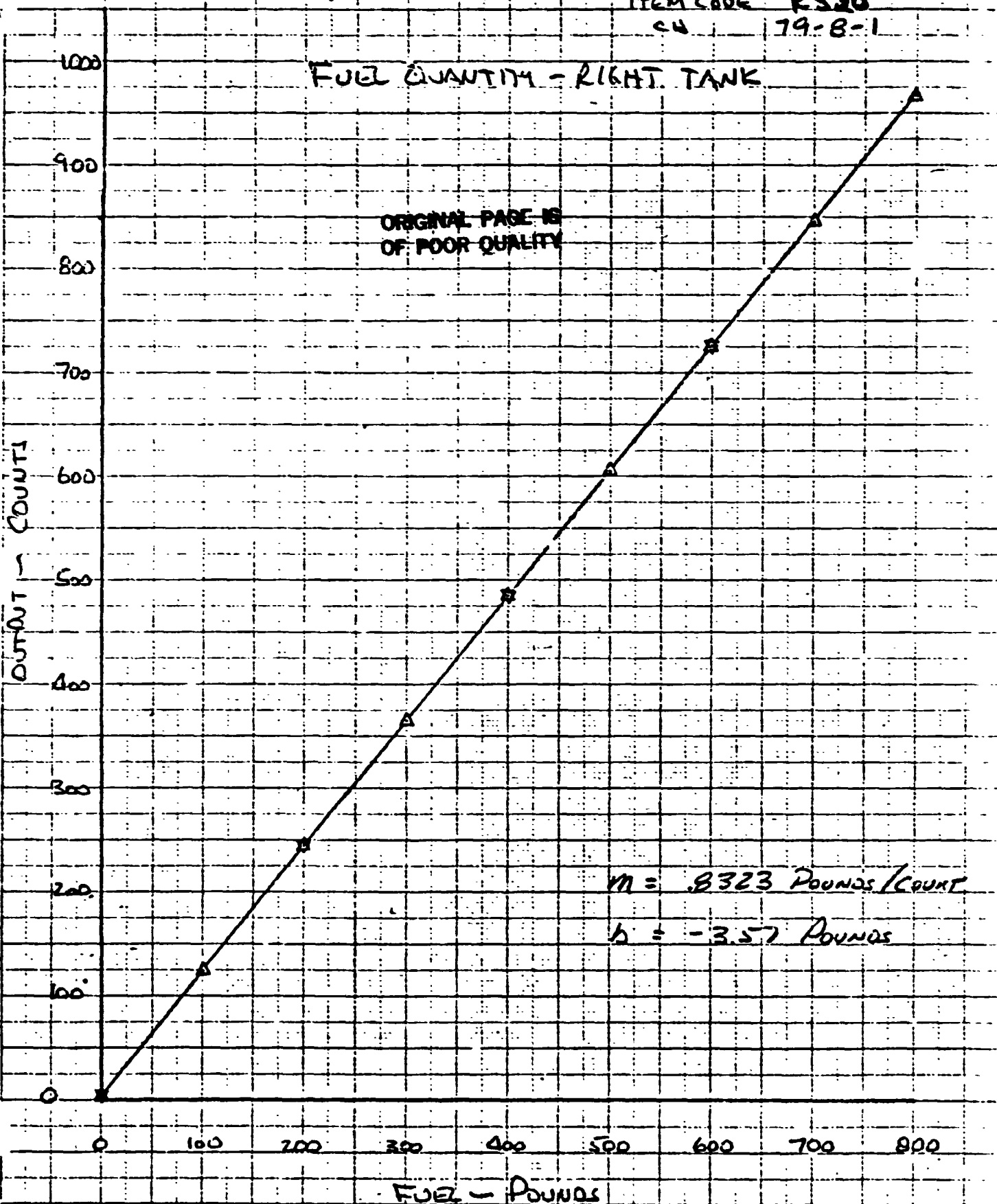
BELL #2 RPT

ITEM CODE R320

CU 79-B-1

FUEL QUANTITY - RIGHT TANK

ORIGINAL PAGE IS
OF POOR QUALITY

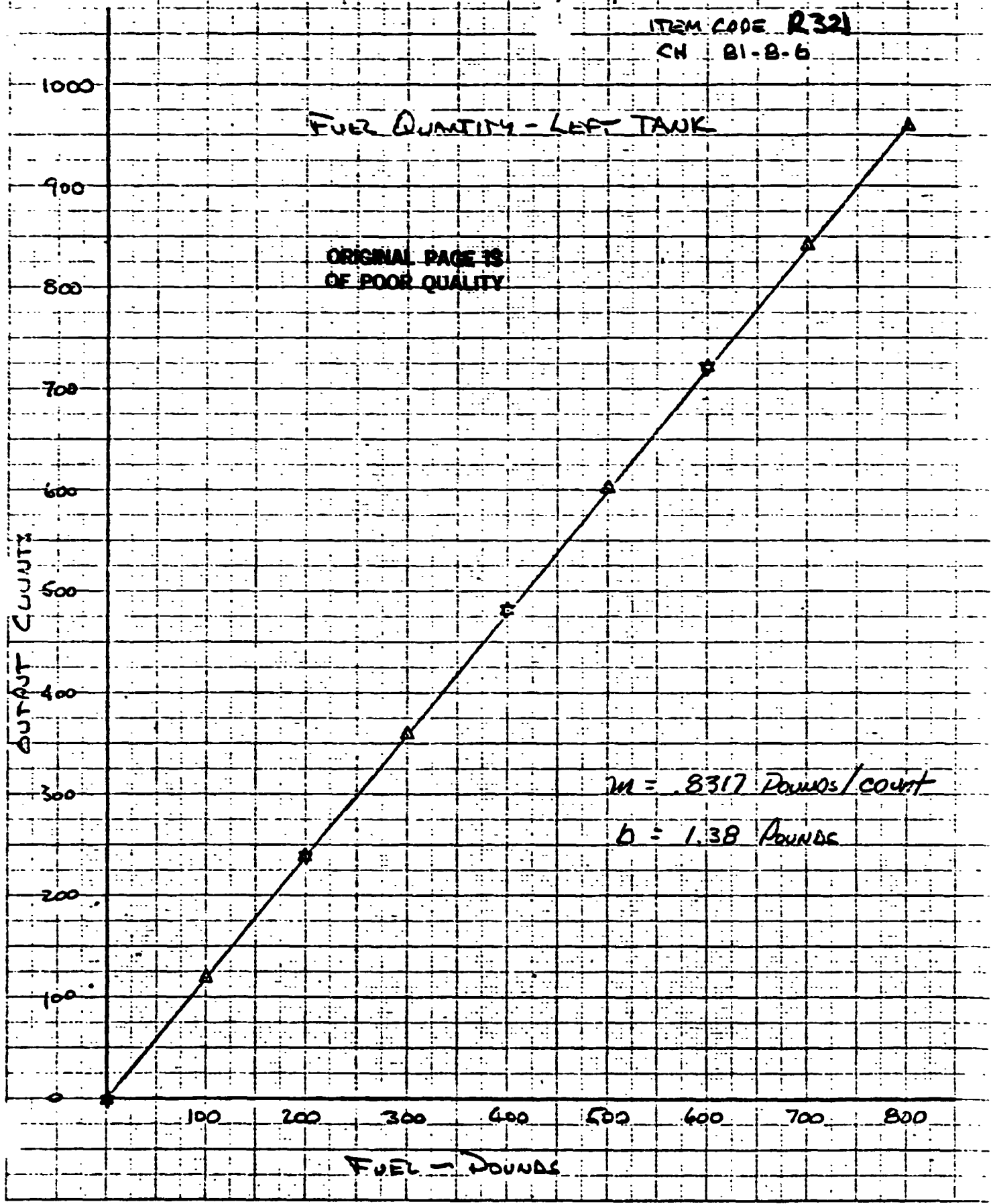


BY MANAGER
CHECKED

BELL HELICOPTER COMPANY

ROBEL 301 PAGE
R11 #2 RPT

ITEM CODE R321
CN B1-B-6



BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE _____

CHECKED Adw

HELI. 142 RPT SKTASW148-1

ORIGINAL PAGE IS OF POOR QUALITY

OAT WIRING

J-Box CP-1

Adw
4-28-72
(BH 112) 279

KPT06-10-6P
TYP OF 2

MARK CONNECTORS: CP1I + CP-1J

MARK: OAT-SIG-22

Disc # J

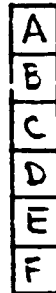


RED

BLACK

Disc # I

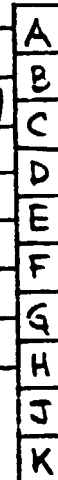
1322



WHITE

BROWN

OAT SIGNAL CONDITIONER



+28 V DC

28 RTN

0-5 V DC

5 V RTN

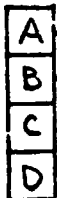
SENSOR

CASE GND

MS3106-145-55

MARK: OAT PROBE-22

OAT PROBE
(MOUNTED ON BELLY OF SHIP)



RED

WHITE

BLACK

BROWN

MOUNTED IN COCK PIT

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-19-78

Project CIRCUIT THERMOCOUPLE TESTS

Lab. No. _____

301 #2

Title DAT.

Serial No. _____

W. O. _____

L. T. R. _____ EWA _____

Part No. _____

Engineer Smith

ITEM CODE: T322

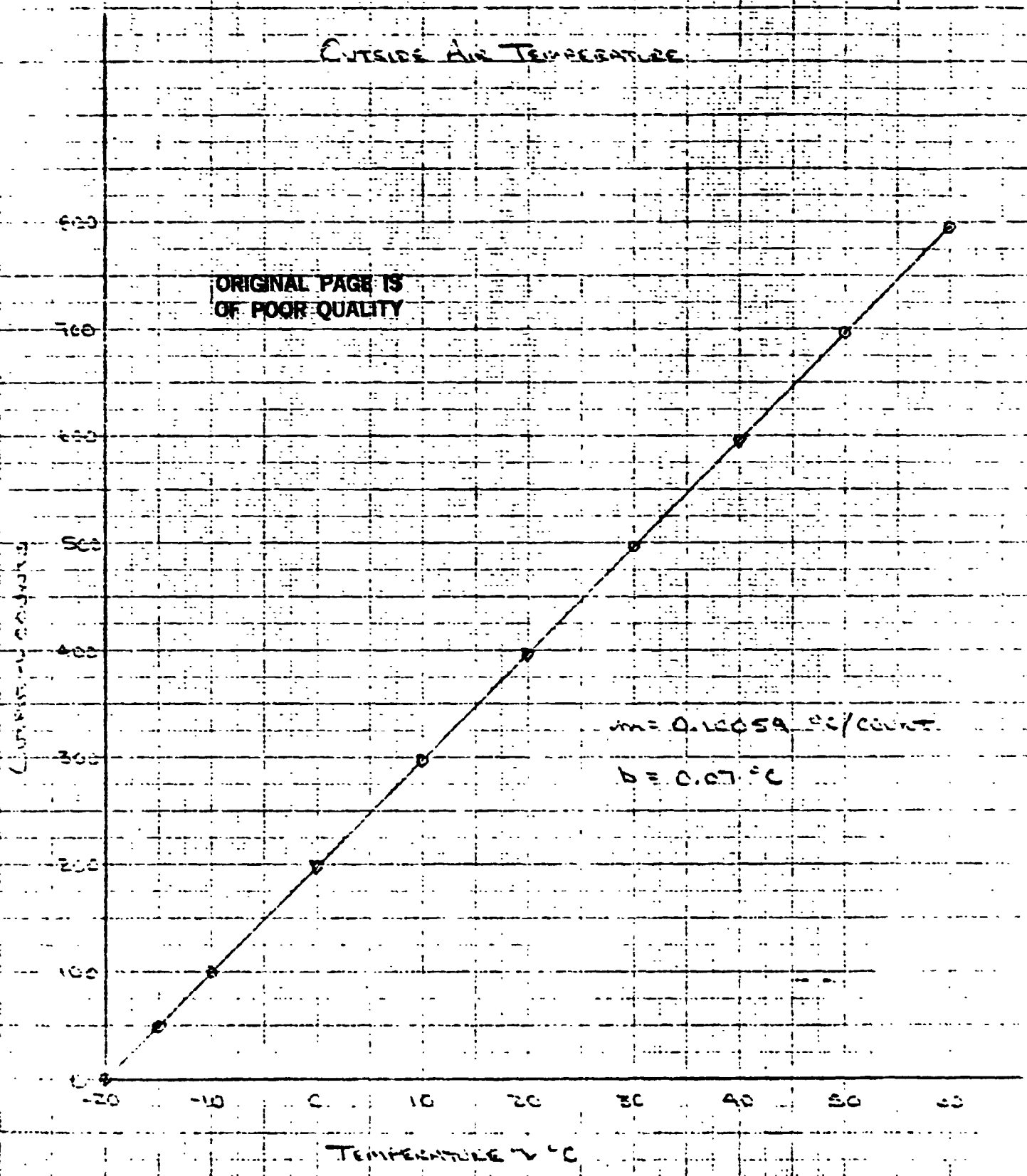
Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Smith</u>					
<u>W. O.</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chen.	<u>RMDU "A" - 80-8-6</u>				
Bridge	<u>C/E T</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Last	Output				
TEMPERATURE (°C)	EQUIVALENT RESISTANCE	COUNT			
		(COUNTS)			
<u>-20</u>	<u>466.69</u>	<u>-203</u>			<u>GPA (82-8-7) = 4</u>
<u>-15</u>	<u>470.66</u>	<u>-154</u>			<u>LLC (83-8-7) = 791</u>
<u>-10</u>	<u>480.35</u>	<u>-104</u>			
<u>0</u>	<u>500.0</u>	<u>-5</u>			
<u>10</u>	<u>519.97</u>	<u>94</u>			
<u>17.5</u>	<u>534.03</u>	<u>169</u>			
<u>20</u>	<u>538.88</u>	<u>193</u>			
<u>30</u>	<u>558.21</u>	<u>294</u>			
<u>40</u>	<u>577.98</u>	<u>394</u>			
<u>50</u>	<u>596.67</u>	<u>493</u>			
<u>60</u>	<u>615.82</u>	<u>592</u>			
<u>70</u>	<u>637.98</u>	<u>694</u>			
<u>80</u>	<u>638.83</u>	<u>793</u>			
<u>17.5</u>	<u>534.03</u>	<u>169</u>			
<u>100</u>	<u>519.97</u>	<u>94</u>			
<u>0</u>	<u>500.0</u>	<u>-5</u>			
<u>-10</u>	<u>480.35</u>	<u>-105</u>			
<u>-15</u>	<u>470.66</u>	<u>-154</u>			
<u>-20</u>	<u>466.69</u>	<u>-204</u>			

OUTSIDE AIR TEMPERATURE

ORIGINAL PAGE IS
OF POOR QUALITY



BY A. WHITEHEAD
CHECKED A. JW

Bell Helicopter **TEXTRON**
Division of Textron Inc.
FIRST OFFICE ONE 400 • FIRST AVENUE, TORONTO, CANADA

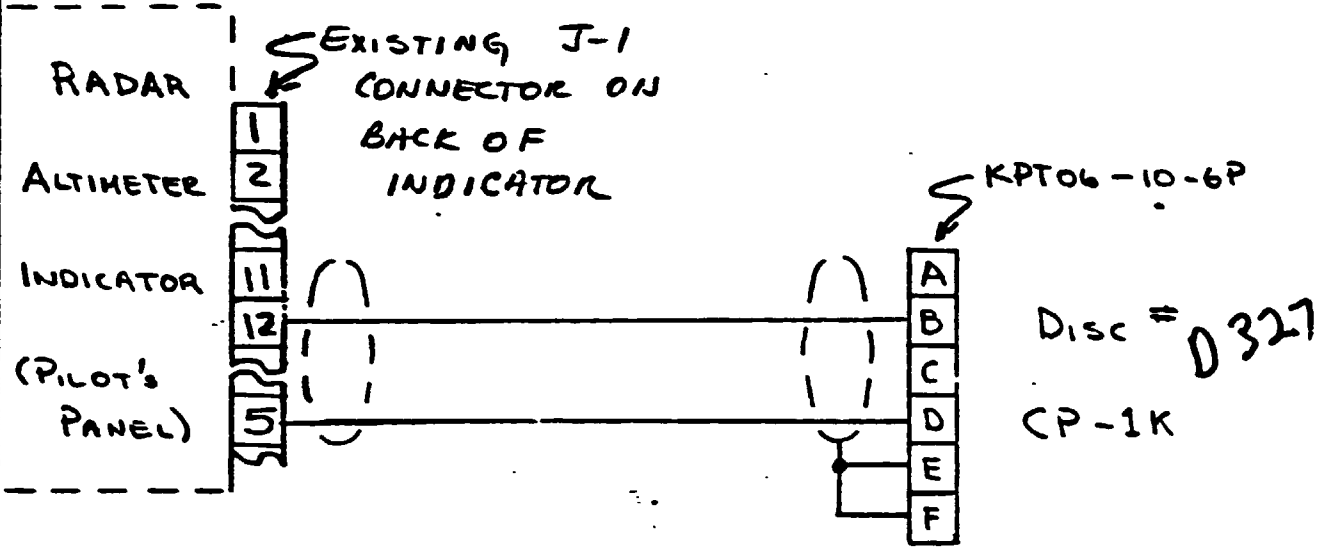
MODEL 301 PAGE 1 of 1
RPT ASW 31877-1

RADAR ALTIMETER CABLE

CP-1

11-15-77
311-76
4-28-78
D327
279

ORIGINAL PAGE IS
OF POOR QUALITY



RADAR ALTIMETER MODULE

W
4-28-78
bh
182 279

ORIGINAL PAGE IS
OF POOR QUALITY

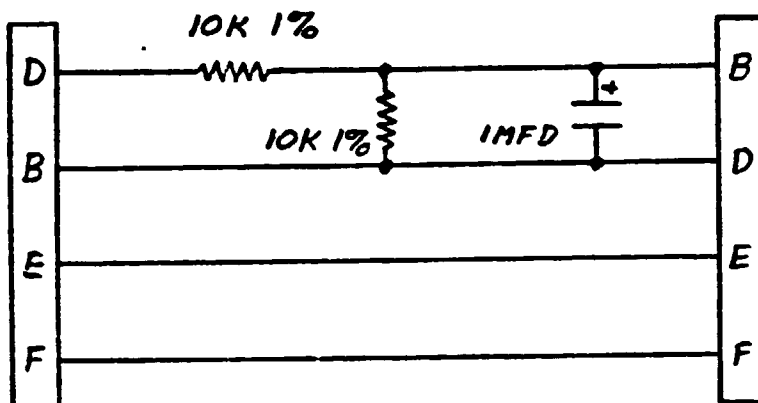
CP-1K

D327

SIGNAL 0 to -10 VDC = 0 to 2500ft.

KPT02-10-65

KPT06-10-6P



BY MAHAJEE

CHECKED

BELL HELICOPTER COMPANY

MODEL 301

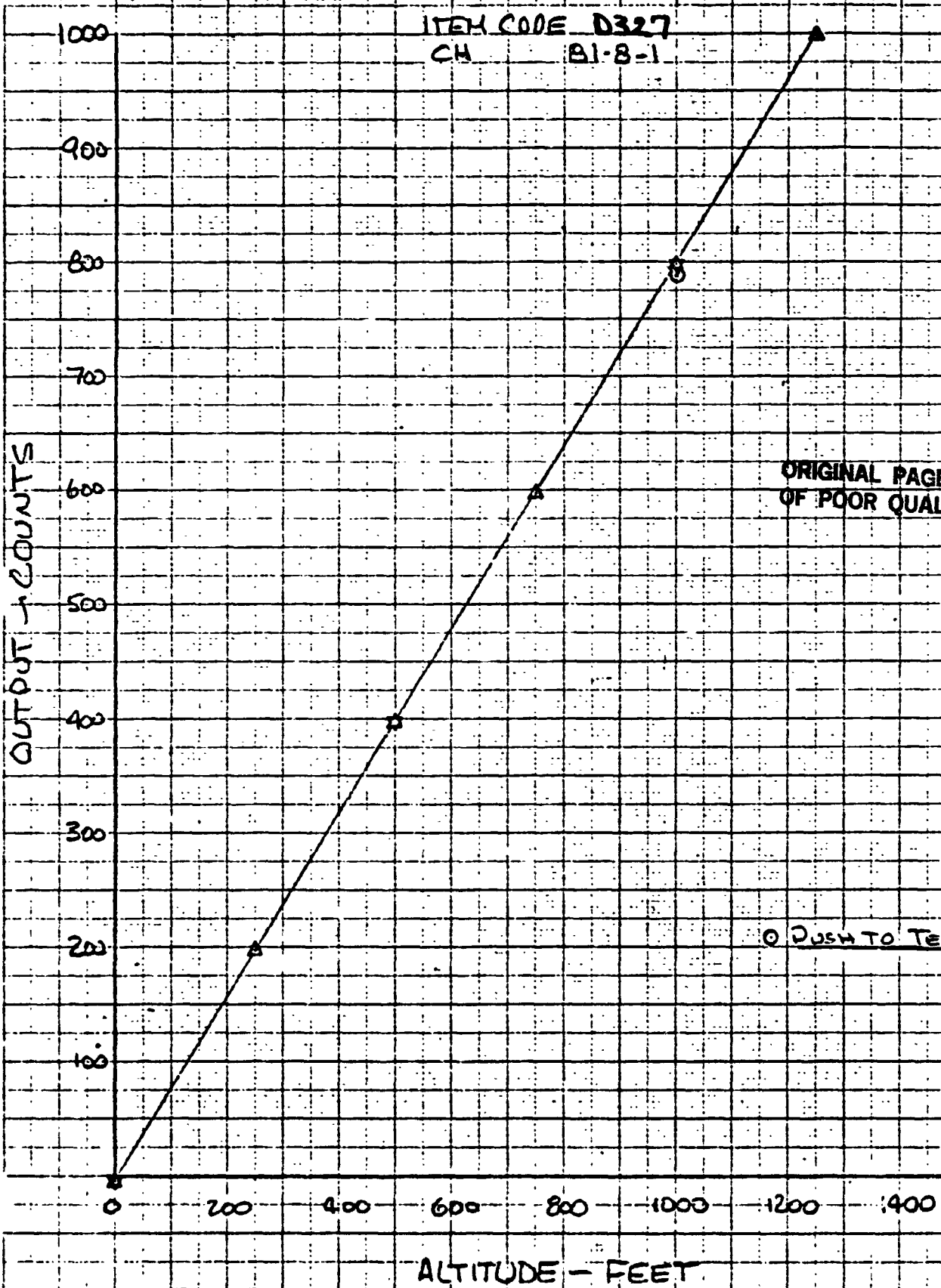
PAGE

REF #2

RPT

RADAR ALTIMETER

ITEM CODE D327
CH B1-8-1



ORIGINAL PAGE IS
OF POOR QUALITY

0 PUSH TO TEST

INSTRUMENTATION LABORATORY

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 688512
EWA NO. A427-11	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11376A
RK ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 301-301-053-49
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF43	SERIAL NO.

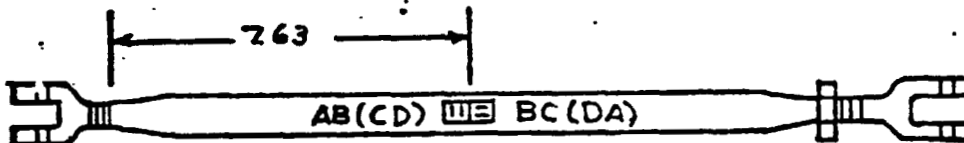
TITLE OF TEST

301 FLIGHT TEST

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

TUBE ASSY, (CYCLIC) F/A



67
182 279

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE _____ AS INDICATED.
 COVER WITH 9309. ATTACH SIX WIRE SIX
 INCH SUPERFLEX LEADS. ENCASE LEADS IN
 VINYL SLEEVING AND TERMINATE WITH KPT-06-B-4P PLUS.

F330
DI

BRIDGE	AXIAL					
SLANCE	4.13					
RES. TO GROUND	10/1mm					
DATE ASSIGNED	12-15-76	TECHNICIAN	C.C.W.	EST. HRS.	APPROVED BY:	
DATE COMPLETED	12-15-76	ENGINEER		ACT. HRS.		

ENTER CHANNEL # 21
1 44.3

ENTER CHANNEL # 21
1 5.28

ORIGINAL PAGE IS
OF POOR QUALITY

ENTER CHANNEL # 28V
ENTER CHANNEL # 2 PROJECT=2301 FLIGHT TEST
PROJECT=301 FLIGHT TEST Tube Assy (cyclic) F/A
DATE=212-15-76
DATE=12-15-76
PART TITLE=2301
PART TITLE=301
PART NUMBER=2301-301-053-49
PART NUMBER=301-301-053-49
SERIAL NUMBER=0N/A
SERIAL NUMBER=0N/A
BRIDGE VOLTAGE =96.0

CH # BRIDGE TYPE LAB-BR # BR.V BR.STA
INPUT CHAN #21
CH 1 : BRIDGE TYPE=2AXIAL
CH 1 : BRIDGE STATION=20
CH 1 LAB-BR NUMBER=2211376A-01
1 AXIAL 11376A-01 6 0
INPUT CHAN #2 LOAD NUMBER =20
PRESS THE 'PRT ALL' KEY
TYPE PULL AXIAL
IS THIS A COUPLE?NO
WILL LOAD BE READ FROM LOAD CELL?NO
LOAD STATION=20
INPUT LOAD UNITS=2LBS
OF LOADS =29
INPUT JACK FACTOR=1.5

LOAD	CHAN	183.3 LBS	366.7 LBS	550.0 LBS	733.3 LBS	916.7 LBS
LOAD 1 =20	0.0					
LOAD 2 =2275						
LOAD 3 =2550						
LOAD 4 =2825						
LOAD 5 =21100						
LOAD 6 =21375						
1	5.3	6.2	7.2	8.2	9.2	10.2

LOAD	CHAN	183.3 LBS	0.0 LBS	0.0 LBS	0.0 LBS	0.0 LBS
LOAD 7 =2825	550.0					
LOAD 8 =2275						
LOAD 9 =20						
1	8.2	6.2	5.3	0.0	0.0	0.0

SELECT NEXT TASK
CHAN 1 TYPE PULL =AXIAL Pos. DATA
BRIDGE TYPE=AXIAL 0(MV) OFFSET= -958.9
LAB-BR NUMBER=11376A-01 UNITY CAL= 1101.252424
BRIDGE VOLT= 6
BRIDGE STA.= 0

LOAD(LBS)	OUTPUT(MV)	LINEARITY	100K CE=	962.2
0.0	5.270	OK		
183.3	6.150	OK		
366.7	7.200	OK		
550.0	8.240	OK		
733.3	9.210	OK		
916.7	10.240	OK		
550.0	8.230	OK		
183.3	6.180	OK		
0.0	5.280	OK		

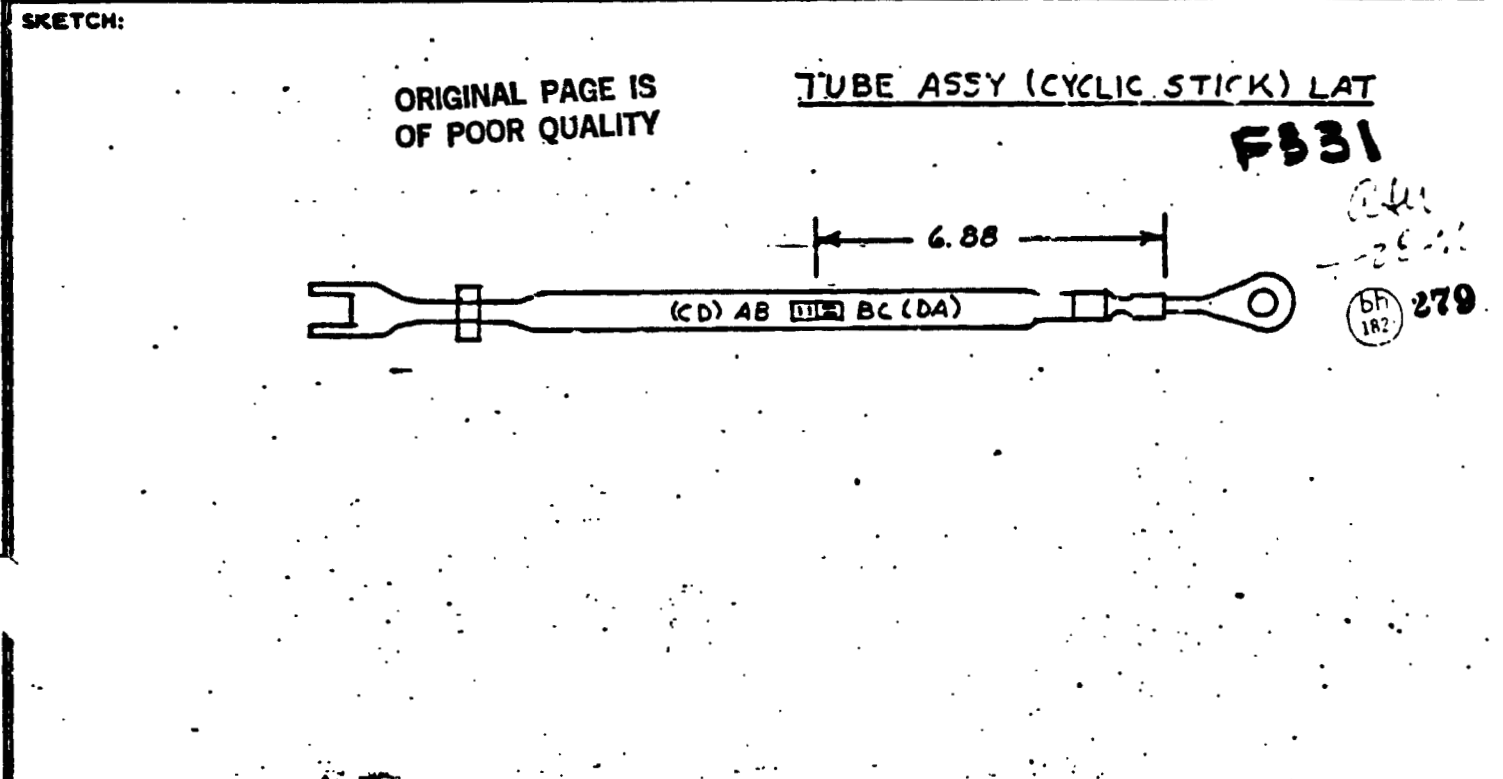
4.97 F330

SELECT NEXT TASK
ENTER CHANNEL # 28V

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-352W	SHEET NO. DLN 678984
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.490	LAB. NO. 10973A
RK ORDER A427	GAGE FACTOR 2.12 ± 1.090	PART NO. 301-301-053-41
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF56	SERIAL NO.

TITLE OF TEST
301 FLIGHT TEST



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH M4P PLUG.

BRIDGE	AXIAL						
BALANCE	4.33						
RES. TO GROUND							
DATE ASSIGNED	6-4-76	TECHNICIAN	C. C. U.		EST. HRS.	APPROVED BY:	
DATE COMPLETED	6-7-76	ENGINEER			ACT. HRS.		

SELECT NEXT TASK

Code :

TYPE PULL = AXIAL (Pos)
BRIDGE TYPE = AXIAL
LAS-OR NUMBER = 10973A 01
BRIDGE VOLT = 10
BRIDGE STR. = 0

DATA
0(MV) OFFSET = -381.1
UNITY CAL = 591.4738428

100K CE = 516.8

285

LOAD	OUTPUT (MV)	LINEARITY (%UC1)
0.0	6.450	0.0
38.0	7.780	0.2
76.0	9.130	0.1
114.0	10.500	0.0
152.0	11.840	0.0
190.0	13.230	0.0
228.0	14.490	0.0
266.0	7.800	0.0
304.0	6.460	0.0

6.78 F331

SELECT NEXT TASK

CALIBRATION REPORT

IDENT = 101 FLIGHT TEST
TITLE = LFT. CYCLIC TUBE ASSY.
DATE = JUNE 22, 1976

PART NUMBER = N/A
SERIAL NUMBER = N/A

N	LAS-OR#	BR TYPE	STATN	UNITY CAL	100K CE	MAX LOAD	LIN	NTLY
1	10973A 01	AXIAL	0.0	591.5	516.8	100	OK	OK

OK
100

ORIGINAL PAGE IS
OF POOR QUALITY

INSTRUMENTATION LABORATORY WORK SHEET

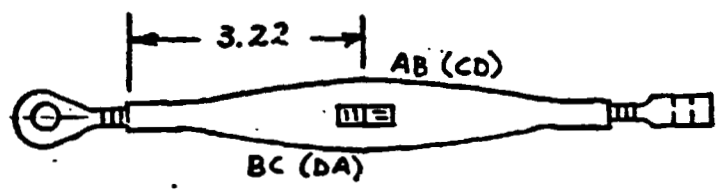
MODEL NO. 301	GAGE TYPE EA-13-125TB-310	SHEET NO. DLN 678737
FWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10974A
ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 301-301-053-013
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF56	SERIAL NO.

TITLE OF TEST: **301 FLIGHT TEST**

SKETCH: ORIGINAL PAGE IS OF POOR QUALITY TUBE ASSY (PEDAL FORCE)

F333

200
6-20-76
bh
182 279



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH M4P PLUG.

F333

01

BRIDGE	AXIAL						
LANCE	4.45						
S. TO GROUND	1Kma						
DATE ASSIGNED	6-4-76			TECHNICIAN	C.C.W.		EST. HRS.
DATE COMPLETED	6-7-76			ENGINEER			APPROVED BY:
							ACT. HRS.

COLLECT NEXT TASK

CHAN 1

TYPE PULL = ANIMAL (Pas)
BRIDGE TYPE = ANIMAL
LAB-REF NUMBER = 1-0740-01
BRIDGE VOLT = 10
BRIDGE STR. = 0

DATA
OCHV) OFFSET = -306.5
UNITY CAL = 530.8173240

100K CE = 507.5

<u>LBS</u>	OUTPUT (MV)	LINEARITY (%UC1)
0.0	5.350	0.0
150.0	7.820	0.5
300.0	10.420	0.2
450.0	13.030	0.1
600.0	15.630	0.1
750.0	18.230	0.0
900.0	20.830	0.2
1050.0	23.430	0.5
1200.0	26.030	0.0

12.88

F333

ORIGINAL PAGE IS
OF POOR QUALITY

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 679754
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10975A
K ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 301-301-053-013
REQUESTED BY: A. WHITENER	LOT NO. Q-A18AF 56	SERIAL NO.

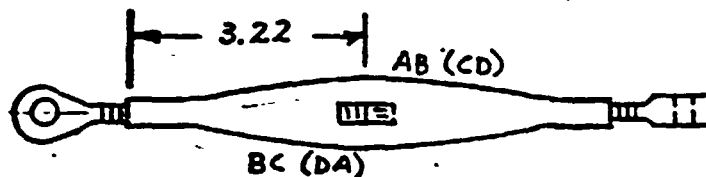
TITLE OF TEST **301 FLIGHT TEST**

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

TUBE ASSY (PEDAL FORCE)

F334



Handwritten notes:
Lili
4-25-76
bh
182
279

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER
WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX
LEADS. ENCASE LEADS IN VINYL SLEEVING AND
TERMINATE WITH M4P PLUG.

Handwritten:
F-334
01

BRIDGE	AXIAL					
RESISTANCE	3,60					
Ω TO GROUND	1K _{min}					
DATE ASSIGNED	6-4-76	TECHNICIAN	C. C. W.	EST. HRS.	APPROVED BY:	
DATE COMPLETED	6-7-76	ENGINEER		ACT. HRS.		

UNIT 2

TYPE FULL = ANIAL (Pos)
BRIDGE TYPE = ANIAL
LAD-DR NUMBER = 10075A-01
BRIDGE VOLT = 10
BRIDGE STA. = 0

DATA
0-MV OFFSET = -335.4
UNITY CAL = 598.2117092

100K CE = 513.9

285

INPUT (MV)	OUTPUT (MV)	LINEARITY (UCLD)
0.0	14.250	0.0
150.0	16.720	0.4
300.0	19.330	0.1
450.0	21.860	0.1
600.0	24.410	0.0
750.0	26.990	0.0
900.0	29.580	0.1
1050.0	32.180	0.4
1200.0	34.790	0.0

12.73 F 334

ORIGINAL PAGE IS
OF POOR QUALITY

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301

PAGE 1 OF 2

CHECKED RLW

HELI. 1+2 RPT SKASW04375-1

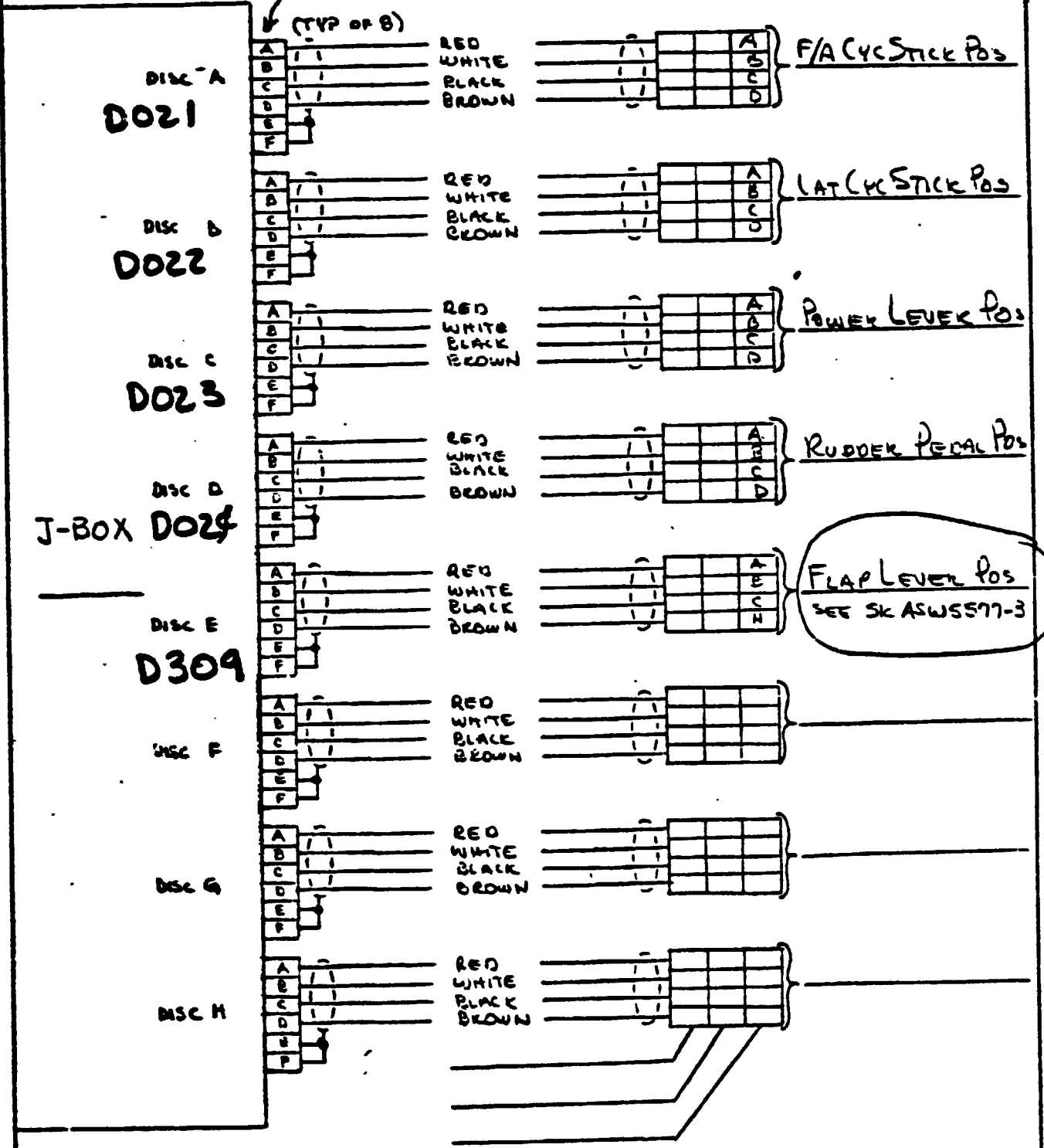
ORIGINAL PAGE IS OF POOR QUALITY

DISCONNECT HARNESS

J-Box Location CP-2

RLW
4-28-72
(DRI) 279

KPT06-10-6P



7948 5508REV 100

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 2 OF 2

CHECKED AW

HELI. 1+2 RPT SKASWD4375-1

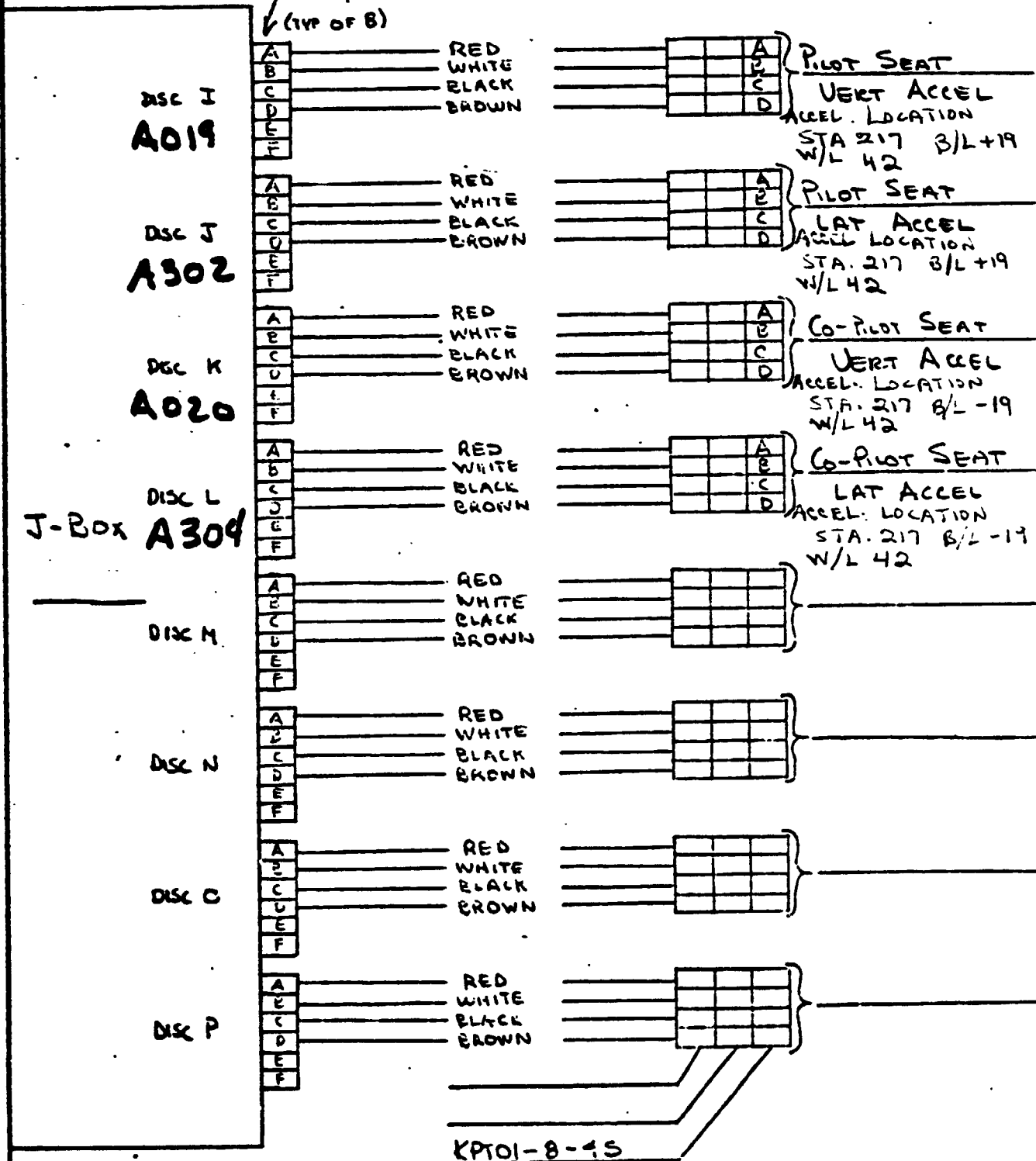
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

111
4-28-92
bh
182 279

J-Box LOCATION CP-2

KPT06-10-6P



7048 0000REV 100

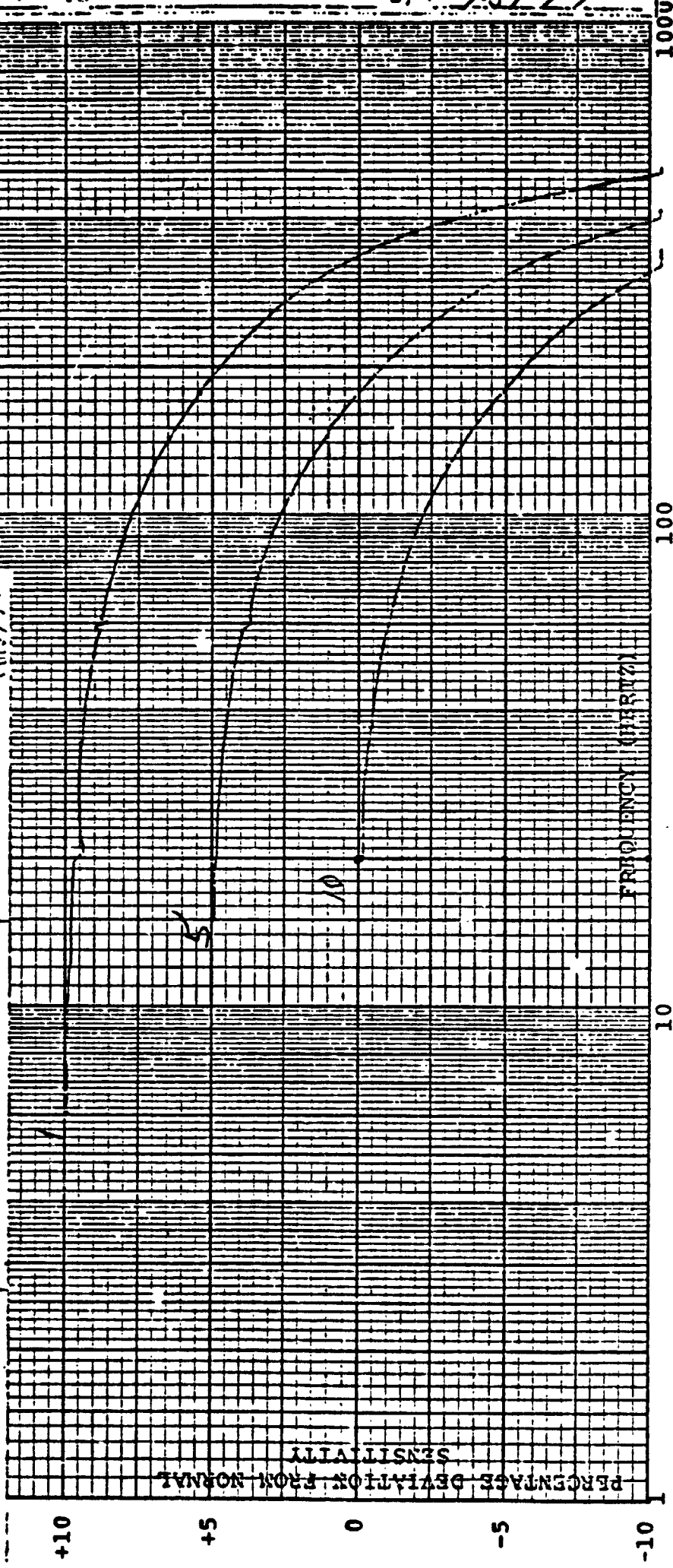
CP-21
 B A 09

ACCELEROMETER CALIBRATION

TYPE A697E-10 RANGE 10 G DATE 3-2-78
 EXCITATION (V) 6.001 NOMINAL SENS (S) 2.89 (mv/G)
 RESISTANCE, A-C 380.0 ohm, B-D 340.2 ohm, Tech. 256

2G INVERSION (REF ONLY)	SHUNT CAL	UNITY CAL
+1 <u>2.95</u> mv	100K C.E. = $\frac{5.06 \text{ mv}}{S}$	U.C. = $\frac{V}{S}$
-1 <u>2.99</u> mv	100K C.E. = <u> </u> G	U.C. = <u> </u>
Avg <u>2.97</u> (mv/G)		

ORIGINAL PAGE IS
 OF POOR QUALITY



A302
PCP-23

4-10-78 SMITHHART 15856

ACCELEROMETER CALIBRATION

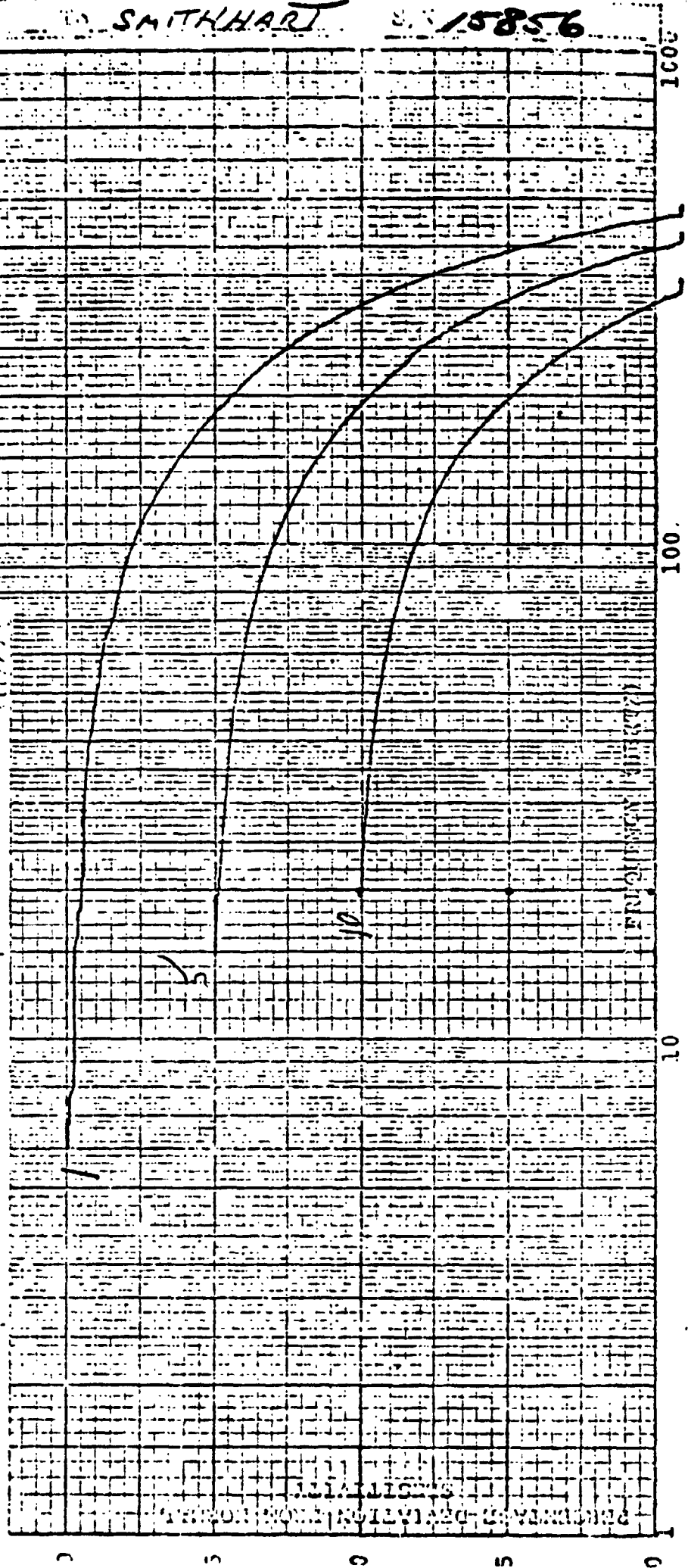
PE 0697C-10-350 RANGE 17 G DATE 4-7-78

VOLTAGE (V) 6.006 NOMINAL SENS (S) 2.190 (mv/g)

SISTANCE, A-C 433.4 ohm, B-D 327.0 ohm, Tech. 16-

ORIGINAL PAGE IS
OF POOR QUALITY

INVERSION (REF ONLY)	SHUNT CAL	UNITY CAL
<u>+2.26</u> mv	100K C.E. = $\frac{4.64}{S}$ mv	U.C. = $\frac{V}{S}$
<u>-2.23</u> mv	100K C.E. = <u>2.119 G</u>	U.C. = <u>2.742</u>
<u>2.245</u> (mv/g)		



A020
Bcpak

Issue Date 4-10-78 To SMITH HALL SN 15857

ACCELEROMETER CALIBRATION

Model A697C-10-330 RANGE 10 G DATE 4-7-78

Excitation (V) 6.010 NOMINAL SENS (S) 2.192 (mv/G)

Resistance, A-C 404.4 ohm, B-D 314.5 ohm, Tech. 23

INVERSION (REF ONLY)

2.28 mv
-2.23 mv

SHUNT CAL

100K C.E. = $\frac{4.73 \text{ mv}}{S}$

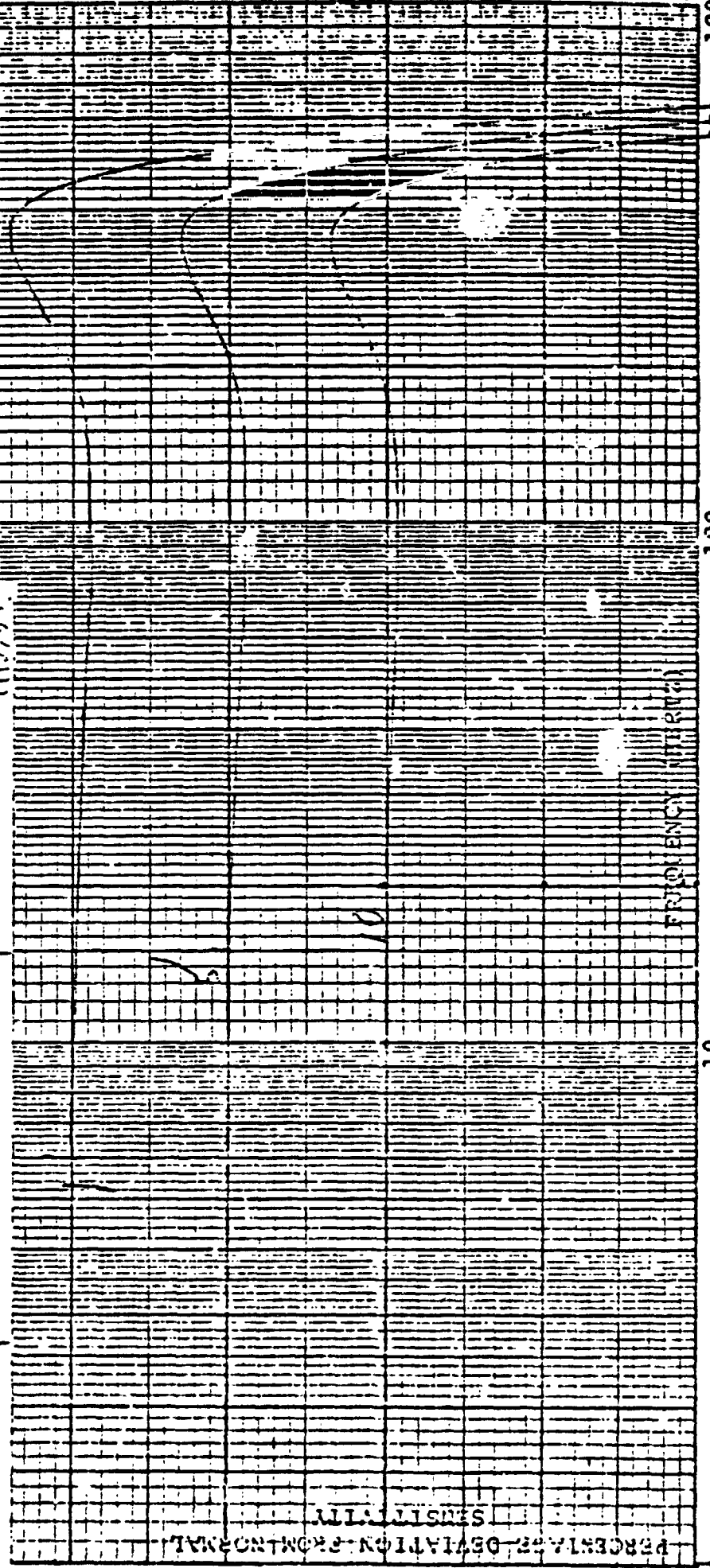
2.255 (mv/G)

UNITY CAL

U.C. = $\frac{V}{S}$

U.C. = 2.742 G (mv/G)

ORIGINAL PAGE 6
OF 1000 QUALITY



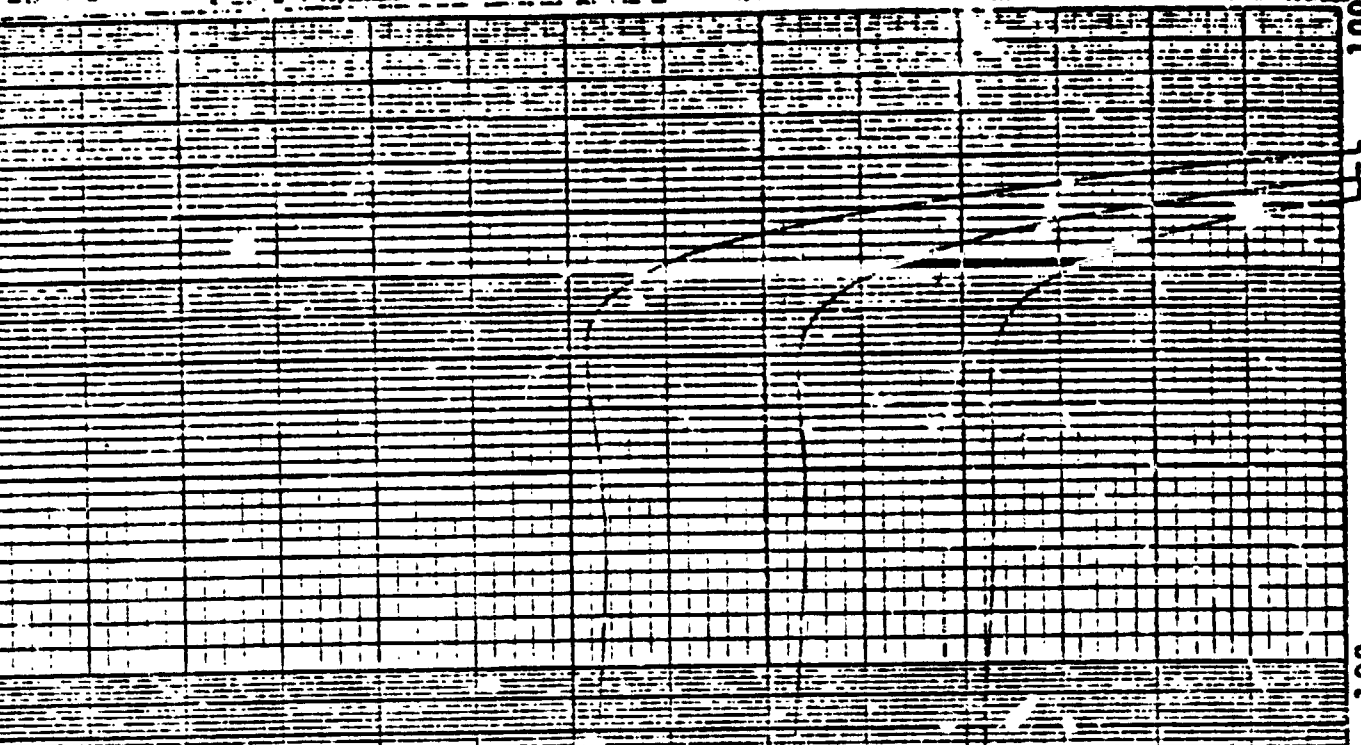
1000
100
10
1000
100
10

Issue Date 4-10-78

To SMITHSONIAN

S/N 15858

A 304
B CP-21



MODEL 10-350 RANGE 10 G DATE 4-7-78
 ACCELEROMETER CALIBRATION
 SENSITIVITY (V) 6.008 NOMINAL SENS (S) 2.260 (mv/G)
 RESISTANCE, A-C 2 ohm, B-D 328.2 ohm, Tech. ZC

ORIGINAL PAGE IS OF POOR QUALITY

UNITY CAL

$$U.C. = \frac{V}{S}$$

SHUNT CAL

$$100X C.E. = \frac{4.98 \text{ mv}}{S}$$

$$100X C.E. = 2.203 G$$

$$U.C. = 2.658 G$$

INVERSION (V ONLY)

2.35 mv
2.29 mv

2.32 (mv/G)

PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

10

100

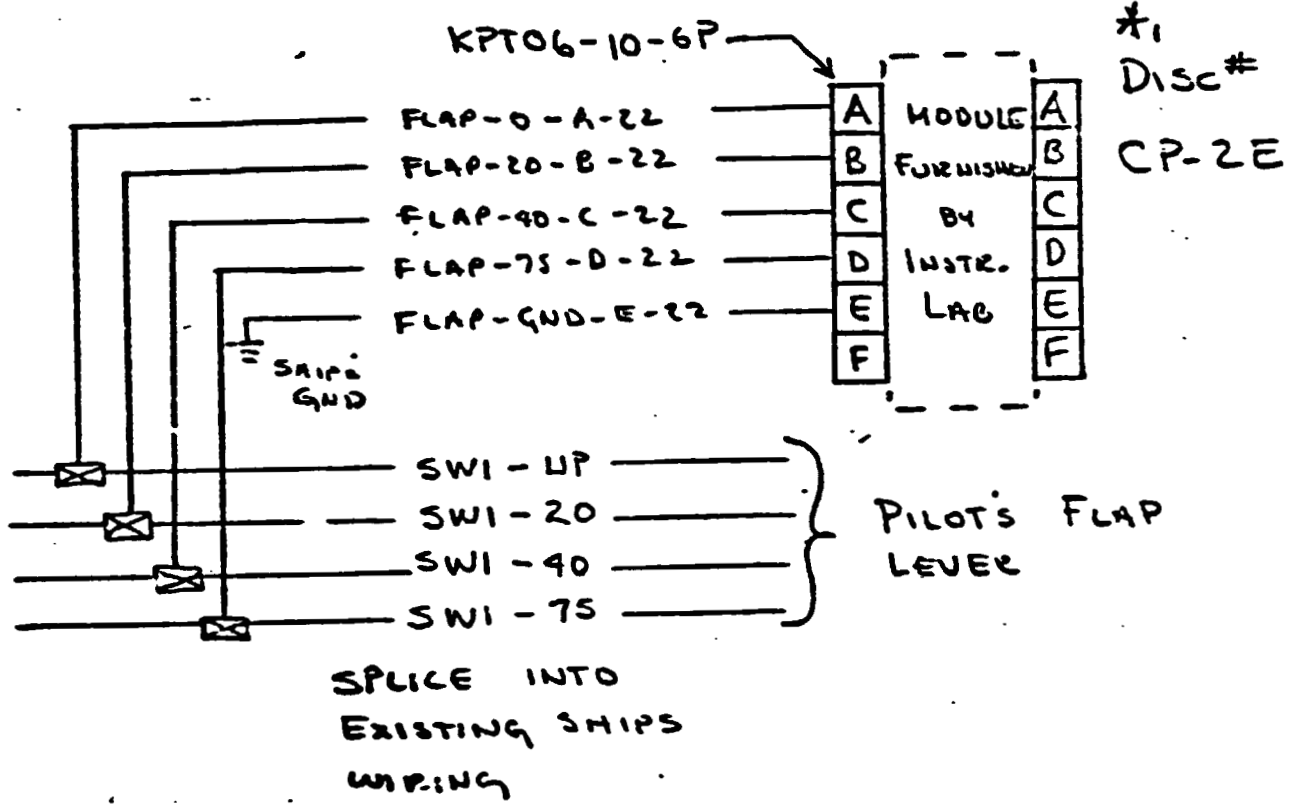
1000

ili
 4-28-78
 (b1) 279
 (182)

PILOT'S FLAP LEVER POS

D309

ORIGINAL PAGE IS
 OF POOR QUALITY



* CABLE MAY BE ALREADY ROUTED IN SHIP (IT WILL A 4-CONDUCTOR SHIELD) IN THIS CASE USE SHIELD AS GND (PINE) AND RED - WHITE - BLACK - BROWN (GREEN) COLOR TO A-B-C-D PINS IN CONNECTOR

BY A. WHITE/EN

Bell Helicopter **HELI-CORP**
Division of Sperry Inc.

MODEL _____ PAGE _____

CHECKED _____

POST OFFICE BOX 400 • FORT WORTH, TEXAS 76101

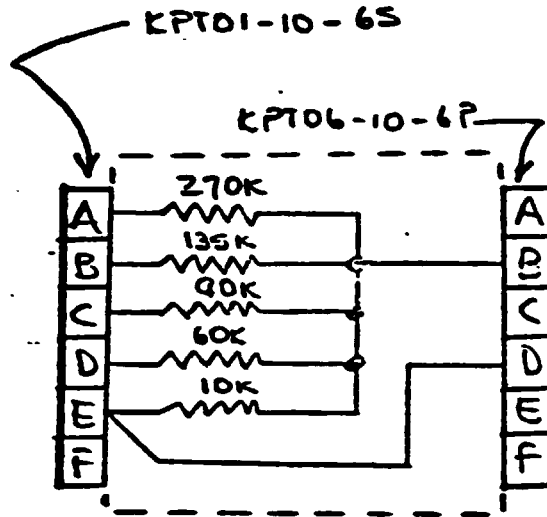
RPT _____

ORIGINAL PAGE IS
OF POOR QUALITY

Calli
4-25-78
(bh 182) 279

*PILOT'S FLAP LEVER POS
ATTEN. MODULE*

D309



BY D.P. Smith
CHECKED

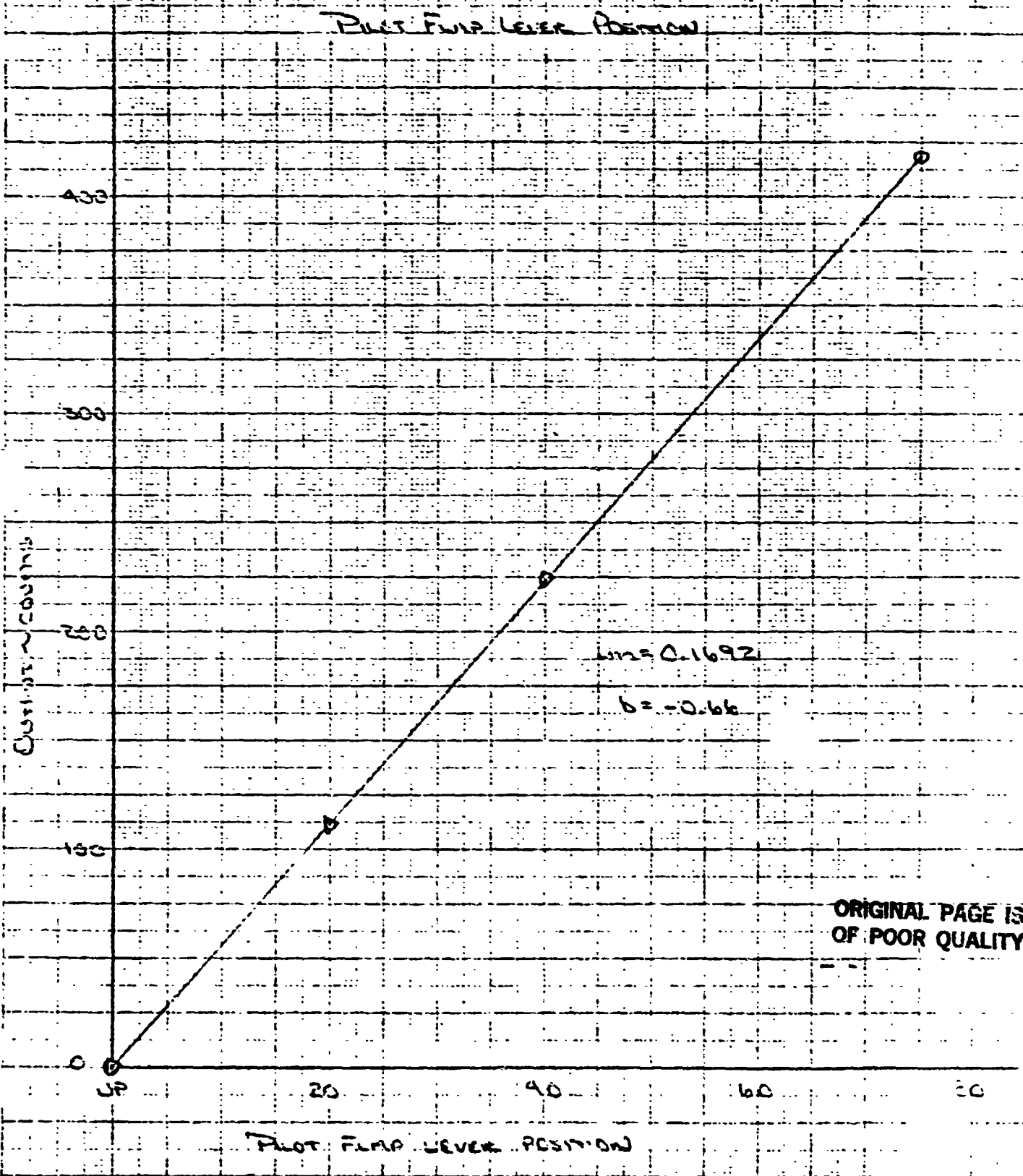
Bed Helicopter 12100N

MODEL 301

PAGE

ITEM CODE: D309

PILOT FLAP LEVER POSITION



ORIGINAL PAGE IS
OF POOR QUALITY

BY Smithhart
CHECKED _____

Bell Helicopter TEXTRON
Division of Textron Inc.
POST OFFICE BOX 400 - POST OFFICE TOWER TOWER

MODEL XV-15 PAGE _____
RPT 6-22-78

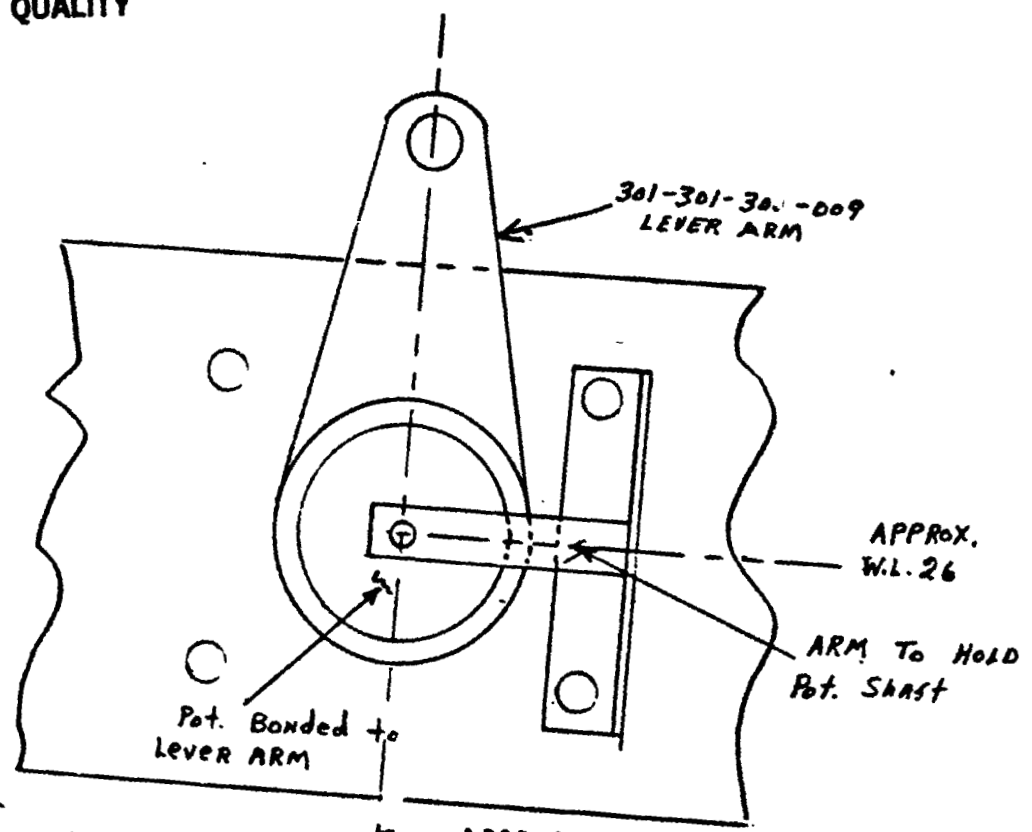
301 #2

F/A Stick Position

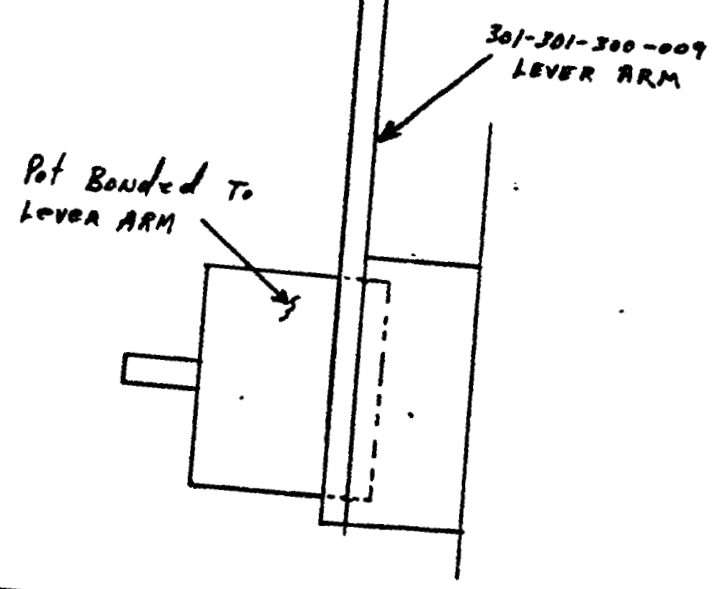
D021

ORIGINAL PAGE IS
OF POOR QUALITY

APPROX. STA. 212



APPROX.
B.L. 16

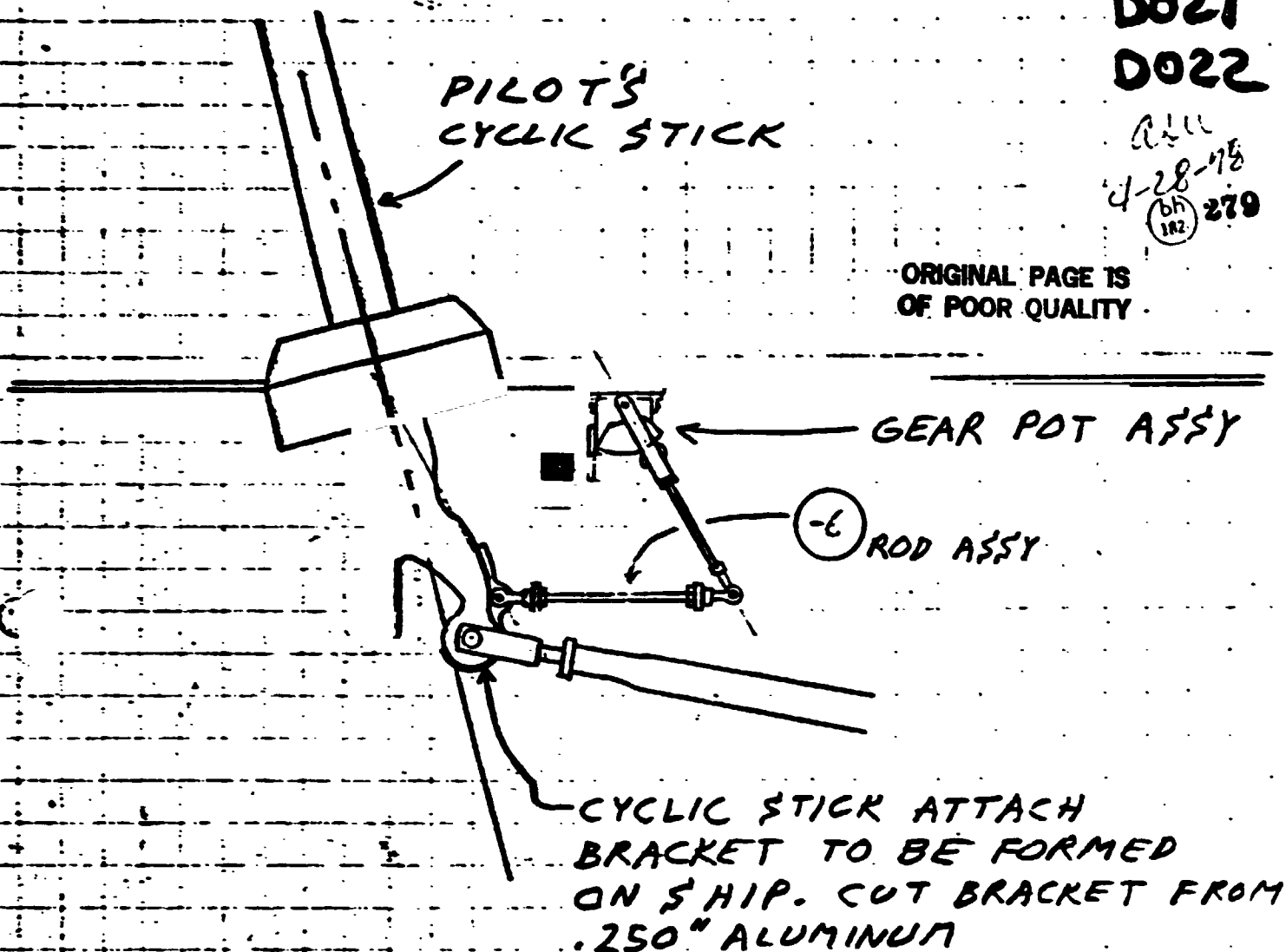


CYCLIC \$TICK POSITION GEAR/POT ASSY

D021
D022

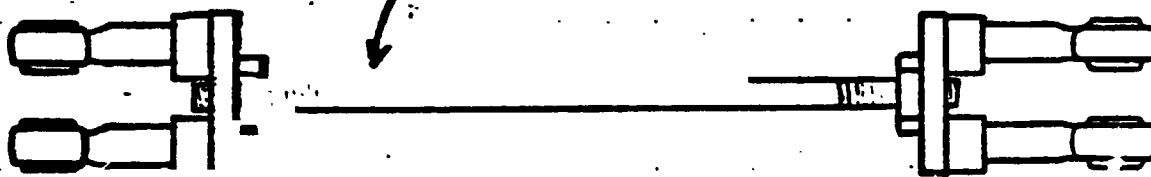
ALL
4-28-75
bh
182
279

ORIGINAL PAGE IS
OF POOR QUALITY



-6 ROD ASSY

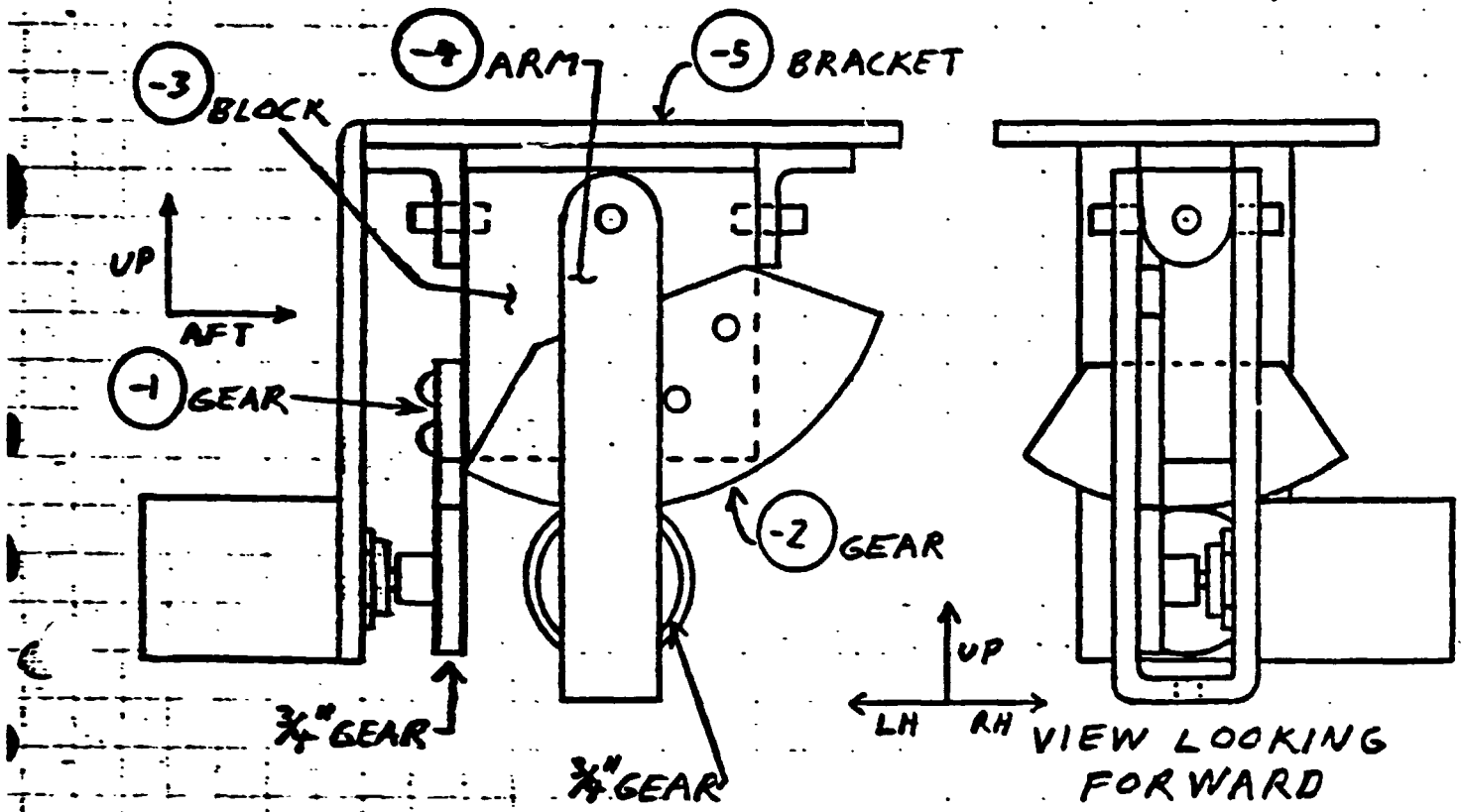
LENGTH TO BE
DETERMINED



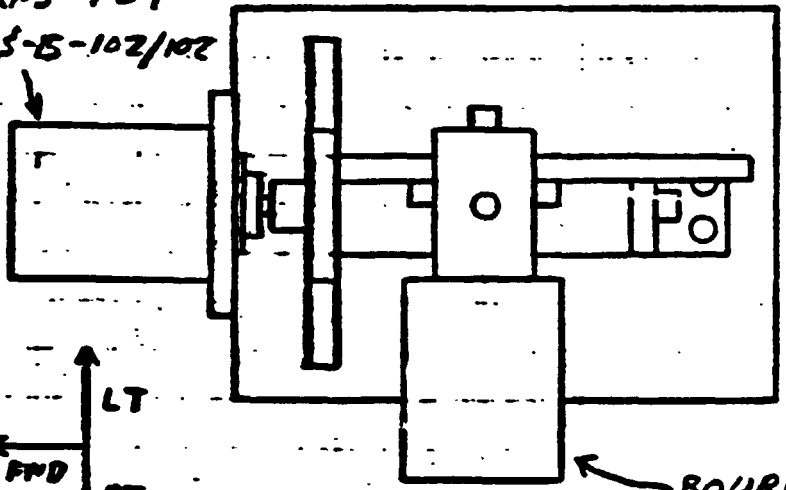
ROD ENDS (4 PL)

CYCLIC TICK POSITION GEAR/POT ASSY

0021
11-22



BOURNS POT
35355-5-102/102



LT

RT

FWD

VIEW LOOKING UP

BOURNS POT
35355-15-102/102

ORIGINAL PAGE IS
OF POOR QUALITY

ITEM COOL D021

feet

1258

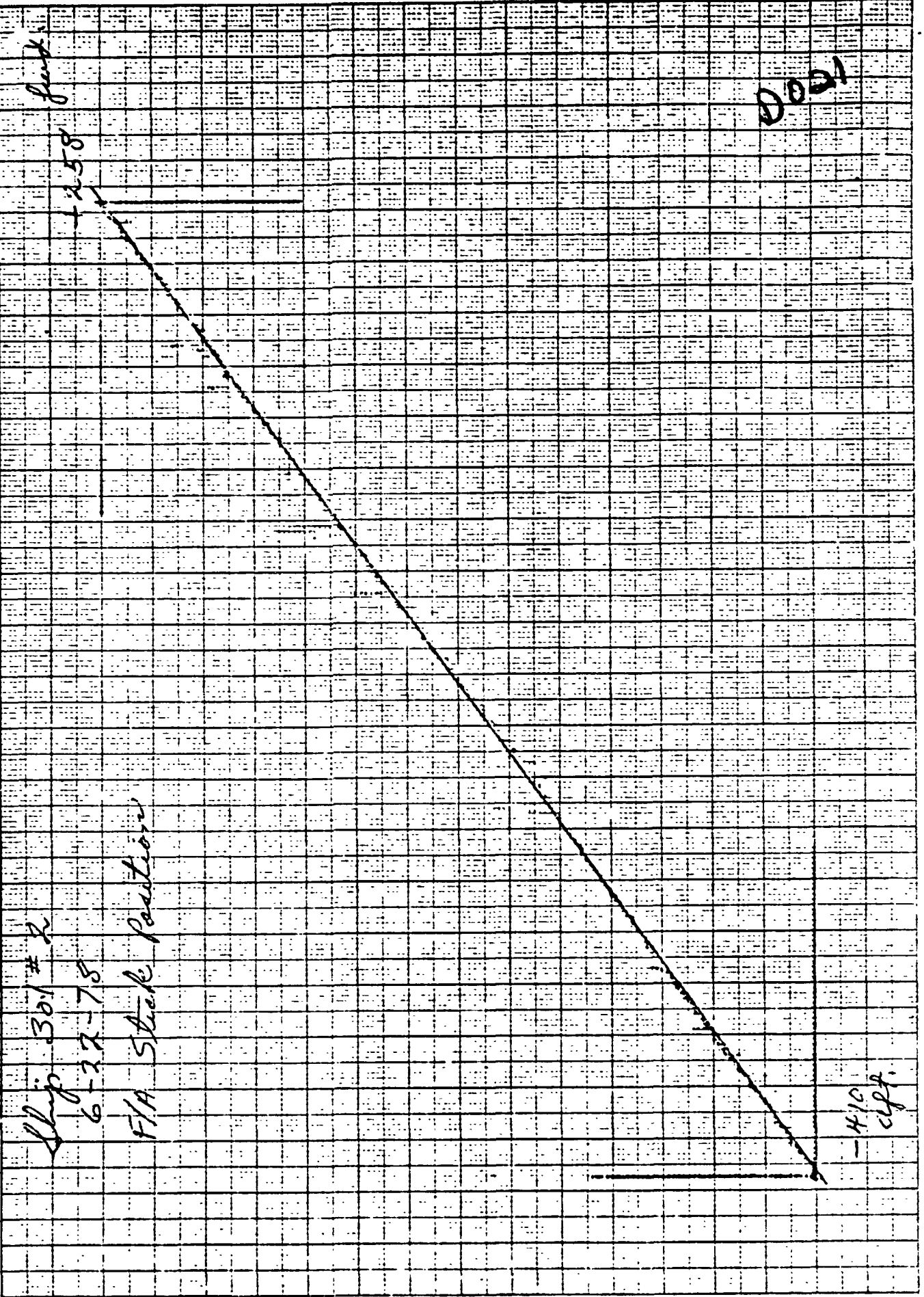
Ship 301 # 2

6-22-75

F/A Stock Position

D021

- HIC
clp.



TIME CODE: D022

204501
RBY
11/10/03 V12+

D022

Whip 301 #2

6-15-78

External Stick Position

V
7

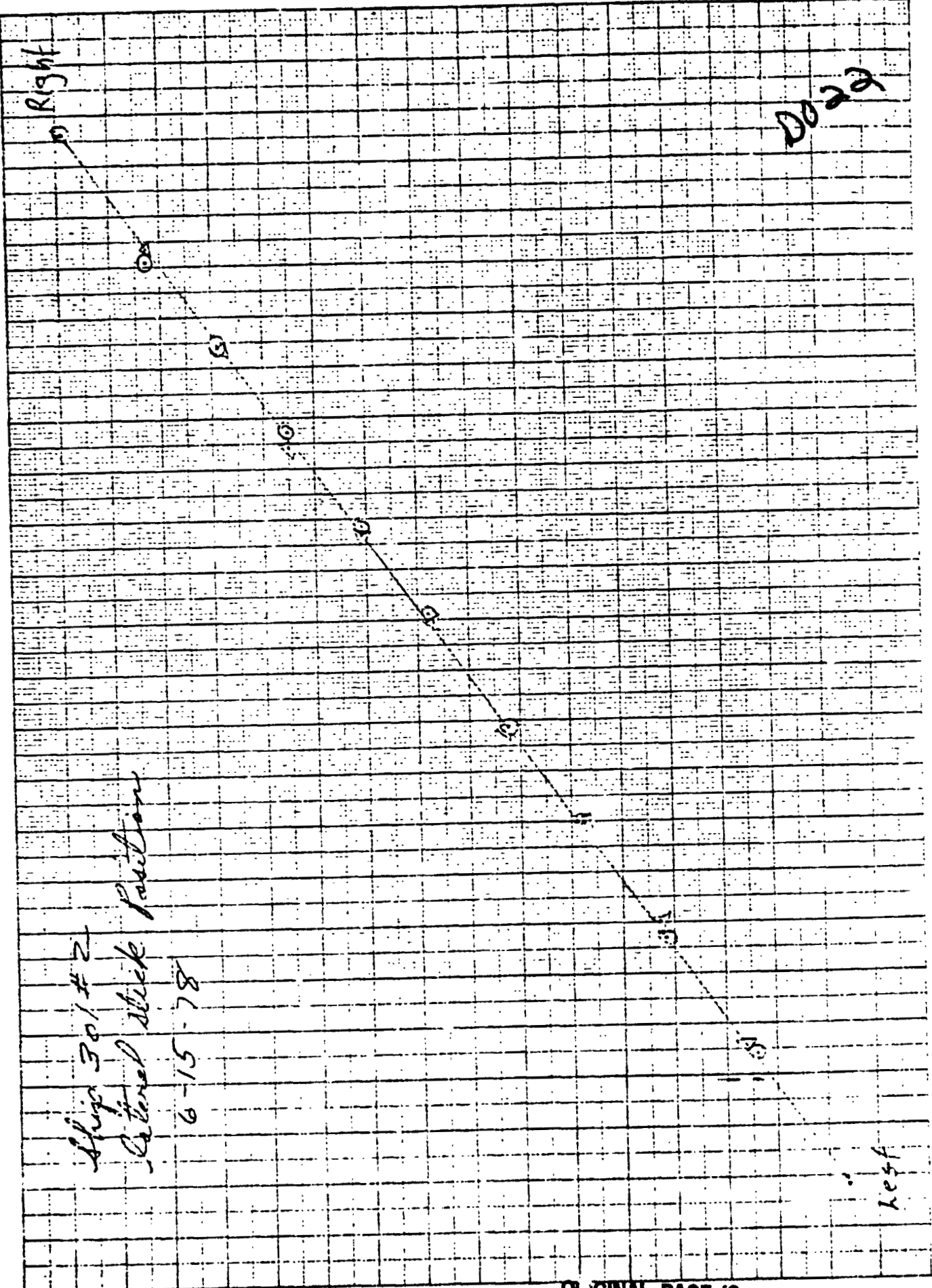
NO2 EQUATE
1534

Top of Page Dozz

Right

Dozz

Ship 301 #2
Lateral Stick Position
6-15-78



ORIGINAL PAGE IS OF POOR QUALITY

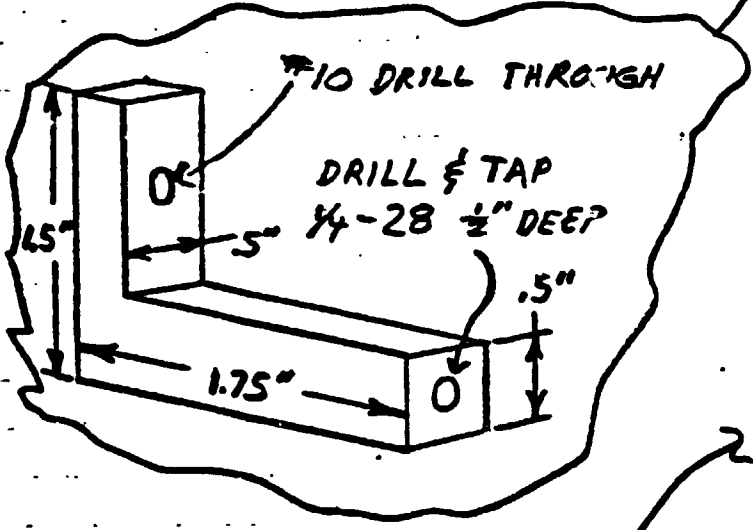
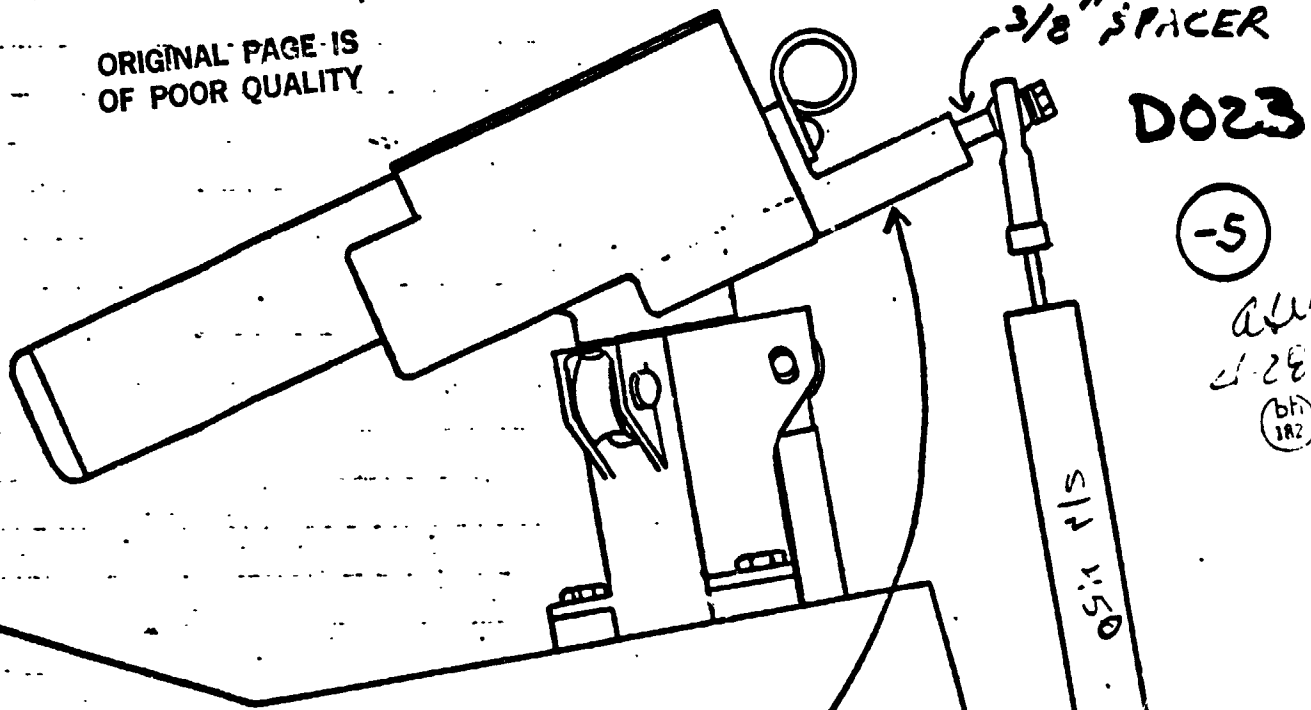
POWER LEVER POSITION POT

ORIGINAL PAGE IS OF POOR QUALITY

D023

(-5)

all
4-28-78
b7c 279



3/8\" SPACER

1/4\" CONSOLE

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-12

Lab. No. _____

Serial No. _____

Part No. _____

Engineer S.M. TH

ITEM CODE: D023

W. U. 301-2

Project GROUND TIEDOWN TEST

Title PULL POWER LEVER POSITION

L. T. R. EWA

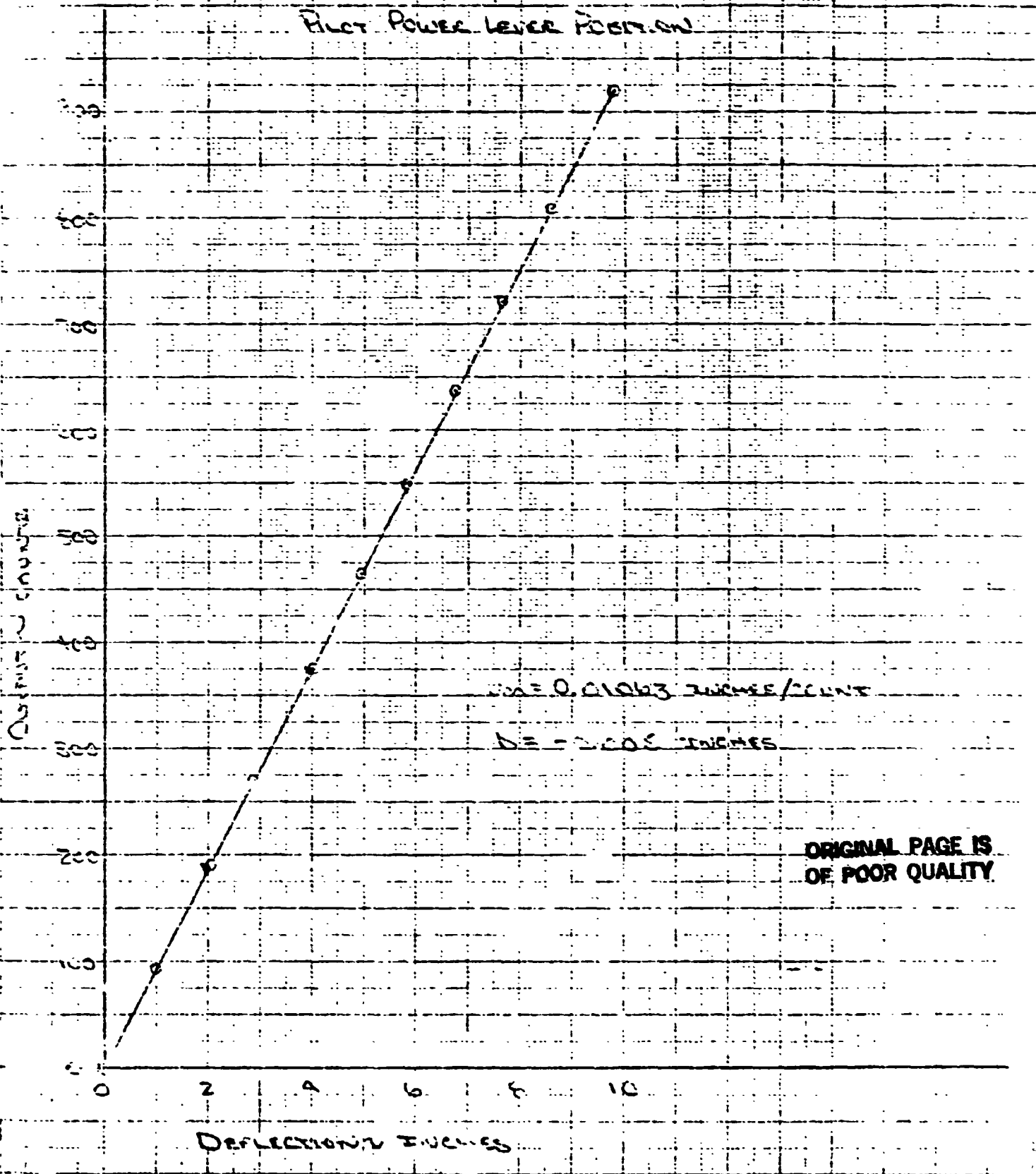
Technician	Lab. Notebook No.	Instruments	Serial No.	I es.	Galvo.
<u>S.M. TH</u>					
<u>LEINHEIMER</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RM DU "B" - 78-8-3</u>				
Bridge	<u>C/S 7</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Load	Input	Output
VISUAL IND. (%)	DEFLECTION (INCHES)	CURRENT (MA)
0	2.45	-516
10	3.46	-422
20	4.49	-325
30	5.33	-245
40	6.45	-141
50	7.36	-51
60	8.26	39
70	9.21	122
80	10.1	206
90	11.04	293
100	12.26	404
80	10.1	265
60	6.25	32
40	6.4	-145
20	4.42	-329
0	2.43	-516
GPA (57.0-7) =		
LLC (53.8-7) =		

ITEM CODE: 0023

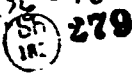
PLCT POWER LEVER POSITION



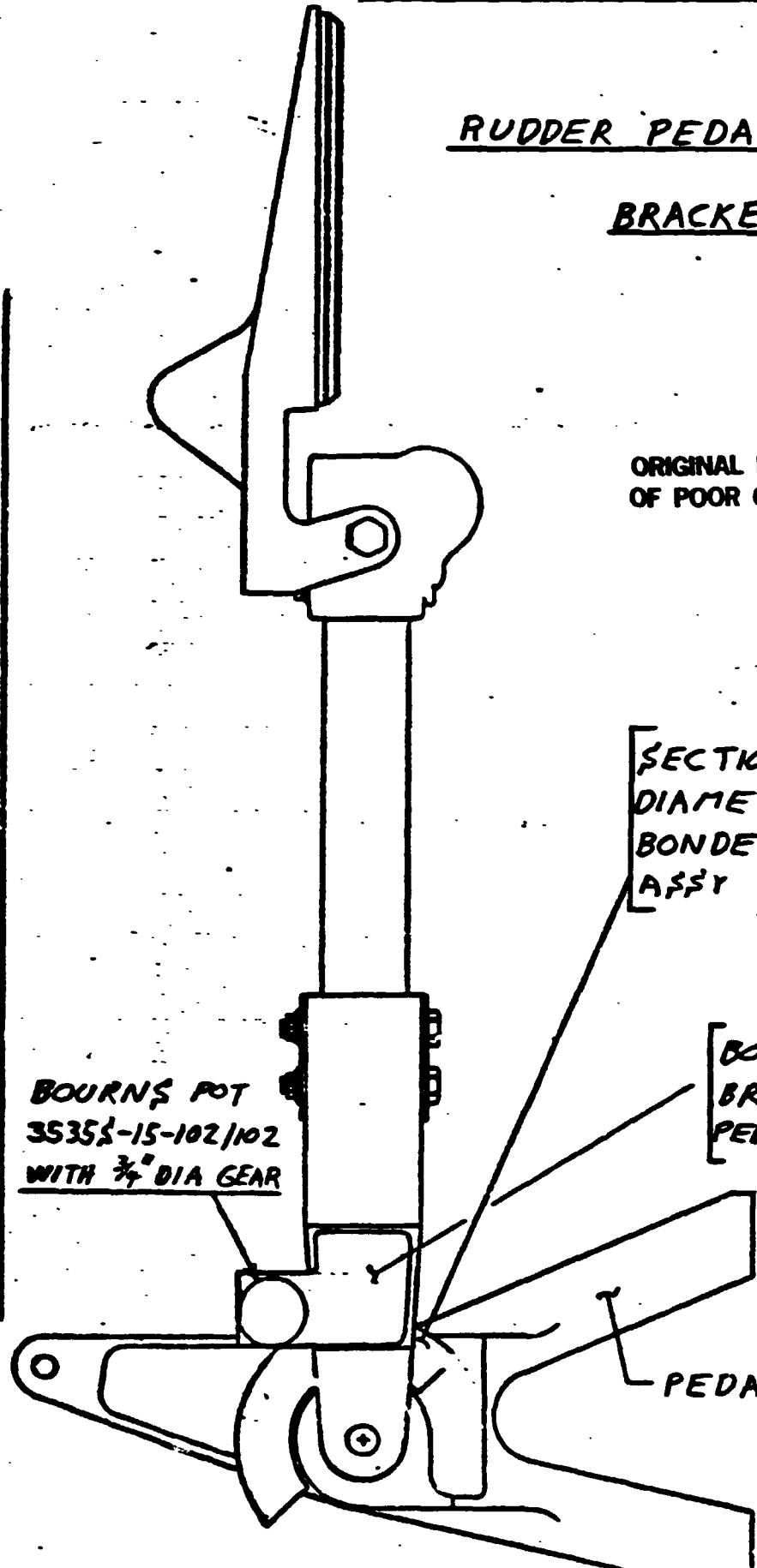
(-6)

RUDDER PEDAL POSITION

BRACKET

DO24
Rev
1-26-76


ORIGINAL PAGE IS
OF POOR QUALITY



SECTION CUT FROM 3"
DIAMETER GEAR STOCK
BONDED TO PEDAL SUPPORT
ASSY

BOURNS POT
35352-15-102/102
WITH 3/4" DIA GEAR

BOND POT SUPPORT
BRACKET TO RUDDER
PEDAL LEVER ASSY

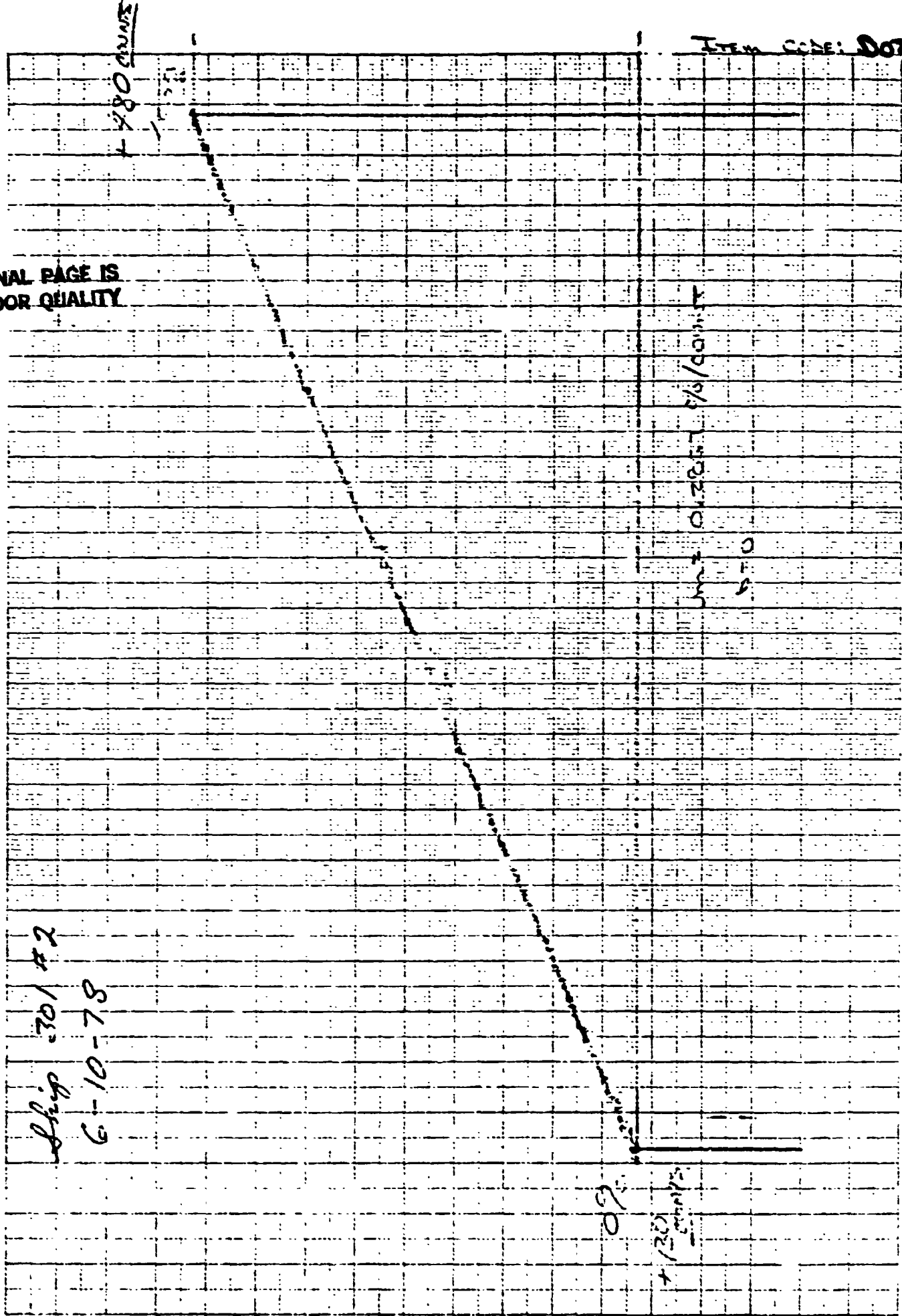
PEDAL SUPPORT ASSY

7248 000000 000

ITEM CODE: D02A

ORIGINAL PAGE IS
OF POOR QUALITY

HEWLETT PACKARD 8470B 1143



Ship 301 #2
6-10-78

89
+ (30)

UNIT OUTPUT %/COUNT
97.0

SHIPPED TO: [illegible] (see 10/11/78)

IDENT. NO. 97499
PRIORITY FOR CHANGE

A. NO.
W.A. NO.

L.E.T.A.R. NO. (11)
REASON:

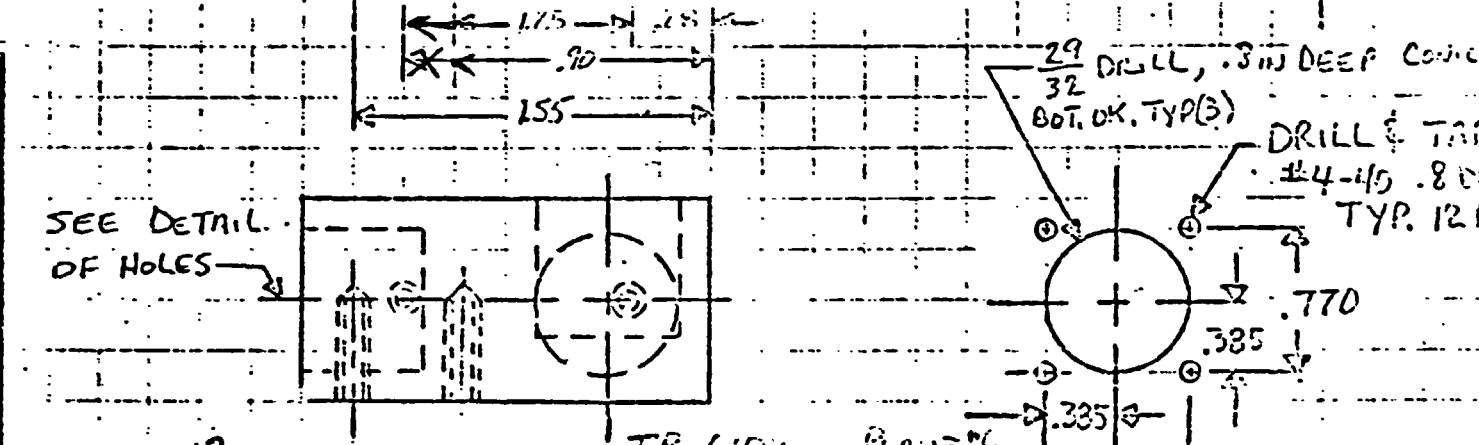
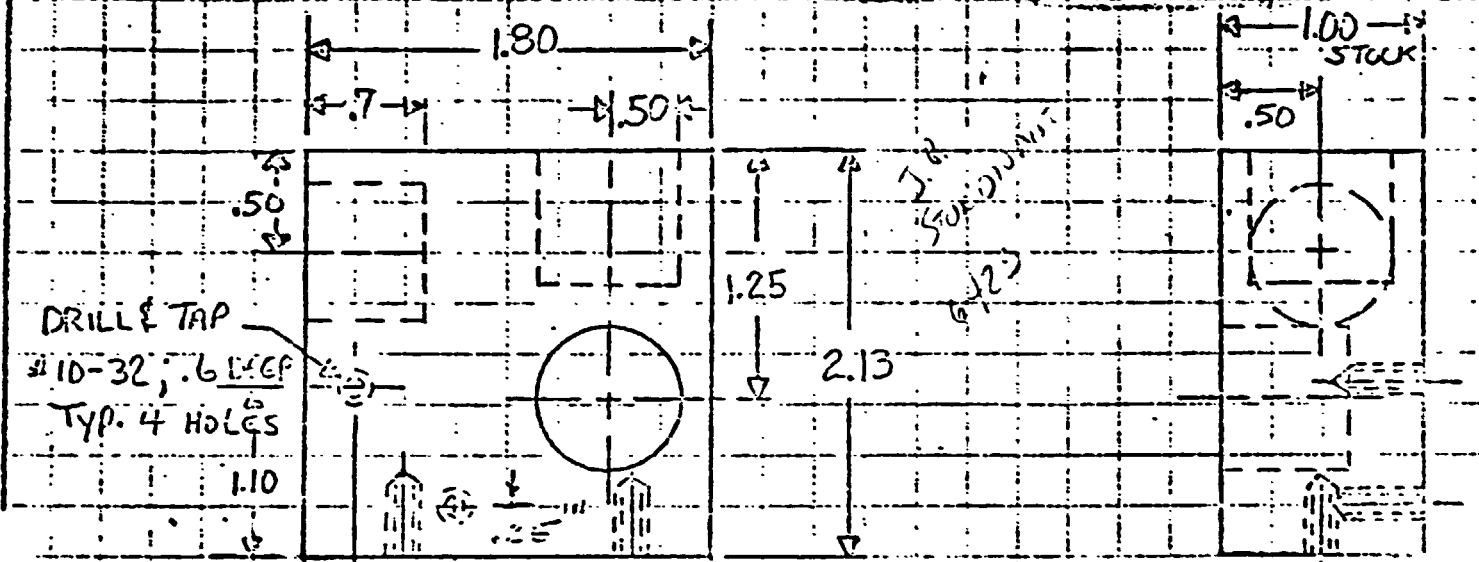
- CHANGE
- RELEASE
- PROCESS
- TEST
- HES

SER. NO.		SHEET
21A HES 311		1
CLASS OF CHANGE	ED AT ISSUE LTR.	OF
		1
ENC'R'G WORK ORDER		

3 AXIS ACCELEROMETER MOUNT FOR VIBRATION SURVEY

DRAWINGS AFFECTED: DRAWING CHANGE LTR. ED NOT IN CORP. TO IN CORP. DRAWING TITLE: (6112) 210

FOR REFERENCE



MAKE: ¹² DELIVERY TO A. WHITENER 4882 13-770-4
 MATERIAL: 2024 AL. ALY. OR EQUIV.
 SURFACE FINISH: PAINT INTL. ORANGE

DETAIL OF HOLES

STATUS	PART/ASSY NO.	ADD.	REP.	CHG.	ENGINEERING DISPOSITION		
SIGNATURE	DATE	SIGNATURE		DATE	SIGNATURE		
PREPARED BY: H. H. MOY	7-6-77	STRUCTURES			MET. DES.		
GROUP ENGR.		CUSTOMER			WEIGHTS		
CREATED BY: D. S.	7/6/77	D.E.R.			PROJ. ENG.		

NONE

NONE

ORIGINAL PAGE IS OF POOR QUALITY

RELEASE INFORMATION	CHANGE CONTROL	ISSUES	ISSUE	ISSUE
---------------------	----------------	--------	-------	-------

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301

PAGE 1 OF 2

CHECKED RLU

HELI. 1+2 RPT SKASW04775-1

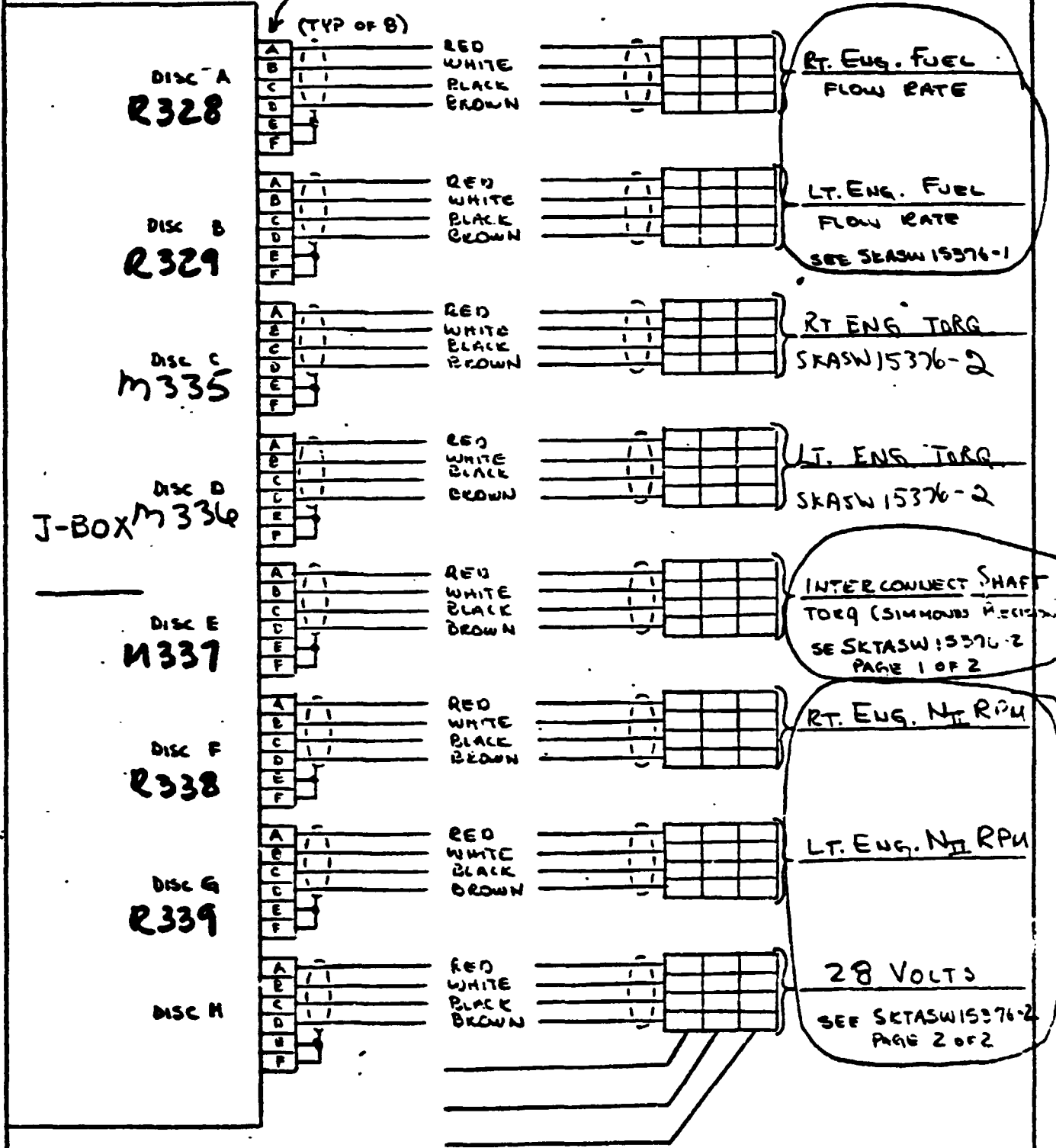
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box Location CP-3

Handwritten: 278
DH 182

KPT06-10-67



ORIGINAL PAGE IS
OF POOR QUALITY

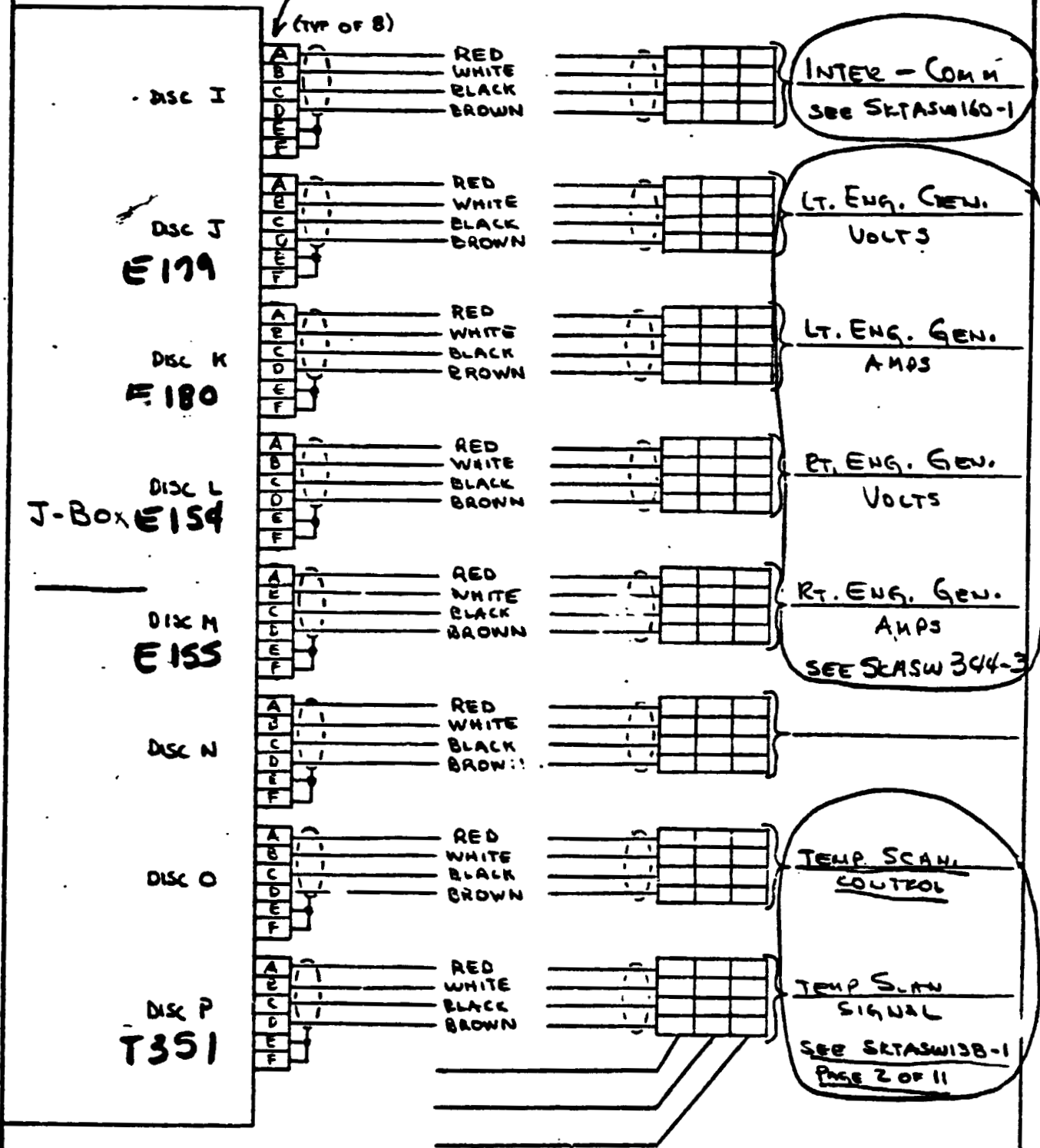
DISCONNECT HARNESS

4-26-68
279

J-Box LOCATION: CP-3

KPTOG-10-6P

(TYP OF 8)



BY J. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE

CHECKED

AW

HELI. 142 RPT SKASW 15376-1

ORIGINAL PAGE IS OF POOR QUALITY

RT. + LT. ENG. FUEL RATE

J-Box CP-3

R328

R329

279

KPT06-10-6 P
TYP OF 2

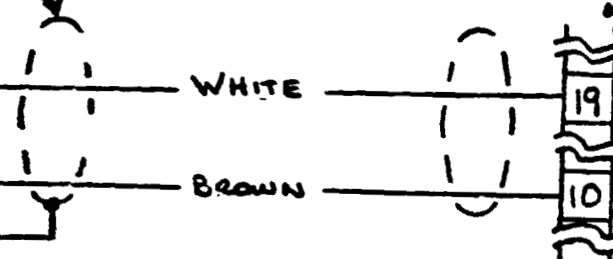
MARK: RT. FUEL-22

DPX2MA-675
TYP OF 2

Disc # A

RT. ENG FUEL FLOW

MARK: CP-3A



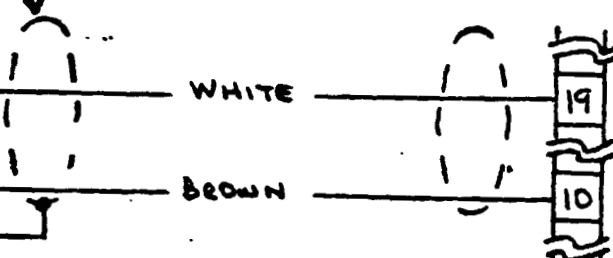
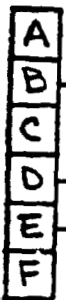
RT. ENG. FUEL RATE

MARK: LT. FUEL-22

Disc # B

LT. ENG FUEL FLOW

MARK: CP-3B



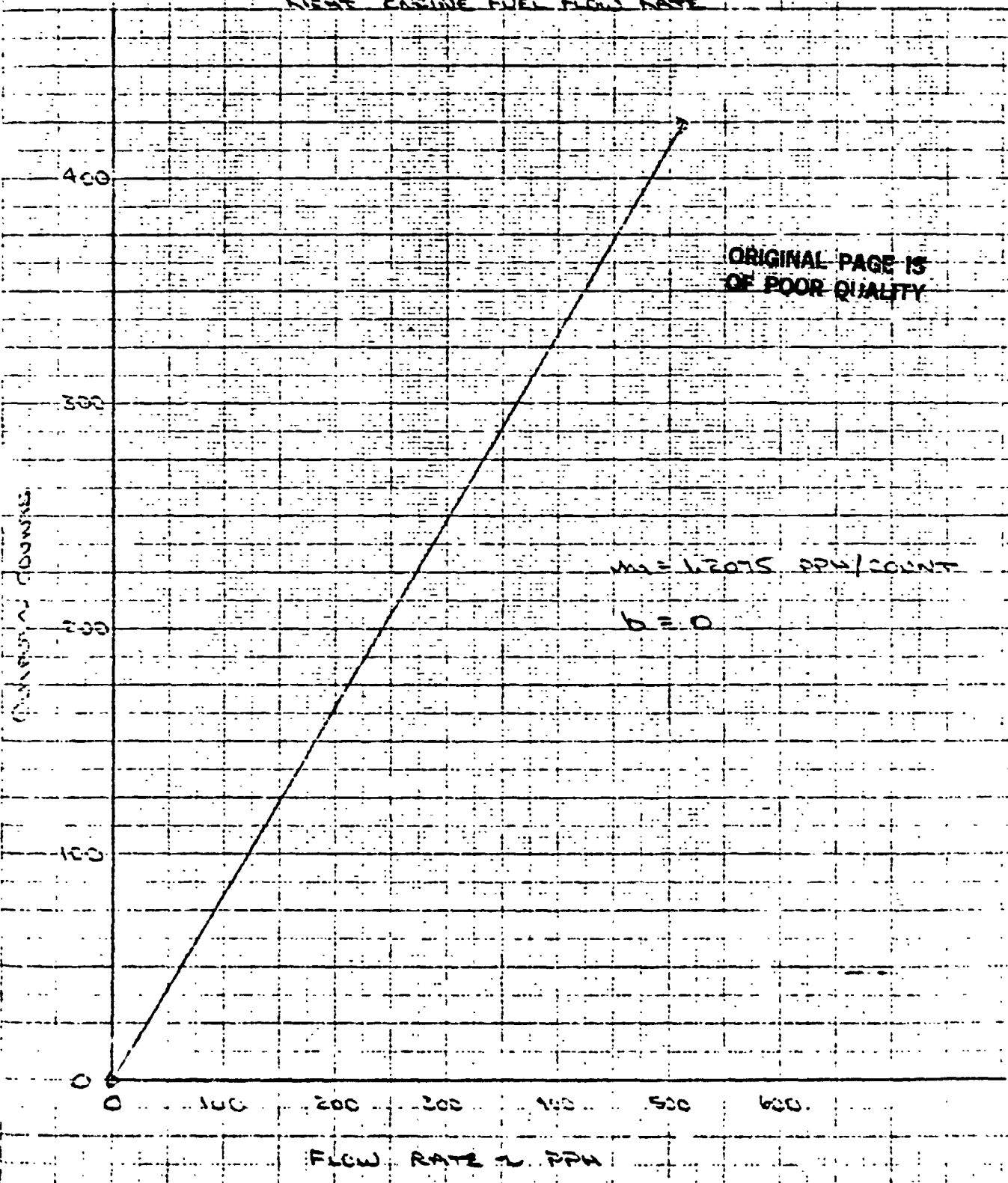
LT. ENG. FUEL RATE

EXISTING CONNECTORS AT LT. RADIO RACK IN FWD CABIN

MAKE FROM 2 CONDUCTOR ORANGE CABLE

Item code: R328

NET ENGINE FUEL FLOW RATE



BY D.P. Smith
CALCULATED

Boeing Helicopter RESERVE

48311 301

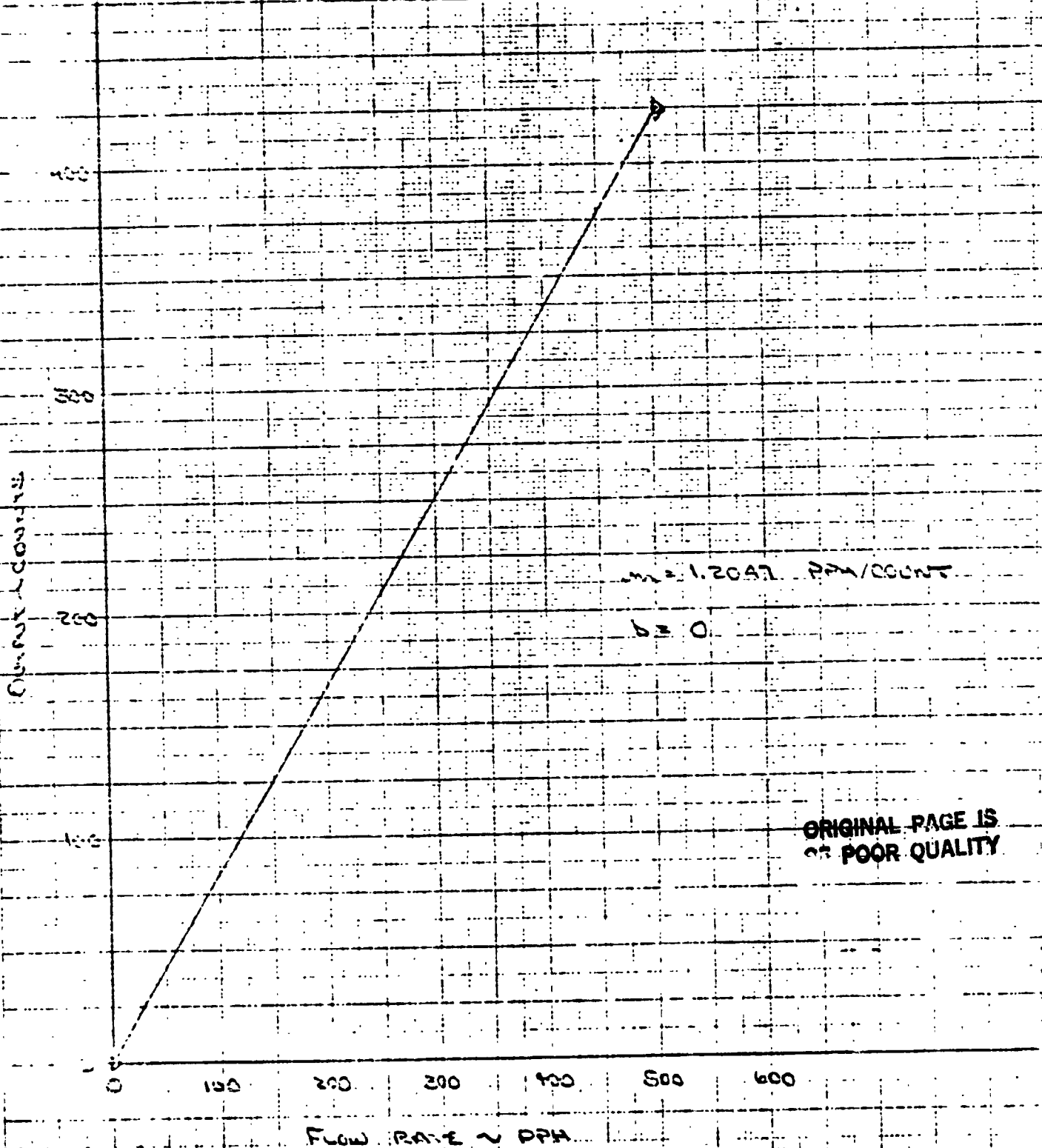
PAGE

REF. 72

271

ITEM CODE: R329

LES ENGINE FUEL FLOW RATE



ORIGINAL PAGE IS
OF POOR QUALITY

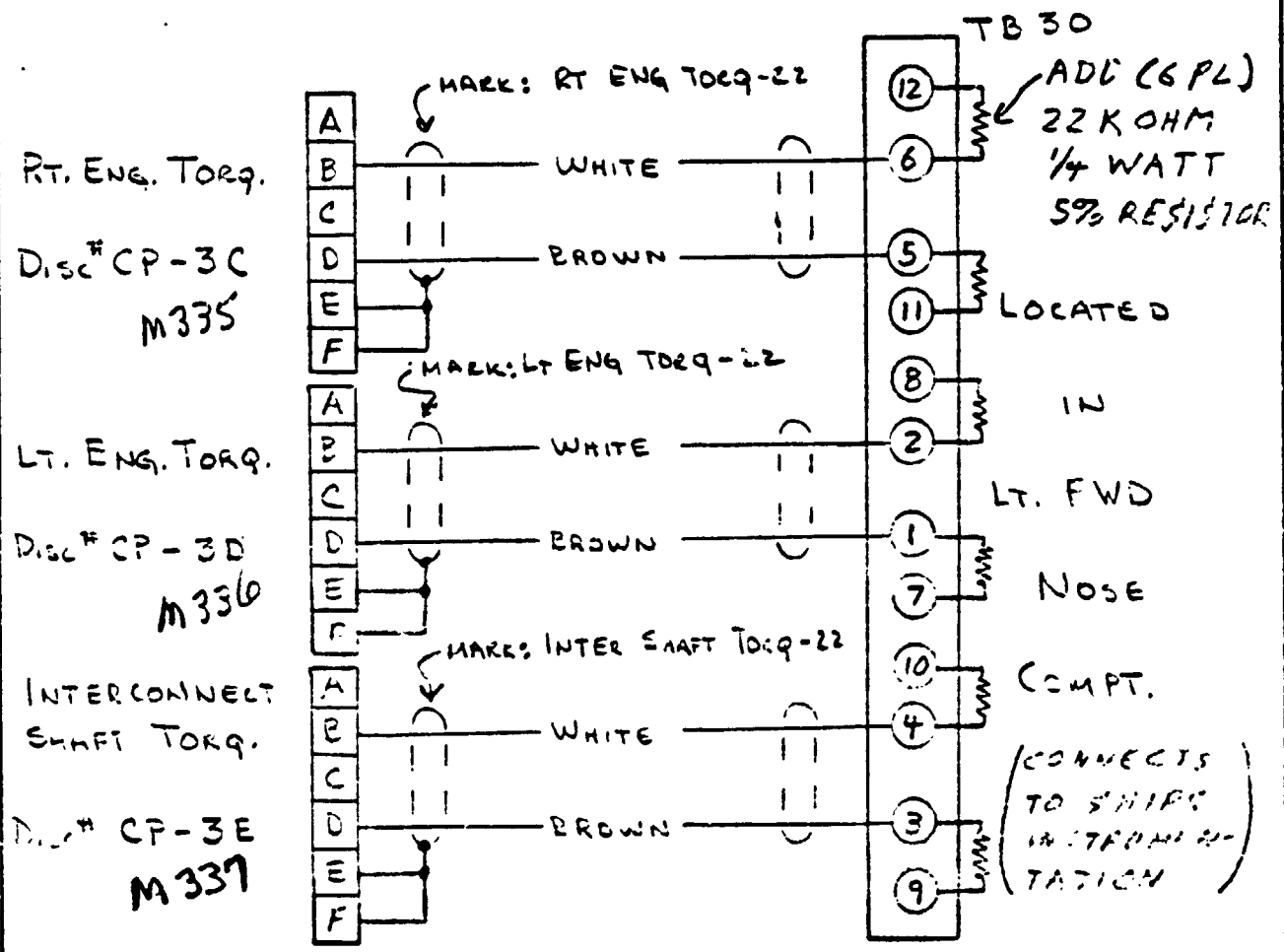
SIMMONDS PRECISION WIRING

REV A
9. 8. 76
12-16-76

ORIGINAL PAGE IS
OF POOR QUALITY

J-Box CP-3

4-28-78
279



MAKE WITH 2 CONDUCTOR ORANGE CABLE

PUT CRIMP LUGS ON TB END AND MARK END PER NUMBER BUT DO NOT CONNECT TO TB

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-13

Lab. No. _____

Serial No. _____

Part No. _____

Engine Sm-20

Project Growth Testdown Tests

Title Reviews Engine Torque

W. O. _____ L. T. R. _____ EWA _____

ITEM CODE: M 335

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvc.
<u>W. O. ...</u>					<u>CP-3C</u>

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chon.	<u>RMDU "A" - 17-3-1</u>				
Bridge	<u>C/S II</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

NOTE: 0% = 0 VOLTS
100% = 4.17 VOLTS

Load	Output				
DOWN BE TEST SFTING	SMPS SUB. (%)	DISC. VOLTS	OUTPUT (CTS)	TRUE TORQUE	
0	0	-0.045	-10	0	
25-30	28	1.133	220	28.3	28.2
55-60	58	2.25	450	58.75	58.2
75-80	75	3.16	600	79	78.5
95-100	95	3.99	750	99.75	98.7
75-80	75	3.16	600	79	78.7
55-60	58	2.25	450	58.75	58.2
25-30	25	1.13	220	28.25	28.1
0	0	-0.045	-10	0	

PLT Q vs. OUTPUT

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301

PAGE 2 OF 2

CHECKED AW

HELI. 142 RPT SKASWD4275-1

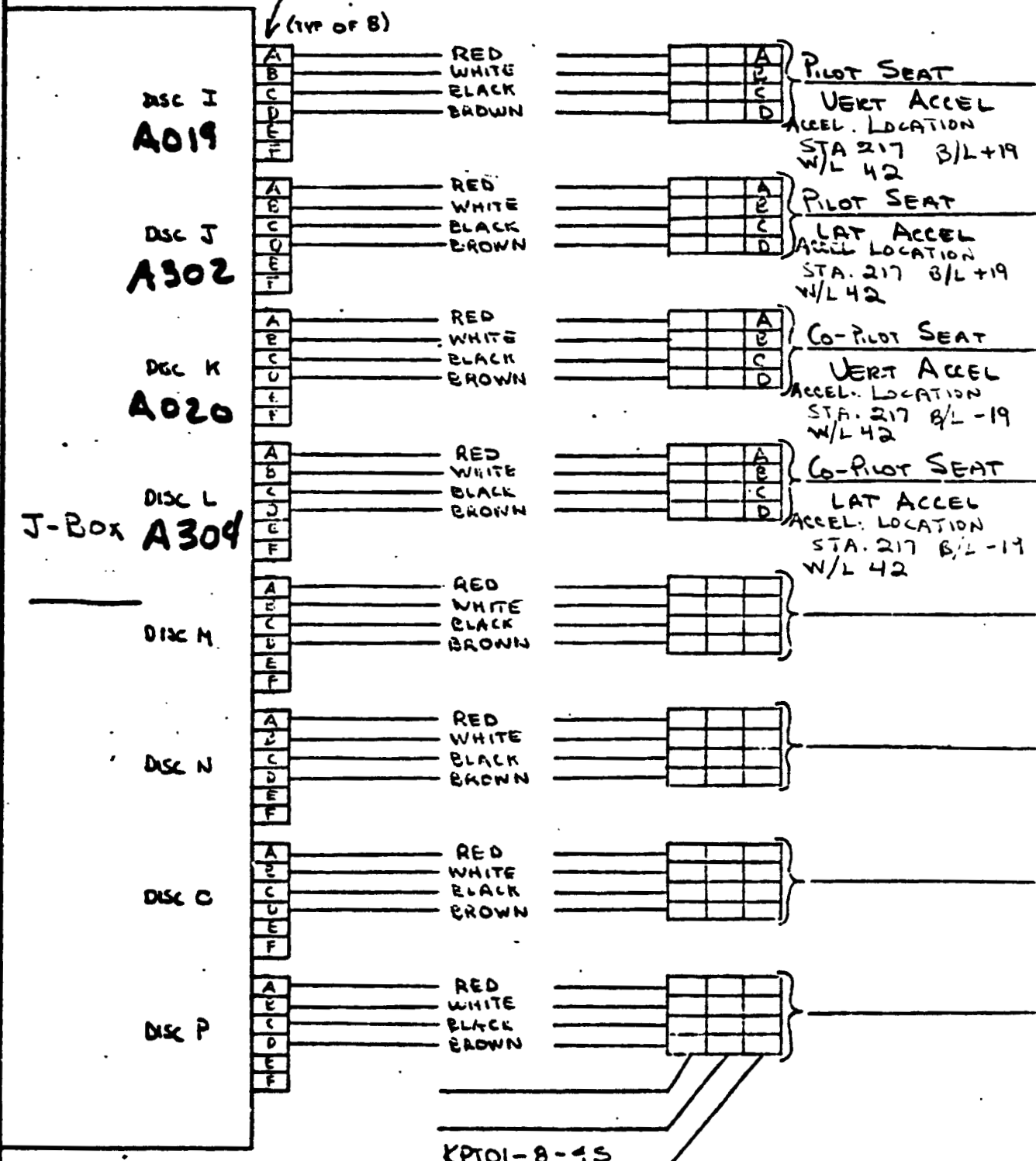
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

11-11-92
4-28-92
bh
182
279

J-Box LOCATION CP-2

KPTOG-10-6P



7042 9900REV 100

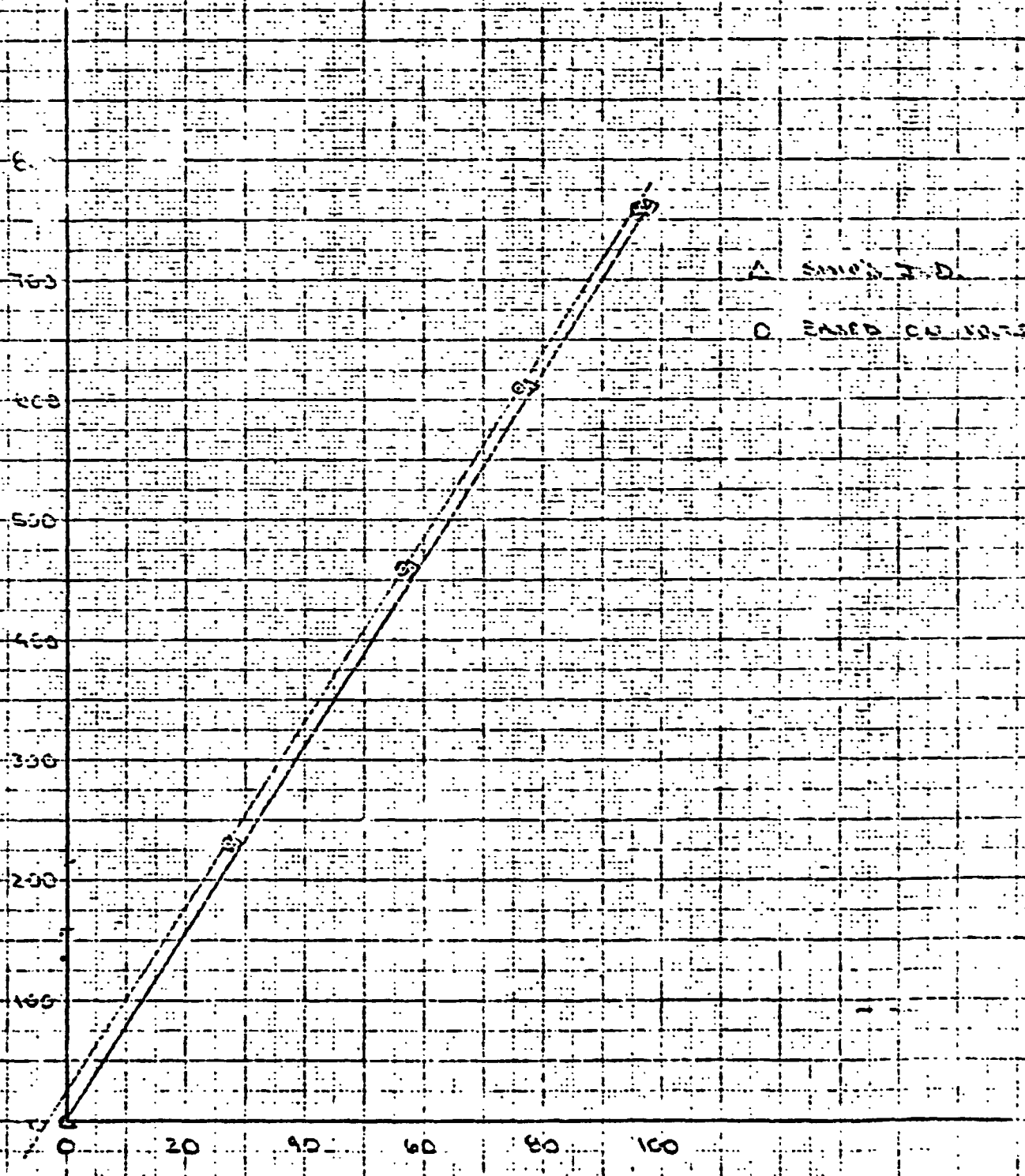
BY _____
CHECKED _____

Sc Helicopter EX-100 MODEL _____

PAGE _____
OFF _____

m335

ORIGINAL PAGE IS
OF POOR QUALITY



C-4

D.P. Smith

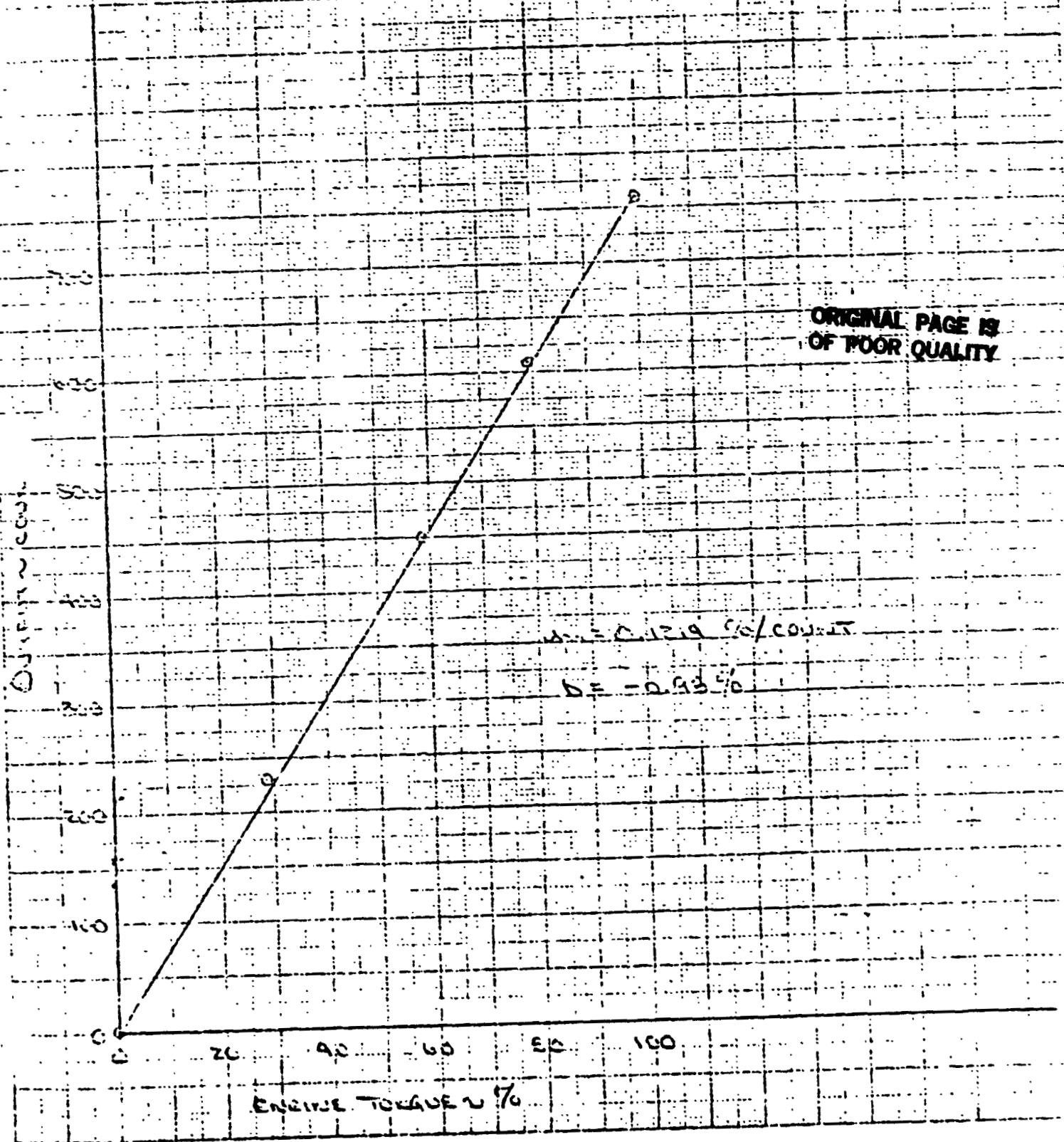
Roll Helicopter (17512)

1951

271

ITEM FILE: M 335

Roll Helicopter Torque



ORIGINAL PAGE IS OF POOR QUALITY

BY D. Smith
CHECKED

Red Stationer

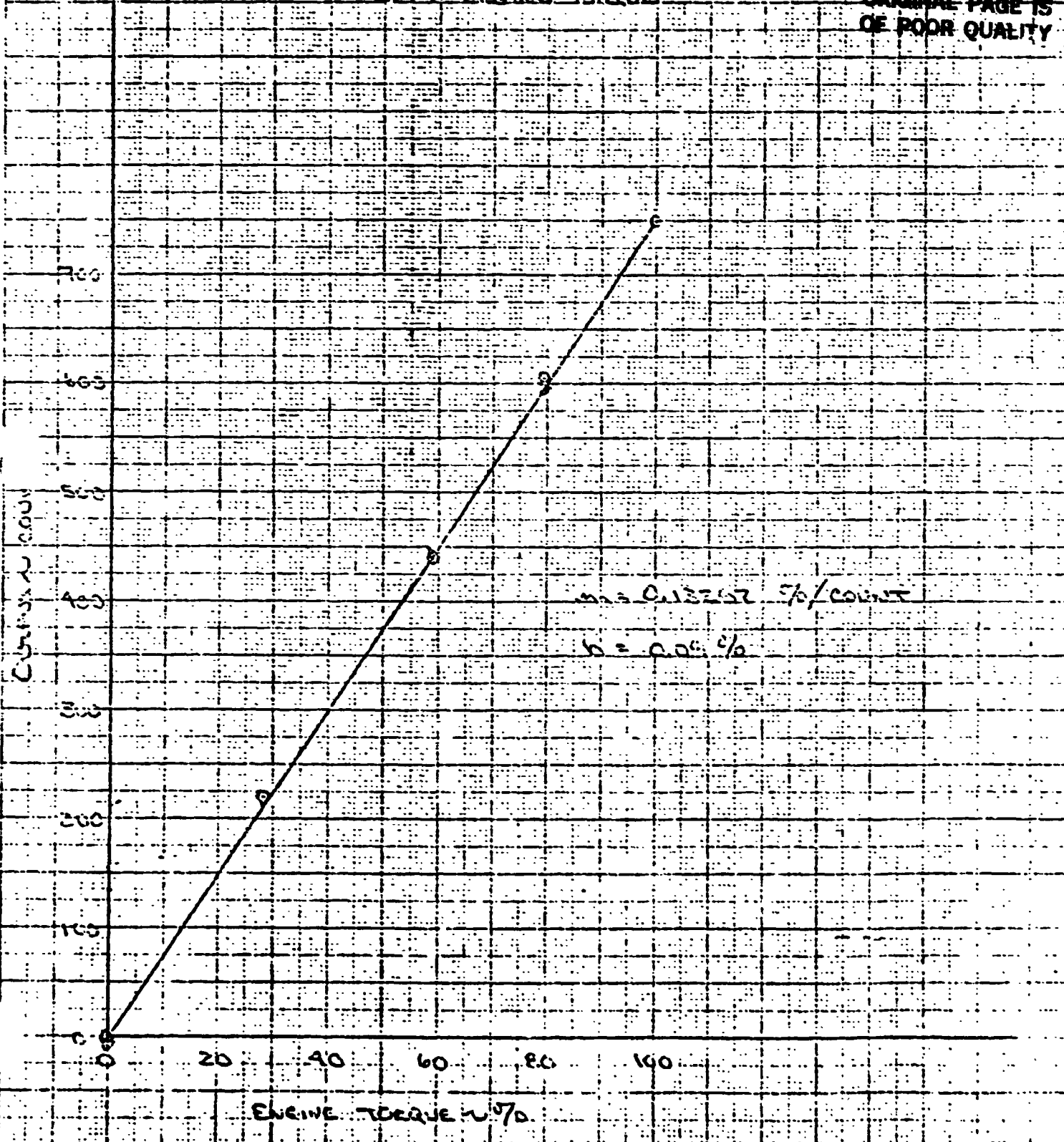
MODEL NO.
SERIAL NO.

PAGE
NO.

ITEM NO. M336

LEFT ENGINE TORQUE

ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-20-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer SMITH

Project GROUND TIEDOWN TEST

Del 301 #2

Title INTERCOMPLET SHAFT TORQUE

L. T. R. (SIMMONS SYSTEM) EWA

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>PMU "B"</u>	<u>62-2-1</u>	<u>A337</u>		
Bridge	<u>CS II</u>				
Config.					
Cal. Res.					
Lever Arm					

Load	Output				
% Torque	ERRUJ		OUTPUT		
	VOLTS		COUNTS		
00 R→L	4.286		820	(691)	
80	3.929		750	(621)	
60	3.571		689	(560)	
40	3.214		620	(491)	
20 R→L	2.857		550	(421)	
0	2.500		480	(351)	
20 L→R	2.143		410	(281)	
40	1.786		340	(211)	
60	1.429		270	(141)	
80	1.071		200	(71)	
100 L→R	.714		129	(0)	
80	1.071		200	(71)	
40 L→R	1.786		340	(211)	
0 R→L	2.500		470	(341)	
40	3.214		625	(496)	
80	3.929		760	(631)	
100 R→L	4.286		810	(681)	
GPA0	(82-8-7) = -005				
LLC	(78-8-8) = 746				

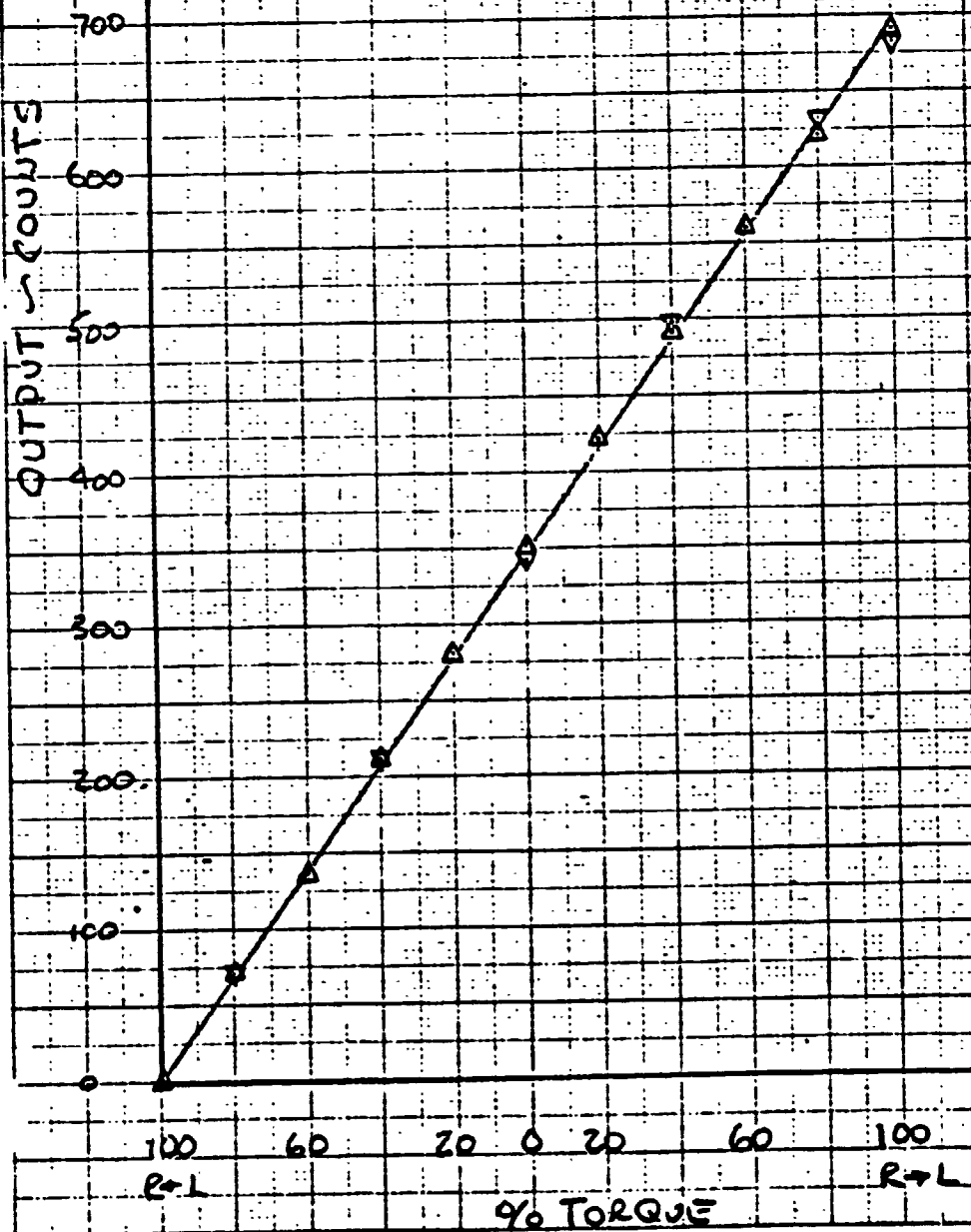
BY MAHAUEY
CHECKED

BELL HELICOPTER COMPANY

MODEL 301 PAGE
#2 RPT

ITEM CODE M337
CH 62-2-1

ORIGINAL PAGE IS
OF POOR QUALITY



BY H.D. WINNIFORD

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 1

CHECKED AW

HELI. 142 RPT SKHD12-21-771

NII TACH WIRING

REPLACE SKASW 2777-1

REV 'A' 4-14-78 QAW

ORIGINAL PAGE IS OF POOR QUALITY

J-Box CP-3

4-28-78
279
SH 182

R338

R339

RT ENG NII RPM

Disc# CP-3F

R338

LT ENG NII RPM

Disc# CP-3G

R339

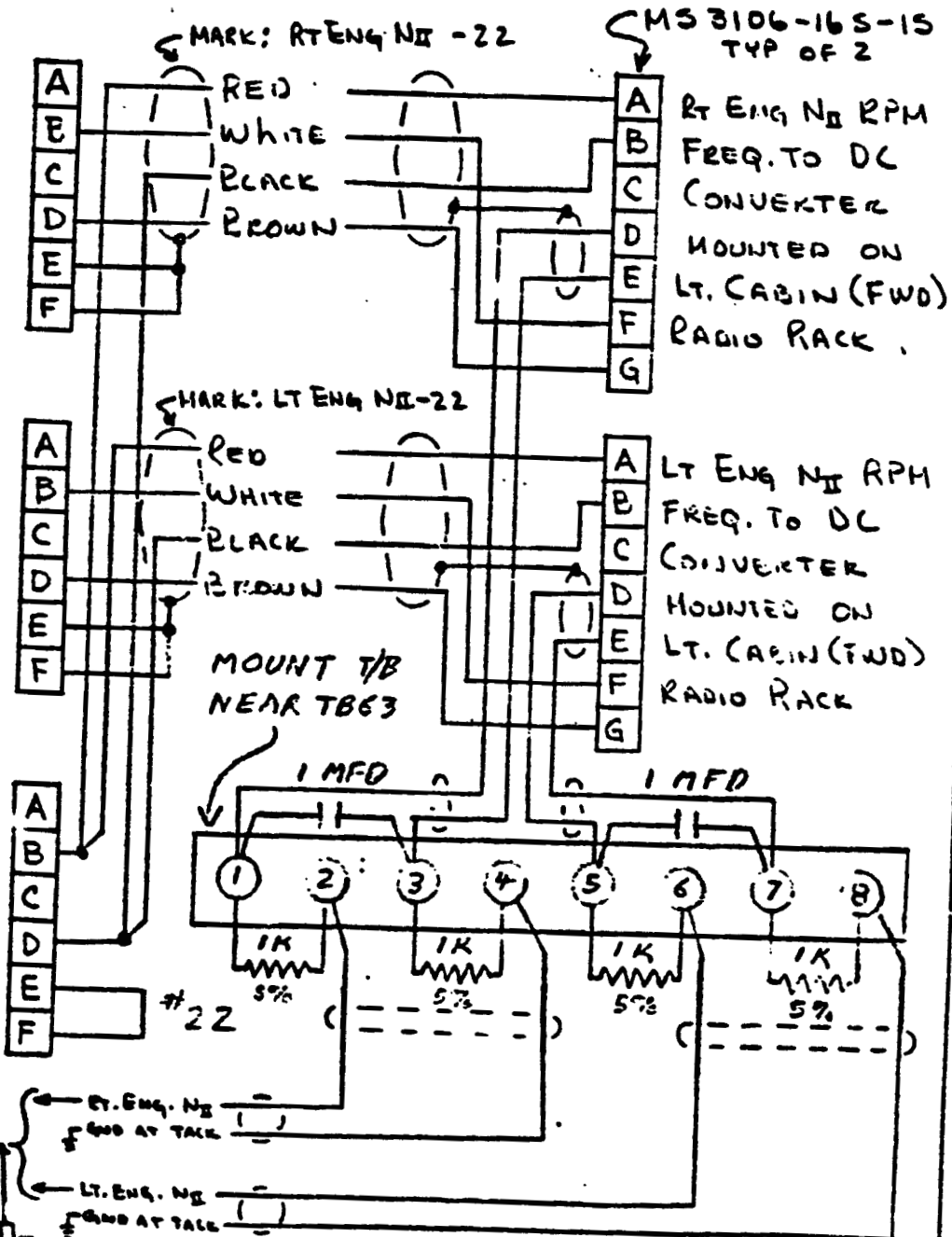
28 VOLTS

Disc# CP-3N

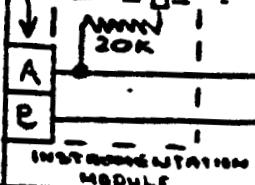
REV 'A'

TYP OF RT. & LT. NII TACH GENERATOR

MS3106-16S-15
SOLDER
FUSE



ENG. NII TACH GENERATOR



SHIP'S CONNECTOR + WIRING REMOVED FROM NII TACH GENERATOR

MS3102-12-3P

1042 000REV 100

CALIBRATION DATA SHEET

Date 6-7-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GRAND TOWER TEST

Title NIE RPM - RIGHT ENGINE

L. T. R. _____ EWA _____

301-2

ITEM CODE: R338

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMD "A" - 70-2-1</u>				
Bridge	<u>C/S II</u>				
Config.					
Cal. Res.	<u>1/A</u>				
Lever Arm					

ORIGINAL PAGE IS
OF POOR QUALITY

NOTE: DRIVE SYSTEM AND SET SWIP'S DELICATE
TO READ POINTS READ FREQUENCY AND
CURRENT CORRECTLY.

Load	Output				
SWIP'S END. (%)	FREQUENCY (HZ)	OUTPUT (COUNTS)	SWIP'S END. (%)	FREQUENCY (HZ)	OUTPUT (COUNTS)
10	7.0	52	15	10.5	63
15	10.9	52	10	7.1	53
30	21.3	178			
45	21.5	266			
60	42.2	357			
70	49.2	416			
80	56.2	479			
85	59.7	505			
90	63.2	536			
95	67.0	570			
100	70.3	600			
105	74.1	630			
110	77.9	663			
120	84.5	720			
105	79.1	630			
100	70.4	600			
95	66.7	570			
90	63.2	536			
80	56.2	479			
60	42.0	357			
45	28.1	193			
20	14.3	63			

GPA. (82-6-7) = 7
LLC. (51-8-8) = 739

BY: D.P. Smith
CHECKED

Bell Helicopter TEXTRON

RD 411 301

PAGE

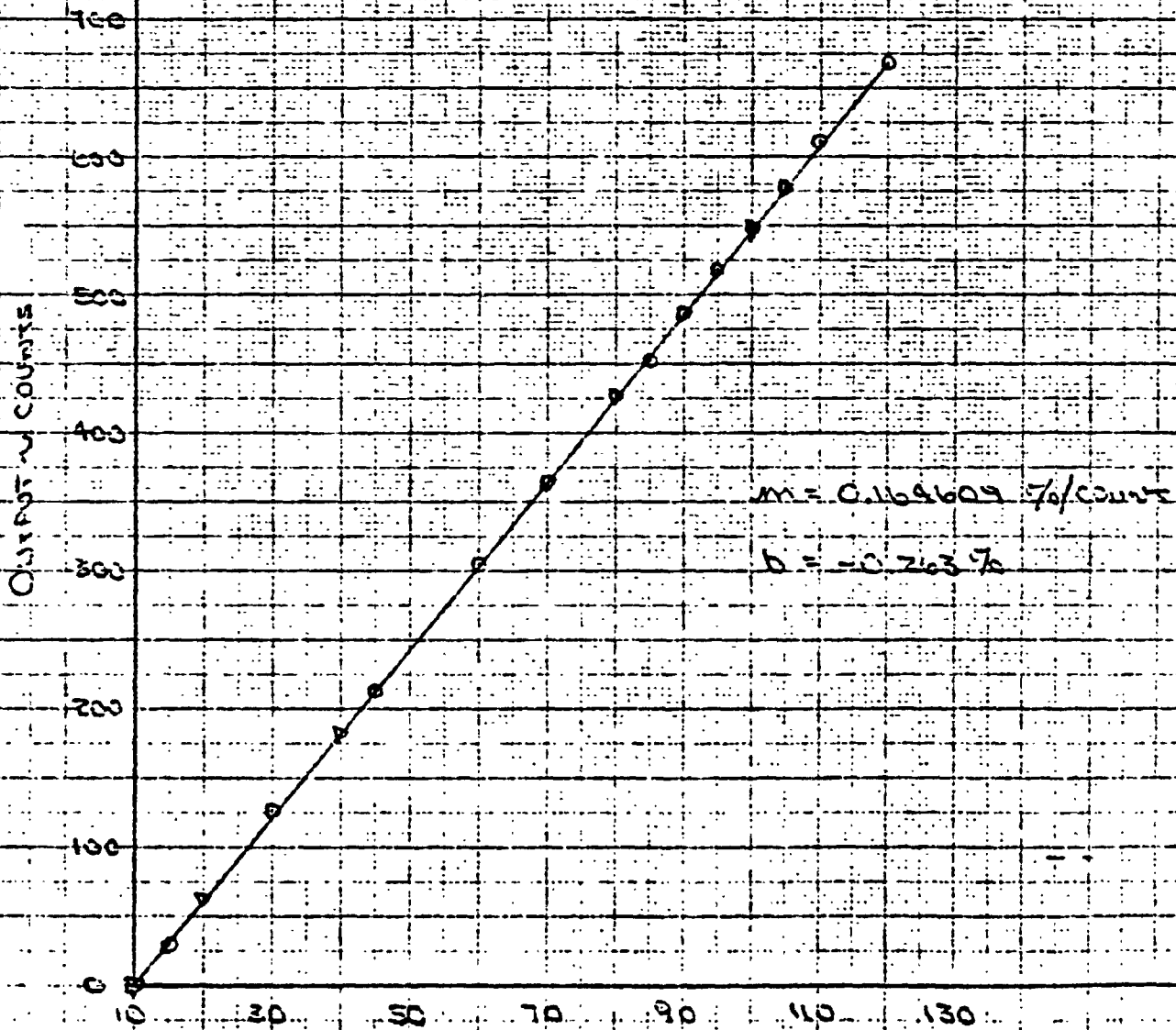
BELL 107

PRT

Item Code: R338

ORIGINAL PAGE IS
OF POOR QUALITY

RIGHT ENGINE IIT RPM



SMIP2 INDICATOR ~ %

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date _____

Lab. No. _____

Serial No. _____

Part No. _____

Engineer _____

Project GROUND TIEDOWN TESTS

Title NT BPM - LEFT ENGINE

L. T. R. EWA

W. O. 301-2

Item Code: R339

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "A" - 70-2-2</u>				
Bridge	<u>C/S II</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

NOTE: DRIVE SYSTEM AND SET SWIP
INDICATOR TO READ COUNTS.

Load	Output				
SWIP'S IND. (%)	FREQ. (Hz)	OUTPUT (COUNTS)	SWIP'S IND. (%)	FREQ. (Hz)	OUTPUT (COUNTS)
0	5.5	45	15	9.1	70
15	9.2	73	0	5.8	45
30	19.9	161			
45	30.0	245			
60	42.9	335			
70	49.2	397			
80	55.0	452			
85	58.1	480			
90	61.6	505			
95	65.1	536			
100	68.9	568			
105	72.5	597			
110	75.6	625			
120	82.9	665			
125	72.2	596			
100	68.7	546			
95	65.1	537			
90	61.7	509			
80	54.4	451			
60	40.5	331			
40	26.6	217			
20	12.8	101			

BY D.P. Smith
ENGINEER

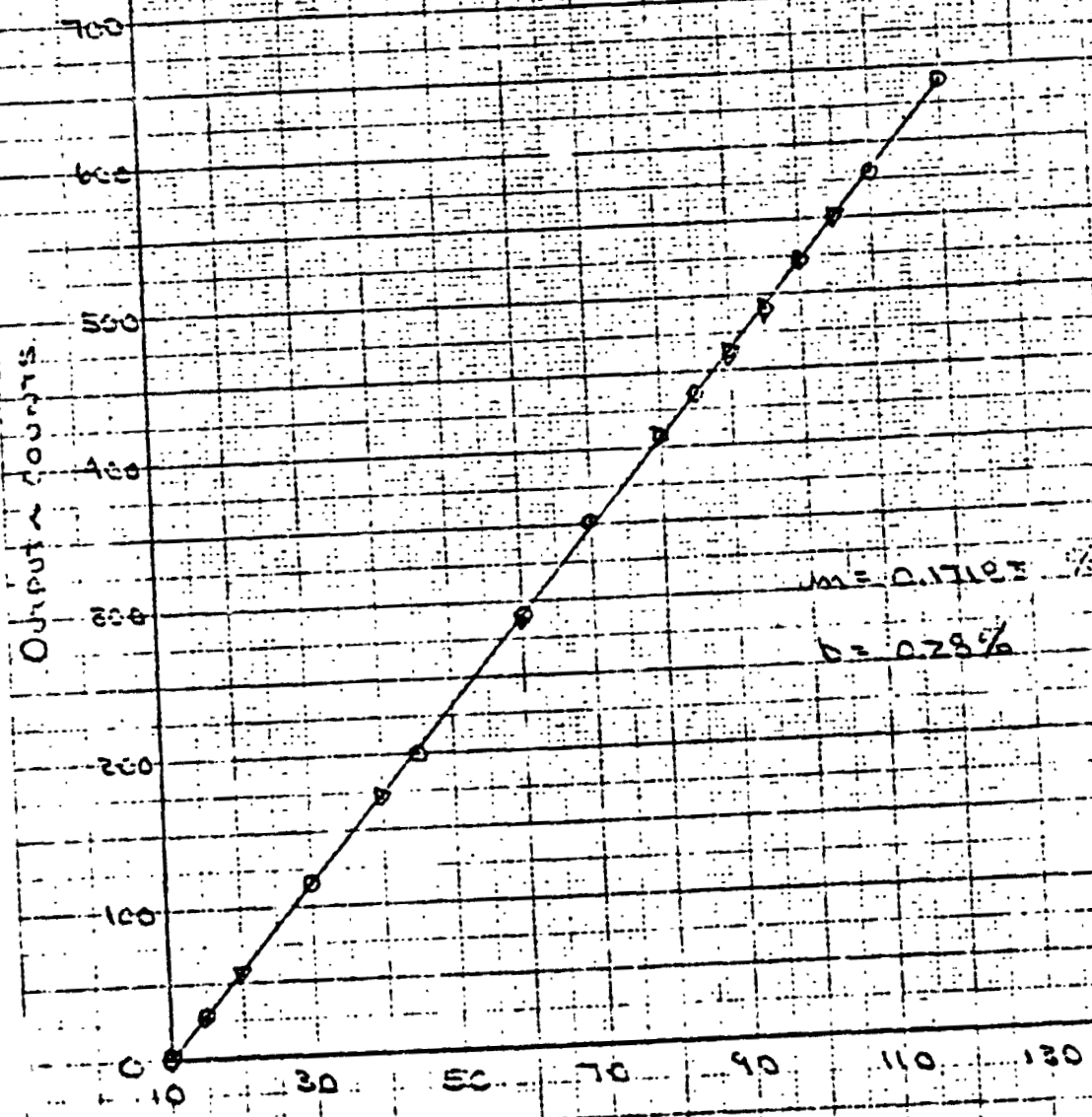
Bell Helicopter SIROD

MODEL 301
#2

PAGE
RPT

ITEM CODE: R339

LEFT ENGINE NIT RPM



$m = 0.17103 \text{ \% / COUNT}$

$b = 0.28\%$

ORIGINAL PAGE IS
OF POOR QUALITY

SNIP's INDICATOR 1.0%

BY A. WHITENER
CHECKED AW

BELL HELICOPTER COMPANY

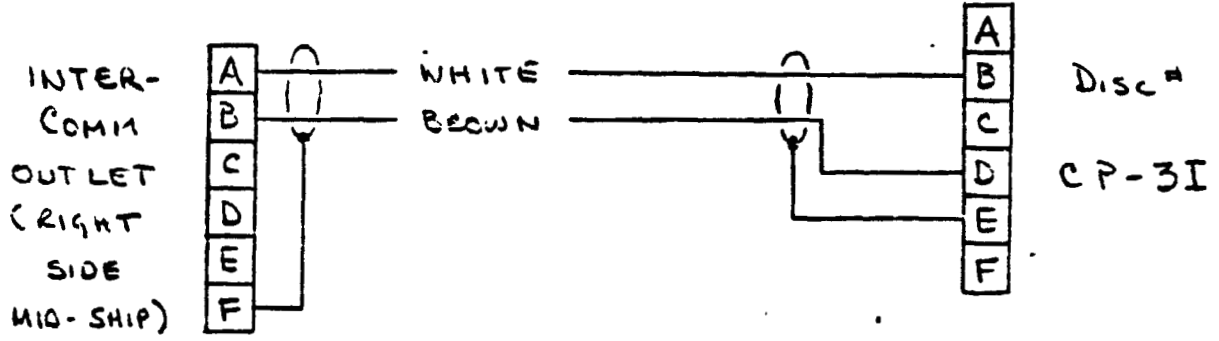
MODEL 301 PAGE 1 of 1
HELI. 142 RPT SKTASW160-1

INTER-COMM WIRING

J-Box CP-3

AW
4-28-70
(DH 142) 279

ORIGINAL PAGE IS
OF POOR QUALITY



BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 of 2

CHECKED _____

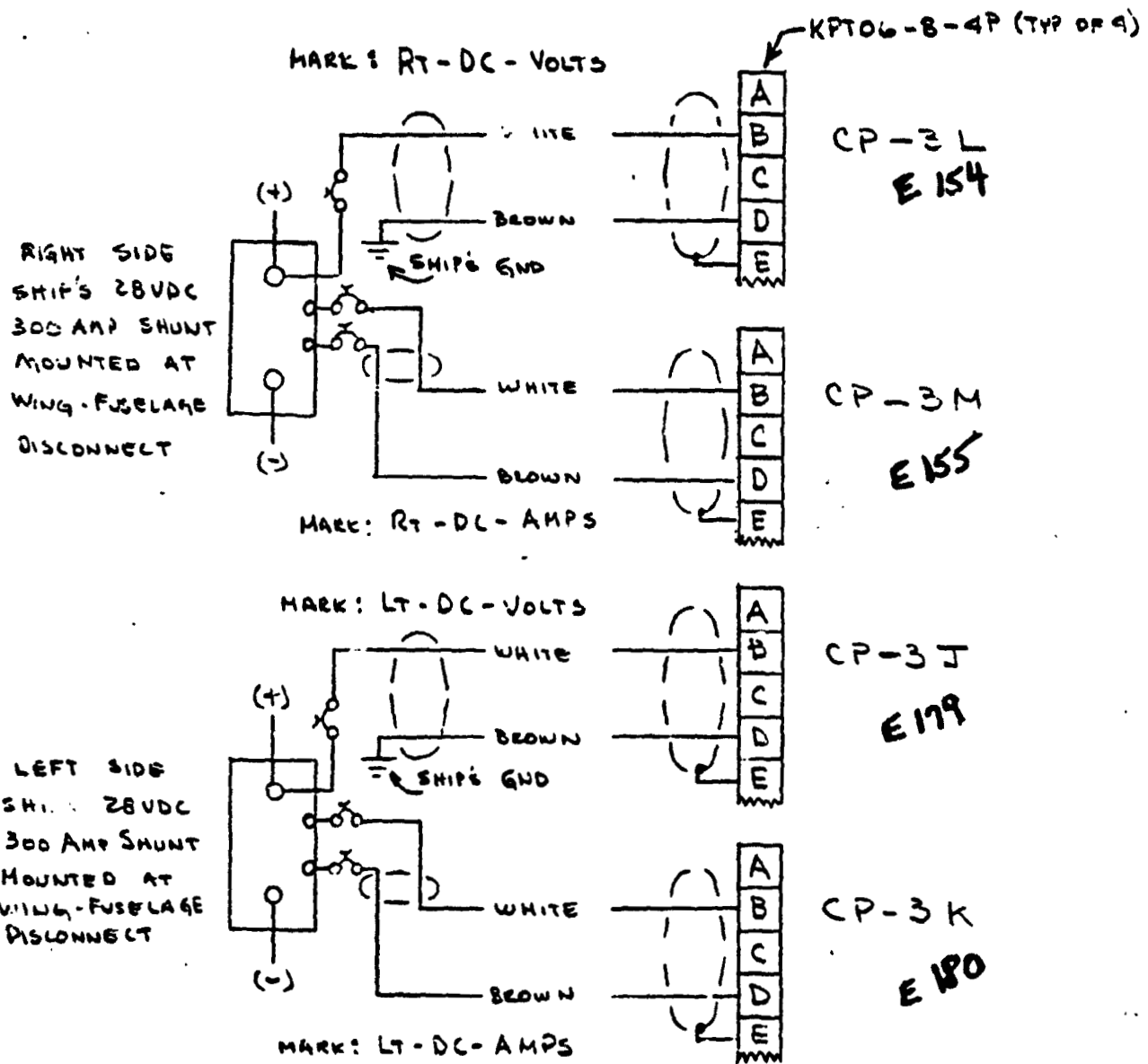
HELI. _____ RPT SKASW344-3

RT. AND LT. GENERATOR

D.C. VOLTS AND AMPS

4-28-78
(SH 112)
279

ORIGINAL PAGE IS OF POOR QUALITY



NOTE: ALL CIRCUIT BREAKERS ARE TO BE 1 AMP

7042 9008REV 100

D.P. Smith

BELL HELICOPTER COMPANY

MODEL 301 PAGE

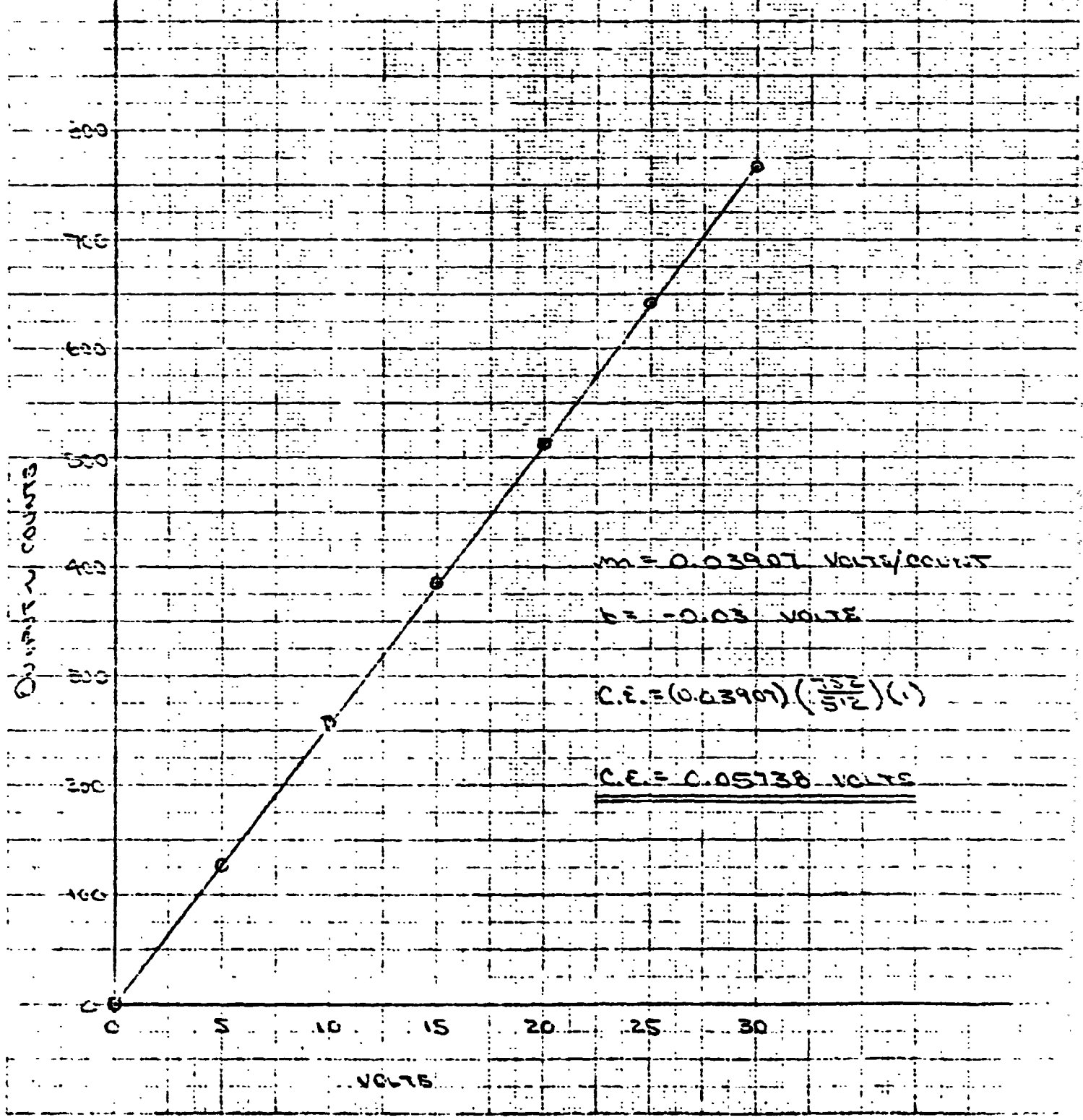
BELL 92 101

ITEM CODE: E 15A

SN: A-49-1-1

ORIGINAL PAGE IS
OF POOR QUALITY

RIGHT D.C. VOLTAGE GENERATOR

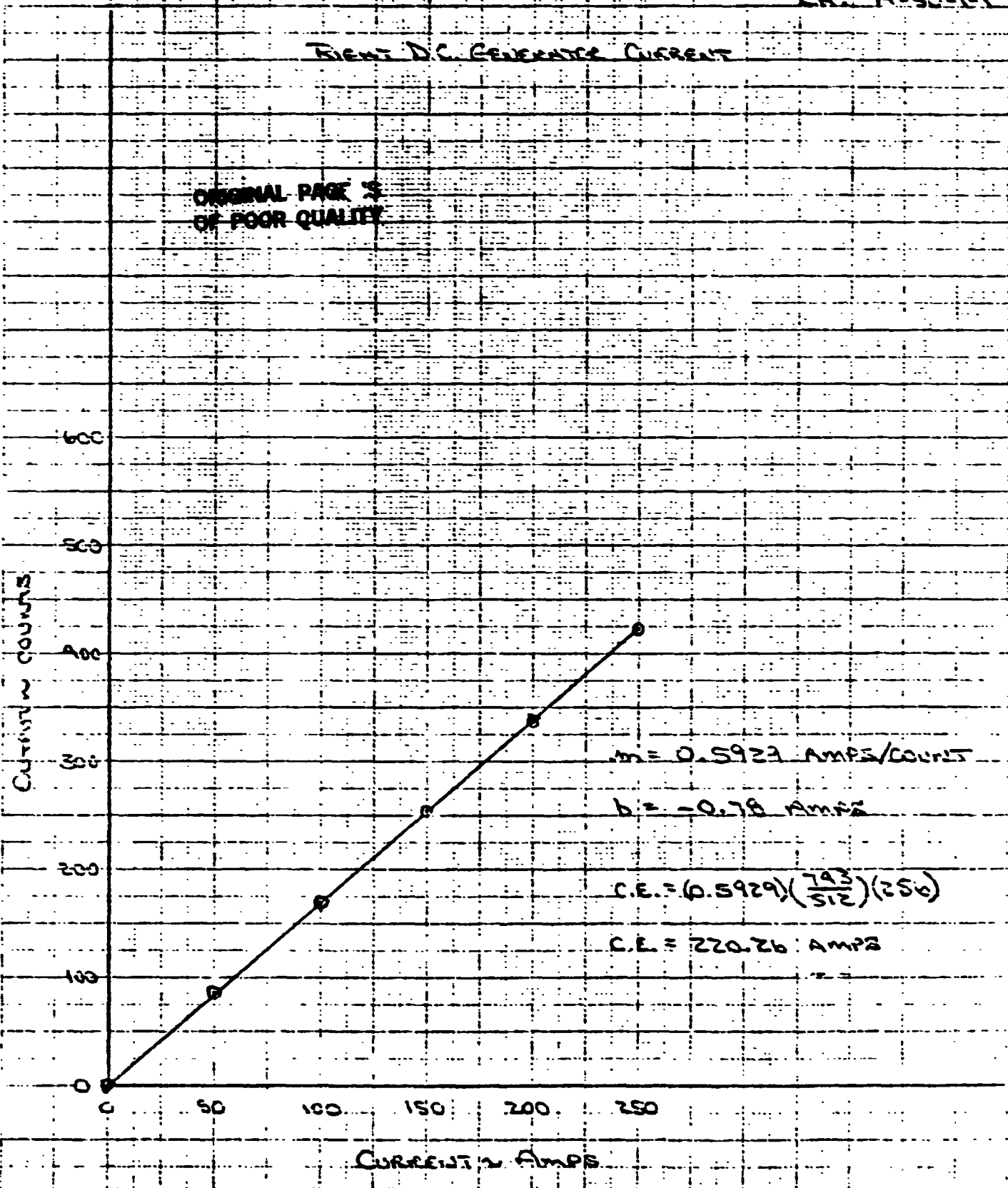


ITEM CODE: E155

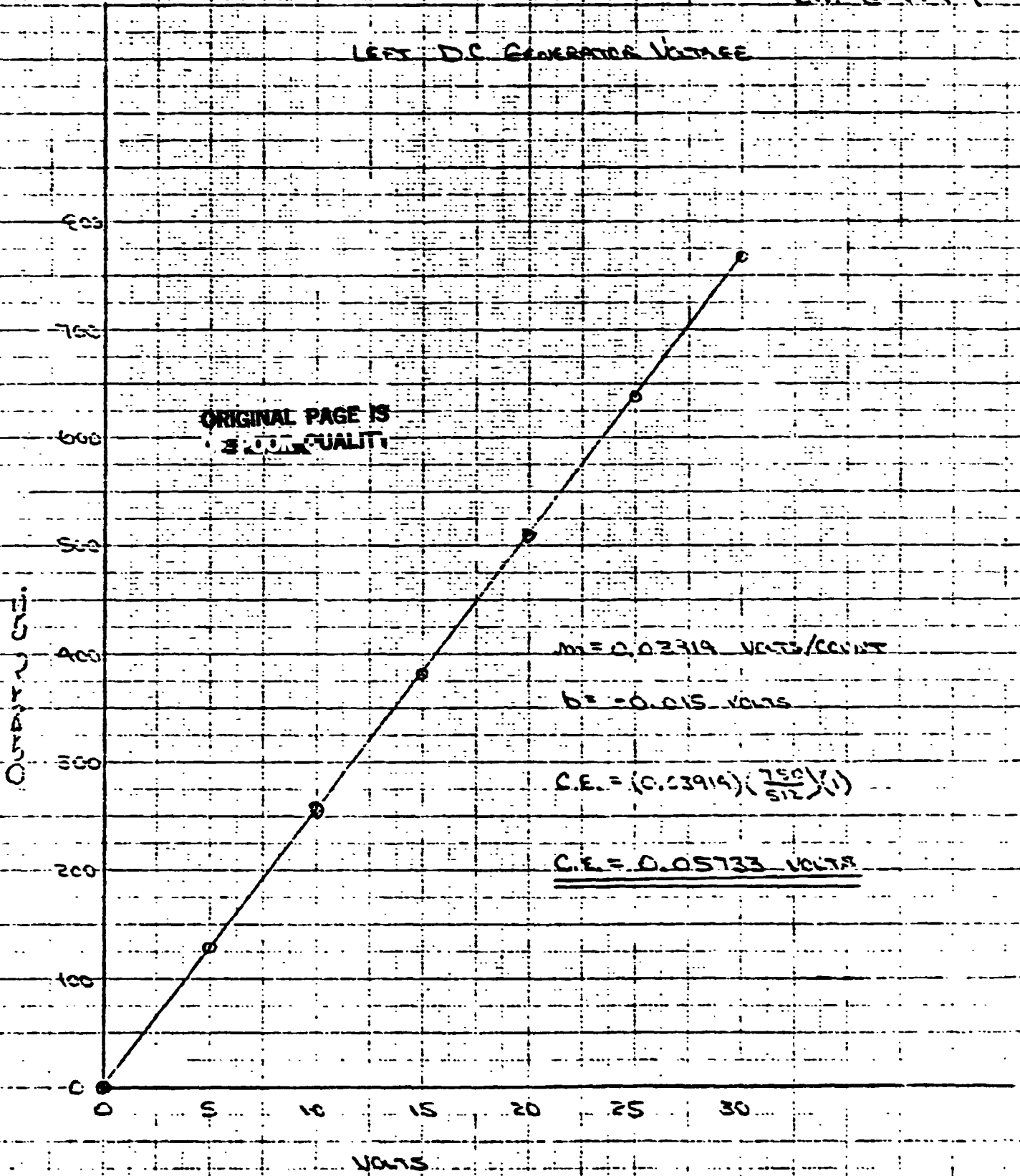
CR: A-50-1-1

Eight DC GENERATOR CURRENT

ORIGINAL PAGE 5
OF POOR QUALITY



LEFT DC GENERATOR VOLTAGE



BY D.P. Smith
CHECKED _____

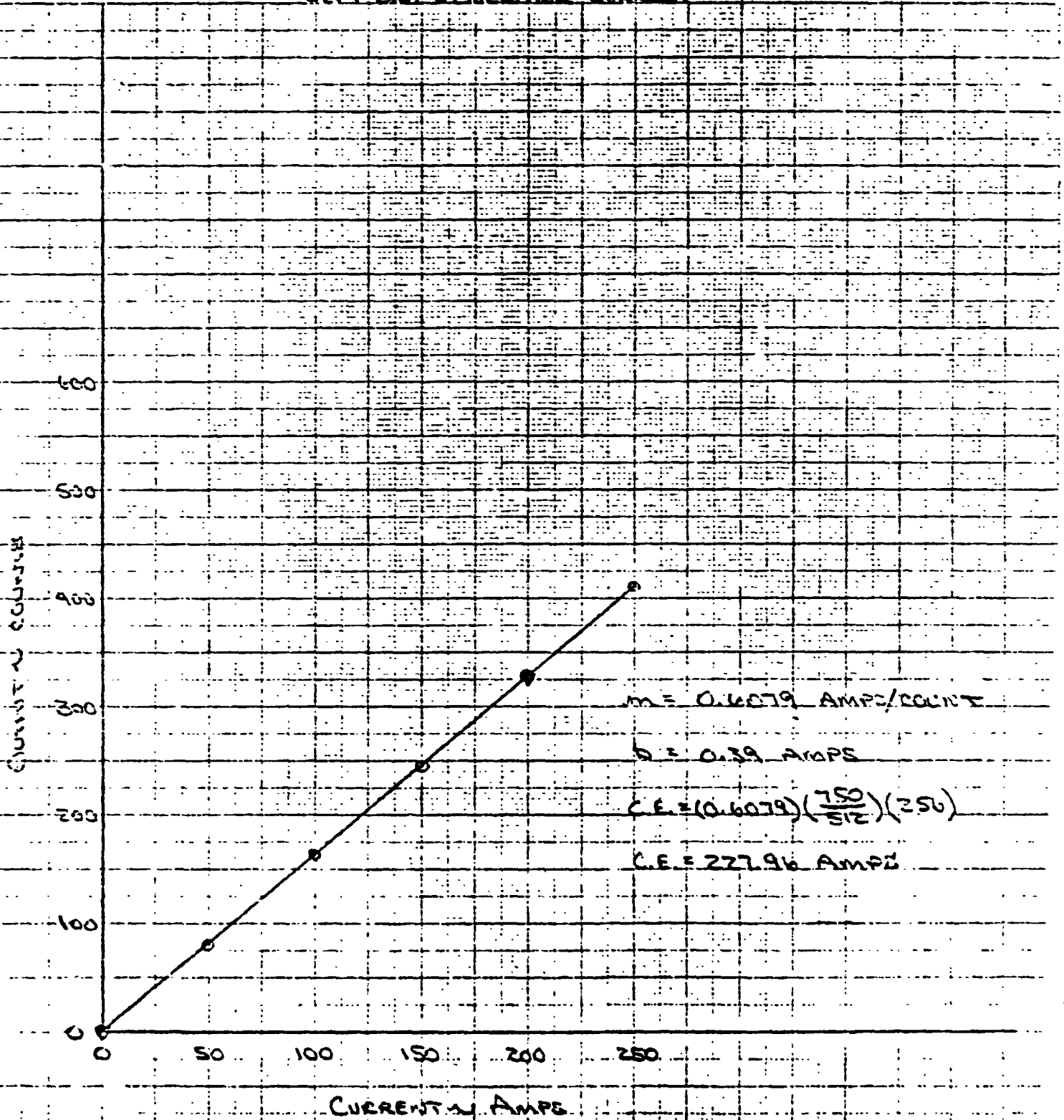
BELL HELICOPTER COMPANY

MODEL 501 PAGE _____
SERIAL 02 PART _____

ORIGINAL PAGE IS
OF POOR QUALITY

ITEM CODE: E100
CHK: B-50-1-1

LEFT DC GENERATOR CURRENT



BY A. WHITENED.

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED R.W.

HELI. 1+2 RPT SKASW04375-1

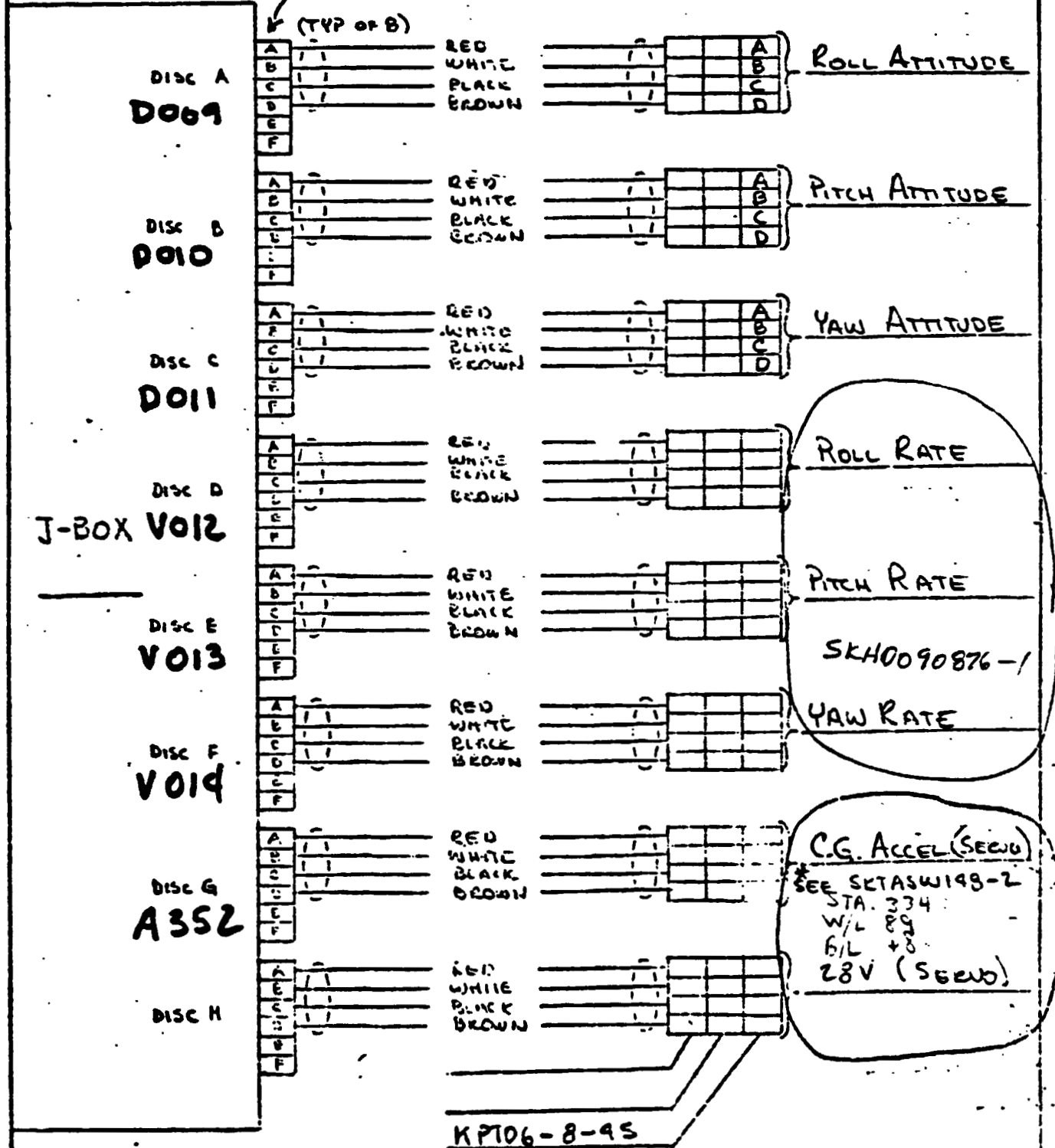
ORIGINAL PAGE IS OF POOR QUALITY

DISCONNECT HARNESS

J-Box LOCATION CAB-1

Handwritten: 279
b1
182

KPT06-10-6P



7842 9808REV 100

ORIGINAL PAGE IS OF POOR QUALITY

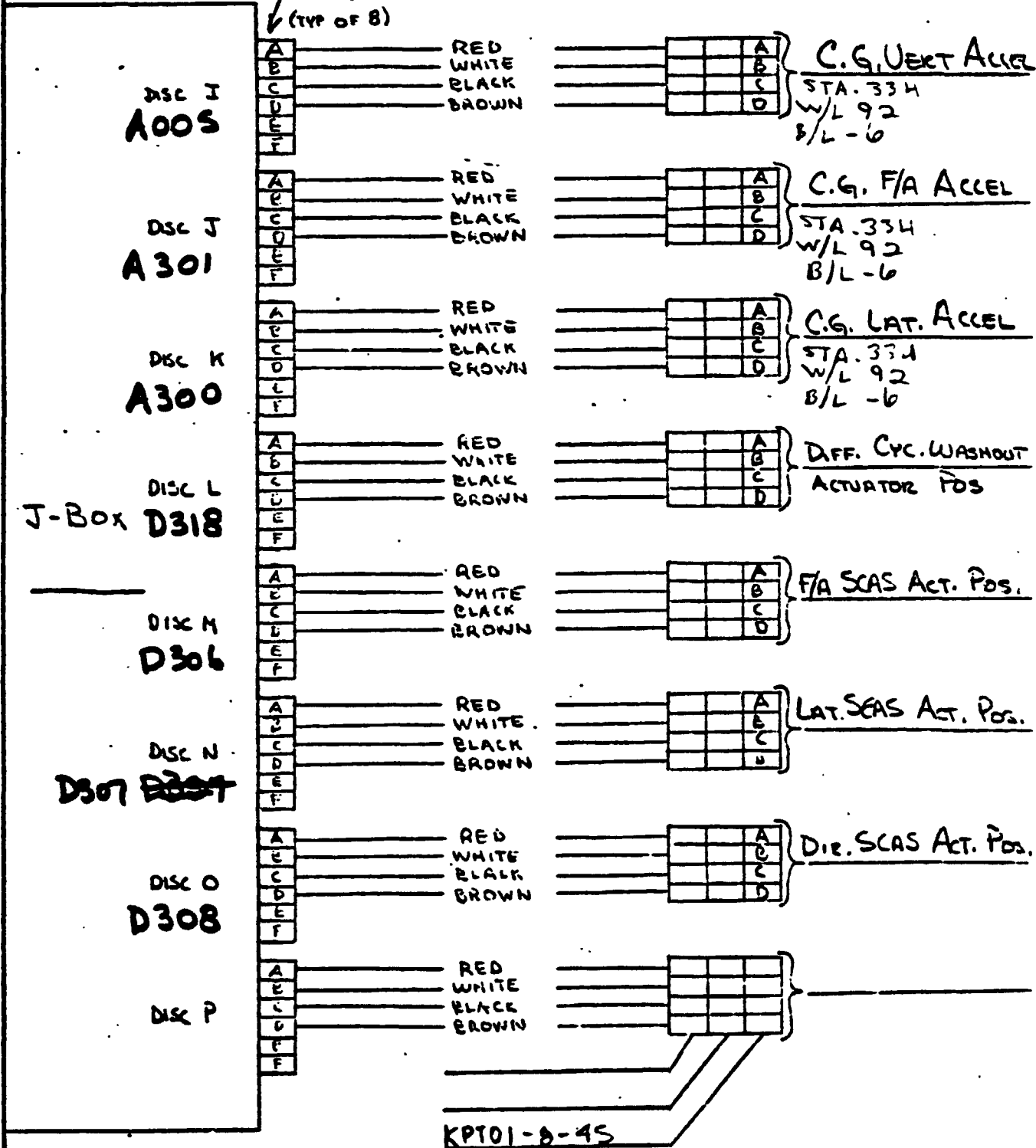
DISCONNECT HARNESS

J-Box LOCATION CAB-1

279

KPT06-10-6P

(TYPE OF 8)

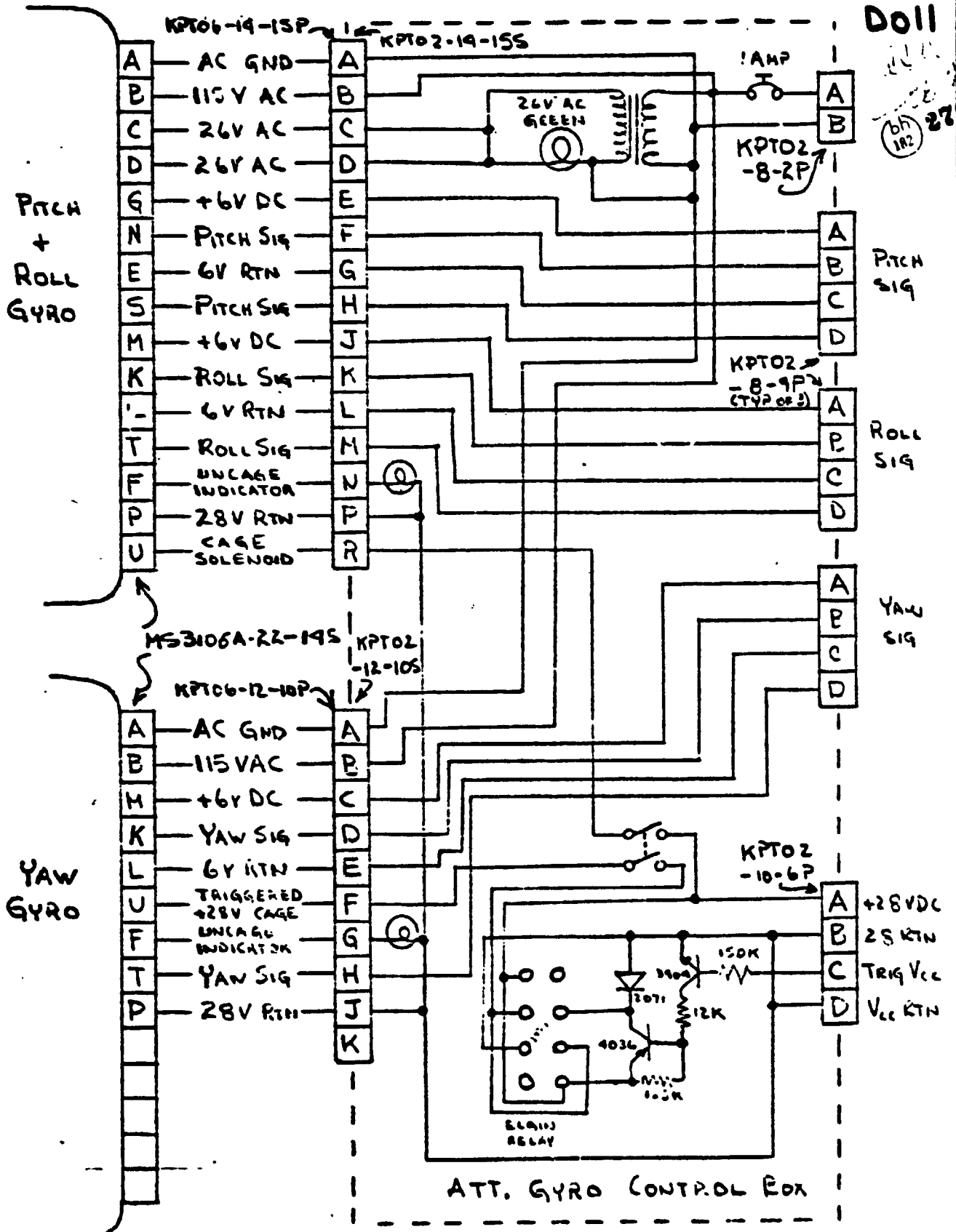


KPT01-8-45

ORIGINAL PAGE IS OF POOR QUALITY

ATTITUDE GYRO PACKAGE

D009
D000
D011



7048 0000REV 100

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/31/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer S. MITA

Project GROUND TRENCHING TESTS

Title ACCURACY EVAL - ROLL

L. T. R. _____ EWA _____

ITEM CODE: 0009

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvs.
<u>S. MITA</u>		<u>TILT TABLE</u>			

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "E" - 72-2-2</u>				
Bridge	<u>C/E II</u>				
Config.					
Cal. Res.					
Lever Arm	<u>POSITIVE DEFLECTION = RIGHT ROLL</u>				

Load	Output				
ROLL AMPLITUDE (COUNTS)	OUTPUT (COUNTS)	ROLL RATE (C.F.S.)	OUTPUT (COUNTS)		
0	159	-60	-395		CAGED = 159 COUNTS
10	251	-40	-210		
20	344	-20	-023		
30	436	C	+164		
40	528				
50	620	GPA ₀ (82-8-7) =	-004		
60	710	LLC (61-8-8) =	745		
70	806				
80	900				
90	715				
100	532				
20	247				
0	162				
-10	70				
-20	-24				
-30	-116				
-40	-210				
-50	-302				
-60	-396				
-70	-490				
-80	-582				

BY D.P. Smith
CHECKED _____

HELL HELICOPTER COMPANY

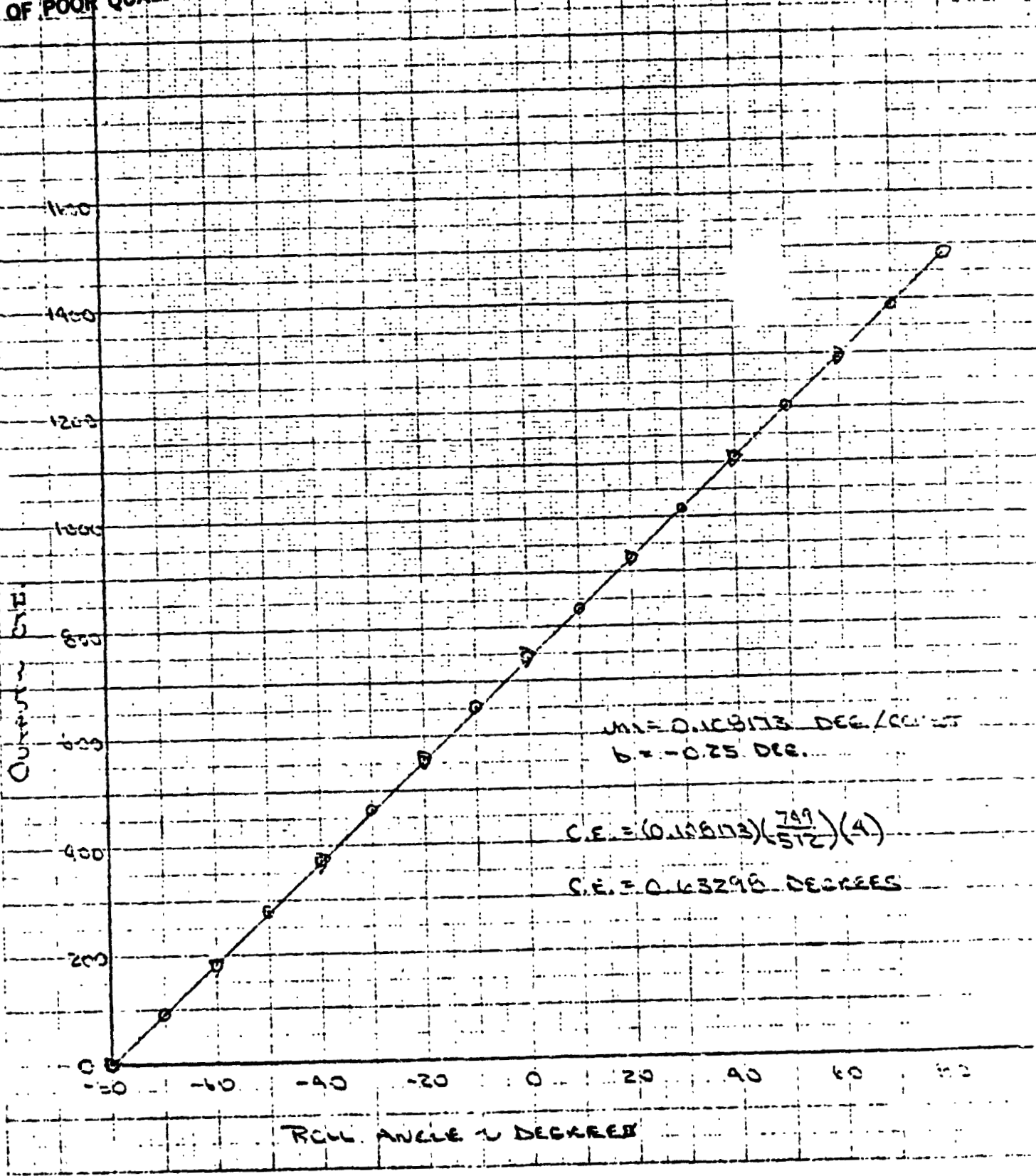
NOB: 301 PAGE _____
HELL 2 RPI _____

ITEM CODE: 0009

ORIGINAL PAGE IS
OF POOR QUALITY

Roll Amplitude

CM: B-72-2-2



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/31/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GROUND TIEDOWN TESTS

Title ANGLE GYRO - PITCH

W. O. _____

L. T. R. _____ EWA _____

From CDE: 0010

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galva.
<u>S. SMITH</u>		<u>TILT TABLE</u>			

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>PINEL "E" - 72-2-1</u>				
Bridge	<u>C/S 11</u>				
Config.					
Cal. Res.					
Lever Arm	<u>NOTE: POSITIVE DEGREE = INCL UP</u>				

Input	Output				
<u>PITCH ANGLE (DEGREE)</u>	<u>OUTPUT (COUNT)</u>				
0	120				
10	213				
20	309				
30	402				
40	495				
50					
60					
40	495				
20	308				
0	120				
-10	-76				
-20	-271				
-30	-464				
-40	-660				
-50	-855				
-60					
-40	-660				
-20	-269				
0	120				
<u>OPIN (52.8-7) = -065</u>					
<u>U.C (51.9-8) = +795</u>					

CAGED = 116 CTS

BY D.P. Smith
CHECKED

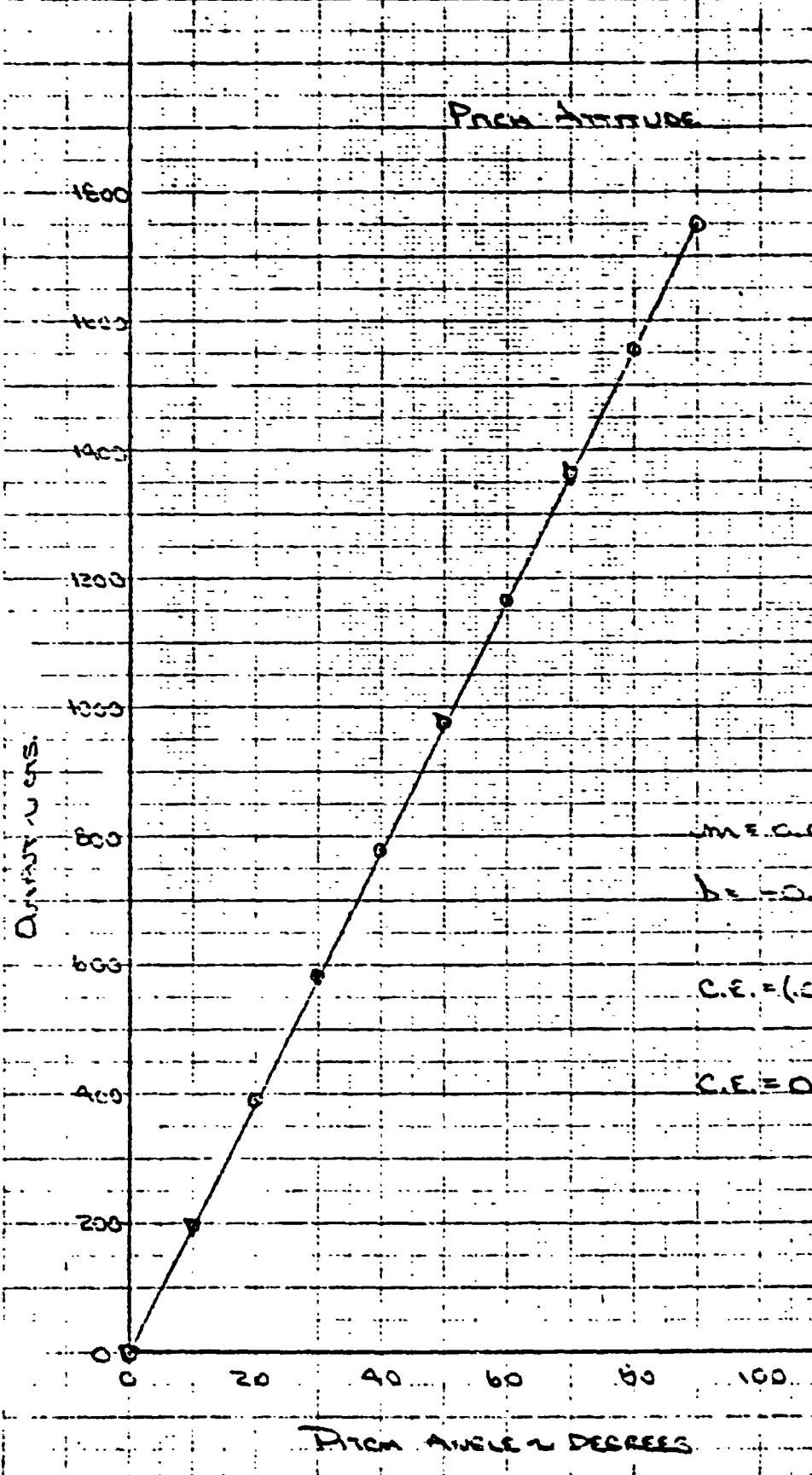
DELL HELICOPTER COMPANY
DATE: _____ TIME: _____

MODEL 301 PAGE _____
REVISION 2 SPI _____

ITEM CODE: 0010

CH: B-72-2-1

Pitch Attitude



MEASUREMENT DEG./COUNT

$b = 0.055$ DEGREES

$$C.E. = (0.05142) \left(\frac{750}{512} \right) (9)$$

$C.E. = 0.03012$ DEGREES

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/31/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer S. J. ...

Project GROUND TIEDOWN TESTS

Title ATTITUDE GYRO - YAW AXIS

L. T. R. EWA

301-2

W. O. _____

ITEM CODE: 001

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Calva.
<u>S. J. ...</u>		<u>TILT TABLE</u>			

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chen.	<u>RMDU "B" - 71-2-2</u>				
Bridge	<u>C/S II</u>				
Config.					
Cal. Res.					
Lever Arm	<u>NOTE: POSITIVE DEGREES INCLINE SWC EIGHT</u>				

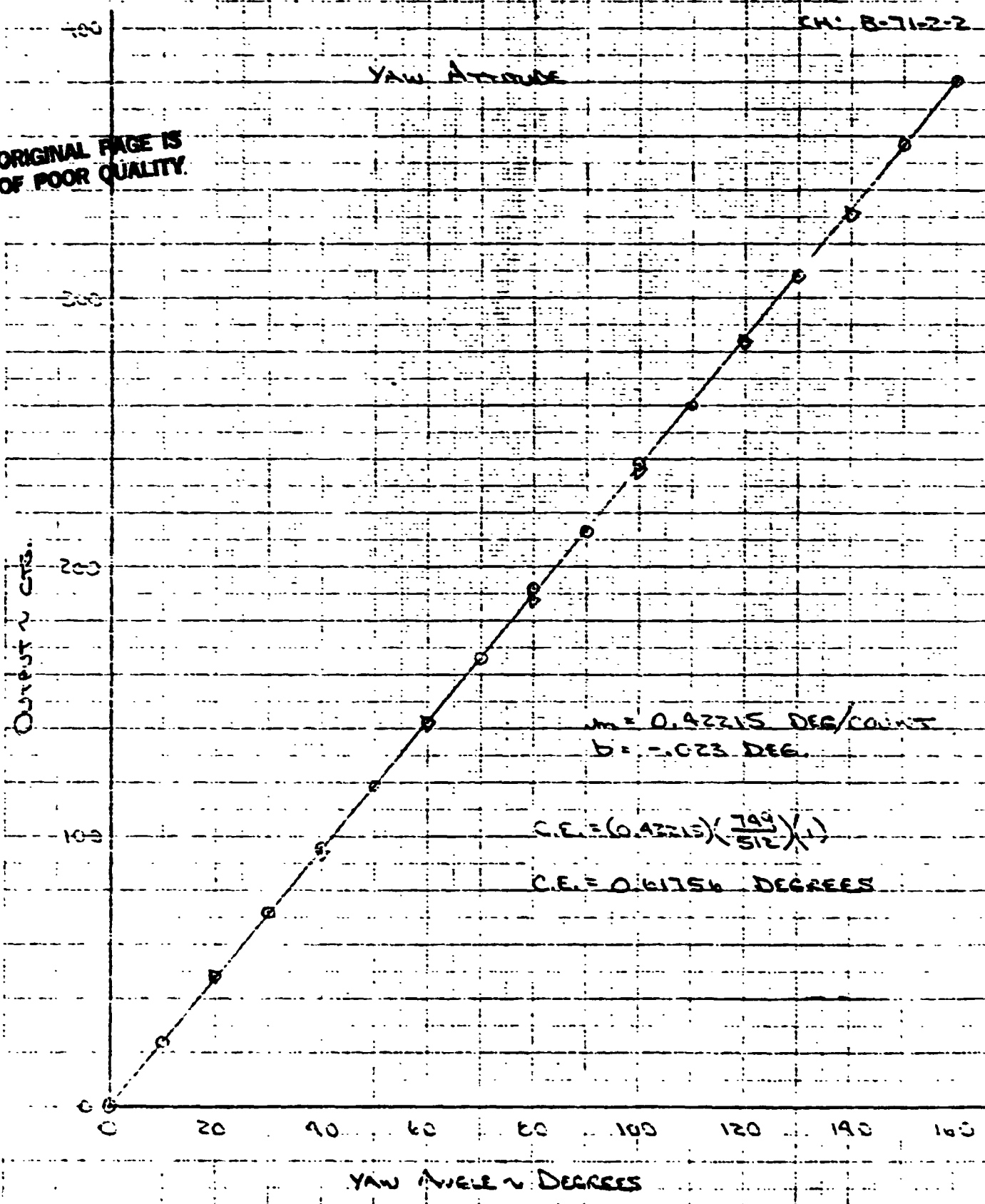
Load	Output	YAW ATT. (DEG)	OUTPUT (COUNTS)	
<u>YAW POSITIVE (DEGREE)</u>	<u>OUTPUT (COUNTS)</u>	<u>YAW ATT. (DEG)</u>	<u>OUTPUT (COUNTS)</u>	
0	-40	-60	-180	<u>CAGED = -40 CTS</u>
10	-15	-90	-139	
20	8	-20	-86	
30	32	0	-40	
40	56			
50	80			
60	103	<u>GPA₀ (52.5-7) = -4</u>		
70	129	<u>LLC (51.6-8) = +795</u>		
80	153			
60	103			
40	56			
20	10			
0	-39			
-10	-62			
-20	-86			
-30	-109			
-40	-132			
-50	-156			
-60	-180			
-70	-204			
-80	-228			

ITEM CODE: 0011

CH: B-712-2

YAW ATTITUDE

ORIGINAL PAGE IS OF POOR QUALITY.

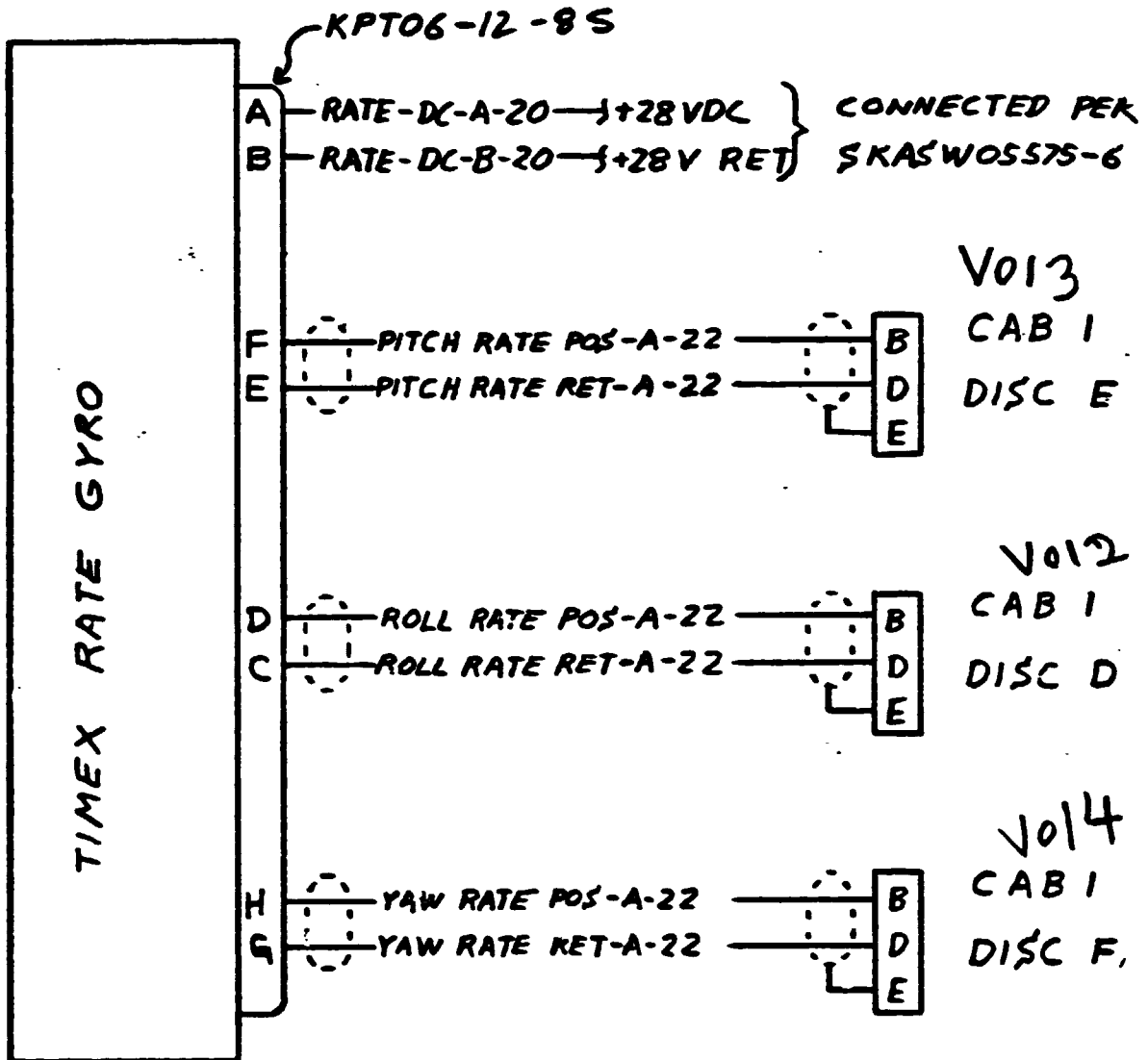


REV 'A'
3-2-78

APR 11 1978
279

TIMEX RATE GYRO WIRING

ORIGINAL PAGE IS OF POOR QUALITY



KPT06-10-6P
(3 PLACES)

440 A 888888 8888

Calibration Data Sheet

Description RATE GYRO 3 AXIS	Date Calibrated:
Model/Type PIN 402405	7-21-77
Range ± 100°/SEC.	Calibration Period:
Mfg. TIMEX	ORIGINAL PAGE IS
Serial No. 201	LCP No. OF POOP QUALITY

Lab No.	Calibrated by:
---------	----------------

Remarks: **7004, P/C 00339, 10K LOAD, NAME PLATE UPRK. II**

Vo12 ROLL	OUTPUT	Vo13 PITCH	OUTPUT	Vo14 YAW	OUTPUT
CW=L BANK	VOLTS	CW=L BANK	VOLTS	CW=R YAW	VOLTS
0	+0.001	0	+0.001	0	0.001
10° CW	-0.513	10° CW	+0.504	10° CW	+0.506
10° CCW	+0.514	10° CCW	-0.502	10° CCW	-0.50
20° CCW	+1.030	20° CCW	-1.004	20° CCW	-1.008
20° CW	-1.027	20° CW	+1.008	20° CW	+1.010
30° CW	-1.539	30° CW	+1.517	30° CW	+1.516
30° CCW	+1.540	30° CCW	-1.510	30° CCW	-1.506
40° CCW	+2.060	40° CCW	-2.012	40° CCW	-2.015
40° CW	-2.053	40° CW	+2.020	40° CW	+2.022
60° CW	-3.079	60° CW	+3.032	60° CW	+3.027
60° CCW	+3.080	60° CCW	-3.010	60° CCW	-3.021
80° CCW	+4.091	80° CCW	-4.005	80° CCW	-4.007
80° CW	-4.088	80° CW	+4.032	80° CW	+4.020
100° CW	-5.063	100° CW	+4.991	100° CW	+4.974
100° CCW	+5.056	100° CCW	-4.951	100° CCW	-4.960
90° CW	0.034		+0.034		+0.003
90° CCW	0.034		+0.034		+0.001
	-0.069	90° CW	0.007		-0.001
	+0.070	90° CCW	0.007		+0.010
	+0.027		+0.007	90° CW	0.007
	-0.004		-0.003	90° CCW	0.003
100° CW	0.043		0.043		+0.003
100° CCW	0.043		0.043		0.001
	-0.085	100° CW	0.003		-0.003
	+0.087	100° CCW	0.003		+0.011
	+0.009		+0.009	100° CW	0.009
	-0.006		-0.004	100° CCW	0.004

7862 111 Rev65

ORIGINAL PAGE IS
OF POOR QUALITY

SERIAL NO.: 201
USC CALIBRATION: 7-21-77
PART#: 402405
TYPE: TIMEX
BRIDGE VOLTAGE: NA
CC: 10 VOLT · 19.8 DEG/SEC

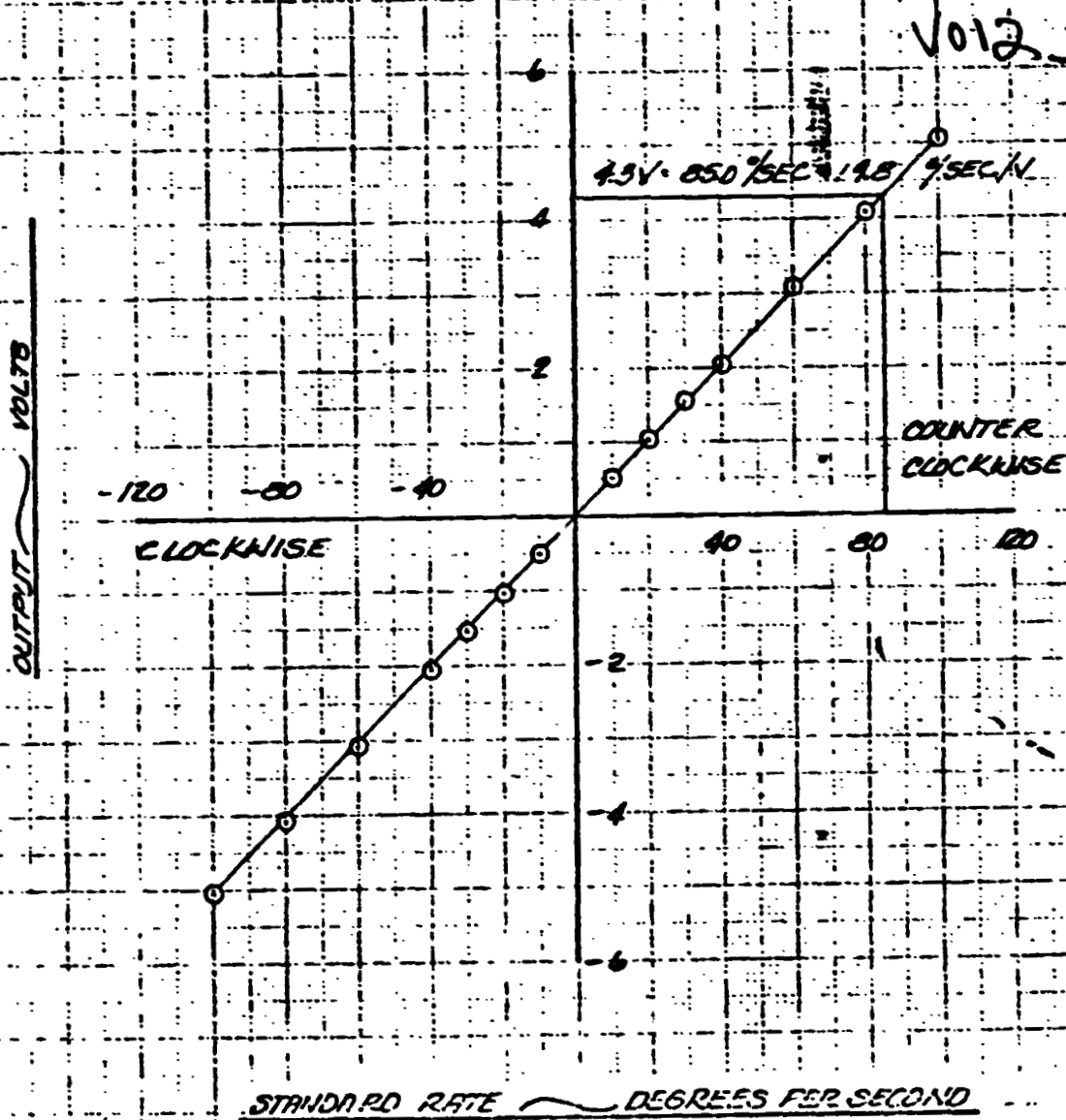


FIG. CALIBRATION OF RATE GYRO
FOR ROLL

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL _____ PAGE _____
SERIAL NO.: 201
LAB CALIBRATION: 7-21-77
MODEL: 402405
TYPE: TIME
BRIDGE VOLTAGE: NA
G.C.: 1.0 VOLT = 20.0 DEG/SEC

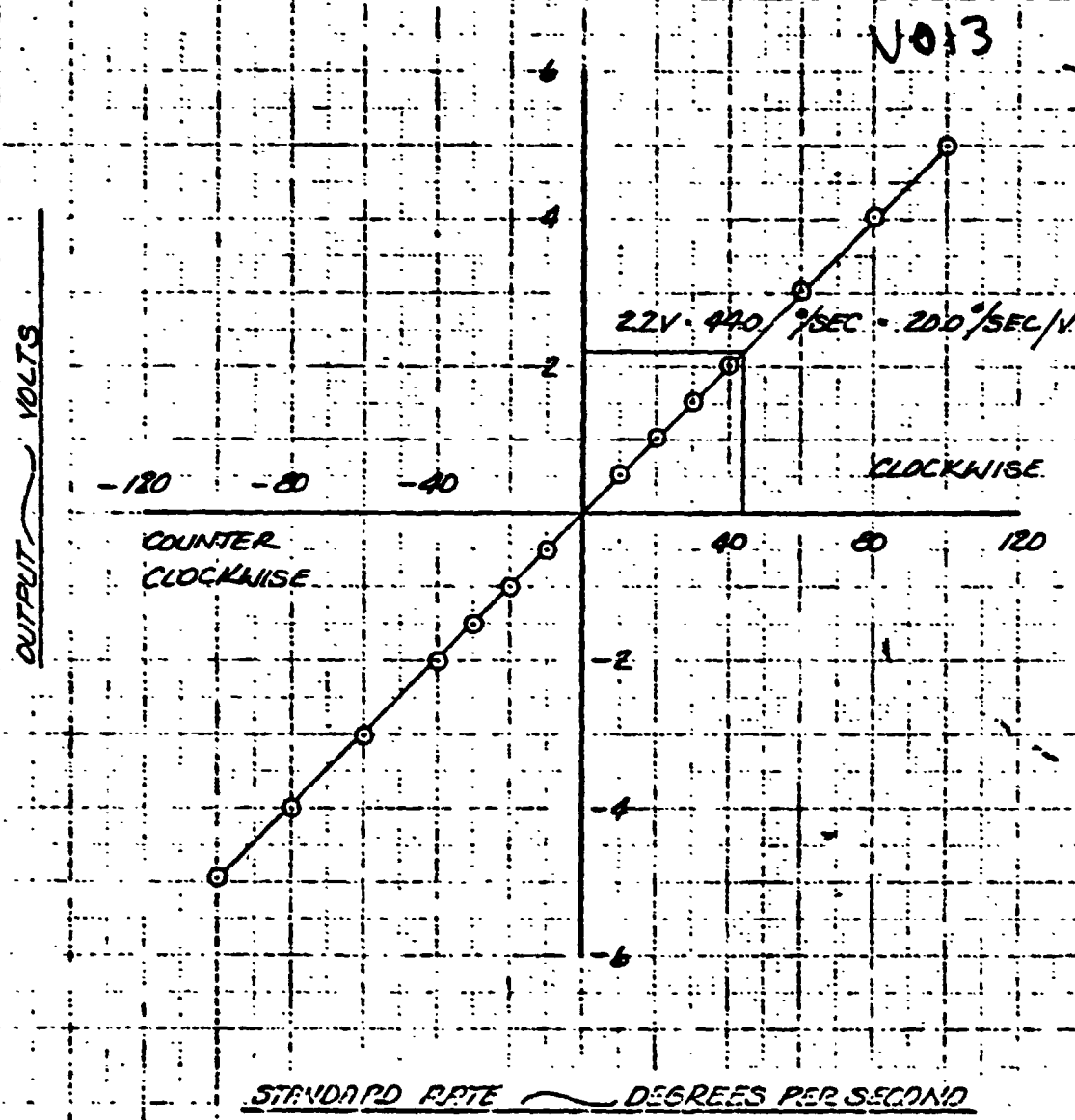


FIG. CALIBRATION OF RATE GYRO
FOR PITCH

ORIGINAL PAGE IS
OF POOR QUALITY

SERIAL NO: 201
LIB. CALIBRATION: 7-21-77
MODEL: 402405
TYPE: TIMEX
BRIDGE INSTRUMENTS: NA
CAL: 1.0 VOLT = 20.0 DEC/SEC

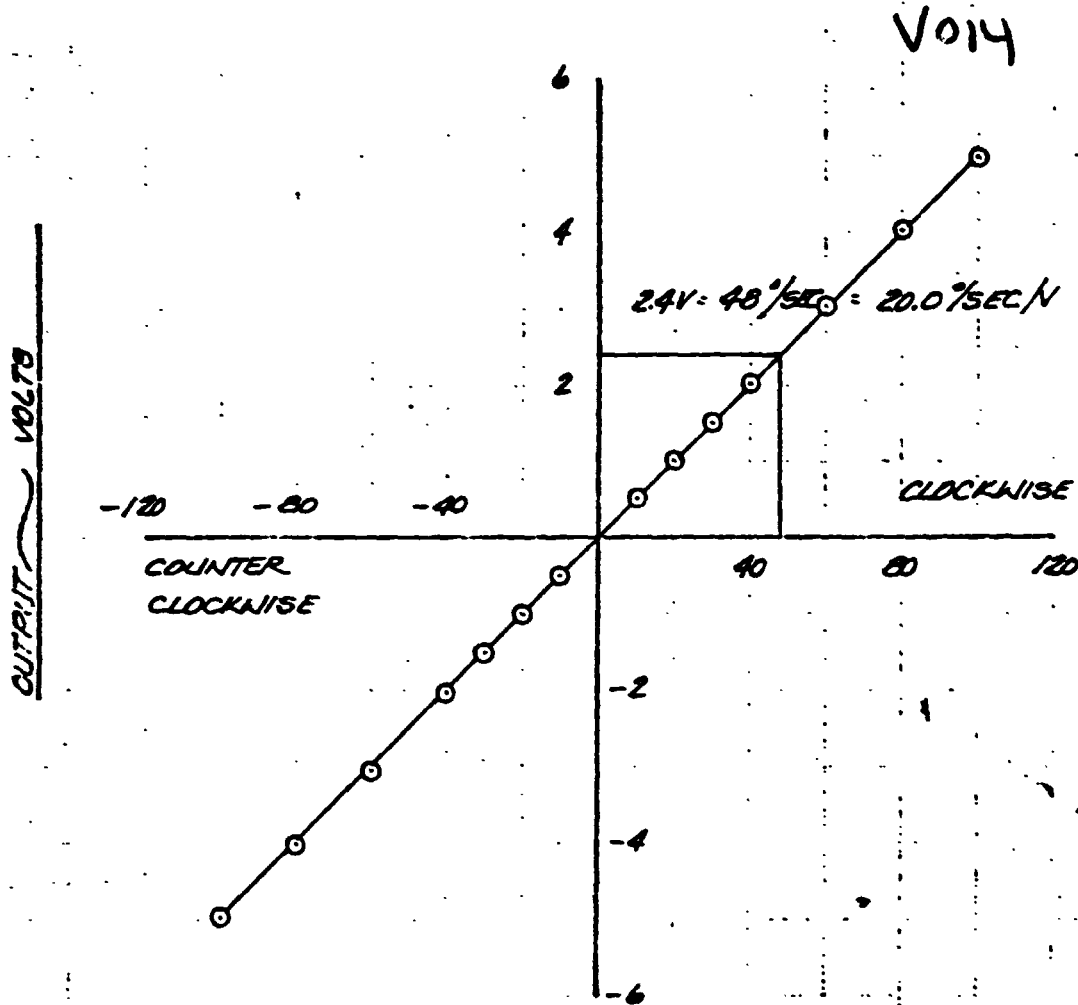


FIG. CONVERSION OF PITCH GYRO
FOR YAW

BY A. WHITENER
CHECKED AW

BELL HELICOPTER COMPANY

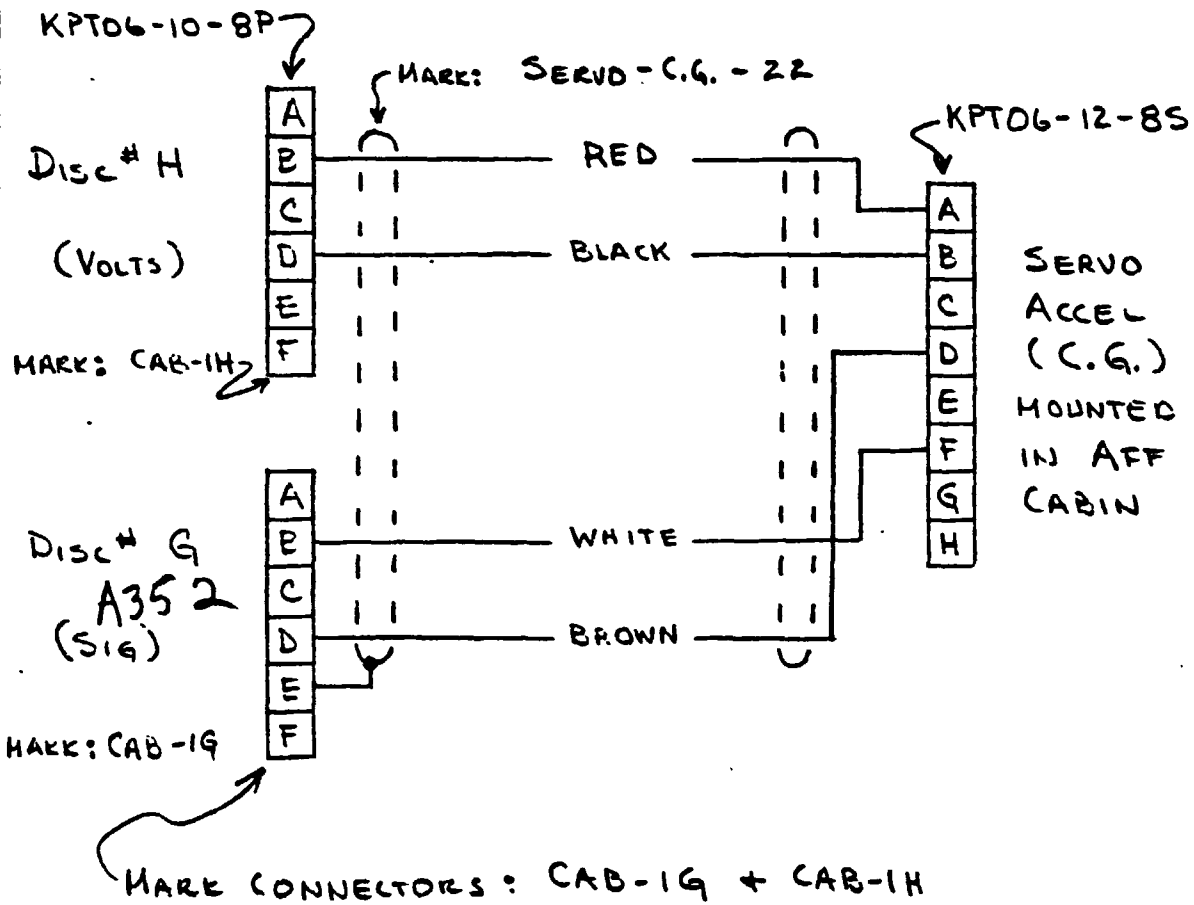
MODEL 301 PAGE _____
HELI. 1+2 RPT SKTASW148-2

SERVO ACCEL. WIRING

ORIGINAL PAGE IS
OF POOR QUALITY

J-Box CAB-1

AW
28
bh
182
270



BY A. WHITENER
CHECKED _____

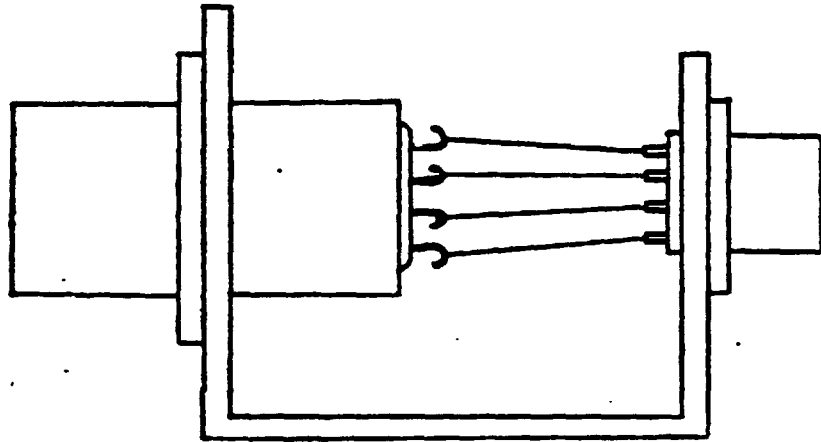
BELL HELICOPTER COMPANY

MODEL 301 PAGE _____
HELI. 1+2 RPT SEA SW 344-1

279
bh
182

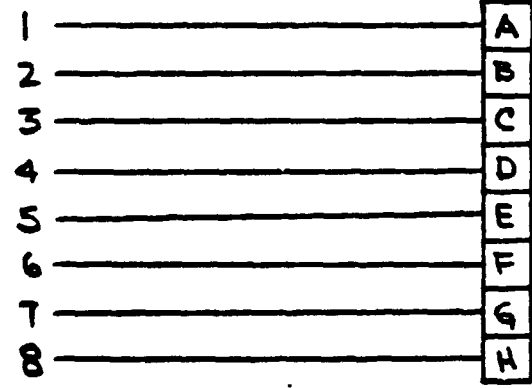
SERVO ACCEL WIRING

ORIGINAL PAGE IS
OF POOR QUALITY



PINS ON
ACCEL

- +28 V
- 28 RTN
- LOW Z SIG
- SIG GND
- GAIN
- SIG
- +TEST
- TEST



KPT02-12-8P

CAR-19
A352

Issue Date 5-30-70 10 371740071 578

PIEZOELECTRIC ACCELEROMETER CALIBRATION

MANUF. KISTLER TYPE 5010 DATE 5-30-70
CAPACITANCE — OF PROPERTY # — TECH 16

MOUNTING METHOD -

REMARKS -

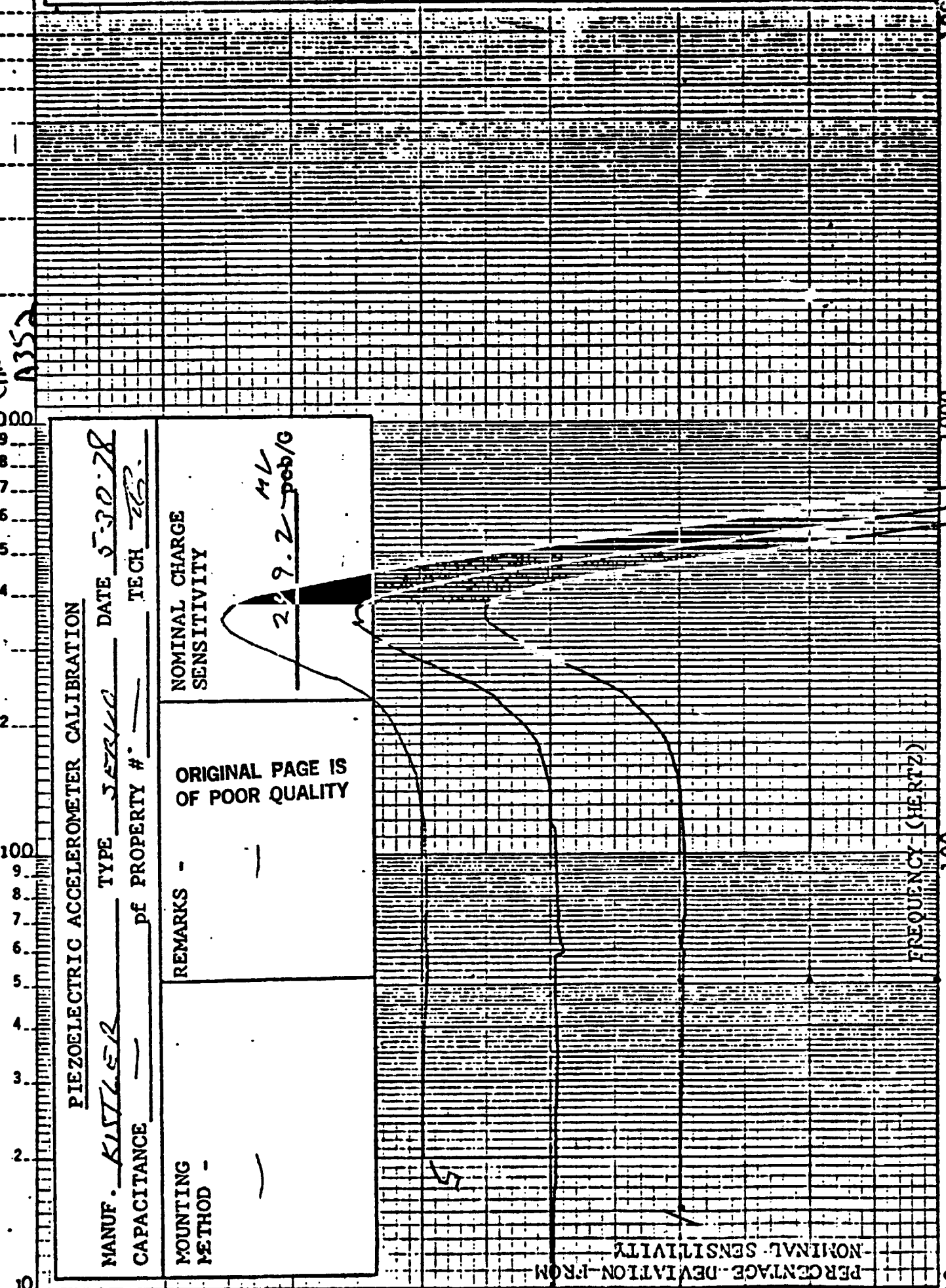
ORIGINAL PAGE IS OF POOR QUALITY

NOMINAL CHARGE SENSITIVITY

229.2 ML
prob/G

PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

FREQUENCY (HERTZ)



SENT NO. 97499
IDENTIFICATION CHANGE

- CHANGE
- RELEASE
- PROCESS.

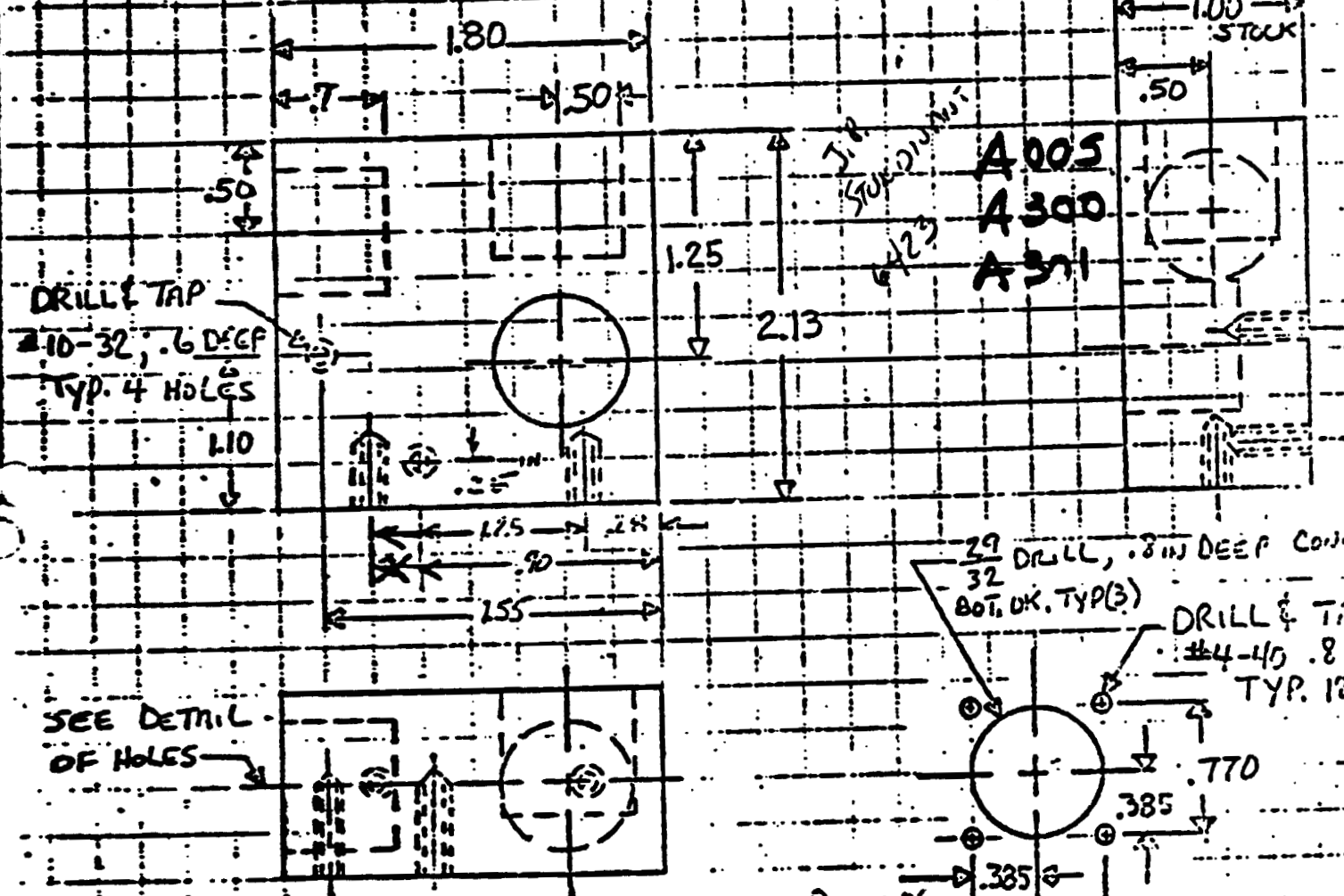
- TEST
- YES

SERIAL NO.		SHI
214 1155 211		
CLASS OF CHANGE	CO. OF ISMA LTR.	OF
		1
ENGR'G WORK ORDER		

SON: **3 AXIS ACCELEROMETER MOUNT FOR VIBRATION SURVEY**

DRAWINGS AFFECTED: **DRAWING CHANGE LTR.** EDNOT INCORP. CO INCORP. DRAWING TITLE: **4-10-12 211**

FOR REFERENCE



MAKE: ¹²12 DELIVERY TO A. WHITENER 4882
 MATERIAL: 2024 AL. ALY. OR EQUIV.
 SURFACE FINISH: PAINT INTL. ORANGE
 TP 6102 PART 06
 1-770-0

STATUS	PART/ASSY NO.	ADD.	REV.	CHG.	ENGINEERING DISPOSITION		
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE
PREPARED BY: <i>H. H. H. H.</i>	7-6-7	STRUCTURES				MET. DES.	
ENGR: <i>[Signature]</i>		CUSTOMER				WEIGHTS	
BY: <i>[Signature]</i>		D.E.R.				PROJ. ENG.	
MANUFACTURING EFFECTIVITY				ENGINEERING EFFECTIVITY			
NONE				NONE			

ORIGINAL PAGE IS OF POOR QUALITY

K&E SEMI-LOGARITHMIC 46 5493
3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO.

A005 B-53-2-1
CGVF

Issue Date 6/20/78 To

S/N 13566

ACCELEROMETER CALIBRATION

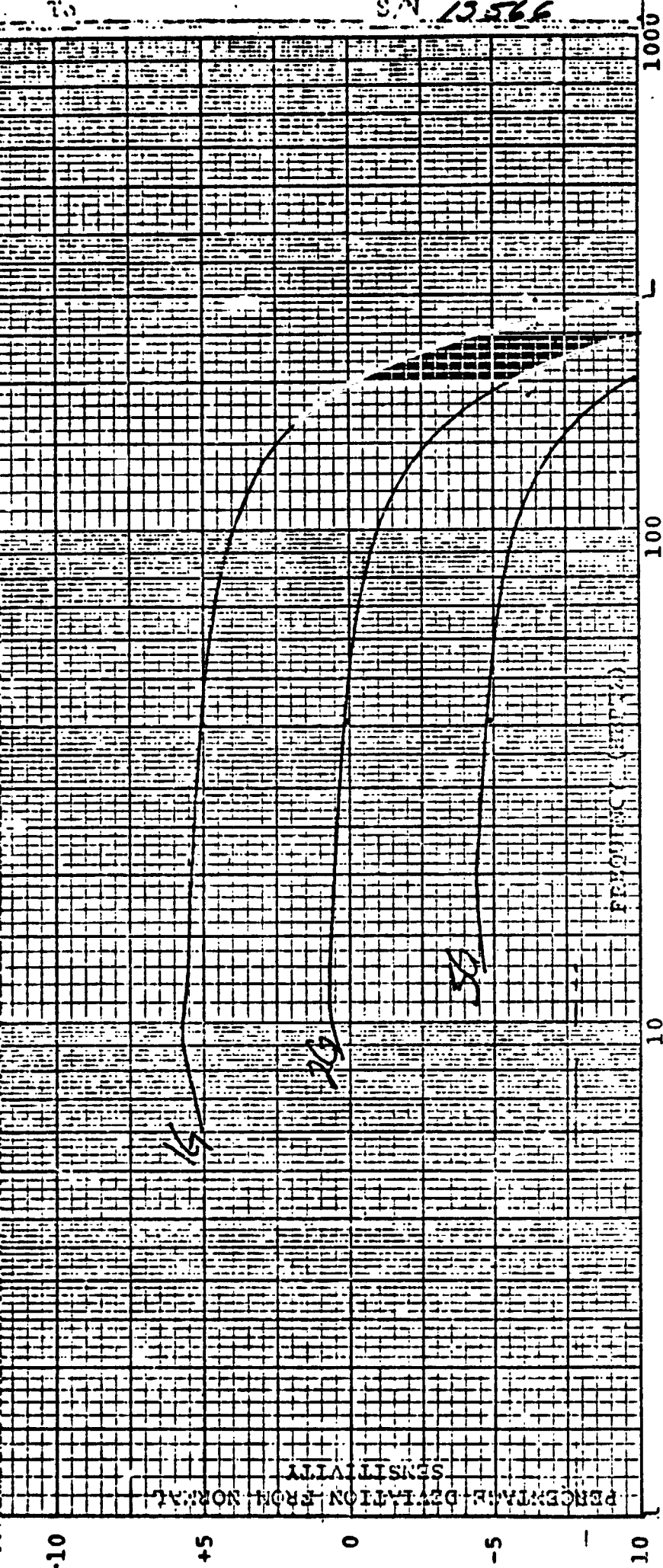
TYPE 6657C-5-3SD RANGE ±5g DATE 6/20/78
 EXCITATION (V) 6.001 NOMINAL SENS (S) 6.40 (mv/g)
 RESISTANCE, A-C 343.8 ohm, B-D 324.1 ohm, Tech. WHL

2G INVERSION (REF ONLY)
 1 6.43 mv
 1 6.41 mv
 vg 6.415 (mv/g)

SHUNT CAL
 100K C.E. = 4.89 $\frac{mv}{S}$
 100K C.E. = .764 g

UNITY CAL
 U.C. = $\frac{V}{S}$
 U.C. = .932 g

ORIGINAL MADE IN
OF POOR QUALITY



1000
100
10
-10
+5
0
-5
10

A300 MS2-2-2
CG LAT

Issue Date 6/20/78

SP1 16573

ACCELEROMETER CALIBRATION

TYPE AD57C-4-150 RANGE ± 4g DATE 6/20/78

EXCITATION (V) 6.001 NOMINAL SENS (S) 6.574 (mv/g)

RESISTANCE, A-C 354.1 ohm, B-D 346.2 ohm, Tech. W.H.L.

2g INVERSION (REF ONLY)

1 66.4 mv

1 66.6 mv

v_s 6.65 (mv/g)

SHUNT CAL

100K C.E. = 450 mv

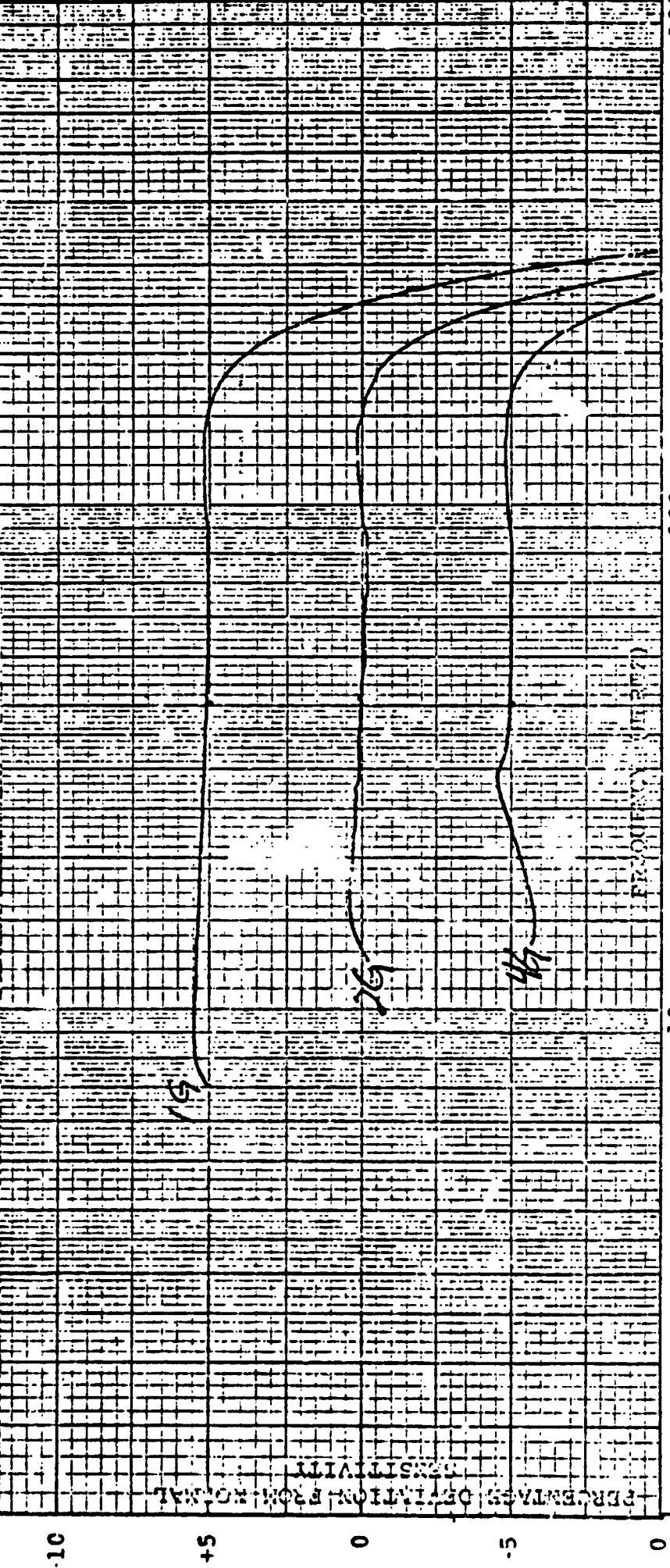
100K C.E. = .688 g

UNITY CAL

U.C. = $\frac{V}{S}$

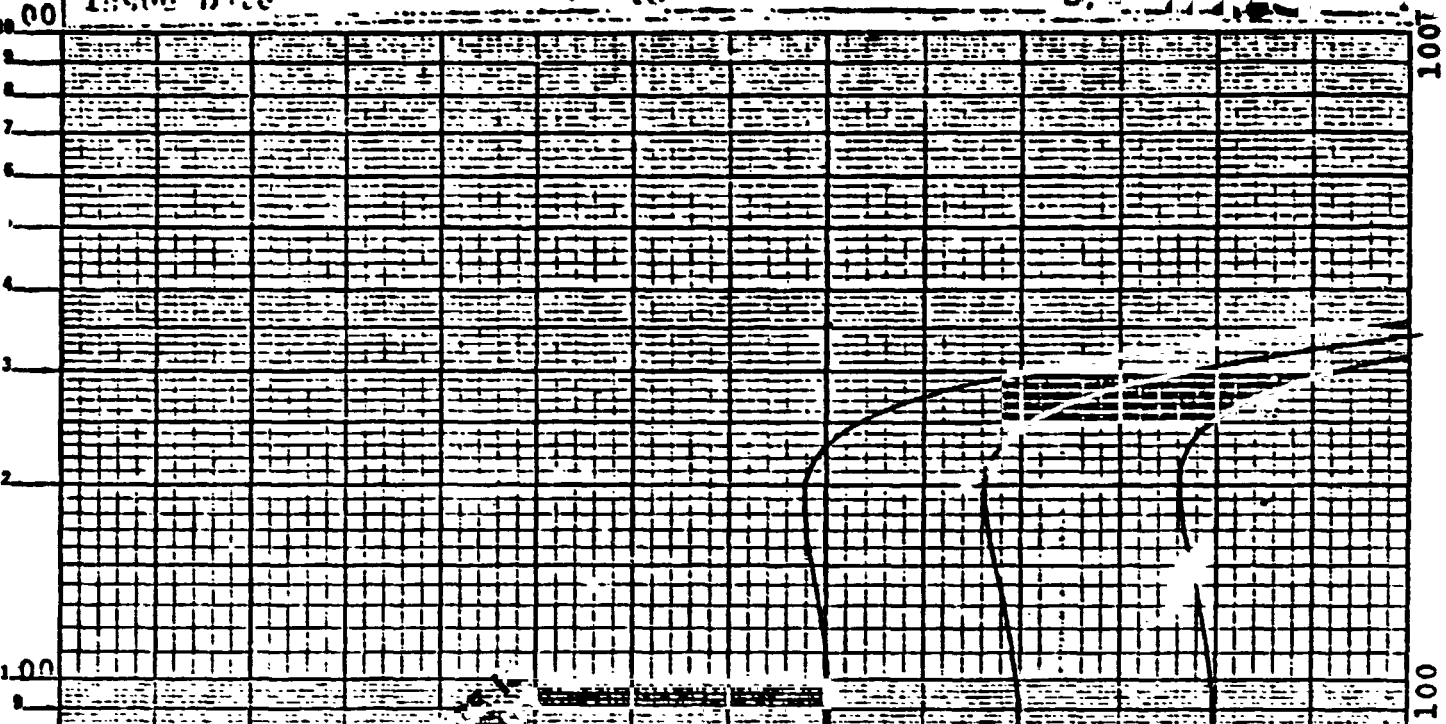
U.C. = .917 g

ORIGINAL PAGE IS
OF POOR QUALITY



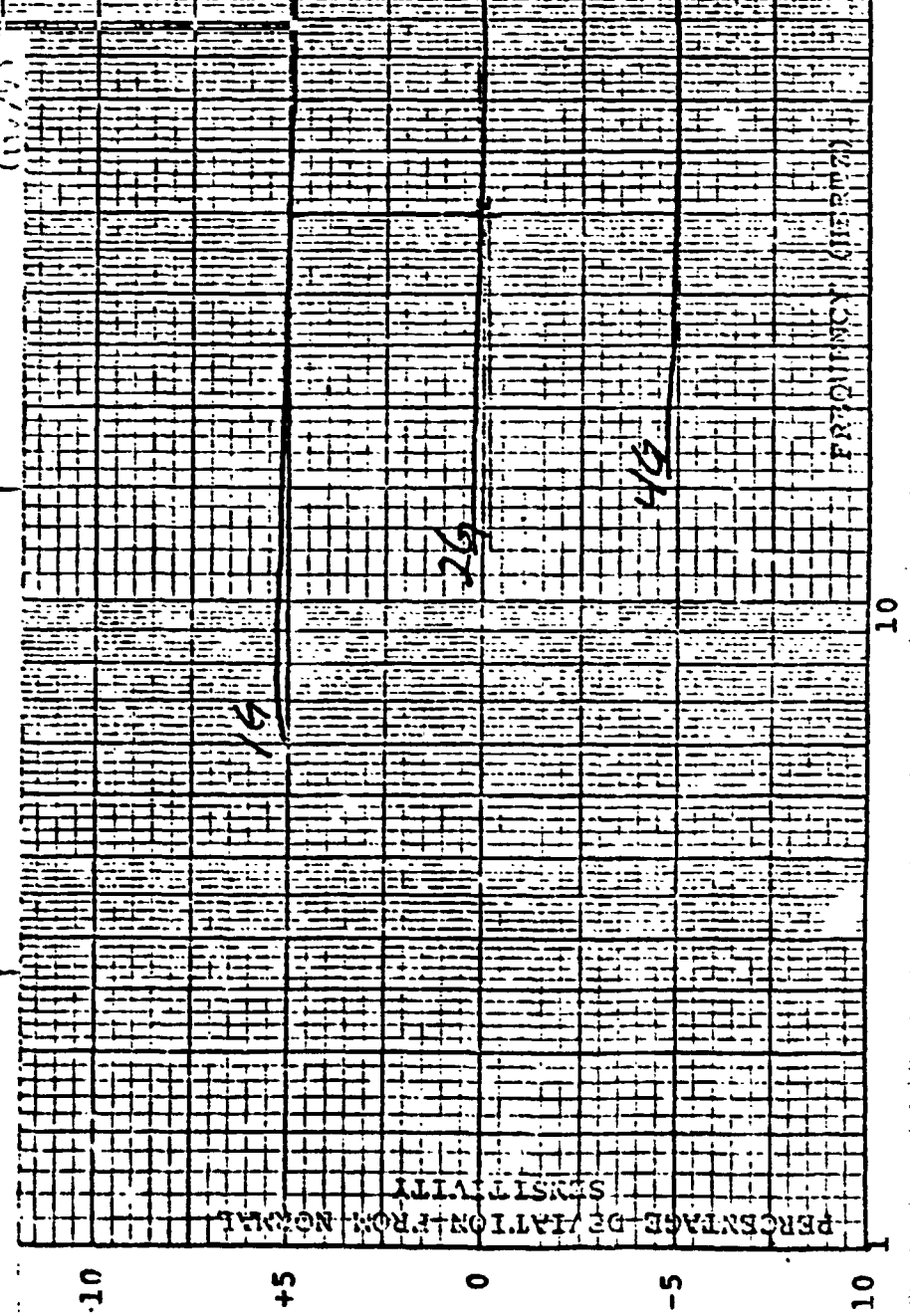
1000
100
10
0

A301 E-52-2-1
 CGP/A



ACCELEROMETER CALIBRATION
 TYPE ARRIS-Y-152 RANGE ± 4G DATE 6/20/78
 EXCITATION (V) 6.001 NOMINAL SENS (S) 7.336 (mv/G)
 RESISTANCE, A-C 347.7 ohm, B-D 390 ohm, Tech. M.S.K.

2G INVERSION (REF ONLY) 1.227 MV
1.227 MV
 U.C. = $\frac{V}{S}$
 U.C. = .815
 SHUNT CAL. LOCK C.E. = 6.033 G U.C. = .815
 UNITS CAL. ORIGINAL OF POOR QUALITY



PERCENTAGE DEVIATION FROM NORMAL SENSITIVITY

FREQUENCY (Hz)

BY A. WHITE NEV.
CHECKED _____

Bell Helicopter **TEXTRON**
Division of Textron Inc.
FIRST OFFICE USE ONLY - FIRST ORIGINAL, THIRD COPY

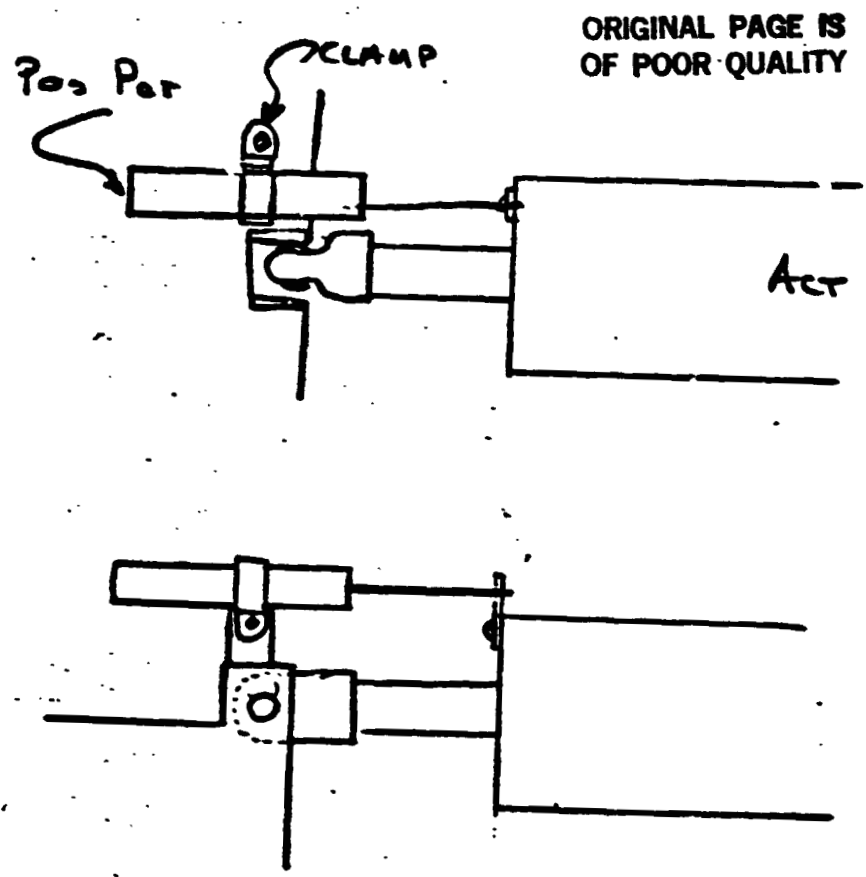
MODEL 301 PAGE 1
RPT ASW 5377-4

SCAS Act. Pos

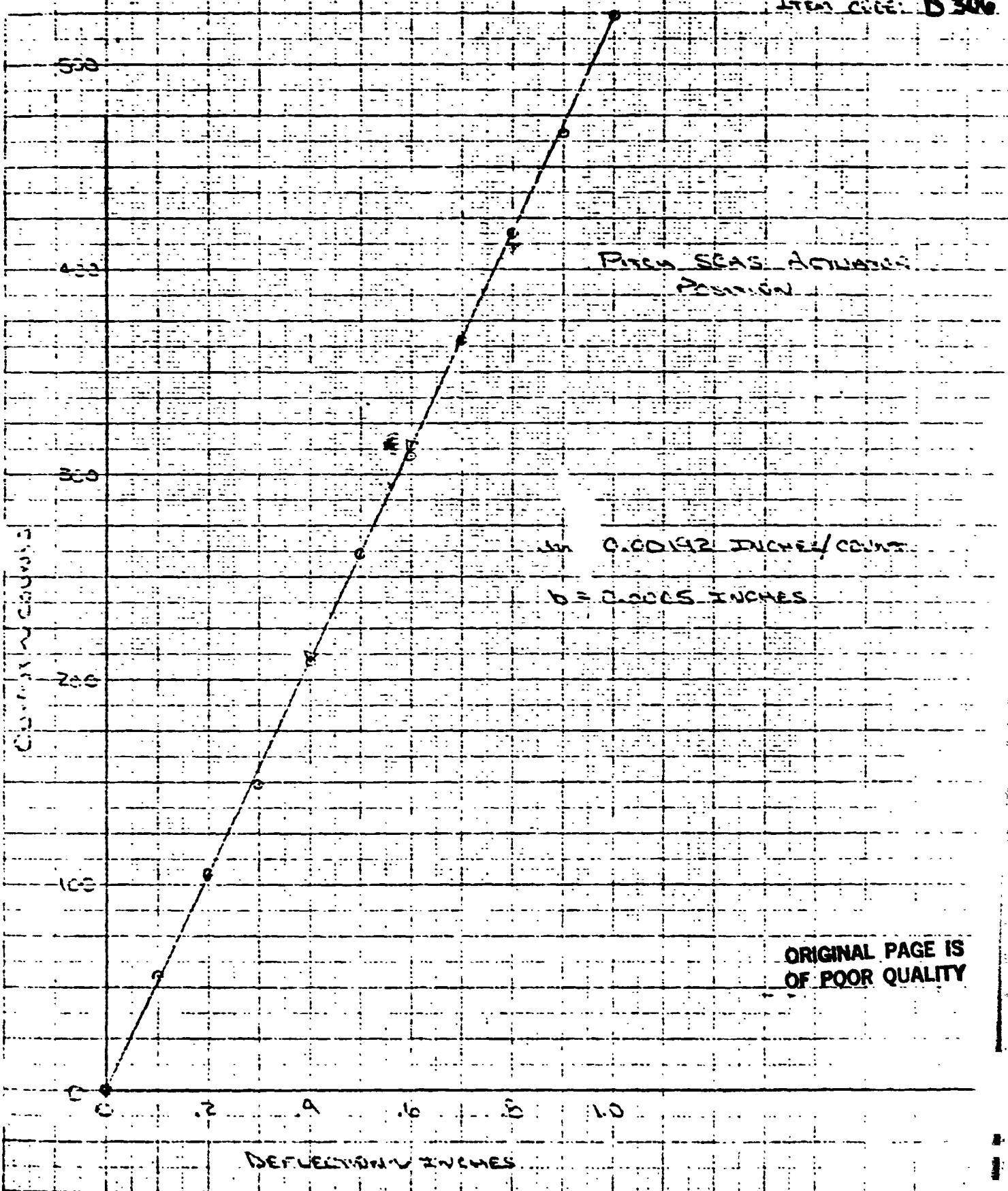
PITCA
Pot. 512 376-214

4-28-75
6th
182
279

D306



ITEM CODE: D306



ORIGINAL PAGE IS OF POOR QUALITY

Counting Channels

CLEARPRINT PAPER CO. 20 THE WILLIAMTINS... BY 7... 100

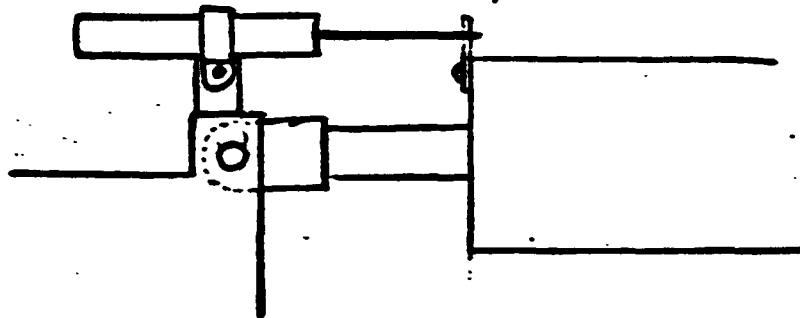
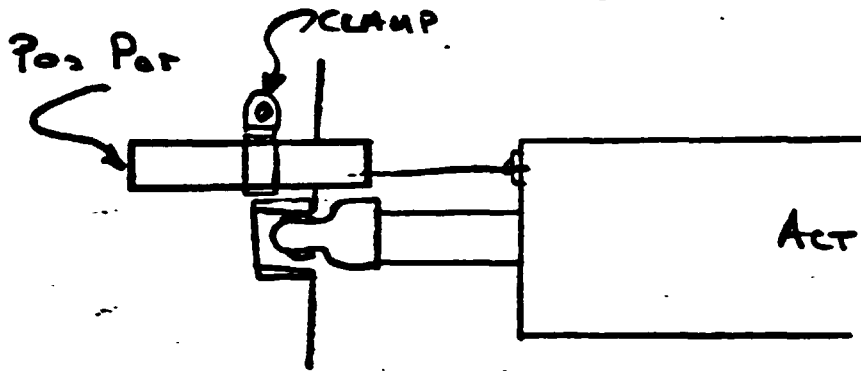
M
4 28 68

SCAS ACT. Pos

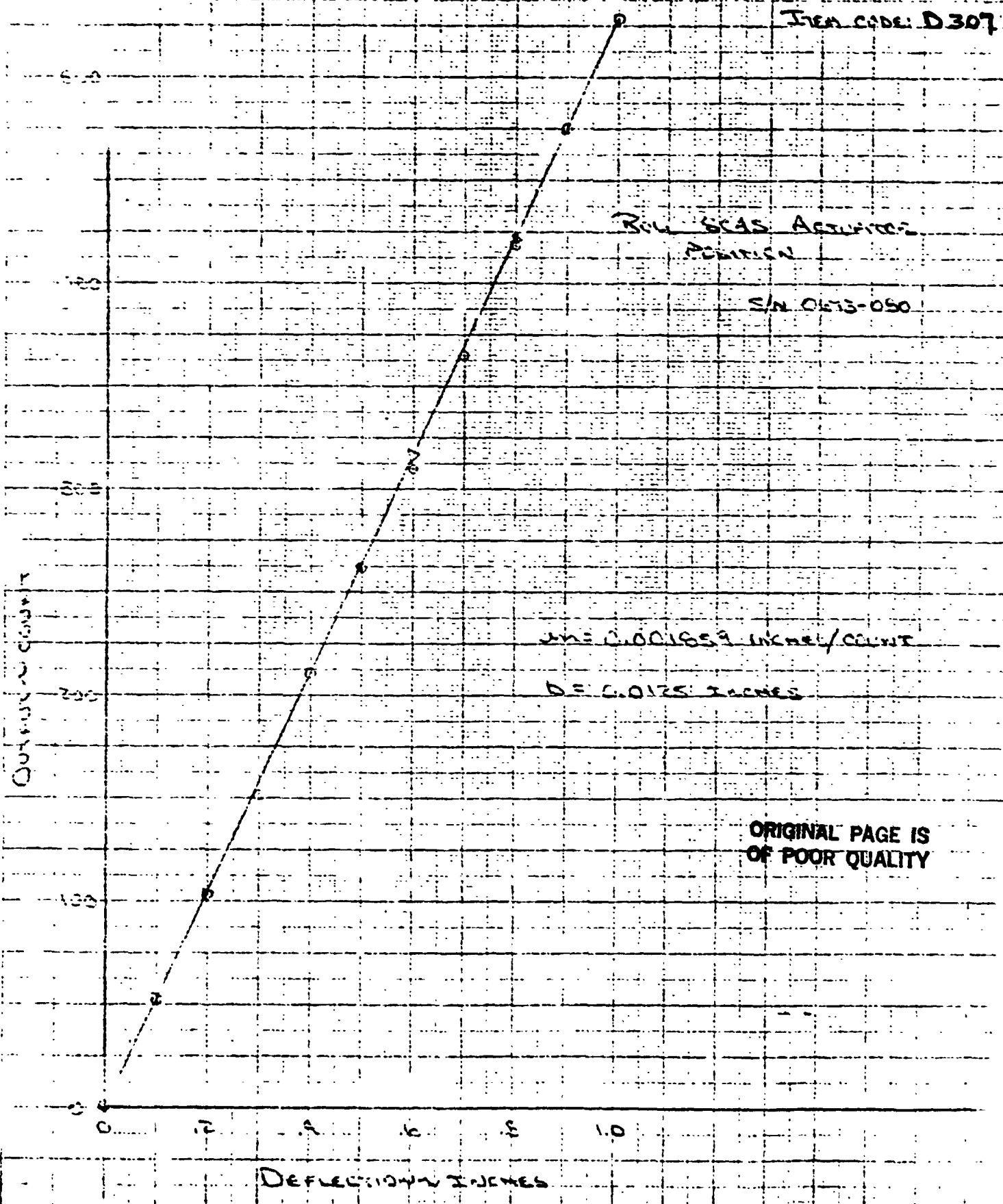
LAT. POT S/N 3776-232

D307

ORIGINAL PAGE IS
OF POOR QUALITY



ITEM CODE: D307



Roll SEAS Acquisition POSITION

SN 0613-050

SLOPE 0.001659 INCHES/COUNT

DE 0.0125 INCHES

ORIGINAL PAGE IS OF POOR QUALITY

DEFLECTION IN INCHES

OUTPUT IN COUNTS

BY A. WHITE NEV
CHECKED _____

Bell Helicopter **TEXTRON**
Division of Textron Inc.
FORT WORTH, TEXAS 76101

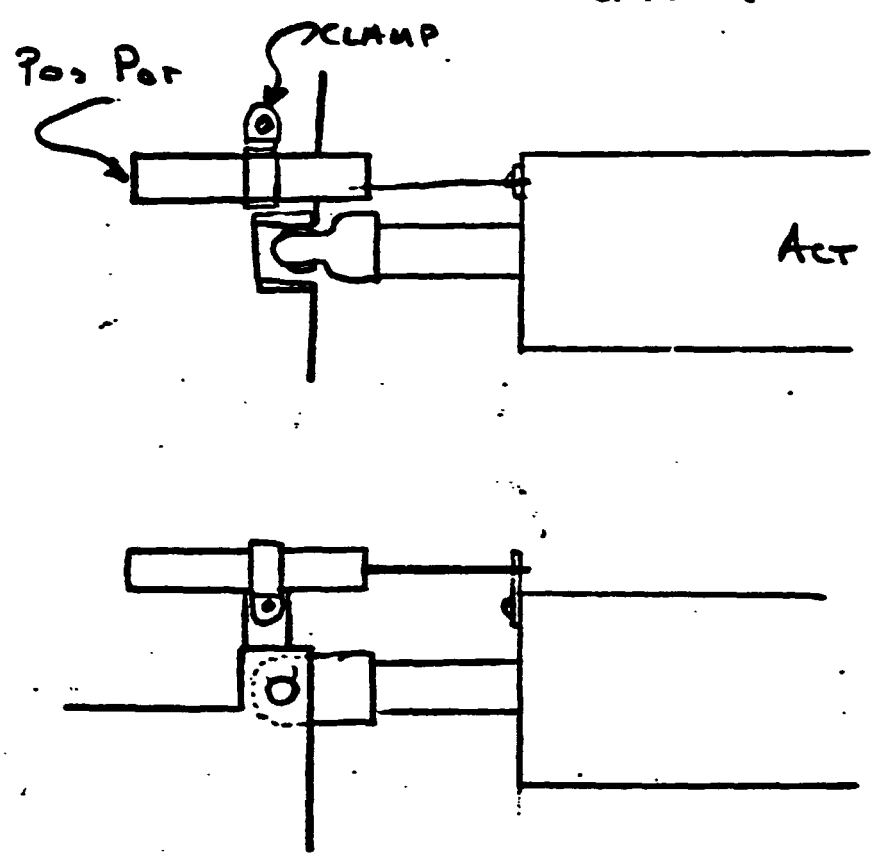
MODEL 301 PAGE 1
RPT ASW 5377-4

SCAS ACT. Pos
YAW POT. SN 3776-225

38-78
(bh) 279
(18)

D308

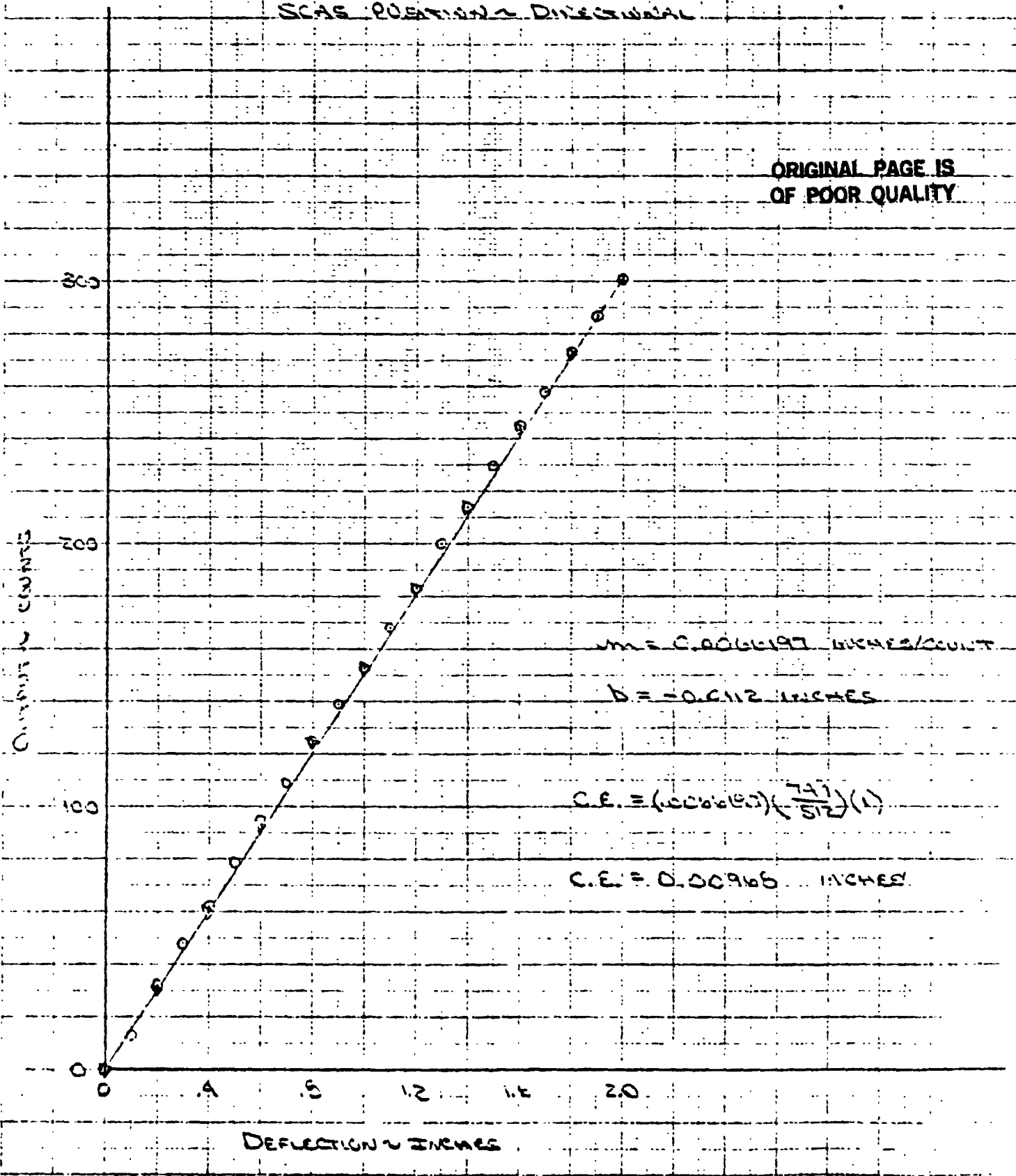
ORIGINAL PAGE IS
OF POOR QUALITY



ITEM CODE: D308
CH: B-76-2-2

SCAS POSITION ~ DIRECTIONAL

ORIGINAL PAGE IS
OF POOR QUALITY



$m = 0.006197$ INCHES/COUNT

$b = -0.0112$ INCHES

$C.E. = (0.006197) \left(\frac{791}{512} \right) (1)$

$C.E. = 0.00966$ INCHES

ANGOPDAG WASHER
MS24665-151 PIN
REVL

117D
3D BOLT
NUT
D1 WASHER
S PIN

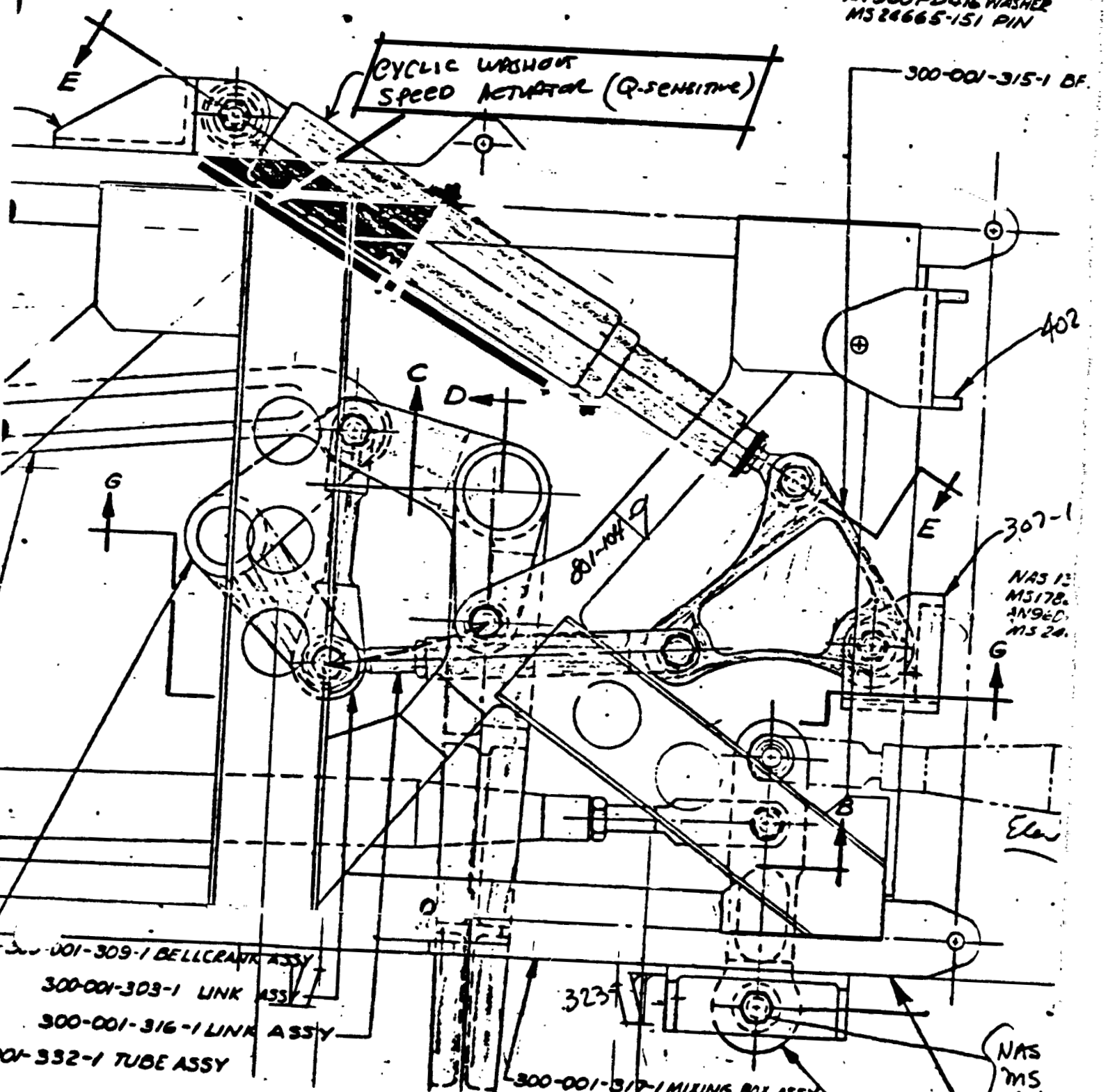
ORIGINAL PAGE IS
OF POOR QUALITY

B/P 300-001-318
ZONE C/S
D318
B78/815
CABLE

SECTION E-E

NAS 1304-12D BOLT
MS17825-4 NUT
ANGOPDAG WASHER
MS24665-151 PIN

300-001-305-1 LINK



NAS 13
MS178
ANGOPDAG
MS 24

Elev

NAS
MS
24

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6/3/76

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GROUND TIE-DOWN TESTS

Title DIFF. GROUND WASHING ACTUATOR RS.

L. T. R. EWA

W. O. _____

ITEM CODE: D318

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Smith</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RNIDJ "B" - 76-8-5</u>				
Bridge	<u>C/S 7</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Lead	Output	DEFLECTION (INCHES)	OUTPUT (COUNTS)
0	-5	1.8	-414
.1	-27	1.6	-370
.2	-49	1.9	-321
.3	-72	1.2	-272
.4	-93	1.0	-226
.5	-116	.8	-182
.6	-139	.6	-139
.7	-160	.4	-99
.8	-182	.2	-46
.9	-206	0	-5
1.0	-229		
1.1	-252		
1.2	-273		
1.3	-296		
1.4	-321		
1.5	-344		
1.6	-371		
1.7	-397		
1.8	-410		
1.9	-435		
2.0	-456		

BY D.P. Smith

BELL HELICOPTER COMPANY

MODEL 301

PAGE

DESIGNED

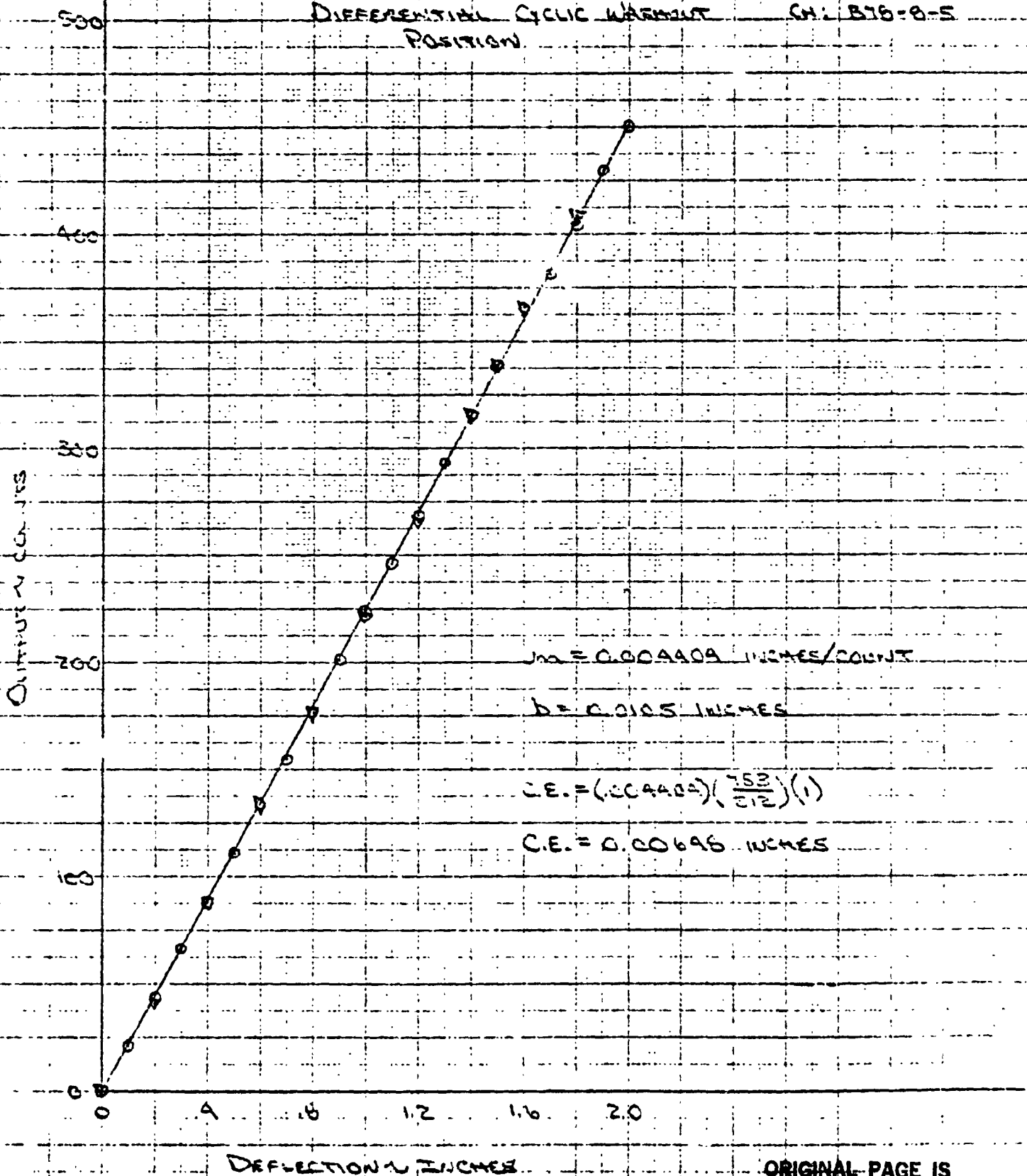
HELL #2

EPT

Form Code: 0318

DIFFERENTIAL CYCLIC WARMUP POSITION

CH: B76-8-5



$m = 0.004409$ INCHES/COUNT

$b = 0.0105$ INCHES

$C.E. = (0.004409) \left(\frac{753}{212} \right) (1)$

$C.E. = 0.00696$ INCHES

DEFLECTION IN INCHES

ORIGINAL PAGE IS OF POOR QUALITY

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 2 OF 2

CHECKED ASW

HELI. 1+2 RPT SKASW04375-1

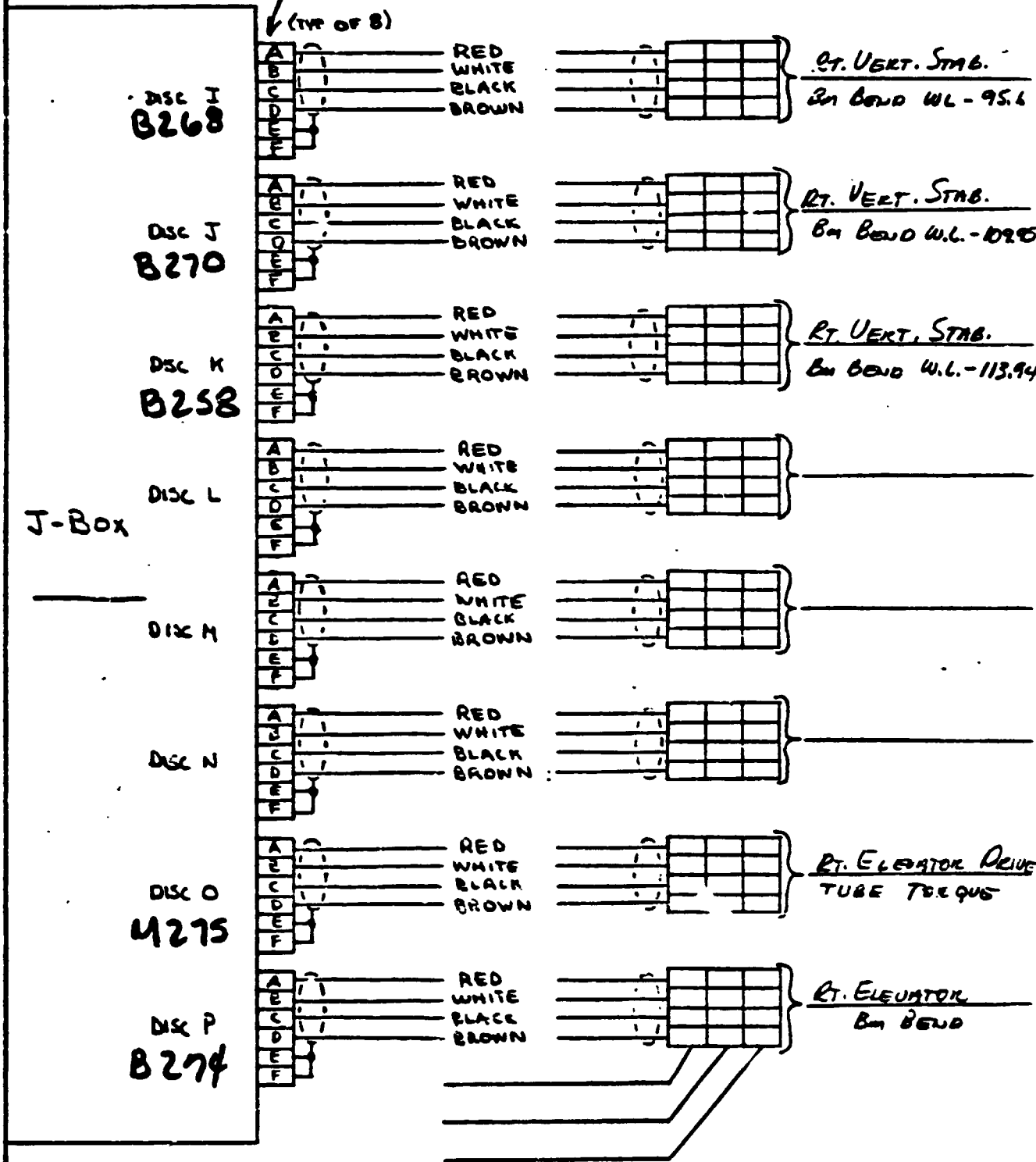
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box LOCATION: EMP-1

279
67
102

KPTOG-10-6P



7044 258988 100

1. L/H Elevator - BM. - HS 49.50 & ES 43.25
2. L/H Elevator - BM. - HS 49.50 & ES 43.25
3. Elevator Torque Tube - L/H Tor. - BL 3.8
4. Elevator Torque Tube - L/H Tor. - BL 3.8
5. Elevator Torque Tube - R/H Tor. - BL 3.8
6. Elevator Torque Tube - R/H Tor. - BL 3.8
7. R/H Elevator - BM. - HS 49.50 & ES 43.25
8. R/H Elevator - BM. - HS 49.50 & ES 43.25
9. Elevator Position
10. Rudder Position
11. R/H Vert. Tail - BM. - WL 95.6 - BM 01
12. R/H Vert. Tail - BM. - WL 94.4 - BM 01
13. L/H Vert. Tail - CH. - WL 97 - CH 02
14. R/H Vert. Tail - CH. - WL 97 - CH 02
15. R/H Vert. Tail - BM. - WL 108.7 - BM 03
16. R/H Vert. Tail - BM. - WL 109.4 - BM 03
17. R/H Vert. Tail - CH. - WL 108.0 - CH.04
18. R/H Vert. Tail - CH. - WL 108.0 - CH.04
19. R/H Rudder - BM. - WL 118.76
20. R/H Rudder - BM. - WL 118.76
21. R/H Rudder Torque Tube - Tor. - WL 105.93
22. R/H Rudder Torque Tube - Tor. - WL 105.93
23. L/H Rudder - BM. - WL 118.76
24. L/H Rudder - BM. - WL 118.76
25. L/H Rudder Torque Tube - Tor. - WL 105.93
26. L/H Rudder Torque Tube - Tor. - WL 105.93
27. R/H Vert. Tail - Spare (vacant on snip #1 at)
28. R/H Vert. Tail - Spare (Master Term. Only)
29. 1/4 H. Horiz. Stab. - Tor. - BL 66 - M267
30. 1/4 H. Horiz. Stab. - Tor. - BL 66 - M266
31. 1/4 H. Horiz. Stab. - CH. - BL 65
32. 1/4 H. Horiz. Stab. - CH. - BL 65
33. 1/4 H. Horiz. Stab. - BM. - BL 65
34. 1/4 H. Horiz. Stab. - BM. - BL 65
35. 1/4 H. Horiz. Stab. - CH. - BL 7.7
36. 1/4 H. Horiz. Stab. - CH. - BL 7.7
37. 1/4 H. Horiz. Stab. - BM. - BL 7.7
38. 1/4 H. Horiz. Stab. - BM. - BL 7.7
39. 1/4 H. Horiz. Stab. - BM. - BL 0
40. 1/4 H. Horiz. Stab. - BM. - BL 0
41. R/H - Vert. Tail - Spare
42. R/H - Vert. Tail - Spare
43. R/H Vert. Tail - Tor. - WL 98.0 - M2
44. R/H Vert. Tail - Tor. - WL 109.7 - M2

301 Exchange

Ship # 2

LAB. NO. 10998A

MASTER Terminal

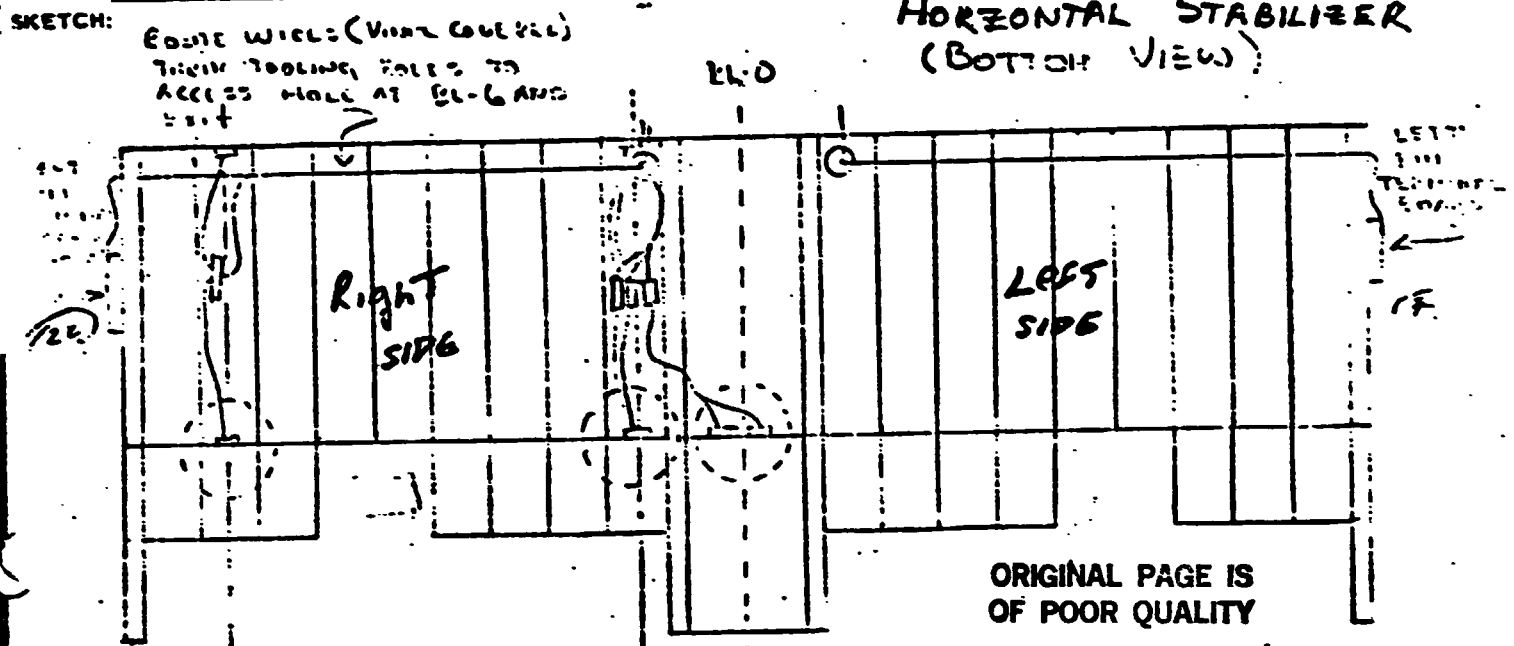
279

ORIGINAL PAGE IS
OF POOR QUALITY

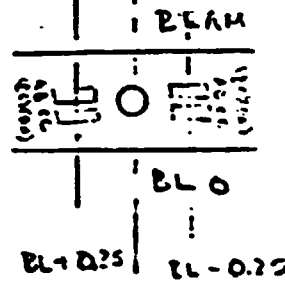
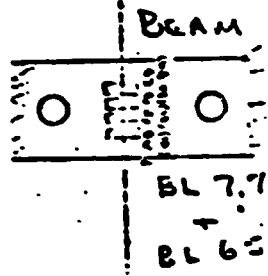
INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-12-250MQ-350	SHEET NO. 67896+
WORK ORDER A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10998A
REQUESTED BY: A. W. NEHER	GAGE FACTOR 2.11 ± 0.5	PART NO.
	LOT NO. Q-A18AF56	SERIAL NO.

TITLE OF TEST: **301 FLIGHT TEST - SHIP 2** (DIN 182) 278



REMARKS:



- B262
- B264
- B263
- M266
- B258

NOTE: ALL BRIDGES ON Right Side

COBDA OPEN

40 39 38 37 ^{B262} 36 ^{B263} 35 34 33 32 31 30 29

RIDGE	EV. 0	EM. 0	EM. 2.2	EM. 2.2	EM. 1.7	CH. 2.7	EM. 0.5	EM. 1.0	CH. 2.5	EM. 1.5	TOL. 8	TOL. 20
LANCE	OUT	OUT	4.52	5.21	OUT	5.05	5.03	3.93	4.9	5.23	4.97	4.8
RES. TO GROUND	[Handwritten notes and markings]											

DATE ASSIGNED	TECHNICIAN Hollis - Chuck	EST. HRS.	APPROVED BY:
DATE COMPLETED 2-15-76	ENGINEER	ACT. HRS.	7

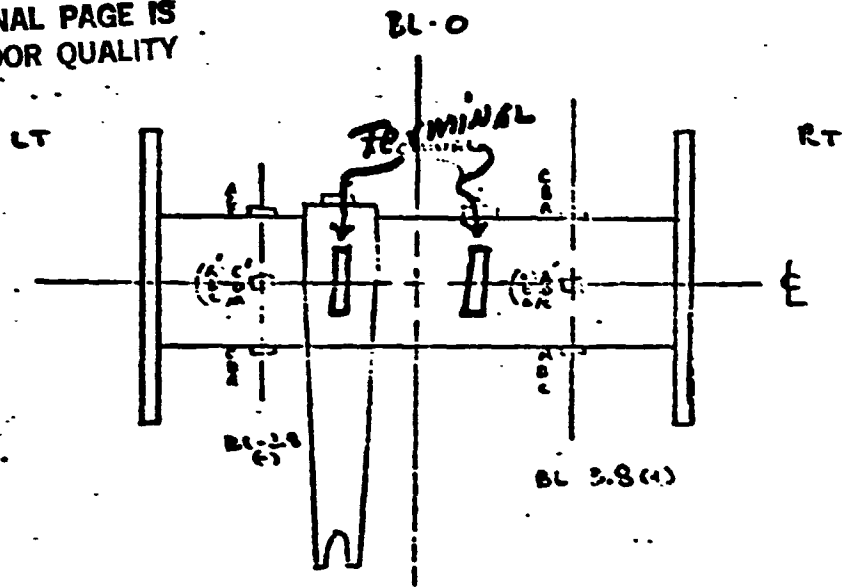
INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE FAE - 2.25 - 35315-E21	SHEET NO. 678984
TEST NO. A-27 11A	RESISTANCE 50.0 ± 5%	LAB. NO. 10998A
WORK ORDER A-27	GAGE FACTOR 2.05 ± 1%	PART NO. <i>1128</i>
REQUESTED BY: A. WHITENER	LOT NO. A-277	SERIAL NO. <i>1128</i>

TITLE OF TEST: **Model 301 - FURTHER TEST - SNIP 2** (bh) 279

SKETCH: ELEVATOR. TEMP. TUBE

ORIGINAL PAGE IS OF POOR QUALITY



M275
M279

MAKE COPY
Y 105 IN EN-2E
FOR M279

REMARKS:

BRIDGE	4 IN TOL BL - 3.9	3 LIMIT PL - 2.9	6 MIN TOL PL + 2.5	5 MIN TOL PL + 2.9		
RESISTANCE	5.11	5.38	5.23	5.39		
RES. TO GROUND	1Kma			1Kma		
DATE ASSIGNED	TECHNICIAN Hollis - Chuck			EST. HRS.	APPROVED BY:	
DATE COMPLETED 6-15-76	ENGINEER			ACT. HRS.		

LOAD IN LB	OUTPUT (MM)	LINEARITY
0.0	-9.140	OK
320.0	-9.180	OK
640.0	-10.440	OK
960.0	-11.140	OK
1280.0	-11.800	OK
1600.0	-12.510	OK
0.0	-	OK

-4790.42 BV= 10.0
CLASS 10

ORIGINAL PAGE IS OF POOR QUALITY

TYPE: TORSION
RE: AB DATE=7-17-78
CHAP: 2

LOAD IN LB	OUTPUT (MM)	LINEARITY
0.0	-1.270	OK
320.0	-1.950	OK
640.0	-2.590	OK
960.0	-3.290	OK
1280.0	-3.930	OK
1600.0	-4.520	OK
0.0	-1.270	OK

100% CE = -4180.02
UNITY CAL = -4786.52
CLASS 10

10998A-04
TORSION STA -3.8
BV= 10.0

M279

TYPE: TORSION
RE: AB DATE=7-17-78
CHAP: 3

LOAD IN LB	OUTPUT (MM)	LINEARITY
0.0	-3.560	OK
320.0	-4.290	OK
640.0	-4.990	OK
960.0	-5.560	OK
1280.0	-6.290	OK
1600.0	-6.910	OK
0.0	-3.560	OK

100% CE = -4330.01
UNITY CAL = -4796.97
CLASS 10

10998A-05
TORSION STA 3.8
BV= 10.0

M275

TYPE: TORSION
RE: AB DATE=7-17-78
CHAP: 4

LOAD IN LB	OUTPUT (MM)	LINEARITY
0.0	-3.660	OK
320.0	-4.330	OK
640.0	-4.990	OK
960.0	-5.570	OK
1280.0	-6.370	OK
1600.0	-7.070	OK
0.0	-3.660	OK

100% CE = -4137.02
UNITY CAL = -4784.85
CLASS 10

10998A-06
TORSION STA 3.8
BV= 10.0

M275

PROJECT: 301 FLIGHT TEST
TEST: TORSION TEST

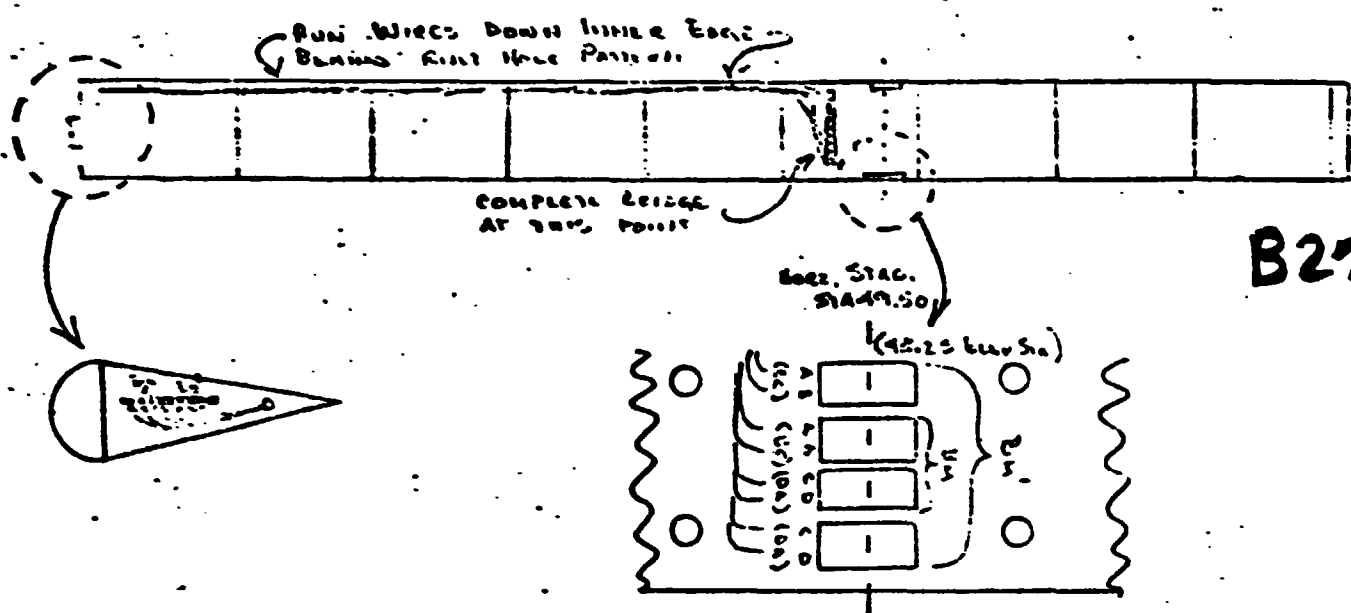
ID	TEST TYPE	STA	CE	CAL	LOAD	REMARKS
1	10998A-03	TORSION	-3.8	-4793.4	-4184.3	1000 10 OK
	10998A-04	TORSION	-3.8	-4786.5	-4180.9	1600 10
	10998A-05	TORSION	3.8	-4797.0	-4190.0	1600 10
4	10998A-06	TORSION	3.8	-4784.8	-4137.0	1600 10

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-250149-330	SHEET NO. 67894
AWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10998A
ORDER A427	GAGE FACTOR 2.11 ± 0.3	PART NO. 51-18
REQUESTED BY: A. V. H. FEINER	LOT NO. Q-A18AF56	SERIAL NO. 28

TITLE OF TEST: **MODEL 301 FLIGHT TEST (XV-15) - SHIP-2** (182) 268

SKETCH: **R/H ELEVATOR**



B274

REMARKS:

ORIGINAL PAGE IS
OF POOR QUALITY

8 7

BRIDGE	Bm	Bm'				
YCE	4.53	4.31				
RES. TO GROUND	11.1ma	11.1ma				
DATE ASSIGNED	TECHNICIAN Hollis - Chuck			EST. MRS.	APPROVED BY:	
DATE COMPLETED 6-15-76	ENGINEER			ACT. MRS.		

LOAD (IN/LB)	CHAN 1 OUTPUT (MV)	UNITY CAL- LINEARITY
0.0	7.930	OK
100.0	8.200	OK
200.0	8.530	OK
300.0	8.860	OK
400.0	9.190	OK
500.0	9.520	OK
0.0	7.870	

3055.56
 CLASS 10
 Y/c

BV= 10.0

ORIGINAL PAGE IS
 OF POOR QUALITY

GAGE OUTPUT TOO LOW FOR CLASS 3 LIMITS *****

*****LINEARITY EXCEEDS DESIRED LIMITS.

TYPE PULL=BEAM
 RE DATE=7-18-78
 CHAN 2

LOAD (IN/LB)	OUTPUT (MV)	LINEARITY
0.0	5.750	OK
100.0	6.090	-0.888%
200.0	6.400	-1.775%
300.0	6.750	-0.888%
400.0	7.100	OK
500.0	7.460	1.444%
0.0	5.750	-0.583%

100% CE = 2606.68
 UNITY CAL = 2984.27
 CLASS 10

10998A-08
 BEAM STA. 49.5
 BV= 10.0

GAGE OUTPUT TOO LOW FOR CLASS 3 LIMITS *****

PROJECT AND PLANT TITLE
 PART TITLE=F W ELEVATOR
 PART NUMBER =NONE

10998A-
 CAL DATE=7-18-78
 SERIAL NUMBER=NONE

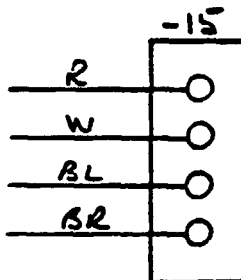
CHAN	LAB-OF.#	SR. TYPE	STATION	UNIT CAL	100%CE	MAX LOAD	CLAS	OK
1	10998A-07	BEAM	49.5	3055.6	2688.9	500		10
2	10998A-08	BEAM	49.5	2984.3	2606.7	500		10

~~B272~~
~~B274~~
 B 274

WIRE MARKING

LAB NUMBER 10998A

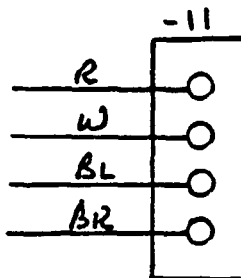
EMP-1K



B258
 B59/2/2
 BM BEND
 R/H VT STAB
 W/L 113

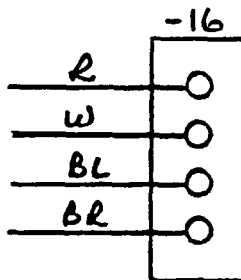
ORIGINAL PAGE IS
 OF POOR QUALITY.

EMP-1I



B268
 A54-2-2
 BM BEND
 R/H VT STAB
 W/L 94

EMP-1J



B270
 B60/2/1
 BM BEND
 R/H VT STAB
 W/L 109.95

ORIGINAL PAGE'S
OF POOR QUALITY

BY	BELL HELICOPTER COMPANY	MODEL	PAGE
CHECKED	PORT ENGINE TEST LAB	HELI	8PT

LAB NO. 10998A11
 LAB CALIBRATION: 2-25-78
 PART NO. 301-328-001
 SER. NO.
 JACK FACTOR 1.5 PSI = 10 LB
 LEVER ARM 66 INCHES
~~220000 LB INCHES~~

$2MEG = 5.55 \times 15 \times 6.6 = 2442 \text{ IN-LBS}$
 $- 20000$
 $100KT = 100K \times 2442 = 244200 \text{ IN-LBS}$

CE No 3000

USE PLOT

RJ 3-16-78

8268

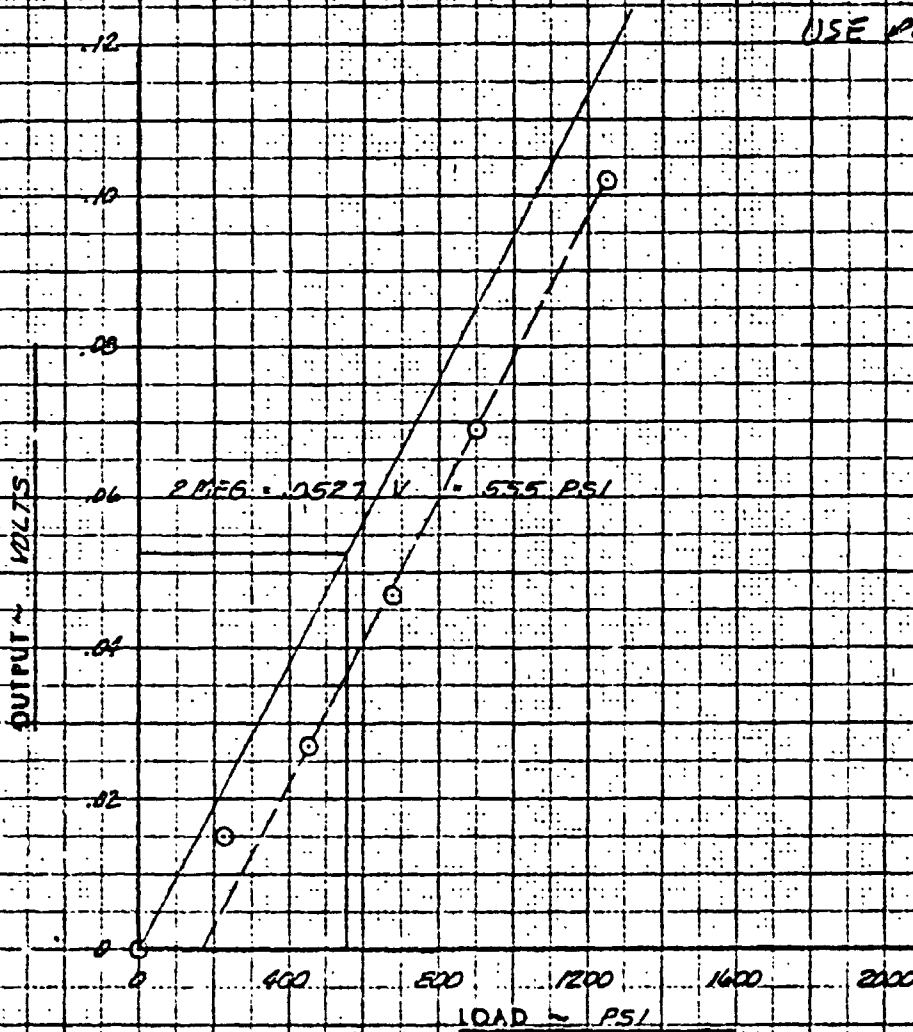


FIG. CALIBRATION OF R/H VERTICAL STABILIZER
FOR BEAM BENDING, STATION 95.1.

MAR 7-78

CALIBRATION DATA SHEET

Date 2-2-78

Lab. No. 10998A

Project Cal. Vert. Strip Pill

Serial No. _____

Model 301 #2

Title Lower Pill

Part No. _____

L. T. R. _____ EWA _____

Engineer H. J. ...

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
Smith, H. J.		DVM			

Volts	11.507				
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.	<i>B268</i>				
Act. Arm					
Chon.	-11				
Bridge	R/H V-21				
Config.	100 95.6				
Cal. Res.	100K				
Lever Arm	C-6				

ORIGINAL PAGE IS OF POOR QUALITY

Load	Output				
100	10.053				
200	10.077				
300	10.082				
400	10.122				
500	10.123				
600	10.155				
700	10.107				
800	10.067				
900	10.055				

Bad linearity. No valid calibration factor. Use of curve is required to prevent large errors.

Ray Schilling
3-15-78

"A" Cal.					
176 #21					

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 1-22-78

Lab. No. 10998A

Project Cal. Vert. Lab. Bull

Serial No. _____

Model 301 #2

Title Upper Fin

Part No. _____

L. T. R. _____ EWA _____

Engineer J. S. [unclear]

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Smith</u>		<u>DVM</u>			

Volts		<u>4.809</u>	<u>4.809</u>	<u>4.809</u>	<u>4.809</u>
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.		<u>B258</u>		<u>B270</u>	
Act. Arm					
Chon.		<u>-15</u>	<u>-16</u>	<u>-34</u>	<u>-32</u>
Bridge		<u>1/4 Volt.</u>	<u>1/4 Volt.</u>	<u>1/4 Volt.</u>	<u>1/4 Volt.</u>
Config.		<u>Stab. Bm 118.94</u>	<u>Stab. Bm 109.75</u>	<u>Pin Fl. 65.0</u>	<u>Pin Fl. 65</u>
Col. Res.		<u>100 K</u>	<u>100 K</u>	<u>100 K</u>	<u>100 K</u>
Lever Arm		<u>27.375</u>	<u>31.875</u>	<u>36.43</u>	<u>37.45</u>

Load	Output	<u>HP</u>	<u>Repts</u>	<u>HP</u>	<u>HP</u>	<u>HP</u>
<u>100K</u>		<u>1.866</u>	<u>1.866</u>	<u>1.866</u>	<u>1.866</u>	<u>1.866</u>
<u>0</u>		<u>-0.226</u>	<u>-0.226</u>	<u>-0.226</u>	<u>-0.226</u>	<u>-0.226</u>
<u>0</u>		<u>0.252</u>	<u>0.252</u>	<u>0.252</u>	<u>0.252</u>	<u>0.252</u>
<u>150 PSI</u>		<u>0.608</u>	<u>0.608</u>	<u>0.608</u>	<u>0.608</u>	<u>0.608</u>
<u>300</u>		<u>1.073</u>	<u>1.073</u>	<u>1.073</u>	<u>1.073</u>	<u>1.073</u>
<u>450</u>		<u>1.540</u>	<u>1.540</u>	<u>1.540</u>	<u>1.540</u>	<u>1.540</u>
<u>600</u>		<u>2.007</u>	<u>2.007</u>	<u>2.007</u>	<u>2.007</u>	<u>2.007</u>
<u>750</u>		<u>2.474</u>	<u>2.474</u>	<u>2.474</u>	<u>2.474</u>	<u>2.474</u>
<u>900 PSI</u>		<u>2.941</u>	<u>2.941</u>	<u>2.941</u>	<u>2.941</u>	<u>2.941</u>
<u>750</u>		<u>1.316</u>	<u>1.316</u>	<u>1.316</u>	<u>1.316</u>	<u>1.316</u>
<u>450</u>		<u>-1.590</u>	<u>-1.590</u>	<u>-1.590</u>	<u>-1.590</u>	<u>-1.590</u>
<u>150</u>		<u>0.629</u>	<u>0.629</u>	<u>0.629</u>	<u>0.629</u>	<u>0.629</u>
<u>0 PSI</u>		<u>-0.277</u>	<u>-0.277</u>	<u>-0.277</u>	<u>-0.277</u>	<u>-0.277</u>

"A" C.Y.L.
 1.5 PSI/11
 ML-A2.2

Bad zero OK all bridges RQS 3-16-78
 Bad linearity. Use curve to
 present errors on each of future bridges.
 Repeatability 3-15-78

BY
CHECKED

BELL HELICOPTER COMPANY
POST BOX 401 • POST BOX 1144

MODEL
WELL

PAGE
8PT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 10998A (?)
LAB CALIBRATION 2-28-78
PART NO. 321-32A-001
SER. NO.
JACK FACTOR: 1.5 PSI • 10 LBS
LEVER ARM: 51.5 INCHES
100K D.C.E = 46.178 IN-LBS

$$250 \text{ KD} \cdot 538 + 1.5 \times 51.5 = 13,471 \text{ IN-LBS}$$

$$100 \text{ KD} \cdot \frac{250 \text{K}}{100 \text{K}} = 100 \times 13,471 = 46,178 \text{ IN-LBS}$$

$$250 \text{ KD} = .538 \text{ V} = 538 \text{ PSI}$$

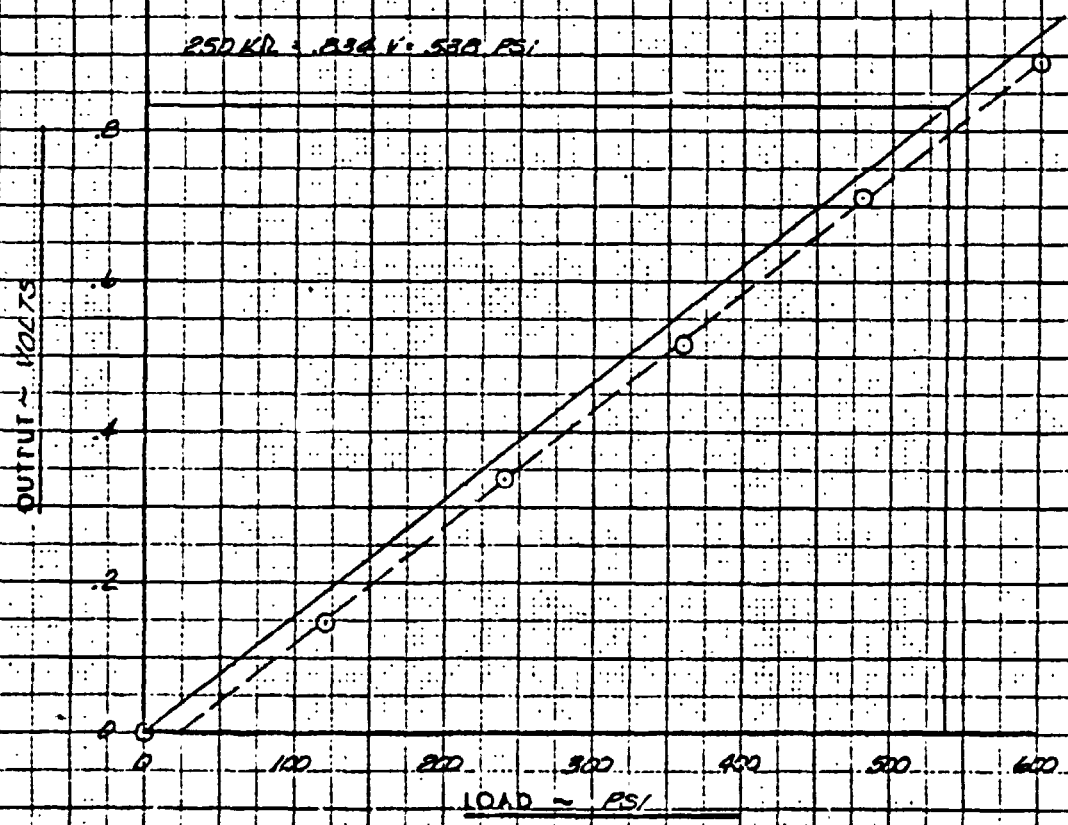


FIG. CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR TORSION, STATION 9.0

BY
CHECKED

BELL HELICOPTER COMPANY
FORM 01072 001 401

MODEL
HELI

PAGE
RPT

LAB NO. 10998A13

LAB CALIBRATION 2-25-70

PART NO. 301-328-001

NO.

JACK FACTOR 15.951 = 10 LB

LEVER ARM 43.925 INCHES

LOGKOCF = 44,657 IN-LBS

ORIGINAL PAGE IS
OF POOR QUALITY

$$250 \text{ KD} \cdot 610 + 1.5 \times 43.925 = 17,863 \text{ IN-LBS}$$

$$100 \text{ KD} = \frac{250 \text{ KD}}{2.5} = \frac{100 \text{ KD}}{2.5} \times 17,863 = 44,657 \text{ IN-LBS}$$

B259

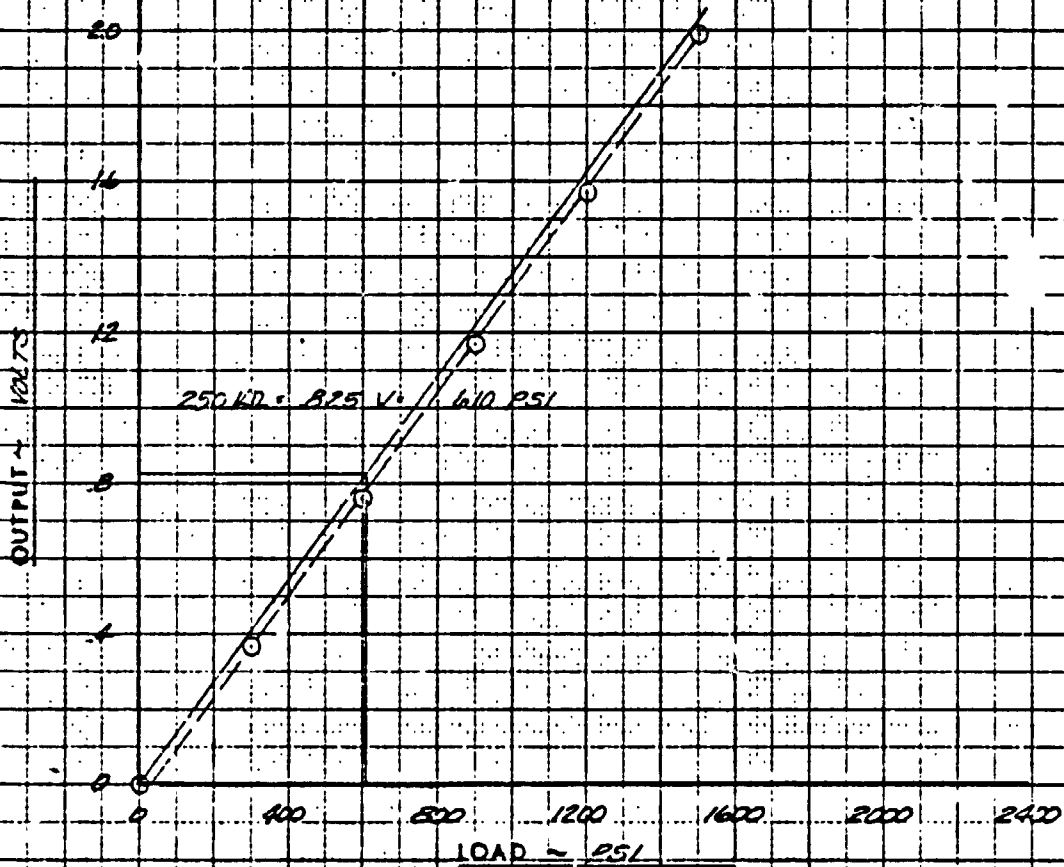


FIG. CALIBRATION OF L/H HORIZONTAL STABILIZER
FOR BEAM BENDING, STATION 7.7

RLW 9-7-70

BY
CHECKED

BELL HELICOPTER COMPANY
1001 WINDY HILL AVE • 1001 WINDY HILL AVE

MODEL
HE11

PAGE
8PT

LAB NO. 10998A14
 LAB CALIBRATION 2-28-78
 PART NO. 901-328-001
 SER. NO. _____
 JACK FACTOR 1.5PSI = 10LB
 LEVER ARM 43.925 INCHES
 TORQUE = 42.631 IN-LBS

ORIGINAL PAGE IS
OF POOR QUALITY

$250KD \cdot 555 \div 1.5 \times 43.925 = 16,252 \text{ IN-LBS}$

$\frac{250K}{100K} \cdot 100K \times 16,252 = 40,631 \text{ IN-LBS}$

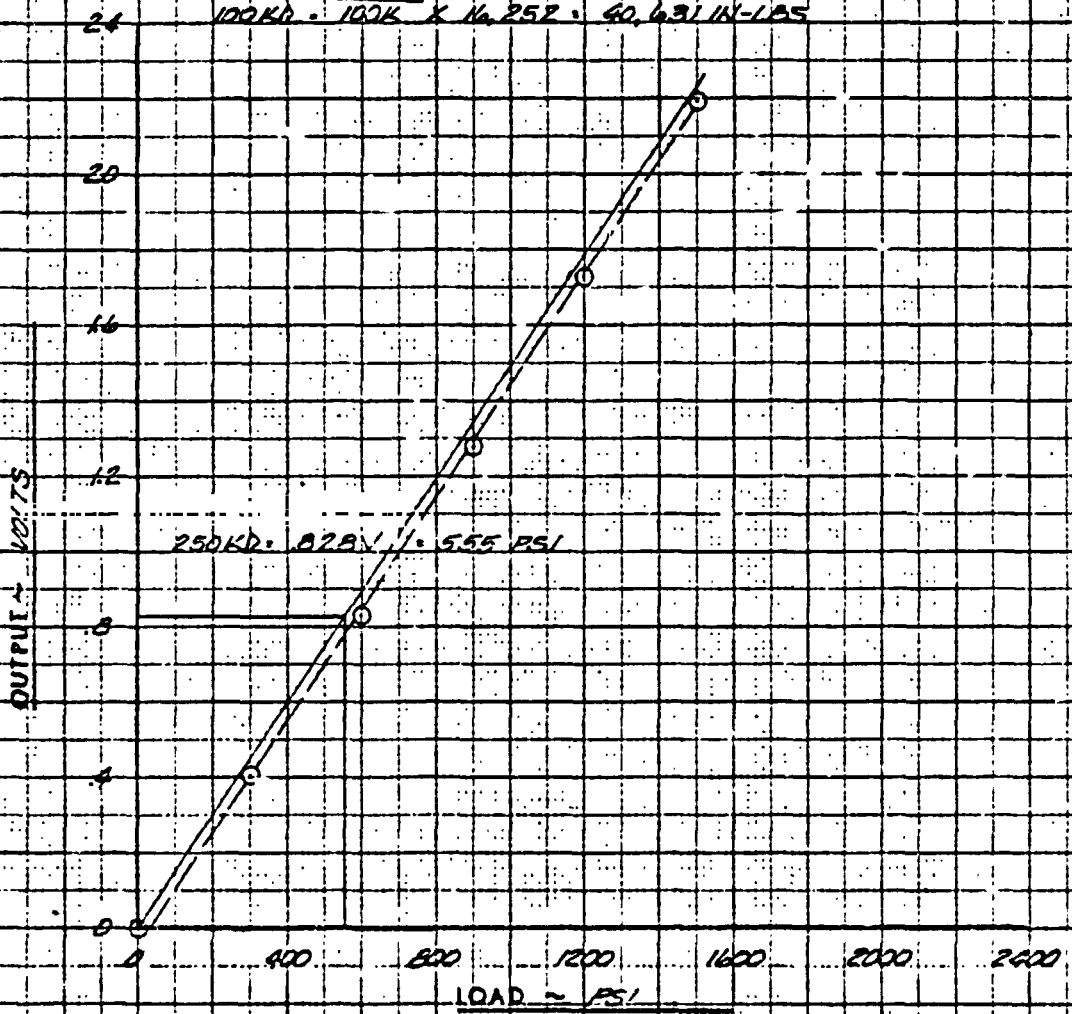


FIG. CALIBRATION OF 1/4 HORIZONTAL STABILIZER
FOR BEAM BENDING, STATION 7.7

BY
CHECKED

DELL HELICOPTER COMPANY
POST OFFICE BOX 601 • HOUSTON, TEXAS 77001

MODEL _____ PAGE _____
MILL _____ RPT. _____

ORIGINAL PAGE IS
OF POOR QUALITY

TAB. NO. 0998615
TAB. CALIBRATION: 2-25-78
PART NO. 301-329-001
SER. NO. _____
JACK FACTOR: 1.5 PSI = 10 LB.
LEVER ARM: 27.375 INCHES
LOAD CELL: 11,771 M.LBS.

$$LOAD = 685 \div 1.5 \times 27.375 = 11,771 \text{ M.LBS.}$$

B258

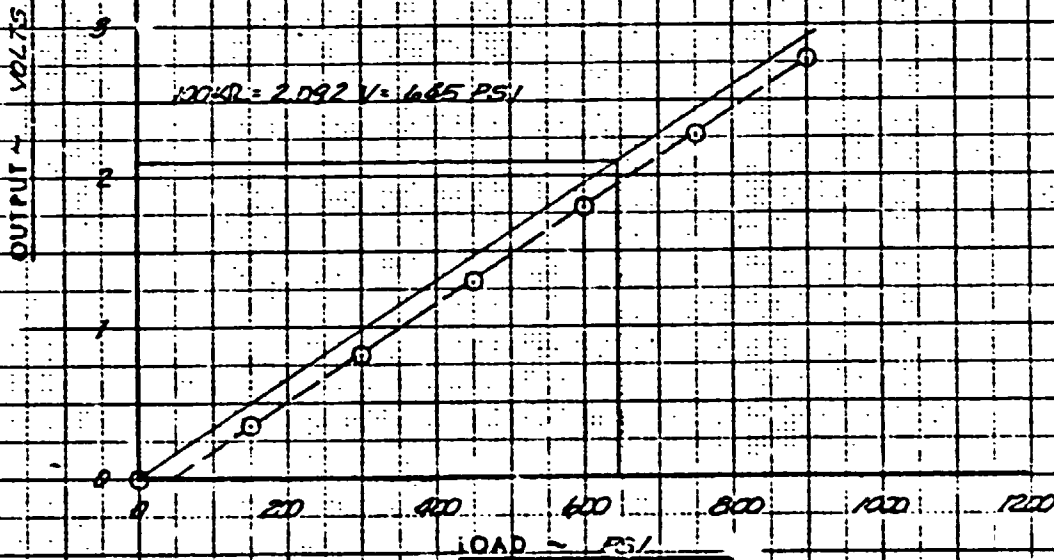


FIG. _____ CALIBRATION OF R/H VERTICAL STABILIZER
FOR BEAM BENDING, STATION 113.99

BY
CHECKED

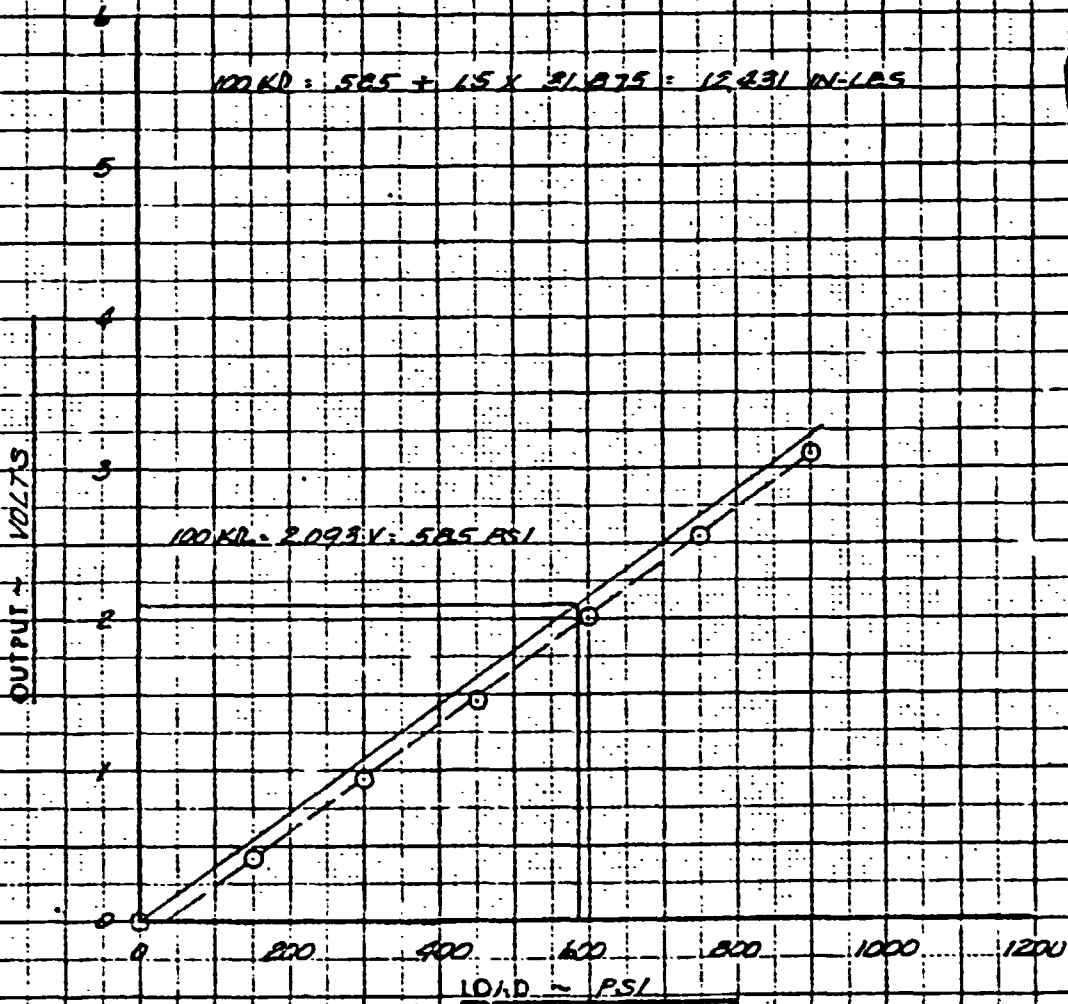
BELL HELICOPTER COMPANY
POST OFFICE BOX 417 • POST OFFICE BOX 417

MODEL
HELI

PAGE
8PT

SER. NO. 10998916
IAB CALIBRATION: 2-25-78
PART NO. 501-32A-001
SER. NO.
JACK FACTOR: 1.5 PSI = 10 LB.
LEVER ARM: 31.875 INCHES
FORCE = 12,831 IN-LBS

ORIGINAL PAGE IS
OF POOR QUALITY



B270

BY
CHECKED

BELL HELICOPTER COMPANY
PLANT BLDG 201 401 • DEPT 0001A C 10000

MODEL
HELI

PAGE
1PT

ORIGINAL PAGE IS
OF POOR QUALITY

TAB NO. 10998A30
TAB CALIBRATION 2-28-78
PART NO. 901-52B-001
SER. NO.
LACK FACTOR 1.5 PSI = 10 LB
LEVER ARM 57.5 INCHES
LOAD OFF 46178 IN-LBS

$$250KR = 538 + 15 \times 91.5 = 12.871 \text{ IN-LBS}$$

250K

$$100KR = 100K \times 12.871 = 46178 \text{ IN-LBS}$$

1.2

1.0

0.8

0.6

0.4

0.2

0

OUTPUT - VOLTS

$$250KR = 8.91V = 538 \text{ PSI}$$

0

100

200

300

400

500

600

LOAD - PSI

M266

FIG. CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR TORSION, SECTION B.O.

BY _____
CHECKED _____

BELL HELICOPTER COMPANY
POST OFFICE BOX 401 • POST OFFICE BOX 401

MODEL
HEU

PAGE
RPT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 10998233
LAB CALIBRATION: 2-25-78
PART NO. 301-928-001
SER. NO. _____
JACK FACTOR: 1.5 PSI = 10 LB.
LEVER ARM: 36.63 INCHES
LOAD CELL = 24,894 IN-LBS

$$250KD = 410 + 1.5 \times 36.63 = 99.58 \text{ IN-LBS}$$

250K

$$100KG = 100K \times 99.58 = 24,894 \text{ IN-LBS}$$

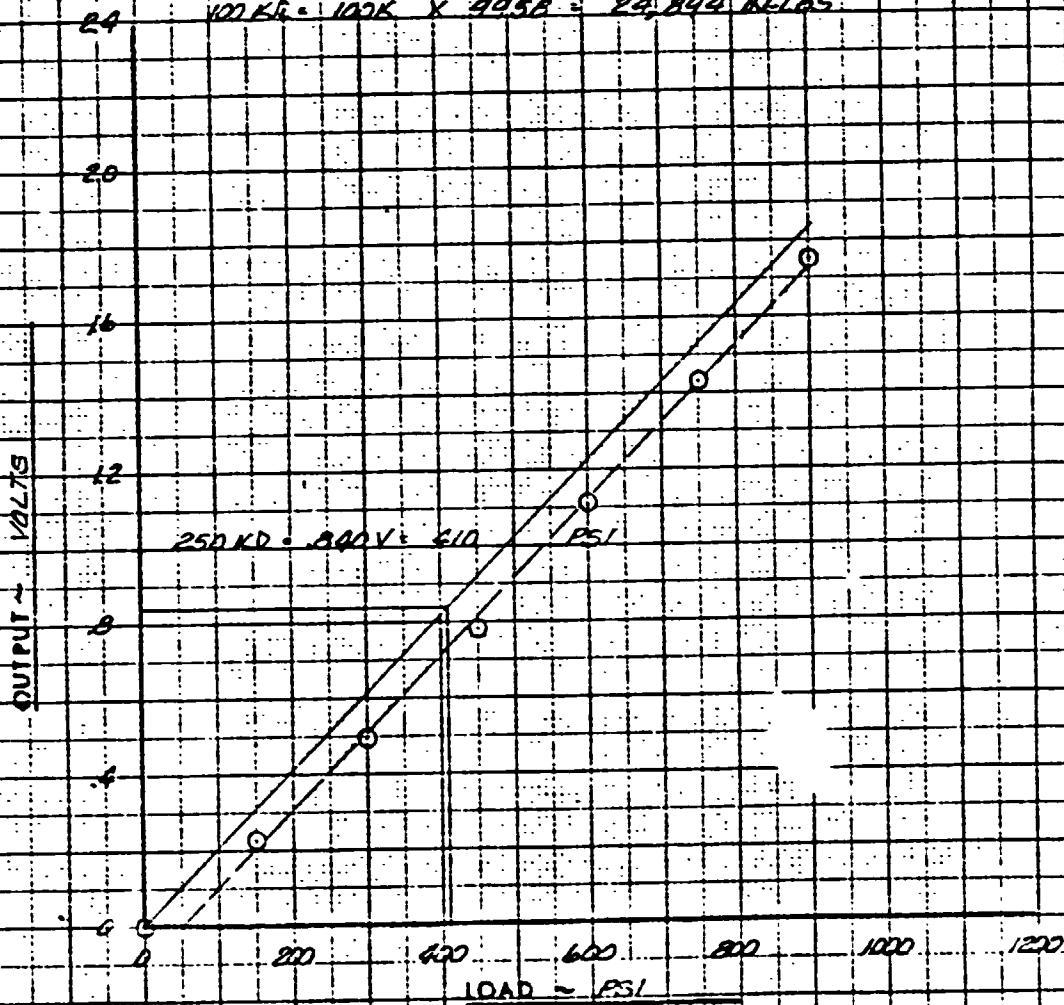


FIG. _____

CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR BERM. PENDINGS, STATION 165.0

BY

CHECKED

BELL HELICOPTER COMPANY
1001 10010 & 10010

MODEL
HELL

PAGE
RPT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 10998734

LAB CALIBRATION: 2-25-78

PART NO. 901-928-001

SER. NO.

JACK FACTOR: 1.5 PSI = 10 LB

LEVER ARM: 36.43 INCHES

100K OCE = 24,893 N-LBS

$250KR = 410 \div 1.5 \times 36.43 = 9958 \text{ IN-LBS}$

$250K$
 $100KD = 100K \times 9958 = 24,893 \text{ N-LBS}$

B264

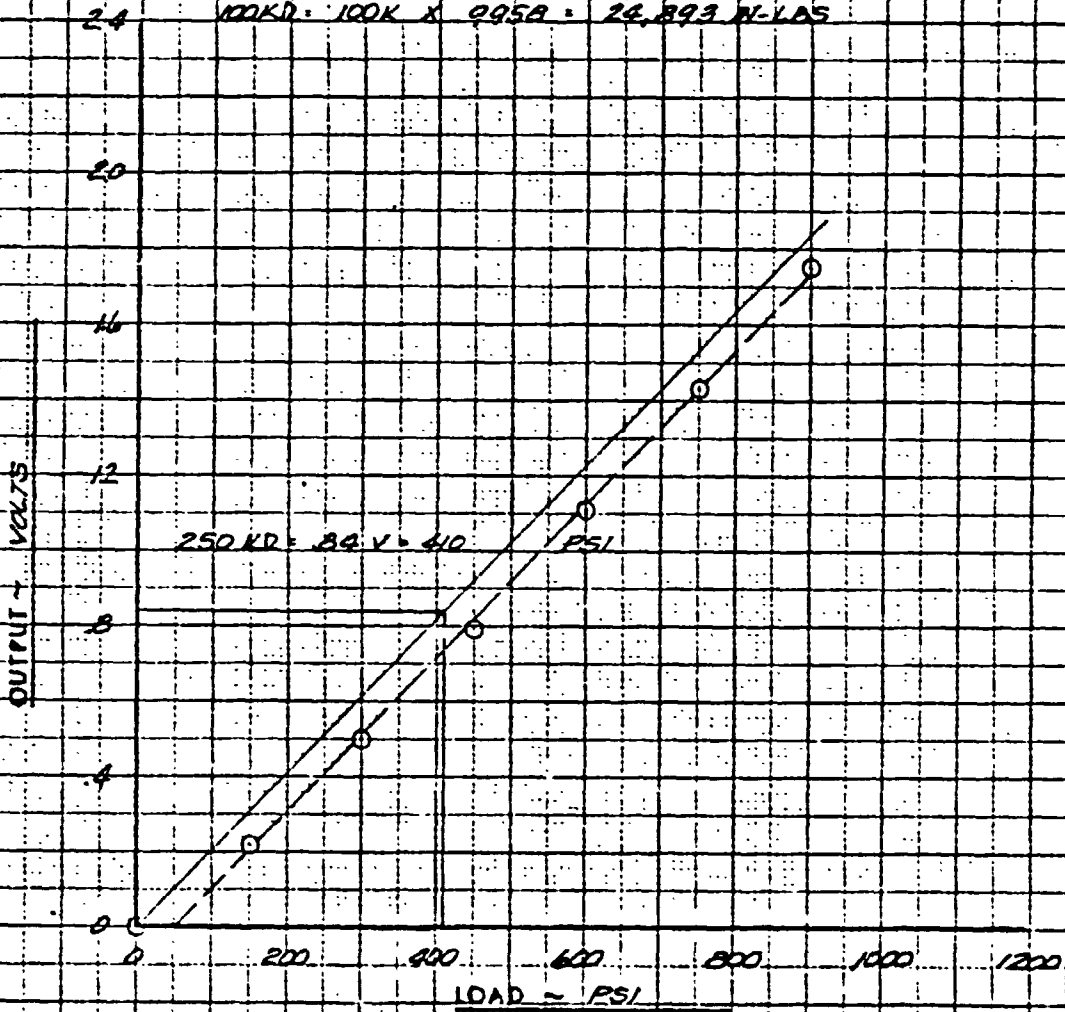


FIG. CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR DEAM BENDING STATION 1050

BY
CHECKED

HELICOPTER COMPANY
POST OFFICE BOX 1001 - 1001 00010 - 10001

MODEL
HELI

PAGE
RPT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 10998A35
LAB CALIBRATION: 2-28-75
PART NO. 301-328-001
SER. NO. _____
JACK FACTOR: 1.5 PSI = 16 LB
LEVER ARM: 59.3 INCHES
100K CF = 132.553 IN-LBS

$$1 \text{ MEQ} = 353 = 1.5 \times 59.3 = 13.955 \text{ IN-LBS}$$

$$100 \text{ KRF} = \frac{1000 \text{ K}}{100 \text{ K}} \times 13.955 = 139.553 \text{ IN-LBS}$$

B263

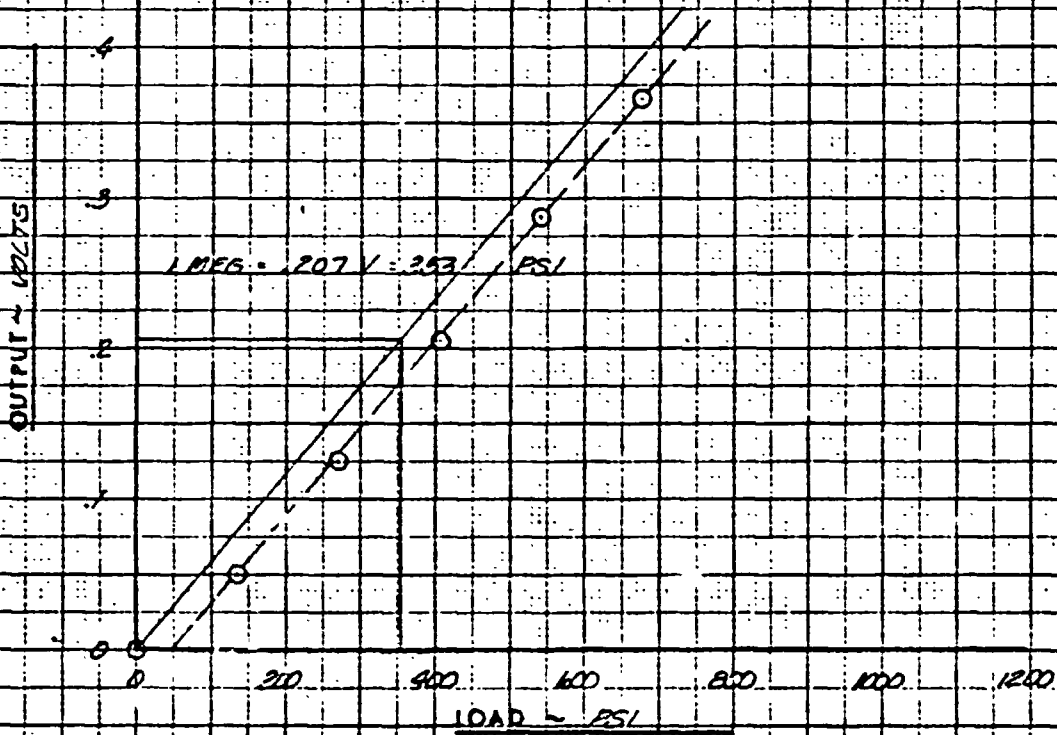


FIG. CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR CH220 BELONGING STATION 7.7

BY
CHECKED

BELL HELICOPTER COMPANY
POST OFFICE BOX 401 POST OFFICE BOX 1000

MODEL
HELI

PAGE
8PT

ORIGINAL PAGE IS
OF POOR QUALITY

TAB NO. 10928236
TAB CALIBRATION 2-28-78
PART NO. 901-526-001
SERL NO. _____
TACK FACTOR 1.5 PSI = 1.0 LB
LEVER ARM 57.3 INCHES
100% O.C.E. = 139,553 IN-LBS

$$1.255 \cdot 353 = 1.5 \times 57.3 = 139,553 \text{ IN-LBS}$$

$$100\% \text{ O.C.E.} = \frac{1000\text{K}}{100\text{K}} \times 139,553 = 139,553 \text{ IN-LBS}$$

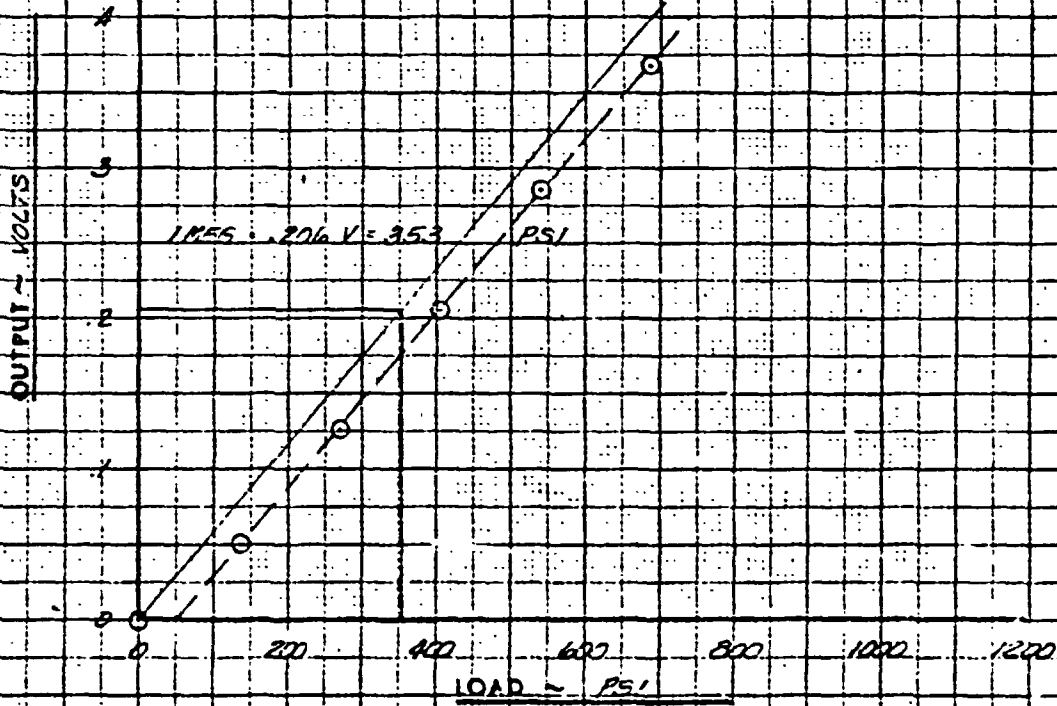


FIG. CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR CHORD BENDING, STATION 7.7

BY
CHECKED

BELL HELICOPTER COMPANY
POST OFFICE BOX 101 • POST OFFICE 10100

MODEL
HELI

PAGE
RPT

LAB NO. 10998A37
LAB CALIBRATION 2-28-78
PART NO. 301-328-001
SER. NO. _____
JACK FACTOR: 1.5 PSI = 10 LB
LEVER ARM 43.925 INCHES
100K OCE = 53.166 IN-LBS

ORIGINAL PAGE IS
OF POOR QUALITY

$$250KD = 535 + 1.5 \times 43.925 = 15.667 \text{ IN-LBS}$$

$$\frac{250K}{100K} = \frac{100K \times 15.667}{39.166 \text{ IN-LBS}}$$

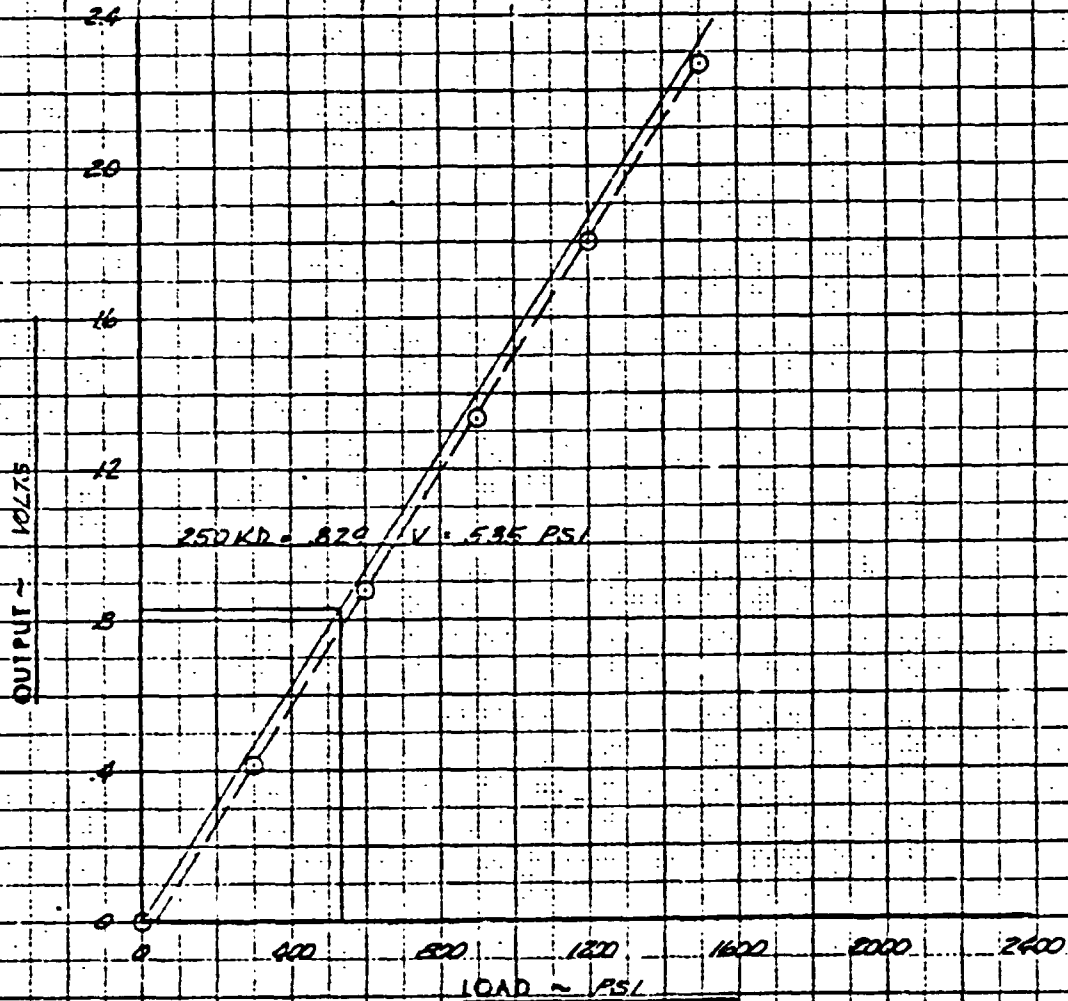


FIG. _____ CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR BEAM BENDING, STRICTION 7.7

BY
CHECKED

BELL HELICOPTER COMPANY
POST OFFICE BOX 401 • POST OFFICE BOX 401

MODEL
HELL

PAGE
RPT

ORIGINAL PAGE IS
OF POOR QUALITY

SAR NO. 1099BA38
LAB CALIBRATION: 2-18-78
PART NO. 301-325-001
SER. NO.
JACK FACTOR: 1.5 PSI = 10 LB.
LEVER ARM: 43.925 INCHES
100% S.C.E. = 42,461 N-LBS

$$250 \text{ KD} = 500 \times 1.5 \times 43.925 = 16,984 \text{ N-LBS}$$

$$\frac{250 \text{K}}{100 \text{K}} \times 100 \text{K} \times 16,984 = 42,461 \text{ N-LBS}$$

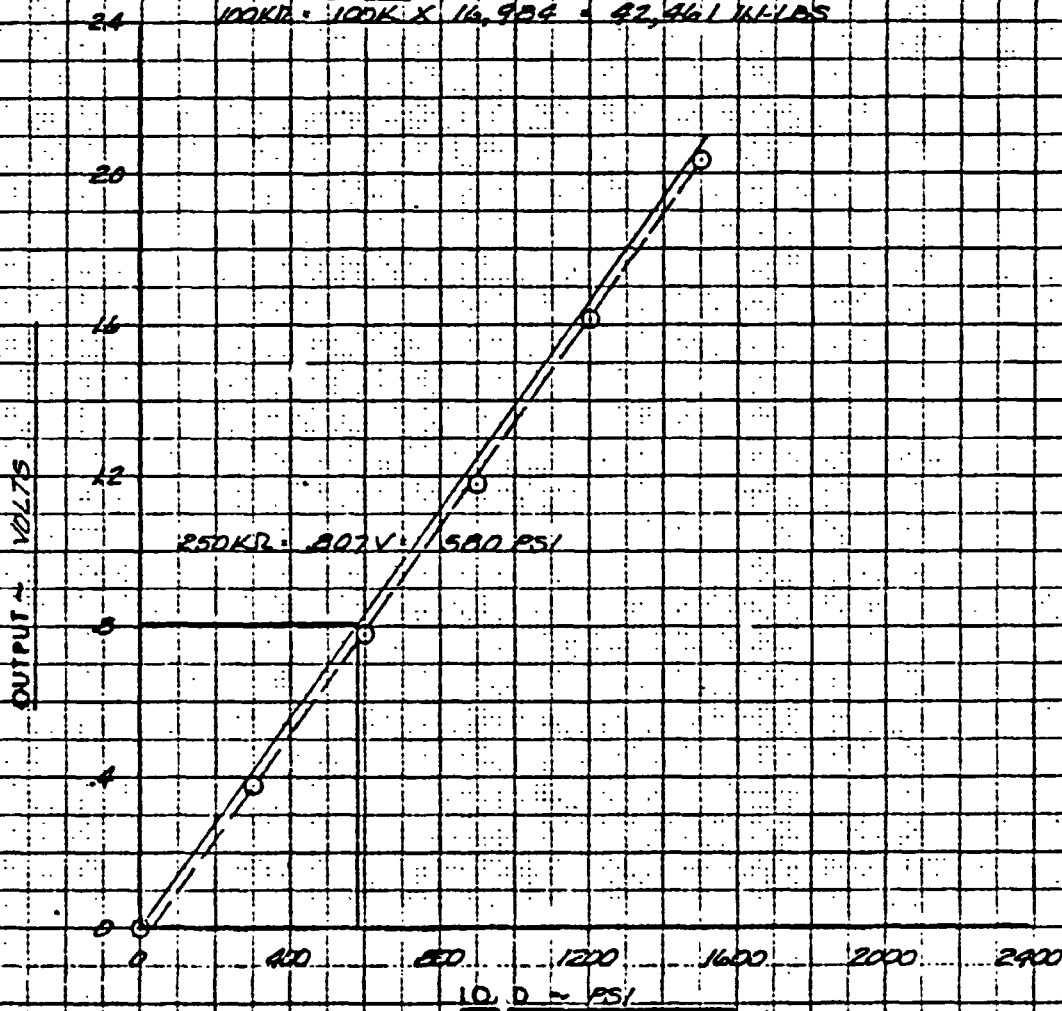


FIG. CALIBRATION OF R/H HORIZONTAL STABILIZER
FOR BEAM BENDING, STATION 7.7

PL 19-7-78

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 2-25-78

Lab. No. 10998A

Project Cal. Hwy. Sta. 1. I.F. UP

Serial No. _____

Model 301 #2

Title _____

Part No. 301-328-001

L. T. R. _____ EWA _____

Engineer H.S. White

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Smith, Gert</u>		<u>DVM</u>			

Volts	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740
Gage Type								
Gage Fac.								
Gage Res.								
Lot. No.								
Act. Arm		<u>B259</u>		<u>M266</u>	<u>B263</u>		<u>B262</u>	
Chon.	<u>12</u>	<u>-13</u>	<u>-14</u>	<u>-30</u>	<u>-35</u>	<u>-36</u>	<u>-37</u>	<u>-38</u>
Bridge	<u>PH Horiz</u>	<u>LH Horiz</u>	<u>LH Horiz</u>	<u>RH Horiz</u>	<u>RH Horiz</u>	<u>RH Horiz</u>	<u>PH Horiz</u>	<u>RH Horiz</u>
Config.	<u>TOP 8.0</u>	<u>Bm St. 7.7</u>	<u>Bm St. 7.7</u>	<u>TOP 8.0</u>	<u>Ch. St. 7.7</u>	<u>Ch. St. 7.7</u>	<u>Bm St. 7.7</u>	<u>Bm St. 7.7</u>
Cal. Res.	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>
Lever Arm	<u>51.5"</u>			<u>51.5"</u>				

Load	Output	HP	HB	HP	HP	HP	HP	HP
<u>100K</u>	<u>2.084</u>	<u>2.010</u>	<u>2.064</u>	<u>2.070</u>	<u>2.089</u>	<u>2.088</u>	<u>2.100</u>	<u>1.990</u>
<u>0</u>	<u>-0.015</u>	<u>-0.052</u>	<u>-0.007</u>	<u>-0.008</u>	<u>+0.020</u>	<u>+0.029</u>	<u>+0.027</u>	<u>-0.038</u>
<u>0</u>	<u>0</u>			<u>0</u>	<u>+0.067</u>	<u>+0.089</u>	<u>+0.021</u>	<u>-0.123</u>
<u>15</u>	<u>0.146</u>			<u>0.183</u>	<u>+0.052</u>	<u>+0.081</u>	<u>-0.025</u>	<u>-0.153</u>
<u>30</u>	<u>0.255</u>			<u>0.370</u>	<u>+0.040</u>	<u>+0.072</u>	<u>-0.057</u>	<u>-0.170</u>
<u>45</u>	<u>0.333</u>			<u>0.555</u>	<u>+0.026</u>	<u>+0.062</u>	<u>-0.160</u>	<u>-0.233</u>
<u>60</u>	<u>0.422</u>			<u>0.740</u>	<u>+0.012</u>	<u>+0.055</u>	<u>-0.207</u>	<u>-0.262</u>
<u>75</u>	<u>0.509</u>			<u>0.927</u>	<u>-0.002</u>	<u>+0.050</u>	<u>-0.278</u>	<u>-0.306</u>
<u>90</u>	<u>0.555</u>			<u>0.590</u>	<u>+0.026</u>	<u>+0.066</u>	<u>-0.109</u>	<u>-0.237</u>
<u>120</u>	<u>0.172</u>			<u>0.196</u>	<u>+0.053</u>	<u>+0.082</u>	<u>-0.027</u>	<u>-0.156</u>
<u>0</u>	<u>0.018</u>			<u>0.040</u>	<u>+0.063</u>	<u>+0.058</u>	<u>+0.020</u>	<u>-0.123</u>

Poor zero point OK on all bridges of 3-16-78
 Bad linearity. Use same
 to avoid discrepancies

P-2.0.10.10

Responsible
3-15-78

Bad up on 100K 100K P/H 2.0
 1.015 1.025

CALIBRATION DATA SHEET

Date 3-16-78

**ORIGINAL PAGE IS
OF POOR QUALITY**

Lab. No. 10928A

Project Cal. in. St. Ch. In. Cal.

Serial No. _____

Model 5015

Title _____

Part No. 5-1-1

L. T. R. _____ EWA _____

Engineer A. S. VITKOFF

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>L. S. L. H.</u>		<u>D/11</u>			

Volts	4.740	4.747	4.740	4.745	4.740	4.740	4.740	4.740
Gage Type								
Gage Fac.								
Gage Res.								
Lot. No.								
Act. Arm								
Chan.	-12	-13	-14	-30	-35	-36	-37	-38
Bridge	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>
Config.								
Cal. Res.	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>
Lever Arm					<u>57.2</u>	<u>57.2</u>		

Load	Output	HP	4F	HP	HP	HP	HP	HP
100	2.017	2.010	2.064	2.070	2.089	2.085	2.100	1.950
0	-0.015	-0.052	-0.027	-0.008	+0.020	+0.029	+0.027	-0.025
0	1.007	-0.164	-0.065	-0.009	-0.027	+0.117	+0.015	-0.178
125	1.007	-0.164	-0.065	-0.016	-0.127	+0.167	+0.016	-0.180
220	-0.056	-0.170	-0.069	-0.023	-0.012	+0.243	+0.017	-0.175
1125	-0.015	-0.162	-0.072	-0.037	-0.021	+0.322	+0.015	-0.174
570	-0.023	-0.177	-0.072	-0.029	-0.074	+0.402	+0.015	-0.175
675	-0.020	-0.176	-0.075	-0.045	+0.453	+0.485	+0.015	-0.170
1405	-0.020	-0.177	-0.075	-0.037	+0.310	+0.340	+0.017	-0.170
135	-0.022	-0.174	-0.070	-0.020	+0.142	+0.177	+0.015	-0.176
0	+0.006	-0.177	-0.070	-0.015	+0.080	+0.109	+0.015	-0.180

Pass zero point OK on all bridges
RQS 3-16-78

A-Cor. in. done

Each linear into use
curves to prevent large
errors
Randomly must

CALIBRATION DATA SHEET

**ORIGINAL PAGE IS
OF POOR QUALITY**

Lab. No. 1099810

Project Cal. Instr. 11/1/78

Serial No. _____

Model 301 #2

Title Rec. Instr. 11/1/78

Part No. 374 200 000

L. T. R. _____ EWA _____

Engineer B.S. Williams

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>W. F. F.</u>		<u>51117</u>			

Volts	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740
Gage Type								
Gage Foc.								
Gage Res.								
Lot. No.								
Act. Arm								
Chan.	<u>-12</u>	<u>-13</u>	<u>-14</u>	<u>-30</u>	<u>-35</u>	<u>-36</u>	<u>-37</u>	<u>-38</u>
Bridge	<u>PH 4001</u>	<u>PH 4001</u>	<u>PH 4001</u>	<u>PH 4001</u>	<u>PH 4001</u>	<u>PH 4001</u>	<u>PH 4001</u>	<u>PH 4001</u>
Config.	<u>Top 9.0</u>	<u>Bot 9.0</u>	<u>Bot 9.0</u>	<u>Top 9.0</u>	<u>Bot 9.0</u>	<u>Bot 9.0</u>	<u>Top 9.0</u>	<u>Bot 9.0</u>
Col. Res.	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>	<u>100K</u>
Lever Arm	<u>--</u>	<u>43.925"</u>	<u>43.925"</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>43.925"</u>	<u>43.925"</u>

Load	Output							
1000	2.069	2.062	2.071	2.072	2.089	2.088	2.073	2.078
0	-0.015	-0.057	-0.007	-0.007	+0.020	+0.029	-0.007	-0.035
0	-0.038	-0.115	-0.050	-0.018	+0.050	+0.061	-0.002	-0.120
500 PSI	+0.015	-0.480	-0.453	+0.001	+0.082	+0.014	-0.418	-0.515
500	-0.017	-0.505	-0.580	-0.006	+0.105	-0.046	-0.500	-0.500
700	-0.036	-1.169	-1.327	-0.009	+0.123	-0.104	-1.332	-1.188
700	-0.060	-1.809	-1.726	-0.020	+0.159	-0.165	-1.800	-1.616
1500 PSI	-0.132	-1.989	-2.544	-0.047	+0.189	-0.224	-2.296	-2.036
900	-0.042	-1.291	-1.324	-0.027	+0.142	-0.107	-1.285	-1.419
300	+0.030	-0.509	-0.485	+0.018	+0.090	+0.015	-0.440	-0.518
0	+0.031	-0.112	-0.055	+0.005	+0.052	+0.060	+0.017	-0.149

A - 11/1/78 @ 01.51002 - (PH 9-1.11)

All bridges OK RJ 3-15-78

Lab. No. 10905 11

Serial No. _____

Part No. _____

Engineer 11/15/78

Project CAL. Vert. Strab. Pull

Model 301 #2

Title Lower FIN

L. T. R. _____ EWA _____

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Calvo.
Smith, H. J.		DVM			

Volts	11.507				
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.	B268				
Act. Arm					
Chan.	-11				
Bridge	R/H Vert				
Config.	11/15/78 95.6				
Cal. Res.	100 K				
Lever Arm	G.C.				

Load	Output H.F.				
100 K	2.105				
		X	Use	Plot	
		X	Repl-		
0	+0.055	0	+0.053	0	Bad linearity. No valid calibration factor. Use of curve is required to prevent large errors.
22.5	+0.070	.015	+0.068	.015	
45.0	+0.082	.027	+0.080	.027	
67.5	+0.102	.047	+0.100	.047	
90.0	+0.123	.068	+0.122	.069	
125	+0.155	.100	+0.155	.102	
150	+0.107				
225	+0.067				
0	+0.055				

Ray Schibz
3-15-78

ORIGINAL PAGE IS
OF POOR QUALITY

"A" copy
176 A 31

11/15/78 W.I. 80

Lab. No. 109750

Project Cal. Vert. Lab. Pull

Serial No.

Model 301 #2

Title Upper Pin

Part No.

L. T. R. EWA

Engineer H.S. [unclear]

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Gage.
Spr. [unclear]		DVM			

Volts		4.809	4.801	4.807	4.801
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.		B258	B220		
Act. Arm					
Chen.		-15	-16	-34	-32
Bridge		1/4 V. d.	1/4 V. d.	Full Horiz.	Full Horiz.
Config.		Stab. Em 113.94	Stab. Em 109.75	Em Fl. 65.0	Em Fl. 65
Col. Res.		100 K	100 K	100 K	100 K
Lever Arm		77.375	31.975	36.43	36.15

Load	Output	HR	Rep'd	HR	HR
100K		1.866	1.866	2.037	2.101
0		0.226	0.226	0.051	-0.239
0		0.252	1.000	1.014	-0.200
150 PSI		0.608	0.652	0.593	0.017
300		1.073	1.108	1.075	0.501
450		1.540	1.296	1.454	0.792
600		2.030	1.930	1.936	1.113
750		2.520	1.864	1.534	1.433
900 PSI		3.030	1.764	2.084	1.750
750			1.516	1.577	1.256
450		-1.590	-0.325	-0.496	0.635
150			10.637	10.578	0.046
0 PSI		-2.277	10.974	11.004	0.000

"A" Cyl.

Bad zero OK all bridges RJP 3-16-78

1.5 PSIC/H

Bad linearity. Use curve to

ML-A2.2

prevent corrosion on each of four trials.

ORIGINAL PAGE IS OF POOR QUALITY

Reproduced 3-15-78

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Lab. No. 10998A
Serial No. _____
Part No. 301-328-001
Engineer A.S. WILSON

Project Cal. Horiz. Stab. Ch. Lead
Title _____
L.T.R. _____ EWA _____

Model 301-328

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvs.
<u>J. L. ...</u>		<u>D/111</u>			

Volts	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740
Gage Type								
Gage Fac.								
Gage Res.								
Lot. No.								
Act. Arm								
Chen.	-12	-13	-14	-30	-35	-36	-37	-38
Bridge	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>
Config.	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>
Col. Res.	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>	<u>1000</u>
Lever Arm					<u>59.3</u>	<u>59.2</u>		

Load	Output	4E	4F	4G	4H	4I	4J	4K
1001	2.000	2.010	2.064	2.070	2.059	2.085	2.100	1.970
	1.000	1.002	1.007	1.008	1.020	1.029	1.000	1.000
0	1.000	-0.160	-0.065	-0.009	0.087	0.117	0.015	-0.100
101	1.000	-0.160	-0.065	-0.016	0.137	0.167	0.016	-0.180
200	-0.001	-0.170	-0.069	-0.020	0.212	0.243	0.018	-0.180
400	-0.015	-0.160	-0.072	-0.032	0.271	0.320	0.015	-0.180
500	-0.023	-0.177	-0.072	-0.039	0.354	0.402	0.015	-0.172
675	-0.000	-0.176	-0.075	-0.045	0.453	0.485	0.015	-0.170
800	-0.000	-0.170	-0.075	-0.037	0.310	0.340	0.010	-0.170
1000	-0.000	-0.174	-0.070	-0.030	0.142	0.172	0.015	-0.170
0	0.000	-0.170	-0.070	-0.015	0.080	0.109	0.015	-0.180

Pass zero point OK on all bridges
RQS 3-16-78

A-Conn. ...

Sub linearity - Use
curves to predict large
loads
RQS 3-16-78

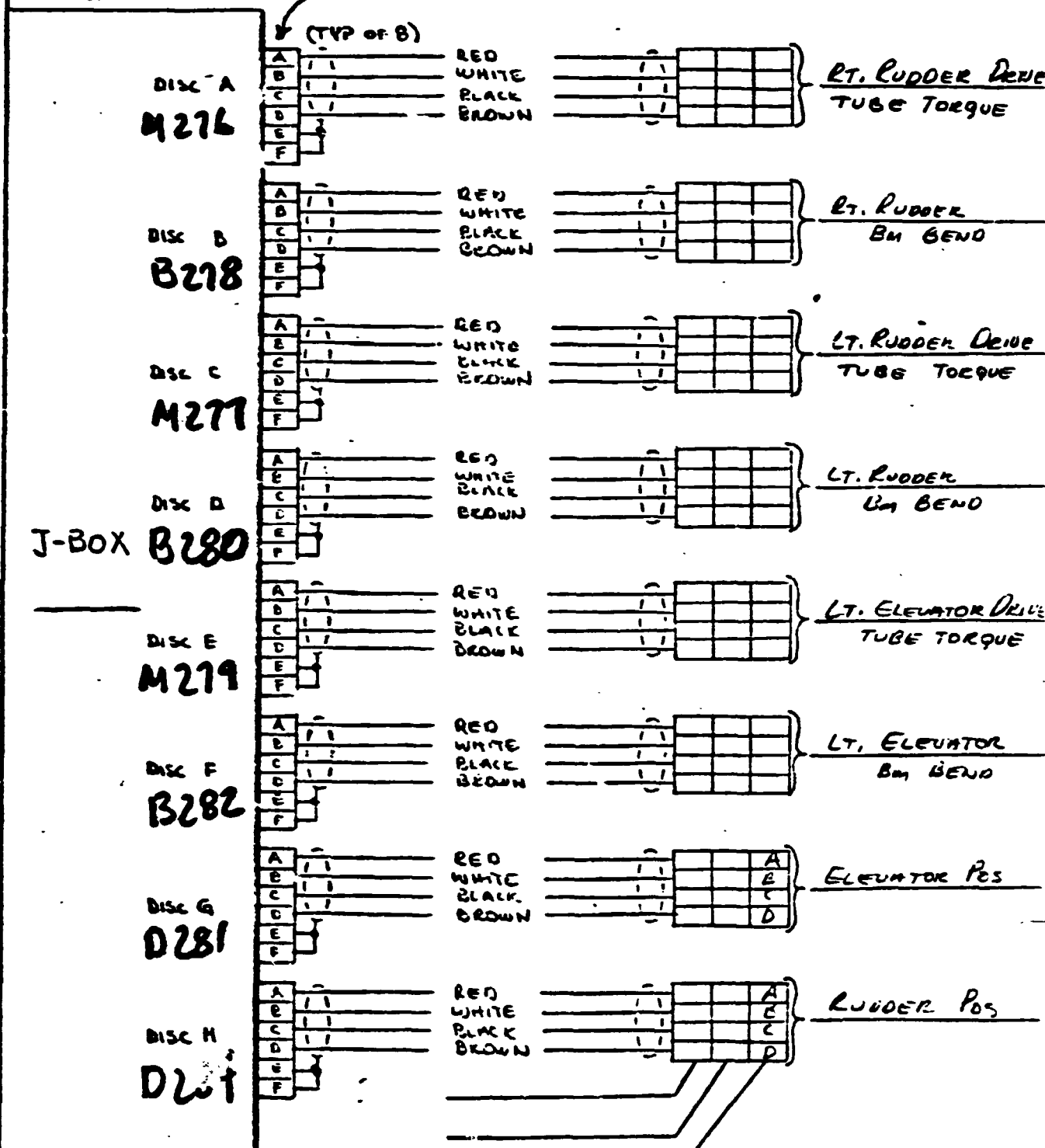
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box Location EMP-2

279

KPT06-10-67

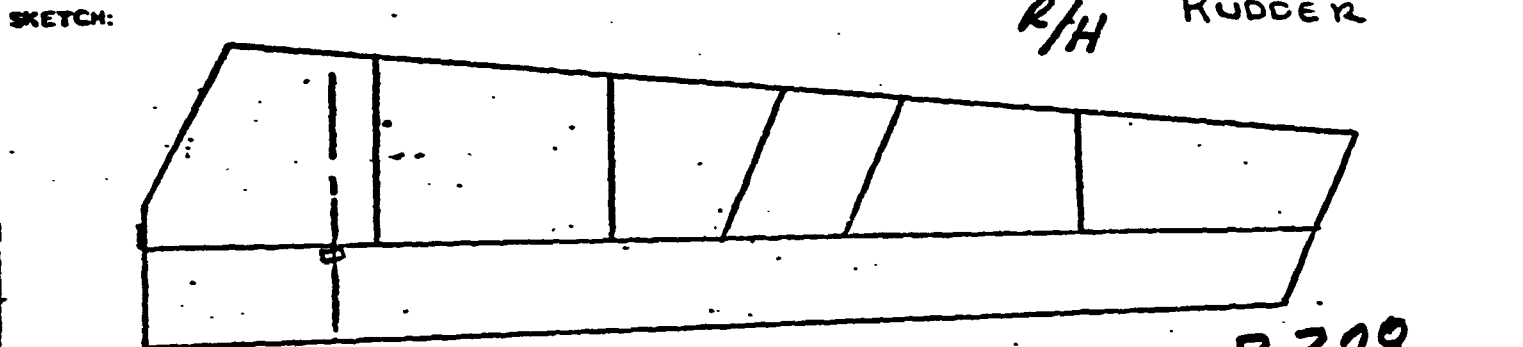


1KPT01-8-95

INSTRUMENTATION LABORATORY WORK SHEET

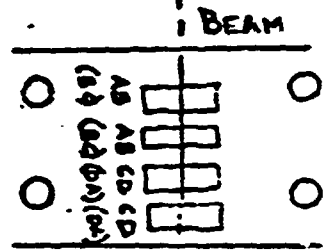
MODEL NO. 301	GAGE TYPE EA-13-250HQ-350	SHEET NO. 678954
EWB NO. A 427-11A	RESISTANCE 350.0 ± 0.4%	LAD. NO. 10998A
ORDER A427	GAGE FACTOR 2.11 ± 0.5%	PART NO. 278
REQUESTED BY: A. WHITENEP.	LOT NO. Q-A1BAF56	SERIAL NO. 278

TITLE OF TEST
MODEL 301 FLIGHT TEST (XV-15) - SHIP 2



10206

ORIGINAL PAGE IS
OF POOR QUALITY



REMARKS: **WL 118.76**

B278

19 20

BRIDGE	EM WL 118.76	EM WL 118.76					
TIME	5.03	5.47					
HES. TO GROUND	1Kms	1Kms					
DATE ASSIGNED:	TECHNICIAN Hollie - Check		EST. MRS.	APPROVED BY:			
DATE COMPLETED	ENGINEER		ACT. S.				
	6-15-76						

WORK SHEET

MOD. L. NO.
 EWA NO.
 WK ORDER
 REQUESTED
 A.
 TITLE OF TEST

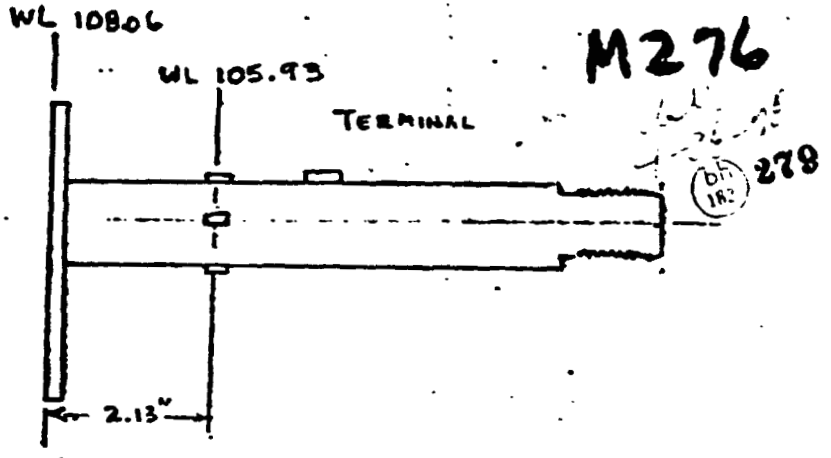
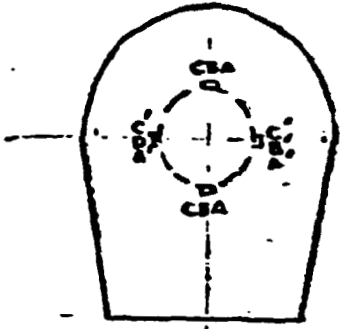
THIS PART HAS BEEN REBAGGED
 PRIOR TO CALIBRATION. THE
 ATTACHED SHEET SHOWS THE
 LATEST INFORMATION.

SHEET NO. 688512
 LAB. NO. 10998A
 PART NO. 301-328-408-012
 SERIAL NO.

MODEL 301 FLIGHT TEST

SKETCH:

R/H RUDDER TORQUE TUBE



ORIGINAL PAGE IS
 OF POOR QUALITY

REMARKS:

BRIDGE	21	22						
ANCE	TOR WL 105.93 4.91	TOR WL 105.93 5.01						
TO GROUND	10K MEG	10K MEG						
DATE ASSIGNED	11-18-76	TECHNICIAN Fox			EST. HRS.		APPROVED BY:	
DATE COMPLETED	11-19-76	ENGINEER			ACT. HRS.			

CHAN 1

BRIDGE TYPE=BENDING
LAB-BR NUMBER=10998A-19
BRIDGE VOLT= 6
BRIDGE STR= 10.7

DCMV OFFSET= -177.8
UNITY CAL= 1331.074090

100K CE= 1207.4

LOAD IN LB	OUTPUT (MV)	LINEARITY
0.0	0.700	OK
42.8	0.940	OK
85.6	1.140	OK
128.4	1.310	OK
171.2	1.550	OK
214.0	1.720	OK
256.8	1.960	OK
0.0	0.700	OK

1.08

B278

ORIGINAL PAGE IS
OF POOR QUALITY

CHAN 2
TYPE PULL =BENDING
CAL DATE =1-10-78
BRIDGE TYPE=LENDING
LAB-BR NUMBER=10998A-20
BRIDGE VOLT= 6
BRIDGE STR= 10.7

DATA

DCMV OFFSET= 772.5
UNITY CAL= 1372.404365

100K CE= 1199.1

LOAD IN LB	OUTPUT (MV)	LINEARITY
0.0	-3.200	OK
42.8	-3.260	OK
85.6	-3.600	OK
128.4	-2.820	OK
171.2	-2.620	OK
0.0	-2.440	OK
0.0	-2.200	OK
0.0	-2.200	OK

1.12

CHAN 3
TYPE PULL =TORSION
CAL DATE =1-10-78
BRIDGE TYPE=TORSION
LAB-BR NUMBER=10998A-21
BRIDGE VOLT= 6
BRIDGE STR= 0

DATA

DCMV OFFSET= 985.6
UNITY CAL=-1008.204436

100K CE= -880.9

LOAD IN LB	OUTPUT (MV)	LINEARITY
0.0	5.870	OK
150.0	4.990	OK
300.0	4.060	OK
450.0	3.150	OK
600.0	2.310	OK
750.0	1.400	OK
0.0	5.850	OK

4.47

M276

CHAN 4
TYPE PULL =TORSION
CAL DATE =1-10-78
BRIDGE TYPE=TORSION
LAB-BR NUMBER=10998A-22
BRIDGE VOLT= 6
BRIDGE STR= 0

DATA

DCMV OFFSET= 550.3
UNITY CAL=-1215.905357

100K CE= -1052.3

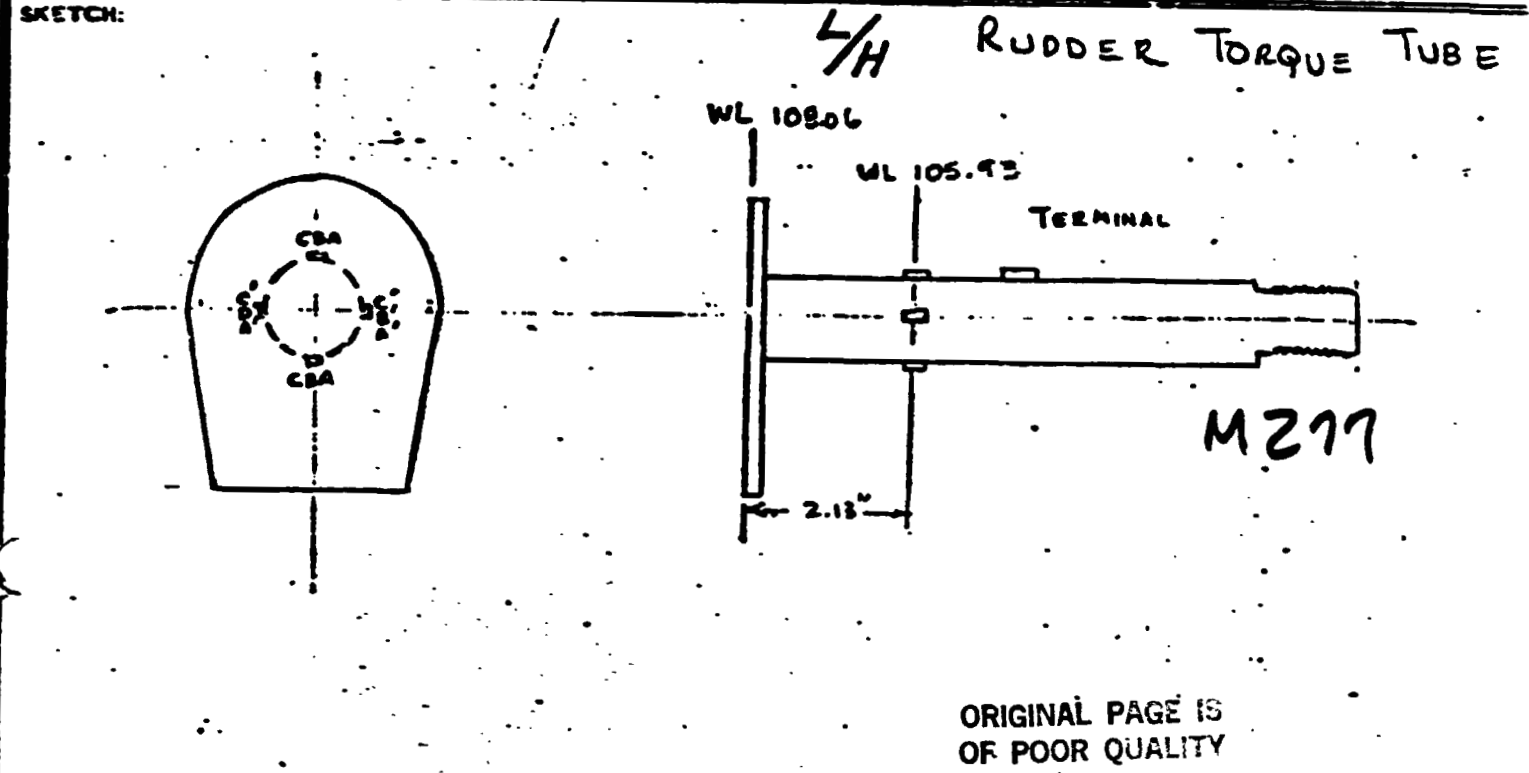
LOAD IN LB	OUTPUT (MV)	LINEARITY
0.0	2.720	OK
150.0	2.010	OK
300.0	1.250	OK
450.0	0.500	OK
600.0	-0.190	OK
750.0	-1.100	OK
0.0	2.720	OK

3.72

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE FAE-2-25-35513-EGH	SHEET NO. 678984
NO. A427-11A	RESISTANCE	LAB. NO. 10998A
WORK ORDER A427	GAGE FACTOR 2.09 ± 1%	PART NO.
REQUESTED BY: A. WHITENER	LOT NO. A-277	SERIAL NO. 4 (18) 289

TITLE OF TEST
MODEL 301 FLIGHT TEST - SHIP-2



REMARKS:

26 M277

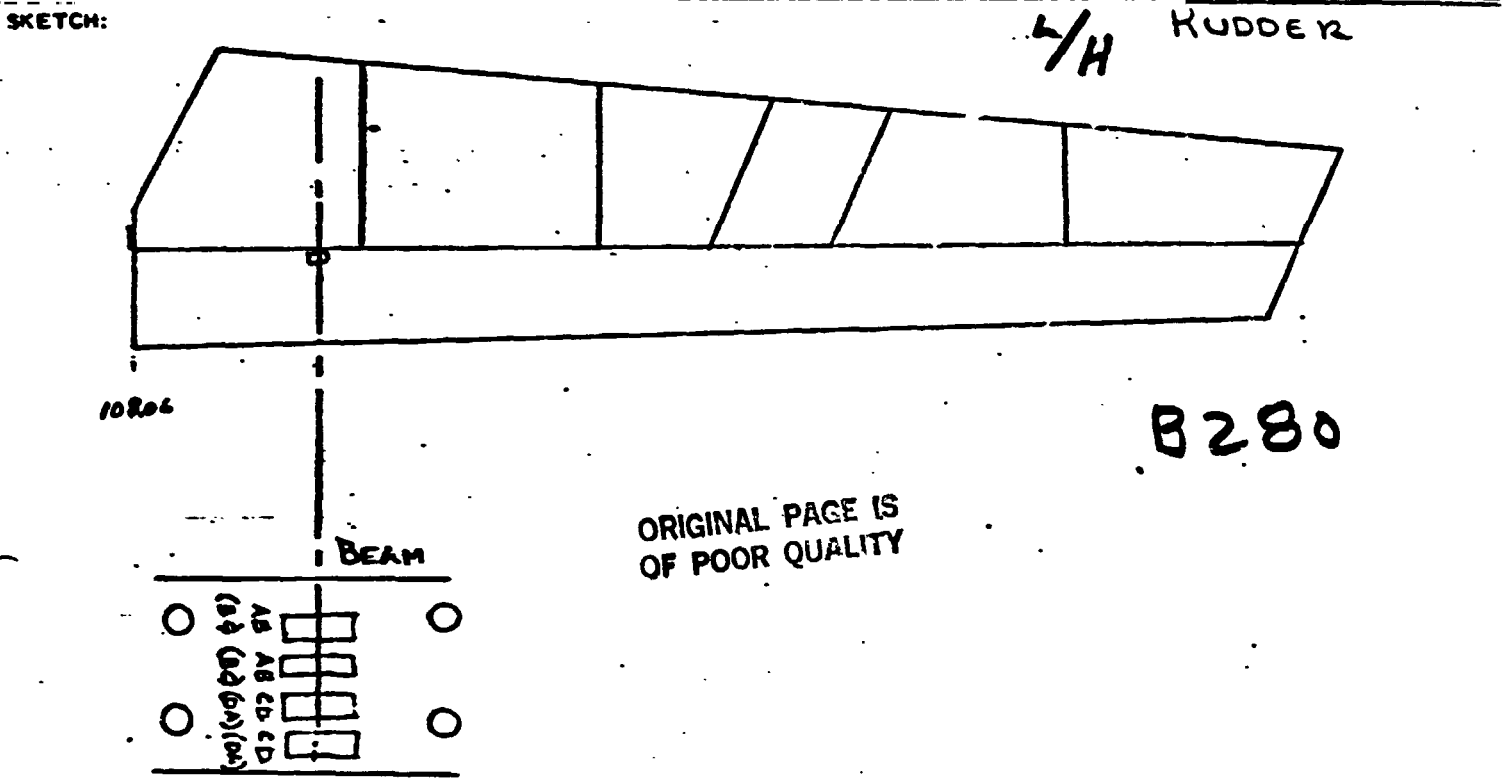
25

GAGE	FOR WL 105.93	FOR WL 105.93				
ANCE	4.58	4.62				
RES. TO GROUND	1 Km	1 Km				
DATE ASSIGNED	TECHNICIAN Hollis - Chuck		EST. HRS.		APPROVED BY:	
DATE COMPLETED	ENGINEER		ACT. HRS.			

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-250 HQ-250	SHEET NO. 678954
AWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10998A
K ORDER A427	GAGE FACTOR 2.11 ± 0.5%	PART NO.
REQUESTED BY: A. L. WHITENEP.	LOT NO. Q-A1BAF56	SERIAL NO. 4 (bf 1R2) 279

TITLE OF TEST
MODEL 301 FLIGHT TEST (XV-15) - SHIP 2



REMARKS: **WL 118.76**

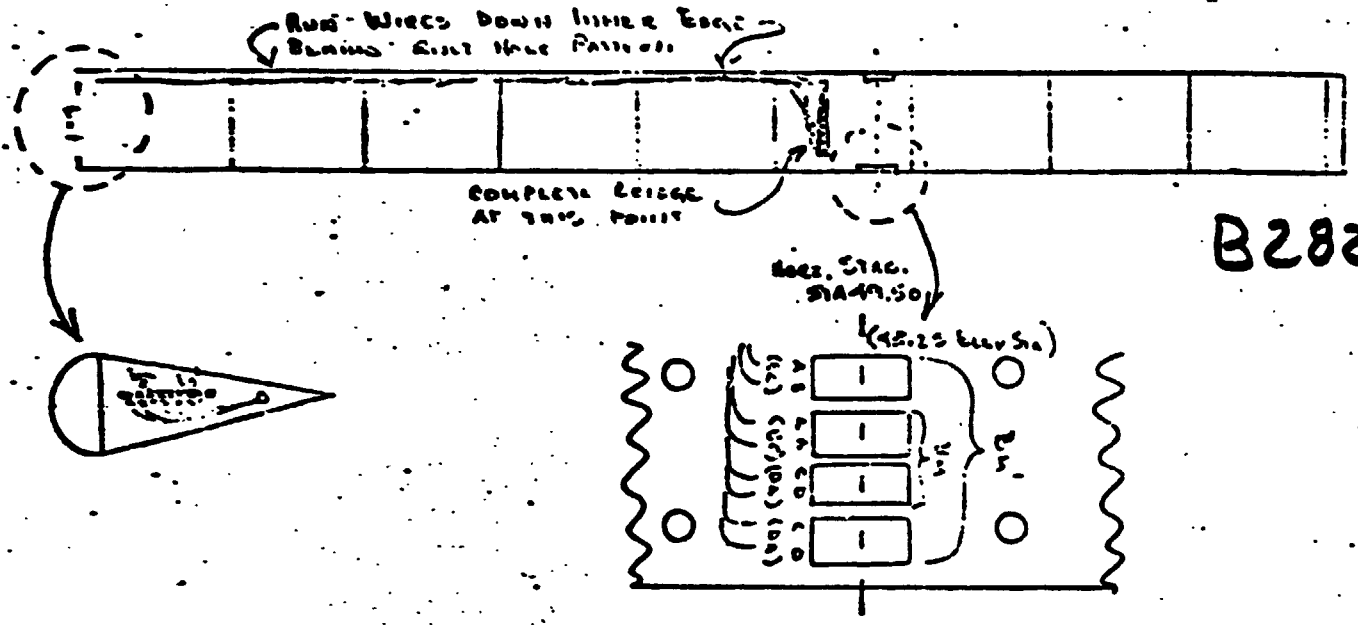
BRIDGE	24 <i>Em</i>	23 <i>Em</i>				
	WL 118.76	WL 118.76				
RANGE	4.93	4.96				
ALTITUDE TO GROUND	1 Km	1 Km				
DATE ASSIGNED	TECHNICIAN Hollis - Chuck		EST. HRS.	APPROVED BY:		
DATE COMPLETED 6-15-76	ENGINEER		ACT. HRS.			

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-250HQ-350	SHEET NO. 6789F4
FWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10998A
ORDER A427	GAGE FACTOR 2.11 ± 0.3	PART NO. 2110518
REQUESTED BY: A. V. H. 1500	LOT NO. Q-A18AF56	SERIAL NO. 279

TITLE OF TEST: **MODEL 301 FLIGHT TEST (XV-15) - SHIP-2**

SKETCH: **4/H ELEVATOR**



REMARKS:

ORIGINAL PAGE IS
OF POOR QUALITY

BRIDGE	BIP	BIP	2	1	1 (AB-open)	
NCE	4.13	4.33		4.31	out	
RES. TO GROUND	1Kma	1Kma		1Kma	X	
DATE ASSIGNED	TECHNICIAN Harris - Check			EST. HRS.	APPROVED BY:	
DATE COMPLETED	ENGINEER			ACT. HRS.		

6-15-76

DATE=7-18-78
 PART TITLE=L/H ELEVATOR
 PART NUMBER=NONE
 SERIAL NUMBER=NONE
 CH # BRIDGE TYPE
 1 BEAM
 PULL NUMBER = 90

LAB-BR #
 10998A-02

BR. RES:
 350

BR. STA
 49.5

PRESS THE 'PRT ALL' KEY
 PULL NUMBER = 90
 0
 PRESS THE 'PRT ALL' KEY
 PULL NUMBER = 91
 TYPE PULL BEAM
 IS THIS A COUPLE? NO
 WILL LOAD BE READ FROM LOAD CELL? NO
 ARE DEAD HEIGHTS TO BE USED? YES
 LOAD STATION = 959.5
 INPUT LOAD UNITS = ? IN/LB
 # OF LOADS = 7
 INPUT JACK FACTOR = 1.0

ORIGINAL PAGE IS
 OF POOR QUALITY

LOAD	1	2	3	4	5	6
LOAD 1	=90					
LOAD 2	=910					
LOAD 3	=920					
LOAD 4	=930					
LOAD 5	=940					
LOAD 6	=950					
CHAN	0.0	10.000	20.000	30.000	40.000	50.000
	LBS	LBS	LBS	LBS	LBS	LBS
1	7.570	7.880	8.110	8.400	8.680	8.900

CHAN	0.0	0.000	0.000	0.000	0.000	0.000
	LBS	LBS	LBS	LBS	LBS	LBS
1	7.500	0.000	0.000	0.000	0.000	0.000

TYPE PULL BEAM

DATE=7-18-78

100% CE =

3209.16

10998A-02

BEAM

STA 49.5

CHAN 1

UNITY CAL =

3674.03

BV = 10.0

LOAD (IN/LB) OUTPUT (MV)

LINEARITY

0.0 7.570

OK

100.0 7.880

2.844%

200.0 8.110

OK

300.0 8.400

1.012%

400.0 8.680

1.600%

500.0 8.900

-2.324%

0.0 7.500

2.256%

B282

GAGE OUTPUT TOO LOW FOR CLASS 3 LIMITS
 *****LINEARITY EXCEEDS DESIRED LIMITS
 CALIBRATION REPORT

PROJECT=301 FLIGHT TEST
 PART TITLE=L/H ELEVATOR
 PART NUMBER=NONE

10998A-
 CAL DATE=7-18-78

CHAN	LAB-BR.#	BR. TYPE	STATION	UNIT CAL	100% CE	MAX LOAD	CLASS
01	10998A-02	BEAM	49.5	3674.0	3209.16	500	99

Alan W. Colles

7-27-78

P.O.

H. will Notify

BLACKMAN

Use

AS I,

CALIBRATION DATA SHEET

DATE 1-6-78

DLN. 671527

MODEL 301 SHIP #2

LAB. NO. 10998A

E.W.A. A422-25

PROJECT 301 FLIGHT TEST

SERIAL NO. _____

W.O. A422

TITLE L/H RUDDER

PART NO. _____

ENGINEER WHITENER

TECHNICIAN	INSTRUMENTS	SERIAL NO.
HENDERSON	N.P. CALCULATOR 71200	EA3257
CARNEY	LEAD WEIGHT	_____

NOTES:
ORIGINAL PAGE IS OF POOR QUALITY

LOAD STATION 100 BEAM L/S = 19.26 MAT

Bridge No.	23	24	25	26
Gage Type	EA-3-250MA-250		FAE-2-25-35S13-EBH	
Gage Fac.	2.11 ± 0.59%		2.08 ± 1.09%	
Gage Res.	250			
Lot No.	A-112 AF56		A-277	
Act. Arm	4.0		3.89	
Cal. Chan.	1	2	3	4
Bridge Type	PENNY		TOPSTON	
Config.	3M 10.7	3M 10.2"	70	70
Bridge Voltage	6.0	12.5		
Lever Arm	8.56"	8.56"	30.0"	COUPLE

LOAD LBS	LOAD LBS
0	0
5	5
10	12
15	15
20	20
25	25
30	0
0	

Beam bridges have very low output
Linearity is OK
OK to use
By Schilt
1-12-78

CHAN 1

BRIDGE TYPE=BENDING
LAB-OR NUMBER=10998A-23
BRIDGE VOLT= 6
BRIDGE STA.= 10.7

0(MV) OFFSET= -291.2
UNITY CAL= 1153.7797

100K CE= 1010.7

LOAD(IN LBS)	OUTPUT(MV)	LINEARITY
0.0	1.510	OK
42.8	1.730	OK
85.6	1.950	OK
128.4	2.150	OK
171.2	2.380	OK
214.0	2.630	OK
256.8	2.970	OK
0.0	1.550	OK

1.36

B 280

ORIGINAL PAGE IS
OF POOR QUALITY

TYPE PULL =BENDING
CAL DATE =1-6-70
BRIDGE TYPE=BENDING
LAB-OR NUMBER=10998A-24
BRIDGE VOLT= 5
BRIDGE STA.= 10.7

DATA

CHAN 2

0(MV) OFFSET= -161.4
UNITY CAL= 1156.501559

100K CE= 1010.4

LOAD(IN LBS)	OUTPUT(MV)	LINEARITY
0.0	0.340	OK
42.8	1.160	OK
85.6	1.380	OK
128.4	1.590	OK
171.2	1.830	OK
214.0	2.050	OK
256.8	2.270	OK
0.0	0.380	OK

1.35

~~MA 281~~

TYPE PULL =TORSION
CAL DATE =1-6-70
BRIDGE TYPE=TORSION
LAB-OR NUMBER=10998A-25
BRIDGE VOLT= 6
BRIDGE STA.= 0

DATA

CHAN 3

0(MV) OFFSET= 399.2
UNITY CAL=-1223.451560

100K CE= -1068.9

LOAD(IN LBS)	OUTPUT(MV)	LINEARITY
0.0	1.350	OK
150.0	1.320	OK
300.0	0.490	OK
450.0	-0.220	OK
600.0	-0.370	OK
750.0	-1.750	OK
0.0	1.950	OK

3.7

M 277

TYPE PULL =TORSION
CAL DATE =1-6-70
BRIDGE TYPE=TORSION
LAB-OR NUMBER=10998A-26
BRIDGE VOLT= 6
BRIDGE STA.= 0

DATA

CHAN 4

0(MV) OFFSET= 445.6
UNITY CAL=-1126.423119

100K CE= -984.1

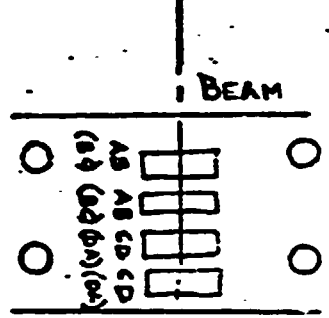
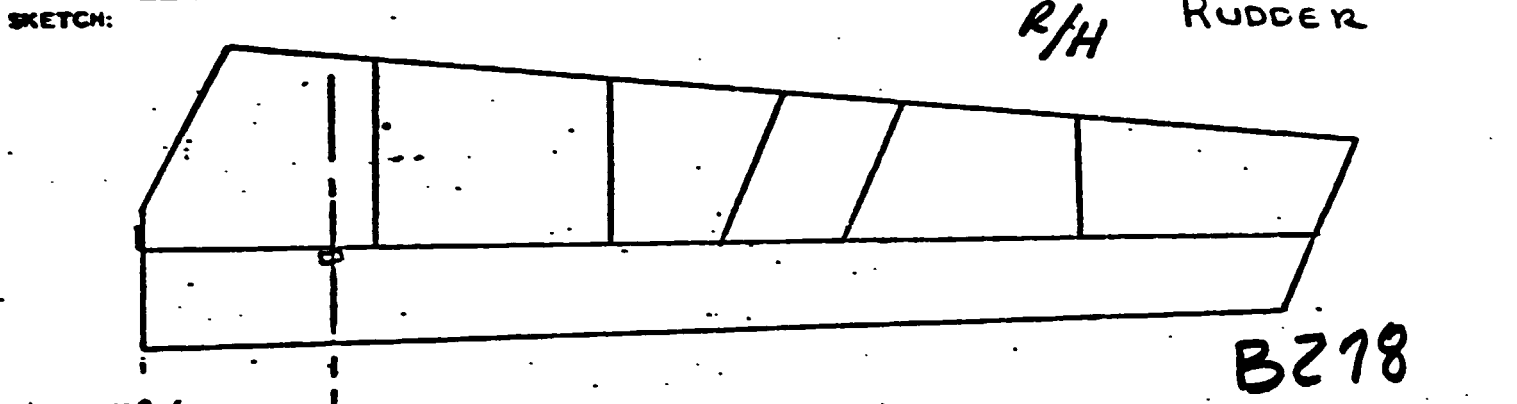
LOAD(IN LBS)	OUTPUT(MV)	LINEARITY
0.0	2.320	OK
150.0	1.570	OK
300.0	0.750	OK
450.0	-0.010	OK
600.0	-0.320	OK
750.0	-1.020	OK
0.0	2.800	OK

4.0

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-250 HQ-350	SHEET NO. 678954
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10998A
ORDER H427	GAGE FACTOR 2.11 ± 0.5%	PART NO. 11-91
REQUESTED BY: A. WHITENE P.	LOT. NO. Q-A1BAF56	SERIAL NO. 182 278

TITLE OF TEST
MODEL 301 FLIGHT TEST (XV-15) - SHIP 2



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS: **WL 118.76**

B278

19 20

BRIDGE	EM WL 118.76	EM WL 118.76				
TE	5.03	5.47				
HES. TO GROUND	1Kma	1Kma				

DATE ASSIGNED:	TECHNICIAN Hollis - Chock	EST. HRS.	APPROVED BY:
DATE COMPLETED 6-15-76	ENGINEER	ACT. S.	

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-125T6-350W	SHEET NO. DLN 678954
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 110C4A
WORK ORDER A427	GAGE FACTOR 2.07 ± 0.5%	PART NO. 301-301-055-21
REQUESTED BY: A. WHITENER	LOT NO. Q-A35AD13	SERIAL NO.

TITLE OF TEST **301 FLIGHT TEST**

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

FITTING - ADJ. HORIZ. STAB.

F286



279

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.

MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER

WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX

LEADS. ENCASE LEADS IN VINYL SLEEVING AND

TERMINATE WITH MAP PLUG.

F286
01

C-5

BRIDGE	AXIAL						
TOLERANCE	3.95						
TO GROUND	10K _{min}						

DATE ASSIGNED 6-17-76	TECHNICIAN CNUCK	EST. HRS.	APPROVED BY:
DATE COMPLETED 6-18-76	ENGINEER	ACT. HRS.	

SELECT NEXT TASK

SN 1

TYPE PULL = ANIAL (*pas*)
BRIDGE TYPE=ANIAL
LAB-BE NUMBER=11034A 01
BRIDGE VOLT= 10
BRIDGE STA.= 0

DATA
0(MV) OFFSET= -4212.9
UNITY CAL= 6157.610563

100K CE= 5380.0

LOAD (LBS)	OUTPUT (MV)	LINEARITY (MUCI)
0.0	6.830	0.0
732.5	8.030	-0.2
1445.0	9.200	-0.1
2167.5	10.330	0.1
2890.0	11.540	-0.0
3612.5	12.720	-0.0
4335.0	13.960	-0.0
5057.5	15.200	0.0
5780.0	16.460	0.0

5.89

F286

ORIGINAL PAGE IS
OF POOR QUALITY

BY H.D. WINNIFORD

HELL HELICOPTER COMPANY
POST OFFICE BOX 401 • FORT WORTH, TEXAS

MODEL 301 PAGE _____

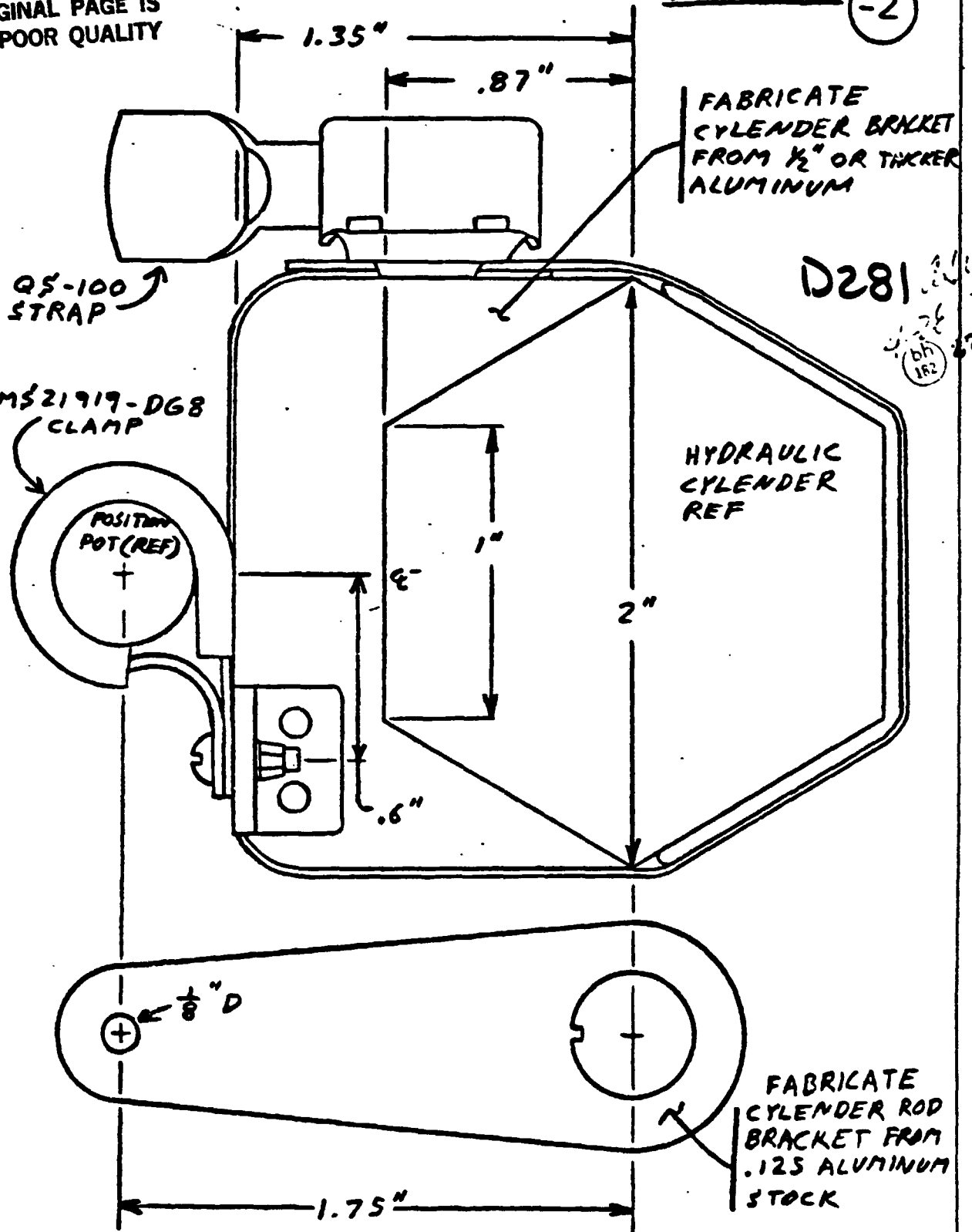
CHECKED _____

RPT SHIP #1

HYDRAULIC CYLINDER POSITION BRACKETS

SKADG-1-76 (2)

ORIGINAL PAGE IS
OF POOR QUALITY



D281
76
79
bh
182

FABRICATE
CYLINDER ROD
BRACKET FROM
.125 ALUMINUM
STOCK

7072 00428

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6/5/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer SALTA

ITEM CODE: D281

Project GROUND TIEDOWN TESTS

Title ELEVATOR POSITION

W. O. _____

L. T. R. _____ EWA _____

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>SALTA</u>		<u>DICHLINOMETER</u>			

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chon.	<u>BRIDGE "A" - 79-S-2</u>				
Bridge	<u>C37</u>				
Config.		<u>NOTE: AIRPLANE MODE REQUIRED. LOGIC LMT.</u>			
Col. Res.	<u>N/A</u>	<u>STICK TO 50%</u>			
Lever Arm					

Lead	Output				
<u>75% STICK POS. ELEV. 9 (DEC)</u>	<u>OUTPUT (MAGNET)</u>				
<u>0</u>	<u>9° 10'</u>	<u>421</u>			
<u>10</u>	<u>6° 40'</u>	<u>375</u>			
<u>20</u>	<u>3° 0'</u>	<u>323</u>			
<u>30</u>	<u>-1° 20'</u>	<u>265</u>			
<u>40</u>	<u>-5° 20'</u>	<u>209</u>			
<u>50</u>	<u>-9° 10'</u>	<u>158</u>			
<u>60</u>	<u>-13° 10'</u>	<u>109</u>			
<u>70</u>	<u>-17° 25'</u>	<u>46</u>			
<u>80</u>	<u>-21° 30'</u>	<u>6</u>			
<u>90</u>	<u>-25° 0'</u>	<u>-66</u>			
<u>100</u>	<u>-29° 0'</u>	<u>-105</u>			
<u>FC</u>	<u>-21° 0'</u>	<u>-3</u>			
<u>60</u>	<u>-13° 10'</u>	<u>109</u>			
<u>40</u>	<u>-5° 20'</u>	<u>209</u>			
<u>20</u>	<u>3° 0'</u>	<u>317</u>			
<u>0</u>	<u>10° 0'</u>	<u>427</u>			

GPA (E2-S-7) = 6

L4C (K3-S-7) = 744

D. P. Smith

ERL HELICOPTER COMPANY

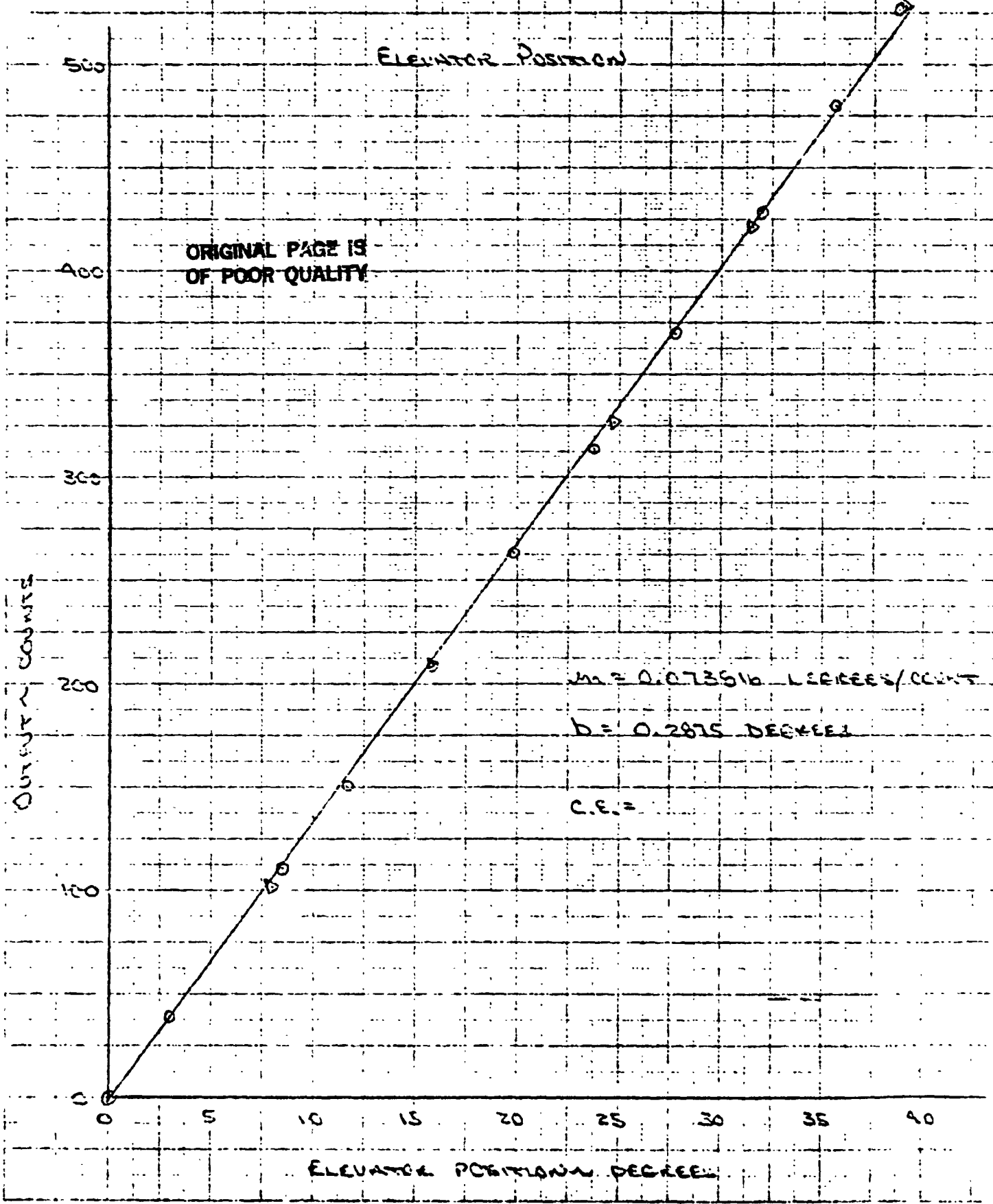
MODEL 301

PAGE

SHEET 2

281

ITEM CODE: 0281



BY H.D. WINNIFORD

BELL HELICOPTER COMPANY
FOOT WORTH, TEXAS

MODEL 301 PAGE _____

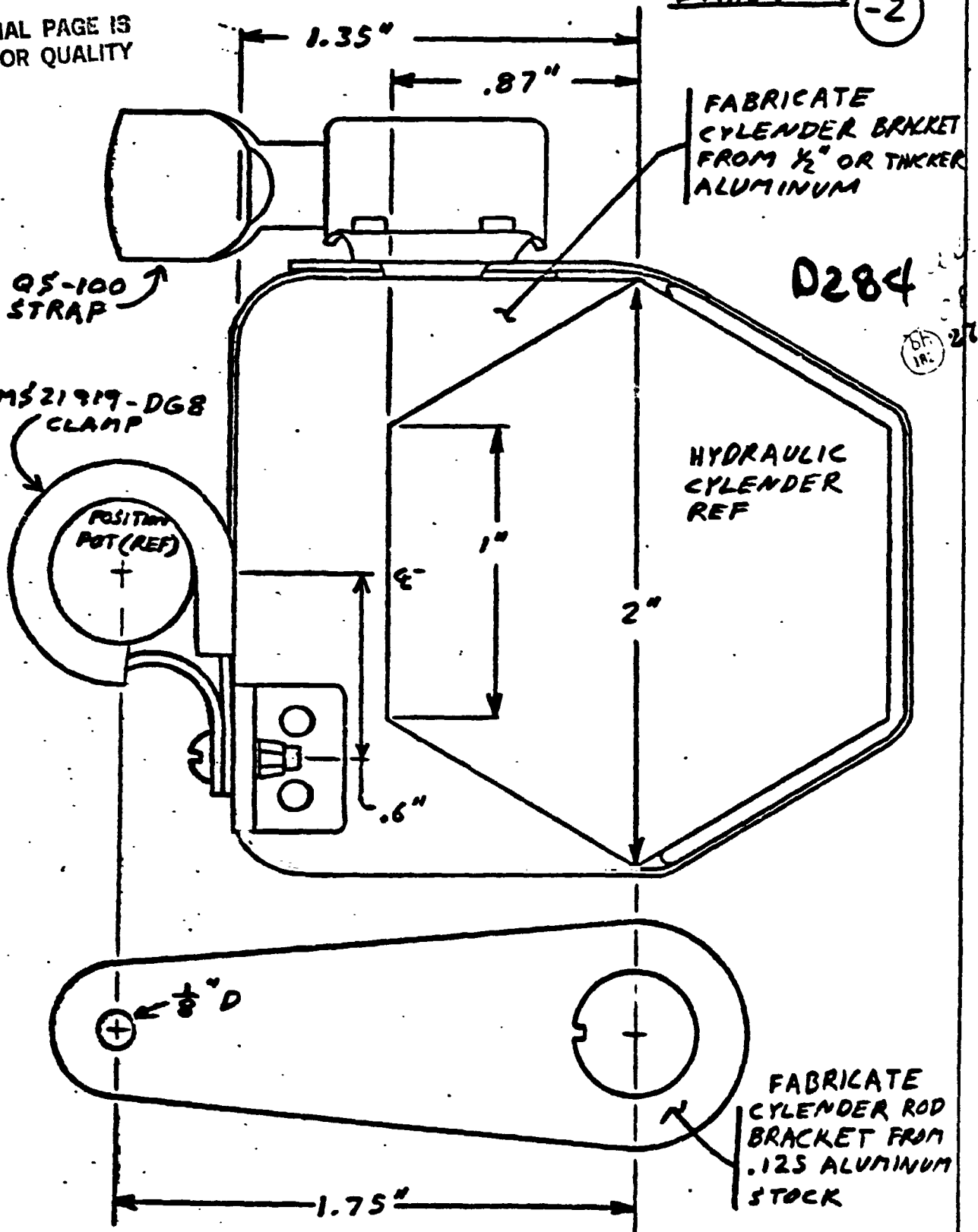
CHECKED _____

RPT SHIP #1

HYDRAULIC CYLINDER POSITION BRACKETS

SKHDS-1-76 (2)

ORIGINAL PAGE IS
OF POOR QUALITY



FABRICATE
CYLINDER BRACKET
FROM 1/2" OR THICKER
ALUMINUM

Q5-100
STRAP

M521919-DG8
CLAMP

POSITION
POT (REF)

HYDRAULIC
CYLINDER
REF

FABRICATE
CYLINDER ROD
BRACKET FROM
.125 ALUMINUM
STOCK

D284

DF
18. 279

7079 9040

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-13-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GROUND TIEDOWN TESTS

Title RUBBER POSITION

L. T. R. EWA

301-2

W. O. _____

ITEM CODE: D284

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>SMITH</u>					
<u>W. O. FENNER</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chon.	<u>RIMDU "A" - 78-6-3</u>				
Bridge	<u>457</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

Load	Output				
PEDAL POS. (%)	LT. ROD. 9 (DEF.)	RT. ROD. 4 (DEF.)	OUTPUT (COUNTS)		
0	-15.5	-20	-316		
10	-13.5	-14	-246		
20	-9.5	-10	-195		
30	-6.0	-6	-142		
40	-2.75	-2.25	-91		
50	+1.0	+1.5	-35		
60	4.0	14.5	9		
70	8.0	9.0	63		
80	11.5	11.5	113		
90	15.5	15.0	162		
99	19.0	15.0	208		
50	11.25	11.25	112		
60	4.0	4.5	7		
40	-3.5	-3.0	-106		
20	-10.0	-10.25	-196		
0	-15.25	-20.0	-316		

PLT AVERAGE OF LEFT & RIGHT

CPA (02-9-7) = 7
LLC (83-9-7) = 799

BY D.P. Smith
CHECKED

Golf Helicopter Division

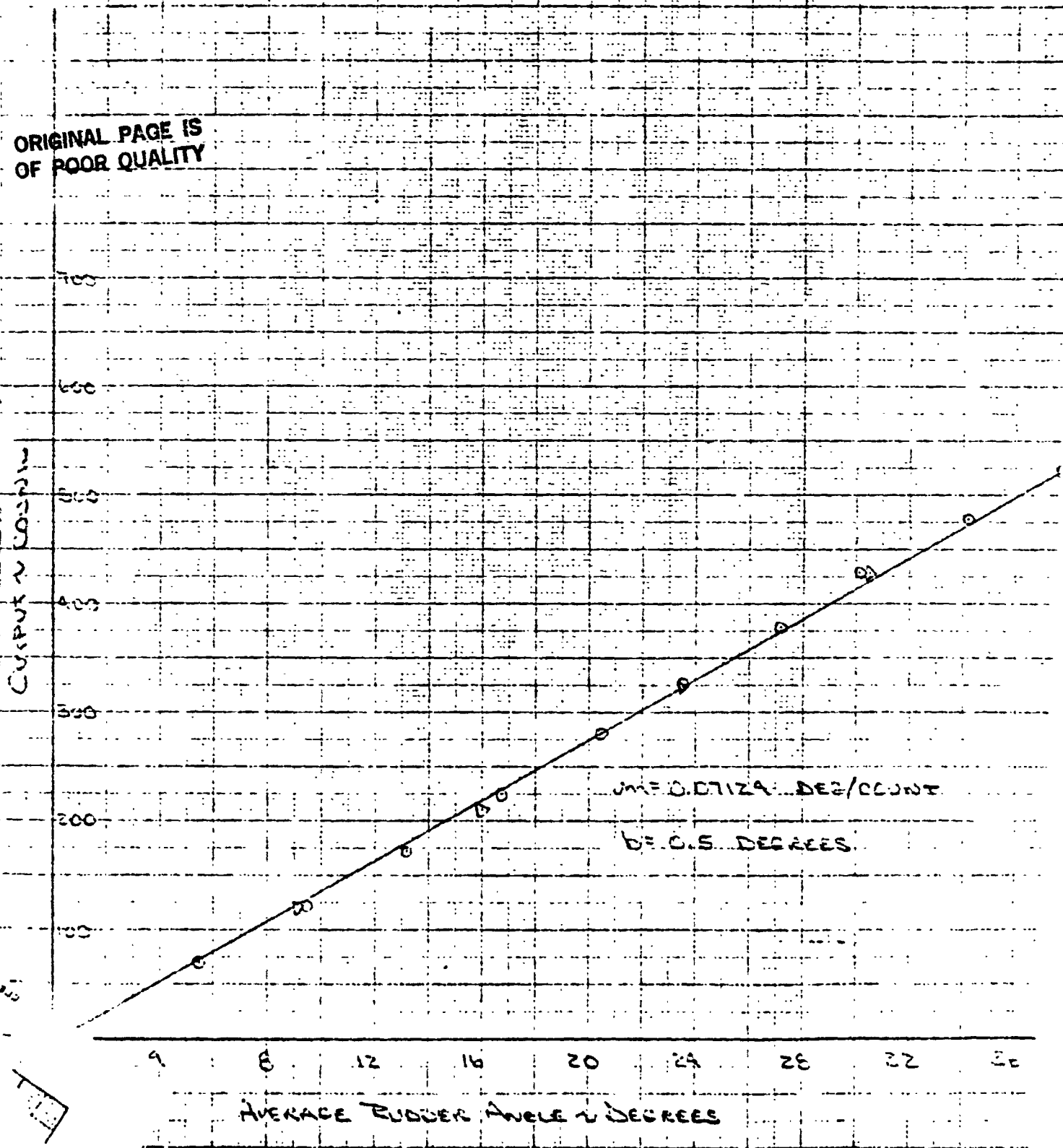
MODEL 705
SERIAL 72

PAGE
PPI

ITEM CODE: D204

Rudder Position

ORIGINAL PAGE IS
OF POOR QUALITY



BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED (Signature)

HELI. 1+2 RPT SKASW0475-1

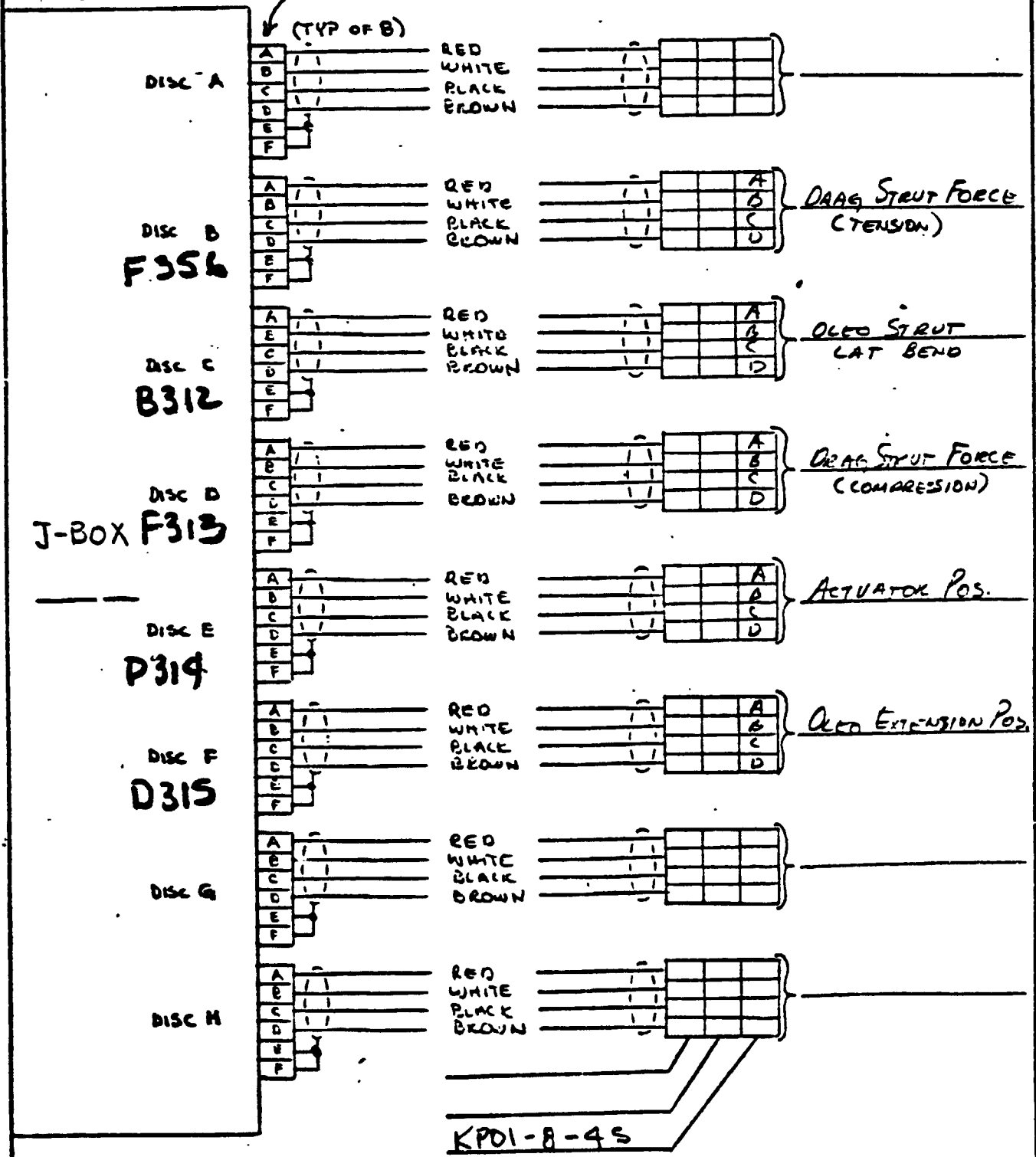
ORIGINAL PAGE IS OF POOR QUALITY

DISCONNECT HARNESS

J-Box LOCATION LMG-1

DR. 182 279

KPT06-10-67

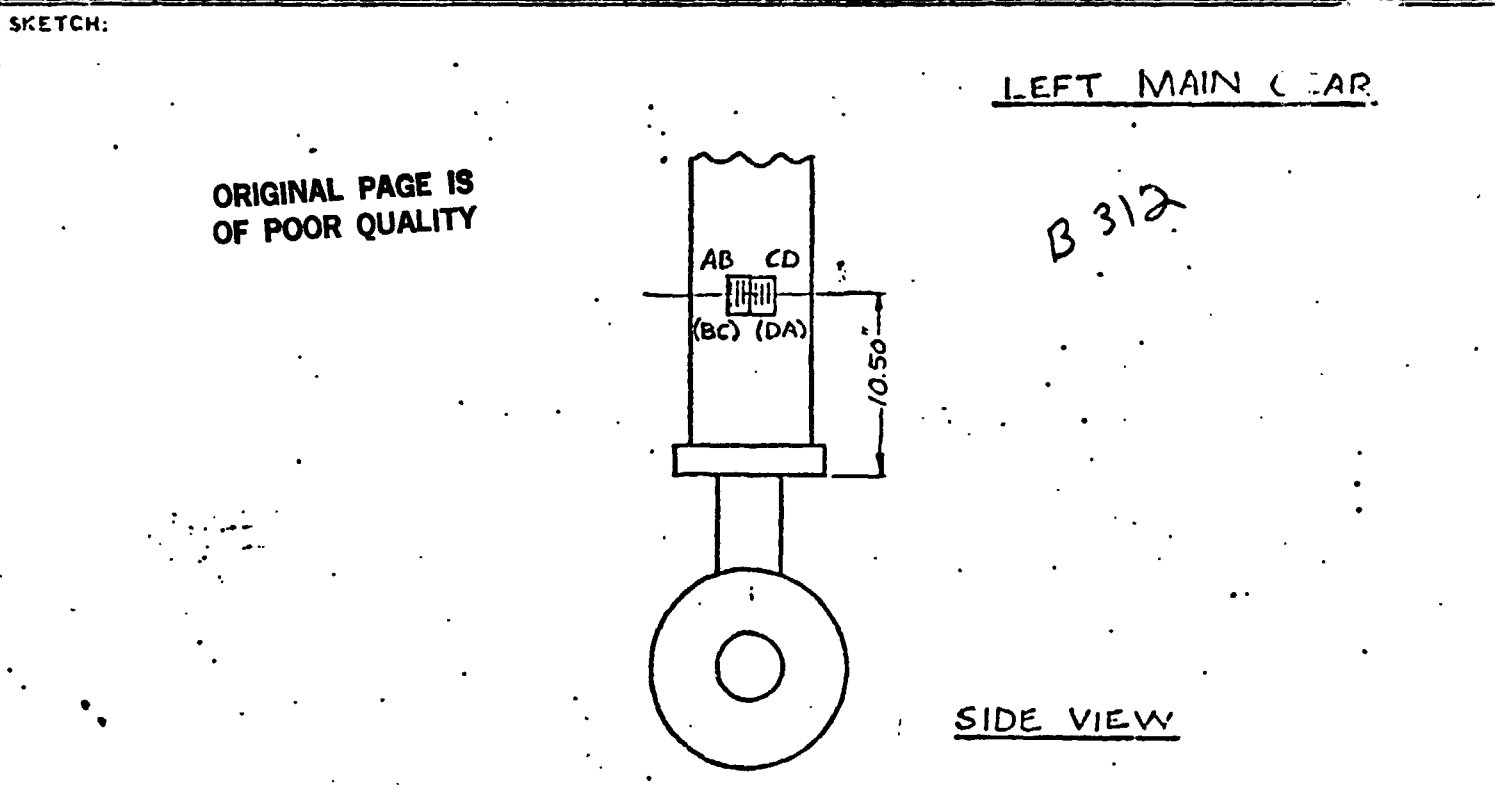


7042 5000REV 100

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-250MQ-350	LAB. NO. 688512
EWA NO. A427-11B	RESISTANCE 350 ± 0.1 %	LAB. NO. 11345A
K ORDER A427	GAGE FACTOR 2.13 ± 0.5 %	PART NO. 10565-201
REQUESTED BY: A. WHITENER	LOT NO. A21AD142	SERIAL NO.

TITLE OF TEST
301 FLIGHT TEST



REMARKS:

INSTALL BENDING BRIDGE AS SHOWN.. USE EASTMAN 910 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH SHELL 9309. ATTACH FOUR TEN INCH SUPRENTANT LEADS. ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH KPT-06-8-4P PLUG.

B 312
03

BRIDGE	BENDING				
ANCE	TURNS	553			
RES. TO GROUND					

DATE ASSIGNED	TECHNICIAN CCW -	EST. HRS.	APPROVED BY:
DATE COMPLETED 11-18-76	ENGINEER	ACT. HRS.	

BY
CHECKED

BELL HELICOPTER COMPANY
ROBT BAKER 400 411 • ROBT BAKER 4 11244

MODEL
HELL

PAGE
PT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 11345003
 LAB CALIBRATION: 8-7-78
 PART NO. 10650-1
 SER. NO. MMC-005
 JACK FACTOR: 0.609 PSI = 10 LB.
 LEVER ARM: 27.975 INCHES
 LOAD OFF = 19.778 IN-LBS

B-312

$$100 \text{ KD} \cdot 440 = 409 \times 27.975 = 19,778 \text{ IN-LBS}$$

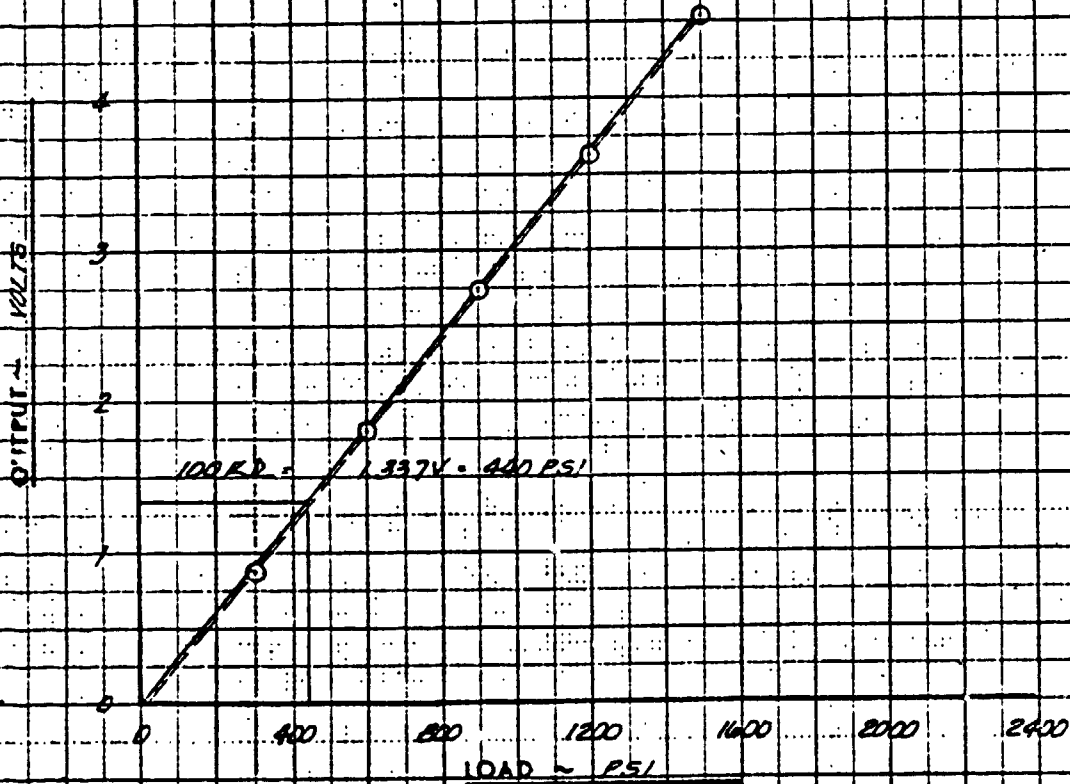


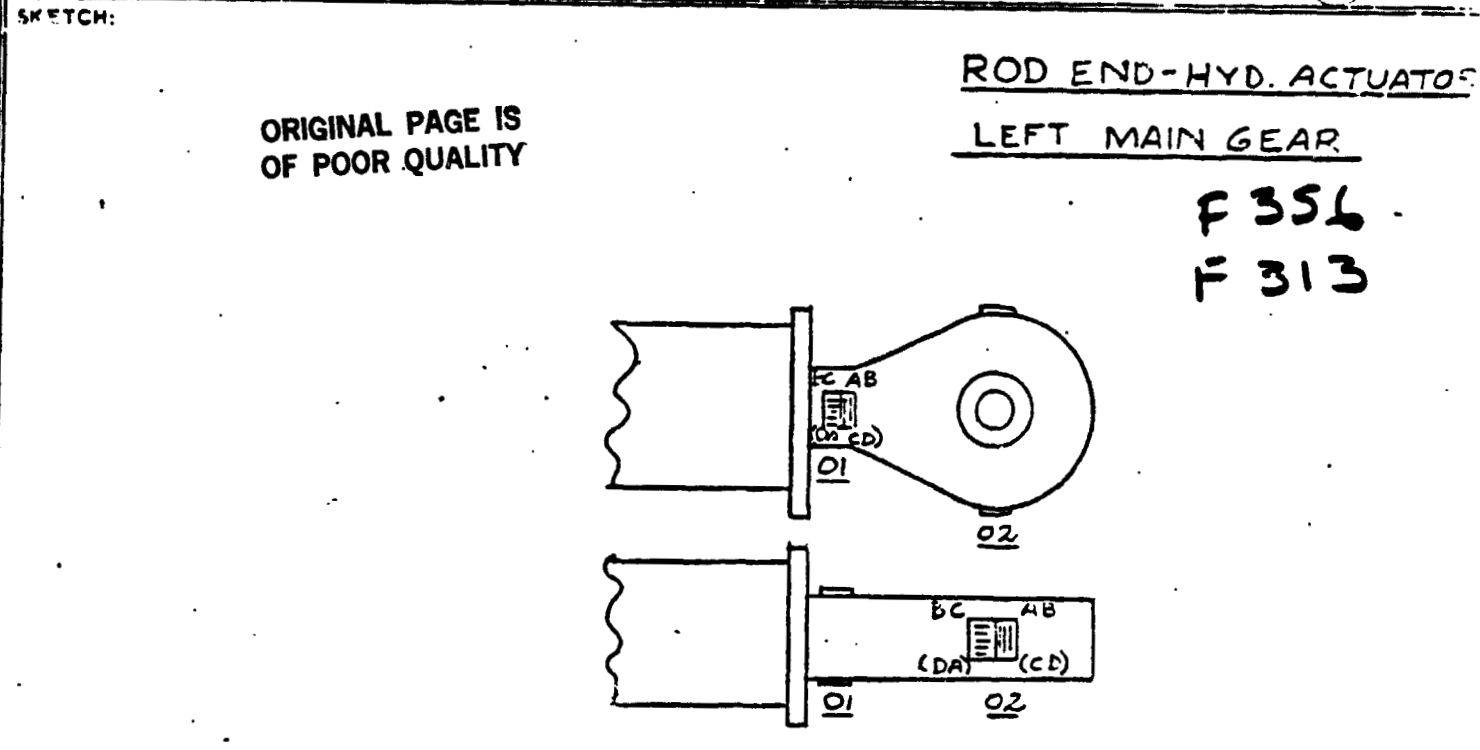
FIG. CALIBRATION OF LEFT HAND STRUT
FOR BENDING

M/A 8-13-78

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-125TB-350	LAB. NO. 673941
EWA NO. A435-39	RESISTANCE 350.0 ± 0.1 %	LAD. NO. 11344A
WORK ORDER A435	GAGE FACTOR 2.12 ± 0.57	PART NO. 0111111
REQUESTED BY: A. WHITENOR	LOT NO. Q-A1BAFY3	SERIAL NO. 108

TITLE OF TEST **301 FLIGHT TEST** 279



REMARKS:

INSTALL AXIAL BRIDGES AS SHOWN. USE EASTMAN 910 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH SHELL 9309. ATTACH FOUR WIRE TEN INCH SUPRENUMERARY LEADS. ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH KPT-06-B-4P PLUG.

F 313
F 356
01
PRIMARY
02
SECONDARY

BRIDGE	AXIAL	AXIAL			
SPACANCE	0.18	0.03			
RES. TO GROUND	10KΩ	10KΩ			
DATE ASSIGNED	TECHNICIAN CCW RE-MN		EST. HRS.	APPROVED BY:	
DATE COMPLETED 1-12-78	ENGINEER		ACT. HRS.		

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: ANDERSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11344A01
CAL DATE: 1-16-78
SERIAL NO: NONE
P/N: NONE

PROJECT: 301 FLIGHT TEST

PART NAME: ROD END
CHANNEL: 04 - POS AXIAL LOADING

LT MCG

F 356

CALIBRATE EQUIVALENT: 100K = 17753 POUNDS
UNIT CAL = 20136 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.120
BRIDGE VOLT. : 5.00
PRE CAL. : 5.29
POST CAL. : 5.29

JACK FAC. : 0.0018 PSI/LB
LEVER ARM : NONE

CAL RES. : 100

LOADS-STD-MV	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	0.437	1465
0.00	0.00	0.000	-0.437	-1465
4.52	2487.51	1.350	0.172	578
9.02	4964.01	2.240	0.324	1068
13.53	7445.01	2.910	0.255	855
18.04	9928.01	3.410	0.015	51
22.52	12393.50	3.800	-0.330	-1106

MAXIMUM CALIBRATION LOAD: 12394 POUNDS

DHC PROGRAM FCCR33 - RUN DATE: 02-03-78

11344
11344
11344

CALIBRATION SHEET
LAB ENGINEER: WHITNER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: ANDERSON

LAB NO. : ~~1134401~~
CAL DATE: 1-16-79
SERIAL NO: NONE
P/N: NONE

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: ROD END
CHANNEL: 33 - NEG AXIAL LOADING

F313

CALIBRATE EQUIVALENT: 100K = 9150 POUNDS
UNIT CAL = 10376 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.120
BRIDGE VOLTS : 6.00
PRE CAL. : 5.28
POST CAL. : 5.29

JACK FAC. : NONE
LEVER ARM : NONE
CAL RES. : 100

LOADS-POUNDS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	-0.068	-117
0.90	0.00	0.000	0.069	117
2660.00	2650.00	1.290	-0.062	-108
4920.00	4920.00	2.730	-0.042	-72
7380.00	7380.00	4.200	0.009	15
9840.00	9840.00	5.630	0.019	33
12300.00	12300.00	7.060	0.009	16

MAXIMUM CALIBRATION LOAD: 12300 POUNDS

BMC PROGRAM FCCR33 - RUN DATE: 02-02-71

CHECKED _____

POST OFFICE BOX 422 • FORT WORTH, TEXAS 76101

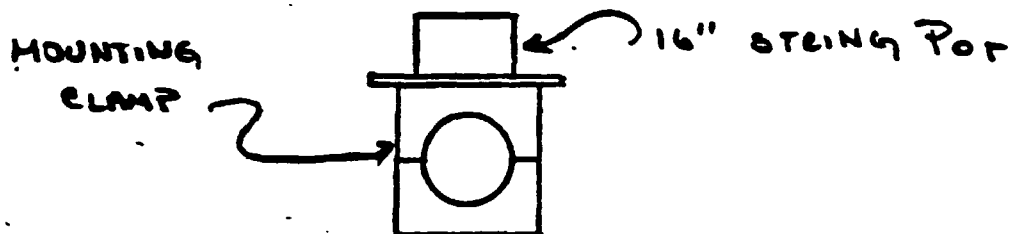
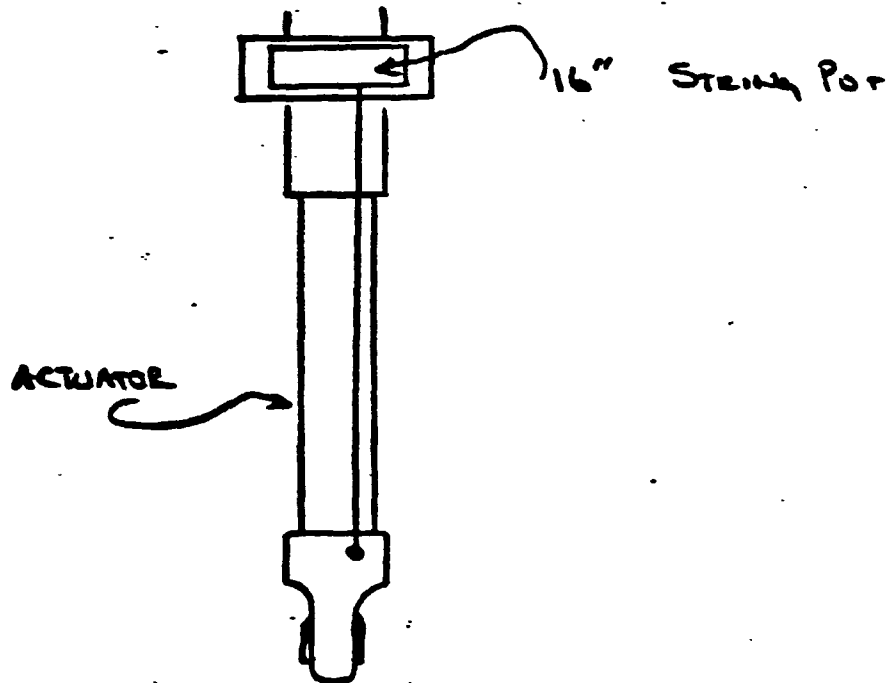
Nose + MAIN LANDING GEAR

ACT POS

(bh 182) 279

D 314

ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/3/78

Project GROUND TIE-DOWN TESTS

Lot. No. _____

Serial No. _____

Title LT. MOUNTING LOG GEAR ADJUSTMENT

Part No. _____

W. O. 301-2

L. T. R. _____ EWA _____

Engineer Smith

ITEM CODE: D 314

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvs.
<u>Smith</u>					
<u>Smith</u>					

Volts	<u>5.795</u>				
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chon.	<u>REMOVED - R - 80-5-3</u>				
Bridge	<u>C/S 7</u>				
Config.					
Col. Res.	<u>N/A</u>				
Lever Arm					

Lead	Output	
DEFLECTION (IN. CMFS)	OUTPUT (COUNTS)	
0	-620	GPA (22-8-7) = -0007
1	-551	LLC (23-8-7) = 0744
2	-465	
3	-410	
4	-336	
5	-269	
6	-195	C.F. = $\frac{LLC - GPA}{512} \times (GPA \text{ GAIN})$
7	-129	
8	-054	
9	019	
10	092	
11	159	
12	233	
13	304	
12	233	
10	092	
8	-053	
6	-195	
4	-342	
2	-465	
0	-620	

SI D.P. Smith
ENGINEER

Bell Helicopter RESEARCH

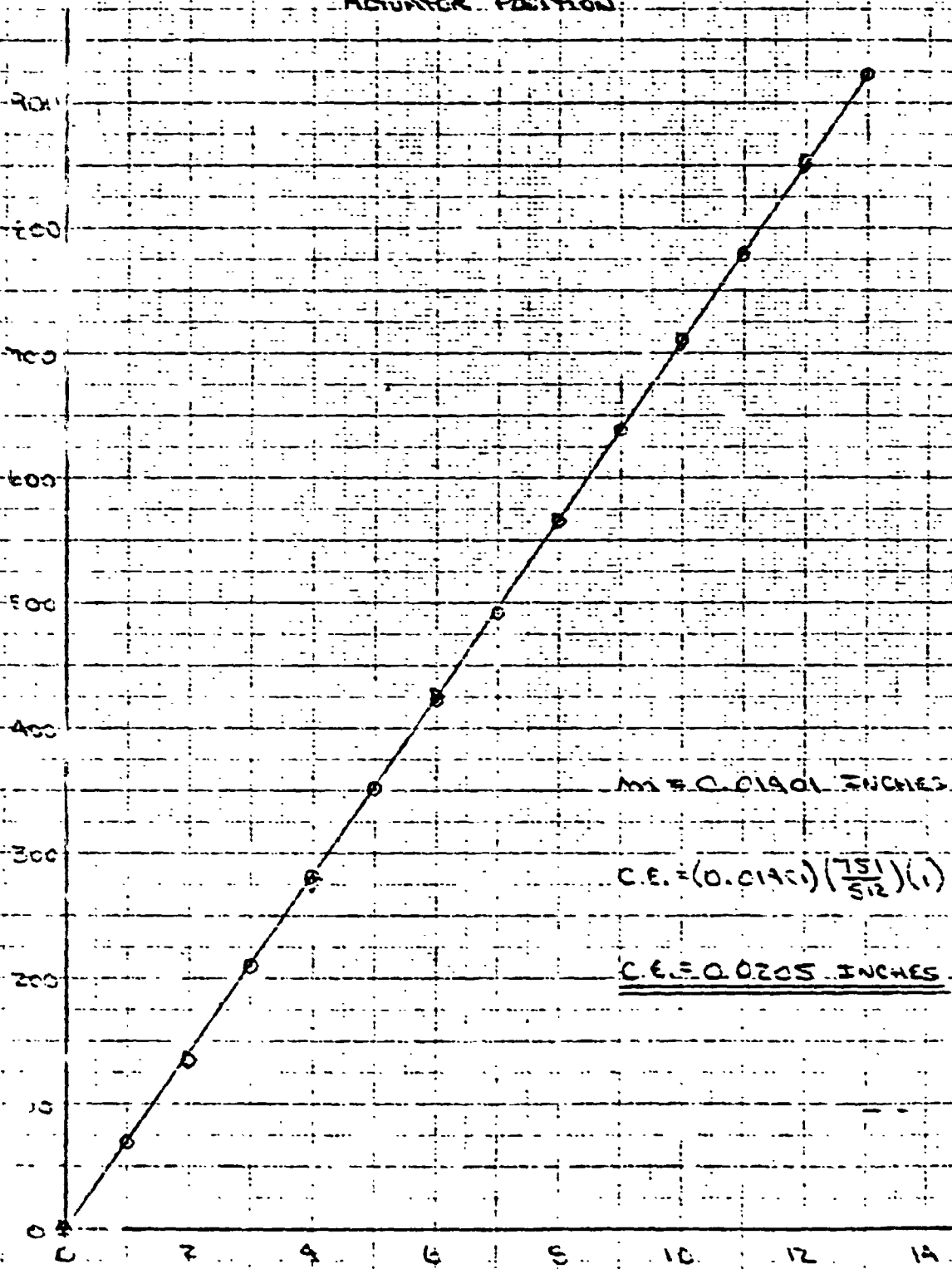
MODEL: 301
SERIAL: 02

PAGE: 151

ITEM CODE: D314

LEFT MAIN LANDING GEAR
ACTUATOR POSITION

CH: B-E-E-3



M = 0.01901 INCHES/COUNT

$$C.E. = (0.01901) \left(\frac{751}{512} \right) (1)$$

C.E. = 0.02205 INCHES

ORIGINAL PAGE IS
OF POOR QUALITY

BY A. WHITENIK

Bell Helicopter **TESTRON**

Division of Textron Inc

MODEL 301 PAGE 1

CHECKED _____

POST OFFICE BOX 402 • FORT WORTH, TEXAS 76101

RPT ASWS377-1

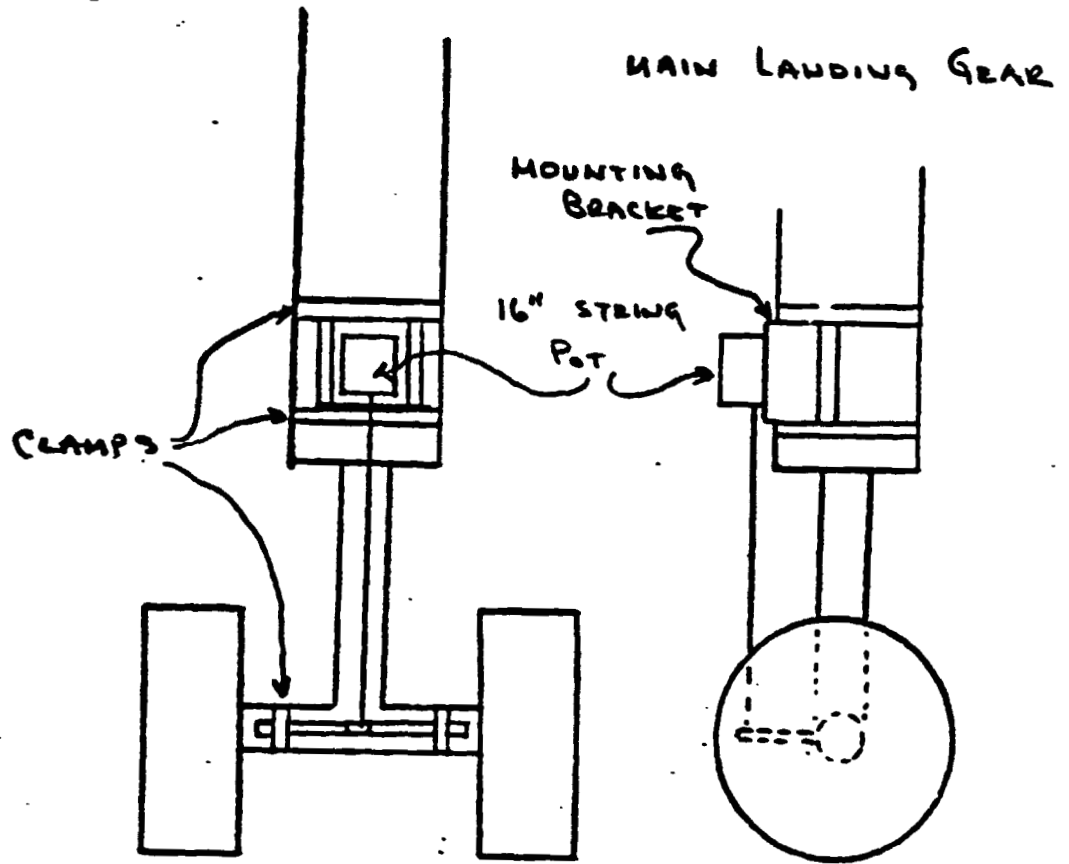
MAIN LANDING GEAR

OLED EXTENTION POS

211
28
bh
182 279

D315

ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/3/78

Lab. No. _____
Serial No. _____
Part No. _____
Engineer S. Smith

Project GROUND TIEDOWN TESTS
Title LT. MAIN LDR. GEAR CASE EXT. RES.
W. O. _____ L. T. R. _____ EWA _____

ITEM CODE: D 35

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>W. SCHUBERT</u>					
<u>LA. SERVICE</u>					

Volts	<u>5.7953</u>				
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chen.	<u>RMDU "B" - 100E-9</u>				
Bridge	<u>C/S 7</u>				
Config.					
Col. Res.	<u>N/A</u>				
Lever Arm					

Load	Output	
DEFLECTION (MILS)	OUTPUT (MILS)	
0	-622	$GPA_0 (27.9-7) = -1007$
1	-545	$LLC (83.9-7) = 743$
2	-479	
3	-405	
4	-339	
5	-268	$C.E. = m \left(\frac{LLC - G_{min}}{S_{12}} \right) (GPA_{min})$
6	-196	
7	-125	
8	-53	
9	+021	
10	+092	
11	+161	
12	236	
10	90	
6	-051	
6	-194	
4	-335	
2	-476	
0	-621	

ITEM CODE: D 315

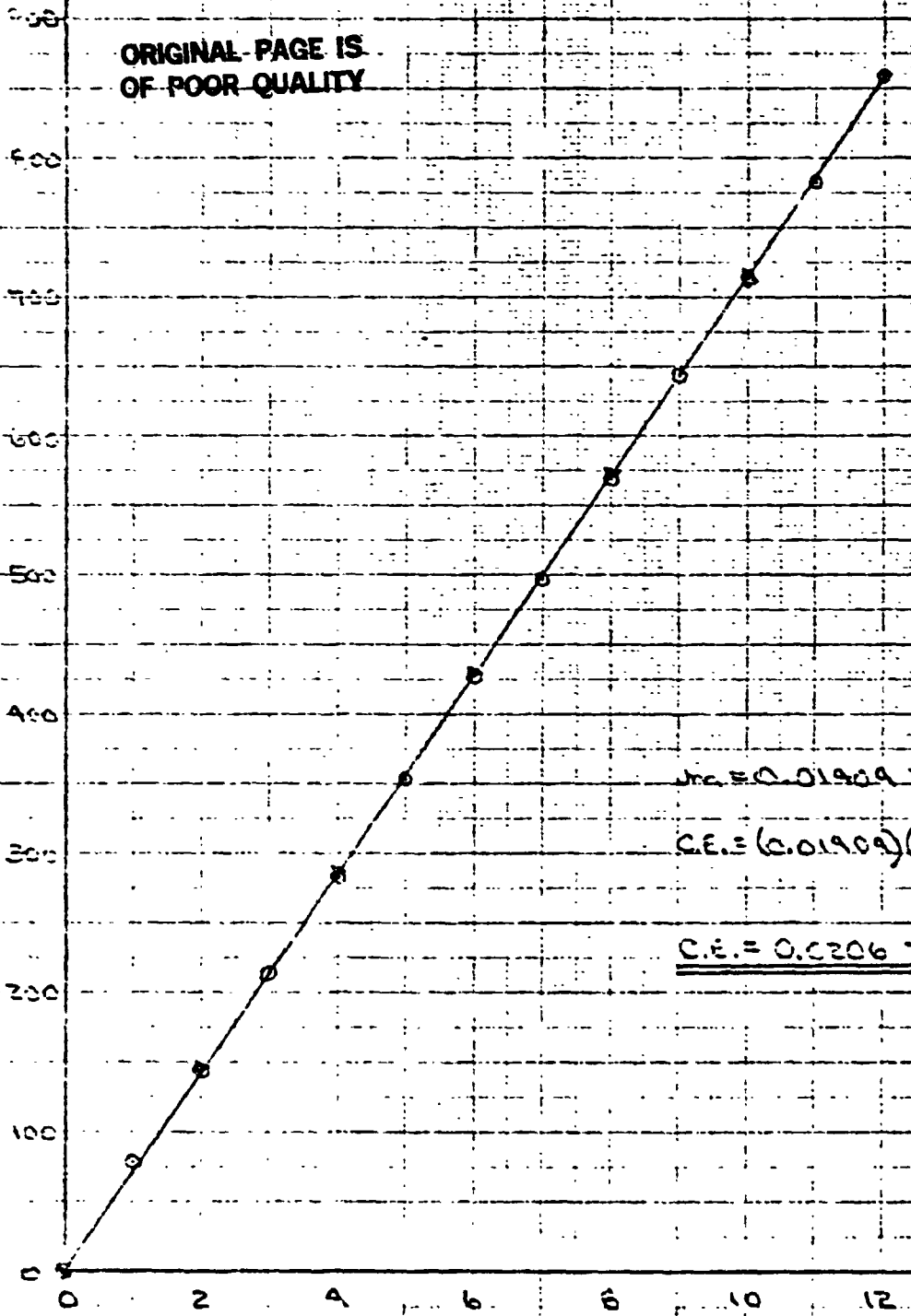
LEFT MAIN LANDING GEAR
LEG EXTENSION POSITION

CH: B-80-9-A

ORIGINAL PAGE IS
OF POOR QUALITY

Count Counts

Quantity Counts



$$M = 0.01909 \text{ INCHES/COUNT}$$

$$C.E. = (0.01909) \left(\frac{750}{512} \right) (1)$$

$$\underline{\underline{C.E. = 0.0206 \text{ INCHES}}}$$

TRAVEL IN INCHES

BY A. WHITENER
CHECKED ASW

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2
HELI. 1+2 RPT SKASW04375-1

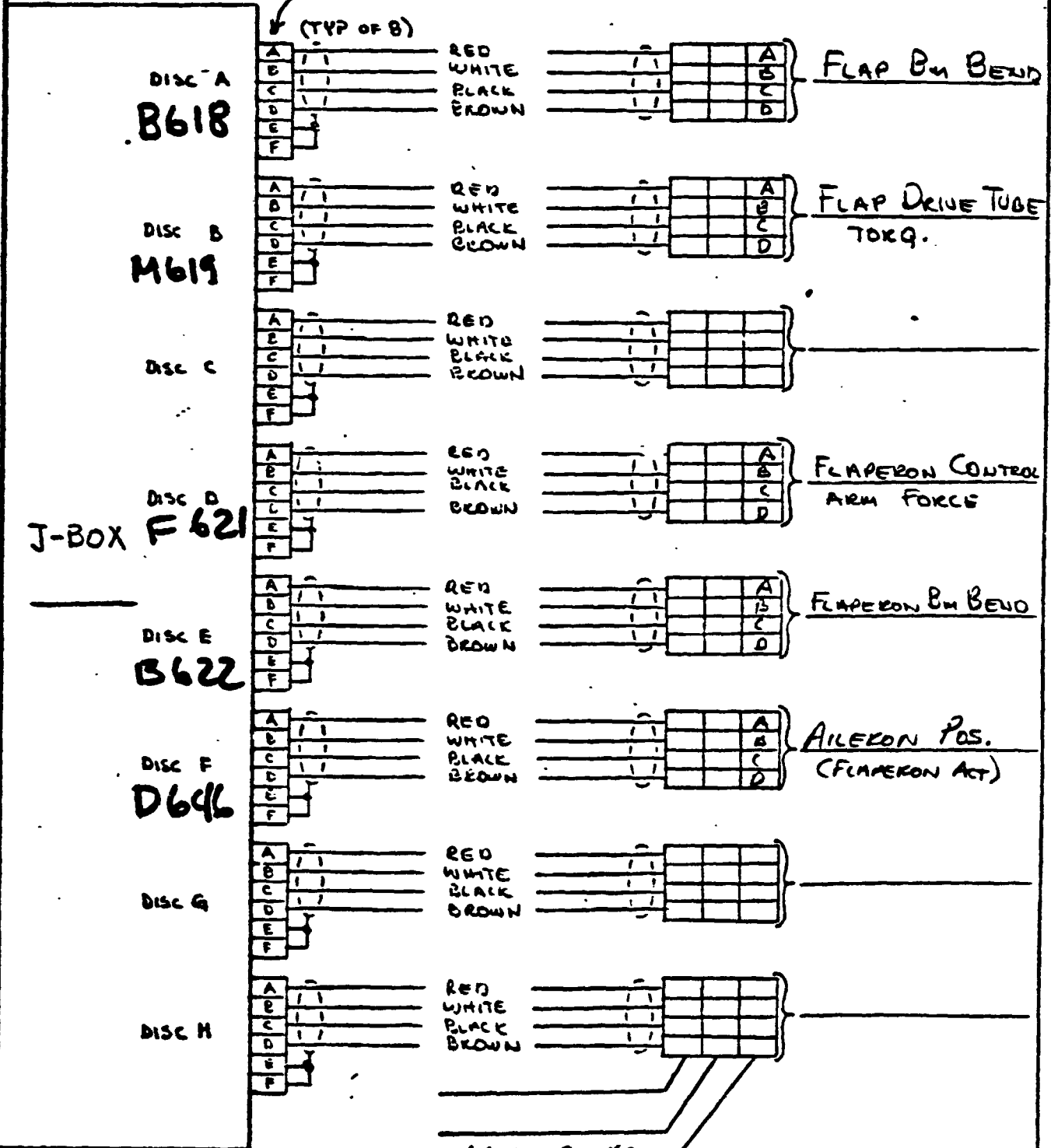
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box Location LW-1

279
bh
182

KPT06-10-62



BY A. WHITENER

CHECKED ASW

BELL HELICOPTER COMPANY

MODEL 301

PAGE 2 OF 2

HELI. 142 RPT SKASWD4375-1

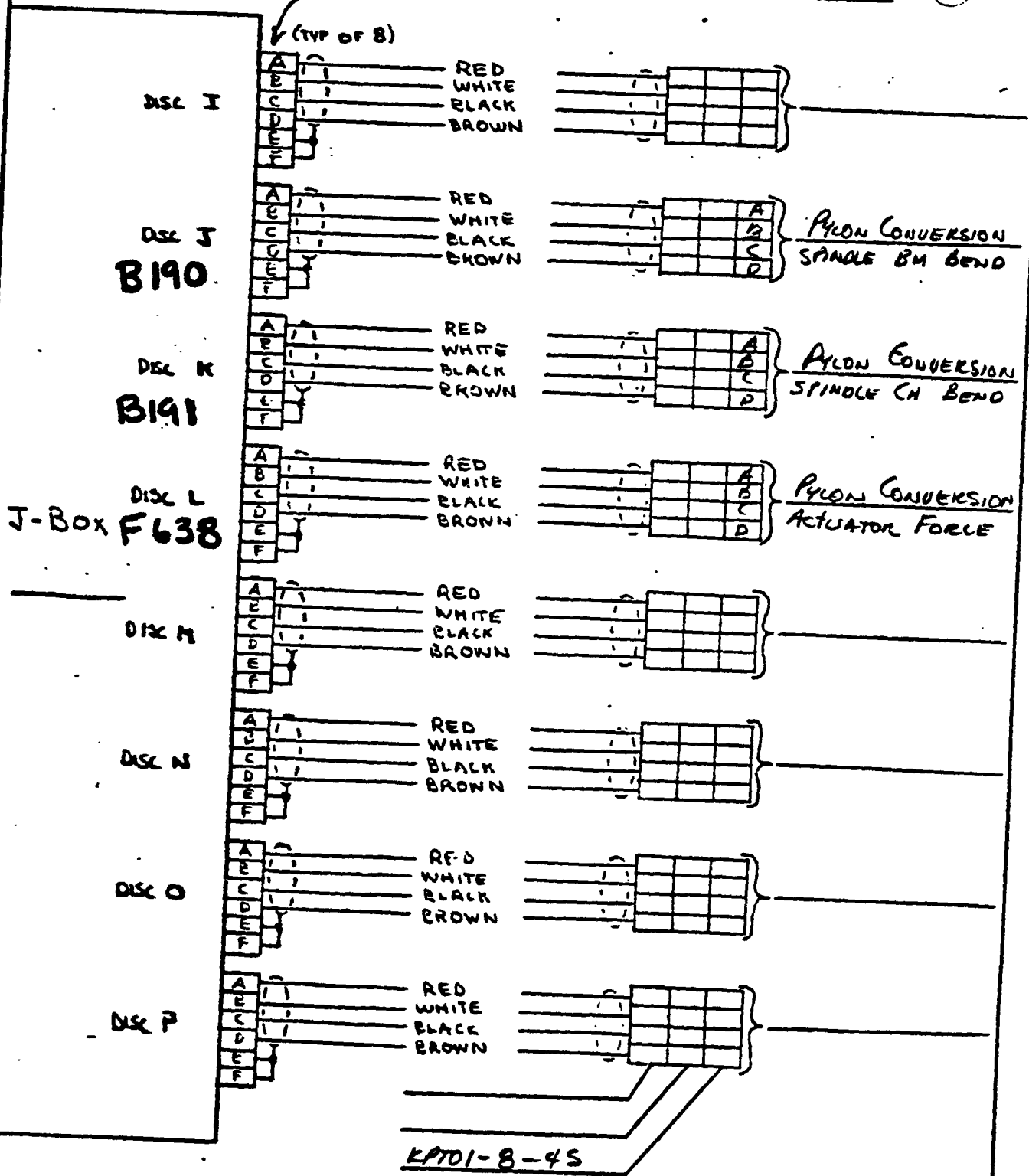
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box LOCATION LW-1

KPTOG-10-6P

279
6/18/62



B190

B191

J-Box F638

7042 000095 100

INSTRUMENTATION LABORATORY WORK SHEET

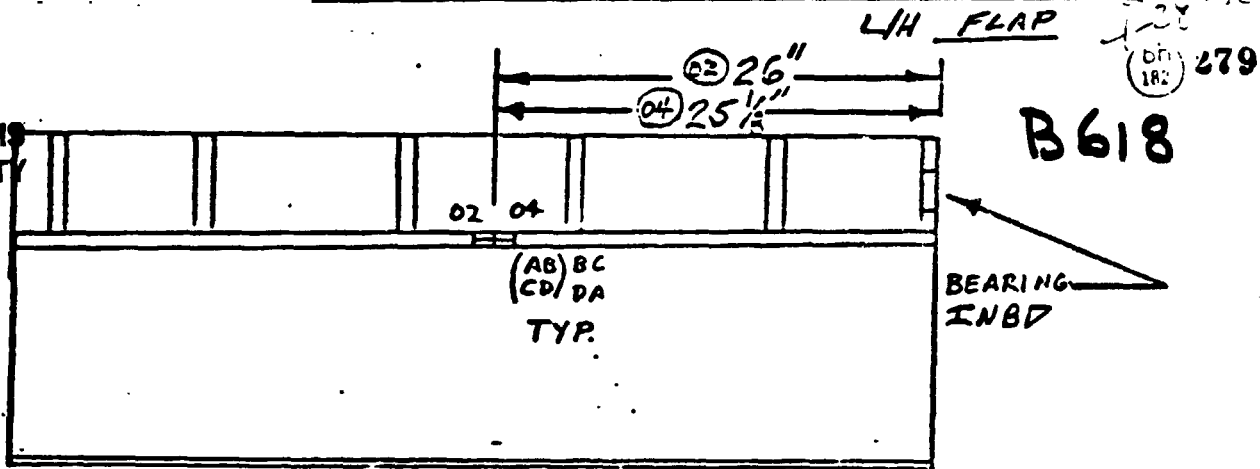
MODEL NO. 301	GAGE TYPE EA-13-250MQ-350E	SHEET NO. 678984
FORM NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11013A
WORK ORDER A427	GAGE FACTOR 2.14 ± 0.5%	PART NO. 300-028-067-1
REQUESTED BY: A. WHITTNER	LOT NO. Q-A32AF04	SERIAL NO. —

TITLE OF TEST

MODEL 301 FLIGHT TEST - SHIP-2

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY



REMARKS:

INSTALL TWO BENDING BRIDGES AS SHOWN.
USE 910 CEMENT. RUN WIRES PER INSTRUCTIONS
TO FLAT TYPE TERMINAL ON INEGARD END.
COVER WITH 9309.

BRIDGE	BND-02	BND-04			
RESISTANCE	3.97	5.12			
TO GROUND	10K Ω	10K Ω			
DATE ASSIGNED	6-21-76		TECHNICIAN	EST. HRS.	APPROVED BY:
DATE COMPLETED	6-27-76		ENGINEER	ACT. HRS.	
			CHUCK		

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11013A02
CAL DATE: 11-2-76
SERIAL NO: NONE
P/N: 300-028-067-2

PROJECT: 301 FLIGHT TEST SHIP 2

PART NAME: LEFT HAND FLAP
CHANNEL: 03 - BEAM BENDING, STATION 26.0

8618

CALIBRATE EQUIVALENT: 100K = 6756 IN-LBS
UNIT CAL = 7679 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.140
BRIDGE VOLT. : 6.00
PRE CAL. : 5.29
POST CAL. : 5.28

JACK FAC. : NONE
LEVER ARM : NONE

CAL RES. : 100

LOADS-IN-LBS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.041	-52
0.00	0.00	0.000	0.041	52
779.00	779.00	0.570	0.002	2
1559.00	1559.00	1.170	-0.008	-10
2338.00	2338.00	1.730	-0.056	-72
3118.00	3118.00	2.350	-0.046	-59
3897.00	3897.00	3.040	0.035	45
4677.00	4677.00	3.650	0.036	46
5456.00	5456.00	4.220	-0.003	-4

MAXIMUM CALIBRATION LOAD: 5456 IN-LBS

BMC PROGRAM FCCR33 - RUN DATE: 11-10-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11013A04
CAL DATE: 11-2-76
SERIAL NO: NONE
P/N: 300-028-067-2

PROJECT: 301 FLIGHT TEST SHIP 2

PART NAME: LEFT HAND FLAP
CHANNEL: 04 - BEAM BENDING, STATION 25.125

CALIBRATE EQUIVALENT: 100K = 7437 IN-LBS
UNIT CAL = 6485 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.140
BRIDGE VOLT. : 6.00
PRE CAL. : 5.26
POST CAL. : 5.26

JACK FAC. : NE
LEVER ARM : NE
CAL RES. :

LOADS-IN-LBS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.013	-19
0.00	0.00	0.000	0.013	19
779.00	779.00	0.530	-0.008	-11
1559.00	1559.00	1.090	0.001	1
2338.00	2338.00	1.620	-0.020	-29
3118.00	3118.00	2.190	-0.032	-3
3997.00	3997.00	2.760	0.017	24
4677.00	4677.00	3.300	0.005	7
5456.00	5456.00	3.840	-0.006	-8

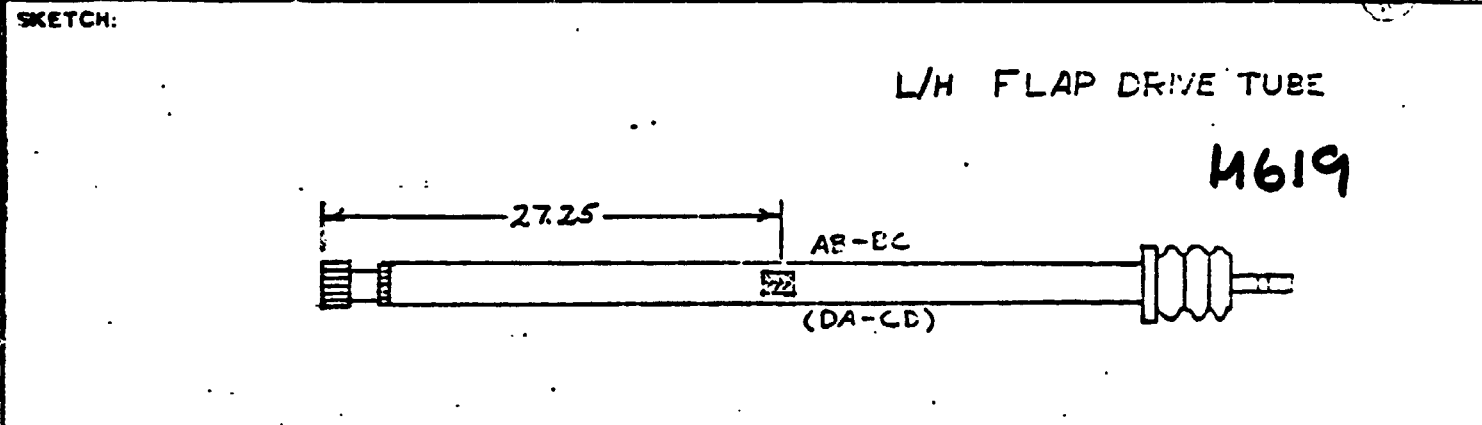
MAXIMUM CALIBRATION LOAD: 5456 IN-LBS

BMC PROGRAM FCCR33 - RUN DATE: 11-10-76

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. A427	GAGE TYPE EA 13 - 062VD - 350W	SHEET NO. DLN 672957
AWA NO. A427-11A	RESISTANCE 350Ω	LAB. NO. 10992A
WORK ORDER A427	GAGE FACTOR 2.075 ± 0.5%	PART NO. BHF50624
REQUESTED BY: A. WHITENER	LOT NO. D-A12 BF61	SERIAL NO. 102

TITLE OF TEST: **301 FLIGHT TEST**



ORIGINAL PAGE IS
OF POOR QUALITY.

REMARKS:

INSTALL TORSION BRIDGE AS SHOWN. USE BR-600.
CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS
INDICATED. ATTACH FOUR 6 FOOT SUPERFLEX
WIRES. ENCASE WIRES IN VINYL SLEEVING
AND COIL AROUND SHAFT FOR SIX REVOLUTIONS.

BRIDGE	01 TORSION				
LANCE	5.41				
RES. TO GROUND	10kΩ				
DATE ASSIGNED	TECHNICIAN Hollis	EST. HRS.	APPROVED BY.		
DATE COMPLETED 6-13-76	ENGINEER	ACT. HRS.			

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 10992A01
CAL DATE: 7-12-76
SERIAL NO: 102
P/N: BMF-50622

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: L/H FLAP DRIVE TUBE
CHANNEL: 03 - TORSION, BRIDGE 01

M619

CALIBRATE EQUIVALENT: 100K = 169 IN-LBS
UNIT CAL = 190 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.075
BRIDGE VOLT. : 10.0
PRE CAL. : 8.85
POST CAL. : 8.86

JACK FAC. : NONE
LEVER ARM : 12.000 IN.
CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0.00	0	0.000	0.030	1
10.00	0.50	0.030	-0.030	-1
20.00	12.00	6.420	0.026	2
30.00	24.00	12.630	-0.008	-0
40.00	36.00	18.870	-0.072	-1
50.00	48.00	25.220	-0.026	-0
60.00	60.00	31.600	0.050	1

MAXIMUM CALIBRATION LOAD: 600 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 07-16-76

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-125 TB-350W	SHEET NO. DLH 678954
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11071A
WORK ORDER A427	GAGE FACTOR 2.07 ± 0.5%	PART NO. 300-001-615-1
REQUESTED BY: A. WHITENER	LOT NO. Q-A35AD13	SERIAL NO. (1111) 279

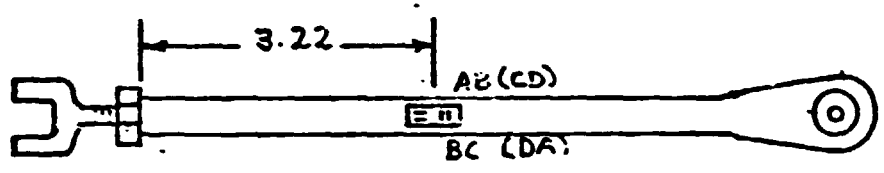
TITLE OF TEST (1111) 279
301 FLIGHT TEST

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

TUBE ASSY - CONTROL

F621



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
 COVER WITH 9309. ATTACH FOUR WIRE SIX
 INCH SUPERFLEX LEADS. ENCASE LEADS IN
 VINYL SLEEVING AND TERMINATE WITH KPT-06-B-4P PLUG.

01

BRIDGE	AXIAL						
BALANCE	+6.6						
RES. TO GROUND	10k ohm						
DATE ASSIGNED	7-13-76	TECHNICIAN	C. C. W.		EST. HRS.	APPROVED BY:	
DATE COMPLETED	7-14-76	ENGINEER			ACT. HRS.		

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: ANDERSON

LAB NO. : 11071A01
CAL DATE: 11-1-76
SERIAL NO: NONE
P/N: 300-001-615-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: CONTROL TUBE ASSEMBLY
CHANNEL: 03 - AXIAL LOADING

F621

CALIBRATE EQUIVALENT: 100K = 2061 POUNDS
UNIT CAL = 2347 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.070
BRIDGE VOLT.: 6.00
PRE CAL. : 5.27
POST CAL. : 5.27

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : NONE

CAL RES. : 100

LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE POUNDS
0	0	0.000	-0.009	-3
0.00	0.00	0.000	0.009	3
400.00	656.91	1.660	0.009	4
800.00	1313.63	3.330	-0.020	-8
1200.00	1970.44	5.020	-0.010	-4
1600.00	2627.26	6.710	0.001	0
2000.00	3284.07	8.400	0.011	4

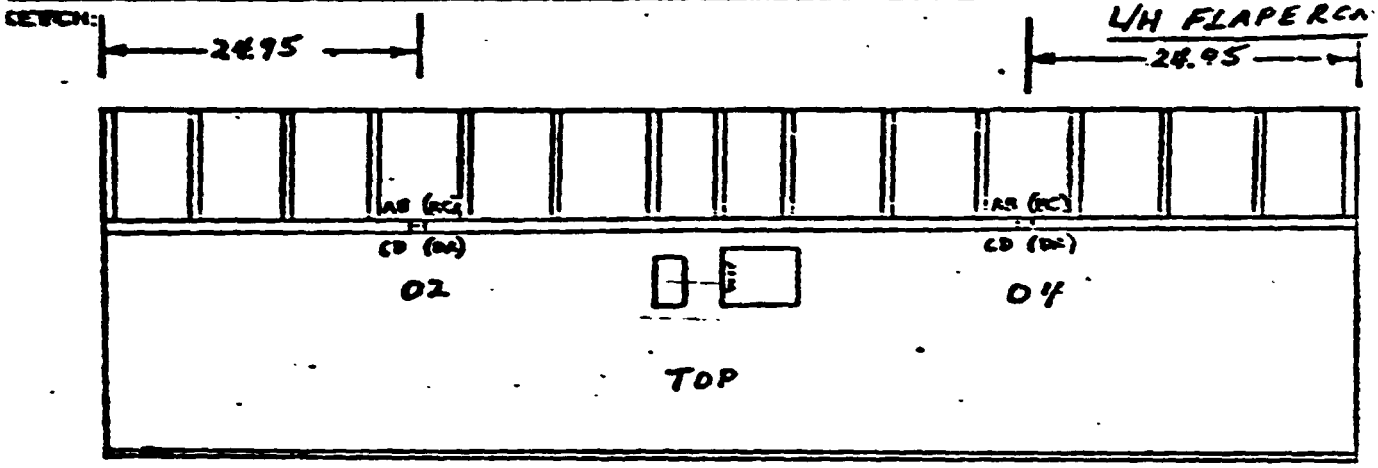
MAXIMUM CALIBRATION LOAD: 3284 POUNDS

BHC PROGRAM FCCR33 - RUN DATE: 11-02-

INSTRUMENTATION LABORATORY WORK SHEET

GAGE NO. 301	GAGE TYPE EA-13-250PF-350-W	SHEET NO. 678984
A427-11A	RESISTANCE 350.0 ± 0.3%	LAB. NO. 11073A
THE ORDER A427	GAGE FACTOR 2.13 ± 0.5%	PART NO. 300-028-106-111
ORDERED BY: A. WHITENER	LOT NO. Q-A32AF01	SERIAL NO.

MODEL 301 FLIGHT TEST (of 182) 279



ORIGINAL PAGE IS
OF POOR QUALITY

B622

REMARKS: INSTALL TWO BENDING BRIDGES AS SHOWN.
USE 910 CEMENT. RUN WIRES PER INSTRUCTIONS
TO POST TYPE TERMINAL IN ACCESS HOLE.
COVER WITH 9309.

BRIDGE	B/D-02	B/D-04			
WICE	4.70	4.23			
WCS. TO GROUND	160 K _Ω	150 K _Ω			
DATE ASSIGNED	7-21-76	TECHNICIAN	<i>P. L. N.</i>	EST. HRS.	ACT. HRS.
DATE COMPLETED	8-13-76	ENGINEER			

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 11073A02
CAL DATE: 11-3-76
SERIAL NO: NONE
P/N: 300-020-106-1

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HANG FLAPERON
CHANNEL: 03 - BEAM BENDING, STATION 24.958

E622

CALIBRATE EQUIVALENT: 100K = 11135 IN-LBS
UNIT CAL = 12644 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.29
POST CAL. : 5.28

JACK FAC. : NONE
LEVER ARM : 24.200 IN.
CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.007	-15
0.00	0.00	0.000	0.007	15
10.00	242.00	0.100	-0.002	-16
20.00	484.00	0.220	-0.003	-5
30.00	726.00	0.340	0.003	5
40.00	968.00	0.450	-0.002	-5
50.00	1210.00	0.570	0.003	6

MAXIMUM CALIBRATION LOAD: 1210 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 11-10-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LGU WRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 11073A04
CAL DATE: 11-3-76
SERIAL NO: NONE
P/N: 360-028-106-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND FLAPERON
CHANNEL: 04 - BEAM BENDING, STATION 24.958

CALIBRATE EQUIVALENT: 100K = 7978 IN-LBS
UNIT CAL = 9085 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.27
POST CAL. : 5.27

JACK FAC. : NONE
LEVER ARM : 24.200 IN.
CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.002	4
0.00	0.00	0.000	-0.002	-4
20.00	484.00	0.320	-0.002	-3
40.00	968.00	0.650	0.003	12
60.00	1452.00	0.960	-0.002	-2
80.00	1936.00	1.280	-0.001	-2
100.00	2420.00	1.600	-0.001	-1

MAXIMUM CALIBRATION LOAD: 2420 IN-LBS

BMC PROGRAM FCCR33 - RUN DATE: 11-10-7

BY H.D. WINNIFORD

BELL HELICOPTER COMPANY
8002 0707 001 002 • 1001 00010 L 10000

MODEL 301 PAGE _____

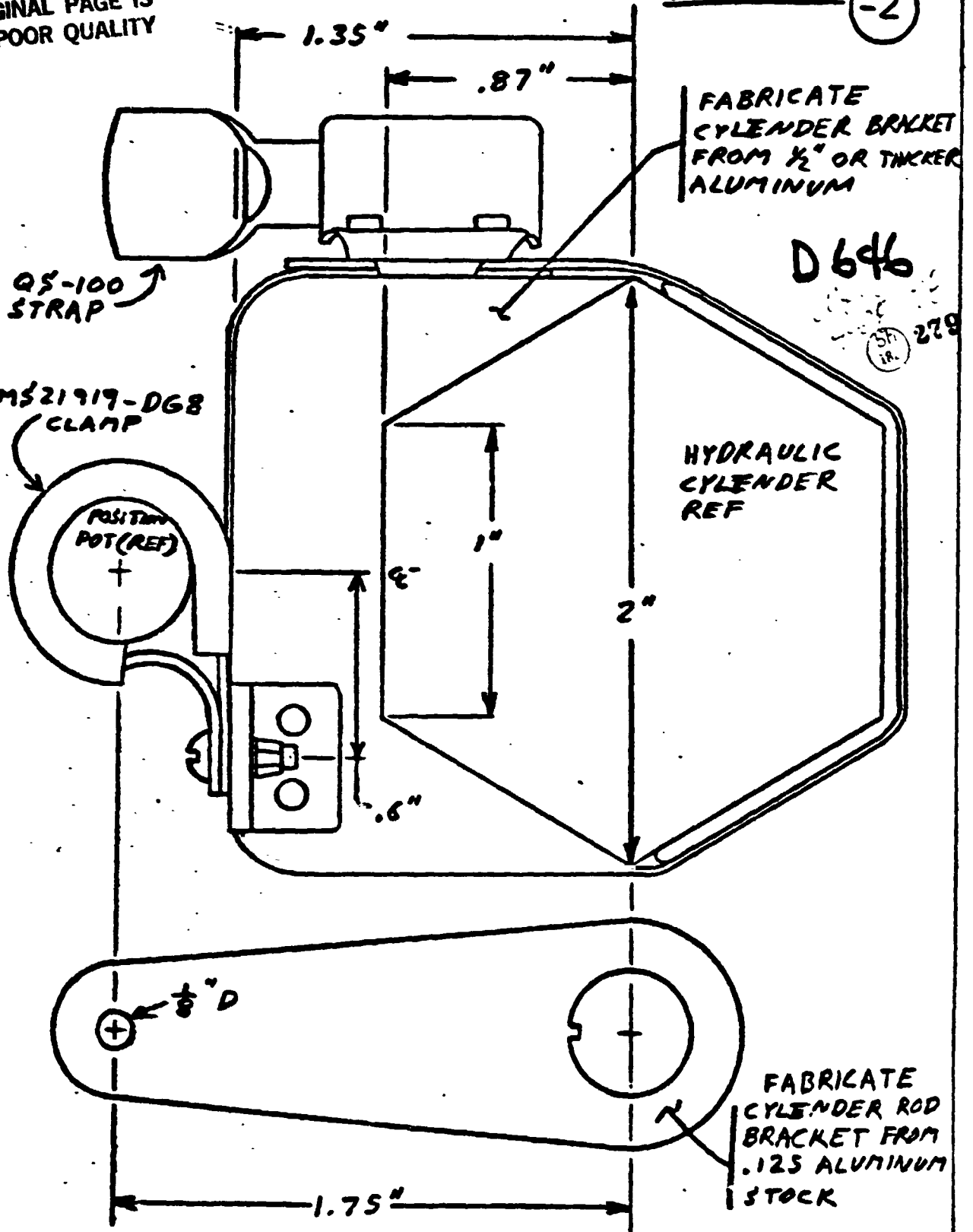
CHECKED _____

RPT SHIP #1

HYDRAULIC CYLINDER POSITION BRACKETS

SKADG-1-76 -2

ORIGINAL PAGE IS
OF POOR QUALITY



1000 00000

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-9-78

Lab. No. _____

Project GROUND TIEDOWN TESTS

Serial No. _____

1 301-2

Title LEFT WING AIRCRAFT POSITION

Part No. _____

W. O. _____

L. T. R. EWA

Engineer SMITH

ITEM CODE: D 646

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>SPITZBERG</u>					
<u>W. H. MEINER</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "B" - 83-8-2</u>				
Bridge	<u>C/S 7</u>				
Config.		<u>NOTE: REF. RMDU "A" 78-8-1</u>			
Cal. Res.	<u>N/A</u>				
Lever Arm					

Load	Output		
INT. CYCLIC RES. (7)	LT. WING (IN)	RT. WING (IN)	OUTPUT (IN)
0	<u>-5°46'</u>	<u>32°11'</u>	<u>401</u>
10	<u>-3°23'</u>	<u>29°53'</u>	<u>295</u>
20	<u>3°42'</u>	<u>27°3'</u>	<u>195</u>
30	<u>6°23'</u>	<u>24°2'</u>	<u>119</u>
40	<u>12°35'</u>	<u>20°52'</u>	<u>47</u>
50	<u>14°0'</u>	<u>17°15'</u>	<u>-17</u>
60	<u>17°1'</u>	<u>13°59'</u>	<u>-65</u>
70	<u>23°9'</u>	<u>9°42'</u>	<u>-119</u>
80	<u>24°44'</u>	<u>5°17'</u>	<u>-162</u>
90	<u>27°1'</u>	<u>0°0'</u>	<u>-201</u>
99	<u>29°-</u>	<u>-5°21'</u>	<u>-226</u>
F-	<u>24°53'</u>	<u>5°7'</u>	<u>-165</u>
CS	<u>19°16'</u>	<u>13°59'</u>	<u>-72</u>
40	<u>12°20'</u>	<u>21°4'</u>	<u>50</u>
20	<u>3°18'</u>	<u>27°14'</u>	<u>259</u>
0	<u>0°6'</u>	<u>32°19'</u>	<u>405</u>

PLOT C/S. VS. LT. WING ANGLE

▲
REFERENCE
ONLY

ITEM NO: 2646

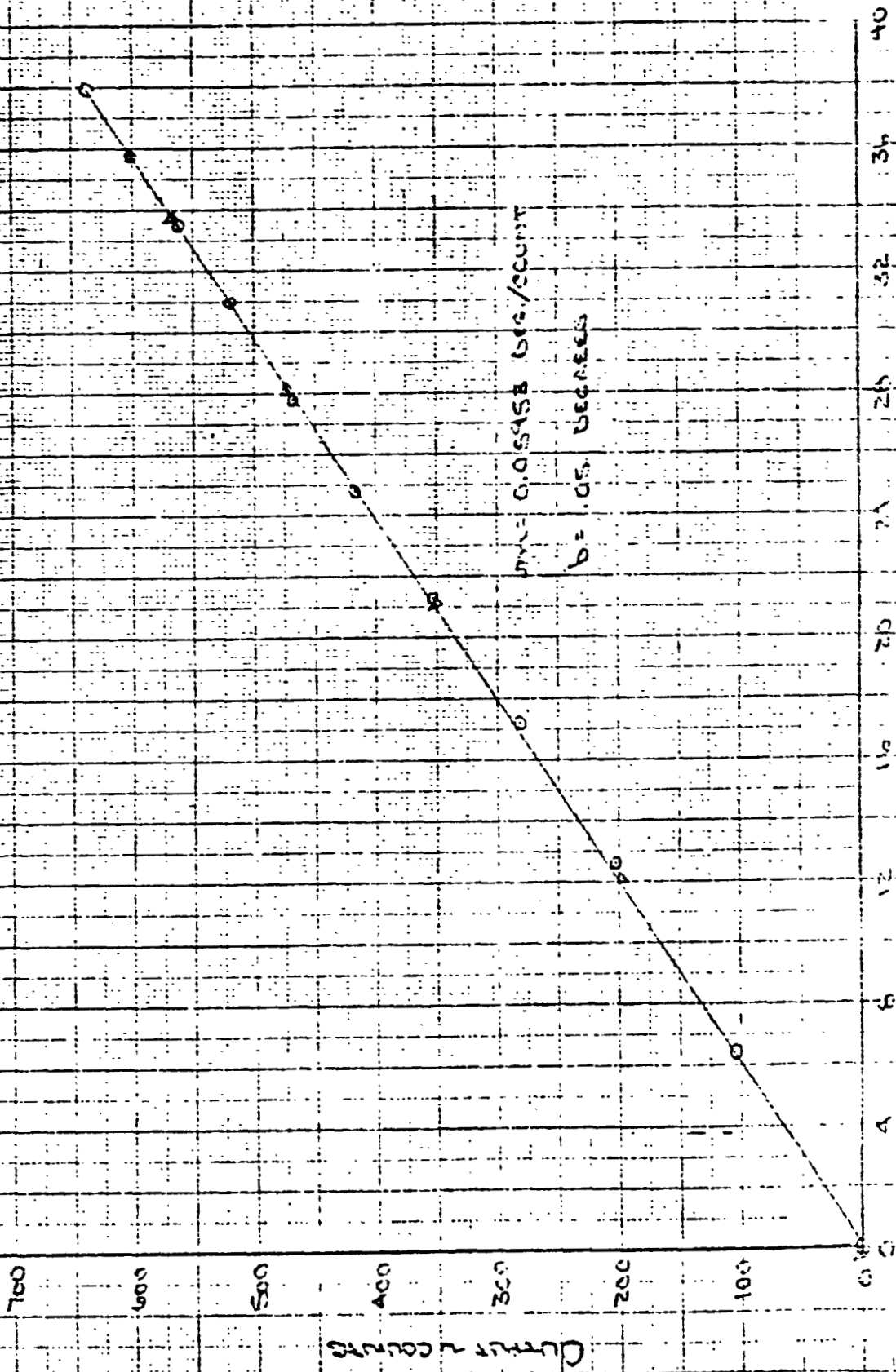
ORIGINAL PAGE IS OF POOR QUALITY

LEFT HAND ANGLE (Degrees)

RIGHT HAND ANGLE (Degrees)

$m = 0.05458$ DEG/COUNT

$b = 1.05$ DEGREES

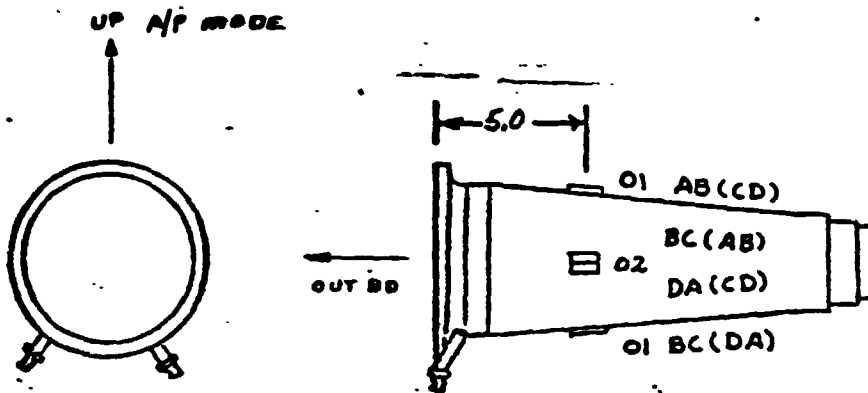


INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-250MQ-350W	SHEET NO. DLN 678962
NO. A427-11	RESISTANCE 350.0 ± 0.490	LAD. NO. 11070A
ORR. ORDER A427	GAGE FACTOR 2.03 ± 0.590	PART NO. 300-010-323-1
REQUESTED BY: A. WHITENER.	LOT NO. Q-A55AD16	SERIAL NO. A12-00003

TITLE OF TEST: **301 FLIGHT TEST**

SKETCH:



L/H SPINDLE ASSY

B190
B191

4 28
279

BR 182

ORIGINAL PAGE IS
OF POOR QUALITY

VIEW LOOKING FORWARD

REMARKS:

INSTALL BENDING BRIDGES AS SHOWN. USE BR-600 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH SHELL 9309. ATTACH FOUR. VIRE... SIX. FOOT SUPERFLEX LEADS TO TERMINAL.

B190 B191

01 02

BRIDGE	BEND	RFND					
ANCE	-2.6	+1.2					
TO GROUND	10K Ω	10K Ω					
DATE ASSIGNED	TECHNICIAN		EST. HRS.		APPROVED BY:		
7-14-70	C.C.W.						
DATE COMPLETED	ENGINEER		ACT. HRS.				
7-16-70							

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: KINSON

LAB NO. : 11070468
CAL DATE: 7-22-76
SERIAL NO: A12-00003
P/N: 300-040-323-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: L/M SPINDLE ASSEMBLY
CHANNEL: 04 - BENDING, BRIDGE 42

B190

CALIBRATE EQUIVALENT: 100K = 143433 IN-LBS
UNIT CAL = 163109 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.080
BRIDGE VOLT. : 10.01
PRE CAL. : 8.6
POST CAL. : 8.80

JACK FAC. : 0.1180 PSI/LB
LEVER ARM : 17.000 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.019	-305
0.00	0.00	0.000	0.019	305
270.00	38898.31	2.360	-0.008	-138
540.00	77796.63	4.750	-0.006	-93
810.00	116694.94	7.180	0.037	605
1080.00	155593.25	9.580	0.056	814
1350.00	194491.56	11.970	0.053	859
270.00	38898.31	2.350	-0.018	-301
540.00	77796.63	4.730	-0.026	-419
810.00	116694.94	7.150	0.037	116
1080.00	155593.25	9.570	-0.050	-490
1350.00	194491.56	11.840	-0.077	-1259

MAXIMUM CALIBRATION LOAD: 194492 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 08-09-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: KINSON

LAB NO. : 1157CA01
CAL DATE: 7-22-76
SERIAL NO: A12-C6G03
P/N: 306-040-323-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: L/H SPINDLE ASSEMBLY
CHANNEL: 03 - BENDING, BRIDGE 01

B191

CALIBRATE EQUIVALENT: 100K = 146758 IN-LBS
UNIT CAL = 165842 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.980
BRIDGE VOLT. : 10.01
PRE CAL. : 8.81
POST CAL. : 8.81

JACK FAC. : 0.1100 PSI/LB
LEVER ARM : 17.000 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
	0	0.000	-0.015	-247
0.00	0.01	0.000	0.015	247
272.00	38898.31	2.300	-0.019	-316
540.00	77796.63	4.650	-0.003	-45
810.00	116694.94	7.010	0.024	392
1080.00	155593.25	9.340	0.020	329
1350.00	194491.56	11.730	0.076	1266
270.00	38898.31	2.310	-0.009	-149
540.00	77796.63	4.640	-0.013	-212
810.00	116694.94	7.010	0.024	392
1080.00	155593.25	9.290	-0.030	-504
1350.00	194491.56	11.570	-0.084	-1401

MAXIMUM CALIBRATION LOAD: 194492 IN-LBS

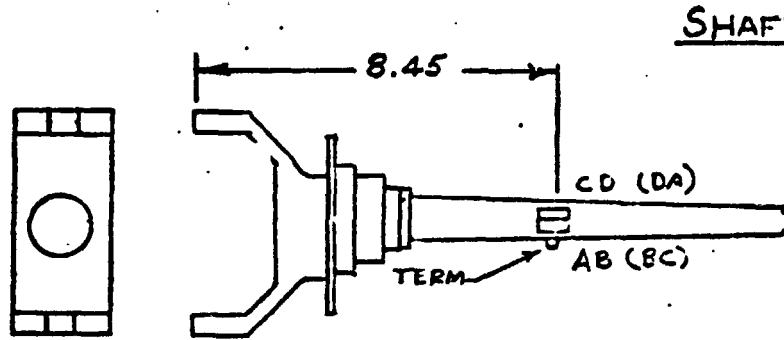
BHC PROGRAM FCCR33 - RUN DATE: 08-09-76

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-250MP-350W	SHEET NO. 678784
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 11068A
RK ORDER A427	GAGE FACTOR 2.08 ± 0.5%	PART NO. BHV200575-1
REQUESTED BY: A. WHITNER	LOT NO. Q-A351D16	SERIAL NO. L/H

TITLE OF TEST **301 FLIGHT TEST**

SKETCH:



F638

2-14-76
bh
18: 279

ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL BENDING BRIDGE AS SHOWN. USE
BR-600 CEMENT. MAKE BRIDGE AT FLAT
TERMINAL AS INDICATED. COVER WITH 9309.
ATTACH FOUR 6 FOOT SUPERFLEX WIRES TO
TERMINAL. ENCASE WIRES IN VINYL SLEEVING.

BRIDGE	01	FEND					
LANCE		4.60					
RES. TO GROUND		10KMS					
DATE ASSIGNED	TECHNICIAN <i>Harris</i>			EST. HRS.		APPROVED BY:	
DATE COMPLETED	ENGINEER			ACT. HRS.			
	2-14-76						

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: ANDERSON

LAB NO. : 11068A01
CAL DATE: 10-20-76
SERIAL NO: 12
P/N: BMV20059-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: SHAFT TRUNNION
CHANNEL: 03 - BENDING, BRIDGE 01

F638

CALIBRATE EQUIVALENT: 100K = 11659 IN-LBS
UNIT CAL = 13242 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.080
BRIDGE VOLT. : 6.00
PRE CAL. : 5.28
POST CAL. : 5.28

JACK FAC. : NONE
LEVER ARM : 3.100 IN.
CAL RES. : 100

LOADS-POUNDS	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.015	24
0.00	0.00	0.000	-0.015	-34
1600.00	4960.00	2.280	0.017	38
3200.00	9920.00	4.470	-0.020	-44
4800.00	14880.00	6.760	0.003	6
6400.00	19840.00	9.010	0.005	12
8000.00	24799.99	11.260	0.008	17
1600.00	4960.00	2.300	0.037	82
3200.00	9920.00	4.500	0.010	11
4800.00	14880.00	6.740	0.017	15
6400.00	19840.00	8.980	0.025	25
8000.00	24799.99	11.270	0.018	40

MAXIMUM CALIBRATION LOAD: 24800 IN-LBS

BHC PROGRAM FCCN33 - RUN DATE: 11-02-

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

BY
CHECKED

BELL HELICOPTER COMPANY
POST OFFICE BOX 211
POST OFFICE BOX 211

MODEL
WF11

PAGE
PT

ORIGINAL PAGE IS
POOR QUALITY

LAB NO. 11234915
LAB CALIBRATION: 12-7-77
PART NO. 520-028-001-1
SER. NO.
JACK FACTOR: 1.5 PSI = 10 LB.
LEVER ARM: 142.5 INCHES
100K O.C.E. = 46" 500 IN-LBS

500KR: $990 \div 1.5 \times 142.5 = 93,100$ IN-LBS
500K
100KR: $100K \times 93,100 = 465,500$ IN-LBS

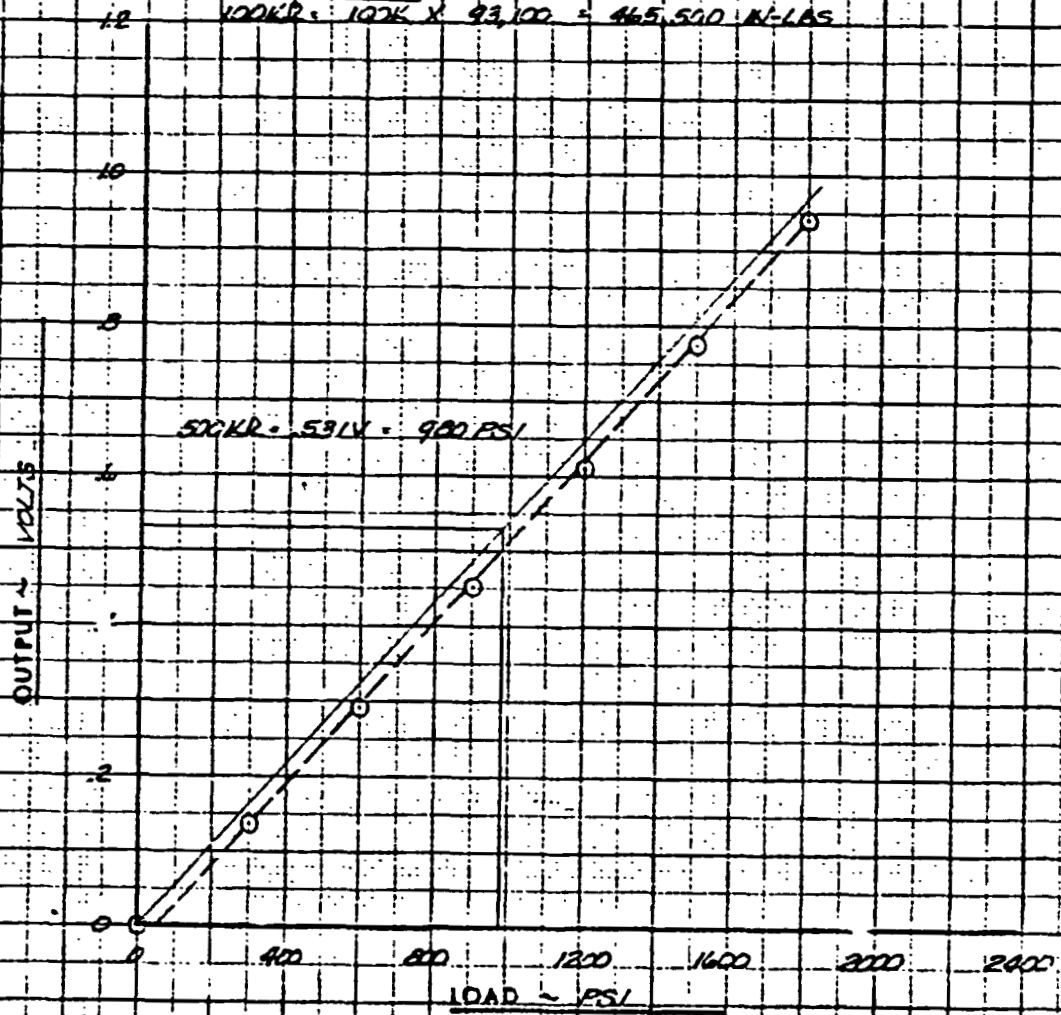


FIG. CALIBRATION OF LEFT HAND WING
FOR CHORD ENDINGS, STATION 22.5

BY
CHECKED

BELL HELICOPTER COMPANY
PAGE NUMBER ONE ONE

MODEL
MELL

PAGE
EPT

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. 11234A16
LAB CALIBRATION: 12-6-77
PART NO. 500-028-001-1
SER. NO. _____
JACK FACTOR: 0.287 PSI = 16.10
LEVER ARM: 162.5 INCHES
LOAD CELL: 225,915 AL-LBS

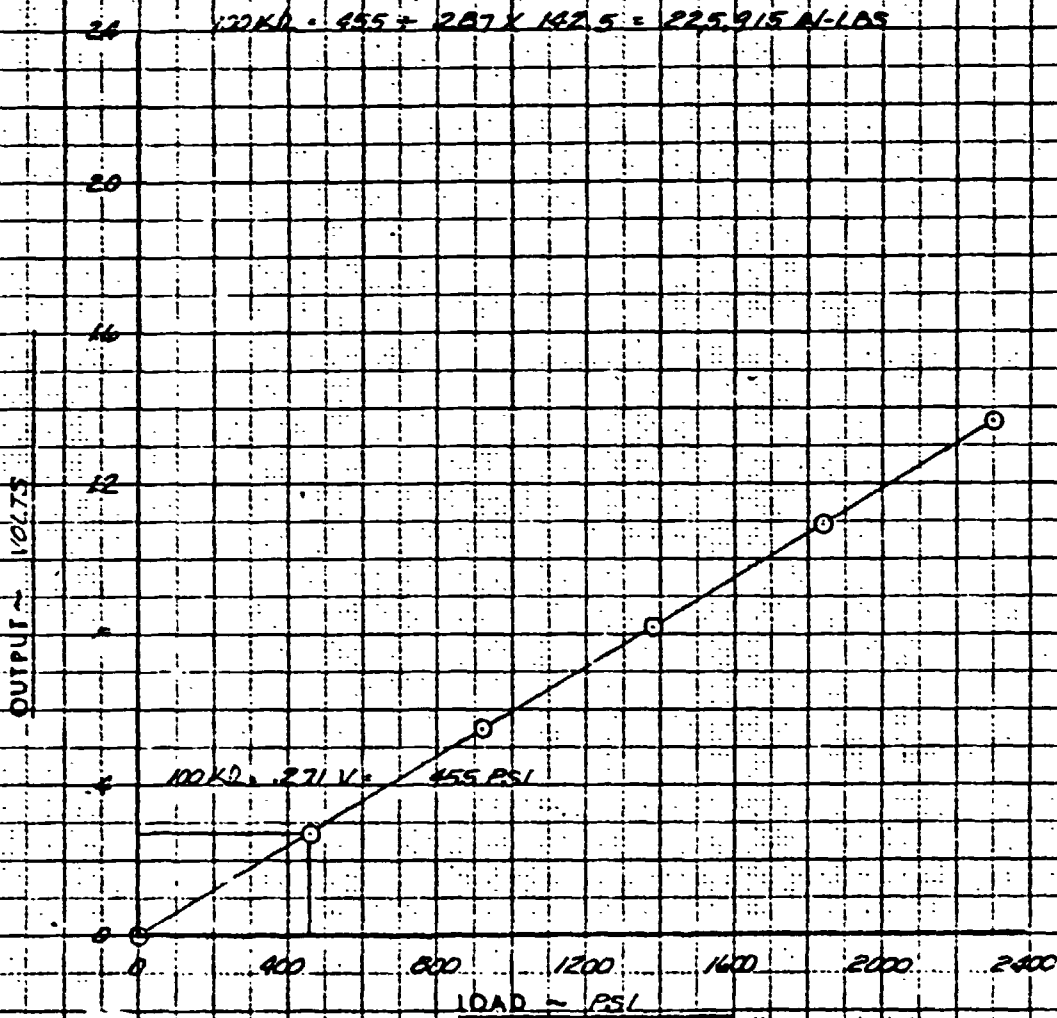


FIG. CALIBRATION OF LEFT HAND WING
FOR BEAM BENDING, STATION 22.5

BY _____
CHECKED _____

BELL HELICOPTER COMPANY
PART NUMBER ONE ONE ONE PART NUMBER TWO TWO TWO

MODEL _____ PAGE _____
MFI: _____ PT. _____

FAB NO. 11234A17
FAB CALIBRATION: 12-6-77
PART NO. 900-02A-001-1
SER. NO. _____
JACK FACTOR: 0.609 PSI = 10 LB
LEVER ARM: 53.0 INCHES
TORSION: 376,396 IN-LBS

$$500KD = 865 + 0.609 \times 530 = 75,279 \text{ IN-LBS}$$

$$\frac{500K}{100KD} \times 75,279 = 376,396 \text{ IN-LBS}$$

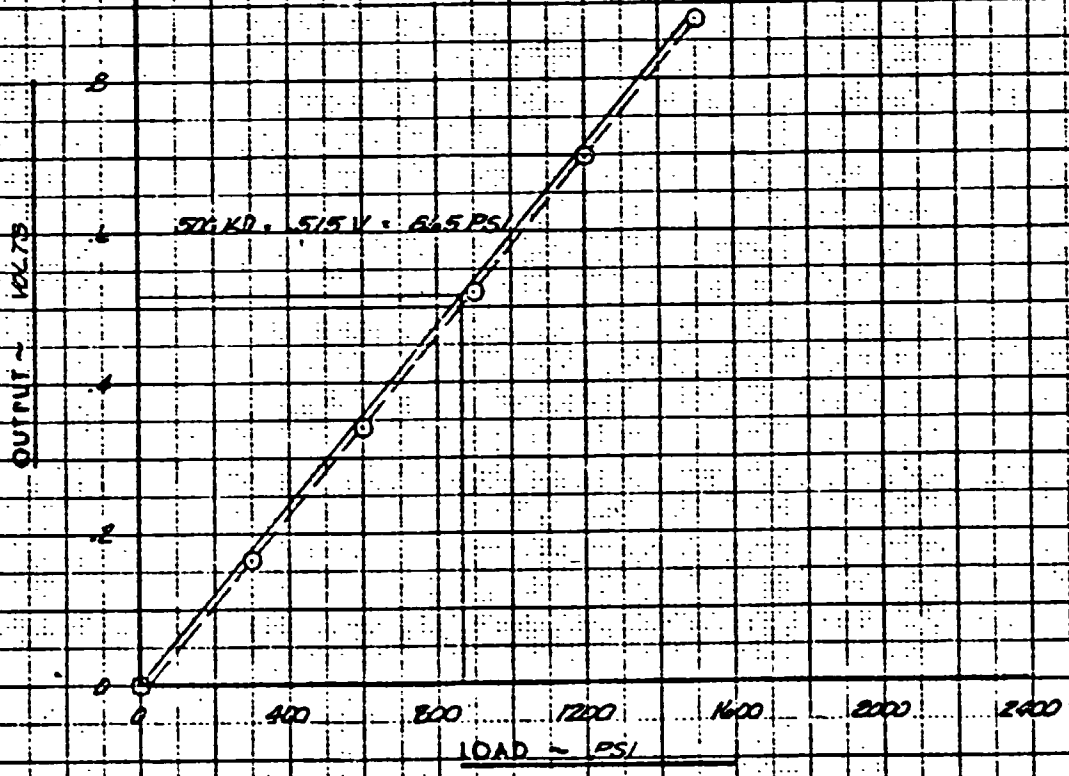


FIG. _____ CALIBRATION OF LEFT HAND WING
FOR TORSION STATION 22.5

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED PLU

HELI. 1+2 RPT SKASW0475-1

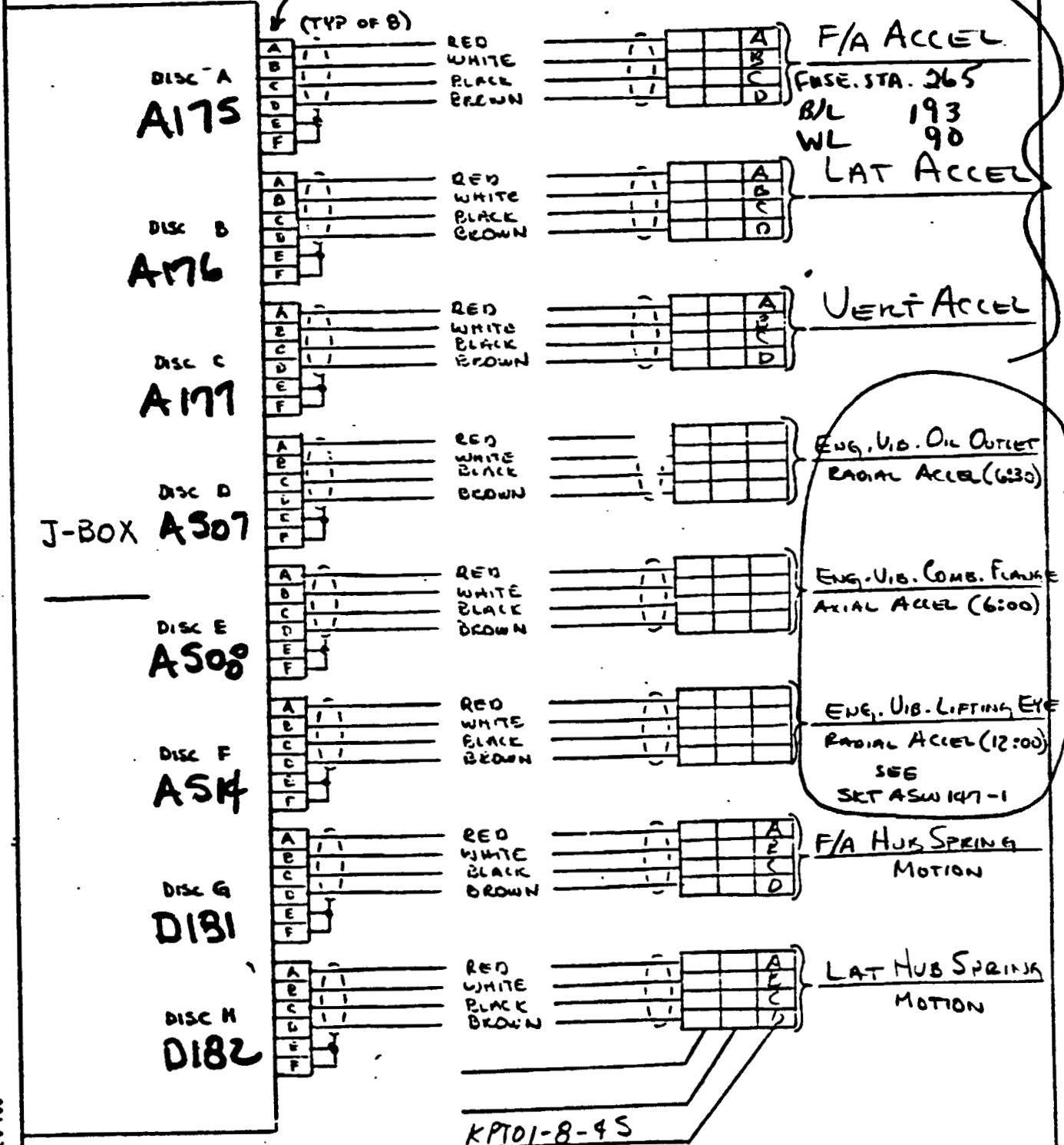
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box Location LP-1

279

KPT06-10-6P



KPT01-8-45

7042 8888REV 100

BY A. WHITENER
CHECKED ASW

BELL HELICOPTER COMPANY

MODEL 301 PAGE 2 OF 2
HELI. 1+2 RPT SKASW04375-1

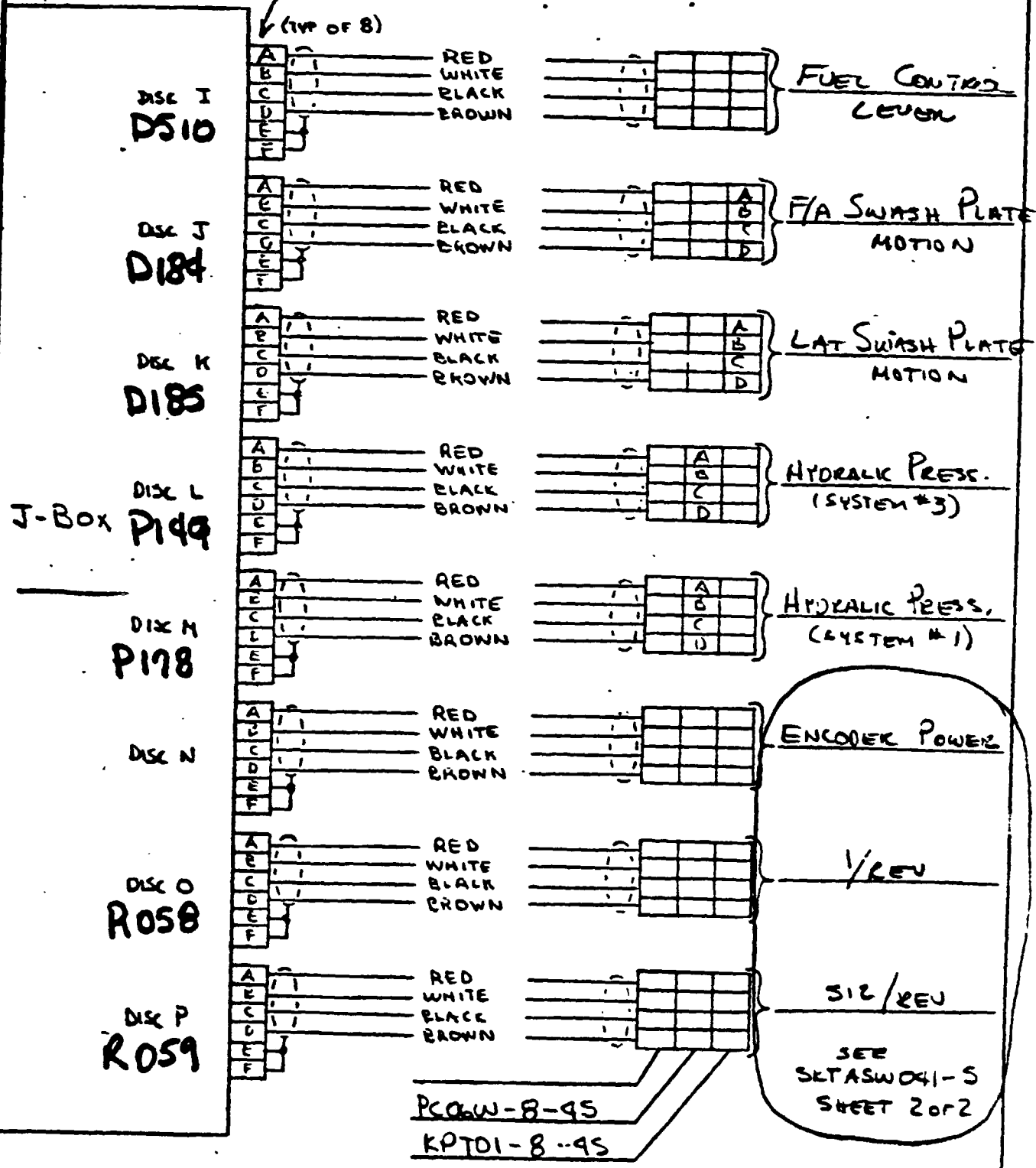
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

278

J-Box LOCATION: LP-1

KPT06-10-6P



7042 0000REV 100

ENGINE VIB. AND TACK GEN.

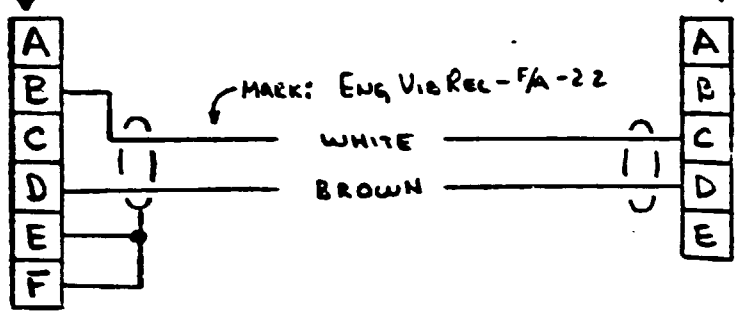
J-Box LP-1

(LOW FREQ)
PCM

TYP OF 3
EXISTING PLUGS
(VPS/4AG15) FROM
PAGE 1

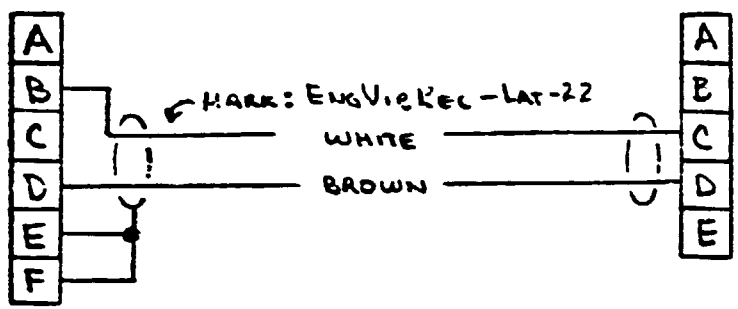
KPT06-10-6P
(TYP OF 3)

Disc # D
A507



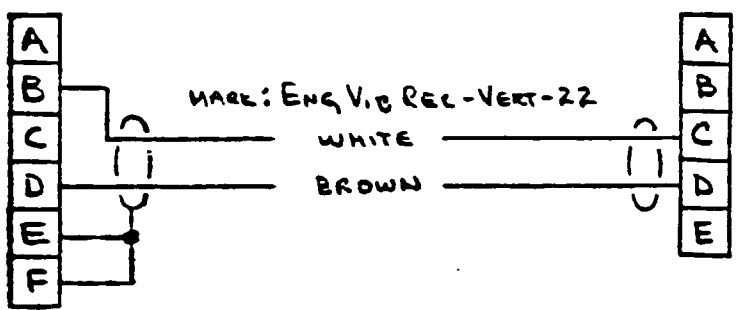
A507
ENG. VIB. A50E
OIL OUTLET A51
RADIAL ACCEL
(6:30)

Disc # E
A508



ENG. VIB.
COMBUSTION FLANGE
AXIAL ACCEL
(6:00)

Disc # F
A514



ENG. VIB.
LIFTING EYE
RADIAL ACCEL
(12:00)

MAKE FROM 2 CONDUCTOR SHIELD (ORANGE)

ORIGINAL PAGE IS
OF POOR QUALITY

AN5
B-10-19

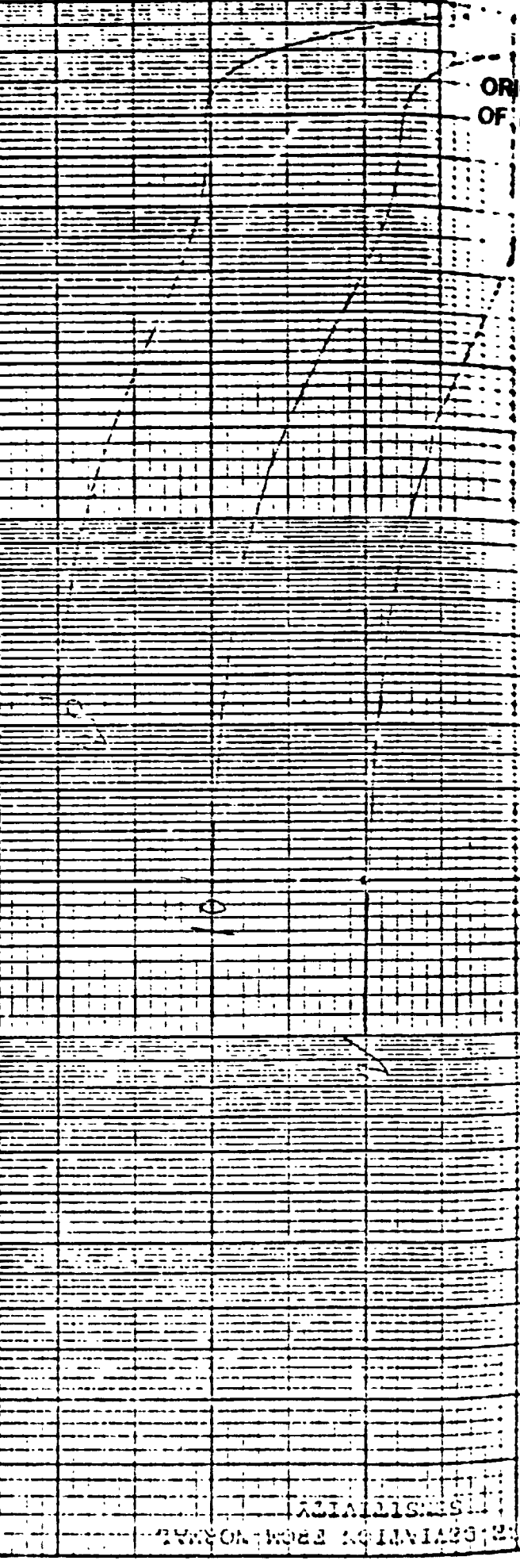
Issue Date 4-10-28 TO SMITH BAR SN 15869

ORIGINAL PAGE IS OF POOR QUALITY

ACCELEROMETER CALIBRATION

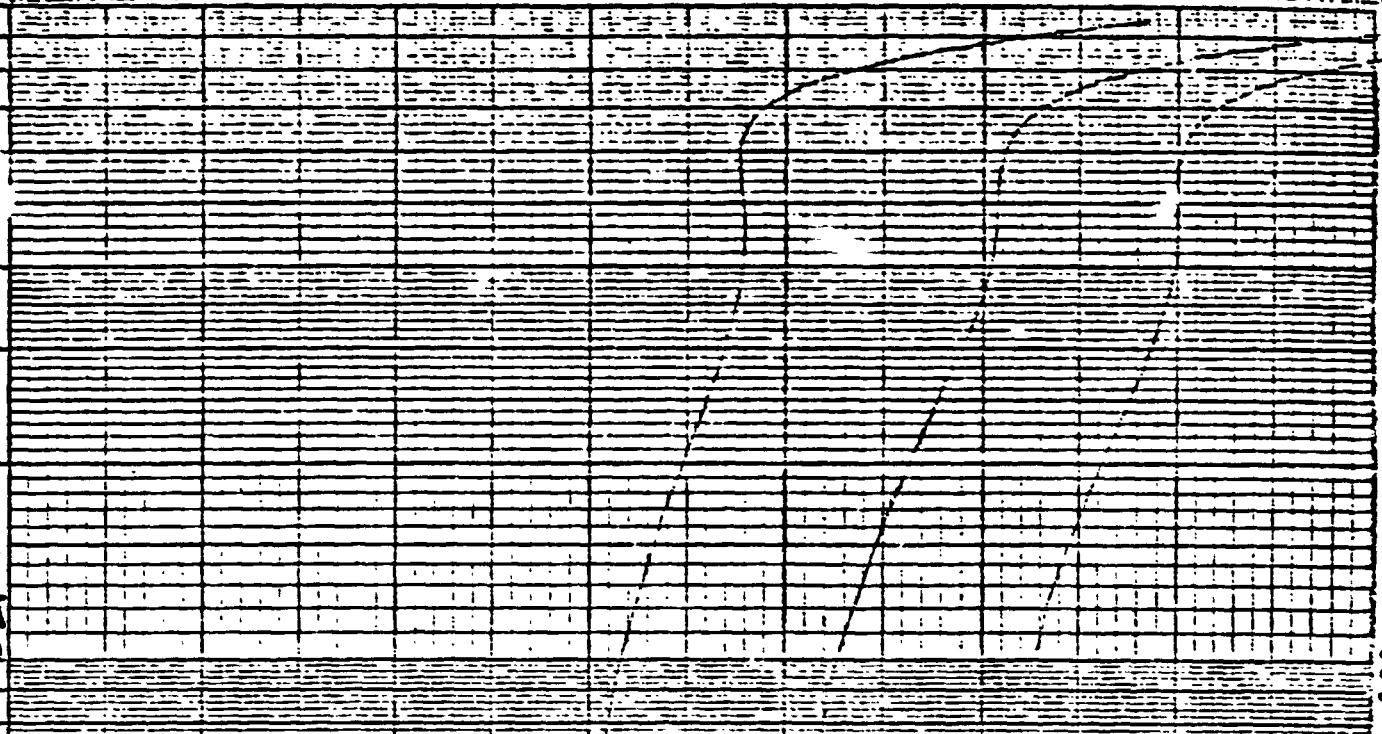
MODEL 2697C-25-350 RANGE 25G DATE 4-7-28
SENSITIVITY (V) 6.010 NOMINAL SENS (S) .857 (mv/G)
RESISTANCE, A-C 397.9 ohm, B-D 327.7 ohm, Tech. W.S.

INVERSION (REF ONLY)	SHUNT CAL	UNITY CAL
<u>1.86</u> mv	100K C.E. = $\frac{4.95}{S}$ mv	U.C. = $\frac{V}{S}$
<u>1.92</u> mv	100K C.E. = <u>5.776</u> G	U.C. = <u>2.013</u> G
<u>1.98</u> (mv/G)		



SMITH BAR
15869

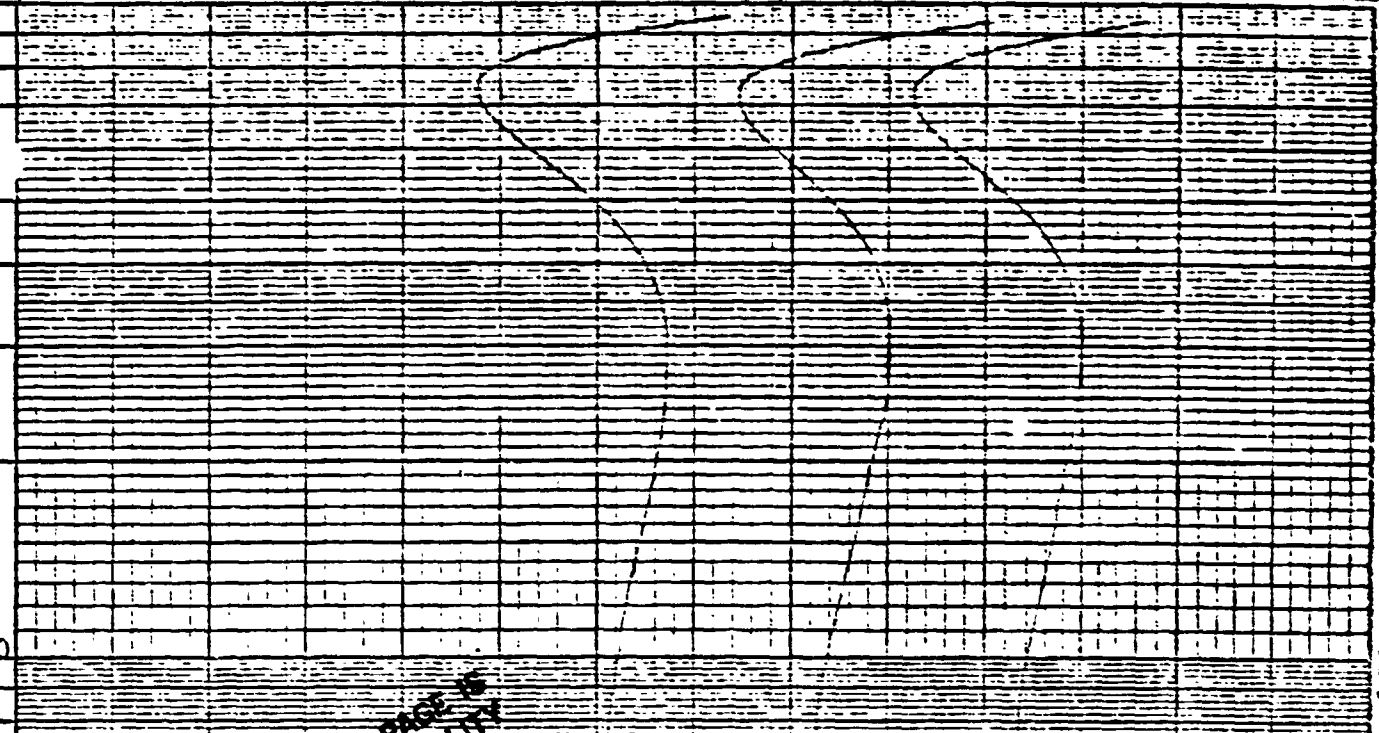
A177
BLP-1C



TYPE <u>A697C-25-330</u> RANGE <u>250</u> DATE <u>4-7-78</u> CITATION (V) <u>5.988</u> NOMINAL SENS (S) <u>.874</u> (mv/G) RESISTANCE, A-C <u>401.0</u> ohm, B-D <u>322.6</u> ohm, Tech. <u>76</u>		ORIGINAL PAGE IS OF POOR QUALITY	
SHUNT CAL 100K C.E. = $\frac{4.8}{S}$ mv 100K C.E. = <u>5.503</u> G		UNITY CAL U.C. = $\frac{V}{S}$ U.C. = <u>6.857</u> c (mv/v)	
G INVERSION (REF ONLY) <u>-.90</u> mv <u>-.89</u> mv <u>5.895</u> (mv/G)			

AV10
ELP-1B

Issue Date 4-10-78 To SMITH HAAT SN 15871



ACCELEROMETER CALIBRATION	
MODEL <u>2227C-25-350</u>	DATE <u>4-6-78</u>
RANGE <u>25-350</u>	NOMINAL SENS (S) <u>816</u> (mv/g)
DISTANCE, A-C <u>428.3</u> ohm, B-D <u>330.8</u> ohm, Tech. <u>73</u>	
INVERSION (REF ONLY)	SHUNT CAL
<u>1.84</u> mv	UNITY CAL
<u>1.84</u> mv	U.C. = $\frac{V}{S}$
<u>.84</u> (mv/g)	100K C.E. = $\frac{4.79 \text{ mv}}{S}$
	100X C.E. = <u>5.82 / G</u>
	U.C. = <u>7.353 G</u>

ORIGINAL PAGE IS OF POOR QUALITY

100

100

10

AS27
~~LP-20~~
 LP-10
 A607

ORIGINAL PAGE IS
 OF POOR QUALITY

PIEZOELECTRIC ACCELEROMETER CALIBRATION

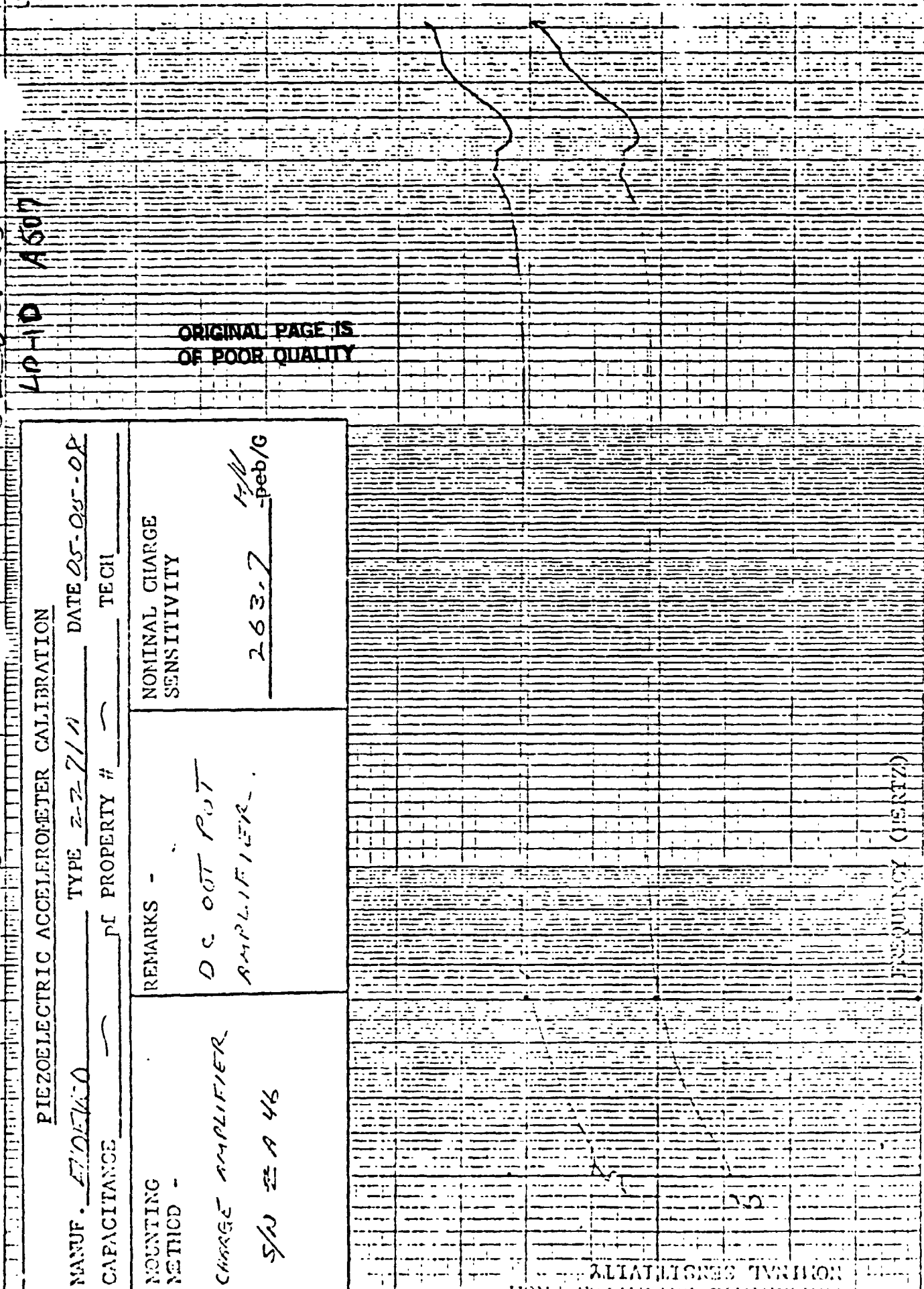
MANUF. ETOEKO TYPE 2-2-7/11 DATE 05-05-0P
 CAPACITANCE _____ PI PROPERTY # _____ TECH _____

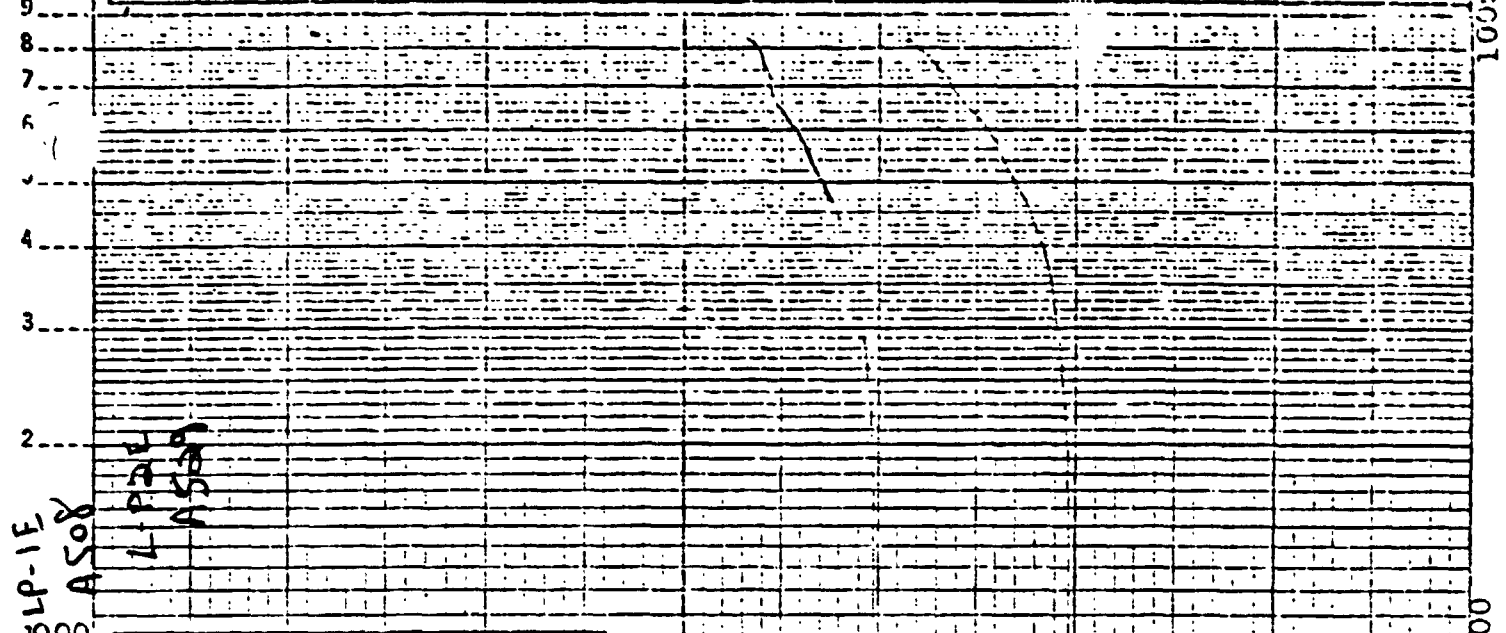
REMARKS -
DC OUT PUT
AMPLIFIER.
S/N EA 46
 NOMINAL CHARGE SENSITIVITY
263.7 1/11
-peb/g

PERCENTAGE DEVIATION FROM
 NOMINAL SENSITIVITY

FREQUENCY (HERTZ)

1000
 100
 10





PIEZOELECTRIC ACCELEROMETER CALIBRATION

MANUF. 5000 TYPE 22-710 DATE 05-04-68 TECH _____

CAPACITANCE _____ OF PROPERTY # _____

MOUNTING METHOD - _____

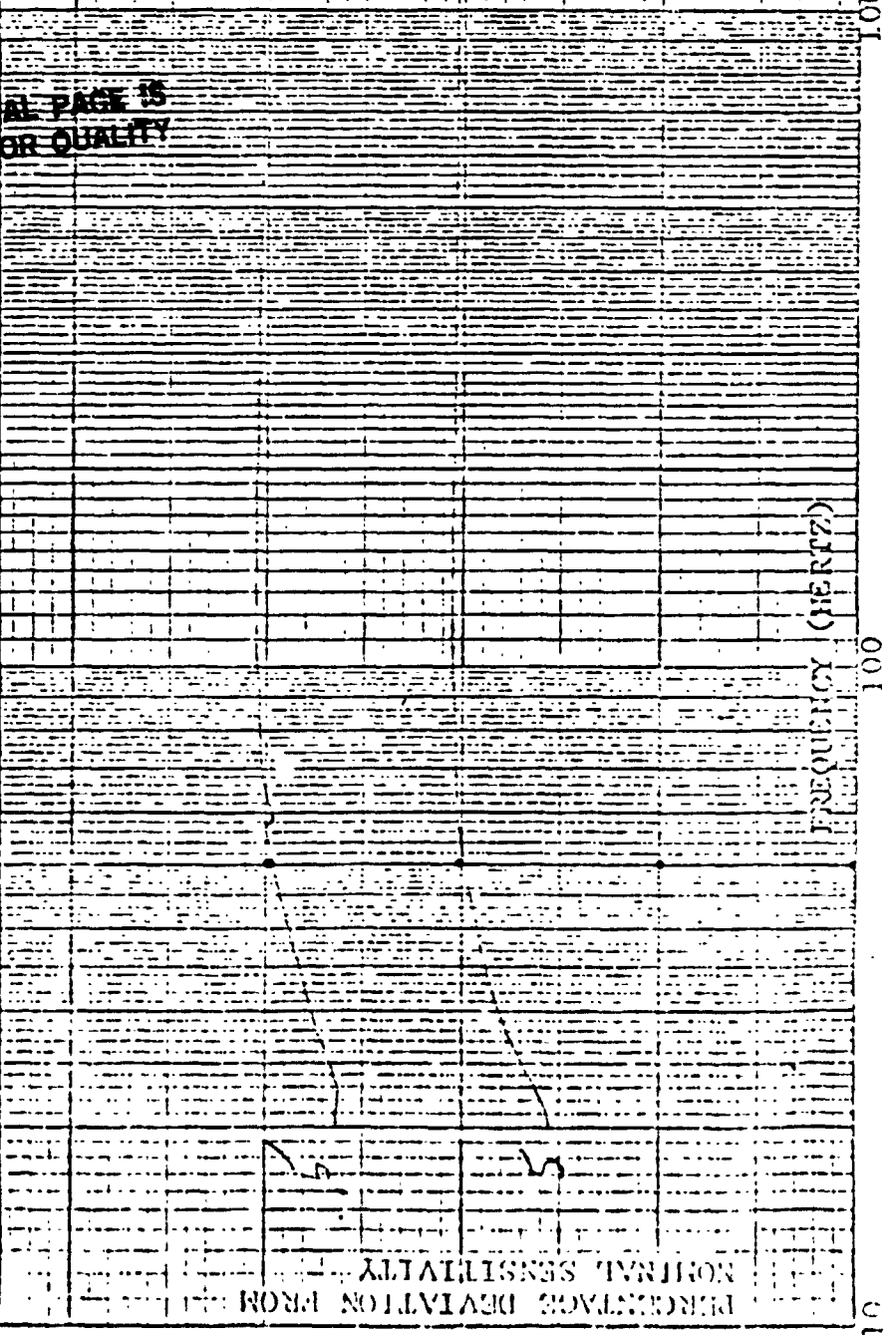
REMARKS - _____

CHARGE AMPLIFIER S/N 2A 44

DC OUT PUT AMPLIFIER

NOMINAL CHARGE SENSITIVITY 260.7 $\frac{mV}{g}$

ORIGINAL PAGE IS OF POOR QUALITY



PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

Issue Date 7-18-78

To 1416412

S/N CP65

PIEZOELECTRIC ACCELEROMETER CALIBRATION

MANUF. ENDEVCO TYPE 2271A DATE 7-18-78

CAPACITANCE OF PROPERTY # TECH TER

MOUNTING METHOD - <u> </u>	REMARKS - <u>DC. OUT PUT</u>	NOMINAL CHARGE SENSITIVITY <u>243.4</u>
CHARGE AMPLIFIER <u>5A ZASO</u>	<u>OF AMPLIFIER</u>	<u>M/V</u> <u>POB/G</u>

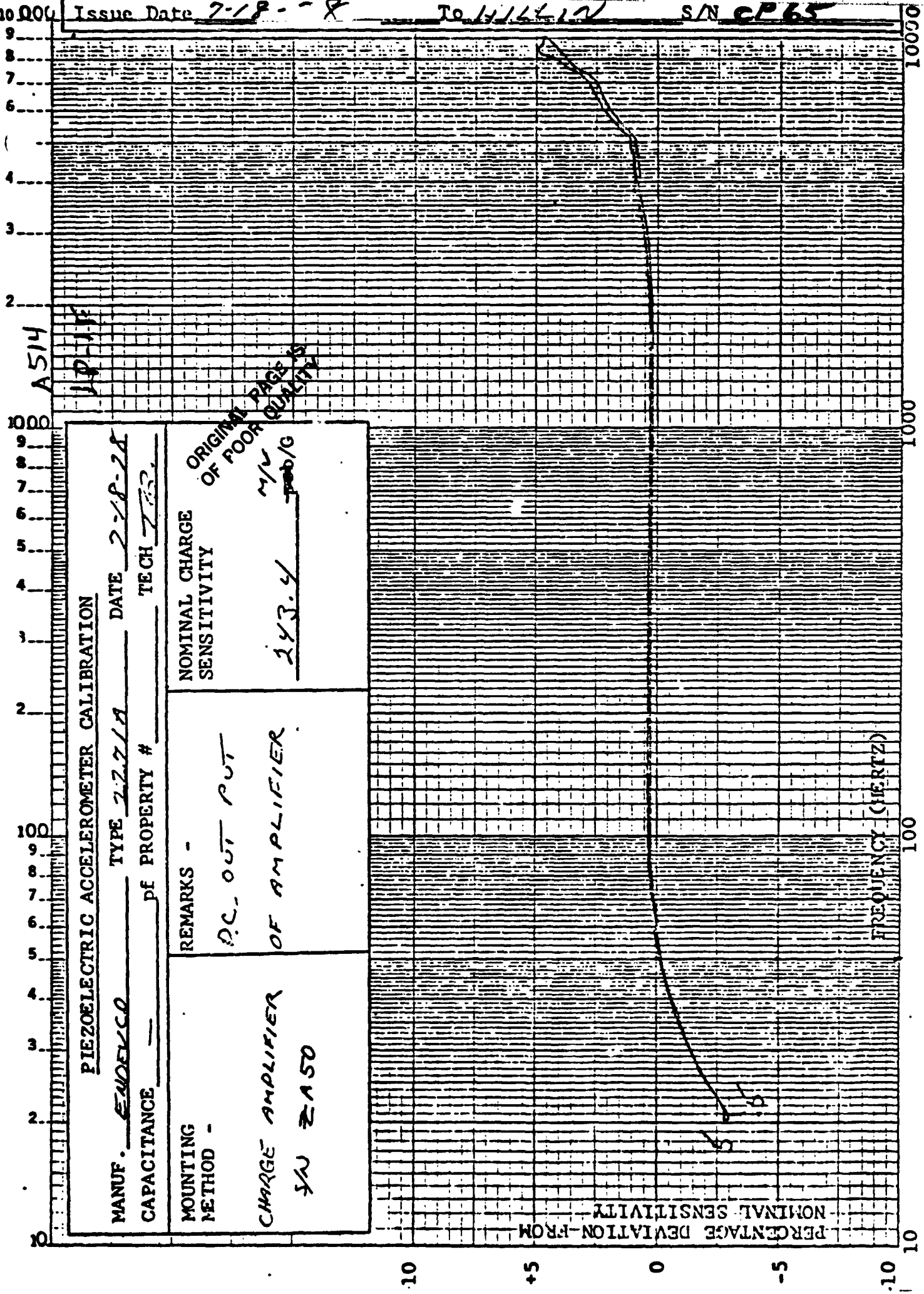
ORIGINAL PAGE IS
OF POOR QUALITY

A514

1P-11F

PERCENTAGE DEVIATION FROM NOMINAL SENSITIVITY

FREQUENCY (HERTZ)



BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 2 OF 2

CHECKED _____

HELI. 142 RPT SKTASW041-5

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL 301

278
104

SHAFT ENCODER WIRING (NON-ROTATING)

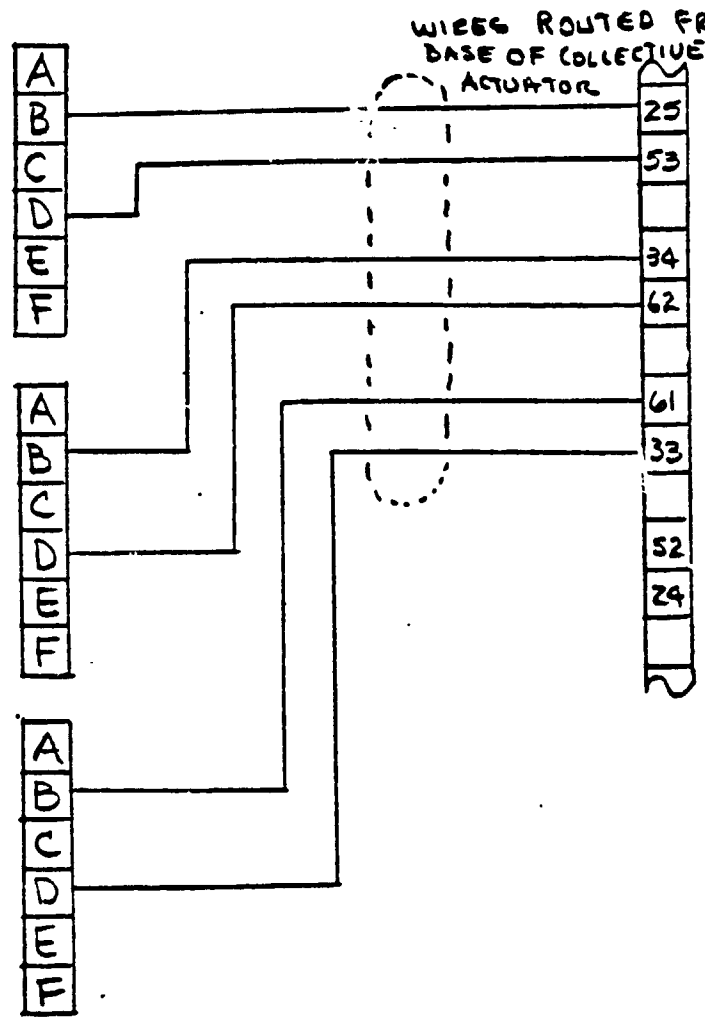
(TYP OF 2 → RIGHT + LEFT ROTOR)

J-BOX
INPUTS

LP-1N
(512/REV)

RO 58
LP-10
(1/REV)

RO 59
LP-1P
(ENCODER
POWER)



← KPT06-10-6P

WENT NO. 97439
REASON FOR CHANGE

- CHANGE
- RELEASE
- PROCESS

- TEST
- YES

SEIL NO. 24115
 CLASS OF CHANGE 1 OF 1
 EQ. NO. / ISSUE DATE (b1) 279
 (182)
 ENG'G WORK ORDER

ET.P.R. NO. (11)
 REASON:

3 AXIS ACCELEROMETER MOUNT FOR VIBRATION SURVEY

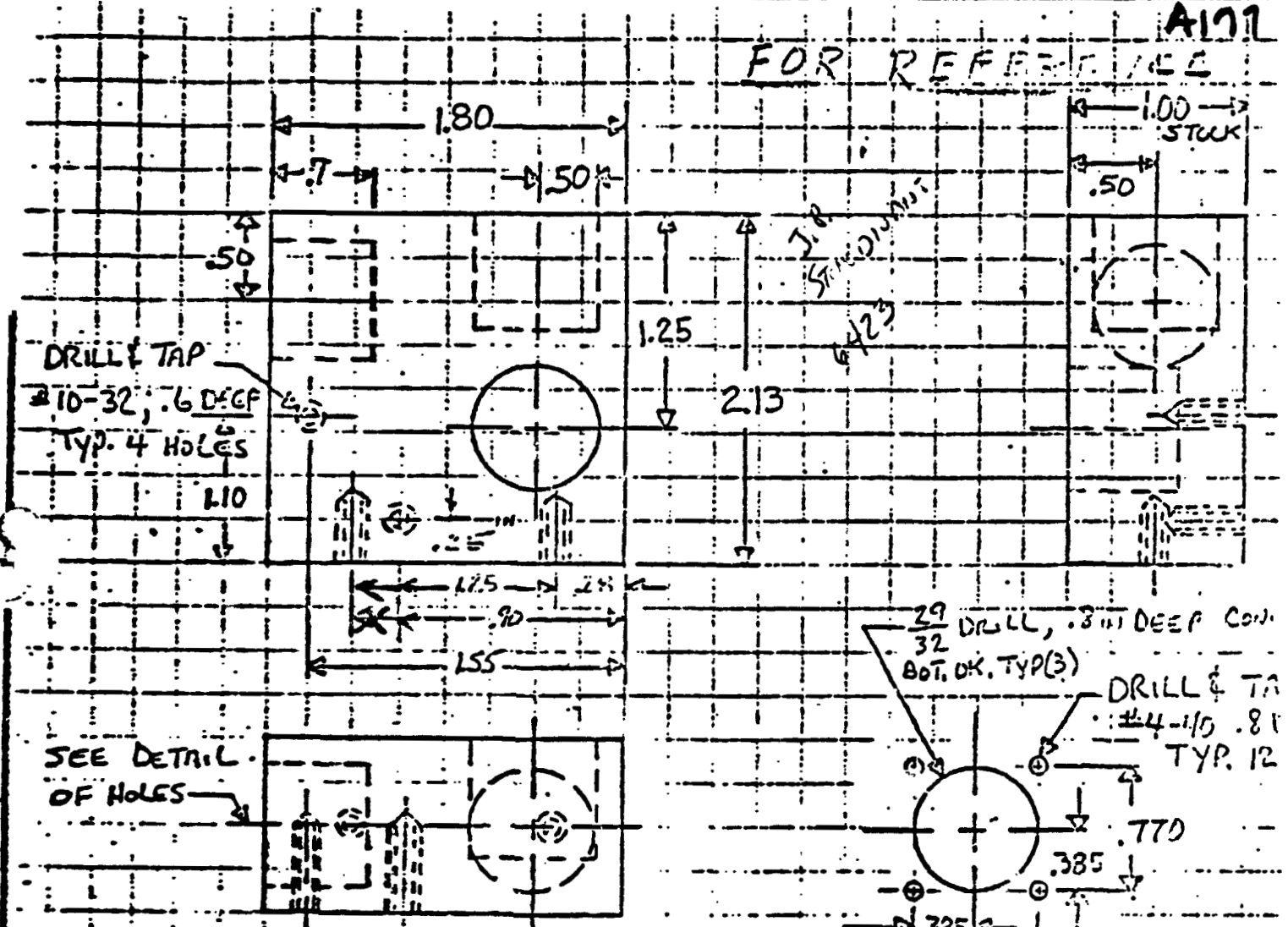
DRAWINGS AFFECTED

DRAWING CHANGE LTR.
 ED. NO. INCORP. ED. INCORP.

DRAWING TITLE

175
A176
A177

FOR REFERENCE



12 MAKE: 1/2 DELIVERY TO A. WHITENER 4882 TP SIDE PART #6

MATERIAL: 2024 AL. ALY. OR EQUIV.

SURFACE FINISH: PAINT INTL. ORANGE

DETAIL OF HOLES

STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION:	
PREPARED BY	H. H. H. H.	7-7	STRUCTURES		SIGNATURE	DATE
DESIGNED BY			CUSTOMER		MET. DES.	
CHECKED BY			D.E.R.		WEIGHTS	
					PROJ. ENG.	

NONE

NONE

ORIGINAL PAGE IS OF POOR QUALITY

BY A. WHITENER

BELL HELICOPTER COMPANY
POST OFFICE BOX 607 • POST OFFICE BOX 607

MODEL 301 PAGE 10E1

CHECKED _____

RPT. SKASW 348-1

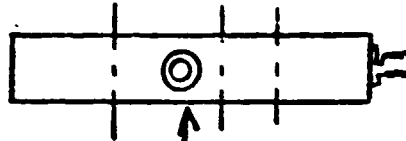
ENGINE VIBRATION ACCELEROMETER MOUNT

POWER TURBINE OIL EXIT TUBE

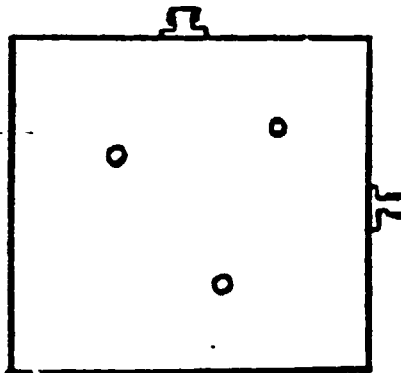
A507

A508

ORIGINAL PAGE IS
OF POOR QUALITY



ACCEL
MOUNTING
STUD



DRILL TO MATCH FITTING

NOTE: USE LYCOMING DRWG 1-000-094-14
FOR THESE LOCATIONS

BY J. WHITENER

BELL HELICOPTER COMPANY

MODEL 301 PAGE _____

CHECKED _____

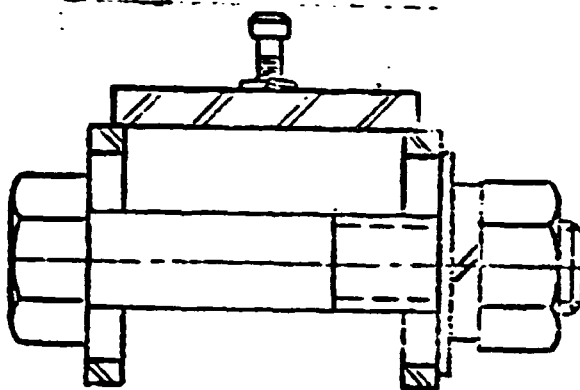
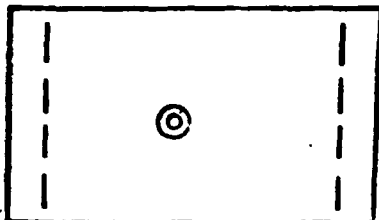
SKASN348-2

ENGINE LIFTING LUG
ACCELEROMETER MOUNT

279

ORIGINAL PAGE IS
OF POOR QUALITY

AS14



NOTE: USE LYCOMING DRAWG 1-000-044-14
FOR THESE LOCATIONS

CODE IDENT. NO. 97499

AUTHORITY FOR CHANGE

P.C.A. NO.

E.W.A. NO. **A427**

U.R. NO.

REASON:

HUB SPRING MOTION DISPLACEMENT TRANSDUCER MOUNT FOR XV-15 NC 142

CHANGE

RELEASE

PROCESS

TEST

HES

SER. NO.

301NES-118

SHEET

1

CLASS OF CHANGE

SO REISSUE LTR.

OF

1

ENG'R'G WORK ORDER

A427

DRAWINGS AFFECTED

DRAWING CHANGE LTR.

SO NOT INCORP.

SO INCORP.

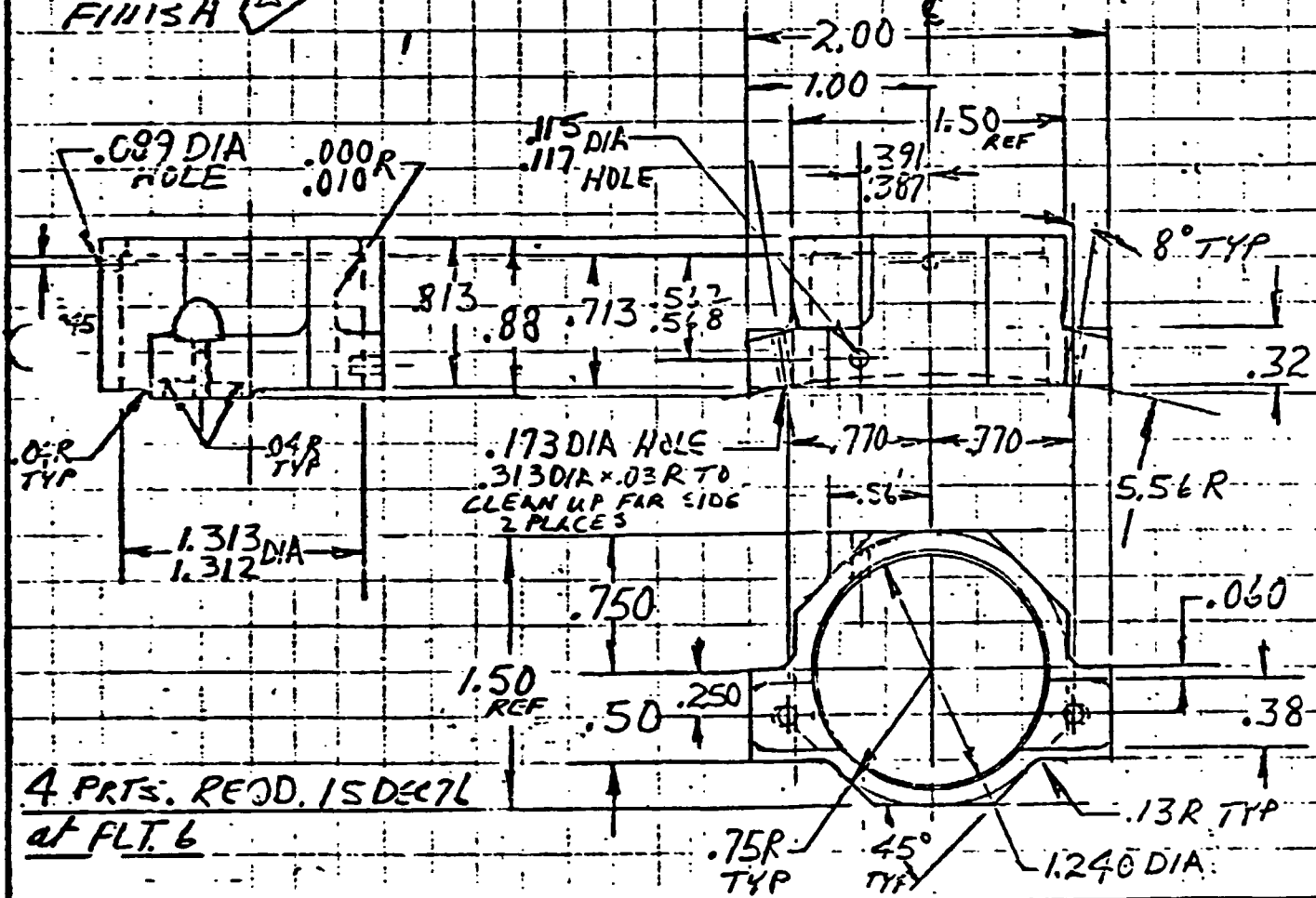
DRAWING TITLE

279

THIS E.O. IS ENGINEERING AUTHORITY TO MFG 8 (EIGHT) 301NES-118 -1 MOUNT

**D181
D182**

MATL. 1.0 x 1.8 x 2.3 2024 AL, QQA-250/A, T351 CHEM A FINISH



4 PRTS. REQD. 15 DEC 76 at FLT. 6

STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION				
PREPARED BY	SCHULHASE 12-11-76	STRUCTURES			SIGNATURE	DATE	SIGNATURE	DATE	
GROUP ENGR	[Signature]	CUSTOMER			MET. DES.				
CHECKED BY		D.E.R.			WEIGHTS				
FACTURING EFFECTIVITY				ENGINEERING EFFECTIVITY				ORIGINAL PAGE IS OF POOR QUALITY	
RELEASE INFORMATION				CHANGE CONTROL		SPARES		MFG. BOARD	
								ENGR. REL. DATE	

TEST

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/4/78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer SMITH

Project GROUND TIEDOWN TESTS

Title LT. RYAN HUE SPRING FA MONITOR

W. O. _____

L. T. R. _____ EWA _____

ITEM CODE: 0181

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>SMITH</u>					
<u>LE JUDGE</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "E" - 72-6-6</u>				
Bridge	<u>C/E 7</u>				
Config.					<u>NOTE: DISCONNECTS DOT FOR CALIBRATION</u>
Cal. Res.	<u>NA</u>				
Lever Arm					

Load	Output				
<u>0</u>	<u>690</u>				
<u>3</u>	<u>610</u>				
<u>6</u>	<u>526</u>				
<u>9</u>	<u>442</u>				
<u>1.2</u>	<u>358</u>				
<u>1.5</u>	<u>272</u>				
<u>1.8</u>	<u>188</u>				
<u>2.1</u>	<u>103</u>				
<u>2.4</u>	<u>19</u>				
<u>2.7</u>	<u>-60</u>				
<u>3.0</u>	<u>-143</u>				
<u>3.3</u>	<u>-229</u>				
<u>3.6</u>	<u>-310</u>				
<u>3.9</u>	<u>-195</u>				
<u>2.4</u>	<u>20</u>				
<u>1.8</u>	<u>192</u>				
<u>1.2</u>	<u>358</u>				
<u>.6</u>	<u>525</u>				
<u>0</u>	<u>690</u>				
<u>GPA. (92-8-7) = -0007</u>					
<u>LCC (92-8-7) = 10795</u>					

ORIGINAL PAGE IS
OF POOR QUALITY

D. P. Smith

DELL HELICOPTER COMPANY

MODEL 221

PAGE

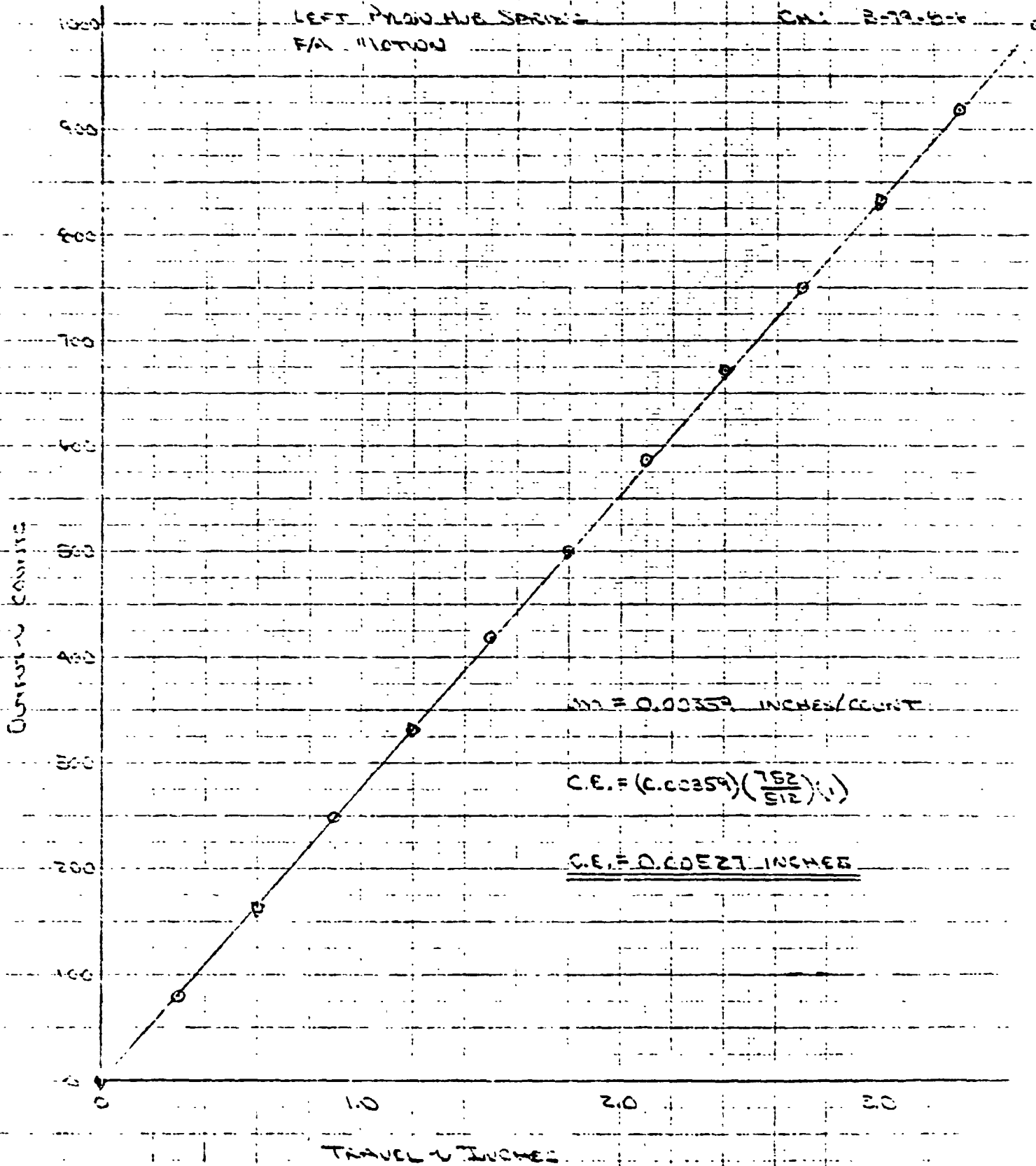
111

8PT

ITEM CODE: 0181

LEFT MAIN HUB SERIES
FAI MOTION

CN: 2-79-506



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 5/4/78

Lab. No. _____

Project GROUND TIEDOWN TESTS

Serial No. _____

301-2

Title LT. RYAN HUB SPRING LATERAL MOTION

Part No. _____

W. O. _____

L. T. R. EWA

Engineer SMITH

ITEM CODE: D152

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>WICKHAM</u>					
<u>LAJUDICE</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chn.	<u>PMDU "B" - 79-8-2</u>				
Bridge	<u>C/S 7</u>				
Config.		<u>NOTE: DISCONNECT PCA FOR CALIBRATION</u>			
Cal. Res.	<u>N/A</u>				
Lever Arm					

Load	Output				
DEFLECTION (INCHES)	OUTPUT (COUNTS)				
0	695				
.3	599				
.6	509				
.9	422				
1.2	342				
1.5	258				
1.8	174				
2.1	94				
2.4	12				
2.7	-72				
3.0	-155				
3.3	-240				
3.6	-319				
3.0	-158				
2.4	+5				
1.8	177				
1.2	342				
.6	506				
0	695				
GPA ₀ (E2-8-7) = -0005					
LLC (E3-8-7) = +6745					

D.A. Smith

HELL HELICOPTER COMPANY

MODEL 2001 PAGE

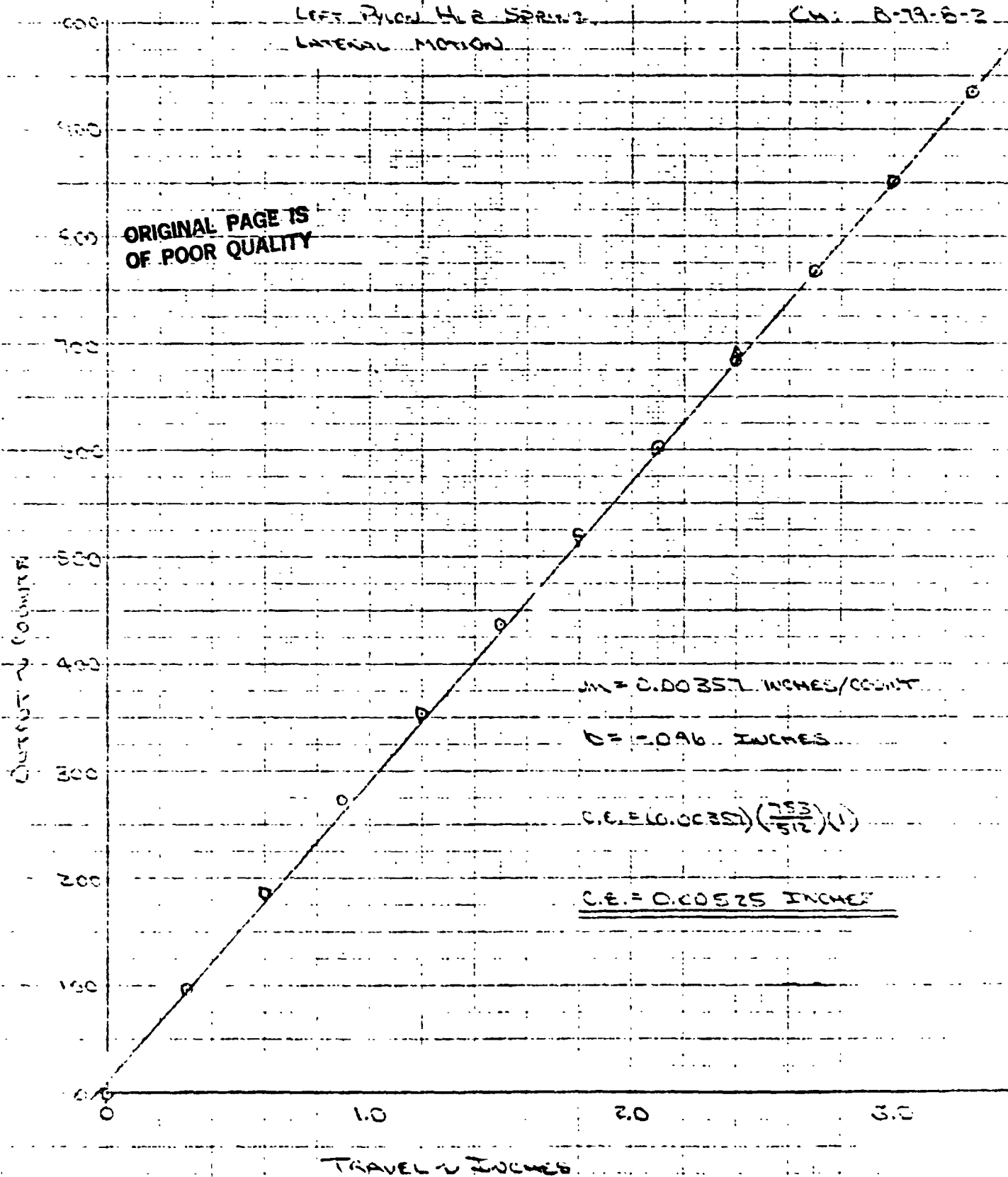
HELL # 2 EPI

ITEM CODE: D.152

LEFT Pylon H₂ SPRING
LATERAL MOTION

CH: B-79-8-2

ORIGINAL PAGE IS
OF POOR QUALITY



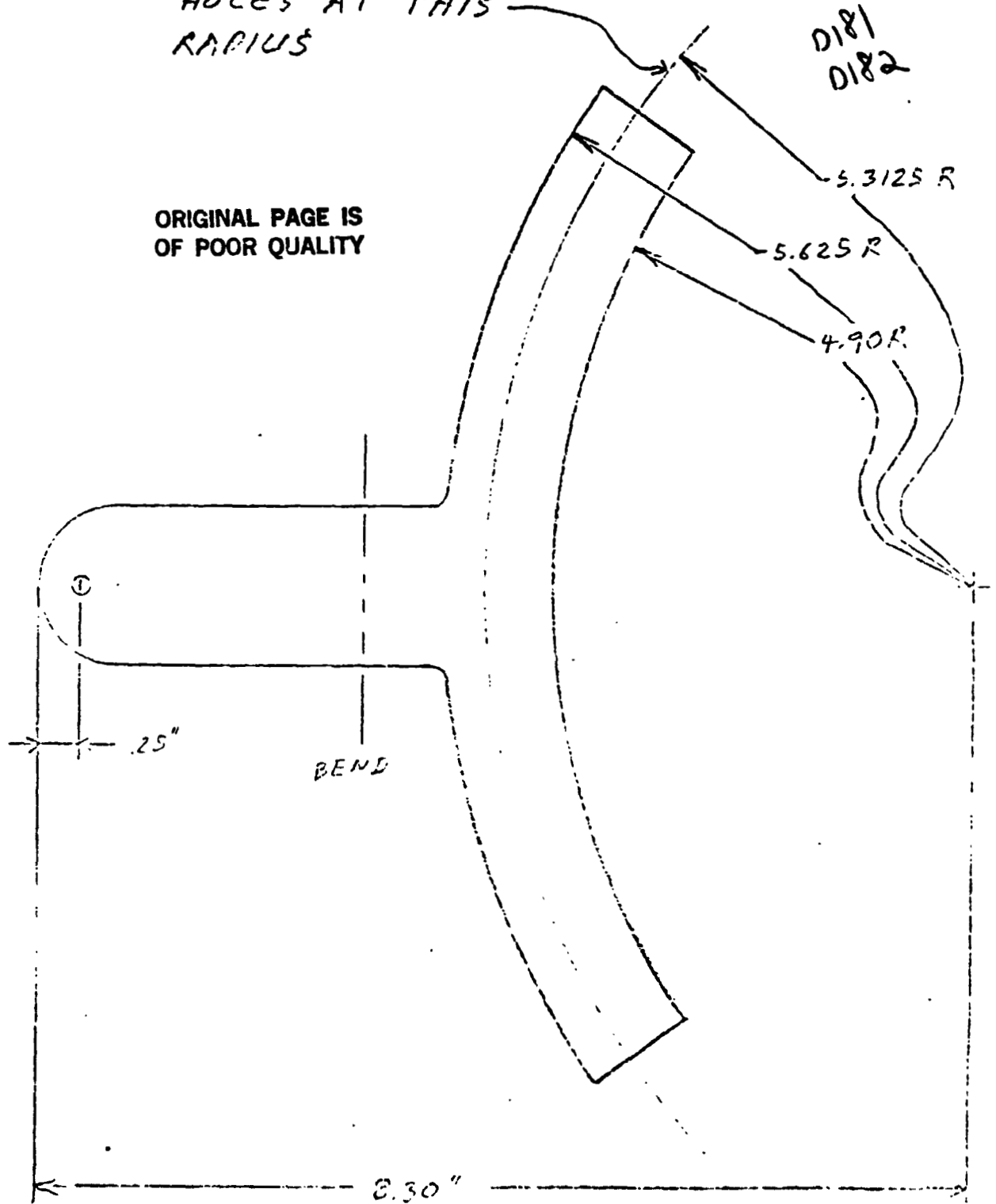
HUB SPRING MOTION BRACKET

4-28-18
279

DRILL MOUNTING
HOLES AT THIS
RADIUS

D181
D182

ORIGINAL PAGE IS
OF POOR QUALITY



301 FUEL CONTROL LEVER POSITION BRACKET

ORIGINAL PAGE IS
OF POOR QUALITY

DS10

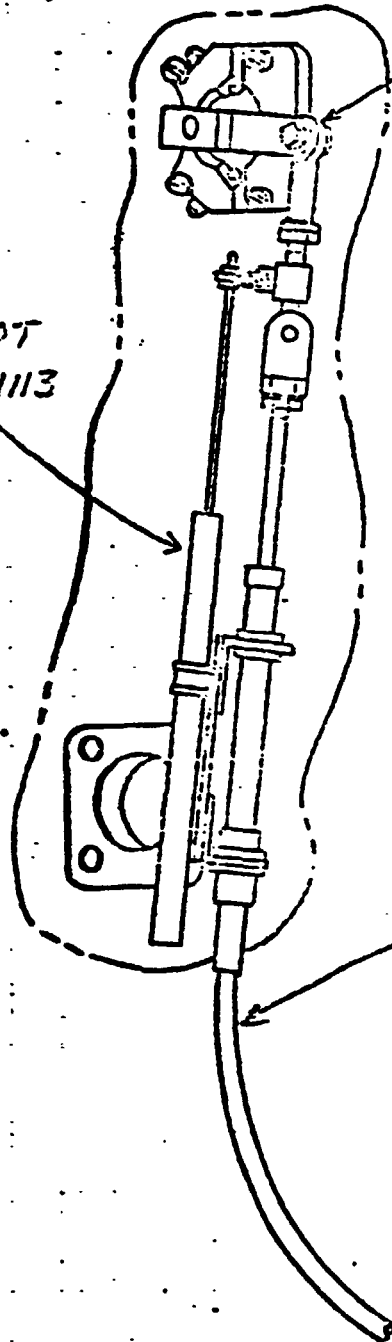
279

BOURNS INC
6.0 IN LINEAR POT
PN 80294-20512-1113
6000 OHMS

THROTTLE LEVER
ON THE ENGINE

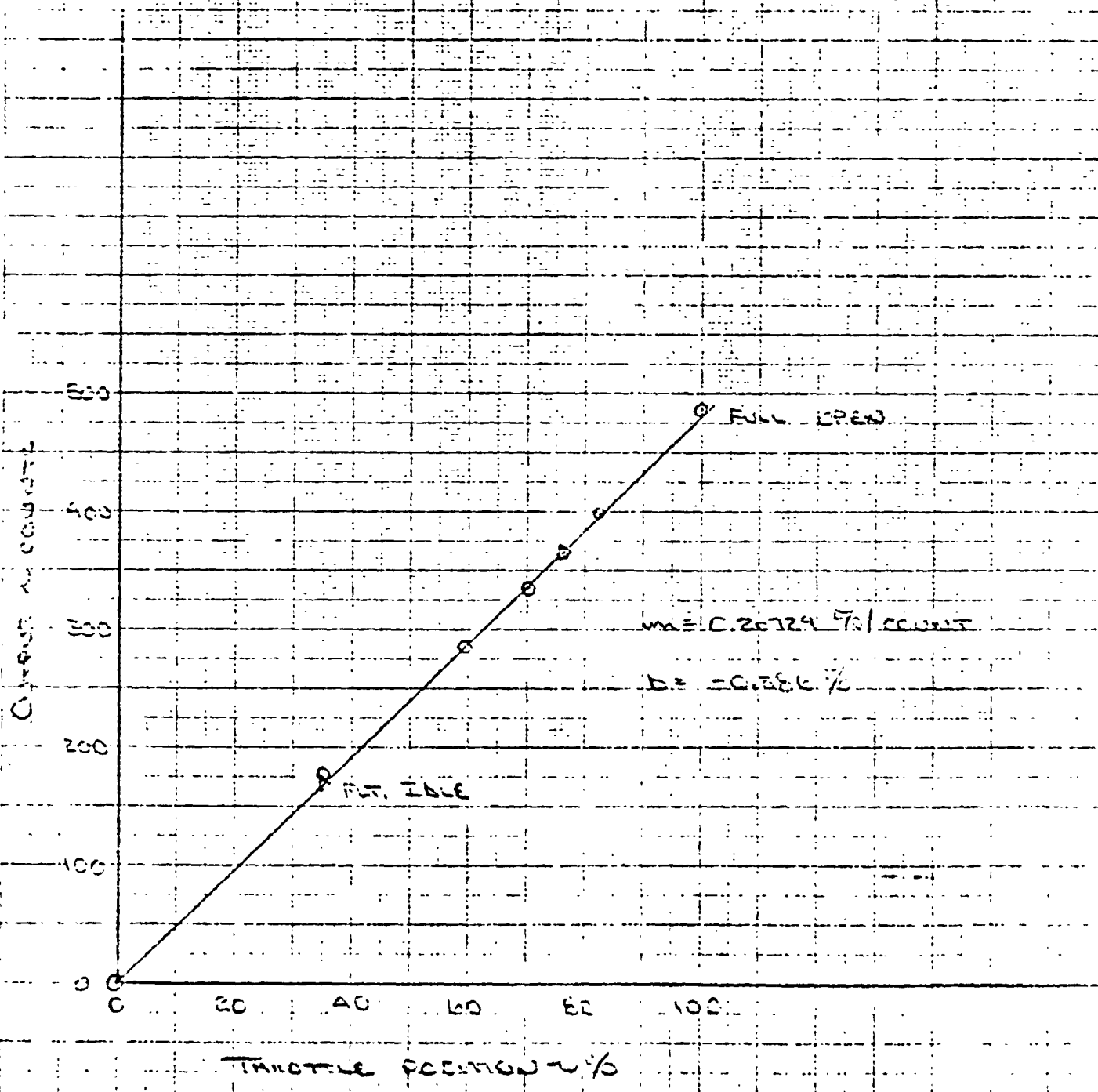
MAKE COPY
FOR D569 RP-1 I

THROTTLE CABLE



ITEM CODE: DS10

LEFT THROTTLE POSITION



ORIGINAL PAGE IS
OF POOR QUALITY

BY H.D. WINNIFORD

HELL HELICOPTER COMPANY
POST OFFICE BOX 402 • 1001 WOOD L TERRACE

MODEL 301 PAGE _____

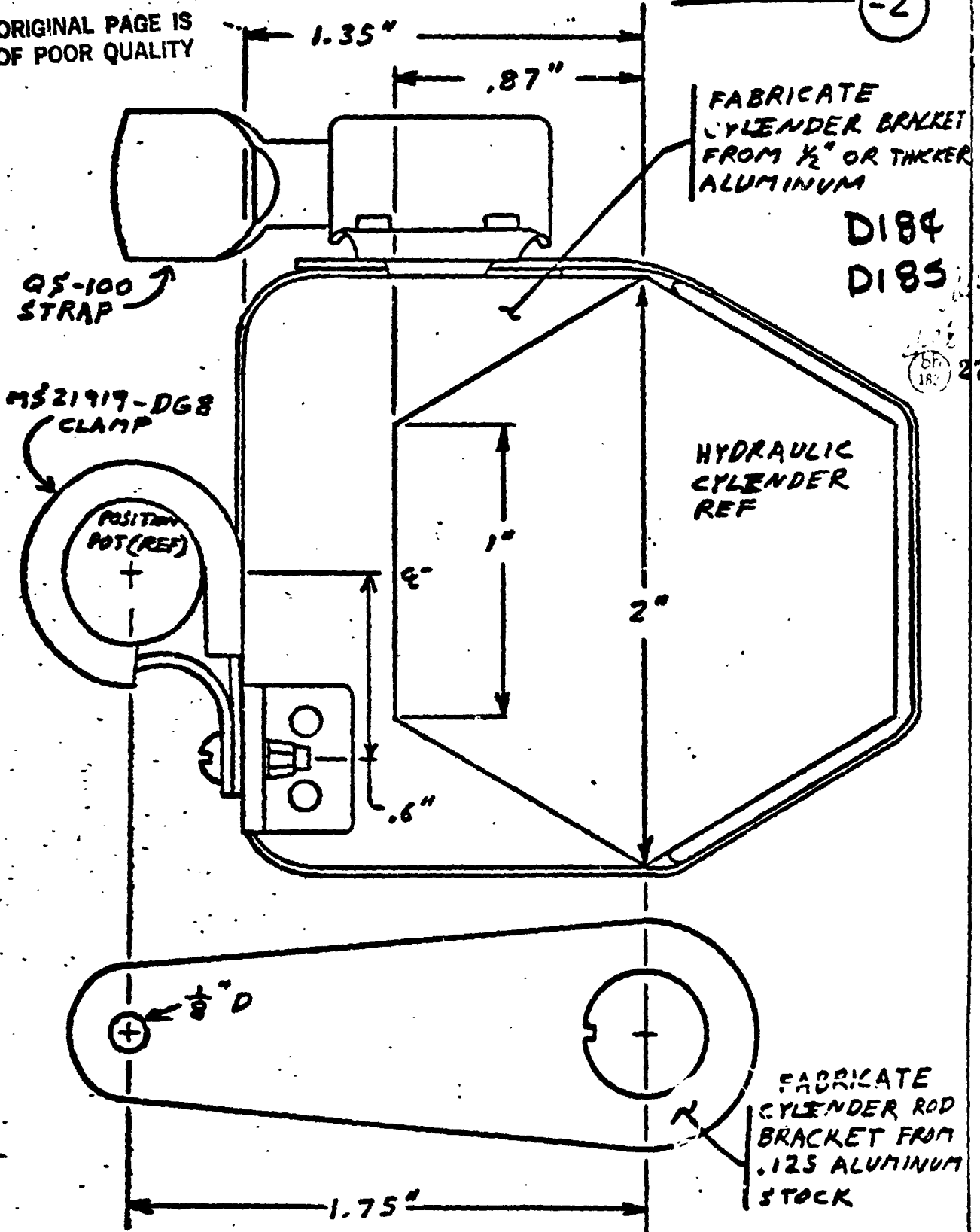
CHECKED _____

RPT SHIP #1

HYDRAULIC CYLINDER POSITION BRACKETS

SKHDS-1-76 -2

ORIGINAL PAGE IS
OF POOR QUALITY



FABRICATE
CYLINDER BRACKET
FROM 1/2" OR THICKER
ALUMINUM

D184
D185

Q5-100
STRAP

MS21919-DG8
CLAMP

POSITION
POT (REF)

HYDRAULIC
CYLINDER
REF

FABRICATE
CYLINDER ROD
BRACKET FROM
.125 ALUMINUM
STOCK

279

ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-17-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Sullivan

Project GROUND TRENCH TESTS

Title LT. RIGGS SUBMITTAL FA. MOUNTAIN

W. O. 301-2

L. T. R. _____ EWA _____

Item Code: DIA

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>Sullivan</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "B" -7A-8-A</u>				
Bridge	<u>2157</u>				
Config.					
Cal. Res.	<u>1/4</u>				
Lever Arm					

NOTE: ① CONVERT ALL DEFLECTIONS TO DEFLECTION PER IN. RANGE INDICATOR

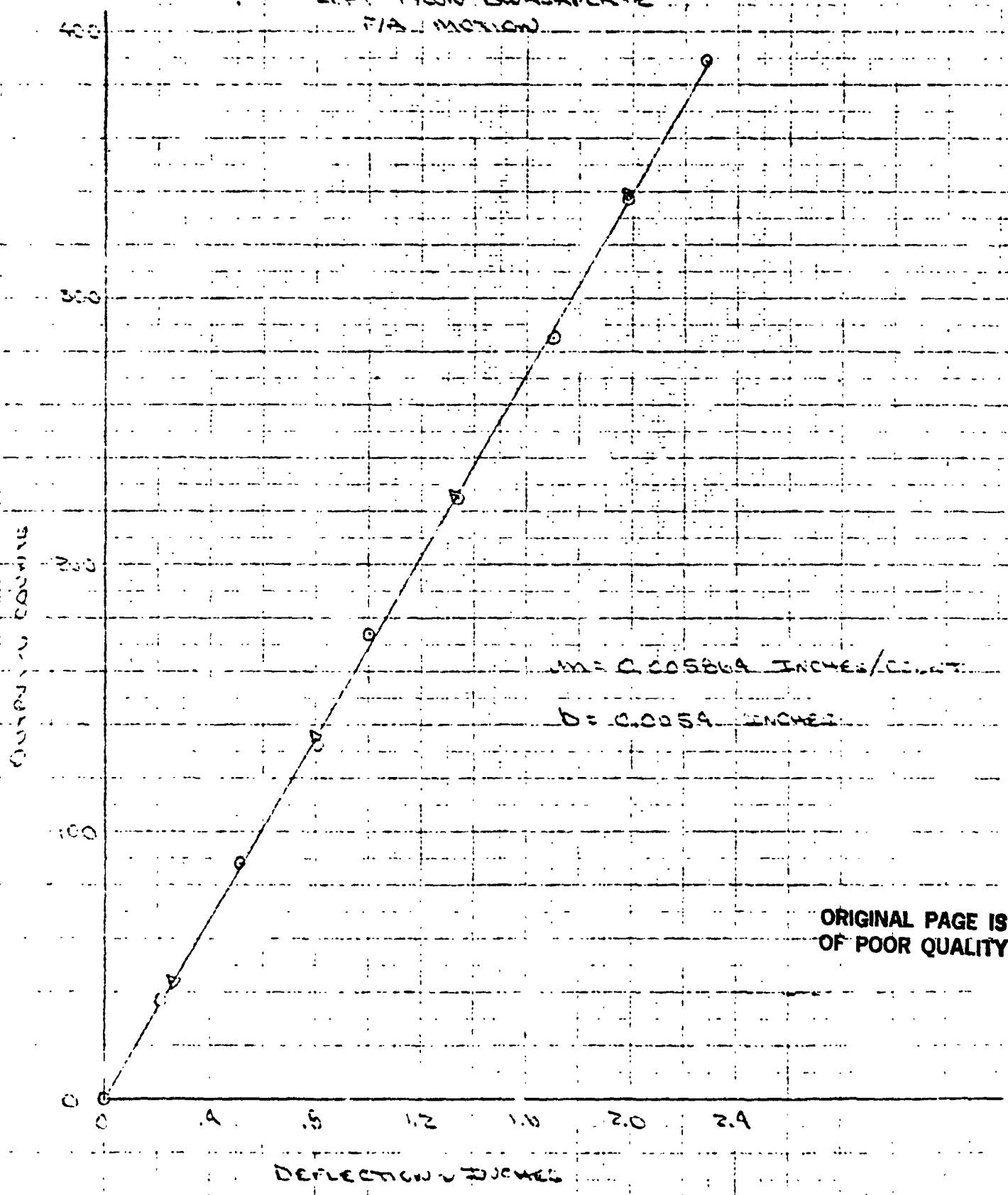
② USE ONLY DIE WITH PEDAL AT 50% SETTING TO OBTAIN LINEARITY & SLOPE

Load	Output		
STAIN P.C. (%)	PEDAL P.C. (%)	DEFLECT. ON OUTPUT (0.10-0.5)	(GTS)
0	FULL RT.	575	-21
10	50	608	-97
20	50	587	-60
30	50	557	-9
40	50	527	+36
50	50	505	77
60	50	479	129
70	50	439	188
80	50	410	240
90	50	380	292
100	FULL LEFT	399	291
0	50	410	292
60	50	475	129
40	50	528	38
20	50	562	-53
0	FULL RT.	579	-17

GPA. (52-8.7) = -5

LIC. (53-8.7) = 793

LEFT PYLON SWASHPLATE
F/A MOTION



ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-5-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

Project GROUND TIE-DOWN TESTS

Title LA. PLYWOOD SUBSTRATE LAT. MOTION

L. T. R. _____ EWA _____

321-2

ITEM CODE: DIES

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
SMITH					
W. J. _____					

Volts					
Gage Type					
Gage Fac					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	INDU "B" - 79-F-5				
Bridge	GIS 7				
Config.					
Col. Res.	NA				
Lever Arm					

NOTE: CONVERT INCHES TRAVEL TO DEGREES PER R. MARK

Lead	Output				
DEFLECTION OUTPUT					
(INCHES) (MILL)					
0	76				
.12	125				
.24	199				
.36	259				
.48	319				
.60	378				
.72	435				
.84	500				
.96	511	← RAD POINT			
.84	500				
.72	435				
.60	378				
.48	319				
.36	259				
.24	199				
.12	125				
0	76				

BY D. P. Simon

Red Helicopter

MODEL 301

DATE

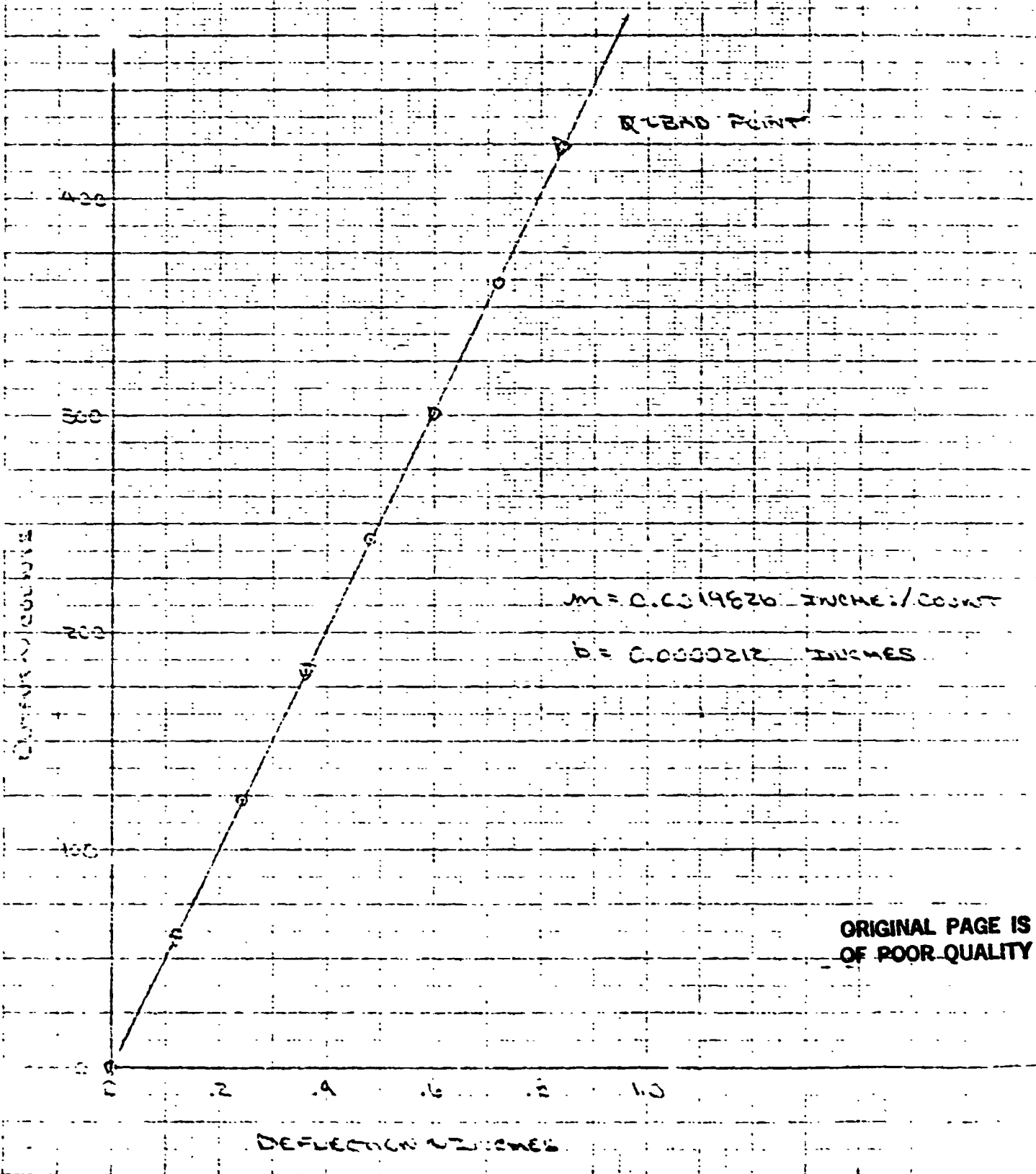
CHECKED

WELL

RFI

ITEM CCBL 0153

LEFT Pylon SWAMP PLATE
LATERAL MOTION



$m = 0.0019626$ INCHES/COUNT

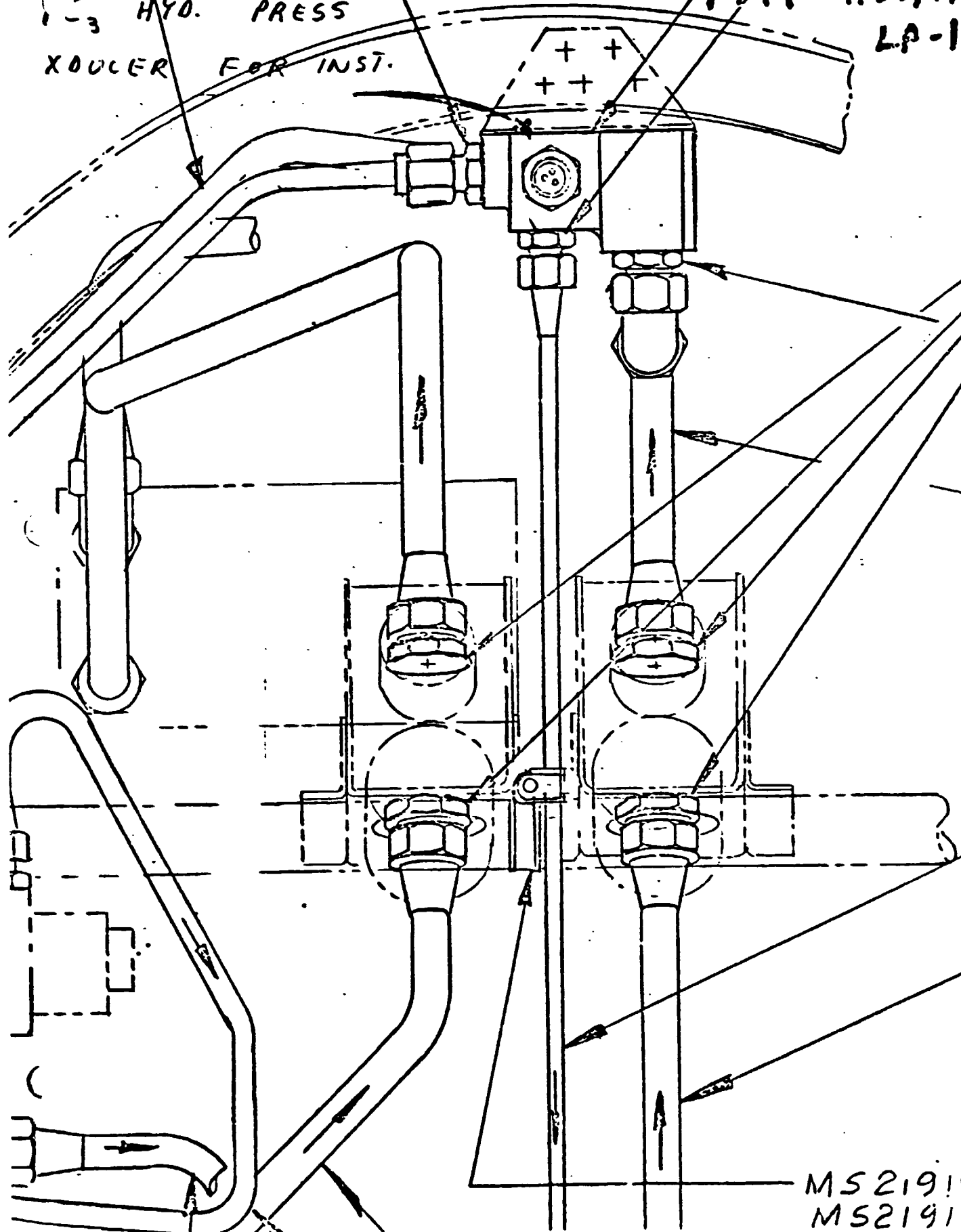
$b = 0.0000212$ INCHES

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

P149 A33/1/1
LP-1-L

HYD. PRESS
XOULER FOR INST.



MS21919W
MS21919H

ORIGINAL PAGE IS
OF POOR QUALITY

ENGINEERING LABORATORIES
Calibration Data Sheet

Description <u>TRANSDUCER PRESSURE</u>		Date Calibrated:
Mfg. / Type <u>PL 722-TC-5M-350</u>		<u>4-18-78</u>
Range <u>0-5000 P.S.I.D.</u>		Calibration Period:
Mfg. <u>STATMAN</u>		<u>6 MO.</u>
Serial No. <u>11825</u>		LEP No. <u>04-018-08</u>

Lab No.	Calibrated by: <u>T. GOSLINSKI</u>
---------	------------------------------------

Remarks: P149

STD	OUT PUT	OUT PUT		
PSI.	M/V	M/V		
0	0	-03		
100K CAL	4.81	4.78		
500	2.42	—		
1000	4.80	4.76		
1500	7.16	—		
2000	9.51	9.46		
2500	11.90	—		
3000	14.26	14.17		
3500	16.60	—		
4000	18.93	18.87		
4500	21.25	—		
5000	23.57	23.53		
			A & C	SHORTED
			R & D	335.5-2
			VOLTAGE	5.000

7607-5000

PY D.P. Smith

BELL HELICOPTER COMPANY

MODEL
HE11

PAGE
RPT

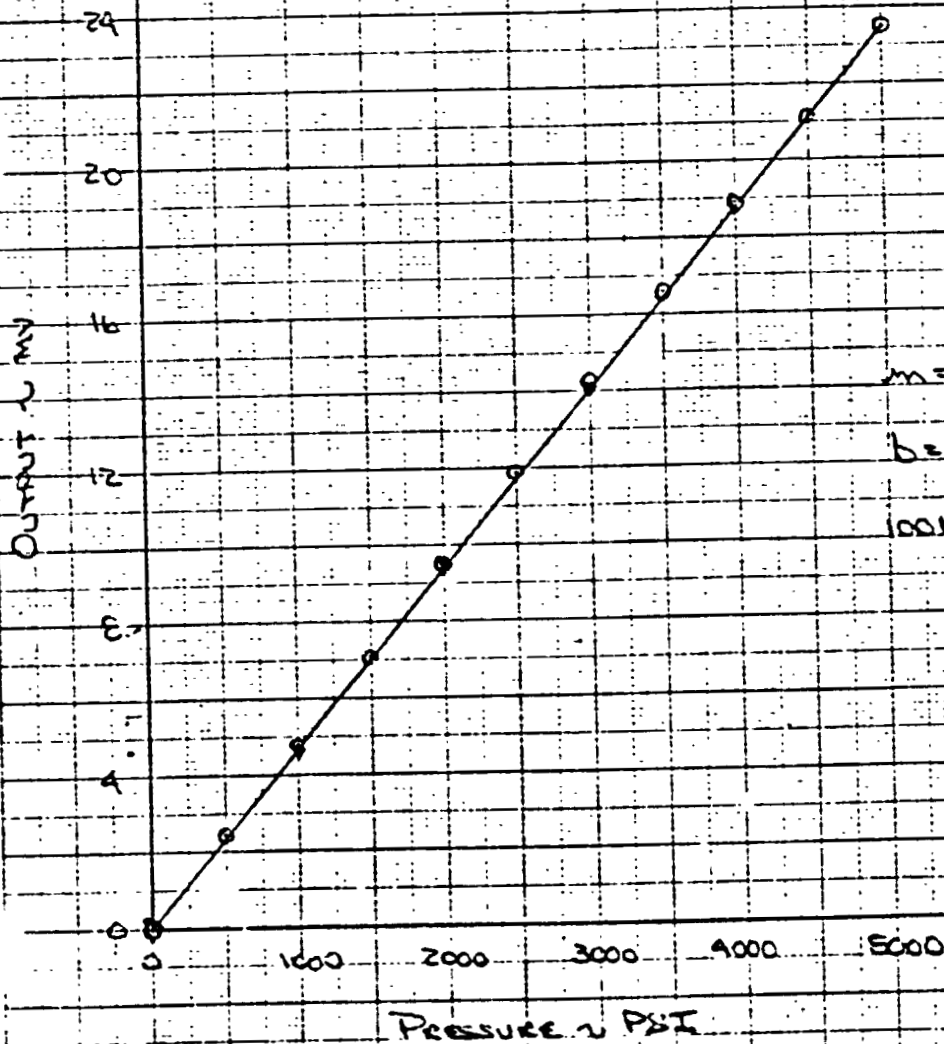
CHECKED

ITEM CODE: P149

HYDRAULIC SYSTEM #3
PRESSURE TRANSDUCER CALIBRATION
SN 11825

CH: A-33-1-1

ORIGINAL PAGE IS
OF POOR QUALITY



$m = 1274.5 \text{ PSI/mV/V}$

$b = -12.4 \text{ PSI}$

$100K = 1009.3 \text{ PSI}$

Clipping Count

10.
INSTL
(2)
P (1)

ORIGINAL PAGE IS
OF POOR QUALITY

B/P 301-076-004
SHEET 2
ZONE B/3

P178

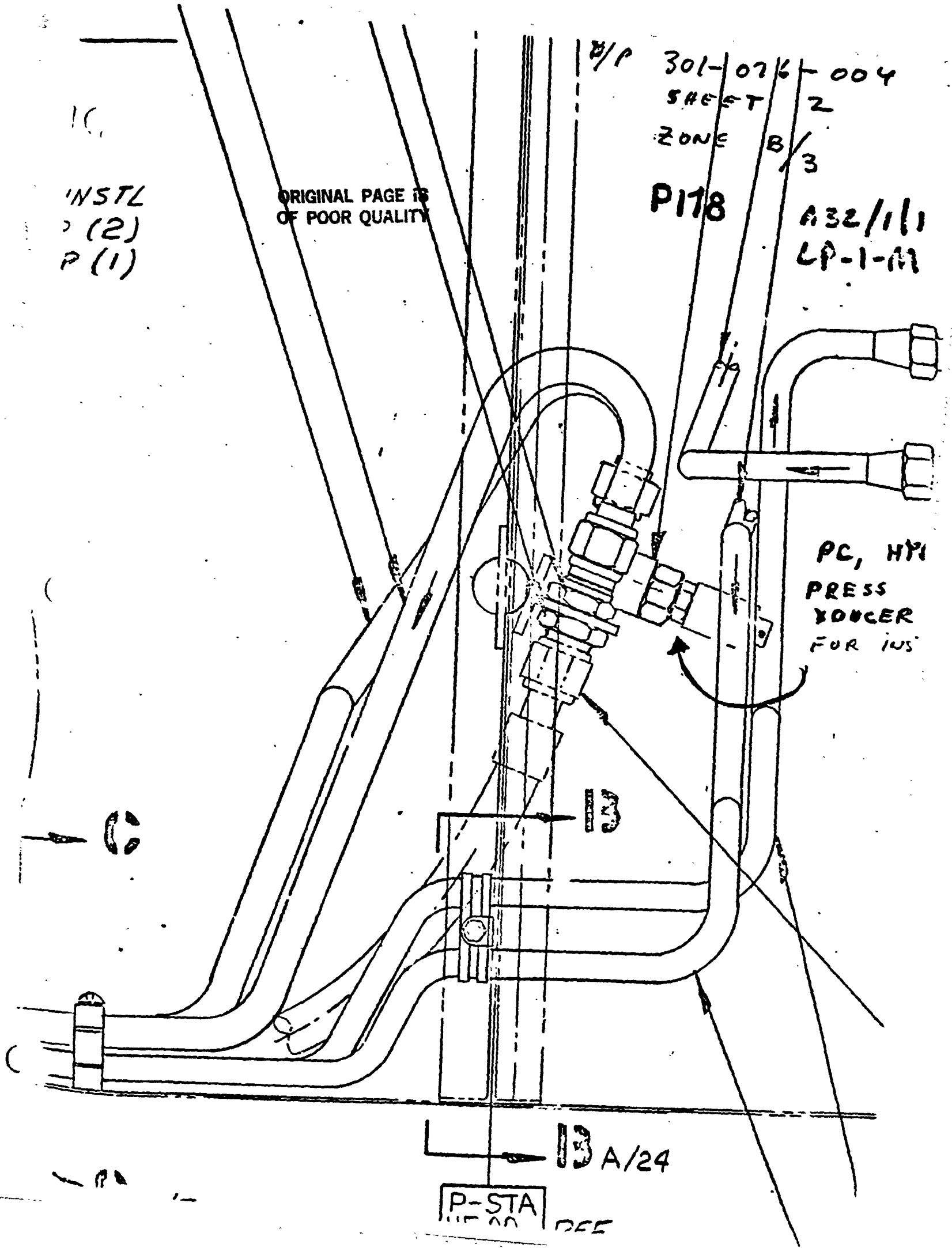
A32/1/1
LP-1-A

PC, HYI
PRESS
BOUCER
FOR INS

13

13 A/24

P-STA
REF



BY: D. P. Smith
CHECKED:

HELL HELICOPTER COMPANY

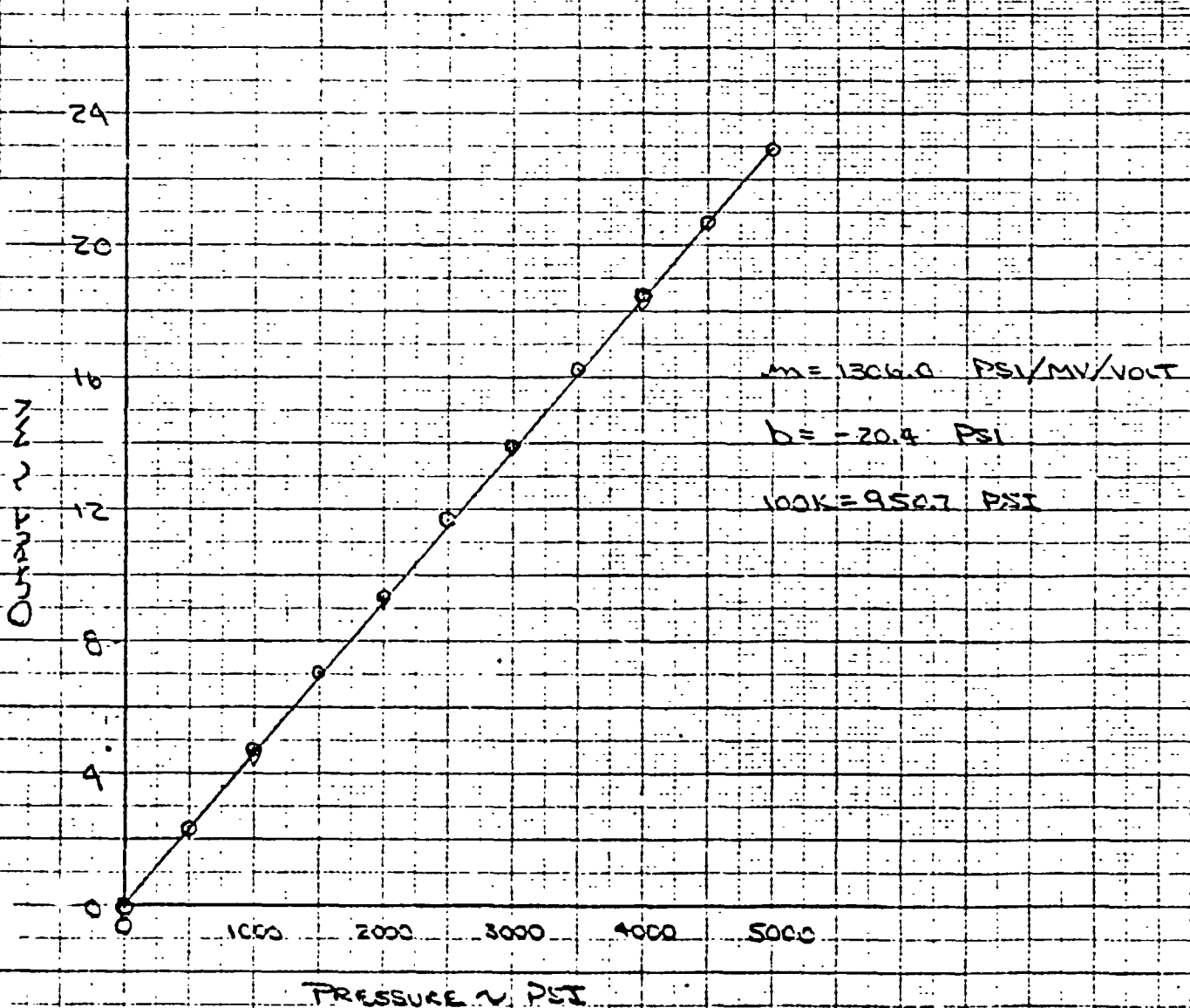
MODEL
HELL

PAGE
RPT

ITEM CODE: **P118**

HYDRAULIC SYSTEM # 1
PRESSURE TRANSDUCER CALIBRATION
S/N 11823

CH: A-32-1-1



ORIGINAL PAGE IS
OF POOR QUALITY

BY A. WHITEJER

BELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED RW

HELI. 142 RPT SKASW04375-1

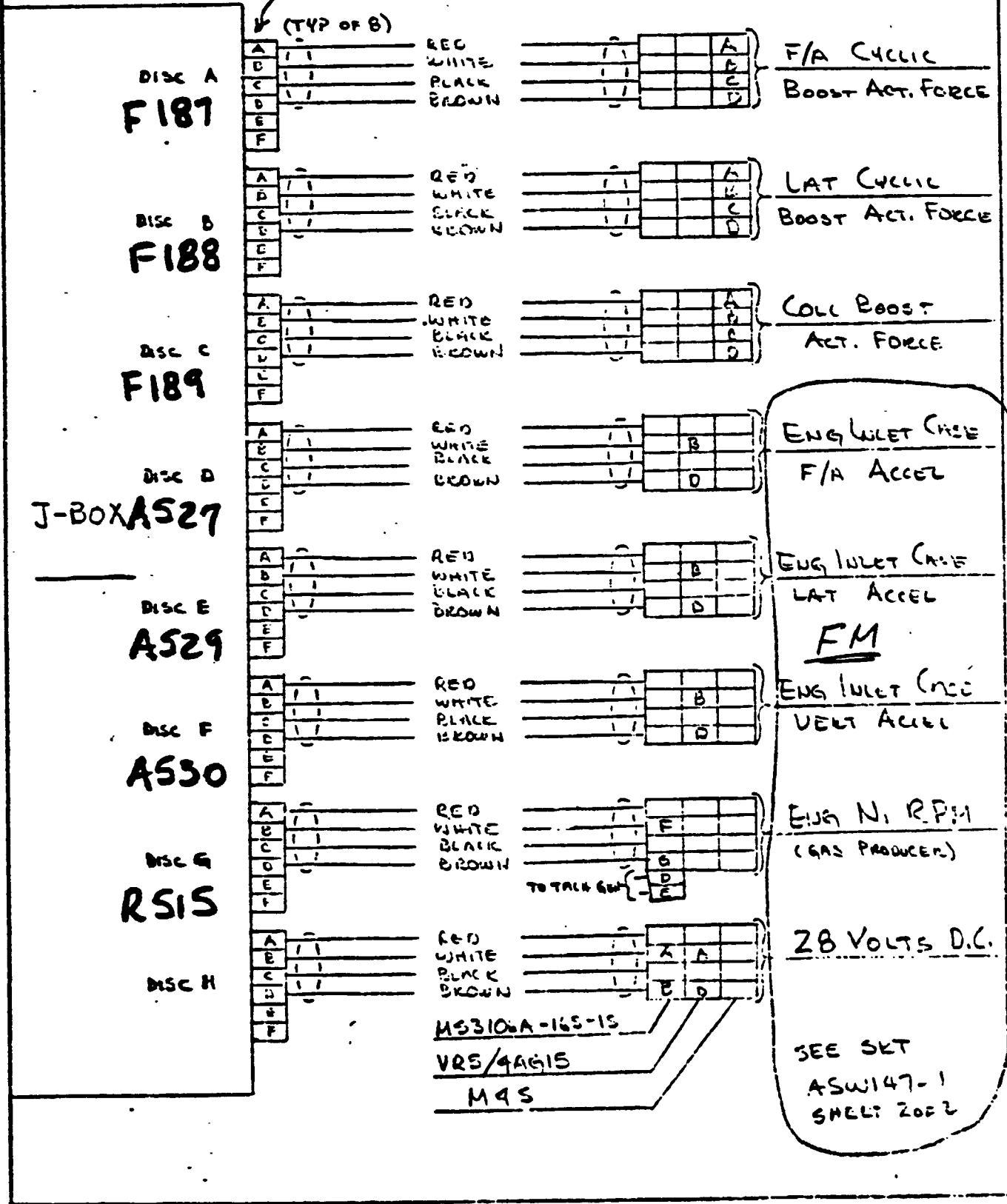
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

bh 182 279

J-Box LOCATION LP-2

KPT06-10-67



7842 0105REV 100

BY A. WHITENER

HELL HELICOPTER COMPANY

MODEL 301 PAGE 2 OF 2

CHECKED ASW

HELI. 1+2 RPT SKASW04375-1

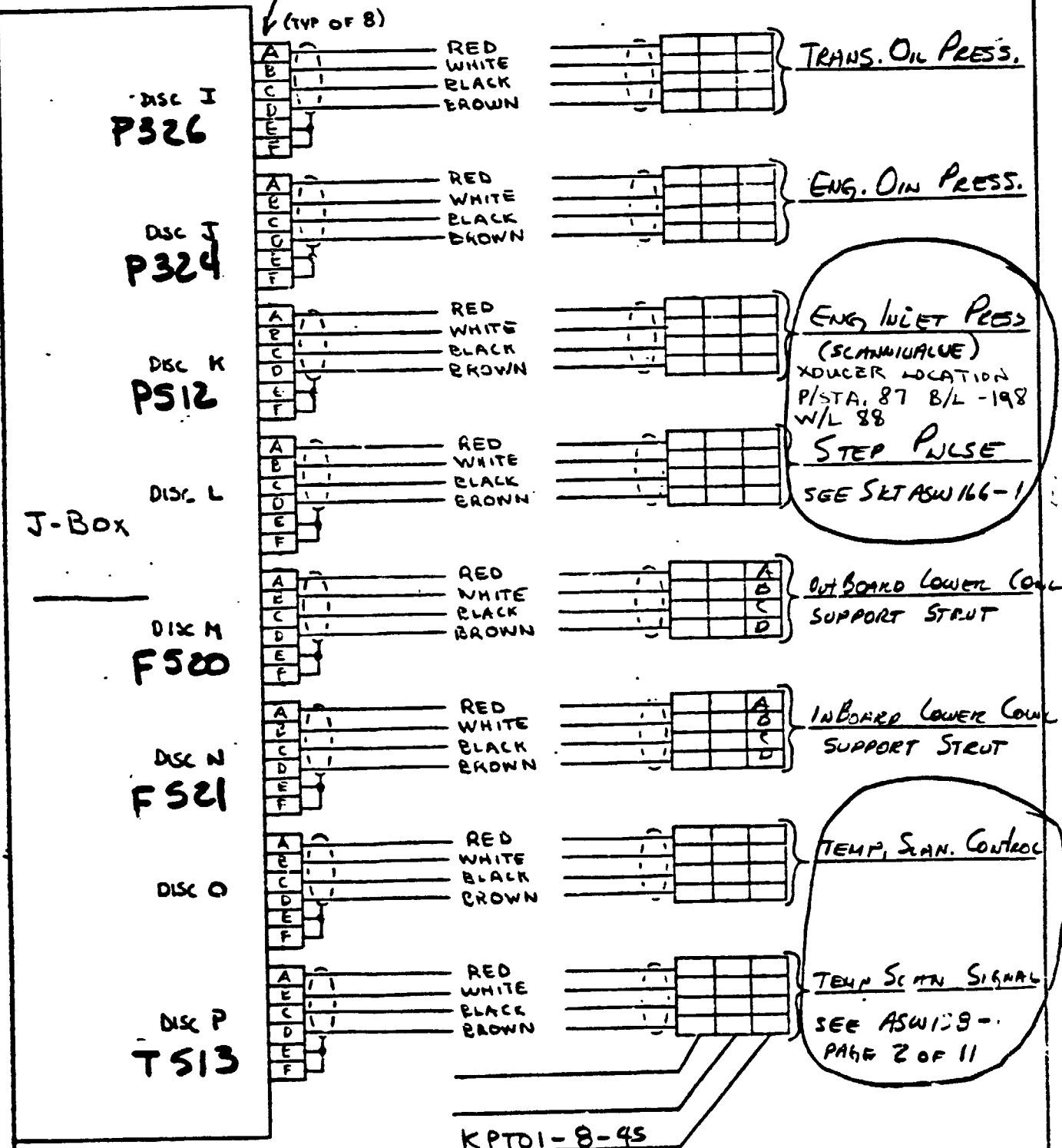
ORIGINAL PAGE IS
OF POOR QUALITY

DISCONNECT HARNESS

J-Box LOCATION: LP-2

bn 279
182

KPT06-10-6P



KPT01-8-95

9042 0000000 0704

ENGINEERING LABORATORIES
Calibration Data Sheet

Description <u>TRANS-DUCER PRESSURE</u>		Date Calibrated:
Model/Type <u>PL 722 TC-150-350</u>		<u>4-17-78</u>
Range <u>0-150 P.S.I.D.</u>		Calibration Period:
Mfg. <u>STRATHAM</u>		<u>6 MO.</u>
Serial No. <u>11817</u>		LEP No. <u>04-017-09</u>
Lab No.	Calibrated by: <u>T. GOSCIUSKI</u>	

Remarks: **ORIGINAL PAGE IS OF POOR QUALITY**

p324

STD	OUT PUT	OUT PUT	LP-25	
P.S.I.	M/V	M/V		
0	0	-06		
100K CAL	+4.88	4.82		
10	-1.54	—		
20	3.11	3.04		
30	4.68	—		
40	6.25	6.16		
50	7.81	—		
60	9.37	9.29		
70	10.93	—		
80	12.49	12.41		
90	14.04	—		
100	15.59	15.51		
110	17.12	—		
120	18.67	18.62		
130	20.22	—		
140	21.75	21.72	A+D	5.998
150	23.27	—	B+C	322.2-52
			VOLTAGE	5.998

7E 6411 Rev 6

ENGINEERING LABORATORIES

Calibration Data Sheet

Description <u>TRANS-DUCER PRESSURE</u>	Date Calibrated:
del/Type <u>PL 72 TC-150-250</u>	<u>4-17-78</u>
Range <u>0-150 P.S.I.</u>	Calibration Period:
Mfg. <u>STATIMAN</u>	<u>6 MO.</u>
Serial No. <u>11818</u>	LEP No. <u>041-017-08</u>

Lab No.	Calibrated by: <u>T. GOSCHINSKI</u>
---------	-------------------------------------

Remarks: **ORIGINAL PAGE IS OF POOR QUALITY**

p326
LP-21

STD.	OUT PUT	OUT PUT			
P.S.I.	M/V	M/V			
0	0	-0.05			
100K CEL	+5.04	+4.99			
10	+1.50	—			
20	3.15	2.99			
30	4.60	—			
40	6.14	6.08			
50	7.68	—			
60	9.21	9.14			
70	10.75	—			
80	12.28	12.21			
90	13.71	—			
100	15.34	15.28			
110	16.85	—			
120	18.37	18.33			
130	19.88	—			
140	21.39	21.37			<u>N+D</u>
150	22.88	—			<u>B+P 337.5-0</u>
					<u>VOLTAGE 6.000</u>

7862-6411 Rev.

ENGINEERING LABORATORIES
Calibration Data Sheet

Description: <u>TRANSDUCER IN SCANIVALVE</u>		Date Calibrated:
Model/Type: <u>PM 131TC</u>		<u>4-13-78</u>
Range: <u>± 2.5 P.S.I.D.</u>		Calibration Period:
Mfg.:	<u>STATHAM</u>	
Serial No.:		<u>6 MO.</u>
<u>52523</u>		LEP No. <u>04-011-08</u>
Lab No.:	Calibrated by:	
<u>SCANIVALVE #4824-1365</u>	<u>T. GOSCINSKI</u>	
Remarks: <u>Q.M. BASED ON MENSOR CALIBRATION. 301 #2</u>		

Q.M.	STD.	OUT PUT	OUT PUT	LP-2K
	P.S.I.	M/V	M/V	P512
0	0	0	0	
—	100K CAL	5.17	5.17	
1.263	.2	+2.27	—	
2.526	.4	4.53	4.55	
3.789	.6	6.79	—	
5.052	.8	9.06	9.09	
6.314	1.0	11.32	—	
7.579	1.2	13.58	13.62	
8.844	1.4	15.84	—	
10.106	1.6	18.10	18.13	
11.366	1.8	20.36	—	
12.625	2.0	22.61	22.63	
13.884	2.2	24.86	—	
15.143	2.4	27.11	27.11	
				A+C SHORTED
				B+D 344.5
				VOLTAGE 5.989
				48 PORT LEAK CK. = 01C

786: 411 Rev665

BY A. WHITENER

HELL HELICOPTER COMPANY

MODEL 301 PAGE 1 OF 2

CHECKED (initials)

HELI. 142 RPT SKTASW147-1

ORIGINAL PAGE IS OF POOR QUALITY

ENGINE VIB. AND N₁ TACH GEN. (HIGH FREQ)

FM

AS27

J-Box LP-2

AS2

KP106-10-6P
TYP OF 5

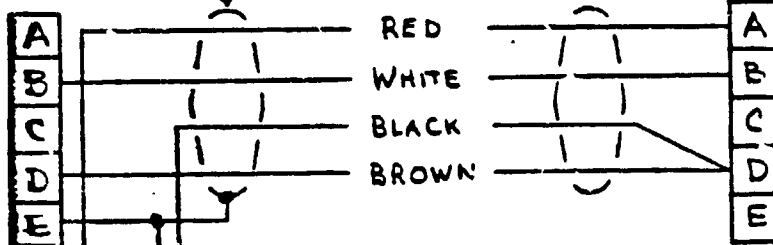
MARK: ENG. VIB - F/A - 22

VP5/4AG15
TYP OF 3

A.13

R51

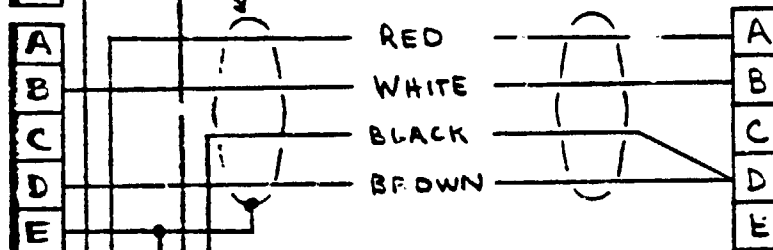
DISC # D
MARK:



ENG. VIB.
OIL OUTLET
RADIAL ACCEL
(6:30)

DISC # E
MARK:

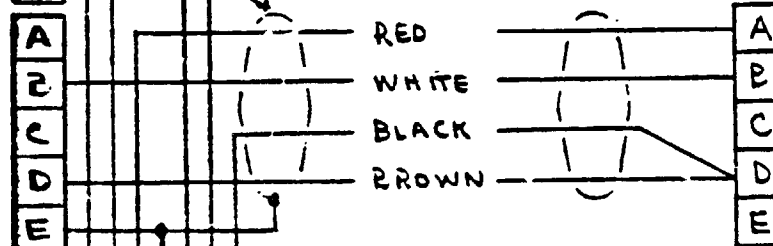
MARK: ENG. VIB. - LAT - 22



ENG. VIB.
COMBUSTION FLANGE
AXIAL ACCEL
(6:00)

DISC # F
MARK:

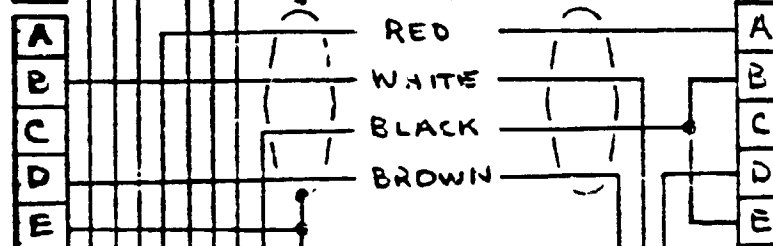
MARK: ENG. VIB - VERT - 22



ENG. VIB.
LIFTING EYE
RADIAL ACCEL
(12:00)

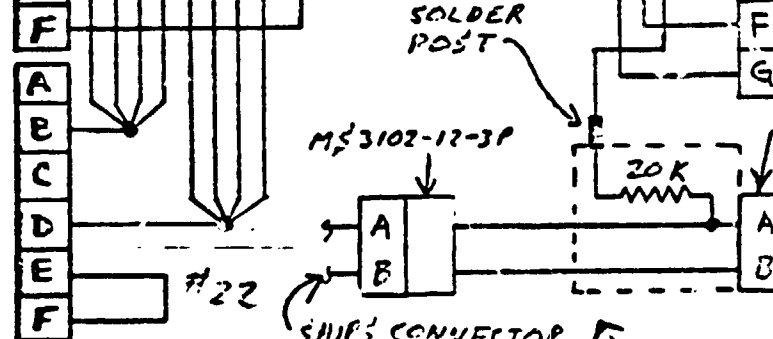
DISC # G
MARK:
R515

MARK: N₁ TACH GEN - 22



N₁ TACH GEN
(GAS
PRODUCER)

DISC # H
MARK:



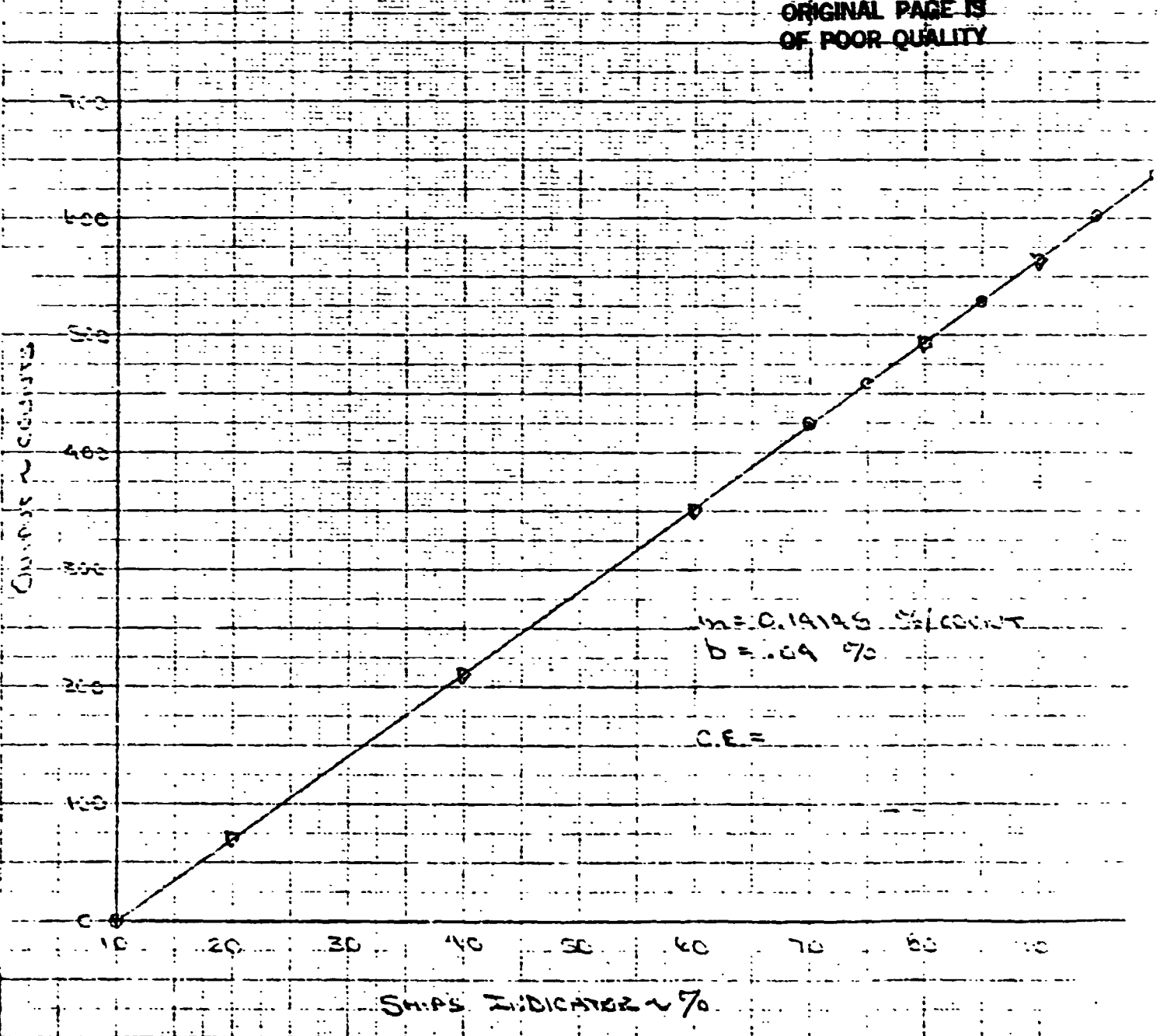
SHIP'S CONNECTOR & WIRING REMOVED FROM N₁ TACH GEN

INSTRUMENTATION MODULE & JUMPER CABLE

ITEM CODE: R515

LEFT ENGINE NI

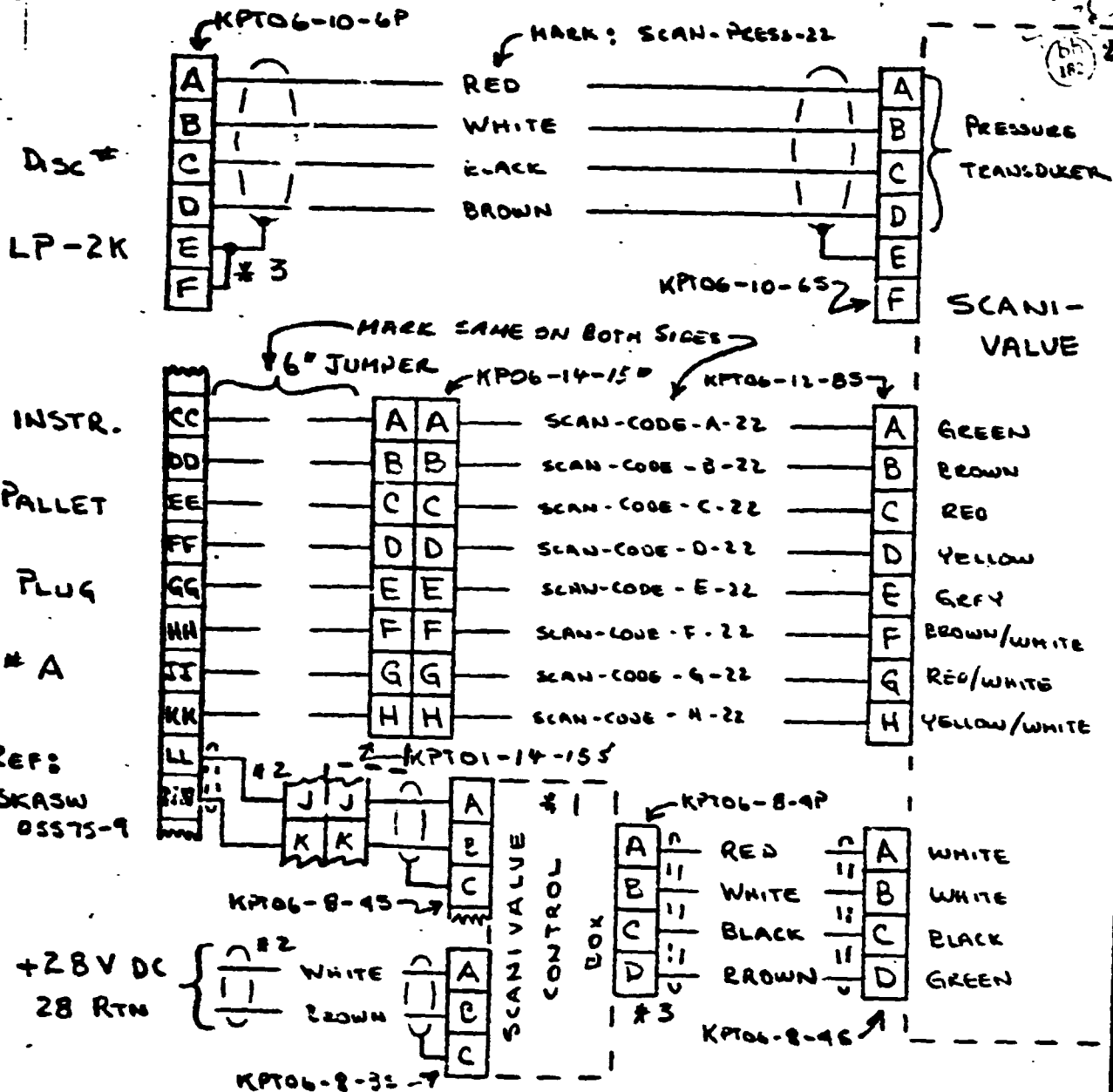
ORIGINAL PAGE IS
OF POOR QUALITY



SCANIVALVE CONTROL WIRING

PS12

ORIGINAL PAGE IS OF POOR QUALITY



- #1 CONTROL BOX MOUNTED ON LEFT PYLON
- #2 - USE 2 CONDUCTOR, 20 GAGE ORANGE WIRE
- #3 - USE 4 " " " " " "

CHECKED _____

POST OFFICE BOX 480 • FORT WORTH, TEXAS 76101

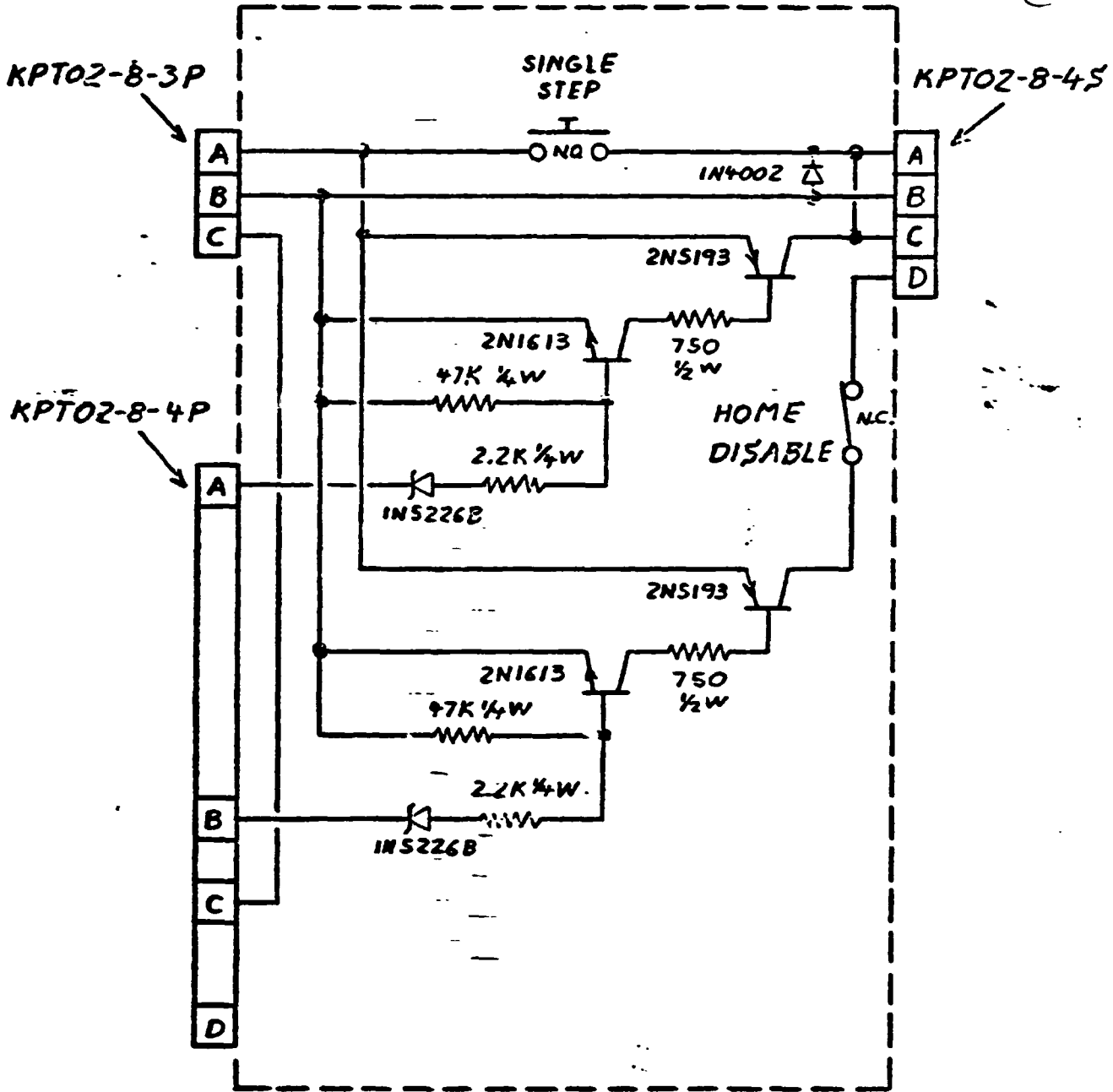
RPT _____

SCANIVALVE CONTROL BOX

PS12

ORIGINAL PAGE IS OF POOR QUALITY

1044
25-72
279

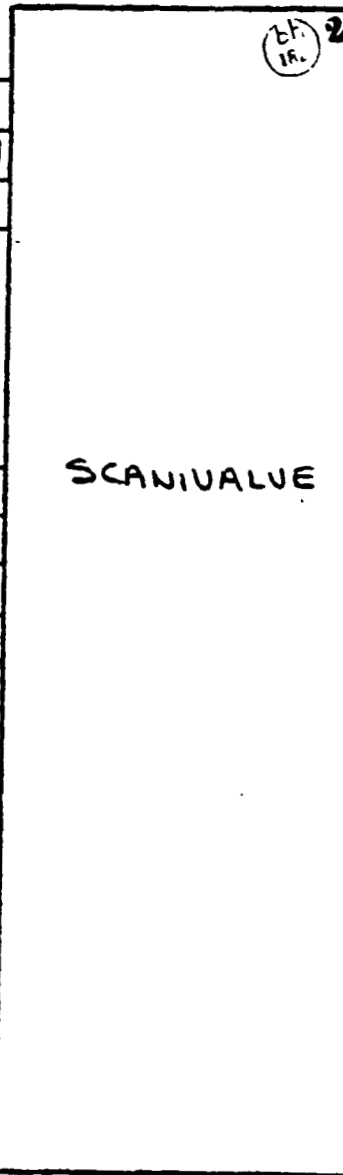
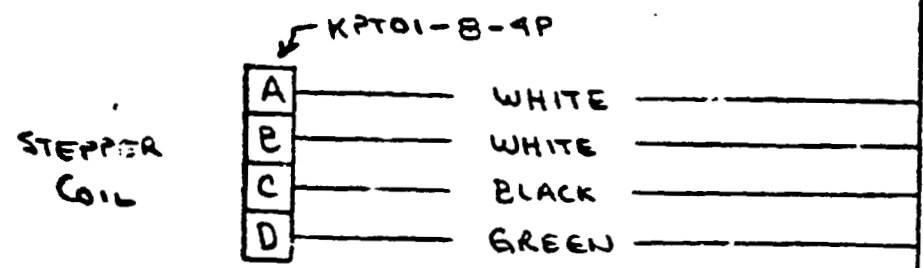
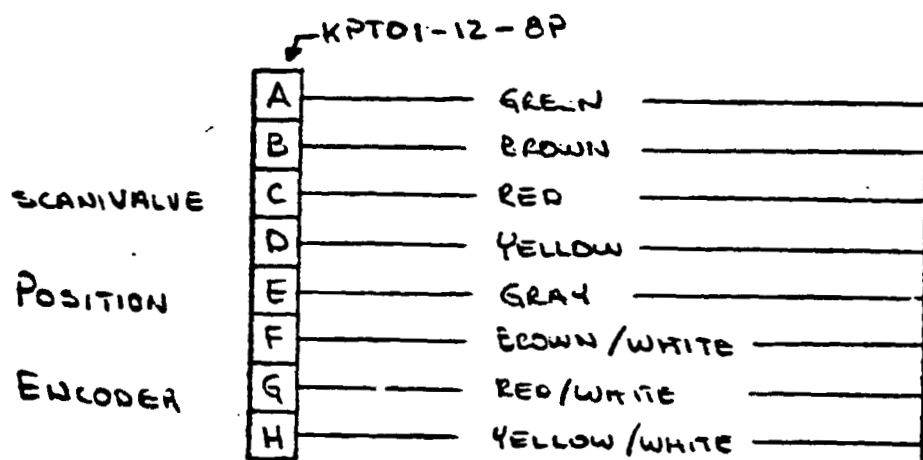
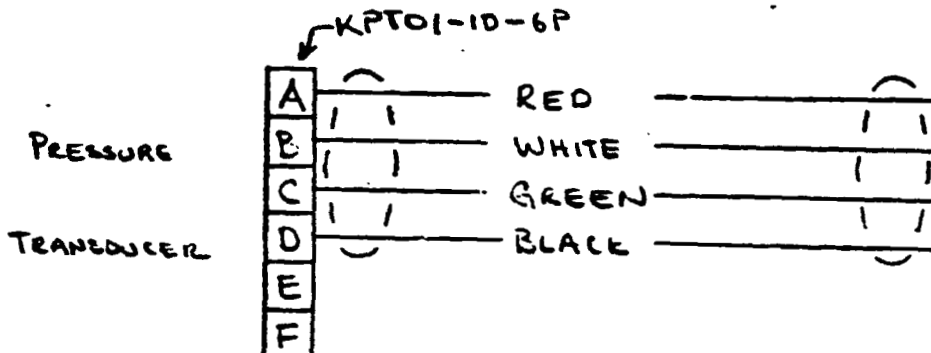


SCANIVALVE WIRING

PS12

ORIGINAL PAGE IS OF POOR QUALITY

279



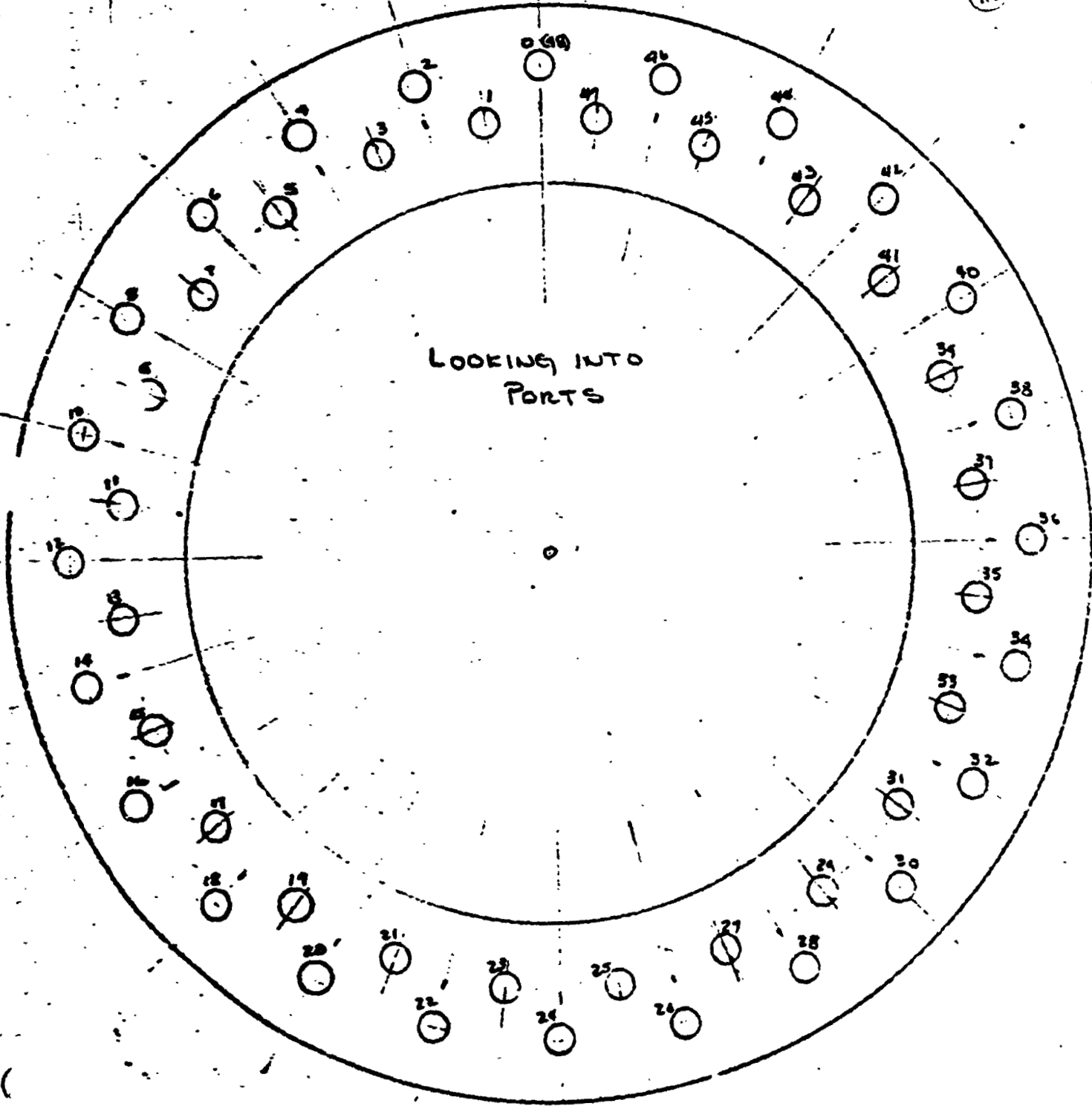
ORIGINAL PAGE IS
OF POOR QUALITY

SCANIVALVE

REMOVED
10-22-81

PS12

279

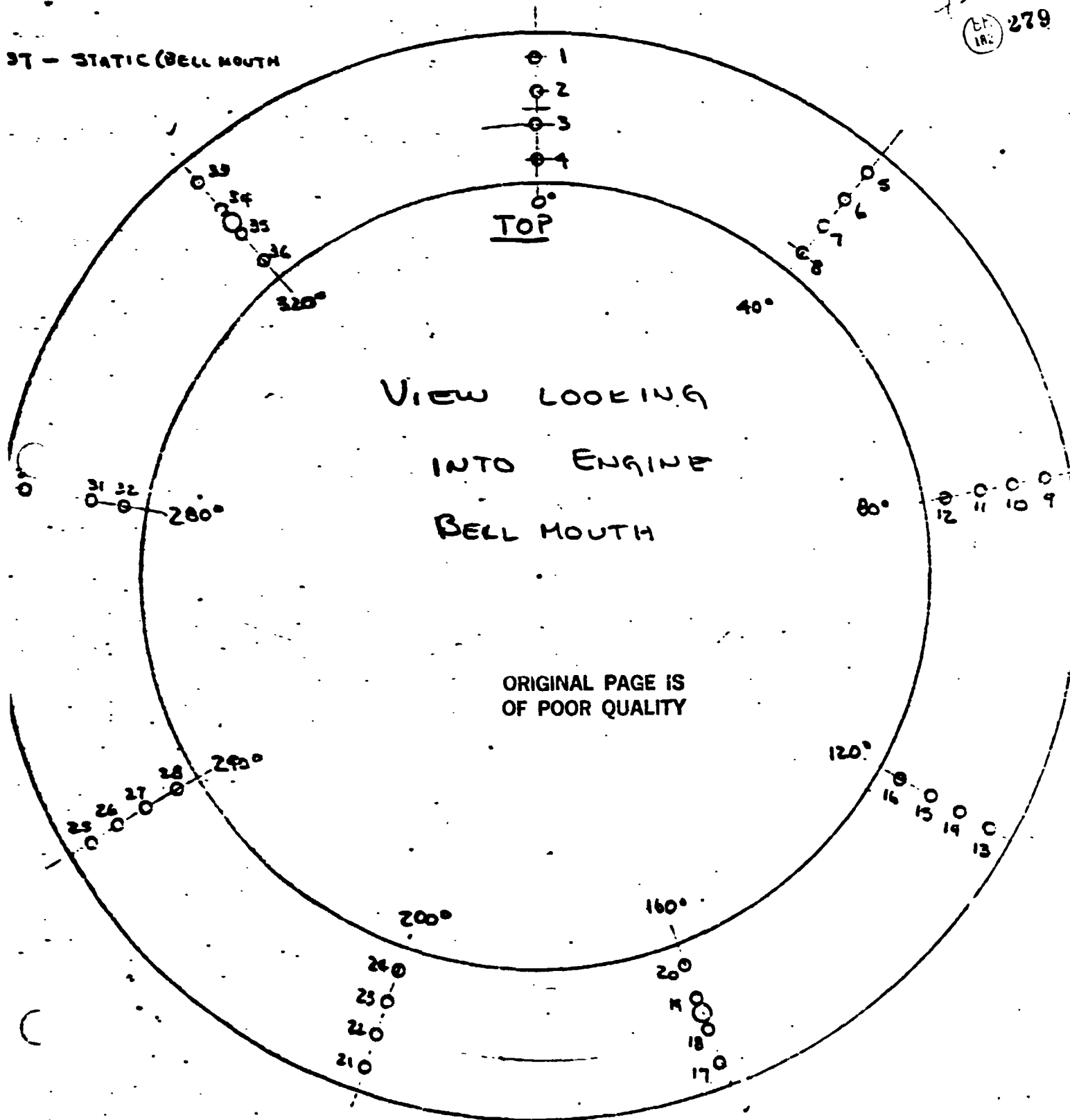


301 INPUT RAKE ENGINE (BELL MOUTH)

PS12

1-28
1-28
279

37 - STATIC (BELL MOUTH)



BY A. WHITENER

BELL HELICOPTER COMPANY
PO BOX 600000 600000 • PO BOX 600000 L 22222

MODEL 301 PAGE 5026

CHECKED _____

RPT ASWSK 32576-1

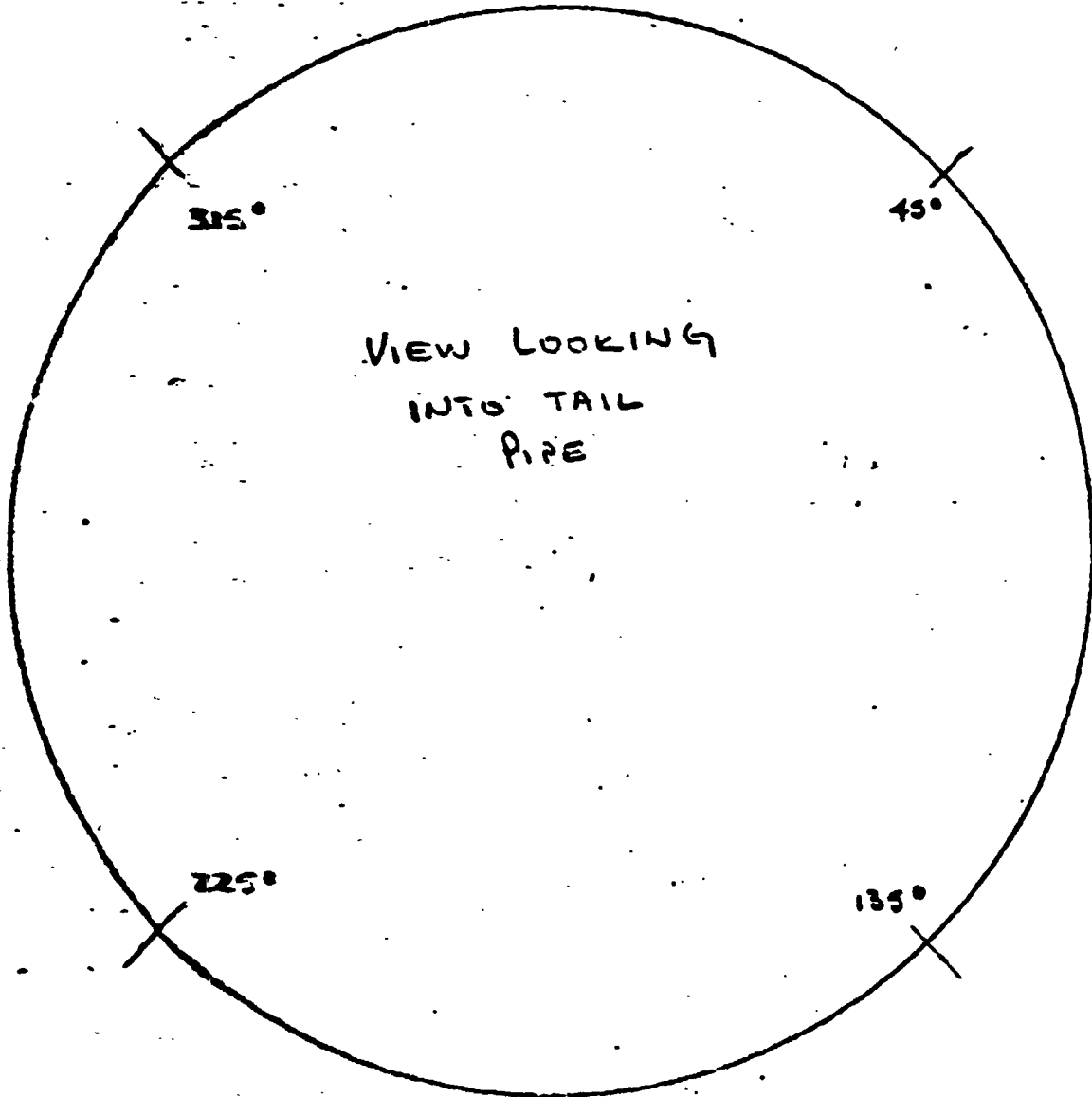
TAIL PIPE STATIC PRESSURE

PS12

ORIGINAL PAGE IS
OF POOR QUALITY

TRANSMISSION
↑

DTI 162 279



BY _____

BELL HELICOPTER COMPANY

MODEL 301 PAGE 6 OF 6

CHECKED _____

HELI. 1+2 RPT A SWSK 325X-1

ENGINE COWLING TOTAL AND STATIC PRESSURE

PS12

11/11/66
279
182

VIEW LOOKING
AFT

ORIGINAL PAGE IS
OF POOR QUALITY

LT.
O.B.

RT.
O.B.



BY A. WHITENER

BELL HELICOPTER COMPANY
POST OFFICE BOX 400 • FORT WORTH, TEXAS

MODEL 301 PAGE 6A OF 6

CHECKED _____

RPT ASWSK 32576-1

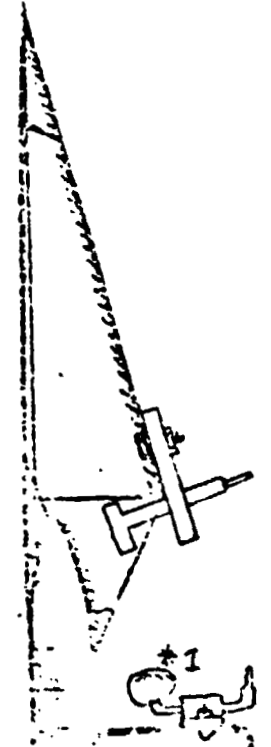
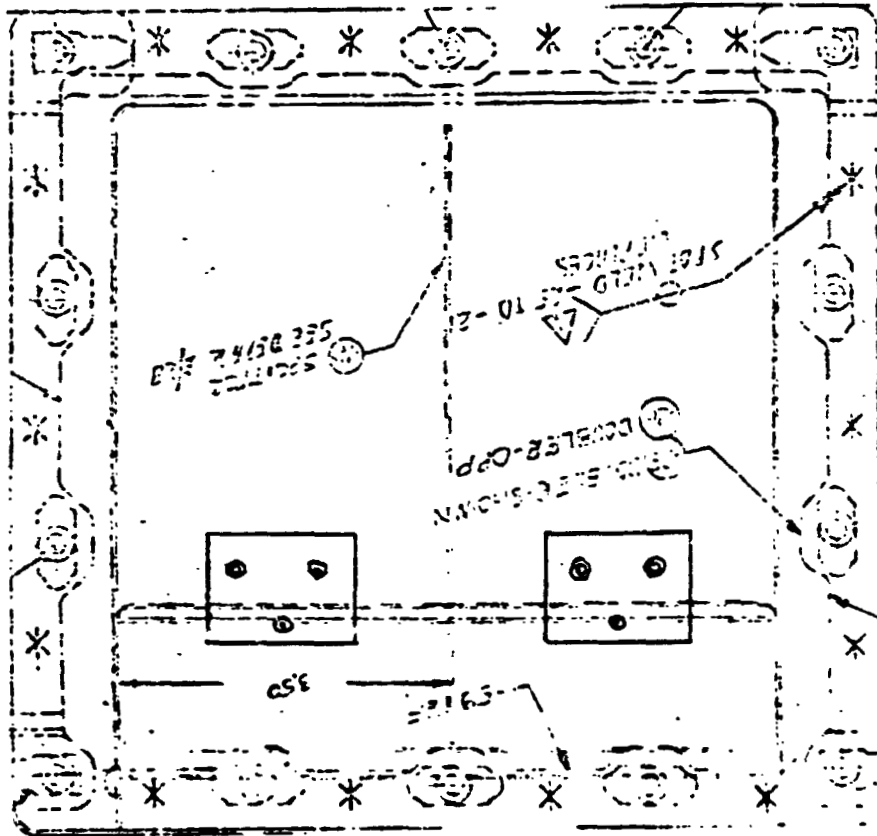
PS12

ORIGINAL PAGE IS
OF POOR QUALITY

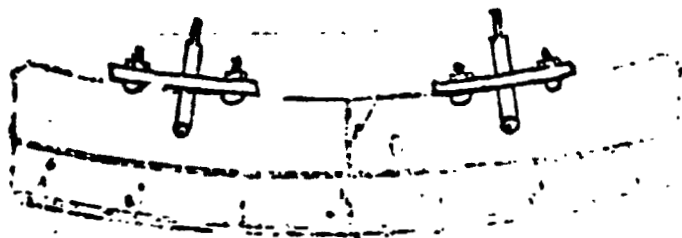
ENGINE COMPARTMENT AIR SCOOP LEFT ENGINE

TOTAL AND STATIC PRESSURE PROBES

28
29
279
EPI 182



VIEW LOOKING INTO SCOOP



*1 MOUNT STATIC PICKUP AT CENTER LINE BETWEEN THE TWO (2) SCOPES

7072 04280

CODE IDENT. NO. 9749
 AUTHORITY FOR CHANGE
 R.C.A. NO.
 L.W.A. NO.
 L.E.T.A.R. NO.

CHANGE
 RELEASE
 PROCESS
 TEST
 HES

SER. NO. 301-HE5-101
 SHEET 1 OF 4
 ENG'R'S WORK ORDER

REASON: ADD PRESSURE PICKUPS TO 301-860-913-S BELL MOUTH

DRAWINGS AFFECTED DRAWING CHANGE LTR. DRAWING TITLE

PS12
 219

1) FABRICATE LH ENGINE PRESSURE RAKE FOR MODEL 301 SHIP #1 AND #2 (A) BY ADDING 38 PRESSURE PORTS TO A 301-860-913-S BELL MOUTH. (1 BELL MOUTH PER SHIP) (A)

ORIGINAL PAGE IS OF POOR QUALITY

REVISION "A"
 CHANGED THE EFF TO INCLUDE SHIP #2 REPLACED SHIP #2 OF B.O. WISNER CONFIG. CHANGE.
 DRAW BY EYERIE 9/24/76
 PROJ. CARLSON 10/9/76

REVISION "B" - REM. 2 RIVETS FROM ATTACH PLATE. MILED PLATE TO THE OUTSIDE OF BELLMOUTH. CHG'D TUBE ANGLE FROM 15° TO 8°-10°. CHG OUTED TUBES. REED CUT TO ATTACH PLATE. REED RIVET DIM. ADDED DIM 2.0 / 2.5. REM. 50 DIM. ADD 2.0 / 2.5 DIM. 1.71 WAS 1.44, 1.19 WAS 1.68 - .69 WAS .72 - .22 WAS .36
 DRAW BY BOBBEE 9/29/76
 PROJ. CARLSON 10/9/76

REVISION "C" - ADDED THREE (3) STATIC PORTS AND A 1/4" COPPER AVERAGING TUBE. ADDED SHEET 4 TO ED. REVISED SHEET 2 OF ED TO SHOW LOCATION OF (3) PROBES.
 DRAW BY D. Winniford 10/9/76
 PROJ. CARLSON 10/9/76

STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION			
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	
PREPARED BY WINNIFORD	9-29-76	STRUCTURES				MET. DES.		
GROUP ENGR		CUSTOMER				WEIGHTS		
CHECKED BY		D.E.R.				PROJ. ENG. CARLSON	9-29-76	

MANUFACTURING EFFECTIVITY

ENGINEERING EFFECTIVITY

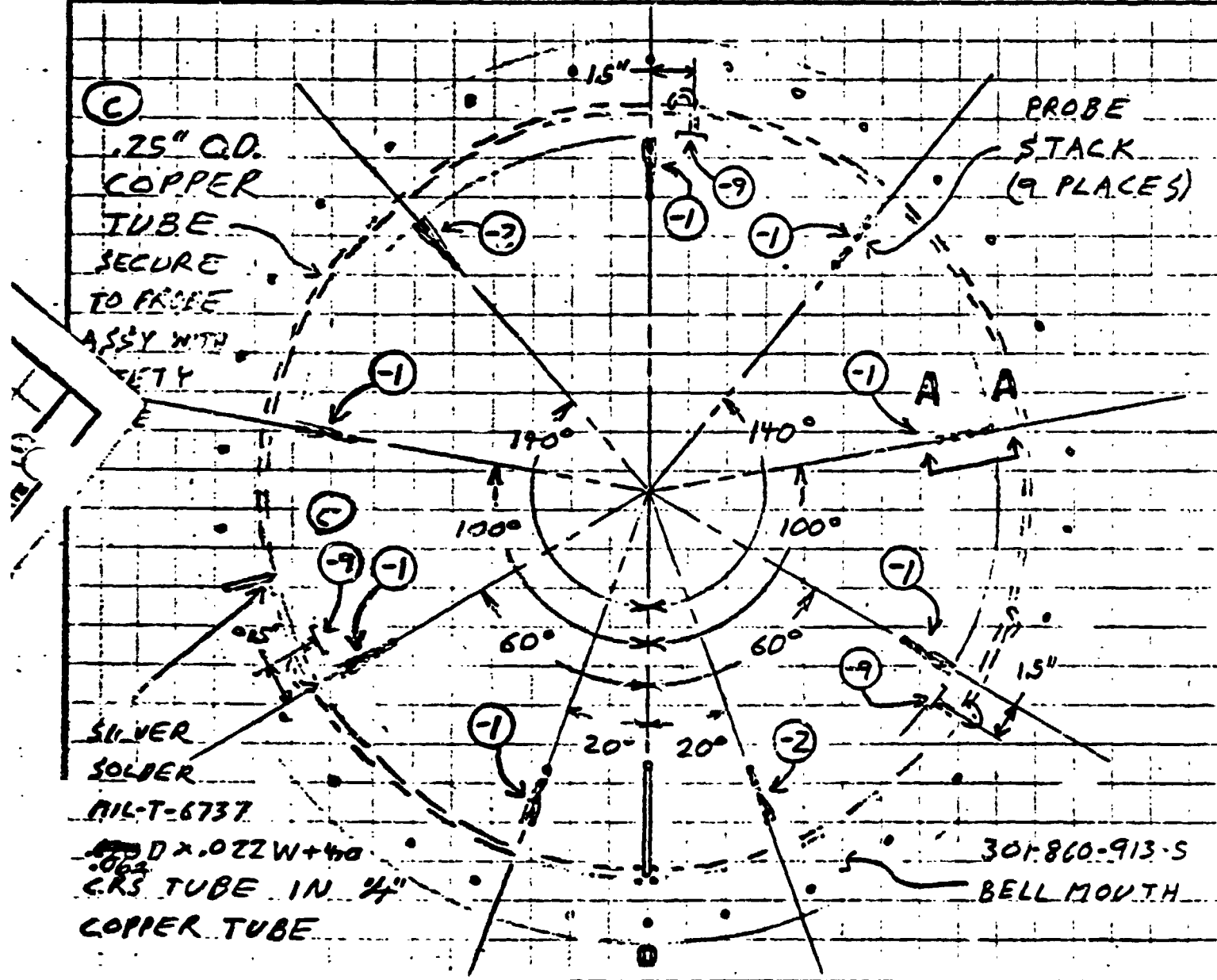
CODE IDENT. NO. 97499
 AUTHORITY FOR CHANGE
 P.C.A. NO.
 M.A. NO.

- CHANGE
- RELEASE
- PROCESS
- TEST
- HES

SER. NO. 301-HES-101
 SHEET 2 OF 4
 CLASS OF CHANGE
 BY CHANGE LTR. C
 ENG'R'S WORK ORDER

REASON: ADD PRESSURE PICKUPS TO 301-860-913-S BELL MOUTH

DRAWINGS AFFECTED [] DRAWING CHANGE LTR. [] NOT INCORP. [] INCORP. DRAWING TITLE 301-860-913-S BELL MOUTH



STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION	
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	
PREPARED BY D. WINN	7/77X	STRUCTURES		MET. DES.		
GROUP ENGR		CUSTOMER		WEIGHTS		
CHECKED BY		D.E.R.		PROJ. ENG. Know		
MANUFACTURING ACTIVITY		ENGINEERING EFFECTIVITY		ORIGINAL PAGE IS OF POOR QUALITY		

CODE IDENT. NO. 97499
 AUTHORITY FOR CHANGE
 A. NO.
 LRA NO. **A427-04**
 L.E.T.A.R. NO.

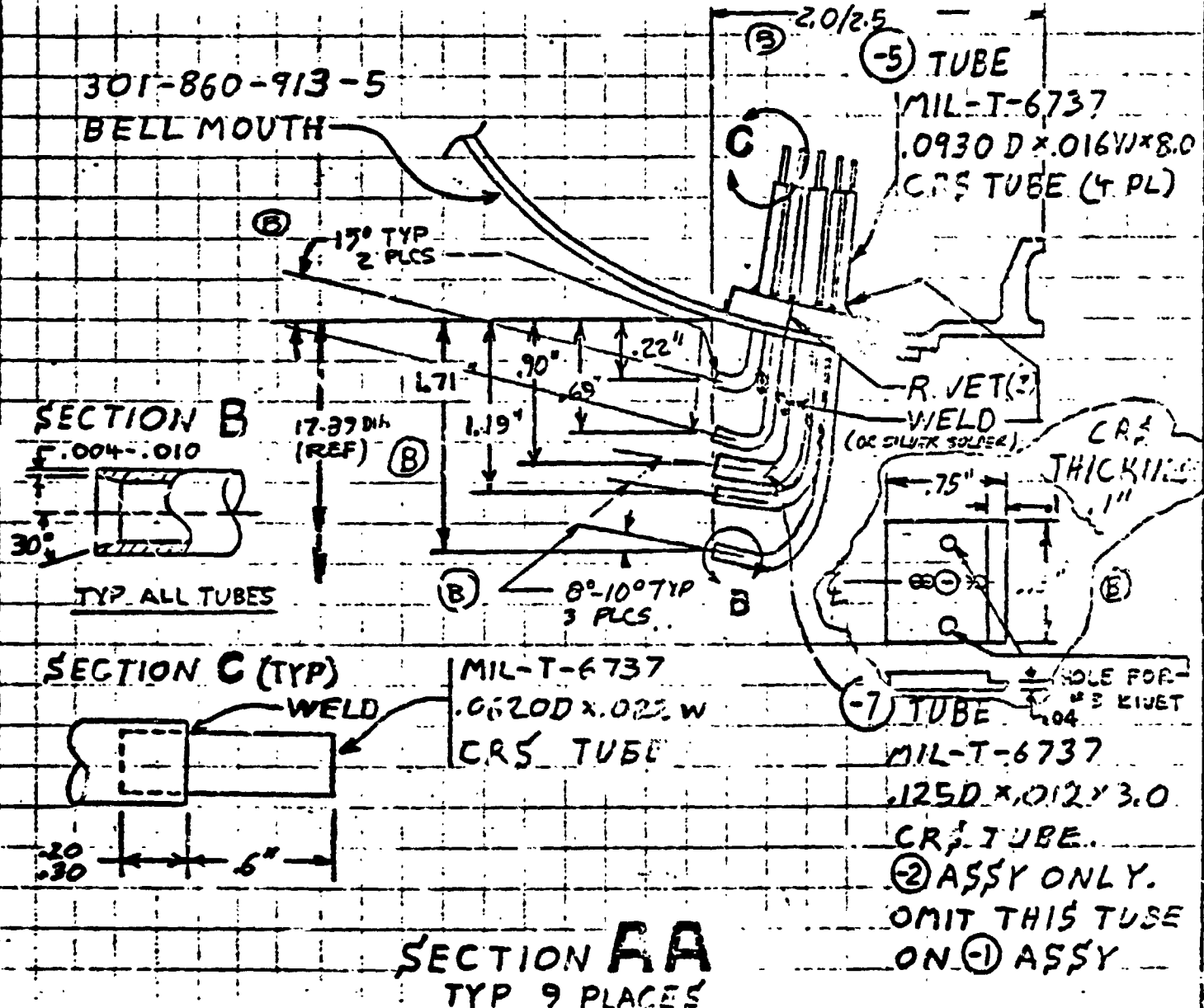
CHANGE
 RELEASE
 PROCESS
 TEST
 HES

REP. NO. **301-HES-101** SHEET **3**
 CLASS OF CHANGE ED NUMBER LTR. OF **C** **4**
 ENG'G WORK ORDER **A427**

REASON: **ADD PRESSURE PICKUPS TO 301-860-913-5 BELL MOUTH**

DRAWINGS AFFECTED **DRAWING CHANGE LTR.** DRAWING TITLE **279**

301-860-913-5 BELL MOUTH



SECTION B
 F.004-.010
 30°
 TYP. ALL TUBES

SECTION C (TYP)
 WELD
 20/30
 6"

MIL-T-6737
 .0620D x .025 W
 CR5 TUBE

(5) TUBE
 MIL-T-6737
 .0930 D x .016 W x 8.0
 CR5 TUBE (4 PL)
 R. JET (?)
 WELD (OR SILVER SOLDER)
 CR5 THICKNESS .1"
(7) TUBE
 MIL-T-6737
 .125 D x .012 x 3.0
 CR5 TUBE.
 (2) ASSY ONLY.
 OMIT THIS TUBE ON (1) ASSY

SECTION AA
 TYP 9 PLACES

STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION			
PREPARED BY D. V. WILFORD	9-17-78	STRUCTURES			SIGNATURE	DATE	SIGNATURE	DATE
DRG ENGR		CUSTOMER			ML DES.		WEIGHTS	
CHECKED BY		D. R.			PROJ. ENG. Carroll			
MANUFACTURING EFFECTIVITY					ENGINEERING EFFECTIVITY			

ORIGINAL PAGE IS OF POOR QUALITY

ORDER NO. **301-HE5-101**
 PRIORITY FOR ORDER
 NAME
 NAME
 STAFF NO.
 GRADE

CHANGE
 RELEASE
 PROCESS
 TEST
 YES

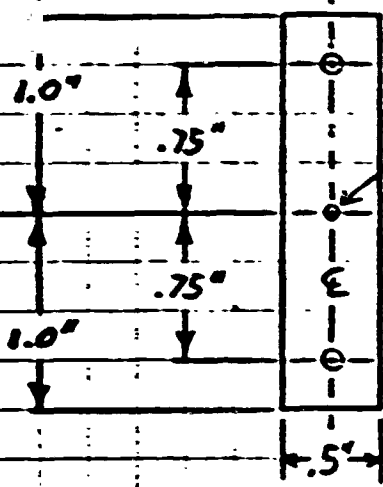
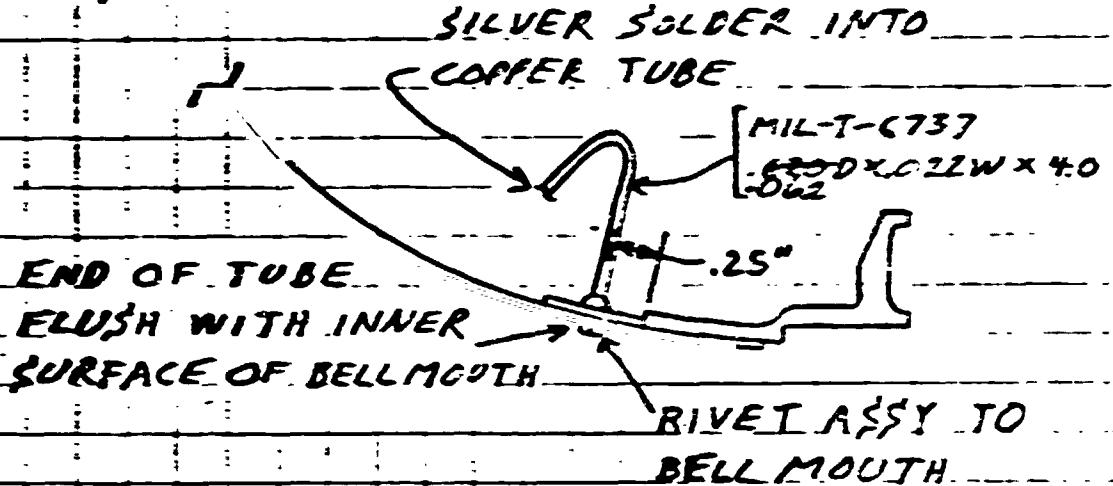
NO. **301-HE5-101** SHEET **4**
 C **4**
 ENGINEER'S WORK ORDER

ADD PRESSURE PICKUPS TO 301-860-913-S BELL MOUTH

ENGINEER AFFECTED: _____ DRAWING CHANGE LTR: _____ DRAWING TITLE: _____

(7) TUBE ASSEMBLY

ORIGINAL PAGE IS OF POOR QUALITY



C-6

STATUS	PARTS BY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION			
PREPARED BY <i>D. J. JENNIFER</i>	DATE <i>10/3/57</i>	SIGNATURES			MET. DES.			
YOUR ENGR		CUSTOMER			WEIGHTS			
CHECKED BY		EFFECTIVITY			PROJ. ENG.			

ORIGINAL PAGE IS OF POOR QUALITY

CODE IDENT NO. 5185
 AUTHORITY FOR CHANGE
 P.C.A. NO.
 D.E.A. NO. **A 415-03**
 STAR NO.

CHANGE
 RELEASE
 PROCESS
 TEST
 YES

DESK NO. **301HES-12** SHEET **1**
 DATE OF WORK ORDER

PROVIDE INSTRUMENTATION PORTS FOR TAIL PIPE TEST

273

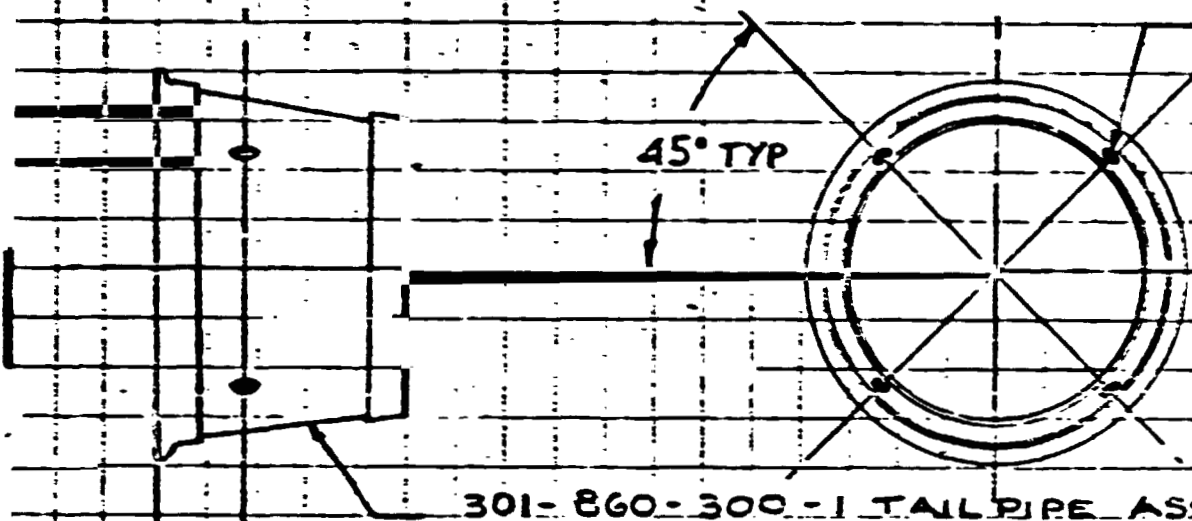
DRAWINGS AFFECTED

DRAWING TITLE

PS12

THIS IS THE ENGINEERING AUTHORITY TO ADD 4 HOLES TO TAIL PIPE AS SHN BELOW

.440 DIA - 4 HOLES



**301-860-300-1 TAIL PIPE ASSY.
 INDEX OF TAIL PIPE OPTIONAL.
 TAIL PIPE WILL BE FURNISHED TO HES. ON 1-1-75**

PARTS REQUIRED FOR TEST 1-3-75

NOTLEY N. BUSBEE EXT 3944 WHEN PART IS READY.

STATUS	PART/ASSY NO.	ADD.	REM.	CHG.	ENGINEERING DISPOSITION			
PREPARED BY	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE
BY BUSBEE		11/12/74	STRUCTURES					
YOUR ENGR		11/12/74	CUSTOMER					
CHECKED BY			D.E.R.					
MANUFACTURING EFFECTIVITY								

ENGINEERING EFFECTIVITY

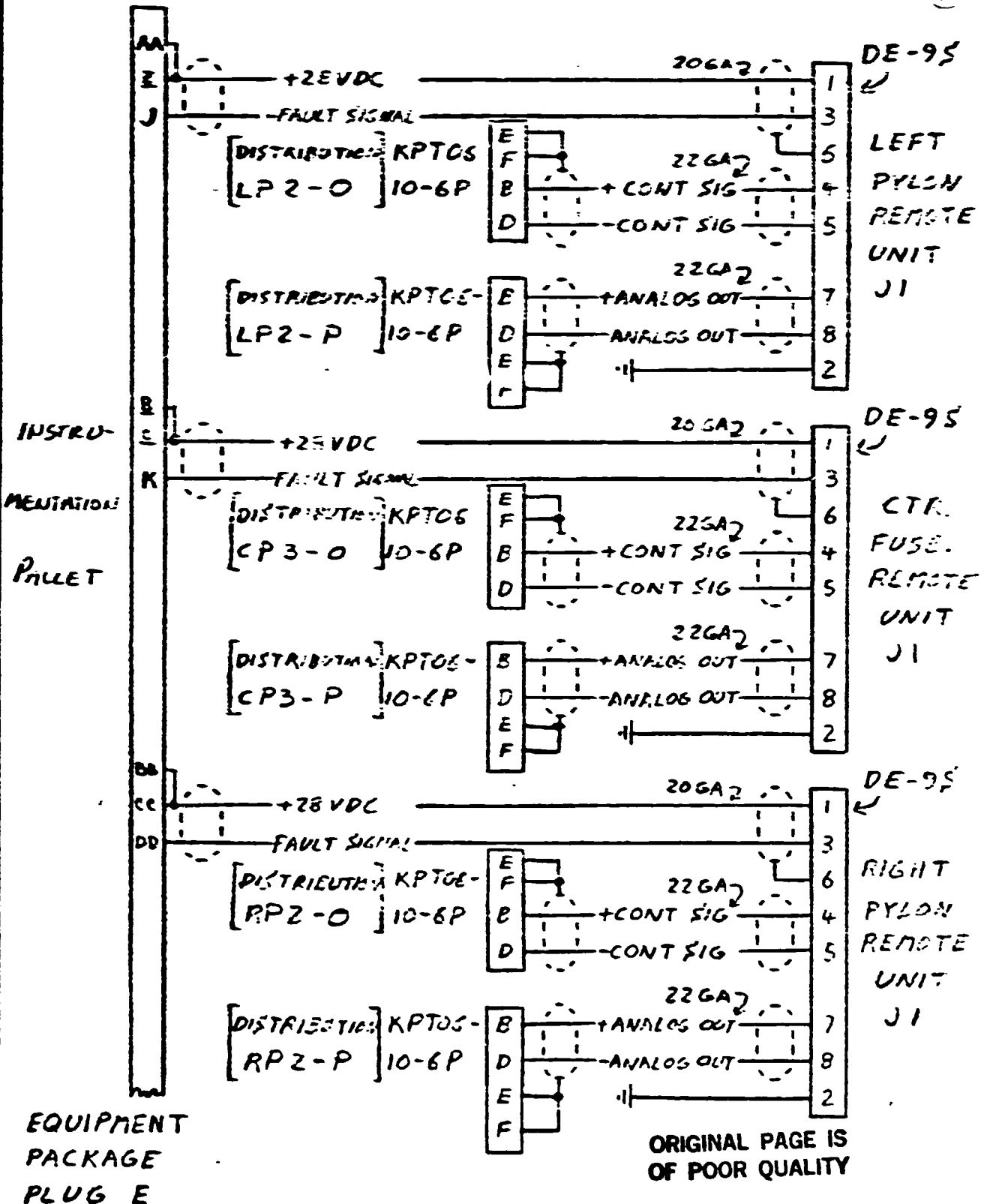
TEST

ORIGINAL PAGE IS OF POOR QUALITY

TSLB

TEMP SCANNER SYSTEM

289



INSTRUMENTATION PALLET

EQUIPMENT PACKAGE PLUG E

7042 000REV 100

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 672954
ENV. NO. A427-BA	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10997A
WORK ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 301-001-352-1
REQUESTED BY: A WHITENER	LOT NO. Q-A18AF47	SERIAL NO.

TITLE OF TEST

301 FLIGHT TEST

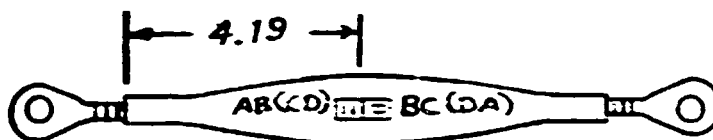
279

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

TUBE FORE & AFT CYCLIC

F187



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER
 WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX
 LEADS. ENCASE LEADS IN VINYL SLEEVING AND
 TERMINATE WITH M4P PLUG.

**F187
01**

BRIDGE	AXIAL						
BALANCE	4.62						
RES. TO GROUND	10kΩ						
DATE ASSIGNED	6-15-76	TECHNICIAN	C.C.W.		EST. HRS.	APPROVED BY:	
DATE COMPLETED	6-16-76	ENGINEER			ACT. HRS.		

SELECT NEXT TASK

TYPE FULL = AXIAL (As)
BRIDGE TYPE = AXIAL
LAB-OR NUMER = 10957A 01
BRIDGE VOLT = 18
BRIDGE STA. = 0

DATA
O(AMP) OFFSET = -445.5
UNITY CAL = 1159.516522

100% CE = 1013.1

REFLECTOR	LINEARITY(COUL)
0.0	0.0
3.890	0.2
7.780	0.1
11.670	0.0
15.560	0.0
19.450	0.0
23.340	0.1
27.230	0.2
31.120	0.0
35.010	0.0

15.79

F187

ORIGINAL PAGE IS
OF POOR QUALITY

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-C62TZ-350	SHEET NO. DLN 673352
EWA NO. A427-26	RESISTANCE 35Ω	LAB. NO. 12035 AF
DRK ORDER A427	GAGE FACTOR 2.07 ± 1%	PART NO. 300-001-621-1
REQUESTED BY: A. WHITENER	LOT NO. Q. A74B706	SERIAL NO. A190003

TITLE OF TEST

301 FLIGHT TEST

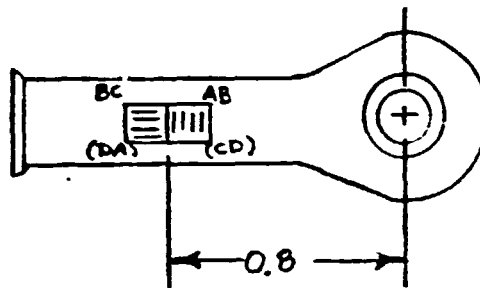
(279)

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

LATERAL ACTUATOR

F188



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE MB-600 CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER WITH 9309. ATTACH FOUR TEN INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL SLEEVING AND TERMINATE WITH KPT-06-8-4P PLUG.

01

BRIDGE	AXIAL						
BALANCE	-0.41						
RES TO GROUND	10kΩ						
DATE ASSIGNED	TECHNICIAN CCW			EST. HRS	APPROVED BY:		
DATE COMPLETED 4-19-78	ENGINEER			ACT. HRS			

LEFT

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: DOBIS

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 12035BF01
CAL DATE: 8-16-78
SERIAL NO: A1930003
P/N: 360-001-321-1
F188

PROJECT: 301 FLIGHT TEST

PART NAME: LATERAL ACTUATOR
CHANNEL: 03 - AXIAL LOADING(TENSION)

CALIBRATE EQUIVALENT: 100K = 3527 POUNDS
UNIT CAL = 4008 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.070
BRIDGE VOLT. : 10.00
PRE CAL. : 0.86
POST CAL. : 0.86

JACK FAC. : 0.0078 PSI/LB
LEVER ARM : NONE
CAL RES. : 100

LOADS-MILLIVOLTS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	0.045	15
0.00	0.00	0.000	-0.045	-18
2.38	332.05	0.890	0.015	7
5.19	680.82	1.770	0.026	11
7.93	1020.59	2.620	0.029	12
10.66	1371.94	3.470	0.002	1
13.28	1709.14	4.300	-0.009	-4
15.93	2050.19	5.140	-0.020	-8

MAXIMUM CALIBRATION LOAD: 2050 POUNDS

LEFT

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
IB TECHNICIAN: DCJIS

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 120358F01
CAL DATE: 6-15-76
SERIAL NO: A1900003
P/N: 360-001-321-1

F128

PROJECT: 301 FLIGHT TEST

PART NAME: LATERAL ACTUATOR
CHANNEL: 03 - AXIAL LOADING (COMPRESSION)

CALIBRATE EQUIVALENT: 100K = 3036 POUNDS
UNIT CAL = 3482 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.070
BRIDGE VOLT. : 10.00
PRE CAL. : 6.72
POST CAL. : 6.72

JACK FAC. : NONE
LEVER ARM : NONE

CAL RES. : 100

LOADS-POUNDS	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	0.036	13
0.00	0.00	0.000	-0.036	-13
100.00	100.00	0.320	-0.003	-1
200.00	200.00	0.630	0.020	7
300.00	300.00	0.910	0.013	4
400.00	400.00	1.190	0.005	2
500.00	500.00	1.460	0.008	3
600.00	600.00	1.770	0.011	4
700.00	700.00	2.060	0.014	5
800.00	800.00	2.330	-0.003	-1
900.00	900.00	2.610	-0.011	-4
1000.00	1000.00	2.690	-0.018	-6

MAXIMUM CALIBRATION LOAD: 1000 POUNDS

BMC PROGRAM FCCR33 - RUN DATE: 06-20-76

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA06-125 TB-550	SHEET NO. DLN 678957
NO. A427-11A	RESISTANCE 350 ± 0.470	LAB. NO. 11002A
ORDER A427	GAGE FACTOR 2.07 ± 0.5%	PART NO. 300-010-417-1
REQUESTED BY: A. WHITENER	LOT NO. Q-A35AD13	SERIAL NO.

TITLE OF TEST

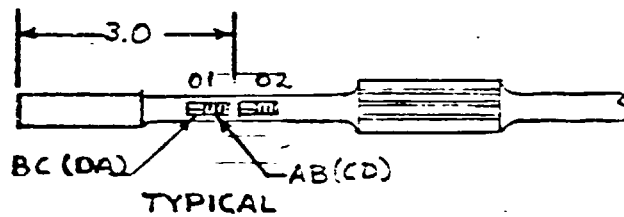
301 FLIGHT TEST

278

SKETCH:

COLLECTIVE TUBE

F189



ORIGINAL PART IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGES AS SHOWN. USE BR-600
CEMENT. MAKE BRIDGE AT FLAT TERMINAL AS
INDICATED. COVER WITH SHELL 9309.

	01	02					
BRIDGE	AXIAL	AXIAL					
RESISTANCE	4.11	4.83					
TO GROUND	5KΩ	5KΩ					
DATE ASSIGNED	TECHNICIAN <i>Hollis</i>		EST. HRS.		APPROVED BY.		
DATE COMPLETED	ENGINEER		ACT. HRS.				
	6-16-76						

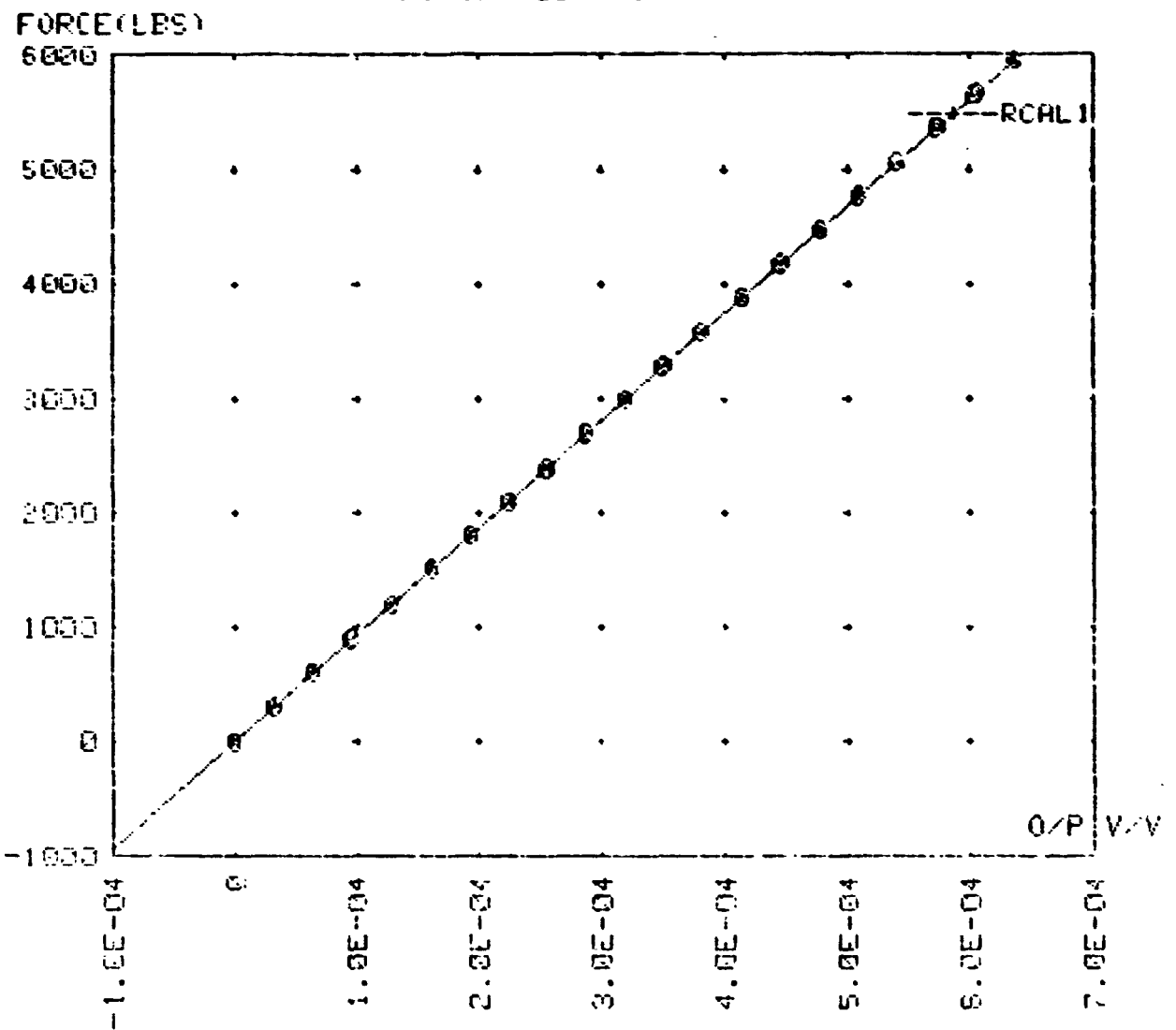
ORIGINAL PAGE IS
OF POOR QUALITY

XV-15 TILT ROTOR #703
TENSION FORCE CALIBRATION
SERIAL # : 002 GAGE02
MODEL # : 300-010-417-1
TARE WEIGHT : 0 lbs
FULL-SCALE LOAD : 6000 lbs

T.O. : D-708
DATE : 1-19-82

- 02. 21. 27
(0.02 2.1, 2.1)

XV-15 TILT ROTOR #703



- SIGN INDICATES FIRST HALF OF THE LOADING CYCLE

RESISTOR = 150 OHMS

	NO LOAD V/V	RCAL V/V	SIG RMF
NO LOAD #1 = .000586 V/V	.000136	.000782	-
TARE #2 = .000104 V/V	.000196	-.000366	+

A.F. RMF = 0.0001 O/P OHM = 251.40

XV-15 TILT ROTOR 8703
 TENSION FORCE CALIBRATION
 SERIAL # : 002 GAGE02
 MODEL # : 300-010-417-1
 TARE WEIGHT : 0 lbs
 FULL-SCALE LOAD : 6000 lbs

T.O. : B-708
 DATE : 1-19-82

RUN #	O/P V V	V1	EXCIT. V2 V	(V1-V0)/V2 V/V	STD LOAD lbs	CALC. LOAD lbs	DEV. lbs	ACCU. %(F.S.)
1	.001180		6.00050	0.0000000	0.00	-0.24	-0.24	-0.004
2	.001379		6.00051	.0000332	311.34	310.17	-1.18	-0.020
3	.001529		6.00050	.0000648	610.54	606.23	-4.31	-0.072
4	.001761		6.00050	.0000968	908.32	905.72	-2.60	-0.043
5	.001950		6.00050	.0001283	1195.29	1201.00	5.71	.0095
6	.002149		6.00053	.0001615	1508.00	1511.72	3.72	.062
7	.002336		6.00050	.0001928	1800.32	1804.04	3.72	.062
8	.002519		6.00052	.0002232	2087.83	2089.02	1.19	.020
9	.002714		6.00053	.0002557	2388.38	2393.50	5.12	.085
10	.002905		6.00052	.0002875	2689.41	2696.66	7.25	.021
11	.003096		6.00051	.0003194	2985.21	2989.53	4.32	.072
12	.003279		6.00053	.0003499	3276.06	3274.50	-1.56	-0.026
13	.003470		6.00050	.0003816	3573.70	3571.83	-1.87	-0.031
14	.003665		6.00052	.0004142	3876.87	3876.61	-0.26	-0.031
15	.003851		6.00053	.0004452	4168.44	4172.29	3.85	.091
16	.004047		6.00052	.0004778	4472.18	4471.54	-0.64	-0.011
17	.004235		6.00052	.0005092	4766.47	4766.19	-0.28	-0.005
18	.004421		6.00054	.0005402	5059.92	5058.15	-1.77	-0.033
19	.004613		6.00051	.0005722	5355.58	5355.51	-0.07	-0.001
20	.004801		6.00052	.0006037	5645.58	5648.60	3.02	.052
21	.004997		6.00053	.0006351	5956.85	5954.01	-2.84	-0.047
22	.004816		6.00053	.0006059	5674.21	5671.21	-3.00	-0.050
23	.004622		6.00050	.0005736	5369.76	5368.44	-1.32	-0.022
24	.004423		6.00051	.0005406	5057.34	5059.30	1.96	.034
25	.004233		6.00052	.0005088	4763.74	4762.29	-1.44	-0.021
26	.004047		6.00052	.0004779	4472.91	4472.94	0.03	.001
27	.003862		6.00052	.0004471	4185.40	4184.37	-1.03	-0.017
28	.003668		6.00051	.0004147	3878.28	3881.30	3.01	.050
29	.003473		6.00051	.0003812	3575.89	3577.28	1.39	.033
30	.003291		6.00053	.0003519	3291.02	3293.07	2.05	.034
31	.003097		6.00053	.0003196	2990.62	2991.08	.46	.008
32	.002910		6.00052	.0002883	2698.32	2697.99	-0.33	-0.005
33	.002710		6.00054	.0002550	2386.32	2386.95	.63	.010
34	.002522		6.00054	.0002239	2096.83	2094.79	-2.05	-0.034
35	.002339		6.00053	.0001931	1807.91	1807.47	-0.45	-0.007
36	.002148		6.00053	.0001613	1507.42	1509.85	2.43	.040
37	.001948		6.00052	.0001281	1194.70	1198.35	3.65	.051
38	.001754		6.00054	.0000951	898.25	895.11	-3.14	-0.032
39	.001568		6.00054	.0000647	609.32	605.45	-3.88	-0.050
40	.001371		6.00054	.0000318	303.27	297.69	-5.58	-0.050
41	.001178		6.00051	-.0000000	-2.04	-2.74	-0.70	-0.012

LEAST SQUARE LINE EQUATION : Y=0.0000000X
 INTERCEPT = 0.0000000
 SLOPE = 0.0000000

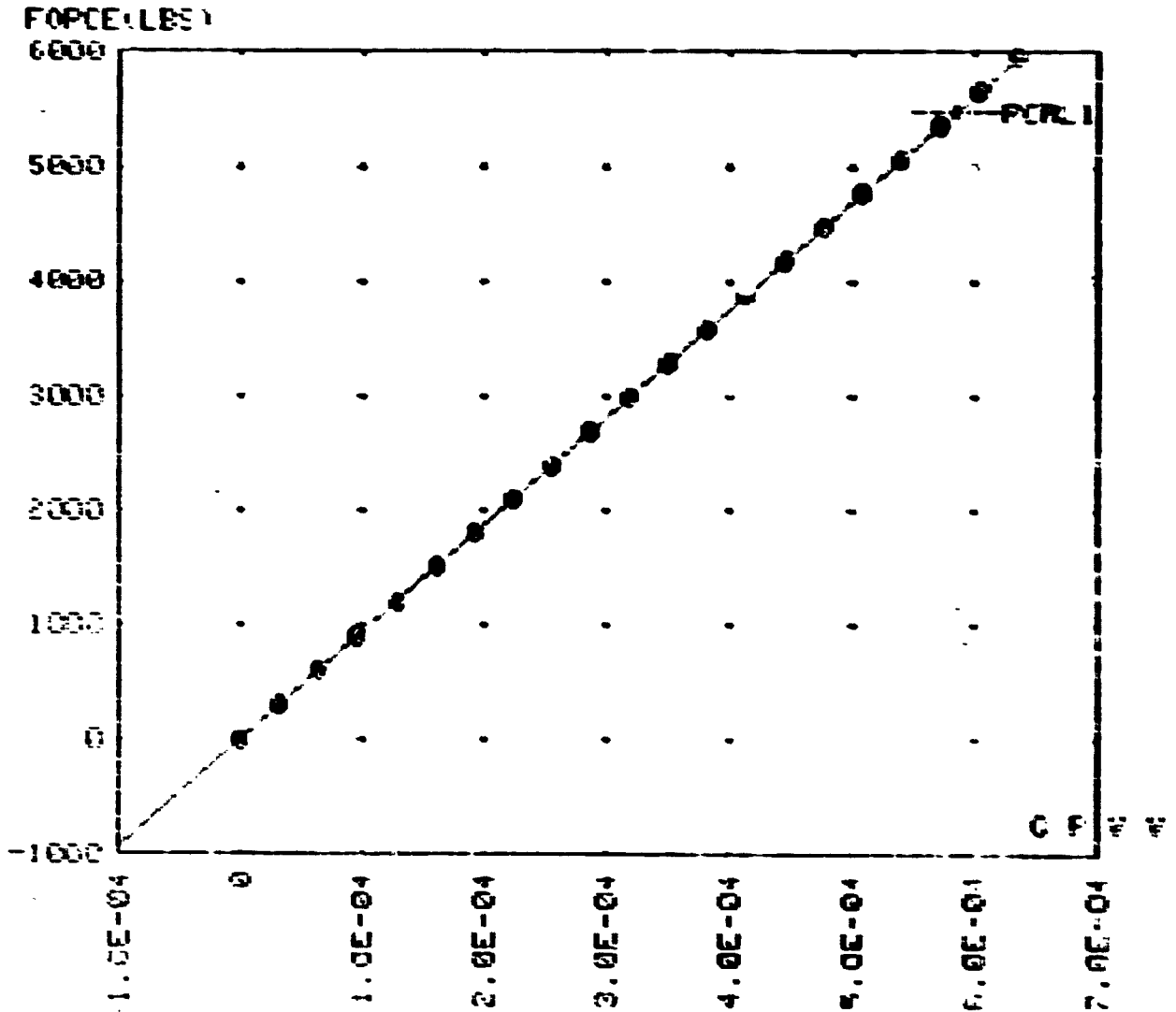
STANDARD DEVIATION = 2.05 lbs
 PERCENT DEVIATION = 5.0%
 CORRELATION COEFF. = 0.0000000

ORIGINAL PAGE IS
 OF POOR QUALITY

XV-15 TILT ROTOR #703
 TENSION FORCE CALIBRATION
 SERIAL # : 802 CASE#:
 MODEL # : 300-010-417-1
 TARE HEIGHT : 0 lbs
 FULL-SCALE LOAD : 6000 lbs

T.O. : D
 DATE : 1-19-58

XV-15 TILT ROTOR #703



* SIGN INDICATES FIRST HALF OF THE LOADING CYCLE

RESISTOR = 150 OHMS

FCR1 #1 = .000594 V/V
 FCR1 #2 = -.000505 V/V

NO LOAD V/F
 .000035
 .000009

FCR2 V/V
 .000073
 -.000458

SIG F/F
 -
 +

I/F OHM= 350.72 O/F OHM= 351.42

ORIGINAL PAGE IS
 OF POOR QUALITY

XV-15 TILT ROTOR 8703
 TENSION FORCE CALIBRATION
 SERIAL # :002 GAGE01
 MODEL # :300-010-417-1
 TAPE HEIGHT : 0 lbs
 FULL-SCALE LOAD : 6000 lbs

T.O. :D-708
 DATE :1-19-82

RUN #	O/P V1 V	EXCIT. V2 V	(V1-V0)/V2 V/V	STD LOAD lbs	CALC. LOAD lbs	DEV. lbs	ACCU. %(F.S.)
1	.000532	6.00074	0.000000	0.00	- .88	- .88	-.015
2	.000736	6.00074	.0000330	311.34	308.37	-2.97	-.050
3	.000921	6.00075	.0000647	610.54	605.59	-4.95	-.082
4	.001112	6.00076	.0000967	908.32	905.47	-2.85	-.048
5	.001302	6.00077	.0001282	1195.29	1201.28	5.99	.100
6	.001501	6.00075	.0001614	1508.00	1512.41	4.41	.074
7	.001688	6.00076	.0001925	1800.32	1804.47	4.14	.069
8	.001870	6.00076	.0002229	2087.83	2089.18	1.35	.023
9	.002065	6.00075	.0002554	2388.38	2393.75	5.37	.090
10	.002255	6.00076	.0002871	2689.41	2699.96	10.55	.176
11	.002446	6.00075	.0003189	2985.21	2989.44	4.23	.070
12	.002629	6.00077	.0003494	3276.06	3275.39	-.67	-.011
13	.002819	6.00077	.0003811	3573.70	3572.77	-.93	-.015
14	.003014	6.00076	.0004135	3876.87	3877.02	.16	.001
15	.003219	6.00078	.0004444	4168.44	4166.73	-1.72	-.029
16	.003394	6.00077	.0004769	4472.18	4471.30	-.88	-.015
17	.003583	6.00077	.0005084	4766.47	4766.33	-.14	-.002
18	.003789	6.00077	.0005393	5059.92	5055.04	-4.88	-.080
19	.003990	6.00078	.0005711	5355.58	5354.49	-1.09	-.018
20	.004147	6.00077	.0006023	5645.58	5645.73	1.14	.019
21	.004343	6.00077	.0006349	5955.85	5953.01	-2.84	-.044
22	.004561	6.00077	.0006647	6274.21	6269.86	-4.35	-.073
23	.004800	6.00077	.0006925	6609.76	6607.64	-2.12	-.035
24	.005070	6.00077	.0007193	6957.24	6958.07	.84	.012
25	.005360	6.00077	.0007479	7313.74	7311.95	-1.79	-.030
26	.005680	6.00078	.0007771	7679.91	7673.32	-.41	-.007
27	.006021	6.00077	.0008064	8055.40	8055.02	-.39	-.006
28	.006387	6.00078	.0008340	8441.28	8441.54	3.25	.054
29	.006780	6.00078	.0008617	8837.99	8837.79	-.20	-.003
30	.007201	6.00077	.0008894	9245.02	9244.21	-.81	-.013
31	.007640	6.00078	.0009172	9662.82	9662.85	0.03	.000
32	.008100	6.00079	.0009451	10091.92	10091.25	-.67	-.011
33	.008580	6.00079	.0009731	10532.82	10531.79	-.93	-.015
34	.009080	6.00077	.0010011	10985.02	10987.47	2.45	.040
35	.009600	6.00077	.0010291	11448.91	11448.99	1.08	.018
36	.010140	6.00078	.0010571	11925.42	11911.14	-14.28	-.238
37	.010700	6.00078	.0010851	12414.70	1198.62	-1152.08	-19.33
38	.011280	6.00078	.0011131	12917.25	893.15	-1208.60	-18.45
39	.011880	6.00078	.0011411	13433.62	604.02	-1289.60	-21.49
40	.012500	6.00077	.0011691	13964.27	292.73	-1371.54	-22.85
41	.013140	6.00078	.0011971	14509.70	-2.91	-1412.61	-23.54

STRETCH LINE EQUATION : Y=0.00000000X+0.00000000
 Y-INTERCEPT = 0.00000000 lbs
 SLOPE = 0.00000000 lbs

ORIGINAL PAGE IS
 OF POOR QUALITY

STRETCH LINE EQUATION : Y=0.00000000X+0.00000000
 Y-INTERCEPT = 0.00000000 lbs
 SLOPE = 0.00000000 lbs

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: GRESAK

LAB NO. : 11002AC1
CAL DATE: 7-13-70
SERIAL NO: 001
P/N: 306-010-417-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: COLLECTIVE TUBE

CHANNEL: 01 - AXIAL LOADING, BRIDGE 01

F189

CALIBRATE EQUIVALENT: 100K = 8055 POUNDS
UNIT CAL = 9221 POUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.073
BRIDGE VOLT. : 10.00

JACK FAC. : 0.2870 PSI/LB
LEVER ARM : NONE

LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	0.029	7950
0.00	0.00	0.040	0.011	10
345.00	1202.09	9.920	-0.013	-12
690.00	2404.18	11.230	-0.036	-6
1035.00	3606.27	12.550	-0.010	-9
1380.00	4808.36	13.880	0.036	33
1725.00	6010.45	15.130	-0.018	-16

MAXIMUM CALIBRATION LOAD: 6010 POUNDS

BHC PROGRAM F00R35 - RUN DATE: 07-15-70

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: GRESAK

LAB NO. : 11002A32
CAL DATE: 7-13-76
SERIAL NO: 031
P/N: 300-010-417-1

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: COLLECTIVE TUBE

CHANNEL: C4 - AXIAL LOADING, BRIDGE 02

CALIBRATE EQUIVALENT: 100K = 8504 PCUNDS
UNIT CAL = 9162 PCUNDS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.870
BRIDGE VOLT. : 10.00

JACK FAC. : 0.2870 PSI/LB
LEVER ARM : NONE

LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	MEAN LINE PCUNDS
	0	0.000	1.447	1325
0.0	0.00	1.466	0.013	12
345.00	1202.09	2.730	-0.029	-20
690.00	2404.18	4.060	0.009	9
1035.00	3606.27	5.380	-0.003	-2
1380.00	4808.36	6.720	0.025	23
1725.00	6010.45	7.990	-0.017	-15

MAXIMUM CALIBRATION LOAD: 6010 PCUNDS

BHC PROGRAM FCCR33 - RUN DATE: 07-15-76

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 67895A
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10995A
ORK ORDER A427	GAGE FACTOR 2.14 ± 1.0%	PART NO. 301-860-934-1
REQUESTED BY: A. WHITENER	LOT NO. Q-A32AF06	SERIAL NO. 279

TITLE OF TEST: (b1) 279
301 FLIGHT TEST

SKETCH:

TUBE ASSY - FRAME

F520



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER
WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX
LEADS. ENCASE LEADS IN VINYL SLEEVING AND
TERMINATE WITH MAP PLUG.

F520
01

BRIDGE	AXIAL							
BALANCE	4.19							
RES. TO GROUND	15.1111							

DATE ASSIGNED 6-17-76	TECHNICIAN CHUCK	EST. HRS.	APPROVED BY:
DATE COMPLETED 6-18-76	ENGINEER	ACT. HRS.	

TEST TABLE

TYPE FULL BRIDGE (Pos)
BRIDGE TYPE=ACIAL
LOAD-CELL NUMBER=100258 01
BRIDGE MULTI= 10
BRIDGE STA.= 0

DATA
0. MV OFFSET= -148.9
UNITY CAL= 828.9261541

IN	OUTPUT MV	LINEARITY (UCI)	100% CE=	724.2
0.0	1.000	0.0		
0.1	2.200	0.0		
0.2	4.600	0.0		
0.3	6.100	0.0		
0.4	7.500	0.1		
0.5	9.000	0.0		
0.6	10.140	0.2		
0.7	11.000	1.0		
0.8	11.820	0.0		

7.21

F520

ORIGINAL PAGE IS
OF POOR QUALITY

INSTRUMENTATION LABORATORY WORK SHEET

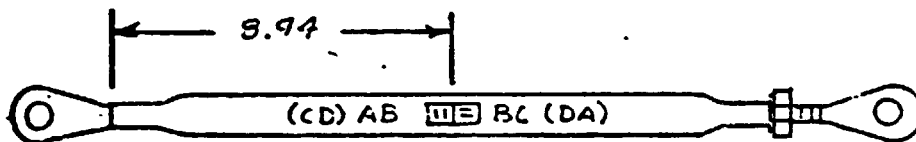
MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 678954
EWA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10996A
PK ORDER A427	GAGE FACTOR 2.14 ± 1.0%	PART NO. 301-860-934-31
REQUESTED BY: A. WHITENER	LOT NO. Q-A32AF06	SERIAL NO. 128

TITLE OF TEST (279)
301 FLIGHT TEST

SKETCH:

TUBE ASSY - FRAME

F521



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER
 WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX
 LEADS. ENCASE LEADS IN VINYL SLEEVING AND
 TERMINATE WITH M4P PLUS.

F521
01

BRIDGE	AXIAL						
SLANCE	4.73						
RES. TO GROUND	10KΩ						

DATE ASSIGNED 6-17-76	TECHNICIAN CHUCK	EST. HRS.	APPROVED BY:
DATE COMPLETED 6-18-76	ENGINEER	ACT. HRS.	

TYPE FULL = 0.100 (Pos)
BRIDGE TYPE=RTIAL
LRA-BP NUMBER=100000 01
BRIDGE VOLT= 10
BRIDGE STR.= 0

DATA
0KRV OFFSET= 61.2
UNITY CAL= 995.205569

100% CE= 729.

	OUTPUT (mV)	LINEARITY (% of 1)
0.0	-0.670	0.0
10.0	0.580	0.0
20.0	2.100	0.4
30.0	3.530	0.3
40.0	5.020	0.1
50.0	6.500	0.0
60.0	8.000	0.1
70.0	9.560	0.8
80.0	-0.700	0.0

7.17

F521

ORIGINAL PAGE IS
OF POOR QUALITY

BY _____

BELL HELICOPTER COMPANY
POST OFFICE BOX 682 • FORT WORTH 1, TEXAS

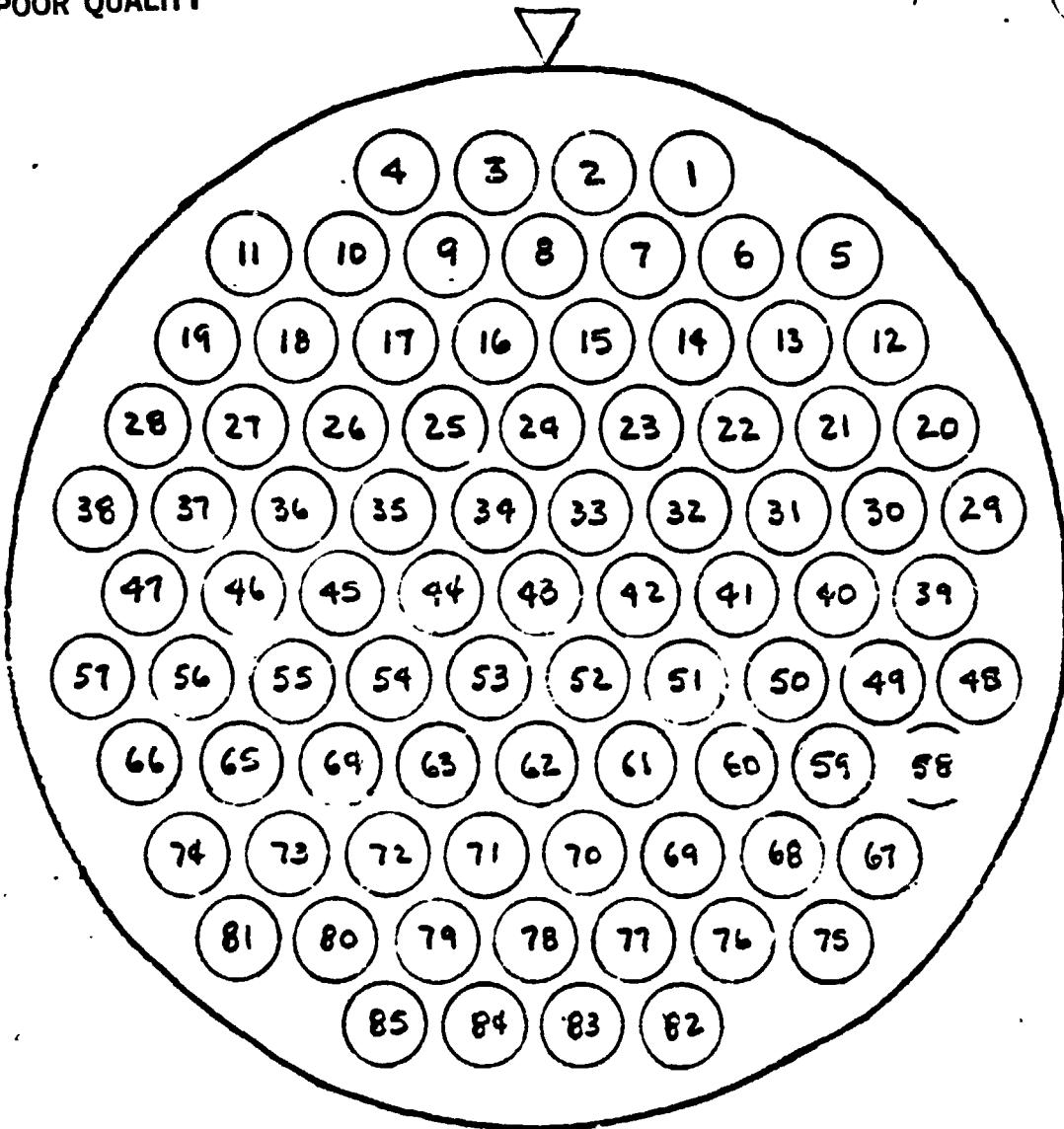
MODEL _____ PAGE _____

CHECKED _____

RPT _____

ORIGINAL PAGE IS
OF POOR QUALITY

244
4-28
279
182



COLL. MAST CONNECTOR

BELL HELIO PLANT #6

MKII @ 5 INSERT

LAYOUT SHOWING
CONTACT NUMBERING
SEQUENCE

ORIGINAL PAGE IS
OF POOR QUALITY

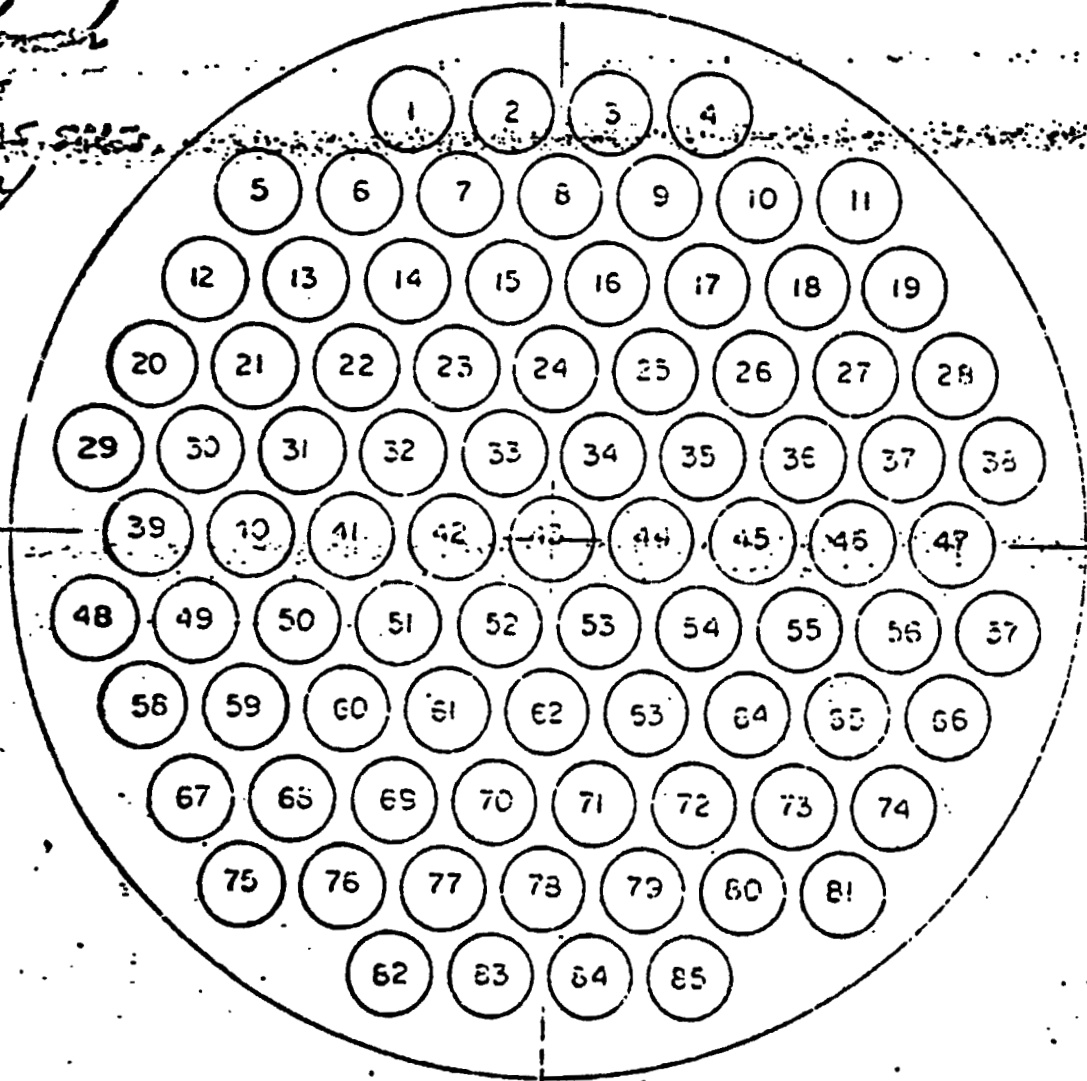
279

ITTCE

ITTCE

5/12/74

TOP
KEYWAY



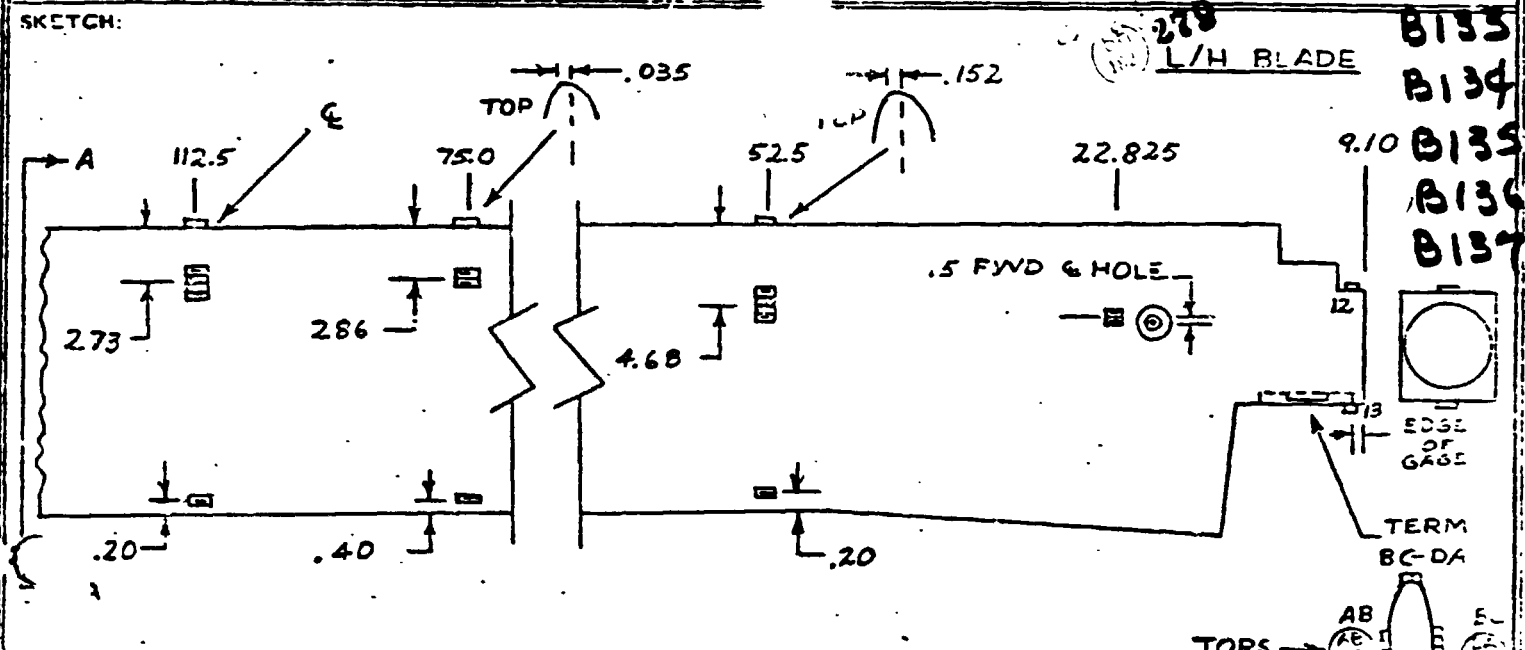
FACE VIEW | PIN INSERT

SLIP RING CONNECTOR

INSTRUMENTATION LABORATORY WORK SHEET

M138
M139

MODEL NO. 301	PAGE 06-012 VP-350-W	EA-06-250M4 350 W	SHEET NO. DLN 678764
WORK ORDER A427-11A	RESISTANCE $350.0 \pm 0.4\%$	$350.0 \pm 0.4\%$	LAB. NO. 10857A
REQUESTED BY: A. WHITENER	GAGE FACTOR $2.045 \pm 0.5\%$	$2.13 \pm 0.5\%$	PART NO. 300-010-001-5
TITLE OF TEST 301 FLIGHT TEST	LOT NO. Q-A35BP00	Q-A21AD189	SERIAL NO. A2-09021



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS: INSTALL CHORD - BEAM & TORSION BRIDGES AS SHOWN.
 USE BR-600 CEMENT. COMPLETE BRIDGE IN GAGE AREA
 USING FLAT TERMINALS. MAIN TERMINAL IS IN AREA
 SHOWN. COVER WITH SHELL 9309.

B130
02
B133
03
B132
04
B135
05
B134
06
B137
07
B136
08
M139
09
M138
10

BRIDGE	EM 22.825	CH 52.5	EM 52.5	CH 75.0	EM 75.0	CH 112.5	EM 112.5	TOP 52.5	TOP 112.5
INCE	4.81	4.49	4.94	4.33	5.36	5.11	4.88	4.91	4.72
TO GROUND	10Kmm							10Kmm	

DATE ASSIGNED 4-22-76	TECHNICIAN W.C.H. - C.C.W.	EST. HRS.	APPROVED BY:
DATE COMPLETED 4-27-76	ENGINEER	ACT. HRS.	

SUI 4

MIR BLADE WIRING

ORIGINAL PAGE IS
OF POOR QUALITY

1-PAX 1R-1

FAST	TYPE	SIZE	USE NO.	ITEM CODE	QUANTITY	WIRE NO.
RED PLATE	EM	22.5	02	B130	100	M2-107-22
	EM	52.5	04	B132	100	-108
	EM	75	06	B134	100	-110
	EM	112.5	08	B136	100	-112
	CH	52.5	03	B133	100	-113
	CH	75	05	B135	100	-114
	CH	112.5	07	B137	100	-115
	TACS	52	09	M139	100	-116
	TACS	112.5	10	M138	100	-117
	RE.S.	9.5	12	S147	100	-118
RED PLATE	TECH	9.5	13	S148	100	-119
VOLTAJE (COVERED)	—	—	—	—	—	—

ITEM COST = $5145/5146 = \underline{\text{STRESS}}$

ORIGINAL PAGE IS
OF POOR QUALITY

$E = 350 \times 10^6$
 $\nu = 29 \times 10^{-6}$
 $\mu = 1$
 $G.I. = 2.09$
 $k_{sn} = 500350$

$SDOKCE = \frac{(350)(29) 10^6}{(1)(2.09)(500350)}$
 $= 9752 \text{ PSI STRESS}$

ITEM COST = $\text{[REDACTED]} = \underline{\text{STRESS}}$

$E = 350 \times 10^6$
 $\nu = 29 \times 10^{-6}$
 $\mu = 1$
 $G.I. = 2.13$
 $k_{sn} = 500350$

$SDOKCE = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$
 $= 9252 \text{ PSI STRESS}$

ITEM COST = $5000/5000/5000/5000 = \underline{\text{STRESS}}$

$E = 350 \times 10^6$
 $\nu = 29 \times 10^{-6}$
 $\mu = 1$
 $G.I. = 2.13$
 $k_{sn} = 500350$

$SDOKCE = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$
 $= 15202 \text{ PSI STRESS}$

ITEM COST = $\frac{5000 \times 5000 \times 5000 \times 5000}{5000 \times 5000 \times 5000 \times 5000} = \underline{\text{STRESS}}$

$E = 350 \times 10^6$
 $\nu = 29 \times 10^{-6}$
 $\mu = 1$
 $G.I. = 2.13$
 $k_{sn} = 500350$

$SDOKCE = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$
 $= 5350 \text{ PSI STRESS}$

ITEM CODE = S145/6146 = STRESS

ORIGINAL PAGE IS
OF POOR QUALITY

$$\begin{aligned} R &= 350 \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.09 \\ R_{sk} &= 500K \end{aligned}$$

$$\begin{aligned} \text{SOOLCE} &= \frac{(350)(29) 10^6}{(1)(2.09)(500350)} \\ &= 9752 \text{ PSI stress} \end{aligned}$$

ITEM CODE = S147/ = STRESS

$$\begin{aligned} R &= 350 \Omega \\ Y &= 29 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sk} &= 500K \end{aligned}$$

$$\text{SOOLCE} = \frac{(350)(29) 10^6}{(1)(2.13)(500350)}$$

ITEM CODE = S609/S610/S622/S629 = STRESS

$$\begin{aligned} R &= 350 \Omega \\ Y &= 107 \times 10^6 \\ N &= 1 \\ G.F. &= 2.13 \\ R_{sk} &= 115K \end{aligned}$$

$$\begin{aligned} 115KCE &= \frac{(350)(107) 10^6}{(1)(2.13)(115350)} \\ &= 15242 \text{ PSI stress} \end{aligned}$$

ITEM CODE = S631/S63 / S632/S633 = STRESS
S634/S635/S636/S637

$$\begin{aligned} R &= 350 \Omega \\ G &= 40 \times 10^6 \\ N &= 2 \\ G.F. &= 2.075 \\ R_{sk} &= 15K \end{aligned}$$

$$\begin{aligned} 15KCE &= \frac{(350)(40) 10^6}{(2)(2.075)(15350)} \\ &= 5869 \text{ PSI } \underline{\underline{STRESS}} \end{aligned}$$

CALIBRATION SHEET
LAB ENGINEER: A. WHITNER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: KINSON/JARVIES

LAB NO. : 10857A02
CAL DATE: 9-22-75
SERIAL NO: A2-G9021
P/N: 300-010-001-5

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND BLADE
CHANNEL: 05 - BEAM BENDING, STATION 22.825

B130

CALIBRATE EQUIVALENT: 100K = 61729 IN-LBS
UNIT CAL = 29828 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.150
BRIDGE VOLT. : 6.00
PRE CAL. : 5.30
POST CAL. : 5.31

JACK FAC. : 1.5000 PSI/LB
LEVER A-F : 123.075 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0.00	0	3.000	-0.025	-225
0.00	0.00	0.000	0.075	230
100.00	6245.00	0.660	-0.021	-277
200.00	12490.00	1.320	-0.012	-144
300.00	18735.00	2.100	-0.051	-11
400.00	24980.00	2.880	0.010	122
500.00	31225.00	3.660	0.002	22

MAXIMUM CALIBRATION LOAD: 41225 IN-LBS

END PROGRAM FCC933 - RUN DATE: 09-20-

CALIBRATION SHEET
LAB ENGINEER: A. WHITNER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: KINSON/JARVIES

LAB NO.: 10857A03
CAL DATE: 9-22-70
SERIAL NO: AL-09021
P/N: 300-010-001-5

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND BLADE

CHANNEL: 03 - CHORD BENDING, STATION 52.5

B133

CALIBRATE EQUIVALENT: 100K = 32785 IN-LBS
UNIT CAL = 37037 IN-LBS/MV/V

BRIDGE RES.: 350.00
GAGE FACTOR: 2.100
BRIDGE VOLT.: 6.00
PRE CAL.: 5.31
POST CAL.: 5.30

JACK FAC.: 1.5000 PSI/LE
LEVER ARM: 94.000 IN.

CAL RES.: 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM BEAR LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.013	-22
0.00	0.00	0.000	0.013	22
100.00	6256.66	0.970	-0.031	-190
200.00	12513.33	2.020	0.005	33
300.00	18760.00	3.050	0.021	132
400.00	25006.66	4.040	-0.003	-16
500.00	31253.33	5.050	-0.007	-41

MAXIMUM CALIBRATION LOAD: 31253 IN-LBS

EMC PROGRAM FCCR33 - RUN DATE: 09-30-

CALIBRATION SHEET
LAB ENGINEER: A. WHITNER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: KINSON/JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10857A04
CAL DATE: 9-22-76
SERIAL NU: A2-09021
P/N: 300-010-001-5

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND BLADE
CHANNEL: 07 - BEAM BENDING, STATION L2.5

B132

CALIBRATE EQUIVALENT: 100K = 13988 IN-LBS
UNIT CAL = 15778 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.50
PRE CAL. : 5.32
POST CAL. : 5.32

JACK FAC. : 1.5000 PSI/LB
LEVER ARM : 94.000 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.112	-294
0.00	0.00	0.000	0.112	294
100.00	6266.66	2.170	-0.102	-267
200.00	12533.33	4.610	-0.045	-116
300.00	18800.00	7.030	-0.008	-22
400.00	25066.66	9.420	-0.002	-5
500.00	31333.33	11.850	0.045	118

MAXIMUM CALIBRATION LOAD: 31333 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 09-30-76

CALIBRATION SHEET
LAB ENGINEER: A. WHITNER
DATA ANALYST: MARY LCU BRIGHT
LAB TECHNICIAN: KINSON/JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10857AG9
CAL DATE: 9-22-70
SERIAL NO: A2-09021
P/N: 300-010-001-5

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND BLADE
CHANNEL: 04 - CHORD BENDING, STATION 75.0

8135

CALIBRATE EQUIVALENT: 100K = 34392 IN-LBS
UNIT CAL = 34941 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 0.00
PRE CAL. : 5.30
POST CAL. : 5.30

JACK FAC. : 1.5000 PSI/LB
LEVER ARM : 71.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.016	-117
0.00	0.00	0.030	0.016	117
100.00	4766.66	0.700	-0.010	-107
200.00	9533.33	1.440	-0.011	-72
300.00	14300.00	2.190	0.004	26
400.00	19066.66	2.920	-0.009	-1
500.00	23833.33	3.660	0.005	34

MAXIMUM CALIBRATION LOAD: 23833 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 09-30-

CALIBRATION SHEET
LAB ENGINEER: A. WHITNER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: KINSON/JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10857A06
CAL DATE: 9-22-70
SERIAL NO: A2-C9021
P/N: 300-010-001-2

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND BLADE
CHANNEL: 02 - BEAM BENDING, STATION 75.0

B134

CALIBRATE EQUIVALENT: 100K = 11623 IN-LBS
UNIT CAL = 13111 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.32
POST CAL. : 5.32

JACK FAC. : 1.5000 PSI/LB
LEVER ARM : 71.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.041	-89
0.00	0.00	0.000	0.041	89
100.00	4706.60	2.090	-0.051	-111
200.00	9533.33	4.320	-0.002	-5
300.00	14300.00	6.510	0.006	13
400.00	19066.66	8.680	-0.006	-13
500.00	23833.33	10.880	0.012	27

MAXIMUM CALIBRATION LOAD: 23833 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 09-30-

CALIBRATION SHEET
LAB ENGINEER: A. WHITNER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: KINSON/JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10857A07
CAL DATE: 9-22-70
SERIAL NO: A2-09021
P/N: 300-010-001-5

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND BLADE

CHANNEL: 05 - CHORD BENDING. STATION 112.5

B137

CALIBRATE EQUIVALENT: 100K = 27426 IN-LBS
UNIT CAL = 31055 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.29
POST CAL. : 5.31

JACK FAC. : 1.5000 PSI/LB
LEVER ARM : 34.000 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.013	-69
0.00	0.00	0.000	0.013	69
100.00	2260.57	0.410	-0.015	-70
200.00	4535.33	0.860	-0.003	-14
300.00	6800.00	1.300	-0.001	-3
400.00	9055.00	1.740	0.001	7
500.00	11333.33	2.180	0.003	17

MAXIMUM CALIBRATION LOAD: 11333 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 09-30-7

CALIBRATION SHEET
LAB ENGINEER: A. WHITNER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: KINSON/JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10557A08
CAL DATE: 9-22-76
SERIAL NO: A2-09C21
P/N: 300-010-001-5

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND BLADE
CHANNEL: 09 - BEAM BENDING, STATION 112.5

8136

CALIBRATE EQUIVALENT: 100K = 5909 IN-LBS
UNIT CAL = 5646 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.150
BRIDGE VOLT. : 6.00
PRE CAL. : 5.33
POST CAL. : 5.34

JACK FAC. : 1.5000 PSI/LB
LEVER ARM : 34.000 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.091	-101
0.00	0.00	0.000	0.091	101
100.00	2266.67	1.880	-0.075	-83
200.00	4533.33	3.960	-0.042	-46
300.00	6800.00	6.020	-0.028	-31
400.00	9066.66	8.120	0.025	25
500.00	11333.33	10.170	0.029	32

MAXIMUM CALIBRATION LOAD: 11333 IN-LBS

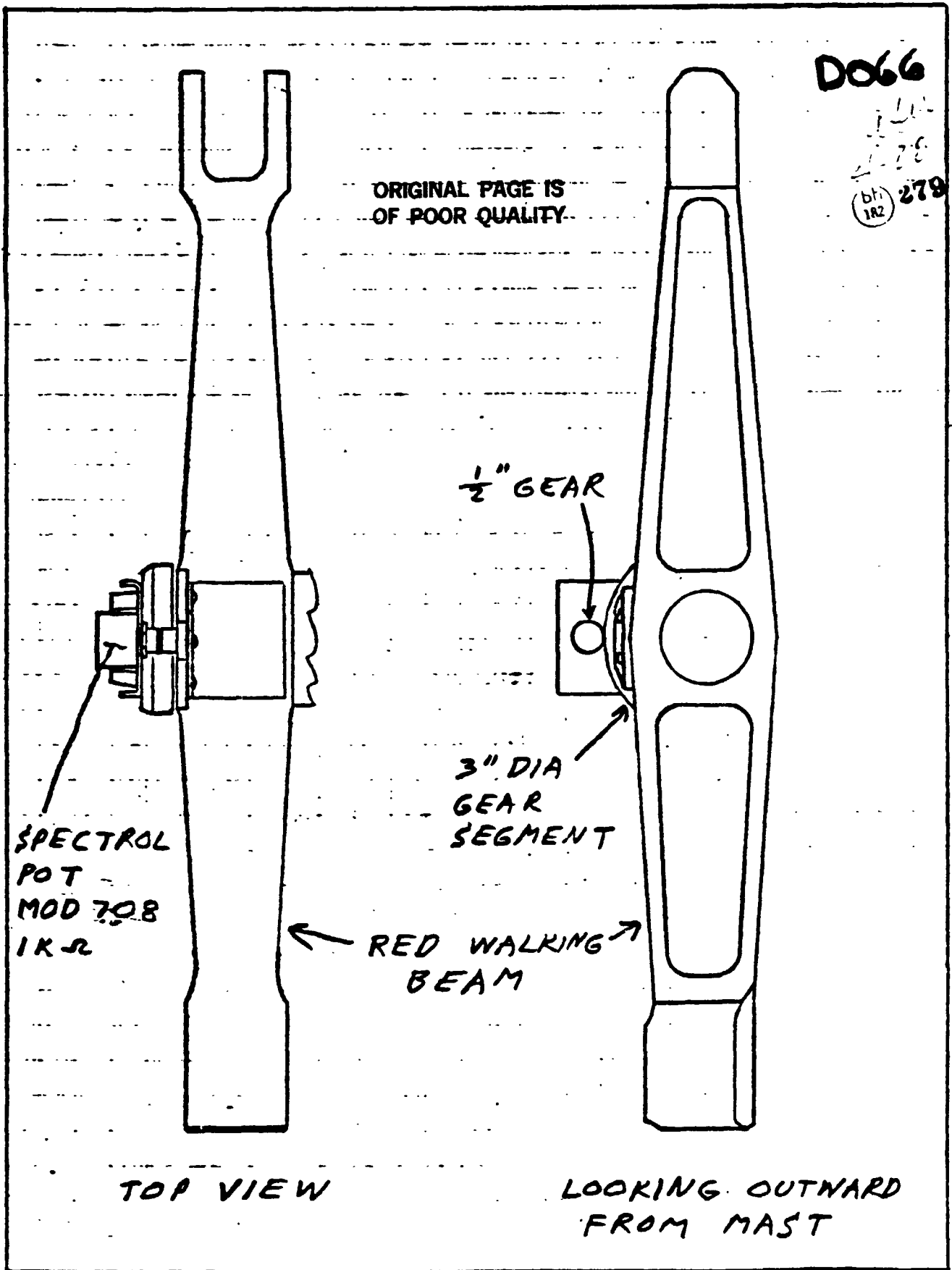
BHC PROGRAM FCCR33 - RUN DATE: 09-30-

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

301 RED BLADE FEATHERING POSITION BRACKET



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 6-10-78

Lab. No. _____

Serial No. _____

Part No. _____

Engineer Smith

ITEM CODE: D066

Project GROUND TIEDOWN TEST

Title BLADE ANGLE - LT. RED POINT BLADE

L. T. R. _____ EWA _____

W. O. 301²

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>W. O. HEINER</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chen.	<u>RMDU "R" - 73-2-1</u>				
Bridge	<u>C/S 11</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm	<u>NOTE: LOCK SWITCH TO 50% FINA LAT. READ RED BLADE</u>				

Load	Output				
CONVERSION PER. (%)	BLADE ANGLE (DEG)	OUTPUT (CONVERTED)			
0	3°15'	105			
10	4°53'	135			
20	6°01'	164			
30	8°27'	196			
40	10°27'	230			
50	11°49'	256			
60	13°10'	279			
70	14°24'	303			
80	15°55'	324			
90	17°15'	346			
99	18°23'	366			
90	16°22'	332			
60	13°40'	286			
40	10°38'	233			
20	7°0'	174			
C	3°16'	103			

$EA_{10} (82.5-7) = -6$

$LLC (41.8-8) = 745$

BY D. P. Smith
CHECKED

NAV HELICOPTER ENGINE

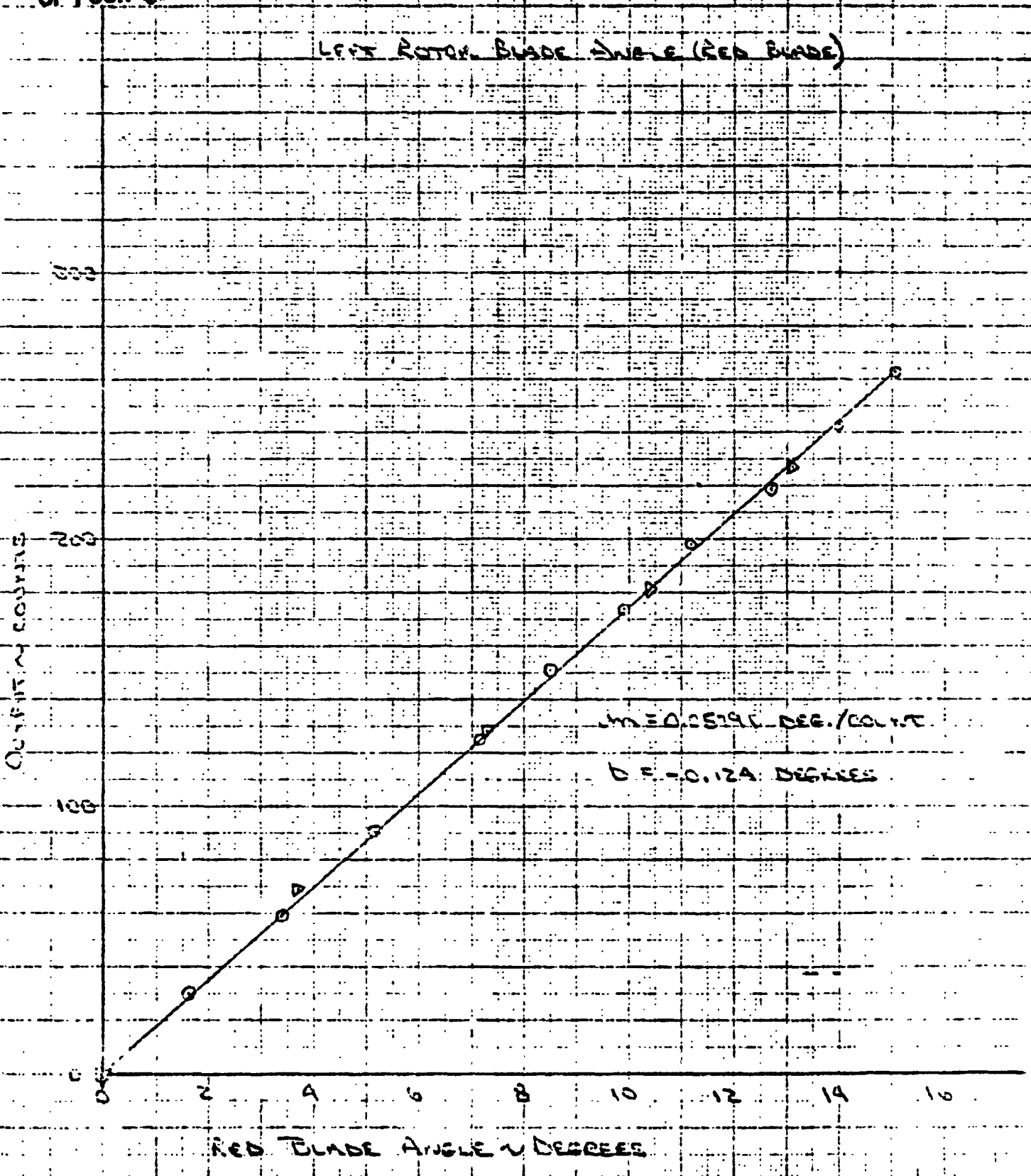
MODEL 30
REV 2

PAGE 1
RPT

ITEM CODE: 0066

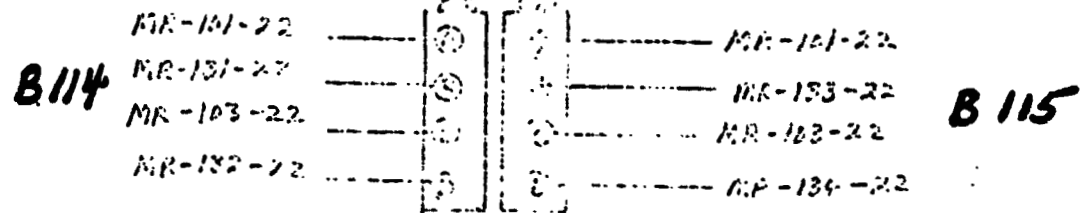
ORIGINAL PAGE IS
OF POOR QUALITY

LEFT ROTOR BLADE ANGLE (RED BLADE)



301 #2
HUB SPINDLE WINDING
W/H RETOR
LR-1

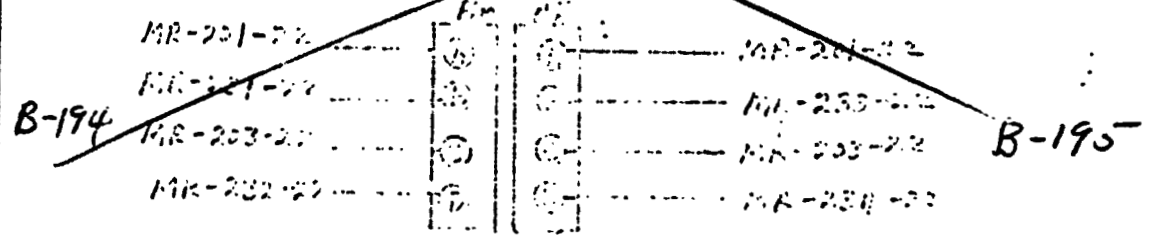
Hub Spindle Red Terminal Block



Hub Spindle White Terminal Block



Hub Spindle Green Terminal Block



1) TERMINAL BLOCKS LOCATED ON UPPER SURFACE OF Hub.

2) Wire No. "MR-101-22", "MR-201-22", "MR-103-22", & "MR-203-22" ARE PARALLEL VOLTAGE WIRES

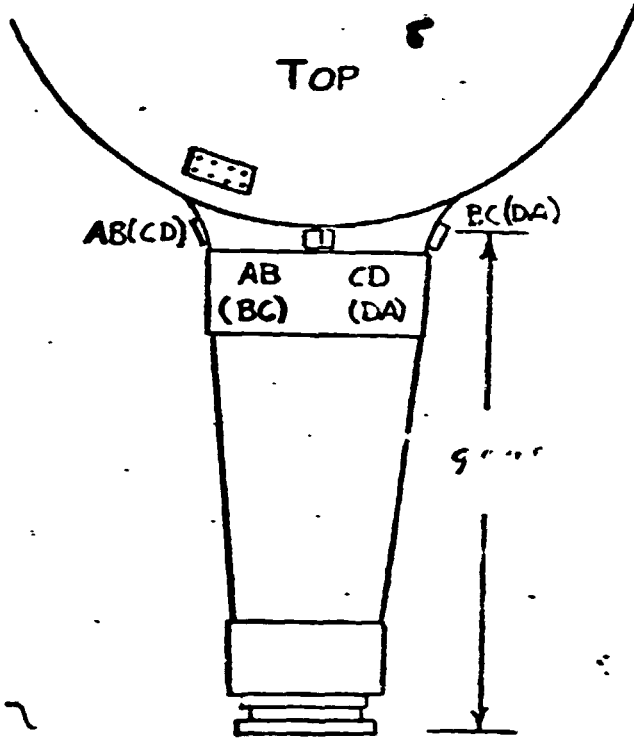
ORIGINAL PAGE IS OF POOR QUALITY

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-06-250MG-350	SHEET NO. DLN 688512
EWA NO. A427 IIB	RESISTANCE 350 Ω	LAB. NO. 105928
ORDER A427	GAGE FACTOR 2.13 ± 0.5%	PART NO. 300-010-101-2
REQUESTED BY: A. WHITENER	LGT. NO. A-AZ1AD142	SERIAL NO.

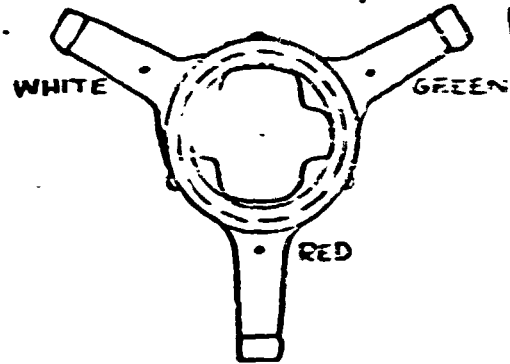
TITLE OF TEST: **301 FLIGHT TEST - SHIP-1**

SKETCH:



L/H YOKE

ORIGINAL PAGE IS OF POOR QUALITY



8114
8115
8192
8193
8194
8195

REMARKS:

VIEW LOOKING AFT

COLOR CODE

CLEAN GAGE AREA PER TITANIUM INSTRUCTIONS. INSTALL BEAM AND CHORD BRIDGES ON THREE SPINDLES. USE BR-600 CEMENT. COMPLETE BRIDGE AT POST TYPE TERMINALS ON TOP SURFACE. COVER WITH SHELL 9309.

BRIDGE	01 RED 02		03 WHITE 04		05 GREEN 06	
	CHORD	BEAM	CHORD	BEAM	CHORD	BEAM
BALANCE	4.81	5.71	4.77	4.58	5.82	3.60
GROUND	10K _{min}	10K _{min}	10K _{min}	10K _{min}	10K _{min}	10K _{min}
DATE ASSIGNED	CHINICIAN <i>NASTILOV</i>			EST. HRS.	APPROVED BY:	
DATE COMPLETED	ENGINEER			ACT. HRS.		

9-27-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10592E01
CAL DATE: 11-29-76
SERIAL NO: NONE
P/N: 300-C10-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND ROTOR YOKE
CHANNEL: 03 - RED CTRFD BENDING. STATION 8.5

B115

CALIBRATE EQUIVALENT: 100K = 19544 IN-LBS
UNIT CAL = 22230 IN-LBS/MV

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 0.00
CAL CAL. : 5.23
PLIST CAL. : 5.27

JACK FAC. : 0.2270 PSI/LB
LEVER ARM : 8.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.017	62
325.00	6625.44	0.000	-0.017	-62
650.00	13250.88	2.640	0.025	96
975.00	19876.31	5.220	0.007	27
1300.00	26501.75	7.800	-0.011	-39
1625.00	33127.19	10.390	-0.019	-69
		13.020	0.013	49

MAXIMUM CALIBRATION LOAD: 48127 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 12-02-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 10592802
CAL DATE: 11-29-76
SERIAL NO: NONE
P/N: 300-010-101-21

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND ROTOR YOKE
CHANNEL: 06 - RED BEAM BENDING, STATION 8.5

B114

CALIBRATE EQUIVALENT: 100K = 27109 IN-LBS
UNIT CAL = 30340 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.28
POST CAL. : 5.27

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 8.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.005	-24
0.00	0.00	0.000	0.005	24
350.00	4885.05	0.940	-0.006	-30
700.00	9770.11	1.900	0.004	19
1050.00	14655.17	2.840	-0.007	-36
1400.00	19540.23	3.800	0.002	13
1750.00	24425.29	4.750	0.002	10

MAXIMUM CALIBRATION LOAD: 24425 IN-LBS

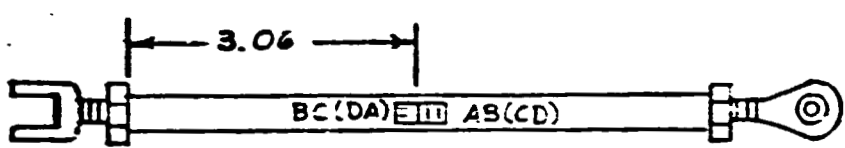
BMC PROGRAM FCCR33 - RUN DATE: 12-23-76

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE FA-13-125TB-350W	SHEET NO. DLN 678984
WA NO. A427-11A	RESISTANCE 50.0 ± 0.4%	LAB. NO. 10986A
ORDER A427	GAGE TOR 2.12 ± 1.0%	PART NO. 300-010-411-11
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF56	SERIAL NO. 570-10

TITLE OF TEST (162) 279
301 FLIGHT TEST

SKETCH: PITCH LINK



F060

ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:
 INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
 COVER WITH 9309. ATTACH FOUR WIRE SIX
 INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL
 SLEEVING AND TERMINATE WITH M4P PLUG.

F060
01

BRIDGE	AXIAL					
LENCE	3.64					
N.S. TO GROUND	1Kmm					
DATE ASSIGNED	6-8-76	TECHNICIAN	C.C.W.		EST. HRS.	APPROVED BY:
DATE COMPLETED	6-8-76	ENGINEER			ACT. HRS.	

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: KINSON

LAB NO.: 1C986A01
CAL DATE: 6-16-76
SERIAL NO: NONE
P/N: 300-010-411-11

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: PITCH LINK
CHANNEL: 03 - AXIAL LOADING

F060

CALIBRATE EQUIVALENT: 100K = 787 POUNDS
UNIT CAL = 897 POUNDS/MV/V

BRIDGE RES.: 350.00
GAGE FACTOR: 2.120
BRIDGE VOLT.: 15.35
PRE CAL.: 8.78
POST CAL.: 8.78

JACK FAC.: 1.5000 PSI/LB
LEVER ARM: NONE
CAL RES.: 100

LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.00	-0.036	-3
90.00	90.00	0.30	0.036	3
270.00	180.00	1.50	-0.021	-2
540.00	360.00	3.00	-0.028	-3
810.00	540.00	5.10	-0.005	-1
1080.00	720.00	7.90	-0.002	-1
1350.00	900.00	10.020	0.020	2

MAXIMUM CALIBRATION LOAD: 900 POUNDS

BHC PROGRAM FCCR33 - RUN DATE: 06-21-76

BY A. WHITENER

BELL HELICOPTER COMPANY

MODEL 301

PAGE

CHECKED (P.M.)

HELI. 1+2

RPT

SKT 501001-2

RESCUE

3-11-77

ORIGINAL PAGE IS
OF POOR QUALITY

MODEL 301 ROTATING SLIP RING HARNESS (J-2) LR-2

279

KPT06-22-55F

B140
 B141
 PLOG
 M43
 J-2
 B142
 D144
 ON
 FOLL
 FOLL
 SLIP
 RING
 B142
 B142
 B144
 B145
 D183
 D148

A	MR-201-22	A	+ VOLTAGE
B	MR-202-22		
C	MR-203-22	E	- VOLTAGE
D	MR-204-22		
E	MR-205-22		VOLT SENSE
F	MR-206-22		
G	MR-207-22		(A) MAST PAGA BAND
H	MR-208-22		(B) ↑ PERP. BAND
I	MR-209-22		(C) MAST TORQ (03)
J	MR-210-22		(D) SWITCH RATE DEVER FORCE
K	MR-211-22		(E) SIMPLE FLAP POS.
L	MR-212-22		(F)
M	MR-213-22	B	
N	MR-214-22	D	
O	MR-215-22	B	
P	MR-216-22		(G)
Q	MR-217-22		
R	MR-218-22		(H) WHITE PITCH LINE
S	MR-219-22	B	
T	MR-220-22	D	
U	MR-221-22	B	
V	MR-222-22	D	(I) GREEN PITCH LINE
W	MR-223-22	D	
X	MR-224-22	D	(J) MAST TORQ (04)
Y	MR-225-22		(K)
Z	MR-226-22		(L) WHITE HUB SPINDLE Cn Bn
A	MR-227-22		(M) WHITE ↑ ↑ Cn
B	MR-228-22		(N) GREEN ↓ ↓ Cn
C	MR-229-22		(O) GREEN HUB SPINDLE Cn Bn
D	MR-230-22		(P) COLL. ACT. POS.
E	MR-231-22		
F	MR-232-22		
G	MR-233-22		
H	MR-234-22		
I	MR-235-22	B	
J	MR-236-22		(Q)
K	MR-237-22		
L	MR-238-22		
M	MR-239-22		
N	MR-240-22	A	512/REV SIG
O	MR-241-22	E	
P	MR-242-22	C	1/REV SIG
Q	MR-243-22	E	

* HS3106-145-55
 KPT01-8-45

△ CONNECT THESE
 WIRES AT 1+2
 COMMON SPICE

* SEE SHEET #1 FOR
 REMAINDER OF WIRES

901 A285866 2042

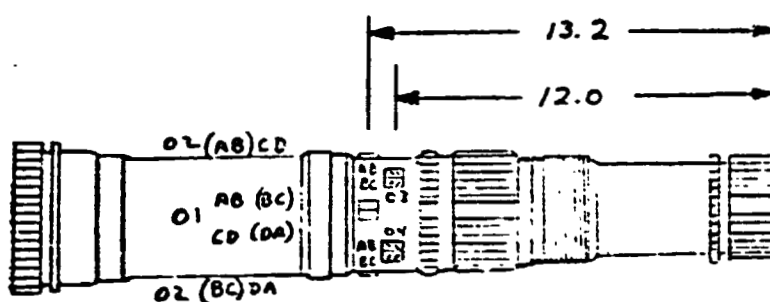
INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-04-250MG-350 EA-06-062VD-350	SHEET NO. 678984
EWA NO. A427-11A	RESISTANCE 350~	LAB. NO. 10498 A
WORK ORDER A427	GAGE FACTOR 2.13 ± 0.5% 2.045 ± 0.5%	PART NO. 300-040-180
REQUESTED BY: D. GLASS	LOT NO. QARIAD142 QA35BD01	SERIAL NO. 117 - P725

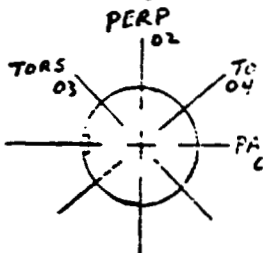
TITLE OF TEST **MODEL 301 FLIGHT TEST**

SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY



**MAST B142
B141
M143**



279

REMARKS:

INSTALL BENDING AND TORSION BRIDGES AS SHOWN.
USE BR-600 CEMENT. MAKE BRIDGE AT FLAT
TERMINAL AS INDICATED. COVER WITH 9309.

B141 B140 M143

13.2 13.2 12.0 12.0

BRIDGE	PERP-01	PARA-02	TORS-03	TORS-04
BALANCE	4.53	4.28	4.79	4.99
RES. TO GROUND	10KΩ	10KΩ	10KΩ	10KΩ
DATE ASSIGNED 1-20-76	TECHNICIAN Chuck		EST. HRS	APPROVED BY:
DATE COMPLETED	ENGINEER		ACT. HRS	

CALIBRATION SHEET
LAB ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS DROGDON
LAB TECHNICIAN: KINSUN

LAB NO. : 10498A01
CAL DATE: 1-27-76
SERIAL NO: 117-P725
P/N: 300-040-180

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: ROTOR MAST

CHANNEL: 03 - PERPENDICULAR BENDING, 13.2

BK1

CALIBRATE EQUIVALENT: 100K = 26238 IN-LBS
UNIT CAL = 30003 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT.: 10.01
PRE CAL. : 8.77
POST CAL. : 8.77

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 12.250 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.013	-39
0.00	0.00	0.000	0.013	39
300.00	6034.48	1.960	-0.040	-121
600.00	12068.96	4.020	0.007	20
900.00	16103.45	6.050	0.023	70
1200.00	24137.93	8.070	0.030	91
1500.00	30172.41	10.020	-0.033	-98

MAXIMUM CALIBRATION LOAD: 30172 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 01-30-76

CALIBRATION SHEET
LAE ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS BROGDON
LAB TECHNICIAN: KINSON

LAB NO. : 10496A02
CAL DATE: 1-27-76
SERIAL NO: 117-P725
P/N: 300-040-180

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: ROTOR MAST

CHANNEL: 04 - PARALLEL BENDING. STATION 13.2

B140

CALIBRATE EQUIVALENT: 100K = 26450 IN-LBS
UNIT CAL = 30121 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLTS : 10.01
PRE CAL. : 6.79
POST CAL. : 6.79

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 12.250 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.012	-36
0.00	0.00	0.000	0.012	36
300.00	6034.48	1.960	-0.034	-101
600.00	12068.96	4.000	0.021	3
900.00	18103.45	6.030	0.026	77
1200.00	24137.93	8.030	0.020	61
1500.00	30172.41	9.990	-0.025	-76

MAXIMUM CALIBRATION LOAD: 30172 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 01-30-76

CALIBRATION SHEET
LAB ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS BROGDON
LAB TECHNICIAN: KINSON

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10495A03
CAL DATE: 1-27-76
SERIAL NO: 117-P725
P/N: 300-040-180

PROJECT: 301 FLIGHT TEST

PART NAME: ROTOR MAST

CHANNEL: 03 - TORSION STATION 12.0

M143

CALIBRATE EQUIVALENT: 100K = 49155 IN-LBS
UNIT CAL = 55535 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.045
BRIDGE VOLT.: 10.01
PRE CAL. : 8.86
POST CAL. : 8.66

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 42.000 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.028	156
0.00	0.00	0.000	-0.028	-156
435.00	30000.00	5.470	0.034	191
870.00	60000.00	10.860	0.037	206
1305.00	90000.00	16.220	-0.030	-168
1740.00	120000.00	21.610	-0.048	-265
2175.00	150000.00	27.100	0.035	193

MAXIMUM CALIBRATION LOAD: 150000 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 01-30-76

CALIBRATION SHEET
LAB ENGINEER: DAVID GLASS
DATA ANALYST: GLADYS BROGDON
LAB TECHNICIAN: KINSON

LAB NO. : 10498A04
CAL DATE: 1-27-76
SERIAL NO: 117-P725
P/N: 300-040-180

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: ROTOR MAST
CHANNEL: 04 - TORSION STATION 12.0

SPARE

CALIBRATE EQUIVALENT: 100K = 49026 IN-LBS
UNIT CAL = 56194 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.045
BRIDGE VOLT. : 10.01
PRE CAL. : 8.84
POST CAL. : 8.84

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 42.000 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.113	-636
0.00	0.00	0.000	0.113	636
435.00	30000.00	5.160	-0.071	-397
870.00	60000.00	10.520	-0.045	-251
1305.00	90000.00	15.860	-0.059	-324
1740.00	120000.00	21.230	-0.033	-183
2175.00	150000.00	26.700	0.093	524

MAXIMUM CALIBRATION LOAD: 150000 IN-LBS

CHC PROGRAM FCCR33 - RUN DATE: 01-30-76

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-RSONIQ-350E	SHEET NO. DLN 688512
TA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAD. NO. 11412A
ORDER A427	GAGE FACTOR 2.14 ± 0.5%	PART NO. 300-010-431-1
REQUESTED BY: A. WHITENER	LOT NO. Q-A32AFO4	SERIAL NO. A1400012 - A140000-1

TITLE OF TEST: **301 FLIGHT TEST**

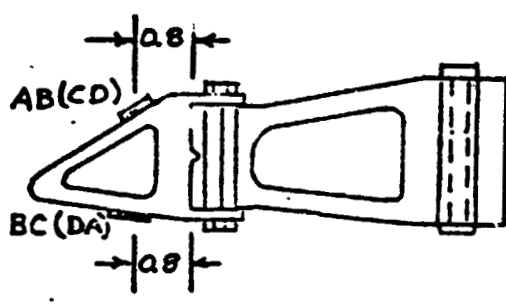
SKETCH:

ORIGINAL PAGE IS
OF POOR QUALITY

DRIVER ASSY.

B142

279



REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED. COVER
 WITH 9309. ATTACH FOUR WIRE SIX INCH SUPERFLEX
 LEADS. ENCASE LEADS IN VINYL SLEEVING AND
 TERMINATE WITH KPT 06-B-4P PLUG.

B142
01

BRIDGE	BEND						
NCE	4.91						
RES. TO GROUND	10K						
DATE ASSIGNED	JAN 12, 1977		TECHNICIAN	Chuck W.		EST. HRS.	APPROVED BY:
DATE COMPLETED	JAN. 12, 1977		ENGINEER			ACT. HRS.	

ORIGINAL PAGE IS
OF POOR QUALITY

1 = 2924.85 LBS91
 2 = -1.03333 LBS90
 3 = 196.85 LBS90
 4 = 200.466 LBS90
 5 = 149.85 LBS90
 6 = 196.433 LBS90
 7 = 114.7 LBS90
 8 = -1.03333 LBS90
 9 = 20.6666 LBS90
 0 = 1.83333 LBS90
 1 = 196.816 LBS90
 2 = 160.166 LBS90
 3 = 39.7833 LBS90

4 = 68.0666 LBS94
 5 = 120.9 LBS94

6 = 160.166 LBS96
 7 = -0.5 LBS 39.8 LBS 80.6 LBS 121.4 LBS 160.2 LBS 198.9 LBS
 8 = 6.8 LBS 7.2 LBS 7.4 LBS 7.7 LBS 8.0 LBS 8.4 LBS

9 = 290.983 LBS97
 0 = 119.866 LBS98

1 = 40.3 LBS99
 2 = 119.9 LBS 40.3 LBS -1.0 LBS 0.0 LBS 0.0 LBS 0.0 LBS
 3 = 7.8 LBS 7.2 LBS 6.9 LBS 0.0 LBS 0.0 LBS 0.0 LBS

END NEXT TRACE

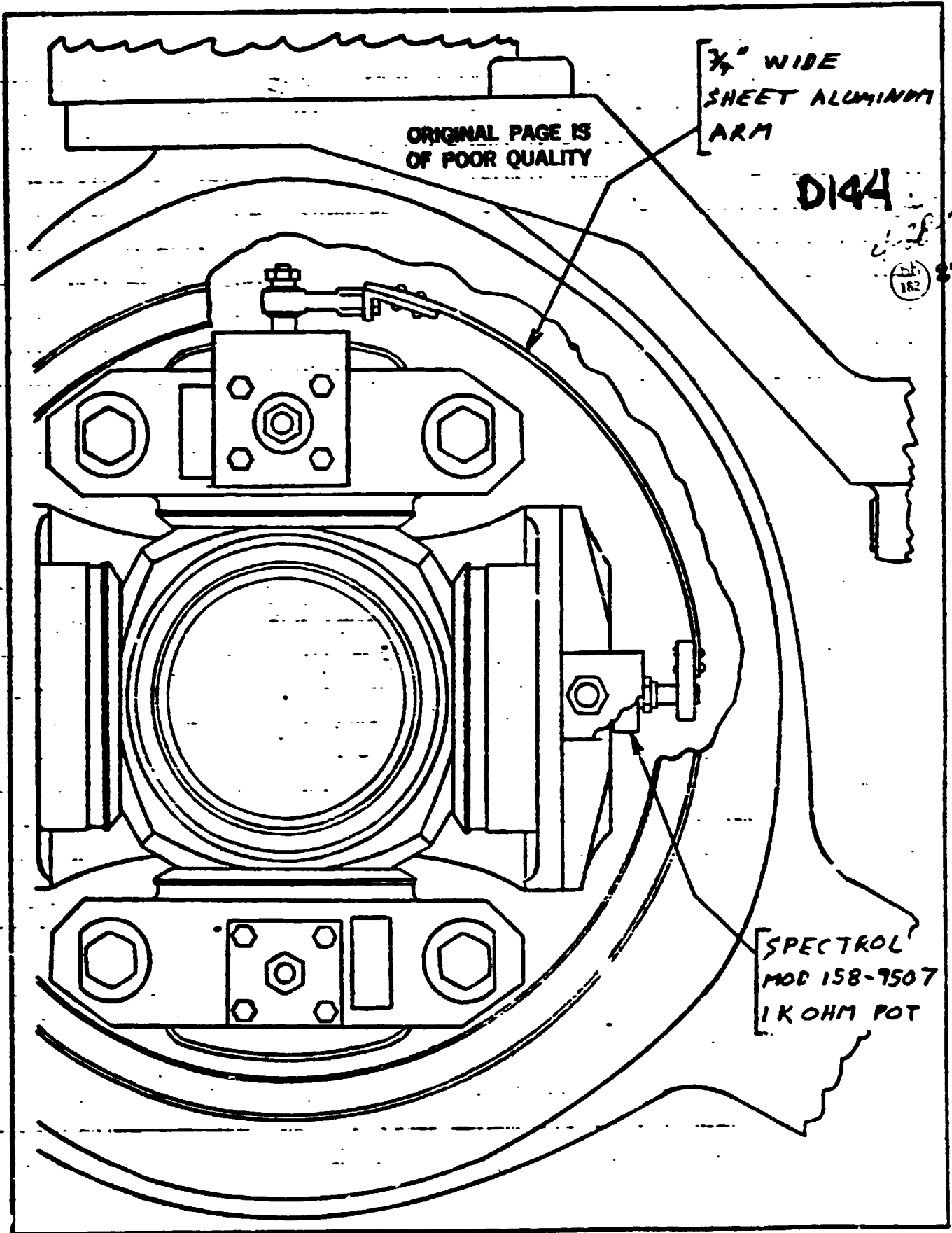
TYPE PULL = BEND DATA
 BRIDGE TYPE = BEND (CMV) OFFSET = -2921.2
 LAB-BF NUMBER = 1413A-01 UNITY CAL = 2556.398782
 BRIDGE VOLT = 6
 BRIDGE STR. = 0.2

INPUT (LBS)	OUTPUT (MV)	LINEARITY	100K CF =
-1.7	6.790	01	263
127.2	7.150	01	774
257.9	7.436	01	29
390.5	7.740	01	
512.5	8.090	01	835
636.5	8.350	01	803
753.5	7.610	01	32
879.5	7.230	01	
98.3	6.990	01	

B142

END NEXT TRACE
 F(1)
 0

301 ROTOR GIMBAL TRUNNION FLAPPING POSITION



ORIGINAL PAGE IS
OF POOR QUALITY

CALIBRATION DATA SHEET

Date 10-13-76

Lab. No. _____

Project GROWING TIEDOWN TESTS

Serial No. _____

301-2

Title FLAPPING PLS - LEFT RIGOR GIMPLE

Part No. _____

W. O. _____

L. T. R. EWA

Engineer Smith

ITEM CODE: DIA

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chon.	<u>MMDU "B" - 75-5-6</u>				
Bridge	<u>C/S ?</u>				
Config.		<u>NOTE: DISCONNECT INT FOR CALIBRATION</u>			
Col. Res.	<u>N/A</u>				
Lever Arm					

Load	Output	Load	Output
FLAP # (DEF)	OUTPUT (COUNT)	FLAP # (DEF)	OUTPUT (COUNT)
0	-932	30	651
2	-531	26	490
4	-733	22	235
6	-612	18	21
8	-510	14	-193
10	-400	10	-400
12	-304	6	-615
14	-193	2	-533
16	-53	0	-534
18	22		
20	126		
22	220		
24	337		
26	441		
28	552		
30	656		
32	752		
34	849		
36	971		

$GPA (22-0-7) = -005$
 $LLC (23-0-7) = 795$

BY D. P. Smith
CHECKED

Cell No: 301

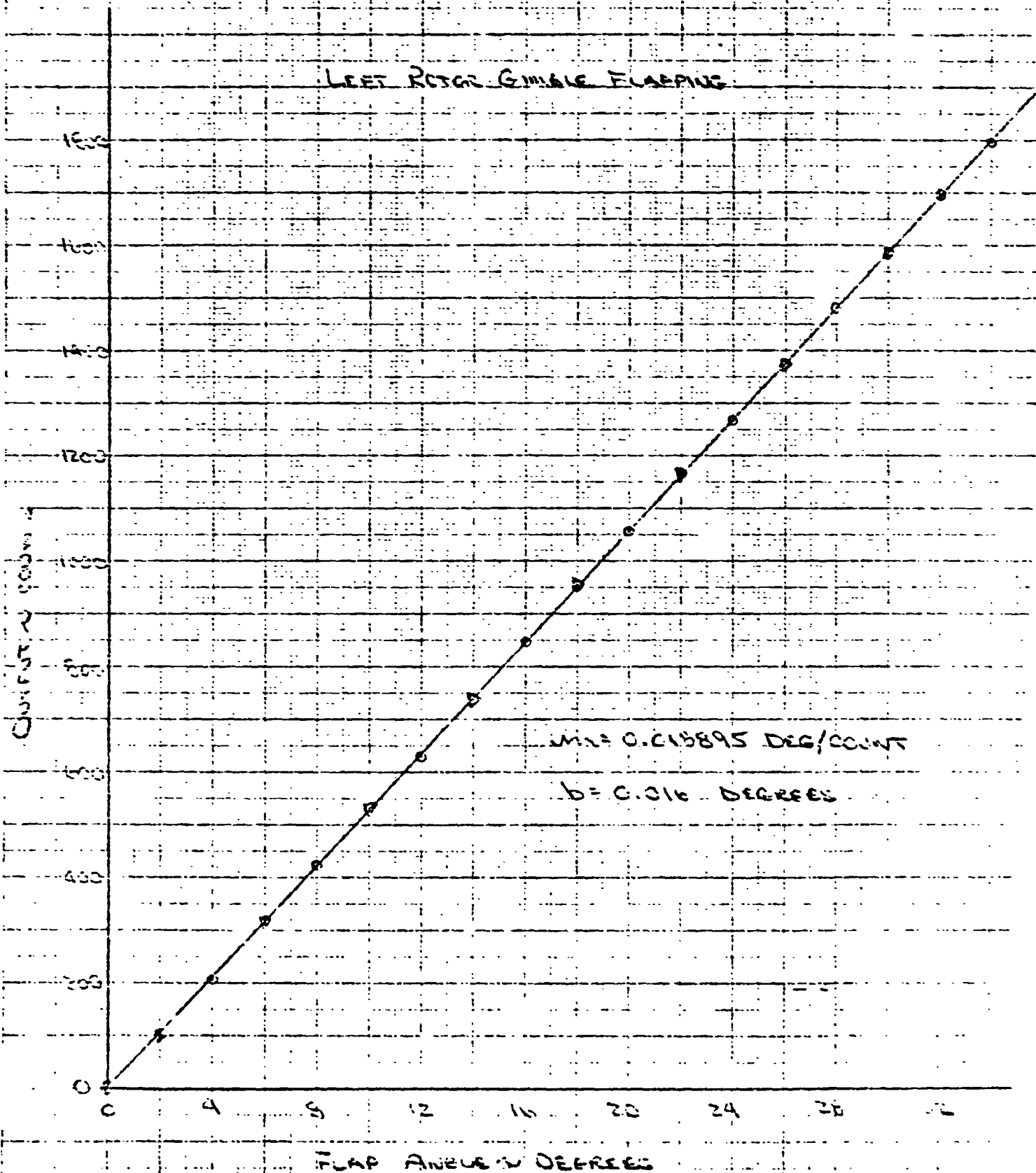
NO. 2

DATE

28

ITEM CODE: 014

LEFT ROTOR GIMBLE FLAPPING



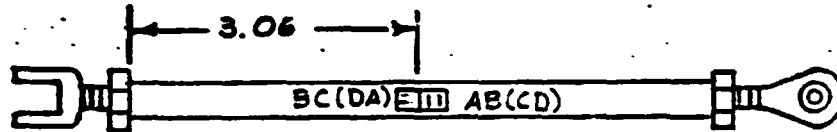
ORIGINAL PAGE IS
OF POOR QUALITY

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE EA-13-125TB-350W	SHEET NO. DLN 678984
WA NO. A427-11A	RESISTANCE 350.0 ± 0.4%	LAB. NO. 10984A
ORDER A427	GAGE FACTOR 2.12 ± 1.0%	PART NO. 300-010-41-11
REQUESTED BY: A. WHITENER	LOT NO. Q-A1BAF56	SERIAL NO.
TITLE OF TEST 301 FLIGHT TEST		

SKETCH:

PITCH LINK



~~F061~~
F061
279

ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE BR-600 CEMENT.
MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
COVER WITH 9309. ATTACH FOUR WIRE SIX
INCH SUPERFLEX LEADS. ENCASE LEADS IN VINYL
SLEEVING AND TERMINATE WITH M4P PLUG.

F061
01

BRIDGE	AXIAL						
LANCE	4.44						
TO GROUND	1Kma						
DATE ASSIGNED	6-8-76	TECHNICIAN	Hallis		EST. HRS.	APPROVED BY:	
DATE COMPLETED	6-8-76	ENGINEER			ACT. HRS.		

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: KINSON

LAB NO. : 10964A31
CAL DATE: 6-16-76
SERIAL NO: NONE
P/N: 300-610-411-11

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

F061
~~F061~~

PART NAME: PITCH LINK
CHANNEL: G3 AXIAL LOADING

CALIBRATE EQUIVALENT: 100K = 787 POUNDS
UNIT CAL = 896 POUNDS/MV/V

BRIDGE RES. : 350.0
GAGE FACTOR : 2.120
BRIDGE VOLT. : 10.0
PRE CAL. : 8.78
POST CAL. : 8.79

JACK FAC. : 1.5000 PSI/LB
LEVER ARM : NONE
CAL RES. : 100

LOADS-PSI	LOADS-POUNDS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	POUNDS
0	0	0.000	-0.036	-3
0.00	0.00	0.000	0.036	3
270.00	180.00	1.950	-0.023	-2
540.00	360.00	3.950	-0.031	-3
810.00	540.00	5.950	0.021	0
1080.00	720.00	8.000	0.003	0
1350.00	900.00	10.020	0.014	1

MAXIMUM CALIBRATION LOAD: 900 POUNDS

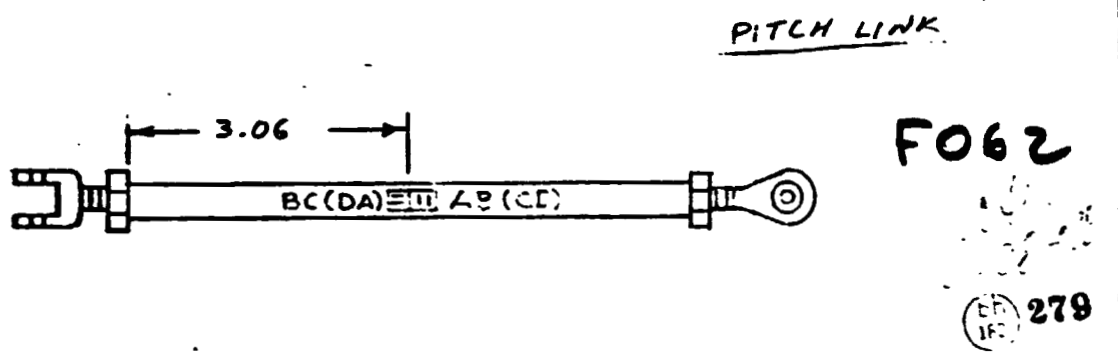
GHC PROGRAM FCCR33 - RUN DATE: 06-21-76

INSTRUMENTATION LABORATORY WORK SHEET

MODEL NO. 301	GAGE TYPE FA-13-125TB-300 E	SHEET NO. DLN 671577
EWA NO. A427-25	RESISTANCE 300 Ω	LAB. NO. 11820 A
JRK ORDER A427	GAGE FACTOR 2.12 ± 1%	PART NO. 300-010-411-11
REQUESTED BY: A. WHITENER	LOT NO. Q.A. 18 AF52	SERIAL NO. 619-2227

TITLE OF TEST **301 FLIGHT TEST**

SKETCH:



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

INSTALL AXIAL BRIDGE AS SHOWN. USE **MB-600** CEMENT.
 MAKE BRIDGE AT FLAT TERMINAL AS INDICATED.
 COVER WITH **9309**. ATTACH FOUR WIRE TWELVE
 INCH SUPERFLEX LEADS. ENCASE LEADS IN NYL
 SLEEVING AND TERMINATE WITH **KPT-06-8-1P** PLUG.

BRIDGE	01	AXIAL					
BALANCE		+3.7					
Ω TO GROUND		10KΩ					
DATE ASSIGNED	TECHNICIAN			EST. HRS.		APPROVED BY:	
DATE COMPLETED	ENGINEER			ACT. HRS.			
	12-1-77						

ORIGINAL PAGE IS
OF POOR QUALITY

F062

10.05

182
118-107

REPORT THE RESULTS OF THE TESTS AND LINEARITY
 TESTS FOR THE FOLLOWING
 PROJECT: 201 FLIGHT TEST
 ENGINEER: G. WITTEBER
 TECHNICIAN: G. E. G. W.
 *** CHANNEL 182 - AXIAL

-PULL- AXIAL	---LOADS---		---VARIATION---		LINEARITY	UC	SLOPE
	F51	L55	(MV)	LBS			
0000E+00	0000E+00	0000E+00	+2424E+01	+3092E-01	N/A	+9019E+03	+7450E-02
2700E+03	1800E+03	0000E+00	+4362E+01	-4231E-01	+9713E+01	+9019E+03	+7450E-02
5400E+03	3600E+03	0000E+00	+6224E+01	-3354E-01	+9921E+01	+9019E+03	+7450E-02
8100E+03	5400E+03	0000E+00	+8420E+01	-8132E-02	+1001E+02	+9019E+03	+7450E-02
10800E+03	7200E+03	0000E+00	+1044E+02	+5529E+00	+1005E+02	+9019E+03	+7450E-02
13500E+03	9000E+03	0000E+00	+1247E+02	+2116E-01	+1007E+02	+9019E+03	+7450E-02
0000E+00	0000E+00	0000E+00	+2448E+01	+5534E-01	-1149E+39	+9019E+03	+7450E-02

4.36
2.72
1.64

6.38
4.36
2.02

8.42
6.36
2.04

10.44
8.42
2.02

12.47
10.44
2.03

*** E O OF REPORT ***

F 062

ORIGINAL PAGE IS
OF POOR QUALITY

3 880140--2333) UNITY CAL AND CROSSTALK
 TEST 10: 11:00 AM
 SUBJECT: 301 FLIGHT TEST
 ENGINEER: A WHITENER
 TECHNICIAN: GRESO
 --Channel--
 --03-- -1FE-
 11719A 101 AXIAL -100K - -BRIDGE--- -VOLTAGE---
 11820A 102 AXIAL + 2074E+03 -> 7926E+03 ✓ + 1008E+02
 + 3019E+03 -> 7078E+03 ✓ + 1008E+02
 -----CROSSTALK-----
 AXIAL FULL DATE (YY0340--2333) PAGE 01
 CHORD FULL DATE (YY0000--MM00)
 TORSION FULL DATE (YY0000--MM00)
 -----CHORD-----
 N/A N/A N/A
 -----BEAN-----
 N/A N/A N/A
 -----AXIAL-----
 100.0
 099.9

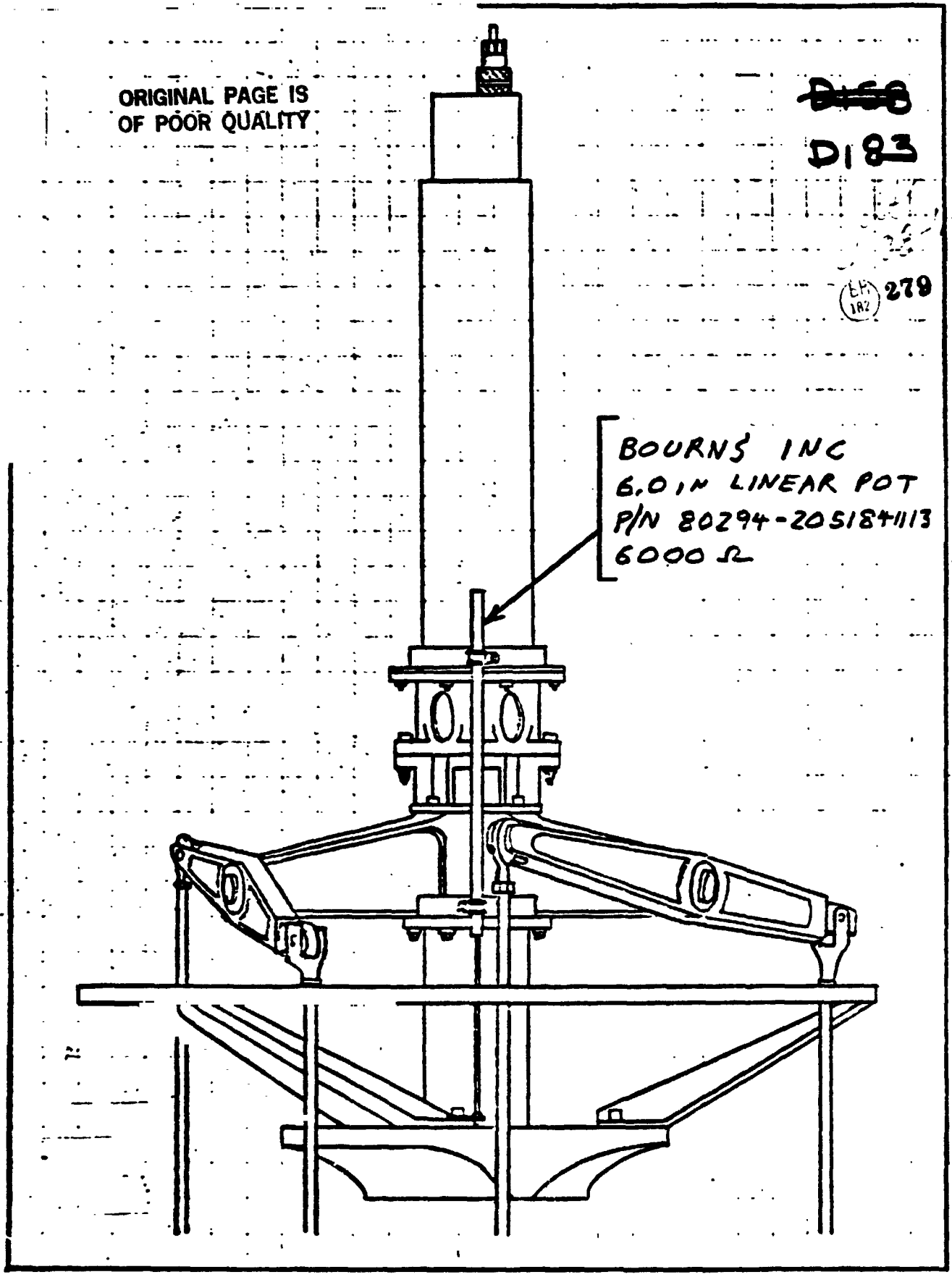
301 COLLECTIVE ACTUATOR POSITION POT

ORIGINAL PAGE IS
OF POOR QUALITY

~~D183~~
D183

279

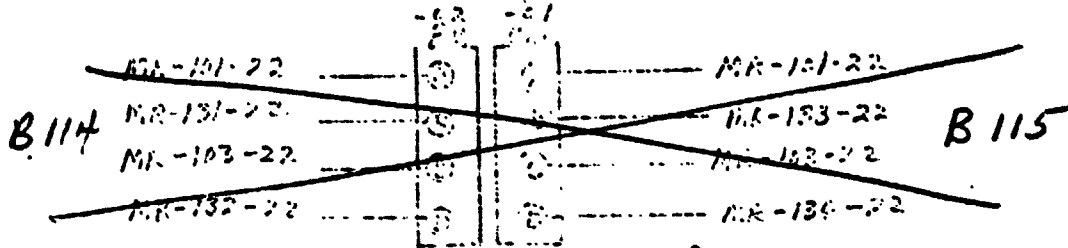
BOURNS INC
6.0 IN LINEAR POT
P/N 80294-205184113
6000 Ω



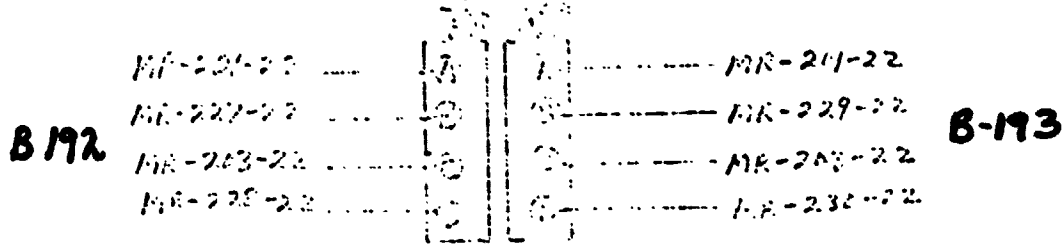
301 #2
HUB SPINNE WIRING
L/R Refor
LR-2

ORIGINAL PAGE IS
OF POOR QUALITY

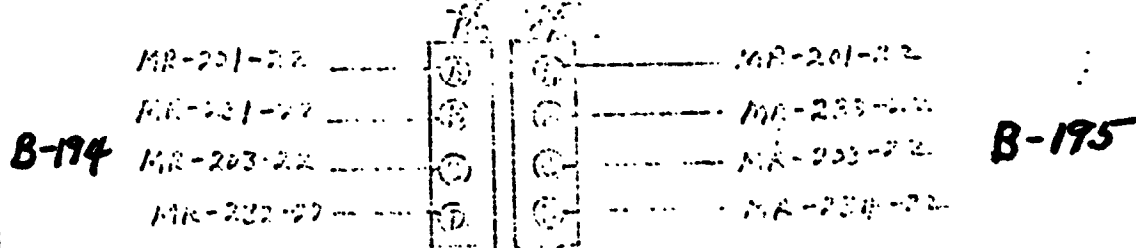
Hub Spinne Red Terminal Block



Hub Spinne White Terminal Block



Hub Spinne Green Terminal Block



1) Terminal Blocks Located on Upper Surface
of Hub.

2) Wire No. "MR-101-22", "MR-201-22", "MR-103-22", & "MR-203-22"
Are Parallel Voltage Wires

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 10592804
CAL DATE: 11-29-76
SERIAL NO: NONE
P/N: 300-010-101-21

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND ROTOR YOKE
CHANNEL: 07 - WHT BEAM BENDING, STATION 8.5

B192

CALIBRATE EQUIVALENT: 100K = 27266 IN-LBS
UNIT CAL = 31073 IN-LBS/KV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.27
POST CAL. : 5.27

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 8.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	0.015	76
0.00	0.00	0.000	-0.015	-76
350.00	4285.05	0.960	0.002	9
700.00	9770.11	1.910	0.008	43
1050.00	14655.17	2.860	0.015	77
1400.00	19540.23	3.800	0.012	60
1750.00	24425.29	4.710	-0.022	-113

MAXIMUM CALIBRATION LOAD: 24425 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 12-23-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: PARY LCU BRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 10592803
CAL DATE: 11-29-76
SERIAL NO: NONE
P/N: 300-010-101-21

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

B 193

PART NAME: LEFT HARC MOTOR YOKE
CHANNEL: 04 - WHT CHORD BENDING. STATION 8.5

CALIBRATE EQUIVALENT: 100K = 19504 IN-LBS
UNIT CAL = 22227 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 0.00
PRE CAL. : 5.26
POST CAL. : 5.27

JACK FAC. : 0.2870 PSI/LB
LEVER ARM : 6.500 IN.

CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE MILLIVOLTS	IN-LBS
0	0	0.000	-0.012	-46
0.00	0.00	0.000	0.010	46
325.00	9625.44	2.070	-0.016	-59
650.00	19250.82	5.190	0.006	22
975.00	28876.31	7.780	-0.002	-9
1300.00	38501.75	10.370	-0.011	-40
1625.00	48127.19	12.990	0.011	41

MAXIMUM CALIBRATION LOAD: 48127 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 12-02-76

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LOU WRIGHT
LAB TECHNICIAN: JARVIES

ORIGINAL PAGE IS
OF POOR QUALITY

LAB NO. : 10592806
CAL DATE: 11-29-76
SERIAL NO: NONE
P/N: 300-010-101-21

PROJECT: 301 FLIGHT TEST

PART NAME: LEFT HAND ROTOR YOKE
CHANNEL: 08 - GRN BEAM BENDING, STATION 8.5

B194

CALIBRATE EQUIVALENT: 100K = 29005 IN-LBS
UNIT CAL = 33169 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.27
POST CAL. : 5.25

JACK FAC. : 0.6090 PSI/LB
LEVER ARM : 8.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE	
			MILLIVOLTS	IN-LBS
0	0	0.000	-0.056	-311
0.00	0.00	0.000	0.056	311
350.00	4685.05	0.320	-0.007	-33
700.00	9770.11	1.660	-0.050	-277
1050.00	14655.17	2.540	-0.053	-294
1400.00	19540.23	3.480	0.004	20
1750.00	24425.29	4.410	0.050	279

MAXIMUM CALIBRATION LOAD: 24425 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 12-23-76

***** END OF JOB *****

***** END OF JOB *****

***** END OF JOB *****

CALIBRATION SHEET
LAB ENGINEER: WHITENER
DATA ANALYST: MARY LCU BRIGHT
LAB TECHNICIAN: JARVIES

LAB NO. : 10592EC5
CAL DATE: 11-29-70
SERIAL NO: NONE
P/N: 300-010-101-21

ORIGINAL PAGE IS
OF POOR QUALITY

PROJECT: 301 FLIGHT TEST

B195

PART NAME: LEFT HAND ROTOR YOKE
CHANNEL: 05 - GRN CHCR BENDING, STATION 8.5

CALIBRATE EQUIVALENT: 100K = 19625 IN-LBS
UNIT CAL = 22301 IN-LBS/MV/V

BRIDGE RES. : 350.00
GAGE FACTOR : 2.130
BRIDGE VOLT. : 6.00
PRE CAL. : 5.25
POST CAL. : 5.25

JACK FAC. : 0.2670 PSI/LB
LEVER ARM : 8.500 IN.
CAL RES. : 100

LOADS-PSI	LOADS-IN-LBS	OUTPUT-MV	VARIATION FROM MEAN LINE	
			MILLIVOLTS	IN-LBS
0	0	0.000	-0.040	-177
0.00	0.00	0.000	0.046	177
325.00	9625.44	2.530	-0.012	-45
650.00	19250.88	5.100	-0.032	-118
975.00	28876.31	7.680	-0.042	-154
1300.00	38501.75	10.300	-0.011	-42
1625.00	48127.19	12.950	0.049	182

MAXIMUM CALIBRATION LOAD: 48127 IN-LBS

BHC PROGRAM FCCR33 - RUN DATE: 12-02-70

CALIBRATION DATA SHEET

Date 6-21-73

Lab. No. _____

Project Ground Tension Tests

Serial No. _____

Model 301-2

Title LT. Pylon Collective Axial Test

Part No. _____

C. _____

L. T. R. _____ EWA _____

Engineer _____

ITEM CODE: D183

Technician	Lab. Notebook No.	Instruments	Serial No.	Res.	Galvo.
<u>W. J. H. K. C.</u>					

Volts					
Gage Type					
Gage Fac.					
Gage Res.					
Lot. No.					
Act. Arm					
Chan.	<u>RMDU "B" - 79-8-3</u>				
Bridge	<u>C157</u>				
Config.					
Cal. Res.	<u>N/A</u>				
Lever Arm					

ORIGINAL PAGE IS OF POOR QUALITY

Load	Output		
COLL. POSITION COEFFICIENT DEFLECTION OUTPUT			
(%)	WHEEL (in)	(in/in)	(in)
0	13	(5.65)	(-373) ← RED BLADE $\delta = 10.44$ DEF.
50	13	(4.93)	(-224)
100	0	4.85	-170
100	13	4.45	-115
100	20	4.24	-90
100	40	3.64	-21
100	60	3.03	+55
100	80	2.43	+122
100	100	1.92	+190 ← RED BLADE $\delta = 35.34$ DEF.
100	80	2.43	+129
100	60	3.04	+56
100	40	3.65	-18
100	20	4.24	-90
100	0	4.82	-160
50	13	(4.83)	(-213)
0	13	(5.65)	(-370)

$GPA_0 (82-8-7) = -005$

$LLC (83-8-7) = +744$

LATERAL PYLON COLLECTIVE ACTUATOR POSITION

ITEM CODE D183
CH B-79-8-3

ORIGINAL PAGE IS
OF POOR QUALITY

