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A Mathematical Simulation Model of a CH-47B Helicopter

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SUMMARY

A nonlinear simulation model of the CH-47B helicopter, developed by the Boeing Vertol Company (ref. 1), has been adapted for use in the NASA Ames Research Center (ARC) simulation facility. The model represents the specific configuration of the ARC variable stability CH-47B helicopter (fig. 1) and will be used in ground simulation research and to expedite and verify flight experiment design.

Modeling of the helicopter uses a total force approach in six rigid body degrees of freedom. Rotor dynamics are simulated using the Wheatley-Bailey equations, including steady-state flapping dynamics. Also included in the model is the option for simulation of external suspension, slung-load equations of motion.

Validation of the model (discussed in volume II of this report) has been accomplished using static and dynamic data from the original Boeing Vertol mathematical model and flight test data from references 2 and 3, as reproduced in reference 4. The model is appropriate for use in real-time piloted simulation and is implemented on the ARC Sigma IX computer where it may be operated with a digital cycle time of 0.03 sec.

NOMENCLATURE

ARC Ames Research Center

BV Boeing Vertol Company

c.g. center of gravity

rpm revolutions per minute

SAS stability augmentation system

INTRODUCTION

Volume II of this report contains static trim data, stability and control derivatives, and dynamic response data for the CH-47B mathematical model described in volume I. Validation of the helicopter itself (without the slung load) was highly successful for all flight conditions examined. Slung load validation was also successful with one exception. The Ames Research Center (ARC) model dynamic response of the slung-load lateral-differential cable angle, ν_L, was unlike the response of the Boeing Vertol Company (BV) model in terms of initial amplitude and damping ratio. Although it was possible to artificially modify the damping of this mode to obtain a good match at most flight conditions (as discussed in the volume I slung-load subroutine description), there is currently a mismatch in initial amplitude, presumably a result of computational differences between the ARC and BV simulation facilities.

Tables 1 through 7 provide a table of contents for the extensive validation data given in tables 8 through 45 and in figures 1 through 110.

Specifically, tables 1 and 2 give the flight conditions corresponding to the helicopter (no slung load) static trim and stability derivative data, respectively. Only ARC model static trim (tables 8-33) and stability derivative (tables 34-41) data are included in this report. During model validation, each number was compared with corresponding BV data and was found to be satisfactory.

The static trim data given in this report were produced with the CH-47B trim-sheet subroutine by selecting flag ICPRNT. Table 3 gives the static trim-sheet key in terms of math model mnemonics.

Table 4 gives the flight conditions corresponding to the dynamic response data given in figures 1-80. For each flight condition, the model was excited with a 1.0 sec pulse in each of the four control axes. Referring to the table, each response consists of four figures, illustrating kinematic, engine, and stability-augmentation-system (SAS) details of the model. Each figure provides a comparison between BV and ARC model responses, SAS on, and SAS off ARC model response.

Next, in figures 81-86, BV simulation model responses are compared with CH-47B and CH-47C flight test data from references 2 and 3, respectively. (The data extracted from ref. 3 are from a CH-47C helicopter with a CH-47B SAS, making the dynamic response data comparable with that of a CH-47B.) These comparisons were originally made in reference 4, and are reproduced for this report. Flight condition details for each of these comparison figures may be found in table 5.

Tables 6 and 7 give the flight conditions for static trim (tables 42-45) and dynamic response data (figs. 87-110) for the helicopter with the slung load attached.

REFERENCES

1. Cogan, C.; Gajkowski, B. J.; and Garnett, Jr., T. S.: Full Flight Envelope Math Model for 347/HLH Control System Analysis — Control Document. Boeing Company, Vertol Division, report D301-10148-1, 1972.

2. Yamakawa, G.; and Miller, L. G.: Airworthiness and Qualification Test, Phase D, CH-47B. USAASTA #66-23, 1970.

3. Albion, N.; Leet, J. R.; and Mollenkof, A.: Ground Based Flight Simulation of CH-47C Helicopter. Boeing Company, Vertol Division, report D8-2418-1, 1969.

4. Hackett, W. E.; Garnett, T. S.; and Borek, B. V.: Mathematical Model of the CH-47B Helicopter Capable of Real Time Simulation of the Full Flight Envelope. NASA CR-166458, 1983.

TABLE 1.- ARC MODEL STATIC TRIM DATA: FLIGHT CONDITIONS

Table number	Gross weight, lb	Moments and products of inertia, slug-ft^2	$\Delta X_{c.g.}$ (DXCG), in.	SAS config-uration	Equivalent airspeed, knot	Flight condition
8	33,000	Nominal: I_{xx} = 34,000 I_{yy} = 202,500 I_{zz} = 191,000 I_{xz} = 14,900 I_{xy} = I_{yz} = 0	0.	OFF	0.1 (Hover)	Straight and level
9		Nominal		ON	.1 (Hover)	
10				OFF	20	
11				ON	20	
12				OFF	40	
13				ON	40	
14				OFF	60	
15				ON	60	
16				OFF	80	
17				ON	80	
18				OFF	100	
19				ON	100	
20				OFF	120	
21				ON	120	
22				OFF	130	
23				ON	130	
24			21.	ON	.1	
25			21.		80	
26			0.		80	Wings level, 1000 ft/min rate of climb
27					80	Wings level, 1000 ft/min rate of descent
28					75	Level flight, β = +15°
29					75	Level flight, β = -15°

TABLE 1.- CONCLUDED

Table number	Gross weight, lb	Moments and products of inertia, slug-ft^2	$\Delta X_{c.g.}$ (DXCG), in.	SAS config-uration	Equivalent airspeed, knot	Flight condition
30	33,000	Nominal	0.	ON	75	Coordinated level turn, $\phi = +30°$
31					75	Coordinated level turn, $\phi = -30°$
32	22,000	$I_{xx} = 18,000$ $I_{yy} = 168,000$ $I_{zz} = 160,000$ $I_{xz} = 11,600$ $I_{yz} = I_{xy} = 0$			.1	Straight and level
33	22,000	$I_{xx} = 18,000$ $I_{yy} = 168,000$ $I_{zz} = 160,000$ $I_{xz} = 11,600$ $I_{yz} = I_{xy} = 0$			80	Straight and level

TABLE 2.- ARC MODEL STABILITY- AND CONTROL-DERIVATIVE DATA: FLIGHT CONDITIONS.

Straight and level
Gross weight = 33,000 lb
I_{xx} = 34,000 slug-ft^2
I_{yy} = 202,500 slug-ft^2
I_{zz} = 191,000 slug-ft^2
I_{xz} = 14,900 slug-ft^2
$I_{xy} = I_{yz} = 0$
$\Delta X_{c.g.} = 0$

Perturbation step size:
δ_B, δ_A, δ_R, δ_C: -0.5 in.
p, q, r: -.2 rad/sec
u, v, w: -10 ft/sec

Table number	Equivalent airspeed, knots
34	0.1
35	20.
36	40.
37	60.
38	80.
39	100.
40	120.
41	130.

TABLE 3.- CH-47B SIMULATION MODEL TRIM SHEET KEY

VTOT VTOTAL	U UB		V VB		W WB			
G.W. WAIT	RPM OMEGA		H ALT	TEMP TAMB	DXCG DXCG		DZCG DZCG	
THETA THET	PHI PHI	PSI PSI	P PB	Q QB	R RB	RHO RHO	OMEGA FR OMEGFR	OMEGA RR OMEGRR
DELB PLT DLONP	DELS PLT DLATP	DELR PLT DYAWP	DELC PLT DCOLP	DELB TOT DLONTOT	DELS TOT DLATTOT	DELR TOT DYAWTOT	DELC TOT DCOLTOT	H DOT ALTD
THETO FR 57.3×THOFR	AICFR 57.3×AICFR	BICFR 57.3×BICFR	THETO RR 57.3×THORR	IXX XIXX	IYY XIYY	IZZ XIZZ	IXZ XIXZ	D. PRES F QBAR
SIGMA FR SIGFR	SIGMA RR SIGRR	GAMMA FS GAMSFR		LAMDA FR ALAMFR	LAMDA RR ALAMRR	MU FR AMUFR	MU RR AMURR	MACH NO. XMACH
THRUST F TFR	NORMAL F HFR	SIDE F YFR	TORQUE F QAERFR	L HUB FR ALHBFR	M HUB FR AMHBFR	V TIP FR VTIPFR	DELTA FR DELFR	F FR FFR
THRUST R TRR	NORMAL R HRR	SIDE R YRR	TORQUE R QAERRR	L HUB RR ALHBRR	M HUB RR AMHBRR	V TIP RR VTIPRR	DELTA RR DELRR	FRR FRR
CT FR CTFR	CH FR CHFR	CY FR CYFR	CQ FR CQFR	A0 FR 57.3×A0FR	A1 FR 57.3×A1FR	B1 FR 57.3×B1FR	Q GOV FR QGOVFR	
CT RR CTRR	CH RR CHRR	CY RR CYRR	CQ RR CQRR	A0 RR 57.3×A0RR	A1 RR 57.3×A1RR	B1 RR 57.3×B1RR	Q GOV RR QGOVRR	
X FUSE XAERFS	X SLING XAERSL	LAMDA SL ALML	X F. ROT XAERFR	X R. ROT XAERRR	X/M AX		BD FRF BDFRF	BD FFR BDFFR
Y FUSE YAERFS	Y SLING YAERSL	NU SL ANUL	Y F. ROT YAERFR	Y R. ROT YAERRR	Y/M AY	A1CF BOD 57.3×A1CFRC	BICF BOD 57.3×BICFRC	THOF BOD 57.3×THOFRC
Z FUSE ZAERFS	Z SLING 0.0	MU SL AMUL	Z F. ROT ZAERFR	Z R. ROT ZAERRR	Z/M AZ	AICR BOD 57.3×AICRRC	BICR BOD 57.3×BICRRC	THOR BOD 57.3×THORRC
L FUSE ALARFS	L SLING 0.0	K BAR SL SLKBAR	L F. ROT ALARFR	L R. ROT ALARRR	L/IXX TTL/XIXX	LHBF BOD ALBDFR	LHBR BOD ALBDRR	PFR PFR
M FUSE AMARFS	M SLING 0.0		M F. ROT AMARFR	M R. ROT AMARRR	M/IYY TTM/XIYY	MHBF BOD AMBDFR	MHBR BOD AMBDRR	QFR QFR
N FUSE ANARFS	N SLING ANARSL		N F. ROT ANARFR	N R. ROT ANARRR	N/IZZ TTN/XIZZ	A1FR BOD 57.3×A1BDFR	A1RR BOD 57.3×A1BDRR	PRR PRR
BETA FS 57.3×BETAFS	BETA SL 57.3×BETSL	SL WGHT WGHTSL	BETA FR BETAFR	BETA RR BETARR		B1FR BOD 57.3×B1BDFR	B1RR BOD 57.3×B1BDRR	QRR QRR
ALPH FS 57.3×ALPHFS	ALPH SL 57.3×ALPHSL	J SL BJSL				HFR BODY HFRBOD	HRR BODY HRRBOD	
VINTF VINTF	THETA SL 57.3×THESL	L SL BLSL			WIRR WIRR	YFR BODY YFRBOD	YRR BODY YRRBOD	
WIFS WIFS	SMA SL SASL	R SL BRSL					A1CRR 57.3×AICRR	BICRR 57.3×BICRR

Logical flags

ISLING	IECSCON
IDCPT	RSASP
RSASQ	RSASR
ISTEADY	NSTALL
NTROQCR	NGREFF

Table entry

FORTRAN MNEMONIC

TABLE 4.- ARC VS. B.V. MODEL DYNAMIC RESPONSE DATA: FLIGHT CONDITIONS

Straight and level
Gross weight = 33,000 lb
I_{xx} = 34,000 slug-ft^2
I_{yy} = 202,500 slug-ft^2
I_{zz} = 191,000 slug-ft^2
I_{xz} = 14,900 slug-ft^2
$I_{xy} = I_{yz} = 0$
$\Delta X_{c.g.} = 0$

Figure number	Perturbation control	Equivalent airspeed, knots
1-4	δ_B	0.1
5-8	δ_A	.1
9-12	δ_R	.1
13-16	δ_C	.1
17-20	δ_B	40.
21-24	δ_A	40.
25-28	δ_R	40.
29-32	δ_C	40.
33-36	δ_B	75.
37-40	δ_A	75.
41-44	δ_R	75.
45-48	δ_C	75.
49-52	δ_B	115.
53-56	δ_A	115.
57-60	δ_R	115.
61-64	δ_C	115.
65-68	δ_B	130.
69-72	δ_A	130.
73-76	δ_R	130.
77-80	δ_C	130.

TABLE 5.- B.V. SIMULATION VS. FLIGHT TEST DYNAMIC RESPONSE DATA: FLIGHT CONDITIONS

Figure number	Flight parameters							
	Gross weight, lb	Density altitude, ft	Rotor rpm	$\Delta X_{c.g.}$ (DXCG) in.	SAS configuration	Equivalent airspeed, knots	Flight condition	Flight test data reference
81	37,000	2400	Nominal: 230	0.5	ON	Hover	Straight and level	2
82	36,780	980	233	6.6	ON	35	Straight and level	3
83	38,470	3220	Nominal	0	ON	70	Straight and level	2
84	33,320	5440	Nominal	17.8	ON	110	Straight and level	2
85	33,320	5440	Nominal	17.2	ON	115	Straight and level	2
86	36,700	4820	236	6.0	ON	127	Straight and level	3

TABLE 6.- ARC MODEL STATIC TRIM DATA: FLIGHT CONDITIONS
— SLUNG LOAD ATTACHED —

Table number	Flight parameters							
	Helicopter weight, lb	Helicopter moments and products of inertia, slug-ft^2	$\Delta X_{c.g.}$ (DXCG), in.	SAS configuration	Equivalent airspeed, knots	Slung load weight, lb	Relative slung load attitude, θ_{SL}, deg	Flight condition
42	25,500	I_{xx} = 25,500 I_{yy} = 185,000 I_{zz} = 170,000 I_{xz} = 13,000 I_{xy} = I_{yz} = 0	0	ON	0.1	7500.	0	Straight and level
43		I_{xx} = 25,500 I_{yy} = 185,000 I_{zz} = 170,000 I_{xz} = 13,000 I_{xy} = I_{yz} = 0			75		0	
44		I_{xx} = 25,500 I_{yy} = 185,000 I_{zz} = 170,000 I_{xz} = 13,000 I_{xy} = I_{yz} = 0			.1		-5	
45		I_{xx} = 25,500 I_{yy} = 185,000 I_{zz} = 170,000 I_{xz} = 13,000 I_{xy} = I_{yz} = 0			75		-5	

TABLE 7.- ARC VS. B.V. MODEL DYNAMIC RESPONSE DATA: FLIGHT CONDITIONS
— SLUNG LOAD ATTACHED —

Straight and level
SAS on
Helicopter weight = 25,500 lb
Helicopter I_{xx} = 25,500 slug-ft^2
Helicopter I_{yy} = 185,500 slug-ft^2
Helicopter I_{zz} = 170,000 slug-ft^2
Helicopter I_{xz} = 13,000 slug-ft^2
Helicopter $I_{xy} = I_{yz} = 0$
$\Delta X_{c.g.} = 0$
Slung load weight = 7500 lb
$\theta_{SL} = 0°$

Figure number	Perturbation control	Equivalent airspeed, knots
87-89	δ_B	0.1
90-92	δ_A	.1
93-95	δ_R	.1
96-98	δ_C	.1
99-101	δ_B	75.
102-104	δ_A	75.
105-107	δ_R	75.
108-110	δ_C	75.

TABLE 8.- STATIC TRIM DATA

V_{eq} = 0.1 knot, SAS off

CH-47B TRIM DATA
RUN NO. [illegible]

14:41 FEB 11,'83

VTOT = .1 KT U = .1 KT V = [illegible] [illegible]
G.W. = 33000.0 LBS RPM = 24.1 [illegible] [illegible]

THETH	PHI	PSI	P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66120E 01	-.44531E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.57220E-02	.32617E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FF	A1CFF	B1CFF	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.18552E 02	.42036E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FF	SIGMA RR	GAMMA FS		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66379E-01	.66979E-01	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16871E 05	.44325E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16690E 05	-.43578E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FF	CH FF	CY FF	CQ FF	[illegible]	[illegible]	[illegible]	[illegible]	
.48217E-02	.12668E-03	.35440E 04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	[illegible]	[illegible]	[illegible]	[illegible]	
.47697E-02	-.12443E-03	-.36363E-04	.41221E-03	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.25000E 00	-.12388E 04	.00000E 00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.20583E 00	.00000E 00	.00000E 00	.13440E 03	.13660E 03	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.57088E 03	.00000E 00	-.10255E 02	-.16733E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	[illegible] BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.21780E 00	.00000E 00	.10135E 01	-.52404E 04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	MHBF BOD	MHBR BOD	UFF
.83096E 03	.00000E 00		.32757E 06	[illegible]	[illegible]	[illegible]	[illegible]	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	A1FF BOD	A1RR BOD	[illegible]
-.50767E 00	.00000E 00		.45476E 05	-.45494E 05	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FF	BETA RR		B1FF BOD	B1RR BOD	URR
-.51618E-01	.00000E 00	.75000E 04	-.51319E-01	-.51328E-01		.42313E 00	[illegible]	.00000E 00
ALPH FS	ALPH SL	J SL				HFF BODY	HRR BODY	
-.89684E 02	.26000E 01	.77711E 04				.44314E 03	[illegible]	

VINTF	THETA SL	L SL			WIFF	YFF BODY	YRR BODY	
.41103E 02	.00000E 00	.20000E 02			.00000E 00	.12440E 03	[illegible]	
WIFS	SMA SL	R SL					A1CPP	B1CPP
-.30444E 02	.20000E 02	.80000E 01					-.44359E 00	.14996E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	RSASP	0
RSASQ	0	RSASR	0
ISTEADY	1	NSTALL	1
NTROCR	1	NGREFF	0
ISLTPM	1		

TABLE 9.- STATIC TRIM DATA

V_{eq} = 0.1 knot, SAS on

CH-47B TRIM DATA
14:40 FEB 11,'83 RUN NO. 33

VTOT = .1 KT U = .1 KT V = -.0 KT W = .0 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 87.0 FT TEMP = 288.0 DG DOOG = .0 IN DZOG = .0 IN PHP = .0

THETA	PHI	PSI	P	Q	R	PDO	OMEGA FP	OMEGA RP
.66120E 01	-.44531E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	.23704E-02	.34085E 02	.34085E 02
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	H OUT
-.57220E-02	.22617E 00	-.32282E-02	.57555E 01	-.57220E-02	.22617E 00	-.33503E-02	.57555E 01	.00000E 00
THETO FP	AICFP	BICFP	THETO RP	IXX	IYY	IZZ	IXZ	D.PRES F
.18552E 02	.41998E 00	-.15004E 01	.18559E 02	.34000E 05	.20250E 06	.19100E 06	.14900E 05	.10971E 01
SIGMA FP	SIGMA RP	GAMMA FS		LAMDA FP	LAMDA RP	MU FP	MU RP	MACH NO.
.66979E-01	.66979E-01	.41076E-02		-.56895E-01	-.57529E 01	.23371E-03	.23787E 03	.15144E-03
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FP	M HUB FP	T TIP FP	DELTA FP	F FP
.16871E 05	.44325E 03	.12389E 03	.47371E 05	.51765E 03	.23095E 04	.72 [illegible] 03	.10773E 01	.34791E 02
THRUST P	NORMAL P	SIDE P	TORQUE P	L HUB RP	M HUB RP	T TIPRP	DELTA RP	F RP
.16690E 05	-.43538E 03	-.12910E 03	.43271E 05	-.64047E 03	-.21515E 04	.72[illegible]E 03	.10745E 01	.34791E 02
CT FP	CH FP	CY FP	CQ FP	A0 FP	A1 FP	B1 FP	D.GOV FP	
.48217E-02	.12668E-03	.35408E-04	.41317E-03	.45674E 01	.15048E 01	.42[illegible]E 00	.43371E 05	
CT RP	CH RP	CY RP	CQ RP	A0 RP	A1 RP	B1 RP	D.GOV RP	
.47697E-02	-.12443E-03	-.36895E-04	.41221E-03	.45955E 01	-.14953E 01	-.44[illegible]E 00	.43271E 05	
X FUSE	X SLING	LAMDA SL	X F.POT	X R.POT	X M		BO FRP	EO FRP
-.25000E 00	-.12388E 04	.00000E 00	.22016E 04	.15086E 04	.37073E 01		.35012E 00	.37062E 00
Y FUSE	Y SLING	MU SL	Y F.POT	Y R.POT	Y M	AICP BOD	BICP BOD	PHOP BOD
.20583E 00	.00000E 00	.00000E 00	.12429E 03	.12871E 03	.24707E 00	.42[illegible]E 00	-.15060E 01	.18952E 02
Z FUSE	Z SLING	MU SL	Z F.POT	Z R.POT	Z M	AILP BOD	BICP BOD	THOP BOD
.57088E 03	.00000E 00	-.10255E 02	-.16733E 05	-.16619E 05	-.31990E 02	-.44[illegible]E 00	.15000E 01	.18559E 02
L FUSE	L SLING	K BAR SL	L F.POT	L R.POT	L IXX	L.OP BOD	LHBP BOD	RRP
.21780E 00	.00000E 00	.10135E 01	-.52418E 04	.52385E 04	-.38373E-03	.61[illegible]E 03	-.65064E 03	.00000E 00
M FUSE	M SLING		M F.POT	M R.POT	M IYY	MHBP BOD	MHBP BOD	MRP
.83096E 03	.00000E 00		.32757E 06	-.32841E 06	-.50000E-04	.22[illegible]E 04	-.21910E 04	.00000E 00
N FUSE	N SLING		N F.POT	N R.POT	N IZZ	NIRP BOD	NIRP BOD	NRP
-.50767E 00	.00000E 00		.45473E 05	-.45486E 05	-.12371E-03	.15044E 01	-.14848E 01	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FP	BETA RP		BICP BOD	BIRP BOD	HRP
-.51618E-01	.00000E 00	.75000E 04	-.51319E-01	-.51328E-01		.42[illegible]E 00	-.44390E 00	.00000E 00
ALPH FS	ALPH SL	J SL				HRP BODY	HRP BODY	
-.89684E 02	.26000E 01	.77711E 04				.44314E 03	-.43527E 03	

VINTF	THETA SL	L SL			WIRP	VRP BODY	VRP BODY	
.41103E 02	.00000E 00	.20000E 02			.00000E 00	.12429E 03	-.12949E 03	
WIFS	SMA SL	R SL					AICRP	BICRP
-.30444E 02	.20000E 02	.80000E 01					-.44397E 00	.14996E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	RSASP	1
RSASQ	1	RSASR	1
ISTEADY	1	NSTALL	1
NTROCR	1	NGREFF	0
ISLTRM	1		

TABLE 10.- STATIC TRIM DATA

V_{eq} = 20 knots, SAS off

CH-47B TRIM DATA
RUN NO. 37

14:45 FEB 11,'83

VTOT = 20.0 KT U = 19.9 KT V = -.0 KT W = 1.9 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 97.5 FT TEMP = 288.0 DG [illegible] = [illegible] IN DZCG = .0 IN [illegible] = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	OMEGA RR
.54756E 01	-.38583E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	.24085E 02	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	[illegible]	DELP TOT	DELC TOT	H DOT
-.14901E 01	.21625E 00	.24915E 00	.56003E 01	-.14901E 01	[illegible]	[illegible]	[illegible]	.00000E 00
THETO FR	AICFR	BICFR	THETO RR	IXX	IYY	IZZ	IXZ	[illegible]
.17350E 02	.12044E 01	-.15003E 01	.19183E 02	.34000E 05	[illegible]	[illegible]	.34200E 05	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NU.
.66979E-01	.66979E-01	.80054E 00		-.45302E-01	[illegible]	[illegible]	.46767E-01	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	[illegible]	TIP FR	DELTA FR	P FR
.16633E 05	.69873E 03	.38148E 03	.32085E 05	[illegible]	[illegible]	[illegible]	.10735E-01	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	[illegible]	[illegible]	DELTA RR	P RR
.16775E 05	-.13963E 03	.16288E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	Q GOV FR	
.47537E-02	.19969E-03	.10902E-03	.30566E-03	.45666E 01	[illegible]	.14759E 01	.32085E 05	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	Q GOV RR	
.47941E-02	-.39906E-04	.46551E-04	.40780E-03	[illegible]	[illegible]	.66483E 00	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		BD FRR	BD FRR
-.72448E 02	-.12388E 04	.00000E 00	.19121E 04	.13003E 04	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	THOF BOD
.22038E 01	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	BICR BOD	THOR BOD
.41296E 03	.00000E 00	-.10255E 02	[illegible]	[illegible]	[illegible]	[illegible]	.15000E 01	.19183E 02
L FUSE	L SLING	F BAR SL	L F.ROT	L R.ROT	[illegible]	LHFR BOD	LHRR BOD	FFR
-.12384E 02	.00000E 00	.10135E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	MHFR BOD	MHRR BOD	QFR
-.14271E 04	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	[illegible]	AIRR BOD	RFR
-.65996E 02	.00000E 00		.39832E 05	-.39762E 05	[illegible]	[illegible]	-.57907E 00	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		[illegible]	BIRR BOD	PRR
-.36985E-01	.00000E 00	.75000E 04	[illegible]	[illegible]		[illegible]	.66446E 00	.00000E 00
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.33697E 02	.26000E 01	.77711E 04				[illegible]	-.13974E 03	
VINTF	THETA SL	L SL			WIFR	VFR BODY	VRR BODY	
.30655E 02	.00000E 00	.20000E 02			.00000E 00	[illegible]	.16279E 03	
WIFS	SMA SL	R SL					AICRR	BICRR
-.25664E 02	.20000E 02	.80000E 01					.37829E 00	.15002E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	RSASP	0
RSASO	0	RSASR	0
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 11.- STATIC TRIM DATA

V_{eq} = 20 knots, SAS on

15:17 FEB 11,'83

CH-47B TRIM DATA
RUN NO. 57

VTOT = 20.0 KT U = 19.9 KT V = -.0 KT W = 1.9 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 97.5 FT TEMP = 388.0 IG [illegible] = .0 IN DZCG = .0 IN [illegible] = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.54760E 01	-.38616E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	.23[illegible]E-02	.24085E 02	.24085E 02
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	R DOT
-.14901E 01	.31587E 00	.25086E 00	.56000E 01	-.14901E 01	[illegible]	.250[illegible]E 00	.56000E 01	.00000E 00
THETO FR	A1CFR	B1CFR	THETO RR	IXX	IYY	IZZ	IXZ	D.RPRS F
.17350E 02	.12075E 01	-.15000E 01	.19183E 02	.34000E 05	.20250E 06	.19100E 06	.14900E 05	.19[illegible]E 01
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.80054E 00		-.45301E-01	-.6381[illegible]	.46[illegible]4E-01	.4[illegible]E-01	.30[illegible]E-01
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	M HUB FR	V TIP FR	DELTA FR	F FR
.16633E 05	.69871E 03	.38238E 03	.32084E 05	.21680E 04	.33[illegible]	[illegible]E 03	.1[illegible]E-01	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	M HUB RR	V TIPRR	DELTA RR	F RR
.16774E 05	-.13964E 03	.16424E 03	.42807E 05	.93125E 03	-.[illegible]	[illegible]	.10760E-01	.3[illegible]E 02
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	Q GOV FR	
.47536E-02	.19969E-03	.10928E-03	.30565E-03	.43665E 01	.23057E 01	.147[illegible]E 01	.32084E 05	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	Q GOV RR	
.47940E-02	-.39907E-04	.46937E-04	.40780E-03	.46003E 01	-.57765E 00	.66[illegible]E 00	.42807E 05	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	X IN		BD FRF	BD FRR
-.72448E 02	-.12388E 04	.00000E 00	.19121E 04	.1309[illegible]E 04	.30[illegible]E 01		.10440E 00	.9501[illegible]E 00
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y IN	A1CF BOD	B1CF BOD	THOF BOD
.22039E 01	.00000E 00	.00000E 00	.38283E 03	-.16432E 03	.21[illegible]	[illegible]	-.15000E 01	.17[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z IN	A1CR BOD	B1CR BOD	THOR BOD
.41296E 03	.00000E 00	-.10255E 02	-.16532E 05	.16724E 05	[illegible]	[illegible]E 00	.15000E 01	.191[illegible]E 02
L FUSE	L SLING	K BAF SL	L F.ROT	L R.ROT	L IN	LHBF BOD	LHBR BOD	FFR
-.12384E 02	.00000E 00	.10135E 01	-.82744E 01	.83018E 01	.36343E 0[illegible]	.2[illegible]E 04	.93070E 03	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	M IN	MHBF BOD	MHBR BOD	QFR
-.14270E 04	.00000E 00		.32691E 06	-.32549E 06	-.11728E 04	.33[illegible]E 04	-.84732E 03	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	N IN	A1FR BOD	A1RR BOD	FRR
-.65995E 02	.00000E 00		.39850E 05	-.39737E 05	.24544E 0[illegible]	.23[illegible]E 01	-.57808E 00	.00000E 00
BETA FS	BETA SL	SL WGHT	BETH FR	BETH RR		B1FR BOD	B1RR BOD	QRR
-.37019E-01	.00000E 00	.75000E 04	-.3630[illegible]E-01	-.36862E-01		.149[illegible]E 01	.66908E 00	.00000E 00
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.33696E 02	.26000E 01	.77711E 04				.60047E 03	-.13974E 03	

VINTF	THETA SL	L SL	WIRR	YFR BODY	YRR BODY		
.30655E 02	.00000E 00	.20000E 02	.00000E 00	.[illegible]8283E 03	.16415E 03		
WIFS	SMA SL	R SL				A1CRR	B1CRR
-.25663E 02	.20000E 02	.80000E 01				.38291E 00	.15002E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	PSASP	1
RSASQ	1	RSASR	1
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 12.- STATIC TRIM DATA

V_{eq} = 40 knots, SAS off

CH-47B TRIM DATA
14:49 FEB 11,'83 RUN NO. 41

VTOT = 40.0 KT U = 39.9 KT V = -.0 KT W = 3.7 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 98.0 FT TEMP = 288.0 DG [illegible] = .0 IN DZCG = .0 IN PHP = .0

THETA	PHI	PSI	P	Q	R	P.C	OMEGA FP	OMEGA PP
.42599E 01	-.29411E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	.25[illegible]E-03	.24085E 02	.24085E 02

DELB PLT	DELS PLT	DELR PLT	DELC PLT	DELB TOT	DELS TOT	DELR TOT	DELC TOT	H TOT
-.23407E 01	.21366E 00	.37495E 00	.51744E 01	-.23407E 01	.21366E 00	.37495E 00	.51744E 01	.00000E 00

THETO FP	AICFP	BICFP	THETO PP	[illegible]	[illegible]	[illegible]	[illegible]	D.FRES F
.16035E 02	.15998E 01	-.15006E 01	.18914E 02	.34000E 05	.33050E 05	.19100E 06	.14900E 05	.55590E 01

SIGMA FP	SIGMA PP	GAMMA FS	[illegible]	LAMDA FP	LAMDA PP	TT FP	TT PP	MACH NO.
.66979E-01	.66979E-01	.12320E 01		-.22254E-01	-.22254E-01	.33[illegible]E-01	.33565E-01	.33565E-01

THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	DELTA FP	A FP
.16456E 05	.90044E 03	.49549E 03	.22480E 05	.30473E 03	.41[illegible]E 03	.72[illegible]E 03	.10077E 01	.34[illegible]E 07

THRUST P	NORMAL P	SIDE P	TORQUE P	[illegible]	[illegible]	[illegible]	DELTA PP	A PP
.16884E 05	.14919E 03	.32805E 03	.33901E 05	.19[illegible]E 04	.44[illegible]	.72[illegible]E 03	.10790E 01	.34[illegible]E 07

CT FP	CH FP	CY FP	CQ FP	MU FP	ALPHA FP	[illegible]	[illegible]
.47031E-02	.25734E-03	.14161E-03	.21416E-03	.41468E 01	.27[illegible]	.21[illegible]E 01	.22[illegible]

CT PP	CH PP	CY PP	CQ PP	MU PP	ALPHA PP	[illegible]	[illegible]
.48254E-02	.42638E-04	.93757E-04	.37059E-03	.45555E 01	.30[illegible]	.13[illegible]E 01	.73901E 05

X FUSE	X SLING	LAMDA SL	X F.POT	X P.POT	[illegible]		BD FPP	BD FPP
-.26260E 03	-.12388E 04	.00000E 00	.16851E 04	.10288E 04	.33[illegible]		.61756E-01	.16551E 01

Y FUSE	Y SLING	MU SL	Y F.POT	Y P.POT	[illegible]	HICP BOD	BICP BOD	THCP BOD
.10885E 01	.00000E 00	.00000E 00	.43503E 03	-.32600E 03	.16[illegible]	.16[illegible]E 01	-.15000E 01	.16035E 02

Z FUSE	Z SLING	NU SL	Z F.POT	Z P.POT	[illegible]	HI P BOD	BICP BOD	THCP BOD
.33934E 03	.00000E 00	-.10255E 02	-.16394E 05	-.16853E 05	-.32[illegible]	.78[illegible] 00	.15000E 01	.18914E 02

L FUSE	L SLING	R BAP SL	L F.POT	L P.POT	[illegible]	LHBP BOD	LHBP BOD	PFP
-.10000E 02	.00000E 00	.10135E 01	.32579E 04	-.32480E 04	-.33026E-05	.32950E 04	.19782E 04	.00000E 00

M FUSE	M SLING		M F.POT	M P.POT	[illegible]	[illegible]	MHBP BOD	HFP
-.34349E 04	.00000E 00		.32661E 06	-.32317E 06	-.10185E-04	.43[illegible]	.44737E 03	.00000E 00

N FUSE	N SLING		N F.POT	N P.POT	N [illegible]	AIPP BOD	AIPP BOD	PPP
.70334E 02	.00000E 00		.32818E 05	-.32689E 05	-.29859E-05	.33[illegible]	.30522E 00	.00000E 00

BETA FS	BETA SL	SL WGHT	BETA FR	BETA PP		BICP BOD	BIPP BOD	OPP
-.21907E-01	.00000E 00	.75000E 04	-.21922E-01	-.21847E-01		.1143E 01	.13496E 01	.00000E 00

ALPH FS	ALPH SL	J SL				HFP BODY	HPP BODY	
-.10154E 02	.26000E 01	.77711E 04				.9005 E 03	.14906E 03	

VINTF	THETA SL	L SL			WIRP	VFP BODY	VPP BODY	
.18152E 02	.00000E 00	.20000E 02			.00000E 00	.49583E 03	.32811E 03	

WIFS	SMA SL	R SL					AICRP	BICRP
-.17096E 02	.20000E 02	.80000E 01					.78367E 00	.15003E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	RSASP	0
RSASO	0	RSASR	0
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 13.- STATIC TRIM DATA

V_{eq} = 40 knots, SAS on

CH-47B TRIM DATA
RUN NO. 29

14:36 FEB 11,'83

VTOT = 40.0 KT U = 39.9 KT V = -.0 KT W = 3.0 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 98.0 FT TEMP = 380.0 DG [illegible] = .0 IN DZCG = [illegible] IN RHP = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.42600E 01	-.29424E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]E-02	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	[illegible]
-.23407E 01	.21360E 00	.37626E 00	.51744E 01	-.23407E 01	[illegible]	[illegible]	.51744E 01	[illegible]
THETO FR	AICFR	BICFR	THETO RR	IXX	IYY	IZZ	IXZ	[illegible]
.16035E 02	.16000E 01	-.15006E 01	.13914E 02	[illegible]E 05	[illegible]	[illegible]	[illegible]	[illegible]E 01
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.12320E 01		-.[illegible]E-01	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	M HUB FR	V TIP FR	DELTA FR	[illegible]
.16456E 05	.90045E 03	.43554E 03	.22480E 05	[illegible]E 04	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	M HUB RR	V TIP RR	DELTA RR	[illegible]
.16884E 05	.14919E 03	.32818E 03	.38901E 05	.19706E 04	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	[illegible]	
.47031E-02	.25735E-03	.14162E-03	.21416E-03	.41469E 01	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	[illegible]	
.48255E-02	.42639E-04	.93792E-04	.37060E-03	.45556E 01	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LANDA SL	X F.ROT	X R.ROT	X M		BD [illegible]	BD [illegible]
-.26260E 03	-.12388E 04	.00000E 00	.16851E 04	[illegible]E 04	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y M	AICF BOD	BICF BOD	THOF BOD
.10885E 01	.00000E 00	.00000E 00	.49588E 03	-.32017E 03	[illegible]	[illegible]	-.15000E 01	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z M	AICR BOD	BICR BOD	THOR BOD
.33934E 03	.00000E 00	-.10255E 02	-.16394E 05	-.16853E 05	-.32110E 02	[illegible]E 00	.15000E 01	[illegible]E 02
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	L [illegible]	LHBF BOD	LHBR BOD	[illegible]
-.10000E 02	.00000E 00	.10135E 01	.32586E 04	-.32501E 04	-.44513E-04	[illegible]E 04	[illegible]E 04	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	M [illegible]	MHBF BOD	MHBR BOD	[illegible]
-.34349E 04	.00000E 00		.32661E 06	-.32318E 06	-.13580E-04	.42957E 04	[illegible]E 03	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	N IZZ	AIFR BOD	AIRR BOD	[illegible]
.70334E 02	.00000E 00		.32819E 05	-.32887E 05	.13414E-04	.29307E 01	[illegible]E 00	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FR BOD	B1RR BOD	[illegible]
-.21917E-01	.00000E 00	.75000E 04	-.21932E-01	-.21857E-01		.21145E 01	.13500E 01	.00000E 00
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.10154E 02	.26000E 01	.77711E 04				.90026E 03	.14907E 03	
VINTF	THETA SL	L SL			WIFR	YFR BODY	YRR BODY	
.18152E 02	.00000E 00	.20000E 02			.00000E 00	.49588E 03	.32823E 03	
WIFS	SMA SL	R SL					AICRR	BICRR
-.17096E 02	.20000E 02	.80000E 01					.78407E 00	.15003E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	RSASP	1
RSASQ	1	RSASR	1
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 14.- STATIC TRIM DATA

V_{eq} = 60 knots, SAS off

15:21 FEB 11,'83

CH-47B TRIM DATA
RUN NO. 57

VTOT = 60.0 KT U = 60.0 KT V = -.0 KT W = [illegible] KT
G.W. = 33000.0 LBS RPM = 24.1 H = 98.6 FT TEMP = [illegible] DG [illegible] .0 IN DCFS = .0 IN RHP = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	OMEGA RR
.29602E 01	-.24453E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELR PLT	DELC PLT	DELB TOT	[illegible]	DELR TOT	DELC TOT	[illegible]
-.10241E 01	.19714E 00	.25889E 00	.47454E 01	.10241E 01	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	AICFR	BICFR	THETO RR	IXX	IYY	IZZ	IXZ	[illegible]
.15555E 02	.11995E 01	-.15003E 01	.17730E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.13537E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	M HUB FR	[illegible]	DELTH FR	[illegible]
.16270E 05	.10886E 04	[illegible]	.19800E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	M HUB RR	[illegible]	DELTH RR	[illegible]
.17092E 05	.38409E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	.31113E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.57495E 03	-.12388E 04	.00000E 00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NG SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.82202E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	[illegible]	Z F.ROT	Z R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.36168E 03	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	L BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.22574E 02	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.23243E 04	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.40113E 02	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		[illegible]	[illegible]	[illegible]
-.12645E-01	.00000E 00	.75000E 04	[illegible]	[illegible]		[illegible]	[illegible]	.00000E 00
ALPH FS	ALPH SL	T SL				[illegible]	[illegible]	
-.36807E 01	.26000E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL	WIFF	[illegible]	[illegible]
.11577E 02	.00000E 00	.20000E 02	.00000E 00	[illegible]	[illegible]
WIFS	SMA SL	R SL		AICRR	BICRR
-.11752E 02	.20000E 02	.80000E 01		.44641E 00	.15001E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	RSASP	0
RSASD	0	RSASR	0
ISTEADY	1	NSTALL	1
NTROCR	1	NGREFF	0
ISLTRM	1		

TABLE 15.- STATIC TRIM DATA

V_{eq} = 60 knots, SAS on

15:14 FEB 11,'83 CH-47B TRIM DATA RUN NO. 57

VTOT = 60.0 KT U = 60.0 KT V = -.0 KT W = 3.[illegible] KT
G.W. = 33000.0 LBS RPM = 24.1 H = 96.6 FT TEMP = 288.0 DG [illegible] IN DCCG = .0 IN PHP = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.29602E 01	-.24446E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]E 02	[illegible] 02
DELB FLT	DELS FLT	DELP FLT	DELC FLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	H DOT
-.22232E 01	.19714E 00	.26046E 00	.47455E 01	.18741E 01	[illegible]	[illegible]E 00	.47455E 01	.00000E 00
THETO FR	AICFR	BICFR	THETO RR	IXX	IYY	IZZ	IXZ	D,PRES F
.15555E 02	.11998E 01	-.15003E 01	.17798E 02	.54000E 05	.20250E 06	.19[illegible] 06	.14900E 05	.1[illegible]E 02
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.13537E 01		-.30790E 01	-.47817E 01	.13[illegible]E 00	.14[illegible] 00	[illegible]E-01
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	M HUB FR	V TIP FR	DELTA FR	R FR
.16271E 05	.10886E 04	.37909E 03	.19600E 05	.33879E 04	.51[illegible] 04	[illegible] 03	.10671E-01	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	M HUB RR	V TIPRR	DELTA RR	R RR
.17092E 05	.38409E 03	.23963E 03	.32076E 05	.18557E 04	.1[illegible] 04	[illegible]	.10[illegible]E-01	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	R DOWN FR	
.46502E-02	.31113E-03	.10834E-03	.10[illegible]-03	[illegible] 01	[illegible]	.19[illegible]E 01	[illegible]	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	R DOWN RR	
.48848E-02	.10477E-03	.60407E-04	.3[illegible]-03	.44[illegible] 01	.9[illegible]	[illegible] 01	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	X CG		BD FRM	BD RRP
-.57495E 03	-.12388E 04	.00000E 00	.14702E 04	.80893E 03	.1[illegible] 01		-.1[illegible]E-01	.17[illegible] 01
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y CG	AICF BOD	BICF BOD	THOF BOD
.82200E 00	.00000E 00	.00000E 00	.37933E 03	-.23955E 03	.13[illegible] 00	.1[illegible]E 01	-.15000E 01	.15555E 02
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z CG	AICR BOD	BICR BOD	THOR BOD
.36168E 03	.00000E 00	-.10255E 02	-.16241E 05	-.1[illegible] 05	-.3015[illegible]	.44[illegible] 00	.15000E 01	.17798E 02
L FUSE	L SLING	F BAR SL	L F.ROT	L R.ROT	L ICG	LHBF BOD	LHBR BOD	PFR
-.22574E 02	.00000E 00	.10135E 01	.25479E 04	.25259E 04	-.1[illegible]	[illegible] 04	.1[illegible]E 04	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	M ICG	MHBF BOD	MHBR BOD	QFR
-.23243E 04	.00000E 00		.32595E 06	-.32[illegible]E 06	.15[illegible]-04	.51[illegible] 04	.14[illegible] 04	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	N ICG	A1FF BOD	A1RR BOD	RFR
-.40113E 02	.00000E 00		.27750E 05	-.[illegible]E 05	.2[illegible]E-04	[illegible] 01	[illegible] 01	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FF BOD	B1RR BOD	URR
-.12641E-01	.00000E 00	.75000E 04	-.12095E 01	-.12626E-01		.1[illegible]E 01	.12660E 01	.00000E 00
ALPH FS	ALPH SL	I SL				HFR BODY	HRR BODY	
-.36807E 01	.26000E 01	.77711E 04				.1[illegible]E 04	.38[illegible] 03	

VINTF	THETA SL	L SL	WIRR	XFR BODY	YRR BODY
.11577E 02	.00000E 00	.20000E 02	.00000E 00	.37933E 03	.23371E 03
WIFS	SMA SL	R SL		AICRR	BICRR
-.11752E 02	.20000E 02	.80000E 01		.44675E 00	.15001E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	RSASP	1
PSASD	1	PSASP	1
ISTEADY	1	NSTALL	1
NTPOCP	1	NGPEFF	0
ISLTPM	1		

TABLE 16.- STATIC TRIM DATA

V_{eq} = 80 knots, SAS off

CH-47B TRIM DATA
RUN NO. [illegible]

15:23 FEB 11.'83

VTOT = 80.0 KT U = 80.0 KT V = -.0 KT W = [illegible]
G.W. = 33000.0 LBS RPM = 24.1 H = 98.0 FT TEMP = 288.0 [illegible] [illegible] IN DCOG = .0 IN FAC = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.29508E 01	-.24199E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	.24085E 02	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	H DOT
-.11228E 01	.17539E 00	.11520E 00	.46284E 01	-.11228E 01	[illegible]	[illegible]	.46284E 01	[illegible]
THETO FR	A1CFR	B1CFR	THETO RR	[illegible]	I Y	[illegible]	[illegible]	D.PRES F
.15768E 02	.70133E 00	-.10287E-03	.17149E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.14014E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	[illegible]	[illegible]	DELTA FR	F FR
.16411E 05	.89806E 03	.25639E 03	[illegible]	[illegible]	[illegible]	[illegible]	.10696E-01	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	[illegible]	[illegible]	DELTA RR	F RR
.16985E 05	.15186E 03	.11881E 03	.28036E 05	.15691E 04	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	Q GOV FR	
.46904E-02	.25667E-03	.73279E-04	.19775E-03	.39727E 01	[illegible]	[illegible]	.20757E 05	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	Q GOV RR	
.48543E-02	.43401E-04	.33955E-04	.26709E-03	.42413E 01	.11296E 00	[illegible]	.28036E 05	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	X M		BD FRF	BD FRR
-.10147E 04	-.12388E 04	.00000E 00	.16804E 04	.10332E 04	[illegible]		-.24792E-01	.16974E 01
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y M	A1CF BOD	B1CF BOD	THOF BOD
.14545E 01	.00000E 00	.00000E 00	.25659E 03	-.11877E 03	.13590E 00	[illegible]	-.95367E-05	.15768E 02
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z M	A1CR BOD	B1CR BOD	THOR BOD
.34819E 03	.00000E 00	-.10255E 02	-.16350E 05	-.16954E 05	-.33156E 02	.31378E-01	.30000E 01	.17149E 02
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	L IXX	LHSF BOD	LHBR BOD	PFR
-.39639E 02	.00000E 00	.10135E 01	.10937E 04	-.10540E 04	.29512E-05	[illegible]	.15692E 04	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	M IYY	MHBF BOD	MHBR BOD	QFR
-.58710E 02	.00000E 00		.32544E 06	-.32537E 06	.68519E-04	[illegible]	.16523E 03	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	N IZZ	A1FR BOD	A1RR BOD	RFR
-.24125E 03	.00000E 00		.26126E 05	-.25885E 05	.25360E-05	.27278E 01	.11273E 00	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FR BOD	B1RR BOD	QRR
-.12474E-01	.00000E 00	.75000E 04	-.12527E-01	-.13459E-01		.16709E 01	.10706E 01	.00000E 00
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.85260E 00	.26000E 01	.77711E 04				.89800E 03	.15183E 03	
VINTF	THETA SL	L SL			WIPP	YFR BODY	YRR BODY	
.87476E 01	.00000E 00	.20000E 02			.00000E 00	.25659E 03	.11884E 03	
WIFS	SMA SL	R SL					AICRR	BICRR
-.89700E 01	.20000E 02	.80000E 01					.30685E-01	.30000E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	RSASP	0
RSASQ	0	RSASR	0
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 17.- STATIC TRIM DATA

V_{eq} = 80 knots, SAS on

15:12 FEB 11,'83 CH-47B TRIM DATA RUN NO. 57

VTOT = 80.0 KT U = 80.0 KT V = -.0 KT W = 4.1 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 98.6 FT TEMP = [illegible] [illegible] = .0 IN DCCG = .0 IN [illegible] = .0

THETA	PHI	PSI	P	Q	R	[illegible]	[illegible] FR	OMEGA RP
.29508E 01	-.24208E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	[illegible] TOT	[illegible] TOT	[illegible] TOT	[illegible]
-.20712E 01	.17539E 00	.11662E 00	.46284E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	AICFR	BICFR	THETO RP	[illegible]	IY	[illegible]	[illegible]	[illegible]
.15768E 02	.70119E 00	-.16390E-03	.17149E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RP	GAMMA FS		LAMDA FR	LAMDA RP	[illegible] FR	[illegible]	[illegible]
.66979E-01	.66979E-01	.14014E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	HUB FR	[illegible]	[illegible] TIP FR	DEL[illegible] FR	[illegible]
.16412E 05	.89011E 03	.25637E 03	.20757E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RP	M HUB RP	[illegible] TIPRP	[illegible] RP	[illegible]
.16985E 05	.15188E 03	.11877E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	[illegible] FR	[illegible] FR	[illegible] FR	
.46906E-02	.25668E-03	.73271E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RP	CH RP	CY RP	CQ RP	A0 RP	A1 RP	B1 RP	[illegible] RP	
.48544E-02	.43407E-04	.33946E-04	.20710E-03	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.POT	X R.POT	X M		[illegible]	[illegible]
-.10147E 04	-.12388E 04	.00000E 00	.16604E 04	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.POT	Y R.POT	Y M	[illegible] BOD	[illegible] BOD	[illegible] BOD
.14545E 01	.00000E 00	.00000E 00	.25656E 03	-.11874E 03	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.POT	Z R.POT	Z M	[illegible] BOD	[illegible] BOD	THUF BOD
.34819E 03	.00000E 00	-.10255E 02	-.16350E 05	-.16054E 05	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	F BAR SL	L F.POT	L R.POT	L [illegible]	LHUF BOD	LHRF BOD	[illegible]
-.39639E 02	.00000E 00	.10135E 01	.10933E 04	-.10534E 04	[illegible]	[illegible]	.15690E 04	.00000E 00
M FUSE	M SLING		M F.POT	M R.POT	M [illegible]	[illegible] BOD	[illegible] BOD	[illegible]
-.58710E 02	.00000E 00		.32545E 06	[illegible]	[illegible]	[illegible]	[illegible]	.00000E 00
N FUSE	N SLING		N F.POT	N R.POT	N [illegible]	[illegible] BOD	[illegible] BOD	[illegible]
-.24125E 03	.00000E 00		.26126E 05	-.25886E 05	[illegible]	[illegible]	[illegible]	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FP	BETA RP		[illegible] BOD	BIRR BOD	[illegible]
-.12479E-01	.00000E 00	.75000E 04	-.12532E-01	-.12464E-01		[illegible]	[illegible]	.00000E 00
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.85271E 00	.26000E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL		WIPR	[illegible] BODY	YRR BODY	
.87480E 01	.00000E 00	.20000E 02		.00000E 00	[illegible]	.11881E 03	
WIFS	SMA SL	P SL				AICPR	BICPR
-.89704E 01	.20000E 02	.80000E 01				.30558E-01	.30000E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	PSASP	1
RSASO	1	PSASP	1
ISTEADY	1	NSTALL	1
NTRDCR	1	NGPEFF	0
ISLTRM	1		

TABLE 18.- STATIC TRIM DATA

V_{eq} = 100 knots, SAS off

CH-47D TRIM DATA
RUN NO. 57

15:25 FEB 11,'83

VTOT = 100.0 KT U = 100.0 KT V = [illegible] KT W = [illegible] KT
G.W. = 33000.0 LBS RPM = 24.1 H = 98.7 FT [illegible]

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FP	OMEGA RP
.26354E 01	-.36[illegible]E 00	.000000E 00	.000000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELR PLT	DELL PLT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.64741E 00	.17457E 00	.81534E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FP	A1CFP	B1CFF	THETO FR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16346E 02	.35967E 00	.14393E 01	[illegible]	[illegible] E 05	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FP	SIGMA FR	GAMMA FS		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	.1417[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.1655[illegible]E 05	.73517E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16928E 05	-.53764E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FP	CH FP	CY FP	CQ FP	[illegible]	[illegible]	[illegible]	[illegible]	
.47307E-02	.20954E-03	.59683E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RP	CH RP	CY RP	CQ RP	[illegible]	[illegible]	[illegible]	[illegible]	
.48381E-02	-.15366E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
-.15823E 04	-.1[illegible]E 04	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.19516E 01	.000000E 00	.000000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.38101E 03	.000000E 00	-.10255E 0[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	H BAR SL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.74346E 02	.000000E 00	.10135E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F,ROT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.23245E 04	.000000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F,ROT	N R,ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.47013E 03	.000000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FF	BETA RF		[illegible]	[illegible]	[illegible]
-.12331E-01	.000000E 00	.7[illegible]000E 04	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	I SL				[illegible]	[illegible]	
.17211E 00	.26000E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL	[illegible]	[illegible]	[illegible]	
.71923E 01	.00000E 00	.20000E 02	.00000E 00	.15560E 03	.39657E 02	
WIFS	SMA SL	R SL			A1CPR	B1CPR
-.72641E 01	.20000E 02	.80000E 01			-.30846E 00	.44999E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	RSASP	0
RSASQ	0	RSASR	0
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 19.- STATIC TRIM DATA

V_{eq} = 100 knots, SAS on

CH-47B TRIM DATA
RUN NO. [illegible]

15:09 FEB 11,'83

VTOT = 100.0 KT U = 100.0 KT V = [illegible] KT W = [illegible] KT
G.W. = 33000.0 LBS RPM = [illegible] H = [illegible] FT [illegible] .0 IN [illegible] .0 IN PHF = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	OMEGA RR
.26348E 01	-.26123E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	[illegible]
-.19959E 01	.17454E 00	.97523E-02	.47819E 01	[illegible]	.17454E 00	[illegible]	.47819E 01	[illegible]
THETO FR	A1CFR	B1CFR	THETO RR	IXX	IYY	IZZ	IXZ	[illegible]
.16346E 02	.36006E 00	.14999E 01	.17143E 03	.34000E 05	[illegible]	.19[illegible]E 06	.34900E 05	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66973E-01	.66079E-01	.14176E 01		-.75600E 01	-.72505E 01	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	M HUB FR	[illegible]	DELTA FR	[illegible]
.16553E 05	.73323E 03	.19565E 03	.24030E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	M HUB RR	[illegible]	DELTA RR	[illegible]
.16928E 05	-.53133E 02	.39803E 02	[illegible]	.13705E 04	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	Q GOV FR	
.47308E-02	.20956E-03	.55914E-04	.27300E-03	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	Q GOV RR	
.48382E-02	-.15357E-04	.11381E-04	.26952E-03	.11158E 01	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.15823E 04	-.12388E 04	.00000E 00	.10652E 04	.12444E 04	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible] BOD	[illegible]	[illegible] BOD
-.19508E 01	.00000E 00	.00000E 00	.19581E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	[illegible] BOD
.38102E 03	.00000E 00	-.10255E 02	-.16463E 05	-.16803E 05	[illegible]	[illegible]	.45000E 01	[illegible]
L FUSE	L SLING	H BAR SL	L F.ROT	L R.ROT	L [illegible]	LHBF BOD	LHBR BOD	RFF
-.74345E 02	.00000E 00	.10135E 01	-.42485E 02	.11557E 03	-.37056E 04	[illegible]	[illegible]	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible] BOD	MHBR BOD	[illegible]
.23203E 04	.00000E 00		.32536E 06	-.32768E 06	.95679E 05	[illegible]	-.10001E 04	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	A1FF BOD	A1RR BOD	RRF
-.47013E 03	.00000E 00		.28099E 05	-.27624E 05	.21515E-04	[illegible]	-.68234E 00	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FF BOD	B1RR BOD	[illegible]
-.12390E-01	.00000E 00	.75000E 04	-.12453E-01	-.12380E-01		[illegible]	.94101E 00	[illegible]
ALPH FS	ALPH SL	J SL				[illegible] BODY	HRR BODY	
.17146E 00	.26000E 01	.77711E 04				[illegible]	-.55742E 02	

VINTF	THETA SL	L SL	WIPP	[illegible] BODY	YRR BODY
.71926E 01	.00000E 00	.20000E 02	.00000E 00	.19581E 03	.39809E 02
WIFS	SMA SL	R SL	AICRR	BICRR	
-.72644E 01	.20000E 02	.80000E 01	-.30800E 00	.44999E 01	

```
CONTROL FLAGS SET UP
  ISLING  0    IECSCON  0
   IDCPT  1      RSASP  1
   RSASD  1      RSASP  1
 ISTEADY  1     NSTALL  1
  NTRDCP  1     NGPEFF  0
  ISLTPM  1
```

TABLE 20.- STATIC TRIM DATA

V_{eq} = 120 knots, SAS off

[illegible] TRIM DATA
RUN NO. 57

15:27 FEB 11,'83

VTOT = 120.0 KT U = 120.[illegible] KT V = -.[illegible] KT W = [illegible] KT
G.W. = 33000.0 LBS RPM = 24.1 H = 39.0 FT [illegible] = [illegible] IN [illegible] = [illegible] IN [illegible] = [illegible] IN [illegible] = .0

THETA	PHI	PSI	P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.19842E 01	-.33413E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	[illegible]	[illegible]	DELC [illegible]	[illegible]
-.31433E 00	.19336E 00	-.10736E 00	.5157[illegible]E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FP	AICFF	BICFF	THETO RP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17250E 02	.38527E-01	.30000E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FP	SIGMA RP	GAMMA FS		LAMDA FP	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66079E-01	.14180E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16747E 05	.60640E 03	.16415E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16934E 05	-.22056E 03	-.30833E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FP	CH FP	CY FP	CQ FP	[illegible]	[illegible]	[illegible]	[illegible]	
.47864E-02	.17331E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RP	CH RP	CY RP	CQ RP	HP RP	[illegible]	[illegible]	[illegible]	
.48398E-02	-.63039E-04	-.80139E-05	.31051E 03	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.POT	X R.POT	[illegible]		[illegible]	[illegible]
-.22794E 04	-.12388E 04	.00000E 00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	MU SL	Y F.POT	Y R.POT	[illegible]	AICF BOD	BICF BOD	THCF BOD
-.28270E 01	.00000E 00	.00000E 00	.16427E 03	.30794E 02	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	NU SL	Z F.POT	Z R.POT	[illegible]	[illegible]	[illegible]	[illegible]
.53248E 03	.00000E 00	-.10255E 02	-.10630E 05	[illegible]	[illegible]	[illegible]	.60000E 01	[illegible]
L FUSE	L SLING	L BAR SL	L F.POT	L R.POT	L [illegible]	LABF BOD	LABR BOD	PFP
-.11212E 03	.00000E 00	.10135E 01	-.14566E 04	.15658E 04	[illegible]	[illegible]	[illegible]	.00000E 00
M FUSE	M SLING		M F.POT	M R.POT	[illegible]	MABF BOD	MABR BOD	QFP
.36774E 04	.00000E 00		.32689E 06	-.33057E 06	[illegible]	[illegible]	-.19735E 04	.00000E 00
N FUSE	N SLING		N F.POT	N R.POT	N [illegible]	AIFP BOD	AIRP BOD	RFP
-.68976E 03	.00000E 00		.33844E 05	-.33158E 05	-.16198E-04	.14737E 01	-.13464E 01	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FP	BETA RP		BIFP BOD	BIRP BOD	[illegible]
-.11575E-01	.00000E 00	.75000E 04	-.11656E-01	-.11575E-01		.14433E 01	.73749E 00	.00000E 00
ALPH FS	ALPH SL	J SL				HFP BODY	HRP BODY	
.25088E 00	.26000E 01	.77711E 04				[illegible]	-.22056E 03	

VINTF	THETA SL	L SL	WIPF	YFP BODY	YRP BODY	
.61096E 01	.00000E 00	.20000E 02	.00000E 00	.16427E 03	-.30883E 02	
WIFS	SMA SL	R SL			AICPP	BICPP
-.61347E 01	.20000E 02	.80000E 01			-.71192E 00	.59998E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	RSASP	0
RSASQ	0	RSASR	0
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 21.- STATIC TRIM DATA

V_{eq} = 120 knots, SAS on

15:08 FEB 11,'83 CH-47B T[illegible]M DATA RUN NO. 57

VTOT = 120.0 KT U = 120.1 KT V = -.0 KT W = [illegible]
G.W. = 33000.0 LBS RPM = 24.1 H = [illegible]0.0 FT TEMP = [illegible] [illegible] = [illegible] IN [illegible] = .0

THETA	PHI	PSI	[illegible]	[illegible]	[illegible]	[illegible]	OMEGA FP	OMEGA RP
.19823E 01	-.33620E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELR PLT	DELC PLT	DELB TOT	[illegible]	[illegible]	[illegible]	[illegible]
-.19628E 01	.19322E 00	-.10629E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FP	AICFP	BICFP	THETO RP	[illegible]	[illegible]	[illegible]	[illegible]	DUPRES F
.17251E 02	.26623E-01	.30000E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FP	SIGMA RP	GAMMA FS		LAMDA FP	[illegible]	[illegible]	MU FP	MACH NO.
.66979E-01	.66979E-01	.14185E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	DELTA FP	[illegible]
.16748E 05	.60655E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	DELTA RP	[illegible]
.16934E 05	-.22047E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FP	CH FP	CY FP	[illegible]	HQ FP	[illegible]	[illegible]	[illegible]	
.47867E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RP	CH RP	CY RP	CQ RP	HQ RP	[illegible]	[illegible]	[illegible]	
.48399E-02	-.63012E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.22795E 04	-.12388E 04	.00000E 00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.28259E 01	.00000E 00	.00000E 00	.16377E 03	.21156E 02	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.53252E 03	.00000E 00	-.10255E 02	[illegible]	-.16878E 05	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	E BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.11212E 03	.00000E 00	.10135E 01	[illegible]	.15755E 04	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.36715E 04	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	AIFF BOD	AIRR BOD	[illegible]
-.68976E 03	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	.13461E 01	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FP	BETA RP		[illegible]	BIFR BOD	[illegible]
-.11637E-01	.00000E 00	.75000E 04	[illegible]	-.11637E-01		[illegible]	.73615E 01	[illegible]
ALPH FS	ALPH SL	I SL				[illegible]	[illegible]	
.24895E 00	.26000E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL	WIFF	YFF BODY	YRR BODY
.61099E 01	.00000E 00	.20000E 02	.00000E 00	.16377E 03	-.31245E 02
WIFS	SMA SL	R SL		AICPR	BICPR
-.61351E 01	.20000E 02	.80000E 01		-.71331E 00	.59998E 01

```
CONTROL FLAGS SET UP
 ISLING  0    IECSCON  0
  IDCPT  1      PSASP  1
  RSASO  1      RSASR  1
ISTEADY  1     NSTALL  1
 NTPOCR  1     NGPEFF  0
 ISLTPM  1
```

TABLE 22.- STATIC TRIM DATA

V_{eq} = 130 knots, SAS off

15:01 FEB 11,'83   CH-47B TRIM DATA
RUN NO. 53

VTOT = 130.0 KT   U = 130.2 KT   V = [illegible] KT   W = [illegible] KT
G.W. = 33000.0 LBS RPM = 24.1   H = 99.5 FT   TEMP = [illegible]   [illegible]   [illegible] IN   FHP = .0

THETA	PHI	PSI	P	Q	R	PHC	OMEGA FR	OMEGA RR
.74947E 00	-.38333E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB FLT	DELS FLT	DELP FLT	DELL FLT	DELB TOT	[illegible]	DELP TOT	DELL TOT	[illegible]
-.23489E 00	.20383E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	A1CFR	B1CFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17841E 02	-.10239E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FR		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66979E 01	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16869E 05	.78011E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17149E 05	-.52451E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
.48212E-02	.22299E-03	.49350E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
.49013E-02	-.14991E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		BD FRR	BD FRR
-.26853E 04	-.12388E 04	.00000E 00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	THOF BOD
.11016E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	NU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	B1CF BOD	THOR BOD
.88877E 03	.00000E 00	-.10295E 02	[illegible]	[illegible]	[illegible]	[illegible]	.60000E 01	[illegible]
L FUSE	L SLING	[illegible] SL	L F.ROT	L R.ROT	[illegible]	[illegible] BOD	LABR BOD	FFF
-.11295E 03	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible] BOD	MABR BOD	[illegible]
.38182E 03	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	[illegible]	[illegible] BOD	FFF
-.64027E 03	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL [illegible]	BETA FR	BETA RR		[illegible] BOD	B1RR [illegible]	[illegible]
-.50145E-02	.00000E 00	.75000E 04	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	[illegible] SL				[illegible] BODY	ARR BOD	
-.73805E 00	.26000E 01	[illegible]				[illegible]	[illegible]	

VINTF	THETA SL	L SL			UIFS	[illegible] BODY	[illegible] BODY	
.56652E 01	.00000E 00	.20000E 02			[illegible]	[illegible]	-.47904E 02	
UIFS	SMA SL	R SL					A1CFF	B1CFF
-.57043E 01	.20000E 02	.80000E 01					-.30473E 00	.59933E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	0	PSASP	0
PSASD	0	PSASR	0
ISTEADY	1	NSTALL	1
NTPDCR	1	NGREFF	0
ISLTRM	1		

TABLE 23.- STATIC TRIM DATA

V_{eq} = 130 knots, SAS on

15:04 FEB 11,'93

CH-47E TRIM DATA
RUN NO. 57

VTOT = 130.0 KT   U = 130.[illegible] KT   V = -.0 KT   W = 1.[illegible] KT
G.W. = 33000.0 LBS RPM = 24.1   H = 99.6 FT [illegible] = [illegible] [illegible]   .0 IN [illegible] = .0 IN [illegible] = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	[illegible]
.74432E 00	-.38364E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]E-02	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELR PLT	DELB [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.20335E 01	.20988E 00	-.15750E 01	.54500E 01	-.23500E 00	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	AICFR	BICFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17844E 02	-.10205E 00	.30000E 01	[illegible]	[illegible]E 05	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	.14013E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16871E 05	.78065E 03	[illegible]	[illegible]E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	DELTA [illegible]	[illegible]
.17151E 05	-.52087E 02	[illegible]	[illegible]E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	[illegible]	[illegible]	[illegible]	[illegible]	
.48220E-02	.22312E-03	.49432E-04	[illegible]E-03	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	[illegible]	[illegible]	[illegible]	[illegible]	
.49019E-02	-.14887E-04	-.13632E 04	.34659E-03	.40401E 01	[illegible]	[illegible]	[illegible]	
X FUSE	SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.26854E 04	-.12388E 04	.00000E 00	.18687E 04	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.10949E 00	.00000E 00	.00000E 00	.17302E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.89068E 03	.00000E 00	-.10255E 02	[illegible]E 05	-.17105E 05	[illegible]	[illegible]	.60000E 01	[illegible]
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.11295E 03	.00000E 00	.10135E 01	[illegible]E 04	[illegible]E 04	[illegible]	[illegible]	[illegible]	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.25601E 03	.00000E 00		.33180E 05	[illegible]E 06	[illegible]E 04	[illegible]	[illegible]E 04	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.63670E 03	.00000E 00		.37883E 05	[illegible]E 05	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		[illegible]	[illegible]	[illegible]
-.49841E-02	.00000E 00	.75000E 04	-.50350E-02	[illegible]E-02		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				[illegible]	[illegible]	
-.74341E 00	.26000E 01	.77711E 04				[illegible]E 03	[illegible]E 02	

VINTF	THETA SL	L SL	[illegible]	YRR BODY	YRR BODY		
.56659E 01	.00000E 00	.20000E 02	.00000E 00	[illegible]E 03	-.47699E 02		
WIFS	SMA SL	R SL				AICRR	BICRR
-.57051E 01	.20000E 02	.80000E 01				-.90457E 00	.59999E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	PSASP	1
RSASQ	1	RSASP	1
ISTEADY	1	NSTALL	1
NTRDCP	1	NGPEFF	0
ISLTRM	1		

TABLE 24.- STATIC TRIM DATA

V_{eq} = 0.1 knot, SAS on

$\Delta X_{c.g.}$ = 21 in.

CH-47B TRIM DATA
RUN NO. 57

15:56 FEB 11.'83

VTOT = .1 KT U = .1 KT V = -.0 KT W = .0 KT

G.W. = 33000.0 LBS RPM = 24.1 H = 96.3 FT TEMP = 288.0 DC [illegible] .0 IN DCPS = .0 IN RHP = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	OMEGA RR	
.67078E 01	-.42129E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	
DELB FLT	DELS FLT	DELR FLT	DELT FLT	DELB TOT	[illegible]	[illegible] TOT	[illegible]	[illegible]	
.87360E 00	.25159E 00	-.23833E 00	[illegible]	.87360E 00	[illegible]	[illegible]	[illegible]	[illegible]	
THETO FR	AICFR	BICFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
.19094E 02	-.27903E 00	-.14998E 01	.18020E 02	.34400E 05	[illegible]	[illegible]	[illegible]	[illegible]	
SIGMA FR	SIGMA RR	GAMMA FS		GAMMA [illegible]	[illegible]	[illegible]	[illegible]	MACH NO.	
.66979E-01	.66979E-01	.39563E-02		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
.18358E 05	.48220E 03	-.88136E [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
.15227E 05	-.39713E 03	-.32939E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT FR	CH FR	CY FR	CQ FR	HQ FR	[illegible]	[illegible]	[illegible]		
.52465E-02	.13781E-03	-.25474E-04	[illegible]	.14450E 01	[illegible]	[illegible]	[illegible]		
CT RR	CH RR	CY RR	CQ RR	HQ RR	[illegible]	[illegible]	[illegible]		
.43518E-02	-.11349E-03	-.94136E-04	[illegible]	.41106E 01	[illegible]	[illegible]	[illegible]		
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		BD FRR	BD RRR	
-.25691E 00	-.12388E 04	.00000E 00	.23955E 04	.14506E 04	[illegible]		.35012E 00	[illegible]	
Y FUSE	Y SLING	MU SL	Y F.ROT	Y R.ROT	[illegible]	AICF BOD	BICF BOD	THOF BOD	
.21749E 00	.00000E 00	.00000E 00	-.88721E 02	.32005E 03	[illegible]	[illegible]	-.15000E 01	.19094E 02	
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	AICR BOD	BICR BOD	THOR BOD	
.60328E 03	.00000E 00	-.10255E 02	-.18207E 05	-.15162E 05	[illegible]	[illegible]	.15000E 01	.18020E 02	
L FUSE	L SLING	F BAR SL	L F.ROT	L R.ROT	[illegible]	LHBF BOD	LHBR BOD	FFR	
.23013E 00	.00000E 00	.10135E 01	-.85383E 04	.85344E 04	[illegible]	[illegible]	[illegible]	.00000E 00	
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	MHBF BOD	MHBR BOD	OFR	
.19341E 04	.00000E 00		.32430E 06	-.32636E 06	[illegible]	[illegible]	[illegible]	.00000E 00	
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	A1FF BOD	A1RR BOD	FRR	
-.91704E 00	.00000E 00		.45468E 05	-.45476E 05	-.44350E-04	[illegible]	[illegible]	.00000E 00	
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FF BOD	B1RR BOD	ORR	
-.49548E-01	.00000E 00	.75000E 04	-.49248E-01	-.49264E-01		[illegible]	-.12401E 01	.00000E 00	
ALPH FS	ALPH SL	J SL				HFF BODY	HRR BODY		
-.89692E 02	.26000E 01	.77711E 04				[illegible]	[illegible]		

VINTF	THETA SL	L SL	WIRR	YFF BODY	YRR BODY		
.42252E 02	.00000E 00	.20000E 02	.00000E 00	-.88721E 02	-.32973E 03		
WIFS	SMA SL	R SL				AICRR	BICRR
-.31295E 02	.20000E 02	.80000E 01				-.12401E 01	.14989E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	RSASP	1
RSASO	1	PSASR	1
ISTEADY	1	NSTALL	1
NTROCR	1	NGPEFF	0
ISLTRM	1		

TABLE 25.- STATIC TRIM DATA

V_{eq} = 80 knots, SAS on

$\Delta X_{c.g.}$ = 21 in.

```
                                    CH-47B  TRIM DATA
15:55 FEB 11.'83                             RUN NO. 57

VTOT =   80.0 KT      U    =   80.0 KT      V    =   -.0 KT      W    =   4.2 KT
G.W. = 33000.0 LBS RPM  =   24.1     H    =   [illegible] FT  [illegible]   [illegible] IN  [illegible]   [illegible] IN  [illegible]
```

THETA	PHI	PSI	P	Q	R	[illegible]	[illegible]	[illegible]
.30320E 01	-.23296E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB FLT	DELS FLT	DELR FLT	[illegible]	DELB TOT	[illegible]	[illegible]	[illegible]	[illegible]
-.14304E 01	.13673E 00	.37652E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FP	AICFP	BICFP	THETO RP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16226E 02	.37622E 00	-.82072E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FP	SIGMA RP	GAMMA FS		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	.13968E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17916E 05	.10391E 04	.18823E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.15504E 05	.96905E 02	.56383E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	HQ FR	[illegible]	[illegible]	[illegible]	
.51204E-02	.29698E-03	.53794E-04	.21090E-03	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	HQ RR	[illegible]	[illegible]	[illegible]	
.44310E-02	.27696E-04	.16038E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.10151E 04	-.12388E 04	.00000E 00	.17764E 04	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.14534E 01	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.37688E 03	.00000E 00	-.10255E 02	[illegible]	-.15473E 05	[illegible]	[illegible]	.30000E 01	[illegible]
L FUSE	L SLING	H BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	LHRR BOD	[illegible]
-.39642E 02	.00000E 00	.10135E 01	[illegible]	.11435E 02	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	MHRR BOD	[illegible]
.19761E 03	.00000E 00		.32454E 06	-.32478E 06	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	AIFR BOD	AIRR BOD	[illegible]
-.22624E 03	.00000E 00		.25723E 05	-.25582E 05	[illegible]	[illegible]	-.69050E-01	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		BIFR BOD	BIRR BOD	[illegible]
-.12339E-01	.00000E 00	.75000E 04	-.12389E-01	-.12324E-01		.14441E 01	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.11343E 01	.26000E 01	.77711E 04				.10391E 04	[illegible]	

VINTF	THETA SL	L SL			WIPR	YFR BODY	YRR BODY	
.95770E 01	.00000E 00	.20000E 02			.00000E 00	.18045E 03	.56310E 02	
WIFS	SMA SL	R SL					AICRR	BICRR
-.98254E 01	.20000E 02	.80000E 01					-.14672E 00	.30000E 01

```
CONTROL FLAGS SET UP
 ISLING  0    IECSCON  0
  IDCPT  1      PSASP  1
  PSASD  1      PSASP  1
ISTEADY  1     NSTALL  1
 NTPOCR  1     NGPEFF  0
 ISLTRM  1
```

TABLE 26.- STATIC TRIM DATA

V_{eq} = 80 knots, SAS on

$\dot{h}$ = +1000 ft/min

CH-47B TRIM DATA

15:51 FEB 11,'83 RUN NO. 57

VTOT = 80.0 KT U = 79.9 KT V = .0 KT W = -6.4 KT

G.W. = 33000.0 LBS RPM = 24.1 H = 98.8 FT [illegible] = [illegible] DG [illegible] = .0 IN DCCG = .0 IN PHP = .0

THETA	PHI	PSI	P	[illegible]	R	[illegible]	OMEGA FR	OMEGA RR
.25404E 01	-.34438E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELR PLT	DELC PLT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.20303E 01	.23328E 00	.71478E-02	.57846E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	AICFR	BICFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17944E 02	.47762E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16969E 05	.10678E 04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17211E 05	.29838E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
.48500E 02	.30517E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
.49190E-02	.85278E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.10398E 04	-.12388E 04	.00000E 00	[illegible]	[illegible]	[illegible]		-.15690E-01	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.57302E 01	.00000E 00	.00000E 00	.28041E 03	-.76568E 02	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.11504E 04	.00000E 00	-.10255E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.49953E 02	.00000E 00	.10135E 01	-.80016E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.11117E 05	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.22843E 03	.00000E 00		.38176E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		[illegible]	[illegible]	[illegible]
.27463E-01	.00000E 00	.75000E 04	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				[illegible]	[illegible]	
-.84193E 01	.26000E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL			WIFR	[illegible]	[illegible]	
.90566E 01	.00000E 00	.20000E 02			[illegible]	.28041E 03	[illegible]	
WIFS	SMA SL	R SL					AICPR	BICPR
-.92011E 01	.20000E 02	.80000E 01					-.41207E 00	.30002E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	RSASP	1
RSASQ	1	RSASR	1
ISTEADY	1	NSTALL	1
NTRDCR	1	NGREFF	0
ISLTRM	1		

TABLE 27.- STATIC TRIM DATA

V_{eq} = 80 knots, SAS on

$\dot{h}$ = -1000 ft/min

15:53 FEB 11,'83

CH-47B TRIM DATA
RUN NO. 57

VTOT = 80.0 KT U = 78.7 KT V = -.0 KT W = 14.0 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 98.3 FT TEMP = 288.0 DG [illegible] = .0 IN DZCG = .0 IN RHP = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	OMEGA RR
.35195E 01	-.86624E-01	.00000E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	[illegible] DOT
-.19523E 01	.12547E 00	.16644E 00	.34140E 01	-.10040E 01	.12547E 00	[illegible]	.34140E 01	[illegible]
THETO FR	AICFR	BICFR	THETO RR	IXX	IYY	IZZ	IXZ	[illegible]
.13583E 02	.76303E 00	-.22128E-03	.14010E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		GAMMA FR	GAMMA RR	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	.15336E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	I HUB FR	[illegible]	[illegible]	[illegible]	[illegible]
.15838E 05	.71257E 03	[illegible]	.96321E 04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	I HUB RR	[illegible]	[illegible]	[illegible]	[illegible]
.16841E 05	-.21849E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	[illegible]	
.45266E-02	.20508E-03	.55140E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	[illegible]	
.48131E-02	-.62444E-05	.29294E-04	.14883E-03	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.93967E 03	-.12388E 04	.00000E 00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	AITF BOD	BITF BOD	[illegible]
-.41025E 02	.00000E 00	.00000E 00	.19313E 03	-.10250E 03	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z M	AIFR BOD	BIFR BOD	THOR BOD
-.38438E 03	.00000E 00	-.10255E 02	-.15756E 05	-.16798E 05	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	L [illegible]	[illegible] BOD	LHRR BOD	PFR
-.30375E 03	.00000E 00	.10135E 01	.23285E 04	-.20250E 04	[illegible]	[illegible]	[illegible]	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	M [illegible]	MHRF BOD	MHRR BOD	[illegible]
.13509E 05	.00000E 00		.31182E 06	-.32533E 06	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	N [illegible]	AIFF BOD	AIRR BOD	PRF
-.53991E 03	.00000E 00		.13838E 05	-.13296E 05	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		BIFF BOD	BIRR BOD	[illegible]
-.16242E-01	.00000E 00	.75000E 04	-.15970E-01	[illegible]		.16501E 01	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
.69388E 01	.26000E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL			WIFR	YFR BODY	YRR BODY	
.88548E 01	.00000E 00	.20000E 02			.00000E 00	.19313E 03	.10249E 03	
WIFS	SMA SL	R SL					AICRR	BICRR
-.87440E 01	.20000E 02	.80000E 01					.28295E 00	.30001E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	PSHSP	1
RSASO	1	RSASP	1
ISTEADY	1	NSTALL	1
NTROCR	1	NGPEFF	0
ISLTPM	1		

TABLE 28.- STATIC TRIM DATA

V_{eq} = 75 knots, SAS on

β = +15°

CH-47B TRIM DATA

15:50 FEB 11,'83 RUN NO. 57

VTOT = 75.0 KT U = 72.4 KT V = 19.5 KT W = [illegible]

G.W. = 33000.0 LBS RPM = 24.1 H = 98.5 FT TEMP = [illegible] [illegible] = .0 IN DCPG = .0 IN PHR = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.30664E 01	.34472E 01	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELF PLT	DELC PLT	DELB TOT	DELS TOT	DELF TOT	DELC TOT	[illegible]
-.16372E 01	.81068E 00	-.12829E 01	.45640E 01	[illegible]	[illegible]	[illegible]	.45640E 01	[illegible]
THETO FR	A1CFP	B1CFP	THETO RR	I XX	I YY	I ZZ	I XZ	[illegible]
.15831E 02	.16346E 01	.57270E-01	.16840E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	[illegible]
.66979E-01	.66979E-01	.13876E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16228E 05	.81948E 03	.51833E 03	.21261E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16632E 05	.84217E 02	-.13004E 03	.26581E 05	.27024E 03	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	[illegible]	
.46379E-02	.23421E-03	.14814E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	[illegible]	
.47535E-02	.24070E-04	-.37167E-04	[illegible]	.41524E 01	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	X CG		BD FRR	BD FFR
-.90283E 03	-.12388E 04	.00000E 00	.16230E 04	.16451E 04	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y CG	A1FF BOD	B1CF BOD	THOF BOD
-.23691E 04	.00000E 00	.00000E 00	.28435E 03	.10049E 03	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z CG	A1CF BOD	B1CF BOD	THOF BOD
-.12257E 03	.00000E 00	-.10255E 02	-.16173E 05	-.16600E 05	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	L IXX	LHBF BOD	LHBF BOD	PFP
-.42770E 04	.00000E 00	.10135E 01	.13956E 04	.28780E 04	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	M IYY	MHBF BOD	MHBF BOD	UFP
-.33965E 04	.00000E 00		.32278E 06	-.31934E 06	[illegible]	[illegible]	-.53998E 02	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	N IZZ	A1FF BOD	A1RF BOD	PRP
.12290E 04	.00000E 00		.27219E 05	-.28442E 05	.30555E-04	[illegible]	-.36840E-01	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FF BOD	B1RF BOD	URP
.15167E 02	.00000E 00	.75000E 04	.15261E 02	.15164E 02		.17903E 01	.20734E 00	[illegible]
ALPH FS	ALPH SL	J SL				HFP BODY	HRP BODY	
-.22836E 01	.26000E 01	.77711E 04				.93701E 03	.47268E 02	
VINTF	THETA SL	L SL			WIFP	YFP BODY	YRP BODY	
.87069E 01	.00000E 00	.20000E 02			.00000E 00	.28435E 03	-.14755E 03	
WIFS	SMA SL	R SL					A1CRP	B1CRP
-.94411E 01	.20000E 02	.80000E 01					-.76565E 00	.29272E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	RSASP	1
RSASQ	1	RSASR	1
ISTEADY	1	NSTALL	1
NTROCR	1	NGREFF	0
ISLTRM	1		

TABLE 29.- STATIC TRIM DATA

V_{eq} = 75 knots, SAS on

β = -15°

CH-47B TRIM DATA
RUN NO. 1

19:26 FEB 22,'83

VTOT = 75.0 FT U = 72.4 FT V = -19.7 FT W = [illegible]
G.W. = 33000.0 LBS RPM = 24.1 H = 95.5 FT THP = [illegible] [illegible] [illegible] [illegible] .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.30659E 01	-.40507E 01	.00000E 00	.00000E 00	[illegible]	.00000E [illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELA PLT	DELC PLT	DELB TOT	[illegible] TOT	[illegible] TOT	[illegible] TOT	H DOT
-.17022E 01	-.47153E 00	.14101E [illegible]	.45[illegible]E 01	-.[illegible]E 00	-.47[illegible]	[illegible]	.45[illegible]	-.1[illegible]E-03
THETO FR	A1CFR	B1CFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.15793E 02	-.62233E 00	-.21844E 00	[illegible]	[illegible]	[illegible]	[illegible]	.14[illegible] 05	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		[illegible] FR	[illegible] FR	[illegible]	[illegible] RR	[illegible]
.66979E-01	.66979E-01	.13851[illegible] 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16205E 05	.89337E 03	-.1[illegible]	.21071E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16689E 05	.10670E 03	.24712E 03	.2[illegible]E 05	[illegible]	-.13[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	[illegible] FR	[illegible]	[illegible]	[illegible] FR	
.46316E-02	.25533E-03	-.34403E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	[illegible] RR	[illegible] RR	[illegible] RR	[illegible] RR	
.47698E-02	.30405E 04	.70620E 04	.25[illegible]E-03	[illegible]	-.1[illegible]	[illegible]	.26[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible] FRR	[illegible] RRR
-.88404E 03	.00000E 00	.00000E 00	.16521E 04	[illegible]E 03	[illegible]		[illegible]	.1[illegible]E 01
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	THOR BOD
.24190E 04	.00000E 00	.00000E 00	.11773E 03	-.21[illegible]	[illegible]	[illegible]	-.37541E 01	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	THOR BOD
-.62575E 02	.00000E 00	.00000E 00	-.16146E 05	-.16[illegible]E 05	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	L BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.37516E 04	.00000E 00	.00000E 00	-.96409E 03	[illegible]	-.13[illegible]	[illegible]	[illegible] 04	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.22225E 04	.00000E 00		.32130E 06	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	[illegible]
-.46051E 03	.00000E 00		.23447E 05	-.22985E 05	.11903E+01	[illegible]	-.40159E 00	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		[illegible] BOD	[illegible] BOD	[illegible]
-.15187E 02	.00000E 00	.75000E 04	-.15[illegible]E 02	-.15187E 02		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				[illegible] BODY	[illegible] BODY	
-.24390E 01	.00000E 00	.77711E 04				.89[illegible]E 03	[illegible]	

VINTF	THETA SL	L SL	WIRR	[illegible] BODY	YRR BODY	
.86814E 01	.00000E 00	.20000E 02	.00000E 00	.11[illegible]E 03	.26644E 03	
WIFS	SMA SL	R SL			AICPR	BICPR
-.94229E 01	.20000E 02	.80000E 01			.52634E 00	.28629E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	PSASP	1
PSASQ	1	RSASR	1
ISTEADY	1	NSTALL	1
NTROCP	1	NGREFF	0
ISLTPN	0		

TABLE 30.- STATIC TRIM DATA

V_{eq} = 75 knots, SAS on

Coordinated, level turn ϕ = +30°

CH-47B TRIM DATA

19:48 FEB 22,'83 RUN NO. 1

VTOT = 75.1 KT U = 75.1 KT V = 1.4 KT W = 4.2 KT

G.W. = 33000.0 LBS RPM = 24.1 H = 98.4 FT TEMP = 288.0 DG DXCG = .0 IN DZCG = .0 IN PHP = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.32988E 01	.29980E 02	.00000E 00	-.93815E-02	.72882E-01	.12631E 00	.2[illegible]E-02	.23953E 02	.24212E 02
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	H DOT
-.19848E 01	.22591E 00	.55957E-01	.51350E 01	-.11717E 01	.2410[illegible] 00	.17[illegible]E 00	.51350E 01	-.24755E-01
THETO FR	A1CFR	B1CFR	THETO RR	IXX	IYY	IZZ	IXZ	[illegible]
.16680E 02	.10286E 01	-.32938E 00	.10132E 02	.44100E 05	.20[illegible]	.1[illegible]	.14900E 05	.19[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.13754E 01		-.34579E-01	-.4[illegible]	[illegible]	.1735[illegible]	.13[illegible]E 00
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	M HUB FR	[illegible]	DELTA FR	[illegible]
.18920E 05	.10798E 04	.35786E 03	.25083E 05	.[illegible]E 04	.42[illegible]E 04	[illegible]	.11212E [illegible]	.34[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	M HUB RR	[illegible]	DELTA RR	[illegible]
.19577E 05	.21476E 03	.12875E 03	.34113E 05	.10132E 04	.4[illegible]	[illegible]	.1126[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	Q GOV FR	
.54644E-02	.31186E-03	.10336E-03	.24153E-03	.4[illegible]E 01	[illegible]	.2[illegible]E 01	.25088E 05	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	Q GOV RR	
.55367E-02	.60738E-04	.36417E-04	.32160E-03	.45511E 01	[illegible]	.1[illegible]E 01	.34113E 05	
X FUSE	X SLING	LANDA SL	X F.ROT	X R.ROT	X [illegible]		BD FRR	BD FRR
-.90882E 03	.00000E 00	.00000E 00	.18803E 04	.11513E 04	[illegible]		-.33175E 01	.17093E 01
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y [illegible]	A1FR BOD	B1CF BOD	THOF BOD
-.19110E 03	.00000E 00	.00000E 00	.31559E 03	-.12865E 03	-.405[illegible]	.1[illegible]E 01	-.76[illegible]E 00	.16680E 02
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z [illegible]	A1[illegible] BOD	B1CR BOD	THOR BOD
.38254E 03	.00000E 00	.00000E 00	-.13853E 05	-.19544E 05	-.77[illegible]	.[illegible]E-01	.26309E 01	.10122E 02
L FUSE	L SLING	F BAR SL	L F.ROT	L R.ROT	L TOT	LHBF BOD	LHBR BOD	PFR
-.31229E 03	.00000E 00	.00000E 00	.12079E 04	-.99242E 03	-.28[illegible]	.2[illegible]E 04	.18125E 04	.14306E-01
M FUSE	M SLING		M F.ROT	M R.ROT	M TOT	MHBF BOD	MHBR BOD	QFR
-.12636E 04	.00000E 00		.37554E 06	-.37435E 06	-.34[illegible]E 03	.435[illegible]E 04	.42819E 04	.72980E-01
N FUSE	N SLING		N F.ROT	N R.ROT	N TOT	A1FF BOD	A1RR BOD	RFR
.15062E 03	.00000E 00		.31665E 05	-.31782E 05	.17[illegible]	.300[illegible]E 01	.28903E 00	-.40942E-03
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FF BOD	B1RR BOD	QFR
.10694E 01	.00000E 00	.75000E 04	.22287E 01	-.31335E-01		.19[illegible]E 01	.12237E 01	.72882E-01
ALPH FS	ALPH SL	J SL				HFF BODY	HRR BODY	
-.17776E 01	.00000E 00	.77711E 04				.10[illegible]E 04	.21468E 03	

VINTF	THETA SL	L SL	WIPP	YFF BODY	YRR BODY		
.10659E 02	.00000E 00	.20000E 02	.00000E 00	.31559E 03	.12888E 03		
WIFS	SMA SL	R SL				A1CRR	B1CRR
-.11025E 02	.20000E 02	.80000E 01				.92778E-01	.26309E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	PSASP	1
PSASQ	1	PSASR	1
ISTEADY	0	NSTALL	1
NTRQCR	1	NGPEFF	0
ISLTRM	0		

TABLE 31.- STATIC TRIM DATA

V_{eq} = 75 knots, SAS on

Coordinated, level turn ϕ = -30°

CH-47B TRIM DATA

19:52 FEB 22,'83 RUN NO. 1

VTOT = 75.1 KT U = 75.1 KT V = 1.4 KT W = 4.2 KT
G.W. = 33000.0 LBS RPM = 24.1 H = 98.9 FT TEMP = 288.0 DG DXCG = .0 IN DZCG = .0 IN PHP = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.22435E 01	-.29912E 02	.00000E 00	.57015E-02	.73042E-01	-.12631E 00	.23703E-02	.24311E 02	.23959E 02
DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT	DELP TOT	DELC TOT	H DOT
-.21801E 01	.23625E 00	.46082E-02	.51301E 01	-.13670E 01	.22530E 00	.12331E 00	.51301E 01	-.71602E-02
THETO FR	A1CFR	B1CFR	THETO RR	IXX	IYY	IZZ	IXZ	D.PRES F
.16551E 02	.82479E 00	-.37030E 00	.18233E 02	.34000E 05	.20250E 06	.19100E 06	.14900E 05	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.13751E 01		-.34343E-01	[illegible]	[illegible]	.17552E 00	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	L HUB FR	M HUB FR	V TIP FR	DELTA FR	F FR
.18930E 05	.10666E 04	.32271E 03	.24843E 05	.28730E 04	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	L HUB RR	M HUB RR	V TIP RR	DELTA RR	F RR
.19593E 05	.24384E 03	.11971E 03	.34165E 05	.17609E 04	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	Q GOV FR	
.53566E-02	.30168E-03	.91276E-04	.23423E-03	.46367E 01	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	Q GOV RR	
.56592E-02	.70427E-04	.34576E-04	.32893E-03	.50370E 01	.37517E 00	[illegible]	.34165E 05	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	X-RT		ED FRF	ED FRR
-.90882E 03	.00000E 00	.00000E 00	.19096E 04	.11381E 04	.30773E 01		-.32094E-01	.10498E 01
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y-M	A1CF BOD	B1CF BOD	THOF BOD
-.19110E 03	.00000E 00	.00000E 00	.32418E 03	-.12883E 03	.41410E-02	.82590E 00	-.36916E 00	.16551E 02
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z-M	A1CR BOD	B1CR BOD	THOR BOD
.38317E 03	.00000E 00	.00000E 00	-.18372E 05	-.19562E 05	-.37129E 02	-.37861E-01	.26308E 01	.18233E 02
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	L IXX	LHBF BOD	LHBR BOD	PFR
-.31214E 03	.00000E 00	.00000E 00	.13911E 04	-.97929E 03	.29302E 02	.29849E 04	.17591E 04	-.14228E-01
M FUSE	M SLING		M F.ROT	M R.ROT	M-IYY	MHBF BOD	MHBR BOD	QFR
-.12698E 04	.00000E 00		.37551E 06	-.37436E 06	-.61451E-03	.42650E 04	.61102E 03	.73022E-01
N FUSE	N SLING		N F.ROT	N R.ROT	N-IZZ	A1FR BOD	A1RR BOD	RFR
.15061E 03	.00000E 00		.31612E 05	-.31829E 05	-.34972E-03	.28797E 01	.42128E 00	.36136E-03
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FR BOD	B1RR BOD	QRR
.10694E 01	.00000E 00	.75000E 04	-.79081E-01	.21648E 01		.19478E 01	.12128E 01	.73108E-01
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.17825E 01	.00000E 00	.77711E 04				.10661E 04	.24818E 03	

VINTF	THETA SL	L SL			WIPP	YFR BODY	YRR BODY	
.10673E 02	.00000E 00	.20000E 02			.00000E 00	.32418E 03	.11041E 03	
WIFS	SMA SL	R SL					AICRR	BICRR
.11036E 02	.20000E 02	.80000E 01					.61544E-01	.26304E 01

```
  CONTROL FLAGS SET UP
 ISLING  0    IELSCON  0
  IDCPT  1      PSASP  1
  RSASO  1      PSASP  1
ISTEADY  1     NSTALL  1
 NTRDCR  1     NGREFF  0
 ISLTRM  0
```

TABLE 32.- STATIC TRIM DATA

V_{eq} = 0.1 knot, SAS on

Gross weight = 22,000 lb

[illegible] TRIM DATA

RUN NO. [illegible]

15:58 FEB 11,'83

VTOT = .1 FT U = .1 FT [illegible]

G.W. = 22000.0 LBS RPM = 24.1 H = [illegible]

THETA	PHI	PSI	P	[illegible]	R	[illegible]	[illegible]	[illegible]
.66128E 01	-.34981E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.10060E-01	.17969E 00	-.23632E-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FP	A1CFP	B1CFP	THETO FP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16103E 02	.33233E 00	-.15006E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FP	SIGMA RP	GAMMA [illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.11246E 05	.29524E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.11126E 05	-.29048E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FP	CH FP	C[illegible] FP	[illegible]	[illegible] FP	[illegible]	[illegible]	[illegible]	
.32141E-02	.84376E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RP	CH RP	CY RP	[illegible]	[illegible] RP	[illegible]	[illegible] RP	[illegible] RP	
.31797E-02	-.83016E-04	-.19412E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		BD FFT	FD FFR
-.20441E 00	-.12388E 04	.00000E 00	.14678E 04	[illegible]	[illegible]		.35000E [illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	THUF BOD
.13716E 00	.00000E 00	.00000E 00	.65527E 02	[illegible]	[illegible]	[illegible]	-.15000E [illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible] BOD	B1CF BOD	THUR BOD
.38017E 03	.00000E 00	-.10255E 02	-.11154E 05	[illegible]	[illegible]	[illegible]	.15000E 01	[illegible]
L FUSE	L SLING	K BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	[illegible]
.13943E 00	.00000E 00	.10135E 01	-.31823E 04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible] BOD	[illegible] BOD	[illegible]
.55240E 03	.00000E 00		.21909E 06	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	A1FP BOD	A1RR BOD	[illegible]
-.38400E 00	.00000E 00		.27666E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FP	BETA RP		B1FP BOD	B1RP BOD	[illegible]
-.40553E-01	.00000E 00	.75000E 04	-.40318E-01	[illegible]		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				HFP BODY	HRP BODY	
-.89613E 02	.26000E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL		WIPP	YFP BODY	YRP BODY	
.33558E 02	.00000E 00	.20000E 02		.00000E 00	.65527E 02	-.68129E 02	
WIFS	SMA SL	R SL				A1CRP	B1CRP
-.24856E 02	.20000E 02	.80000E 01				-.35024E 00	.14998E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	RSASP	1
RSASQ	1	RSASR	1
ISTEADY	1	NSTALL	1
NTRQCR	1	NGREFF	0
ISLTRM	1		

TABLE 33.- STATIC TRIM DATA

V_{eq} = 80 knots, SAS on

Gross weight = 22,000 lb

15:59 FEB 11.'83 [illegible] TRIM DATA

RUN NO. [illegible]

VTOT = 80.0 KT U = 80.0 KT [illegible]

G.W. = 22000.0 LBS RPM = 24.1 [illegible]

THETA .28229E 01	PHI -.22475E 00	PSI .00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT -.15087E 01	DELS PLT .14062E 00	DELF PLT [illegible]	DELR PLT [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETØ FP .14073E 02	AICFP .49076E 00	BICFP -.10490E [illegible]	THETØ RP [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FP .66979E-01	SIGMA RP .66973E-01	GAMMA FS [illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F .11024E 05	NORMAL F [illegible]	SIDE F [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R .11277E 05	NORMAL R -.60555E 02	SIDE R [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FP .31507E-02	CH FP .13713E-03	CY FP [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RP .32229E-02	CH RP -.17507E-04	CY RP [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
X FUSE -.10118E 04	X SLING -.12388E 04	LAMDA SL .00000E 00	X F.ROT [illegible]	X R.ROT [illegible]	[illegible]		[illegible]	[illegible]	
Y FUSE -.12590E 01	Y SLING .00000E 00	NU SL .00000E 00	Y F.ROT .11070E 03	Y R.ROT [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Z FUSE .23562E 03	Z SLING .00000E 00	MU SL -.10255E 02	Z F.ROT -.10364E 05	Z R.ROT -.11745E 05	[illegible]	[illegible]	[illegible]	[illegible]	
L FUSE -.50114E 02	L SLING .00000E 00	K BAR SL .10135E 01	L F.ROT [illegible]	L R.ROT [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
M FUSE .16501E 04	M SLING .00000E 00		M F.ROT .21749E 06	M R.ROT [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
N FUSE -.30618E 03	N SLING .00000E 00		N F.ROT .18290E 05	N R.ROT -.17983E 05	[illegible]	[illegible]	[illegible]	[illegible]	
BETA FS -.11082E-01	BETA SL .00000E 00	SL WGHT .75000E 04	BETA FP -.11173E-01	BETA RP [illegible]		[illegible]	[illegible]	[illegible]	
ALPH FS .25971E 00	ALPH SL .26000E 01	J SL .77711E 04				[illegible]	[illegible]		

VINTF .59853E 01	THETA SL .00000E 00	L SL .20000E 02
WIFS .60468E 01	SMA SL .20000E 02	R SL .80000E 01

WIPP .00000E 00	[illegible] [illegible]	[illegible] [illegible]
	AICRR -.46995E-01	BICRR .30000E 01

CONTROL FLAGS SET UP

ISLING	0	IECSCON	0
IDCPT	1	PSASF	1
PSASO	1	PSASP	1
ISTEADY	1	NSTALL	1
NTRQCR	1	NGPEFF	0
ISLTRM	1		

TABLE 34.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 0.1 KNOT.

	L	M	N	X	Y	Z
			SAS off			
δ_B	-0.34640E-01	0.32816E 00	0.54072E-01	0.57000E-01	-0.48486E-03	0.49865E-01
δ_A	.48630E 00	.74250E-05	.97491E-02	.10006E-04	.10917E 01	-.76234E-04
δ_R	-.12634E 00	.00000E 00	.19269E 00	-.47646E-06	.98684E-02	.00000E 00
δ_C	-.17040E-01	-.14318E-02	-.55263E-03	.98157E 00	.65680E-01	-.84737E 01
p	-.12795E 01	.29530E-01	-.14808E-01	.42600E-01	-.28362E 01	-.12520E 00
q	.87128E-01	-.10973E 01	-.13378E 00	.27807E 01	-.73125E-02	-.26472E 00
r	-.90288E 01	-.26861E 00	-.89168E-01	-.15904E 00	-.33045E 00	-.52506E-01
u	-.53257E-03	.11090E-01	.73452E-03	-.19998E-01	-.27807E-03	.31149E-01
v	-.10771E-01	.94978E-05	.58132E-03	-.45945E-03	-.10704E 00	.40019E-02
w	.39976E-03	.63815E-03	.42493E-04	.30085E-01	.22338E-02	-.29831E 00
			SAS on			
δ_B	-0.34638E-01	0.32817E 00	0.54074E-01	0.56998E-01	-0.47325E-03	0.49895E-01
δ_A	.48630E 00	.61875E-06	.97481E-02	-.47646E-06	.10917E 01	.00000E 00
δ_R	-.12634E 00	.61875E-06	.19269E 00	.00000E 00	.98734E-02	-.76234E-05
δ_C	-.17013E-01	-.14349E-02	-.54782E-03	.98214E 00	.65751E-01	-.84789E 01
p	-.21634E 01	.29517E-01	-.22771E-01	.42658E-01	-.48053E 01	-.12531E 00
q	.86503E-01	-.10992E 01	-.13382E 00	.27653E 01	-.84882E-02	-.11685E 00
r	.59843E-01	-.26865E 00	-.32381E 00	-.15908E 00	-.35487E 00	-.52430E-01
u	-.53341E-03	.11090E-01	.73457E-03	-.20019E-01	-.27930E-03	.31343E-01
v	-.10786E-01	.86934E-05	.60258E-03	-.45872E-03	-.10704E 00	.39943E-02
w	.39204E-03	.64854E-03	.40124E-04	.29589E-01	.22011E-02	-.29380E 00

TABLE 35.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 20 KNOTS.

	L	M	N	X	Y	Z
			SAS off			
δ_B	-0.10461E-01	0.33548E 00	0.52540E-01	0.42182E-01	0.63174E-01	0.25168E 00
δ_A	.48558E 00	-.21656E-04	.86124E-02	.93387E-04	.10867E 01	-.10444E-02
δ_R	-.13097E 00	.21038E-03	.19173E 00	-.72899E-04	-.77150E-02	.12274E-02
δ_C	-.21810E-01	-.83005E-02	.20635E-02	.72384E 00	.53387E-01	-.84539E 01
p	-.88622E 00	.17136E-01	-.58689E-02	.27653E-01	-.15122E 01	-.10570E 00
q	.23866E-01	-.16339E 01	-.15186E 00	.28998E 01	-.15524E 00	-.27731E 01
r	-.64698E-01	-.24771E 00	-.76432E-01	-.11116E 00	-.20182E 00	.17641E 00
u	.36675E-03	.15577E-01	.93359E-03	-.12844E-01	.20535E-02	-.40523E-01
v	-.87699E-02	-.87330E-03	.23044E-03	.14363E-03	-.46031E-01	.44315E-02
w	.83370E-03	.16648E-01	.71363E-03	.26766E-01	.43533E-02	-.28244E 00
			SAS on			
δ_B	-0.10458E-01	0.33549E 00	0.52542E-01	0.42205E-01	0.63190E-01	0.25147E 00
δ_A	.48558E 00	.50737E-04	.86163E-02	-.19535E-04	.10867E 01	.28207E-03
δ_R	-.13097E 00	.11632E-03	.19173E 00	-.86717E-04	-.77228E-02	.11588E-02
δ_C	-.21808E-01	-.83098E-02	.20679E-02	.72385E 00	.53403E-01	-.84541E 01
p	-.17699E 01	.17608E-01	-.11083E-01	.27304E-01	-.34746E 01	-.10080E 00
q	.23845E-01	-.16340E 01	-.15184E 00	.29000E 01	-.15530E 00	-.27756E 01
r	.94610E-01	-.24799E 00	-.31011E 00	-.11104E 00	-.19343E 00	.17427E 00
u	.36832E-03	.15576E-01	.93124E-03	-.12845E-01	.20536E-02	-.40519E-01
v	-.11932E-01	-.87052E-03	.45401E-02	.14368E-03	-.46926E-01	.44441E-02
w	.83532E-03	.16647E-01	.71129E-03	.26766E-01	.43535E-02	-.28244E 00

TABLE 36.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 40 KNOTS.

	L	M	N	X	Y	Z
			SAS off			
δ_B	0.16262E-01	0.37444E 00	0.36975E-01	0.35347E-01	0.10732E 00	0.64975E 00
δ_A	.48558E 00	.74250E-05	.76233E-02	.30970E-04	.10845E 01	-.41167E-03
δ_R	-.13531E 00	.10642E-03	.19126E 00	.95293E-05	-.23260E-01	.19059E-03
δ_C	-.95659E-02	.12353E 00	.53661E-02	.49135E 00	.65350E-01	-.79678E 01
p	-.95132E 00	.12811E-01	-.48200E-02	.26064E-01	-.17385E 01	-.93921E-01
q	-.70335E-01	-.17676E 01	-.82320E-01	.28099E 01	-.26218E 00	-.32915E 01
r	-.83902E-01	-.25619E 00	-.68326E-01	-.91516E-01	-.24125E 00	.31847E-01
u	-.27828E-03	.73133E-03	.25274E-03	-.14508E-01	-.45629E-03	-.10797E 00
v	-.89953E-02	-.15318E-02	.32037E-03	.71239E-03	-.59403E-01	.15510E-02
w	.27440E-02	.25877E-01	.24907E-04	.28541E-01	.71078E-02	-.34978E 00
			SAS on			
δ_B	0.16266E-01	0.37447E 00	0.36974E-01	0.35376E-01	.10733E 00	0.64948E 00
δ_A	.48558E 00	.16706E-04	.76228E-02	.33829E-04	.10845E 01	-.41167E-03
δ_R	-.13531E 00	.10147E-03	.19126E 00	.76234E-05	-.23263E-01	.19059E-03
δ_C	-.95641E-02	.12354E 00	.53671E-02	.49134E 00	.65357E-01	-.79677E 01
p	-.18352E 01	.12746E-01	-.82783E-02	.25948E-01	-.36978E 01	-.92587E-01
q	-.70338E-01	-.17676E 01	-.82320E-01	.28099E 01	-.26219E 00	-.32914E 01
r	-.83904E-01	-.25619E 00	-.68327E-01	-.91541E-01	-.24125E 00	.32076E-01
u	-.16688E-03	.30276E-02	.47155E-03	-.14280E-01	.20976E-03	-.10406E 00
v	-.15384E-01	-.15291E-02	.88345E-02	.71267E-03	-.61624E-01	.15575E-02
w	.27579E-02	.26180E-01	.53823E-04	.28559E-01	.71934E-02	-.34916E 00

TABLE 37.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 60 KNOTS.

	L	M	N	X	Y	Z
			SAS off			
δ_B	0.20527E-01	0.41184E 00	0.29139E-01	0.47545E-01	0.94130E-01	0.84306E 00
δ_A	.48669E 00	.14850E-04	.62967E-02	.23823E-04	.10852E 01	-.35830E-03
δ_R	-.14165E 00	.10457E-03	.19128E 00	.95293E-05	-.44399E-01	.25920E-03
δ_C	-.18126E-02	.23377E 00	.45609E-02	.32755E 00	.63338E-01	-.81505E 01
p	-.10201E 01	.19924E-01	-.45460E-02	.21280E-01	-.19788E 01	-.62703E-01
q	-.66438E-01	-.15813E 01	-.50139E-01	.26308E 01	-.13403E 00	-.64037E 00
r	-.88795E-01	-.27361E 00	-.63247E-01	-.69984E-01	-.24875E 00	-.18037E 00
u	-.77862E-03	-.72600E-02	.27577E-03	-.89043E-02	-.13639E-02	-.75485E-01
v	-.92920E-02	-.12844E-02	.74233E-03	.45669E-03	-.72300E-01	.23884E-02
w	.20447E-02	.14508E-01	-.30937E-03	.34278E-01	.43612E-02	-.56357E 00
			SAS on			
δ_B	0.20524E-01	0.41183E 00	0.29137E-01	0.47545E-01	0.94120E-01	0.84314E 00
δ_A	.48669E 00	.43313E-05	.62940E-02	.19059E-04	.10852E 01	-.38880E-03
δ_R	-.14166E 00	.10333E-03	.19128E 00	.12865E-04	-.44434E-01	.18296E-03
δ_C	-.18128E-02	.23375E 00	.45590E-02	.32753E 00	.633311E-01	-.81503E 01
p	-.19063E 01	.20035E-01	-.55991E-02	.21198E-01	-.39406E 01	-.60911E-01
q	-.66423E-01	-.15813E 01	-.50141E-01	.26308E 01	-.13399E 00	-.64041E 00
r	-.88790E-01	-.27361E 00	-.63247E-01	-.69969E-01	-.24874E 00	-.18052E 00
u	-.49027E-03	-.14984E-02	.68419E-03	-.82746E-02	-.48504E-04	-.63429E-01
v	-.18995E-01	-.12780E-02	.13316E-01	.45590E-03	-.76522E-01	.24044E-02
w	.20616E-02	.14837E-01	-.28640E-03	.34319E-01	.44362E-02	-.56292E 00

TABLE 38.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 80 KNOTS.

	L	M	N	X	Y	Z
			SAS off			
δ_B	0.18186E-01	0.43017E 00	0.25086E-01	0.49940E-01	0.69011E-01	0.72319E 00
δ_A	.48646E 00	.19800E-04	.71456E-02	.42405E-04	.10864E 01	-.57176E-03
δ_R	-.13782E 00	.13118E-03	.19154E 00	.11435E-04	-.31017E-01	.22870E-03
δ_C	-.32358E-02	.22604E 00	.50223E-02	.41855E 00	.47280E-01	-.93412E 01
p	-.10358E 01	.26438E-01	-.11789E-01	.20552E-01	-.20591E 01	-.53021E-01
q	-.58419E-01	-.16518E 01	-.27933E-01	.26311E 01	-.41224E-01	-.40780E 00
r	-.86358E-01	-.27552E 00	-.62181E-01	-.64663E-01	-.24425E 00	-.18331E 00
u	-.72031E-03	-.80721E-02	.29346E-03	-.57070E-02	-.85947E-03	.23015E-01
v	-.10178E-01	-.77693E-03	.13452E-02	-.73144E-03	-.87794E-01	.48923E-02
w	.18117E-02	.11446E-01	-.55603E-03	.42780E-01	.24069E-02	-.63679E 00
			SAS on			
δ_B	0.18185E-01	0.43017E 00	0.25085E-01	0.49938E-01	0.69008E-01	0.72302E 00
δ_A	.48646E 00	.80437E-05	.71494E-02	.41929E-04	.10864E 01	-.59463E-03
δ_R	-.13780E 00	.13179E-03	.19154E 00	.17153E-04	-.30952E-01	.18296E-03
δ_C	-.32329E-02	.22606E 00	.50244E-02	.41854E 00	.47293E-01	-.93412E 01
p	-.19214E 01	.26402E-01	-.14384E-01	.20525E-01	-.40223E 01	-.52983E-01
q	-.58435E-01	-.16518E 01	-.27931E-01	.26312E 01	-.41266E-01	-.40757E 00
r	-.86361E-01	-.27561E 00	-.62185E-01	-.64679E-01	-.24427E 00	-.18317E 00
u	-.46929E-03	-.20446E-02	.64880E-03	-.50124E-02	.10565E-03	.33220E-01
v	-.16872E-01	-.78216E-03	.10384E-01	-.73635E-03	-.89888E-01	.49240E-02
w	.18230E-02	.11717E-01	-.53788E-03	.42811E-01	.24501E-02	-.63634E 00

TABLE 39.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 100 KNOTS.

	L	M	N	X	Y	Z
			SAS off			
δ_B	0.90613E-02	0.44705E 00	0.37866E-01	0.50019E-01	0.56612E-01	0.61777E 00
δ_A	.48682E 00	.13612E-04	.78353E-02	.62417E-04	.10891E 01	-.78521E-03
δ_R	-.13497E 00	.15283E-03	.19208E 00	.10482E-04	-.20293E-01	.31256E-03
δ_C	-.96637E-02	.19979E 00	.82407E-02	.48930E 00	.57241E-01	-.10341E 02
p	-.10130E 01	.32085E-01	-.17801E-01	.21528E-01	-.20089E 01	-.48580E-01
q	-.21003E-01	-.17096E 01	-.60791E-01	.26825E 01	.25619E-01	-.52836E 00
r	-.82925E-01	-.28395E 00	-.60608E-01	-.64930E-01	-.24014E 00	-.18054E 00
u	-.65926E-03	-.68107E-02	.85861E-04	-.12636E-01	-.75137E-03	.77988E-01
v	-.11280E-01	-.35758E-03	.17701E-02	-.13568E-02	-.10514E 00	.66061E-02
w	.13236E-02	.11651E-01	-.70293E-03	.49820E-01	.84167E-03	-.67691E 00
			SAS on			
δ_B	0.90609E-02	0.44708E 00	0.37866E-01	0.50063E-01	0.56606E-01	0.61809E 00
δ_A	.48681E 00	.16706E-04	.78342E-02	.54793E-04	.10891E 01	-.71660E-03
δ_R	-.13497E 00	.17758E-03	.19208E 00	.16676E-04	-.20313E-01	.29731E-03
δ_C	-.96468E-02	.19983E 00	.82411E-02	.48935E 00	.57290E-01	-.10341E 02
p	-.18992E 01	.32175E-01	-.21583E-01	.21556E-01	-.39764E 01	-.47151E-01
q	-.21047E-01	-.17095E 01	-.60784E-01	.26824E 01	.25607E-01	-.52264E 00
r	-.82966E-01	-.28400E 00	-.60604E-01	-.64910E-01	-.24013E 00	-.18054E 00
u	-.57006E-03	-.22004E-02	.47949E-03	-.12140E-01	-.21226E-03	.84532E-01
v	-.16821E-01	-.35272E-03	.94919E-02	-.13535E-02	-.10633E 00	.66145E-02
w	.13294E-02	.11841E-01	-.68916E-03	.49846E-01	.86571E-03	-.67667E 00

TABLE 40.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 120 KNOTS.

	L	M	N	X	Y	Z
			SAS off			
δ_B	0.44967E-02	0.45113E 00	0.41217E-01	0.52785E-01	0.33761E-01	0.51063E 00
δ_A	.48837E 00	.80437E-05	.85038E-02	-.26682E-04	.10958E 01	-.86907E-03
δ_R	-.13277E 00	.17263E-03	.19330E 00	-.73376E-04	-.10244E-01	.16772E-03
δ_C	-.12798E-01	.18235E 00	.13521E-01	.51532E 00	.64276E-01	-.10988E 02
p	-.96118E 00	.38905E-01	-.25580E-01	.23660E-01	-.18659E 01	-.39966E-01
q	.28512E-02	-.17035E 01	-.64121E-01	.27440E 01	.12582E 00	-.47326E 00
r	-.69907E-01	-.29838E 00	-.66858E-01	-.70063E-01	-.20300E 00	-.21412E 00
u	-.47924E-03	-.41431E-02	.87713E-04	-.27700E-01	-.13417E-03	.63076E-01
v	-.12484E-01	.92008E-04	.21020E-02	-.16492E-02	-.12355E 00	.81514E-02
w	.11215E-02	.12060E-01	-.70963E-03	.52272E-01	.52805E-03	-.70081E 00
			SAS on			
δ_B	0.44515E-02	0.45118E 00	0.41178E-01	0.52667E-01	0.33591E-01	0.51360E 00
δ_A	.48834E 00	.92812E-05	.85063E-02	.67658E-04	.10957E 01	-.83095E-03
δ_R	-.13275E 00	.17572E-03	.19329E 00	.21441E-04	-.10192E-01	.15247E-03
δ_C	-.12818E-01	.18237E 00	.13475E-01	.51540E 00	.64092E-01	-.10985E 02
p	-.18499E 01	.38673E-01	-.30602E-01	.23319E-01	-.38448E 01	-.38880E-01
q	.23448E-02	-.17036E 01	-.63966E-01	.27436E 01	.11146E 00	-.48112E 00
r	-.69859E-01	-.29837E 00	-.66854E-01	-.69797E-01	-.20289E 00	-.22188E 00
u	-.44009E-03	-.15333E-03	.45154E-03	-.27231E-01	.16060E-03	.67680E-01
v	-.17427E-01	.10027E-03	.91899E-02	-.16471E-02	-.12418E 00	.79958E-02
w	.11216E-02	.12191E-01	-.70072E-03	.52297E-01	.52671E-03	-.70069E 00

TABLE 41.- STABILITY AND CONTROL DERIVATIVES, V_{eq} = 130 KNOTS.

	L	M	N	X	Y	Z
			SAS off			
δ_B	0.21123E-02	0.44601E 00	0.43973E-01	0.65784E-01	0.27197E-01	0.46277E 00
δ_A	.49179E 00	.68062E-05	.82524E-02	.23823E-04	.11066E 01	-.35830E-03
δ_R	-.13550E 00	.79200E-04	.19517E 00	.17629E-04	-.15153E-01	.53364E-04
δ_C	-.14705E-01	.19110E 00	.15004E-01	.35527E 00	.59271E-01	-.11143E 02
p	-.93025E 00	.41965E-01	-.29312E-01	.24776E-01	-.17771E 01	-.35792E-01
q	.14853E-01	-.16772E 01	-.68904E-01	.27638E 01	.16740E 00	-.30235E 00
r	-.70654E-01	-.30869E 00	-.56485E-01	-.78874E-01	-.18537E 00	-.25638E 00
u	-.47011E-03	-.22112E-02	-.13100E-03	-.37849E-01	.25163E-03	.13208E-01
v	-.13160E-01	.27804E-03	.22743E-02	-.17813E-02	-.13514E 00	.81796E-02
w	.13102E-02	.12423E-01	-.68993E-03	.42638E-01	.28617E-02	-.70578E 00
			SAS on			
δ_B	0.21255E-02	0.44608E 00	0.43970E-01	0.65772E-01	0.27233E-01	0.46282E 00
δ_A	.49179E 00	.12994E-04	.82566E-02	.38594E-04	.11066E 01	-.52602E-03
δ_R	-.13549E 00	.87862E-04	.19517E 00	.17629E-04	-.15109E-01	.22870E-04
δ_C	-.14739E-01	.19101E 00	.15009E-01	.35526E 00	.59168E-01	-.11143E 02
p	-.18254E 01	.42097E-01	-.33686E-01	.24709E-01	-.37760E 01	-.35182E-01
q	.14795E-01	-.16770E 01	-.68886E-01	.27638E 01	.16725E 00	-.30254E 00
r	-.70668E-01	-.30869E 00	-.56483E-01	-.78869E-01	-.18540E 00	-.25634E 00
u	-.45135E-03	.17370E-02	.25679E-03	-.37269E-01	.49216E-03	.17447E-01
v	-.18035E-01	.28193E-03	.92009E-02	-.17801E-02	-.13590E 00	.83442E-02
w	.13086E-02	.12469E-01	-.68580E-03	.42640E-01	.28572E-02	-.70574E 00

TABLE 42.- STATIC TRIM DATA, SLUNG LOAD ATTACHED

V_{eq} = 0.1 knot, SAS on

θ_{SL} = 0°

CH-47B TRIM DATA

18:28 FEB 22,'83 RUN NO. 5

VTOT = .1 KT U = .1 KT V = -.0 KT W = .0 KT

G.W. = 25500.0 LBS RPM = 24.1 H = 97.0 FT TEMP = 288.0 DG DYCG = .0 IN DZCG = .0 IN RHP = .0

THETA	PHI	PSI	P	Q	R	RHO	OMEGA FR	OMEGA RR
.66237E 01	-.39458E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	.23704E-02	.24085E 02	.24085E 02
DELB PLT	DELS PLT	DELR PLT	DELC PLT	DELB TOT	DELS TOT	DELR TOT	DELC TOT	H DOT
.98861E-01	.20269E 00	-.30603E-01	.57566E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	AICFR	BICFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.18618E 02	.28825E 00	-.15000E 01	.10496E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		LAMDA FR	LAMDA RR	MU FR	MU RR	MACH NO.
.66979E-01	.66979E-01	.40931E-02		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	DELTA FR	F FR
.17054E 05	.44803E 03	.86029E 02	.43902E 05	[illegible]	[illegible]	[illegible]	.10011E-01	[illegible]
THRUST R	NORMAL R	SIDE F	TORQUE R	[illegible]	[illegible]	[illegible]	DELTA RR	F RR
.16515E 05	-.43084E 03	-.13982E 03	.42771E 05	[illegible]	[illegible]	[illegible]	.10714E-01	.34991E 07
CT FR	CH FR	CY FR	CQ FR	A0 FR	A1 FR	B1 FR	Q GOV FR	
.48740E-02	.12804E-03	.24586E-04	.41823E-03	.46179E 01	[illegible]	[illegible]	.43302E 05	
CT RR	CH RR	CY RR	CQ RR	A0 RR	A1 RR	B1 RR	Q GOV RR	
.47198E-02	-.12313E-03	-.39975E-04	.40745E-03	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		BD FRF	BD FRR
-.25129E 00	-.20366E-02	.39458E 00	[illegible]	.15319E 04	[illegible]		.35012E 00	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	Y M	[illegible]	BICF BOD	THOF BOD
.20728E 00	.89942E-05	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]	-.15000E 01	.18618E 02
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	Z M	[illegible]	BICR BOD	THOR BOD
.57495E 03	.00000E 00	-.66237E 01	-.16914E 05	-.16445E 05	[illegible]	[illegible]	.15000E 01	.10496E 02
L FUSE	L SLING	R BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	LHOR BOD	PFP
.21933E 00	.00000E 00	.10000E 01	-.57997E 04	.53870E 04	[illegible]	[illegible]	-.71210E 03	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	MHBR BOD	QFF
.83688E 03	.00000E 00		.33110E 06	-.32500E 06	[illegible]	[illegible]	[illegible]	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	A1FF BOD	A1RR BOD	RFP
-.51126E 00	-.42326E-05		.45193E 05	-.45193E 05	[illegible]	.15043E 01	-.14343E 01	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		B1FF BOD	B1RR BOD	QFF
-.45820E-01	-.44907E-01	.75000E 04	-.45553E-01	-.45561E-01		[illegible]	-.46584E 00	.00000E 00
ALPH FS	ALPH SL	J SL				HFF BODY	HRR BODY	
-.89685E 02	.65203E 01	.77711E 04				[illegible]	-.43073E 03	

VINTE	THETA SL	L SL		WIFF	YFF BODY	YRR BODY	
[illegible] 02	.00000E 00	.20000E 02		.00000E 00	.86385E 02	.14022E 03	
[illegible]	[illegible]	[illegible]				AICRR	[illegible]
[illegible]	[illegible]	[illegible]				[illegible]	[illegible]

[illegible]

RSASQ 1 RSASR 1
ISTEADY 1 NSTALL 1
NTROCR 1 NGREFF 0
ISLTRM 1

TABLE 43.- STATIC TRIM DATA, SLUNG LOAD ATTACHED

V_{eq} = 75 knots, SAS on

θ_{SL} = 0°

CH-47B TRIM DATA

19:40 FEB 24,'83 RUN NO. 9

VTOT = 75.0 KT U = 75.1 KT V = -.0 KT W = 1.4 FT
G.W. = 25500.0 LBS PPM = 24.1 H = 99.4 FT TEMP = 288.0 DG DCC = .00 IN DCS = .0 IN FHP = .0

THETA	PHI	PSI	P	Q	R			
.10461E 01	-.23680E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00			

DELB PLT	DELS PLT	DELP PLT	DELC PLT	DELB TOT	DELS TOT			
-.20137E 01	.17264E 00	.11664E 00	.49325E 01	-.12078E 01	.17264E 00			

THETO FP	AICFR	BICFR	THETO RP					
.16285E 02	.68903E 00	-.37506E 00	.17764E 02					

SIGMA FP	SIGMA RP	GAIN FS						
.66973E-01	.66973E-01	.13589E 01						

THRUST F	NORMAL F	SIDE F	TORQUE F					
.16770E 05	.10082E 04	.27543E 03	.23402E 05					

THRUST R	NORMAL R	SIDE R	TORQUE R					
.16834E 05	.23701E 03	.13918E 03	.31566E 05					

CT FR	CH FR	CY FR	CQ FR	MQ FR				
.47932E-02	.28815E-03	.73717E-04	.22296E-03	.41315E 01				

CT RR	CH RR	CY RR	CQ RR	MQ RR				
.48112E-02	.67739E-04	.39778E-04	.30092E-03	.43916E 01				

X FUSE	X SLING	LAMDA SL	X F.PUT	X R.POT				
-.89948E 03	-.10623E 04	.23680E 00	.16377E 04	.98775E 03				

Y FUSE	Y SLING	NU SL	Y F.PUT	Y R.POT				
.31663E-01	.59913E 00	.00000E 00	.27549E 03	-.13913E 03				

Z FUSE	Z SLING	MU SL	Z F.POT	Z R.POT				
.53621E 03	.00000E 00	-.91139E 01	-.16722E 05	-.16809E 05				

L FUSE	L SLING	F BAR SL	L F.PUT	L R.POT				
-.37867E 02	.00000E 00	.10100E 01	.77991E 03	-.29025E 03				

M FUSE	M SLING		M F.POT	M R.POT				
-.32282E 04	.00000E 00		.33393E 06	-.32107E 06				

N FUSE	N SLING		N F.POT	N R.POT				
-.72878E 02	-.11903E 01		.29119E 05	-.29046E 05				

BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR				
-.43241E-02	-.43243E-02	.75000E 04	-.43653E-02	-.43291E-02				

ALPH FS	ALPH SL	J SL						
-.33565E 01	.10461E 01	.77711E 04						

VINTF	THETA SL	L SL			WIRR			
.94679E 01	.00000E 00	.20000E 02			.00300E 00			

WIFS	SMA SL	R SL					AICRR	BICRR
-.97476E 01	.20000E 02	.80000E 01					.39430E-01	.26250E 01

CONTROL FLAGS SET UP

ISLING	1	IECSCON	0
IDOPT	1	PSASP	1
PSASO	1	PSASR	1
ISTEADY	1	NSTALL	1
NTROCR	1	NGREFF	0
ISLTRM	1		

TABLE 44.- STATIC TRIM DATA, SLUNG LOAD ATTACHED

V_{eq} = 0.1 knot, SAS on

$\theta_{SL} = -5°$

CH-47B TRIM DATA

RUN NO. 1

19:09 FEB 22,'83

VTOT = .1 KT U = .1 KT V = -.0 KT W = .0 KT

G.W. = 25500.0 LBS RPM = 24.1 H = 97.0 FT TEMP = [illegible] DS [illegible] = .0 IN [illegible] = .0 IN [illegible] = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	OMEGA RR
.66237E 01	-.39501E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELR PLT	DELC PLT	DELB TOT	DELS TOT	[illegible]	[illegible]	[illegible]
.98889E-01	.20224E 00	-.30171E 01	.57569E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	AICFR	BICFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.18613E 02	.23875E 00	-.15003E 01	.13487E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		GAMMA RR	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.17056E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16516E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	[illegible]	[illegible]	[illegible]	[illegible]	
.48744E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	[illegible]	[illegible]	[illegible]	[illegible]	
.47202E-02	-.12314E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	X TOT		BD FRR	BD RRR
-.25132E 00	-.19021E-02	.39501E 00	.22257E 04	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	MU SL	Y F.ROT	Y R.ROT	Y TOT	[illegible] BOD	[illegible] BOD	THOR BOD
.20730E 00	.11111E-04	.00000E 00	.06545E 02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	NU SL	Z F.ROT	Z R.ROT	Z TOT	AICR BOD	BICR BOD	THOR BOD
.57500E 03	.00000E 00	-.66237E 01	-.16316E 05	-.16446E 05	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	[illegible] BAR SL	L F.ROT	L R.ROT	L TOT	[illegible] BOD	[illegible] BOD	FRR
.21935E 00	.00000E 00	.10000E 01	-.57985E 04	.53764E 04	[illegible]	[illegible]	[illegible]	.00000E 00
M FUSE	M SLING		M F.ROT	M R.ROT	M TOT	[illegible] BOD	[illegible] BOD	ORR
.83695E 03	.00000E 00		.33113E 06	-.32503E 06	[illegible]	[illegible]	[illegible]	.00000E 00
N FUSE	N SLING		N F.ROT	N R.ROT	N TOT	AIFR BOD	AIRR BOD	FRR
-.51131E 00	-.36507E-04		.45203E 05	-.45187E 05	[illegible]	[illegible]	[illegible]	.00000E 00
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		BIFR BOD	BIRR BOD	ORR
-.45870E-01	-.63446E-01	.75000E 04	-.45603E-01	-.45611E-01		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				HFR BODY	HRR BODY	
-.89685E 02	.14610E 01	.77711E 04				[illegible]	[illegible]	
VINTF	THETA SL	L SL			WIRR	YFR BODY	YRR BODY	
.41251E 02	-.49996E 01	.20000E 02			.00000E 00	.06545E 02	-.13959E 03	
WIFS	SMA SL	R SL					AICRR	BICRR
.30554E 02	.20000E 02	.80000E 01					-.48381E 00	.14996E 01

CONTROL FLAGS SET UP

ISLING	1	IECSCON	0
IDCPT	1	RSASP	1
RSASO	1	RSASR	1
ISTEADY	1	NSTALL	1
NTROCR	1	NGPEFF	0
ISLTRM	1		

TABLE 45.- STATIC TRIM DATA, SLUNG LOAD ATTACHED

V_{eq} = 75 knots, SAS on

$\theta_{SL} = -5°$

CH-47B TRIM DATA
RUN NO. 1

19:07 FEB 22.'83

VTOT = 75.0 KT U = 75.1 KT V = -.0 KT W = [illegible]
G.W. = 25500.0 LBS RPM = 24.1 H = 93.5 FT [illegible] = [illegible] DG [illegible] = [illegible] IN [illegible] = .0 IN [illegible] = .0

THETA	PHI	PSI	P	Q	R	[illegible]	OMEGA FR	OMEGA RR
.96231E 00	-.23708E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	[illegible]	[illegible]	[illegible]
DELB PLT	DELS PLT	DELP PLT	DELC PLT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-.20112E 01	.17302E 00	.11521E 00	.49453E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THETO FR	A1CFR	B1CFR	THETO RR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16310E 02	.69526E 00	-.37505E 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SIGMA FR	SIGMA RR	GAMMA FS		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.66979E-01	.66979E-01	.13574E 01		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST F	NORMAL F	SIDE F	TORQUE F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16784E 05	.10106E 04	[illegible]	.23536E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THRUST R	NORMAL R	SIDE R	TORQUE R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
.16829E 05	.23828E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CT FR	CH FR	CY FR	CQ FR	[illegible]	[illegible]	[illegible]	[illegible]	
.47969E-02	.28885E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CT RR	CH RR	CY RR	CQ RR	[illegible]	[illegible]	[illegible]	[illegible]	
.48099E-02	.68104E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
X FUSE	X SLING	LAMDA SL	X F.ROT	X R.ROT	[illegible]		[illegible]	[illegible]
-.89976E 03	-.11081E 04	.23786E 00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Y FUSE	Y SLING	NU SL	Y F.ROT	Y R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.29263E-01	.59513E 00	.00000E 00	.27543E 03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Z FUSE	Z SLING	MU SL	Z F.ROT	Z R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
.54473E 03	.00000E 00	-.93726E 01	-.16735E 05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L FUSE	L SLING	[illegible] BAR SL	L F.ROT	L R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.37878E 02	.00000E 00	.10103E 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M FUSE	M SLING		M F.ROT	M R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.33383E 04	.00000E 00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N FUSE	N SLING		N F.ROT	N R.ROT	[illegible]	[illegible]	[illegible]	[illegible]
-.68114E 02	-.59513E 00		.29250E 05	-.29181E 05	[illegible]	[illegible]	[illegible]	[illegible]
BETA FS	BETA SL	SL WGHT	BETA FR	BETA RR		[illegible]	[illegible]	[illegible]
-.39957E-02	-.39958E-02	.75000E 04	-.40348E-02	[illegible]		[illegible]	[illegible]	[illegible]
ALPH FS	ALPH SL	J SL				[illegible]	[illegible]	
-.34430E 01	-.40373E 01	.77711E 04				[illegible]	[illegible]	

VINTF	THETA SL	L SL	WIPP	[illegible] BODY	[illegible] BODY	
.94761E 01	-.49996E 01	.20000E 02	.00000E 00	[illegible]	.13851E 03	
WIFS	SMA SL	R SL			AICRR	BICRR
-.97545E 01	.20000E 02	.80000E 01			.34181E-01	.26250E 01

CONTROL FLAGS SET UP

ISLING	1	IECSCON	0
IDCPT	1	PSASP	1
PSASD	1	PSASR	1
ISTEADY	1	NSTALL	1
NTPOCR	1	NGPEFF	0
ISLTRM	1		

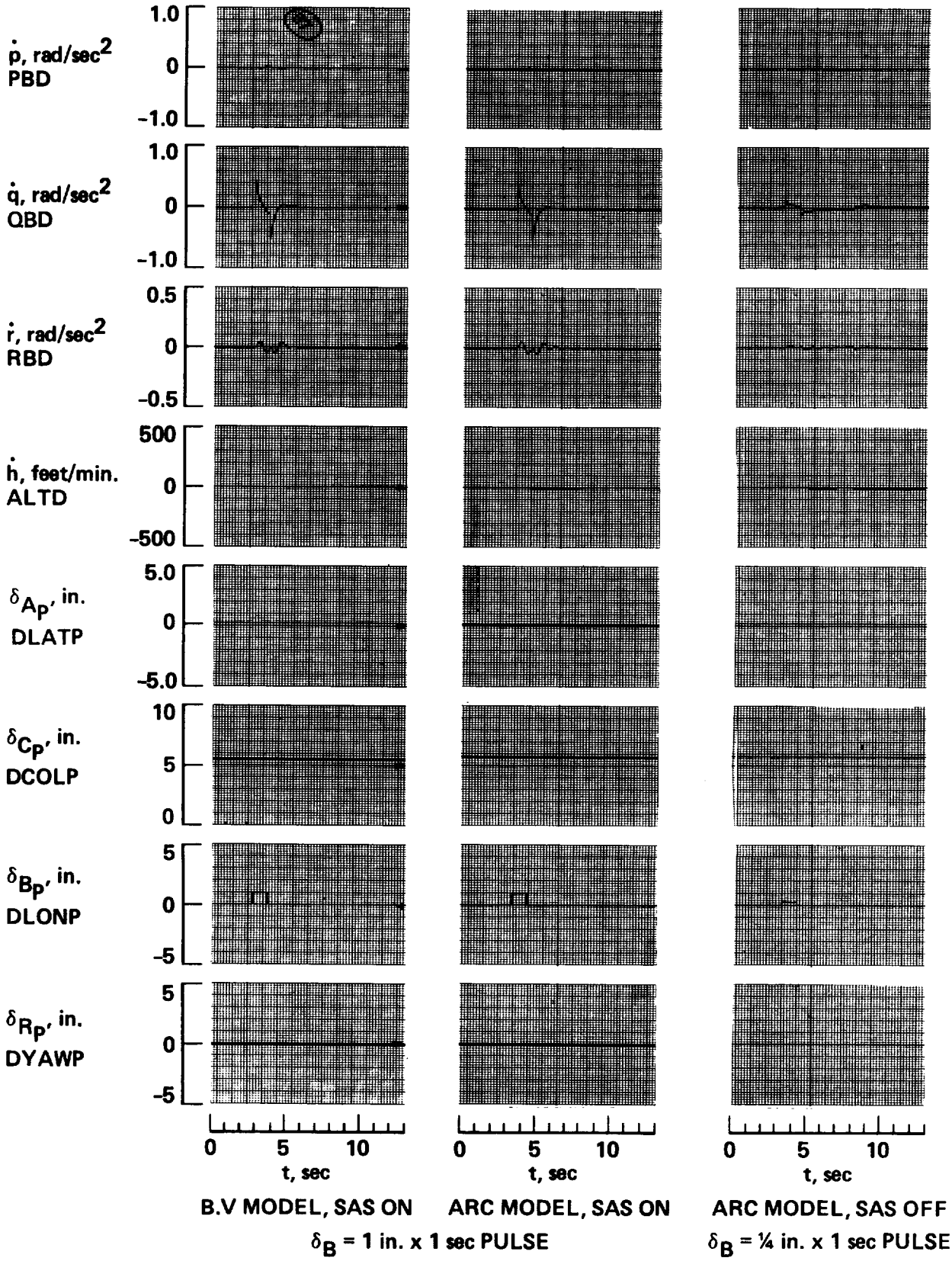

Figure 1.- BV versus ARC simulation response data; hover.

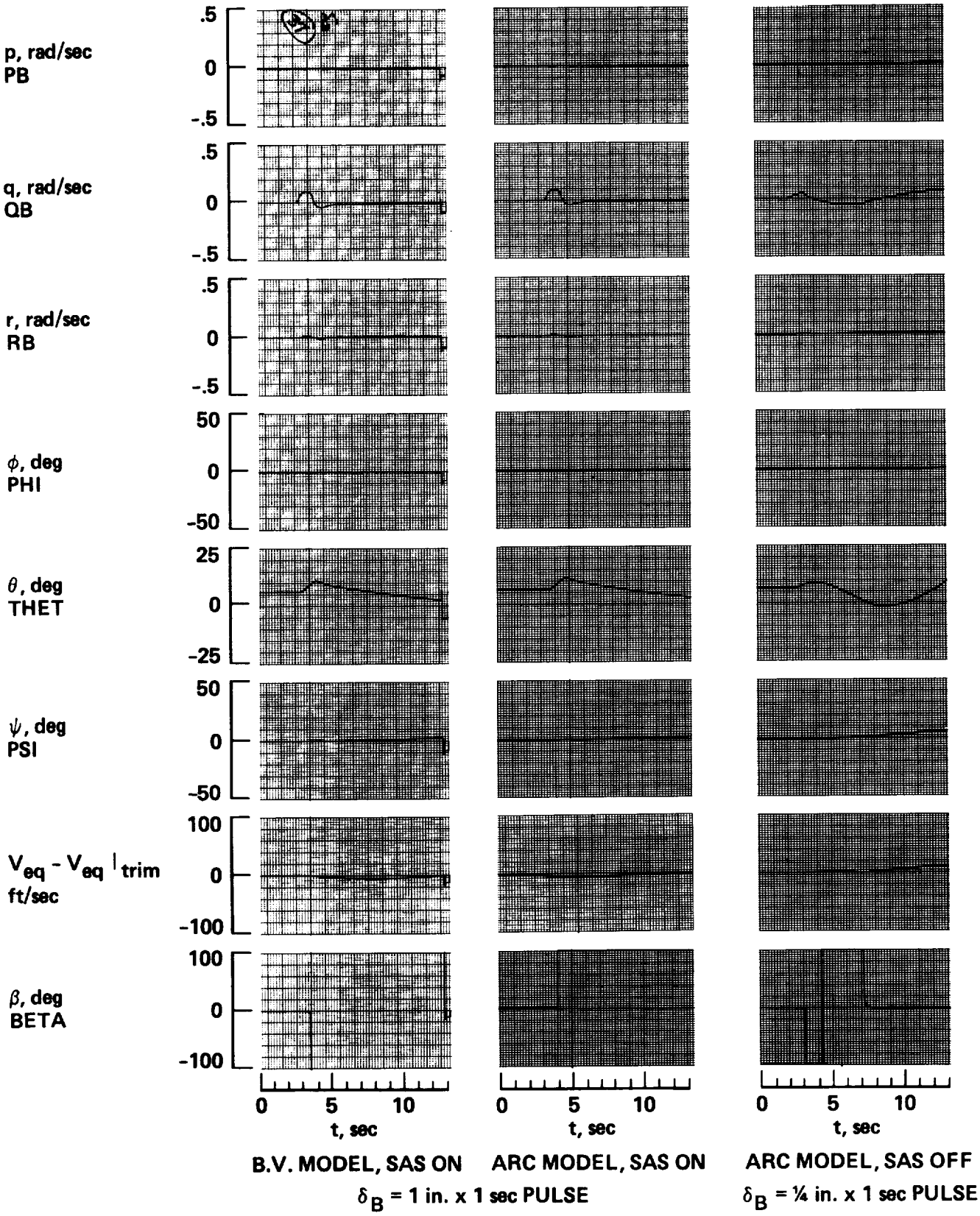

Figure 2.- BV versus ARC simulation response data; hover.

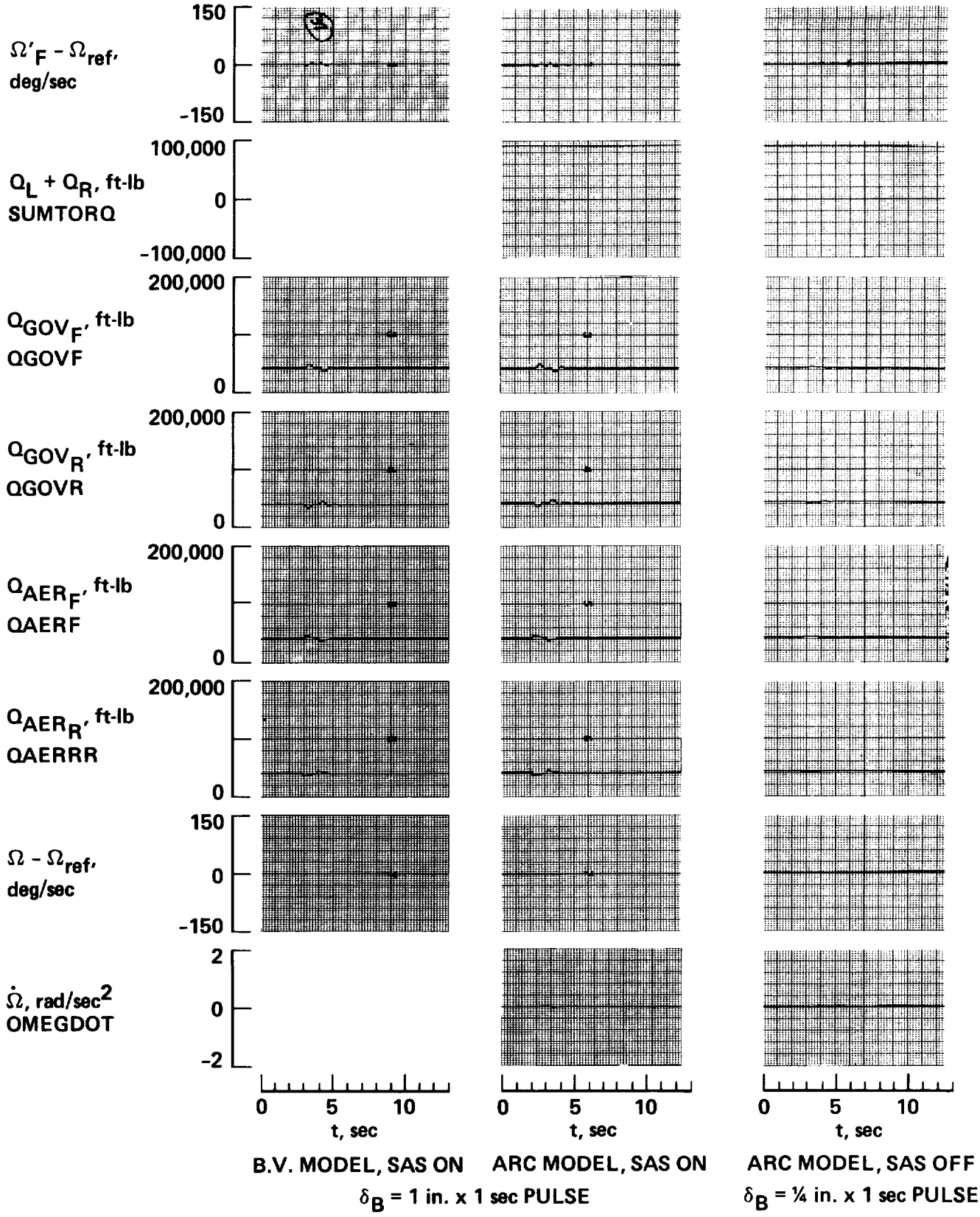

Figure 3.- BV versus ARC simulation response data; hover.

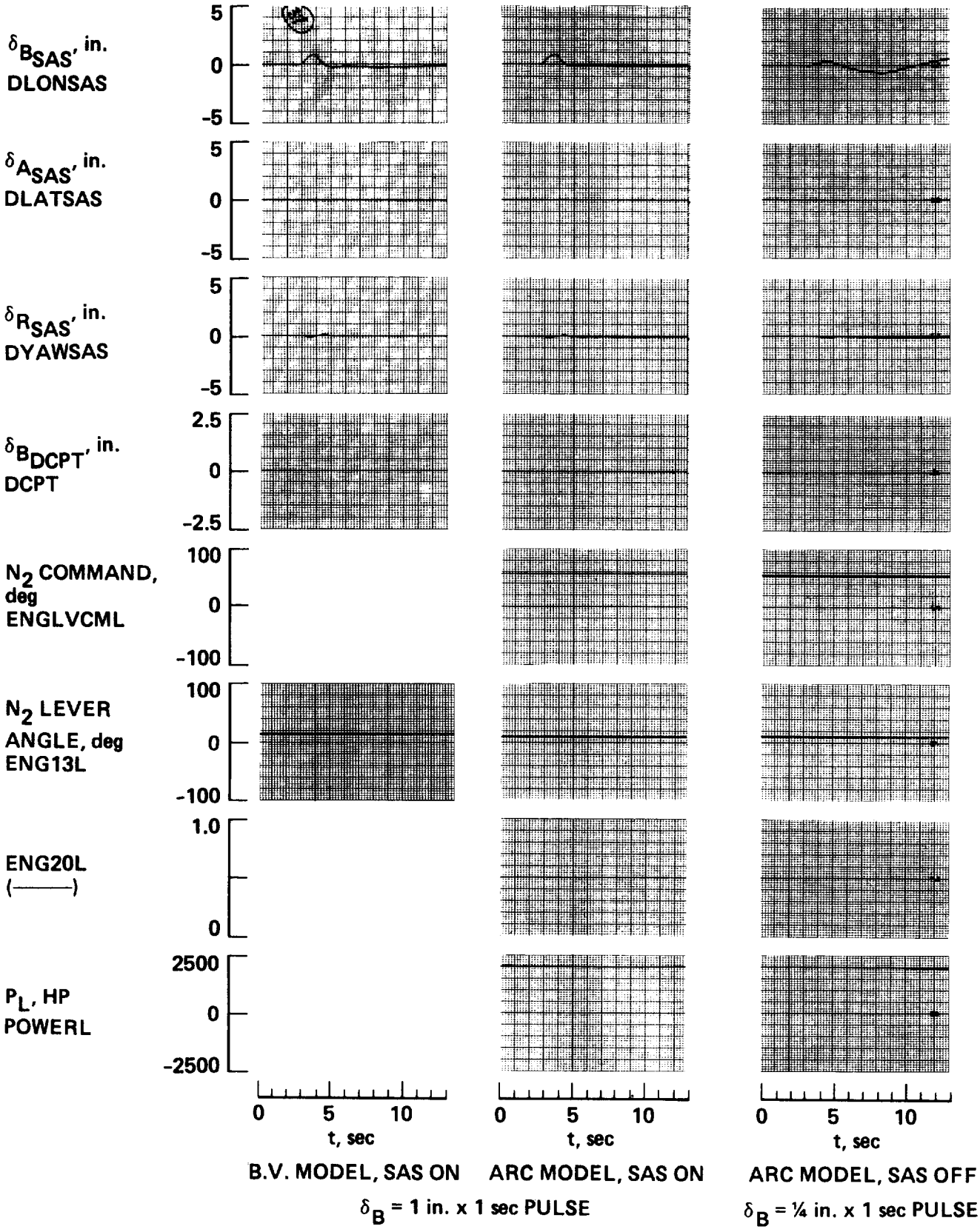

Figure 4.- BV versus ARC simulation response data; hover.

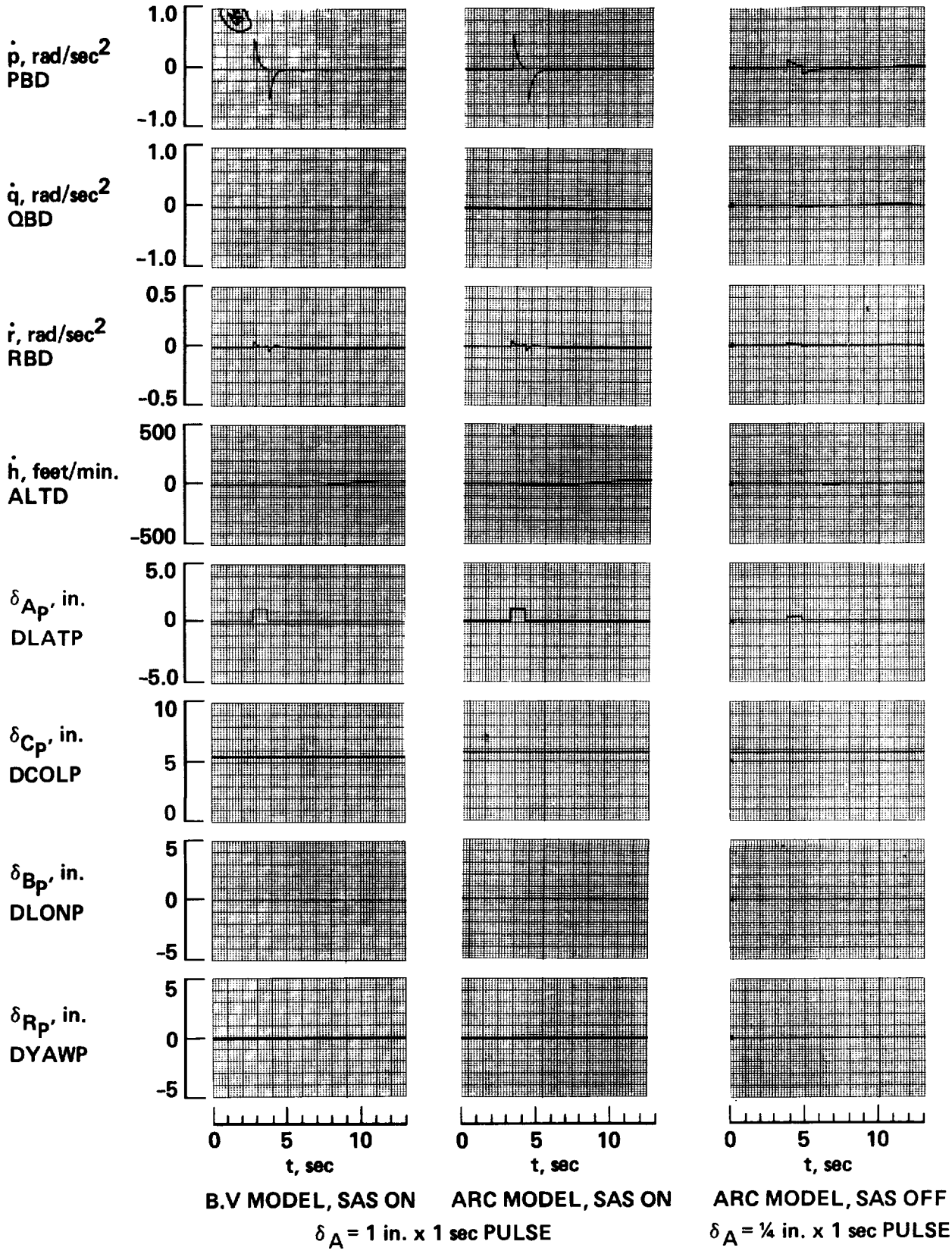

Figure 5.- BV versus ARC simulation response data; hover.

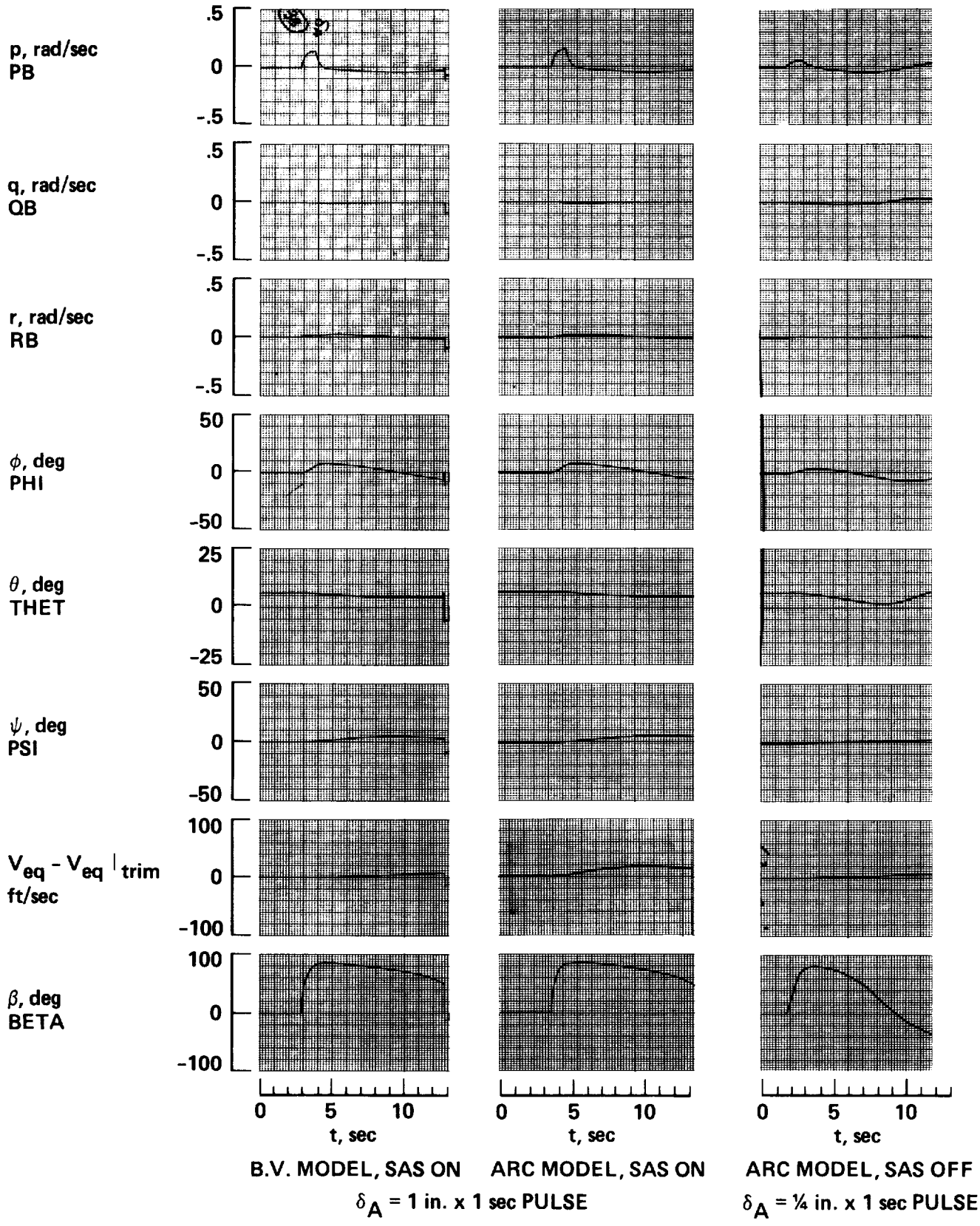

Figure 6.- BV versus ARC simulation response data; hover.

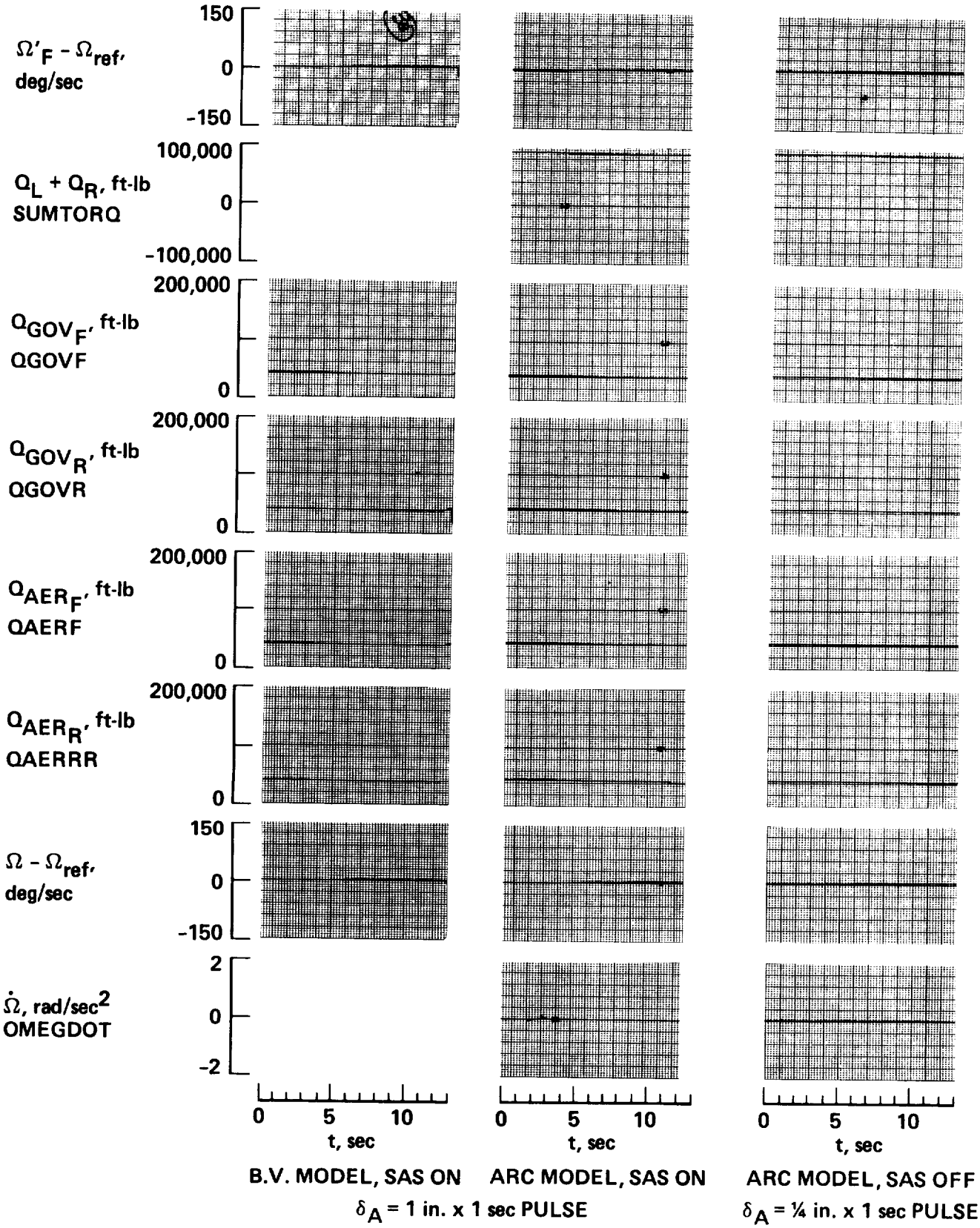

Figure 7.- BV versus ARC simulation response data; hover.

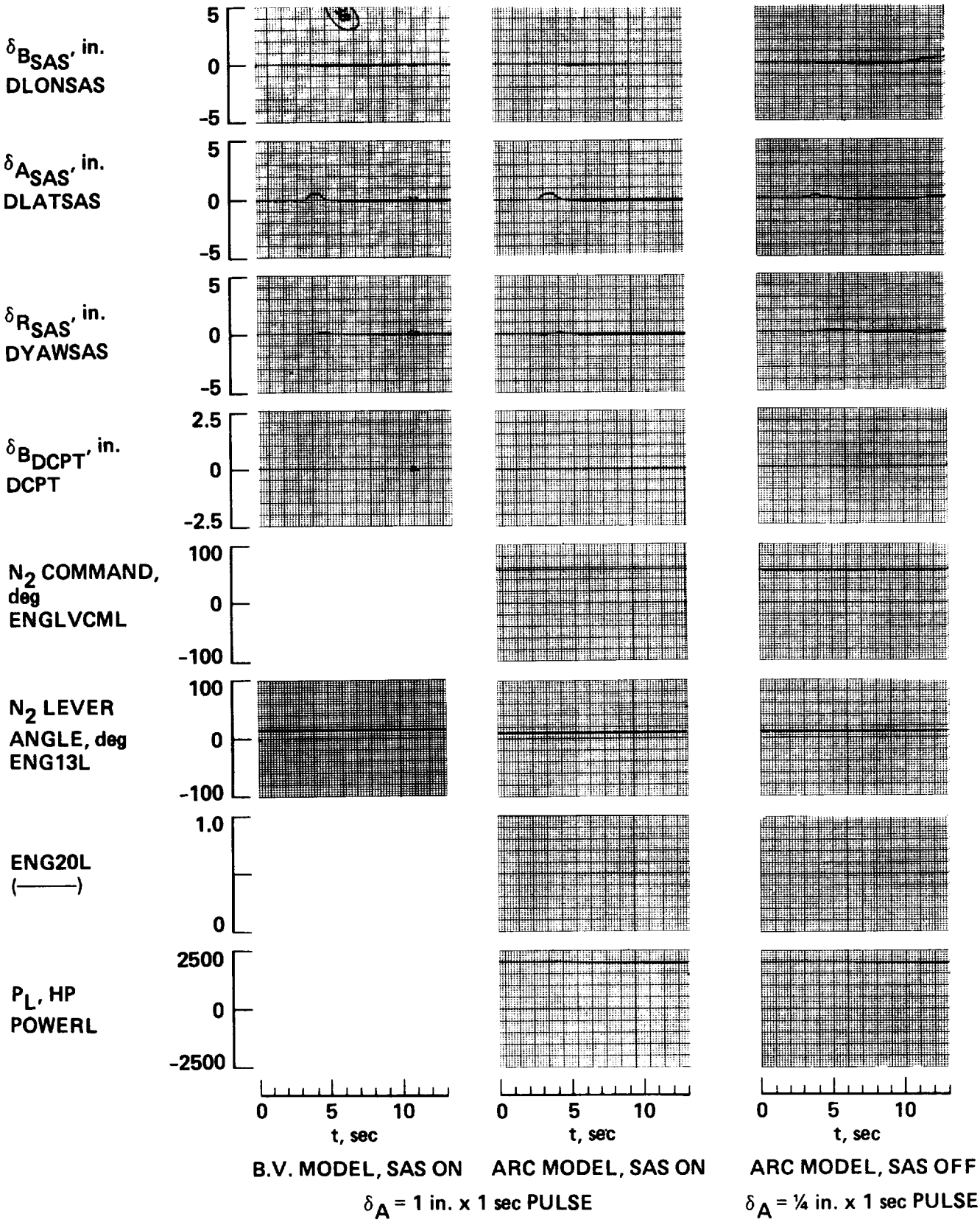

Figure 8.- BV versus ARC simulation response data; hover.

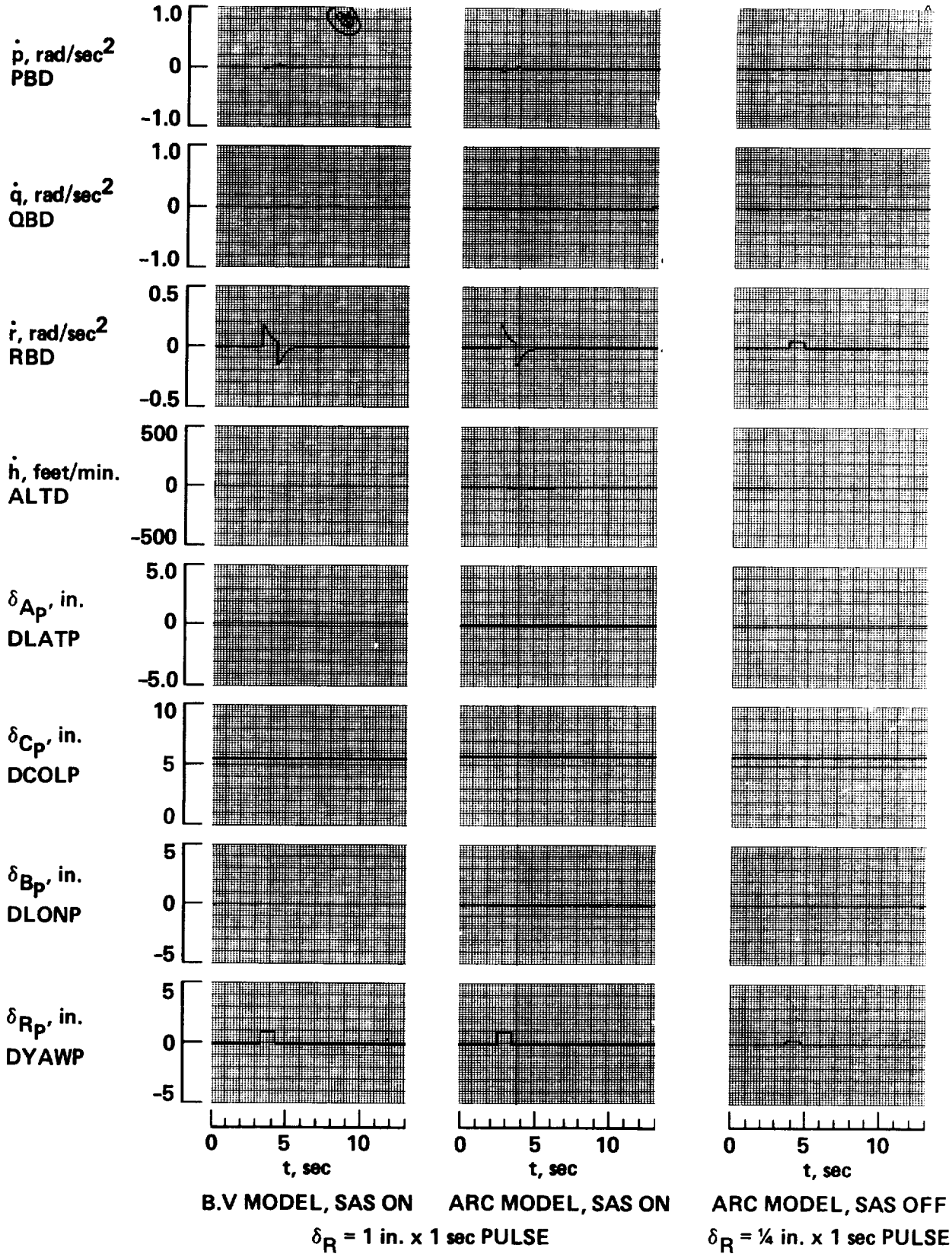

Figure 9.- BV versus ARC simulation response data; hover.

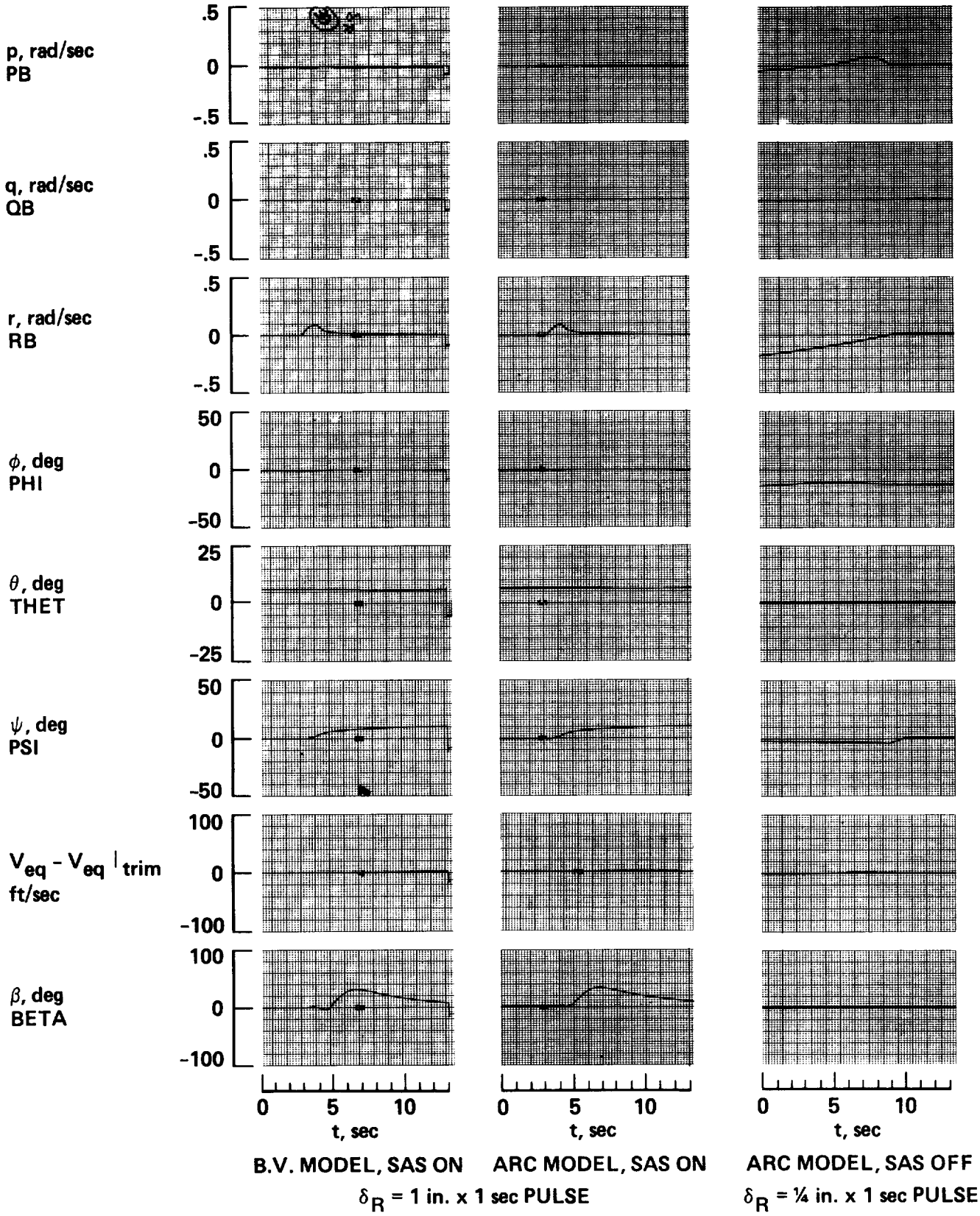

Figure 10.- BV versus ARC simulation response data; hover.

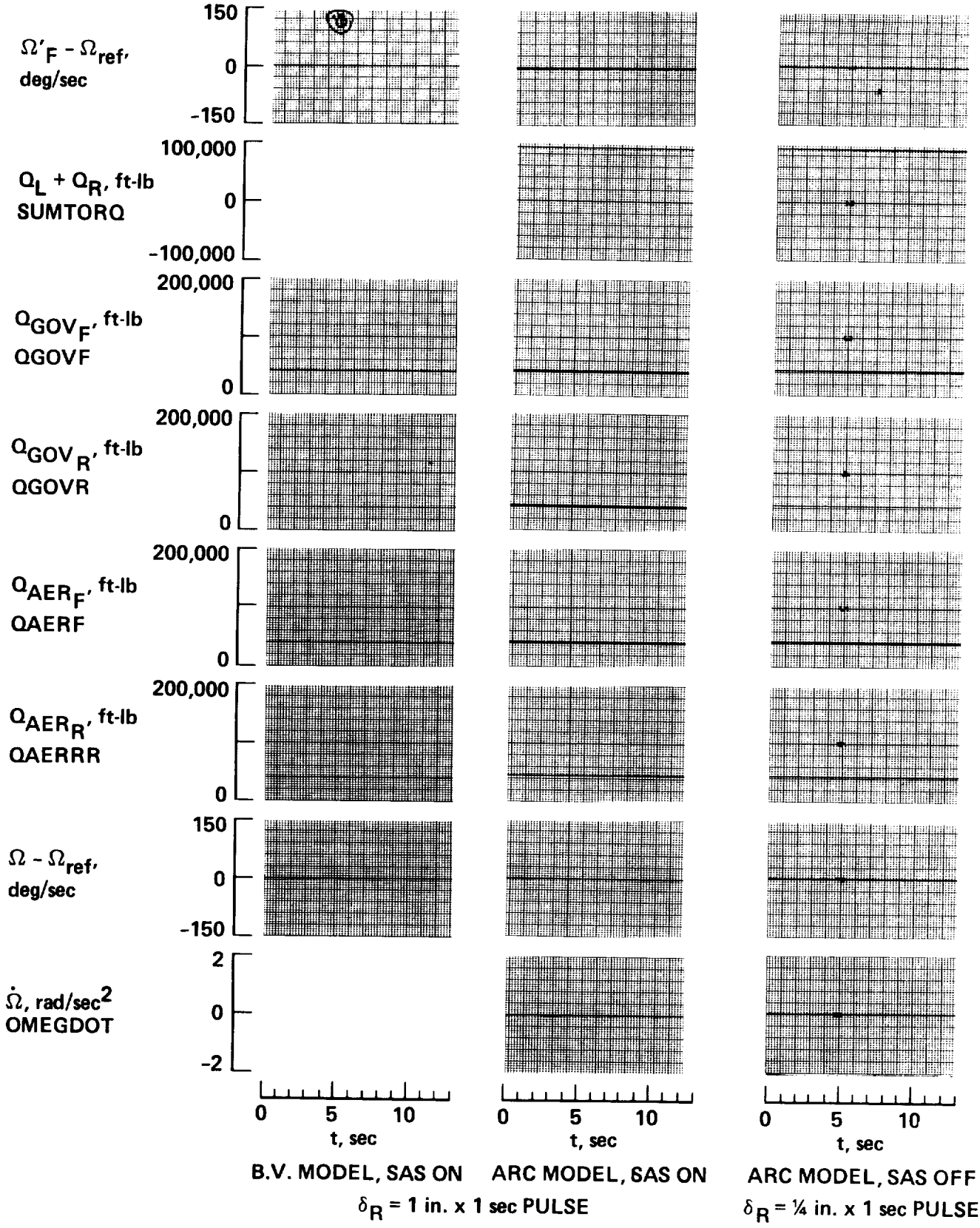

Figure 11.- BV versus ARC simulation response data; hover.

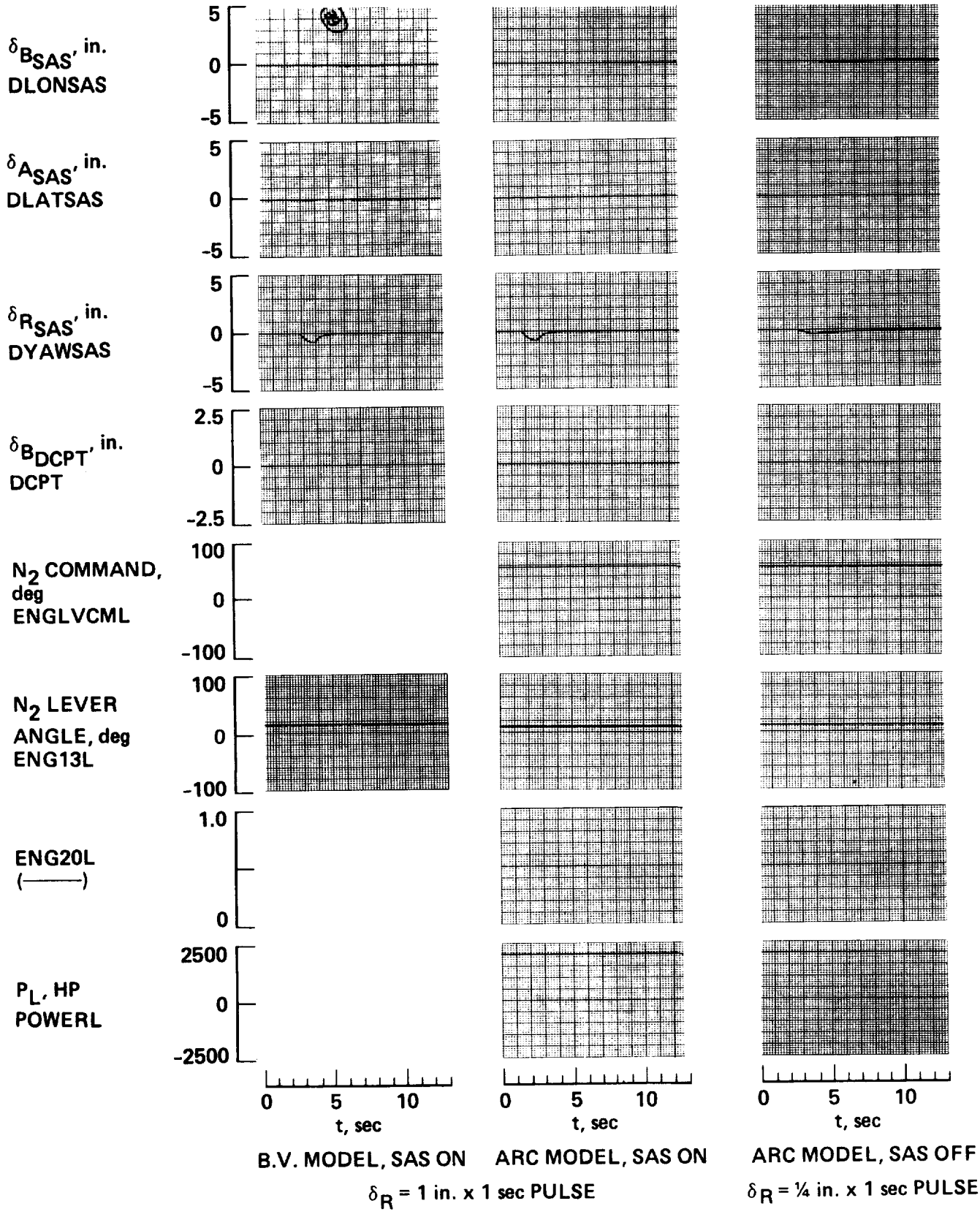

Figure 12.- BV versus ARC simulation response data; hover.

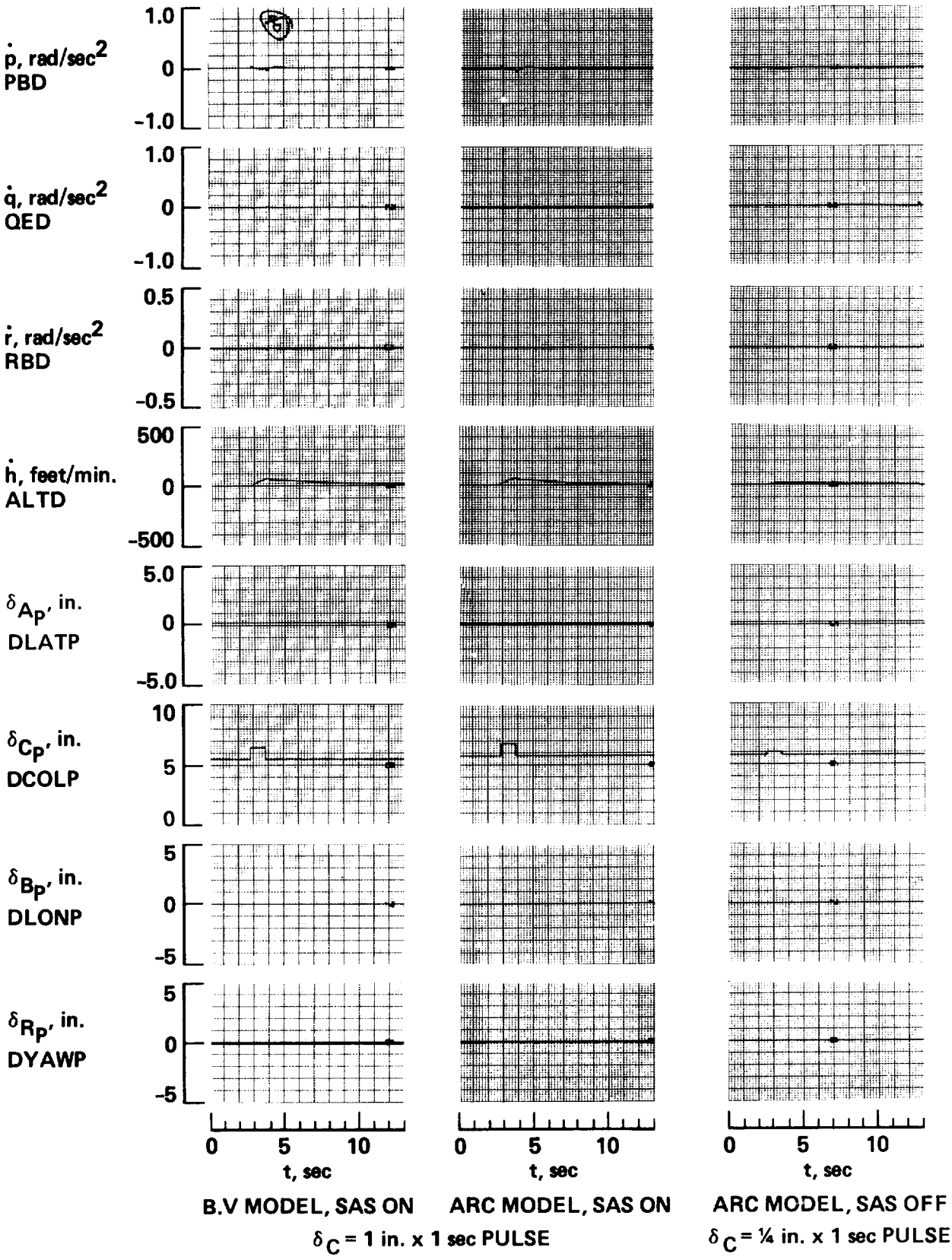

Figure 13.- BV versus ARC simulation response data; hover.

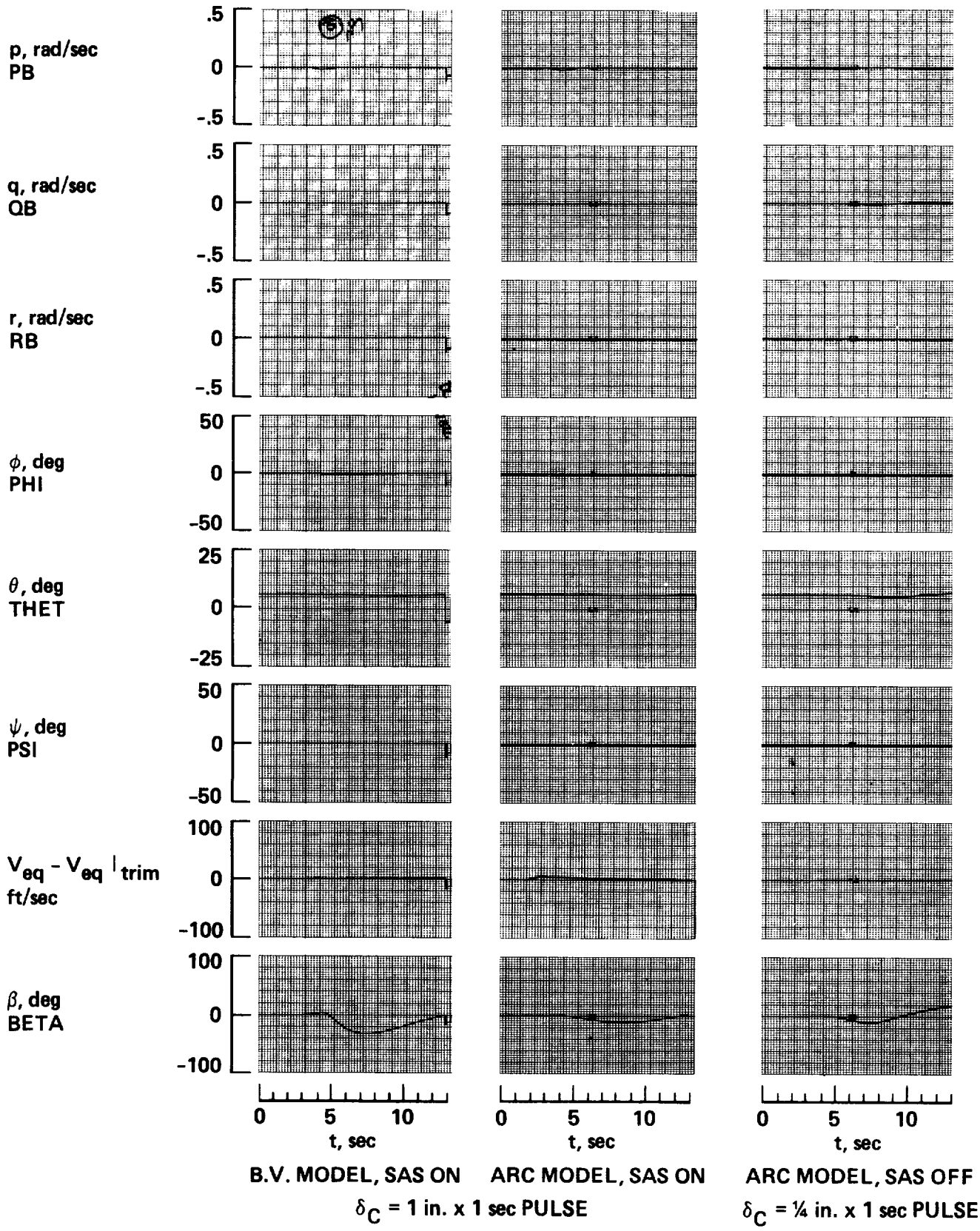

Figure 14.- BV versus ARC simulation response data; hover.

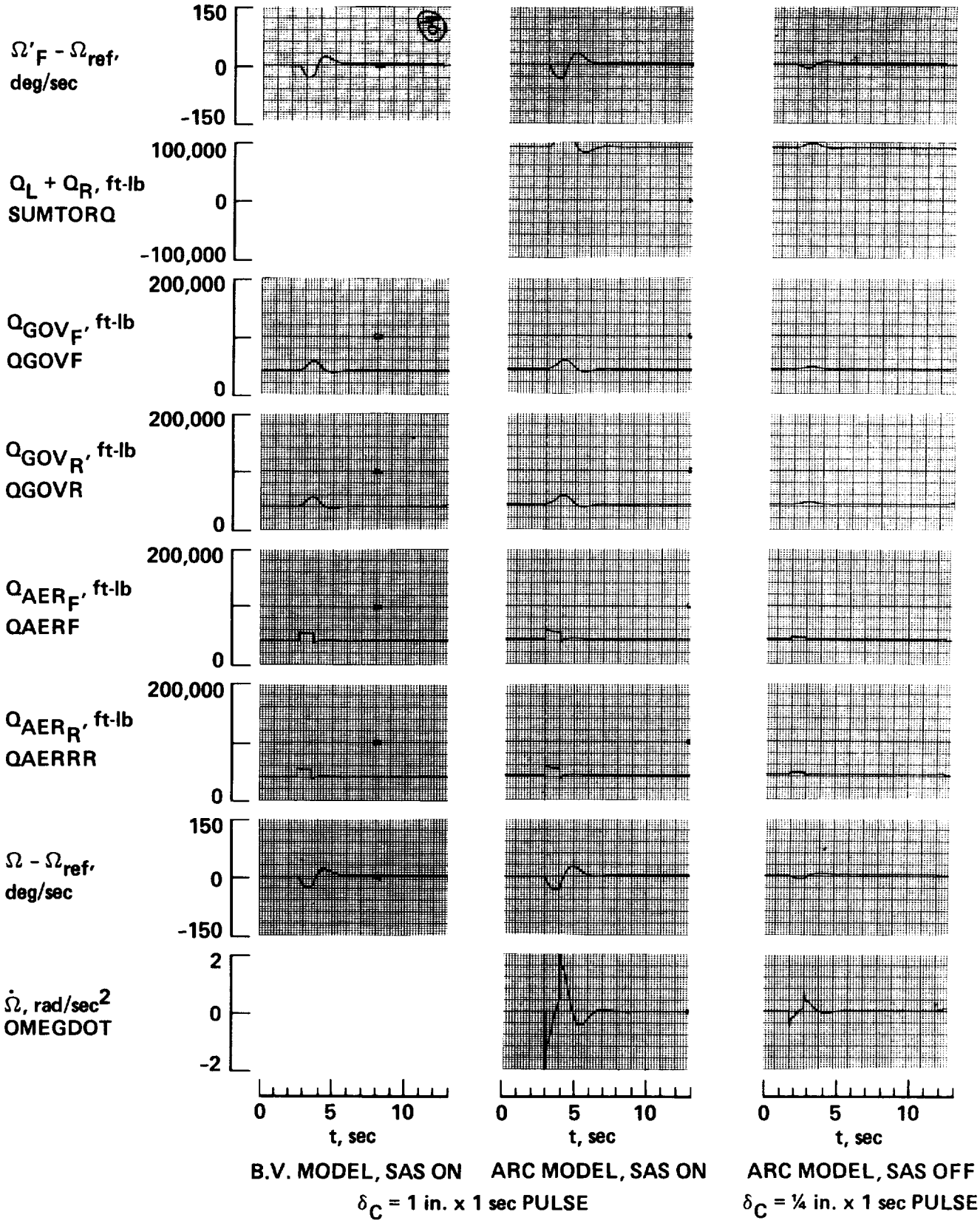

Figure 15.- BV versus ARC simulation response data; hover.

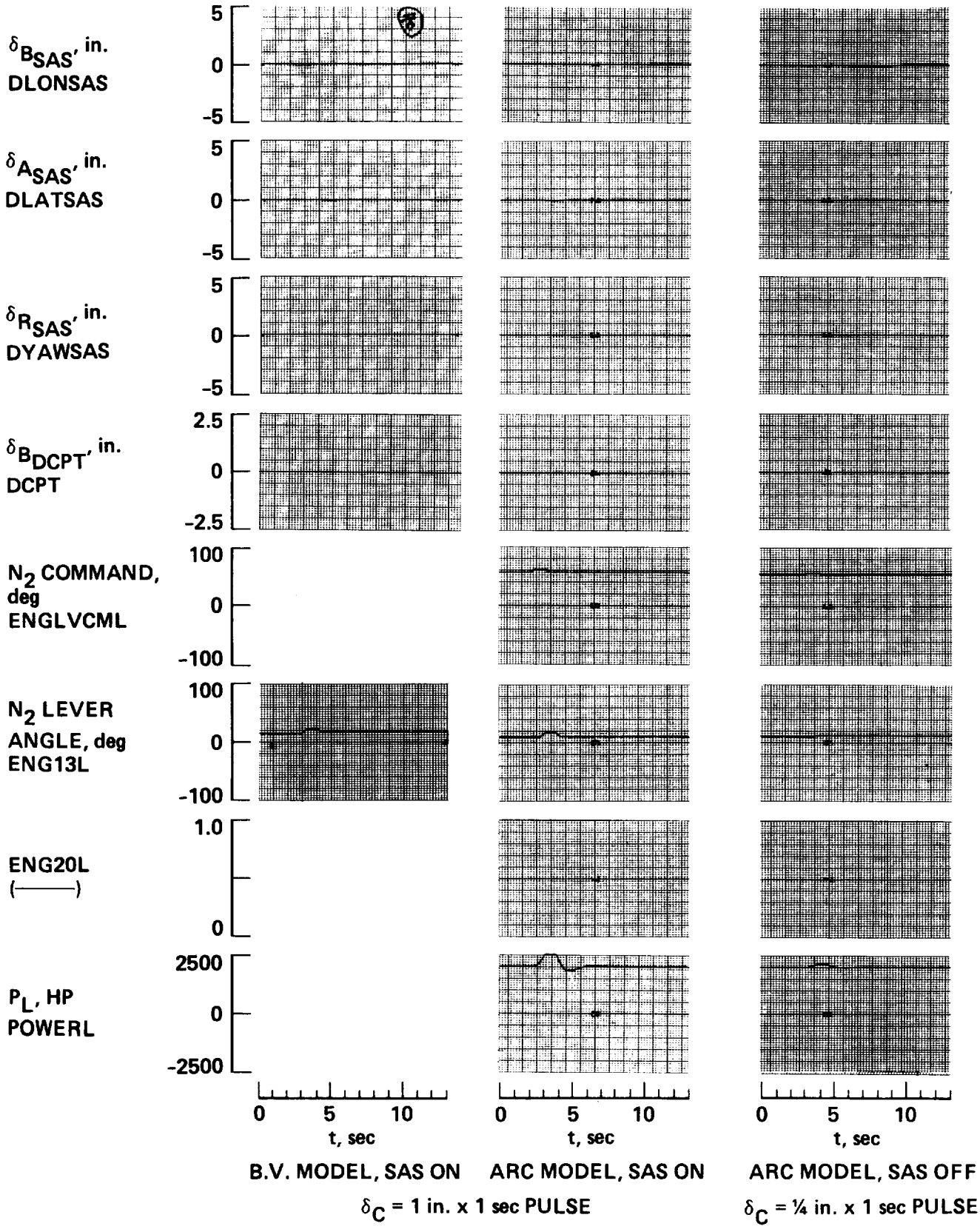

Figure 16.- BV versus ARC simulation response data; hover.

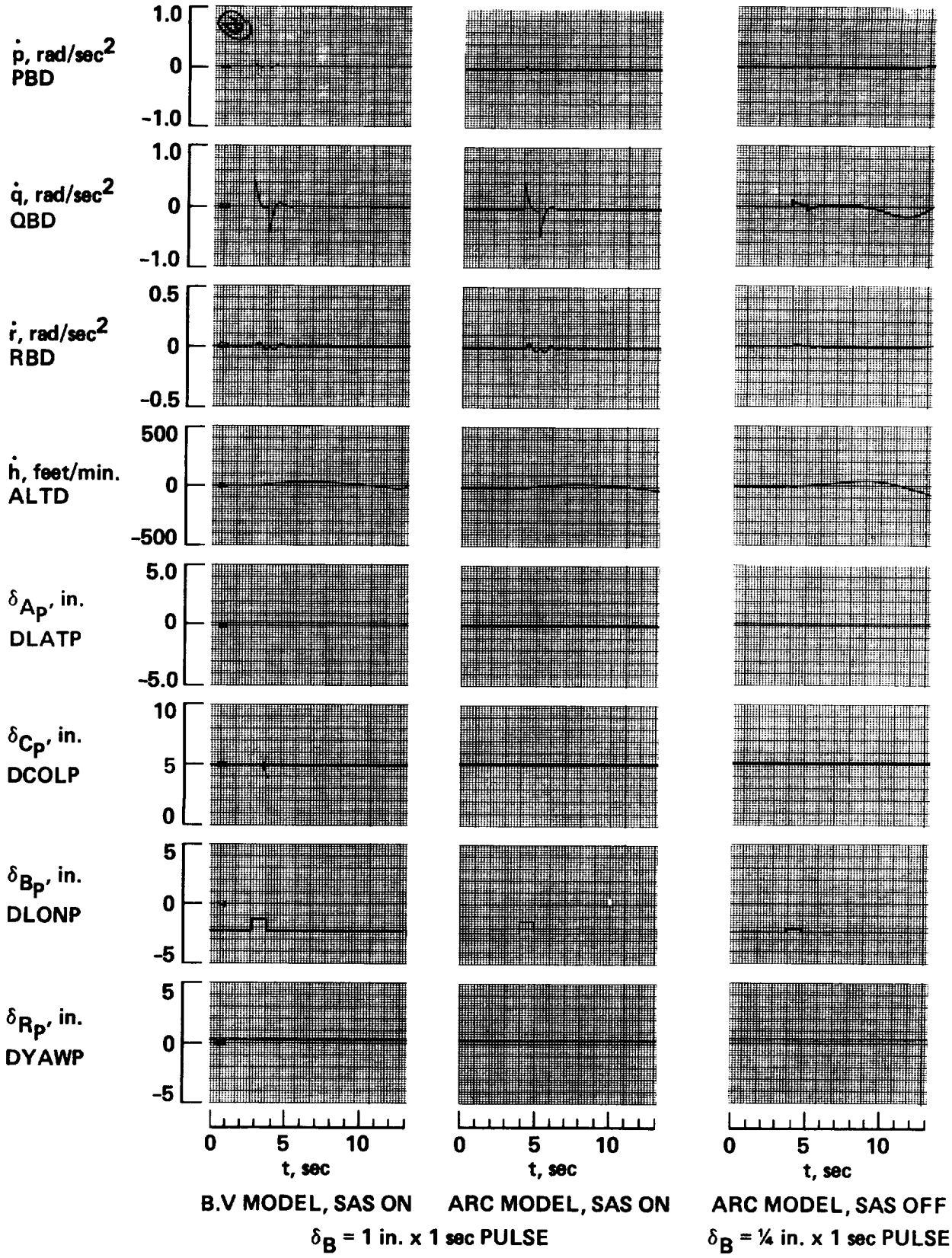

Figure 17.- BV versus ARC simulation response data; V_{eq} = 40 knots.

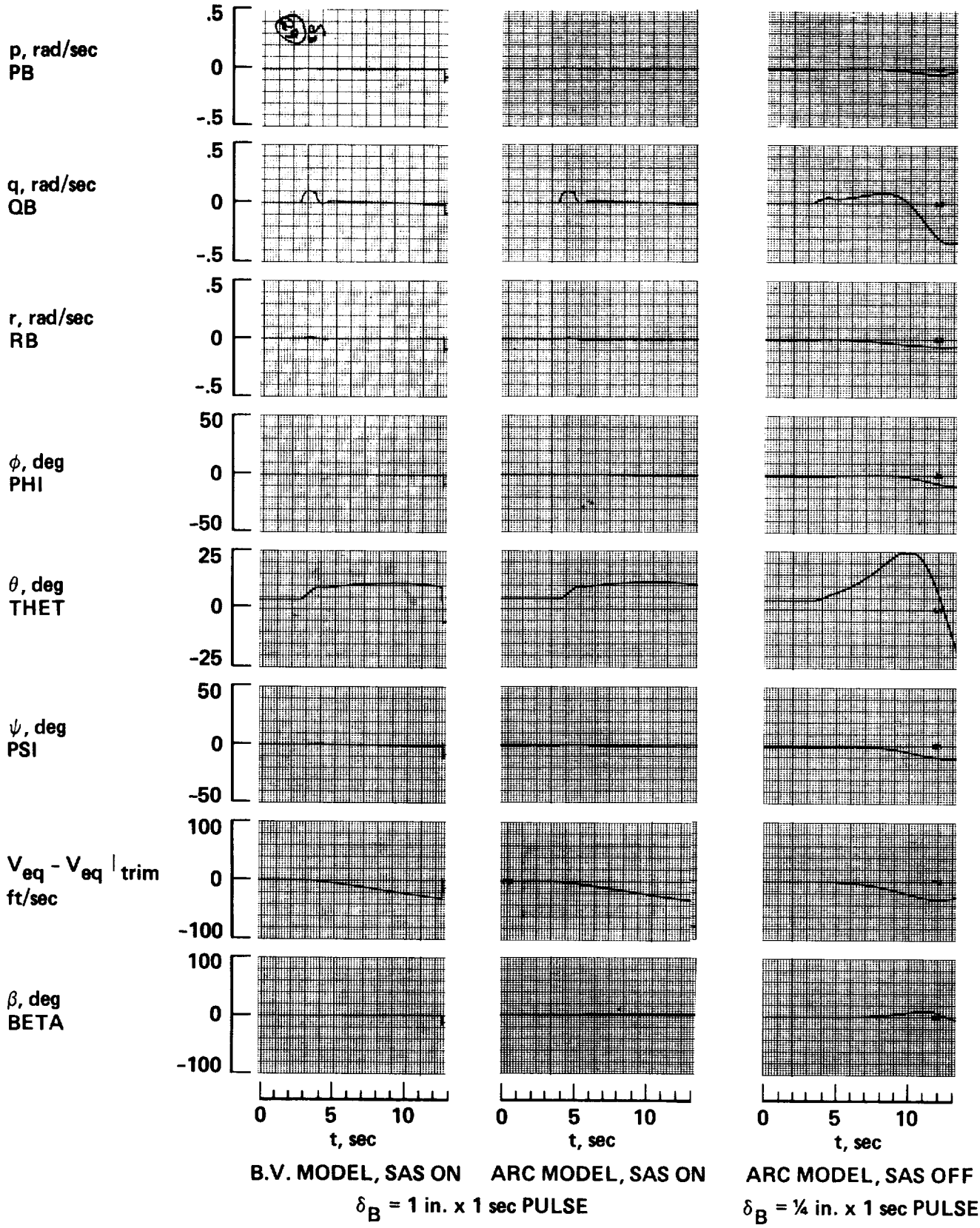

Figure 18.- BV versus ARC simulation response data; V_{eq} = 40 knots.

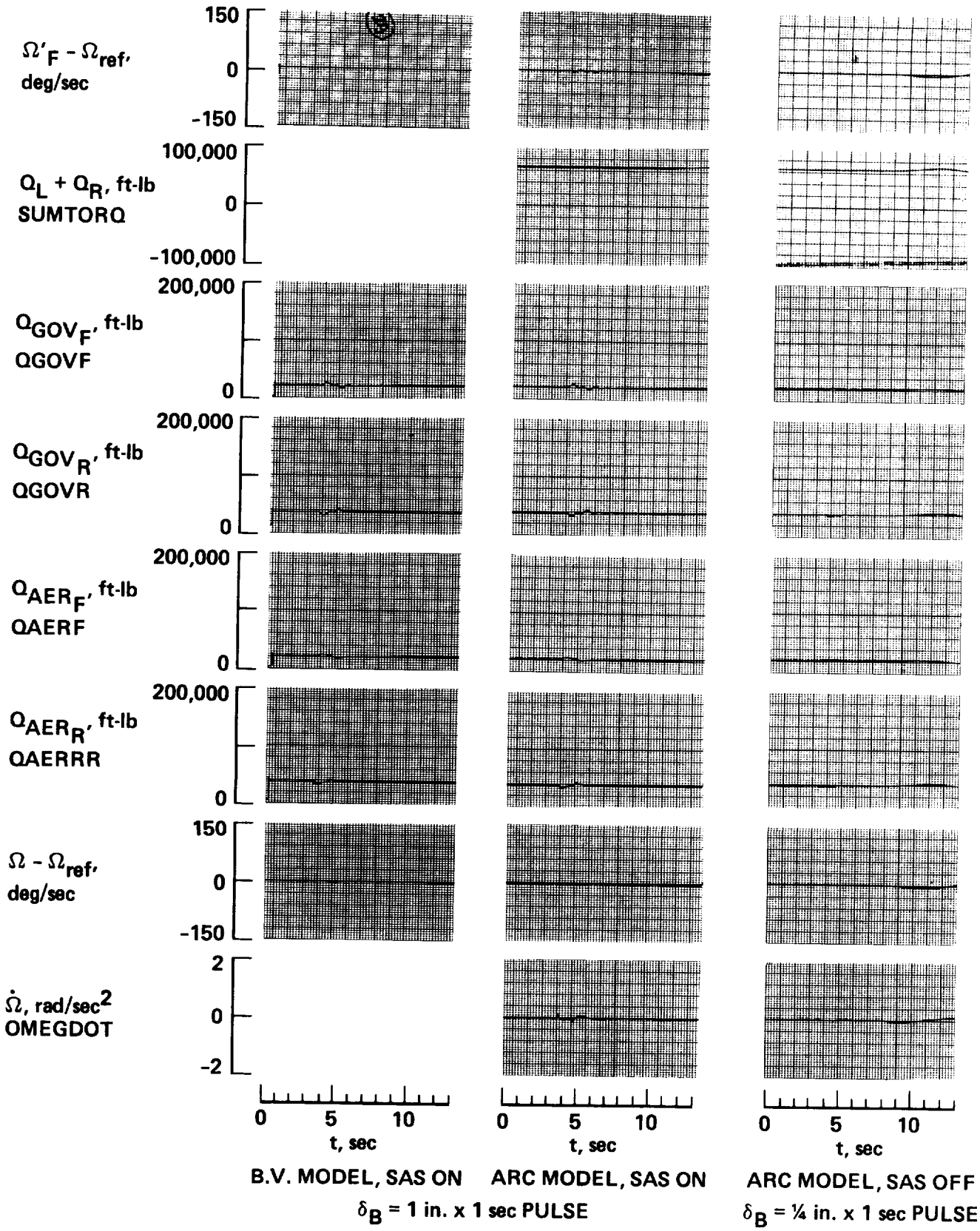

Figure 19.- BV versus ARC simulation response data; V_{eq} = 40 knots.

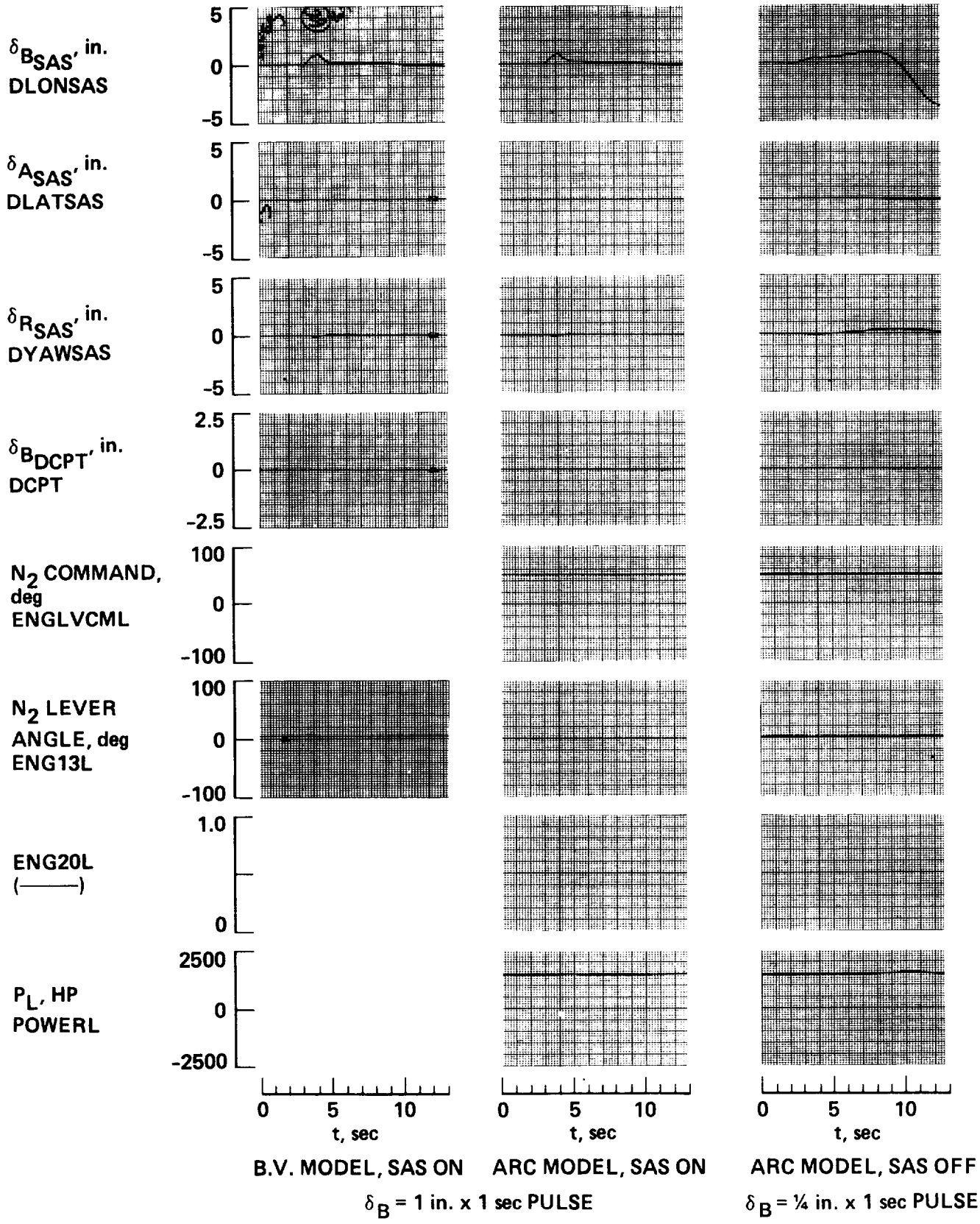

Figure 20.- BV versus ARC simulation response data; V_{eq} = 40 knots.

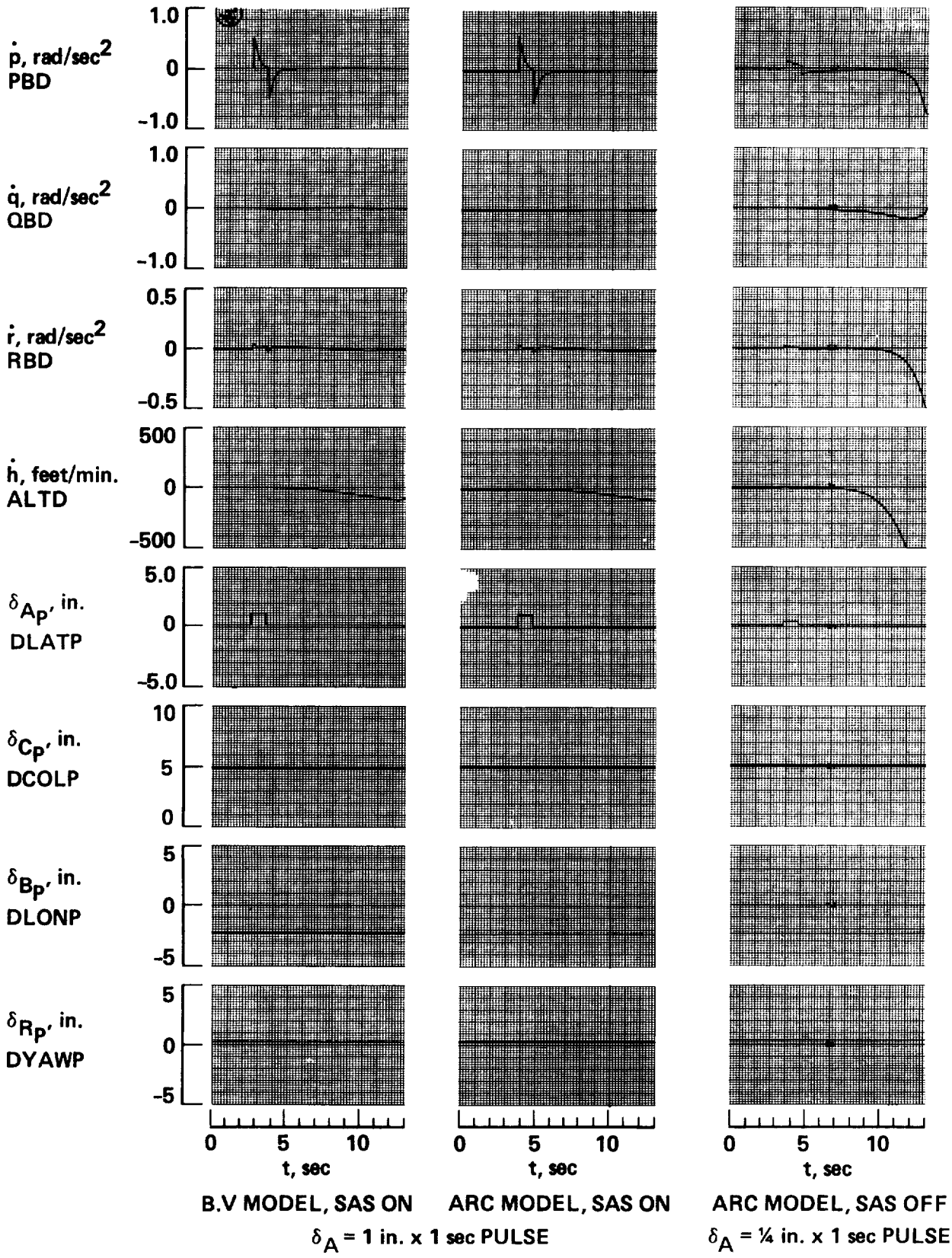

Figure 21.- BV versus ARC simulation response data; V_{eq} = 40 knots.

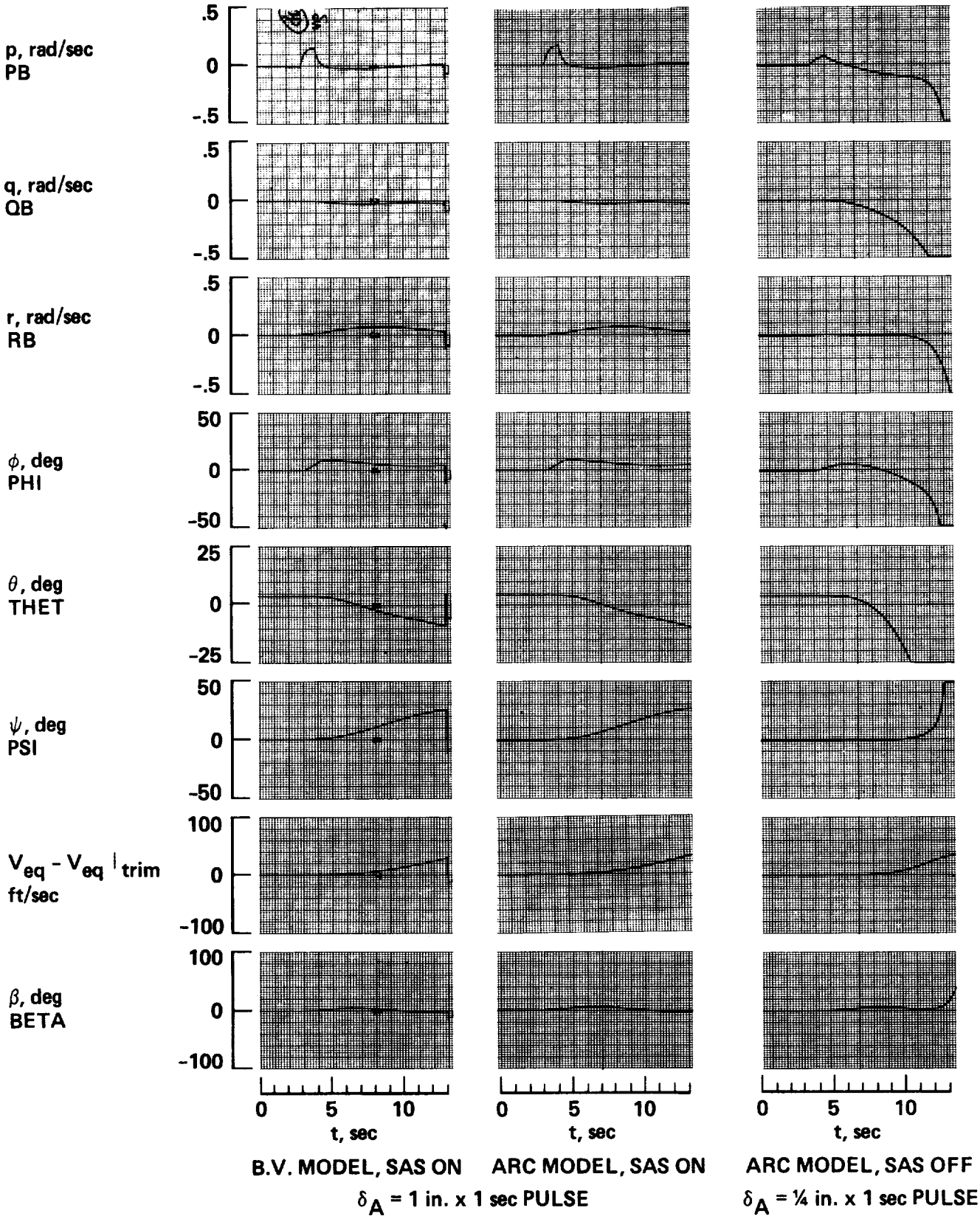

Figure 22.- BV versus ARC simulation response data; V_{eq} = 40 knots.

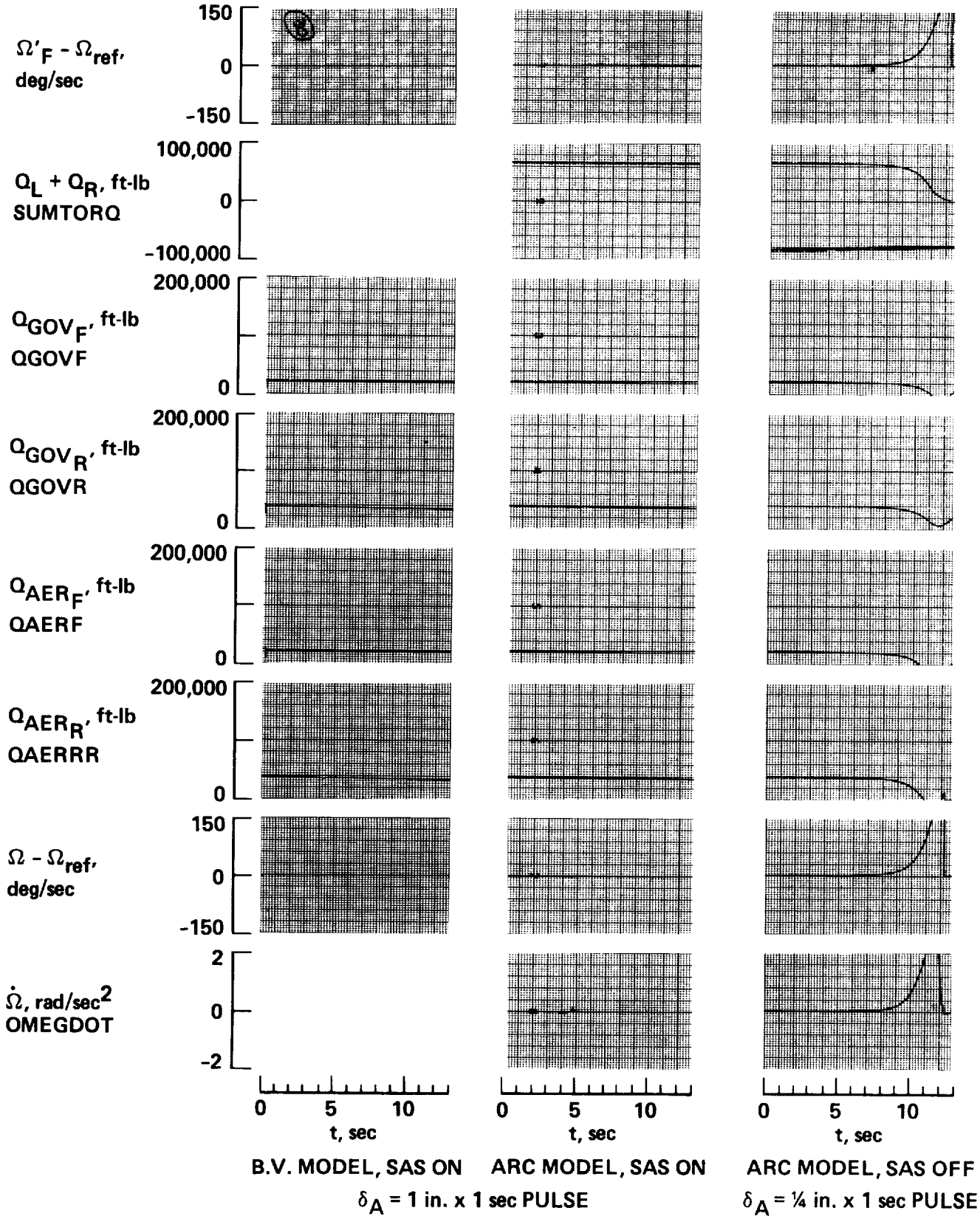

Figure 23.- BV versus ARC simulation response data; V_{eq} = 40 knots.

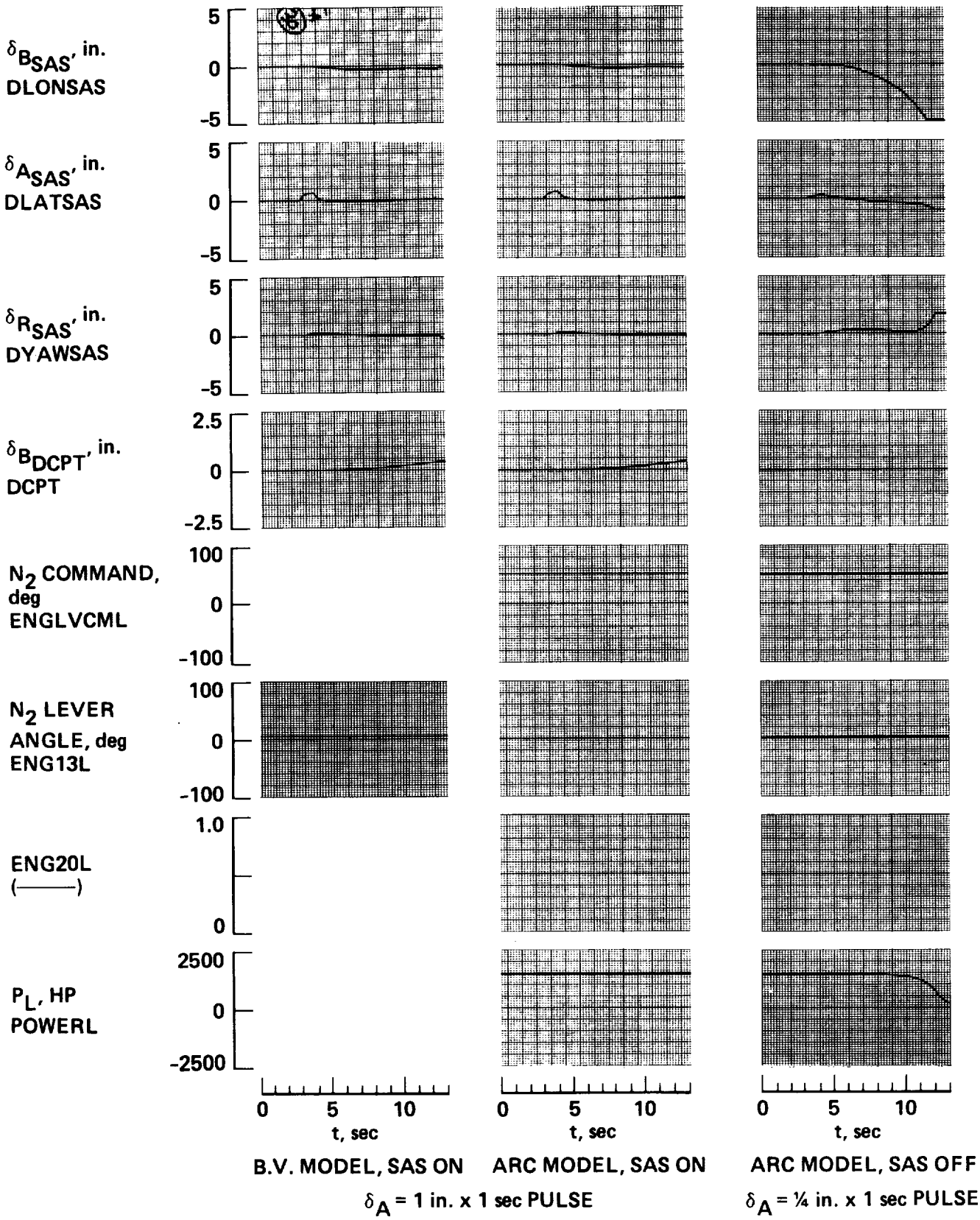

Figure 24.- BV versus ARC simulation response data; V_{eq} = 40 knots.

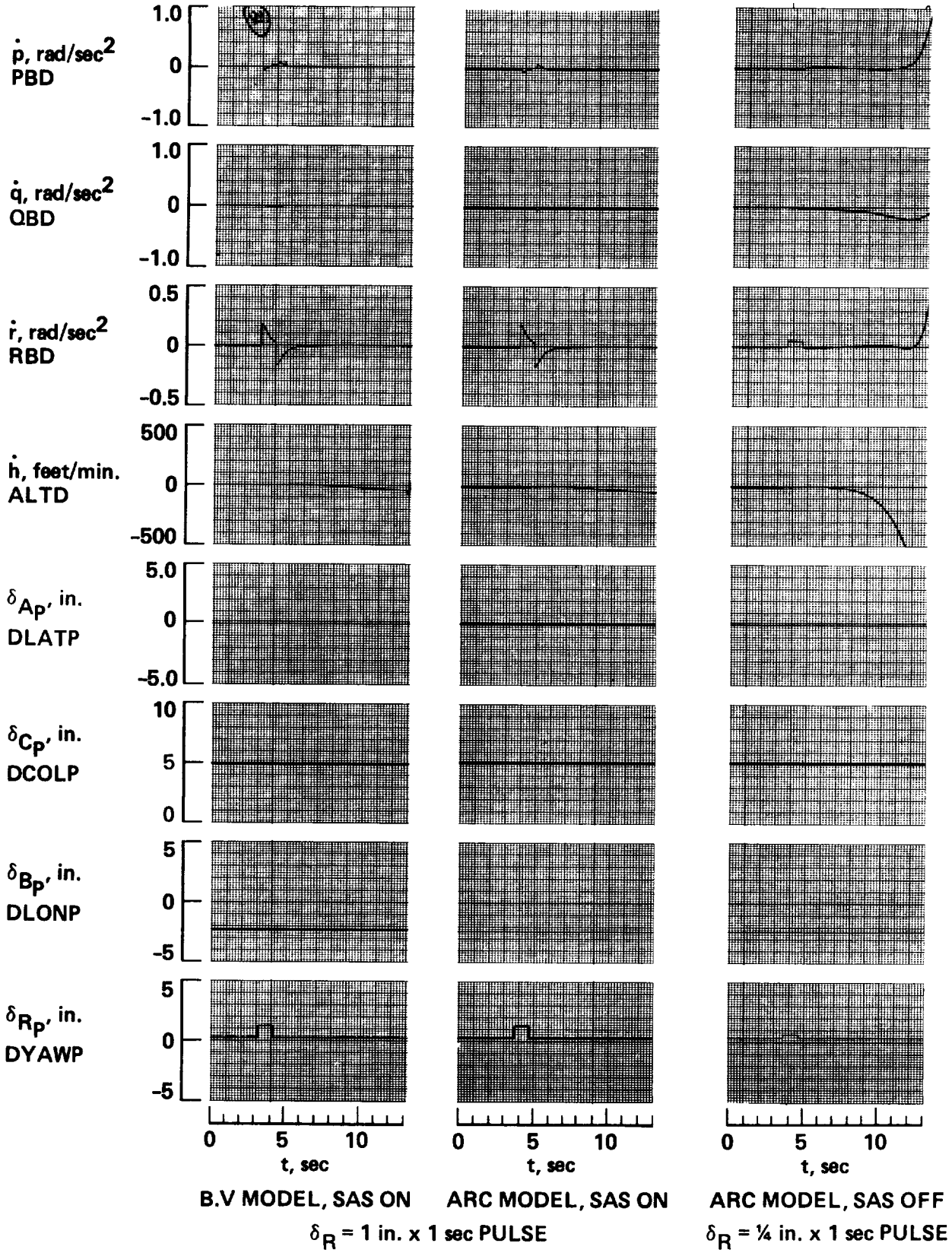

Figure 25.- BV versus ARC simulation response data; V_{eq} = 40 knots.

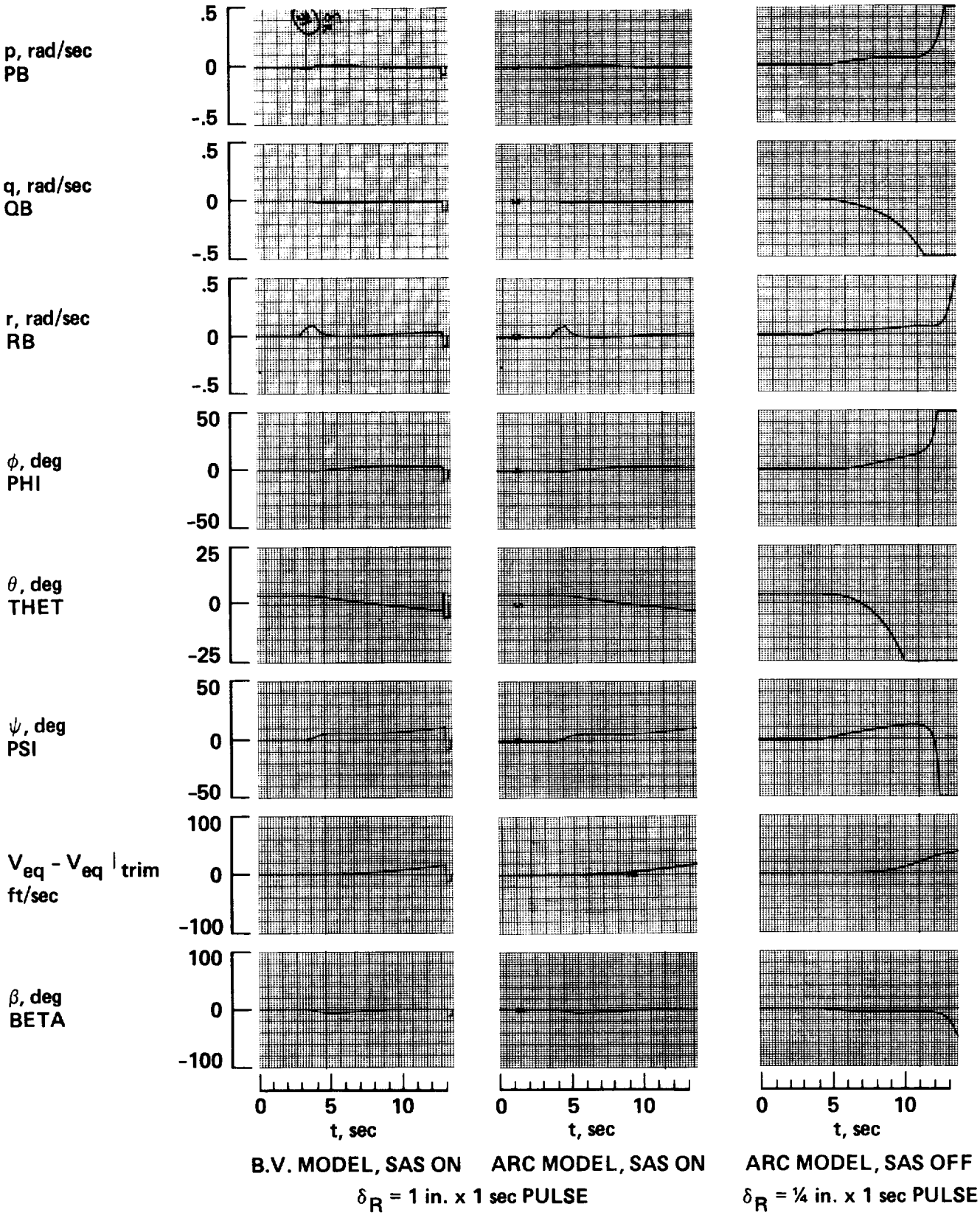

Figure 26.- BV versus ARC simulation response data; V_{eq} = 40 knots.

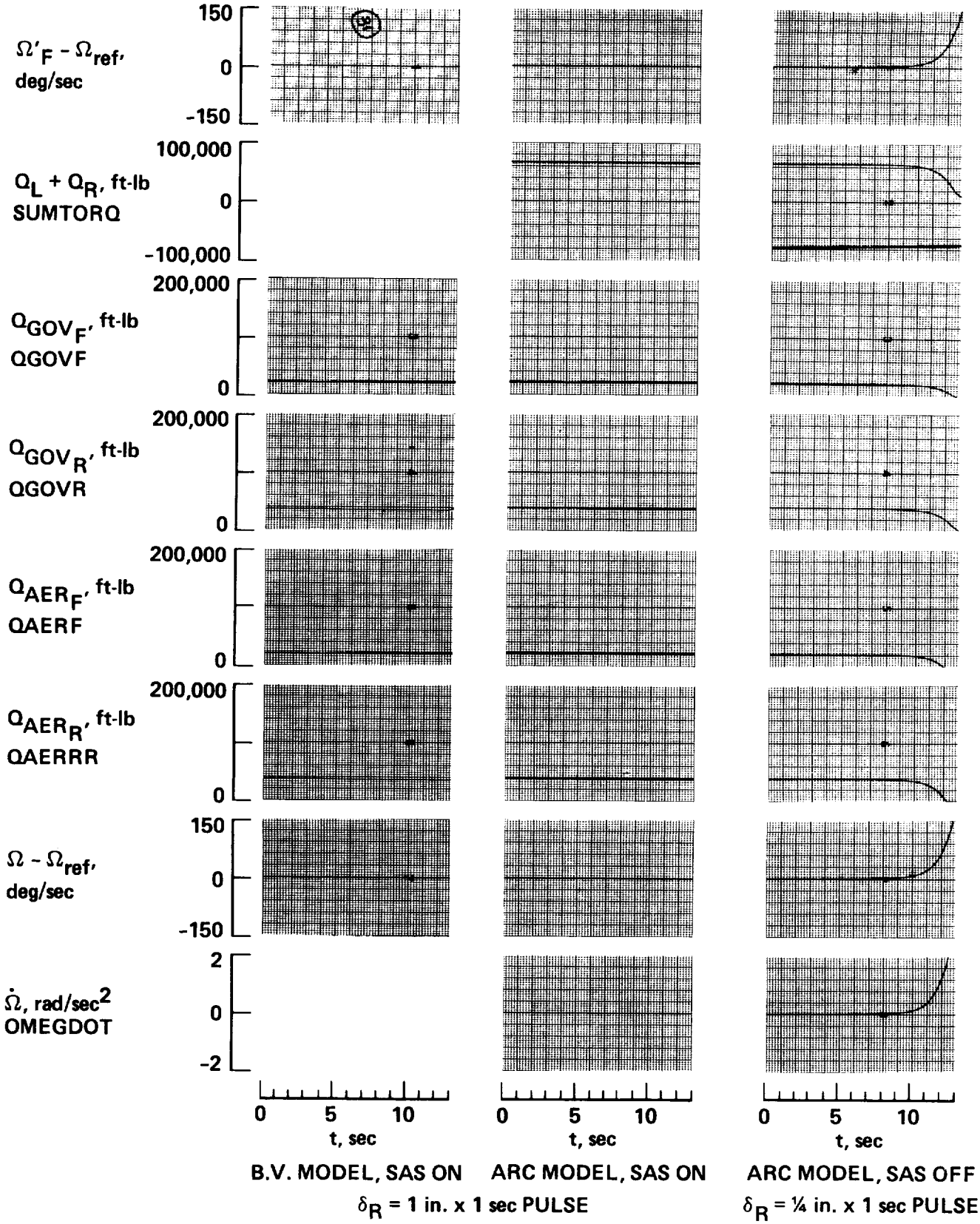

Figure 27.- BV versus ARC simulation response data; V_{eq} = 40 knots.

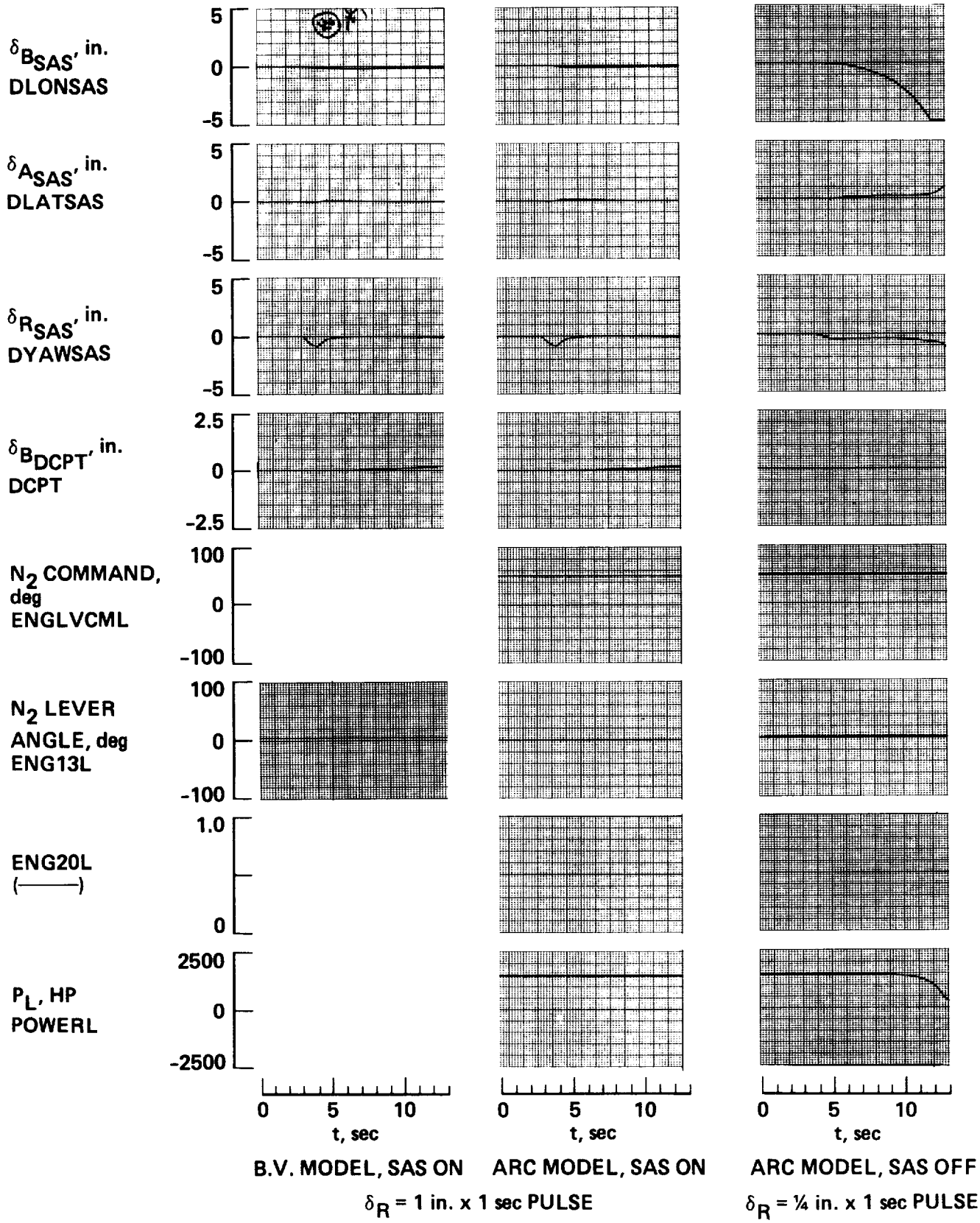

Figure 28.- BV versus ARC simulation response data; V_{eq} = 40 knots.

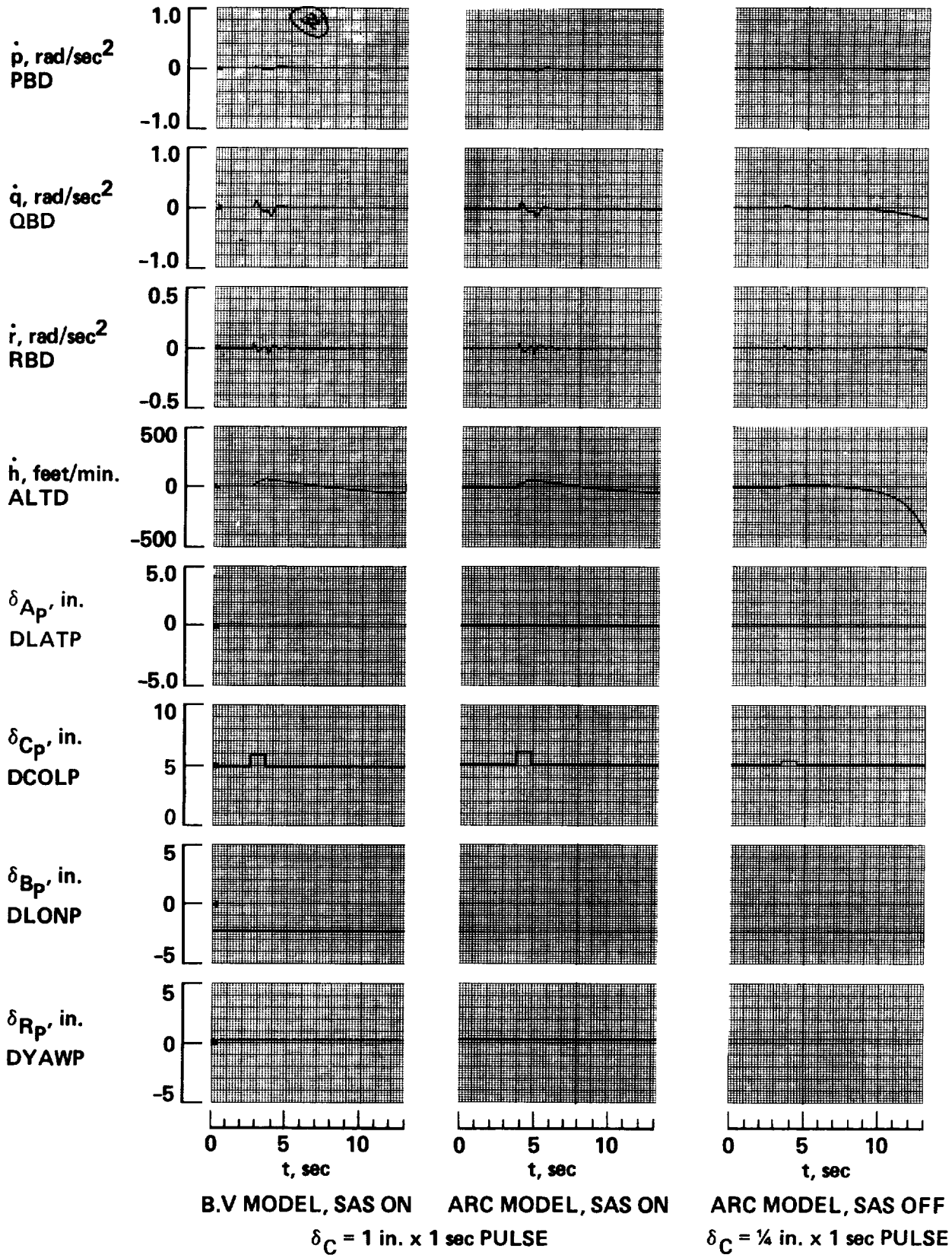

Figure 29.- BV versus ARC simulation response data; V_{eq} = 40 knots.

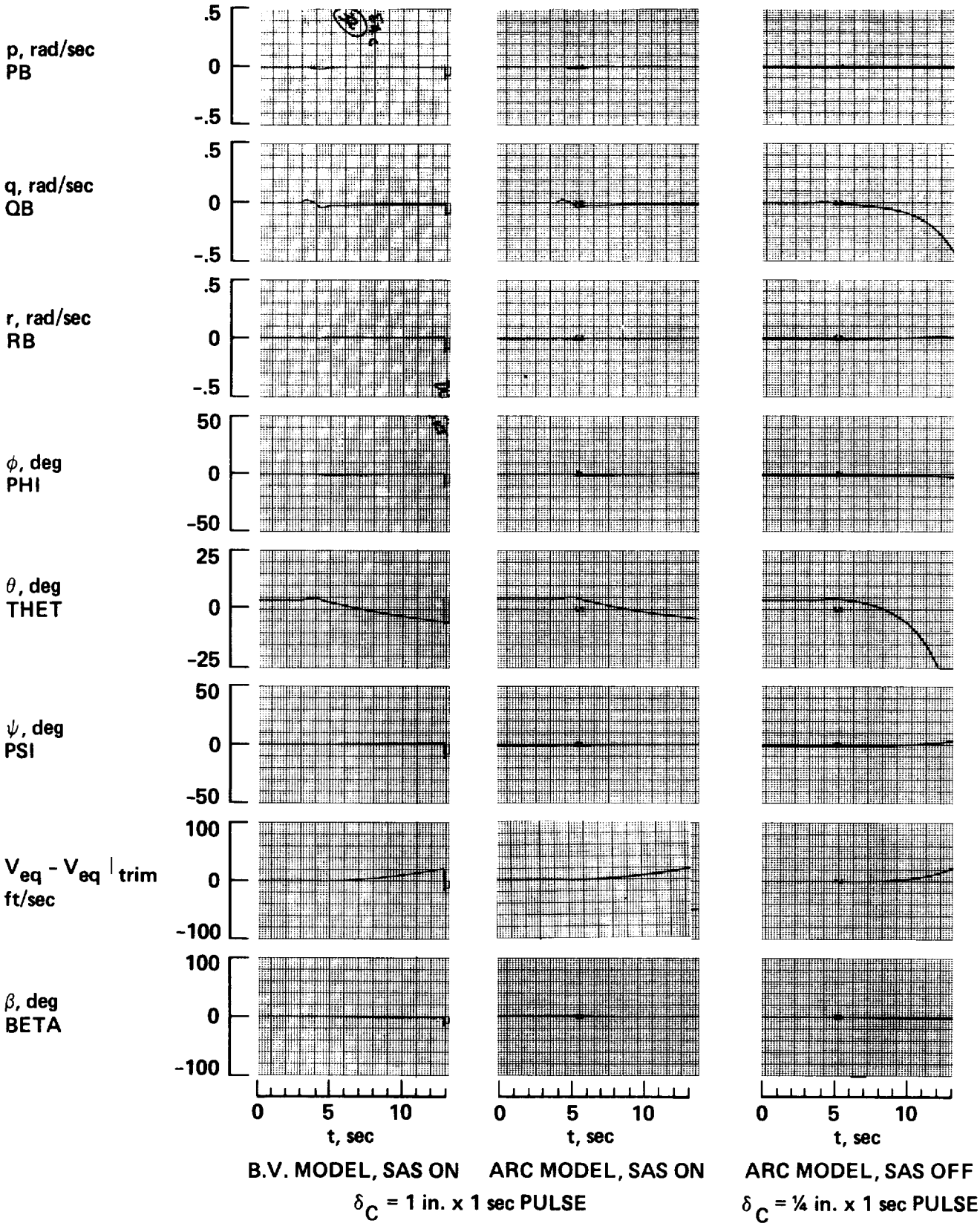

Figure 30.- BV versus ARC simulation response data; V_{eq} = 40 knots.

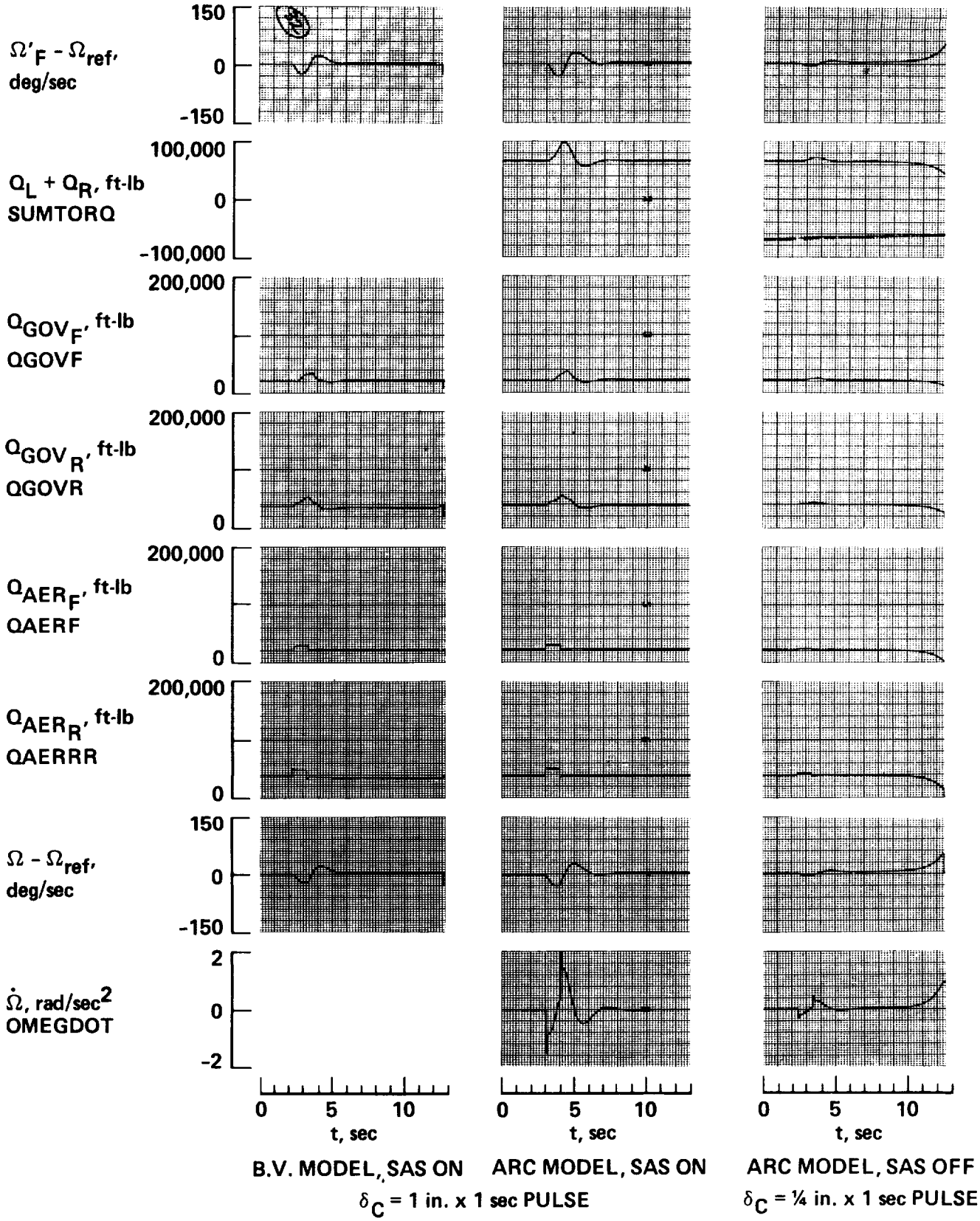

Figure 31.- BV versus ARC simulation response data; V_{eq} = 40 knots.

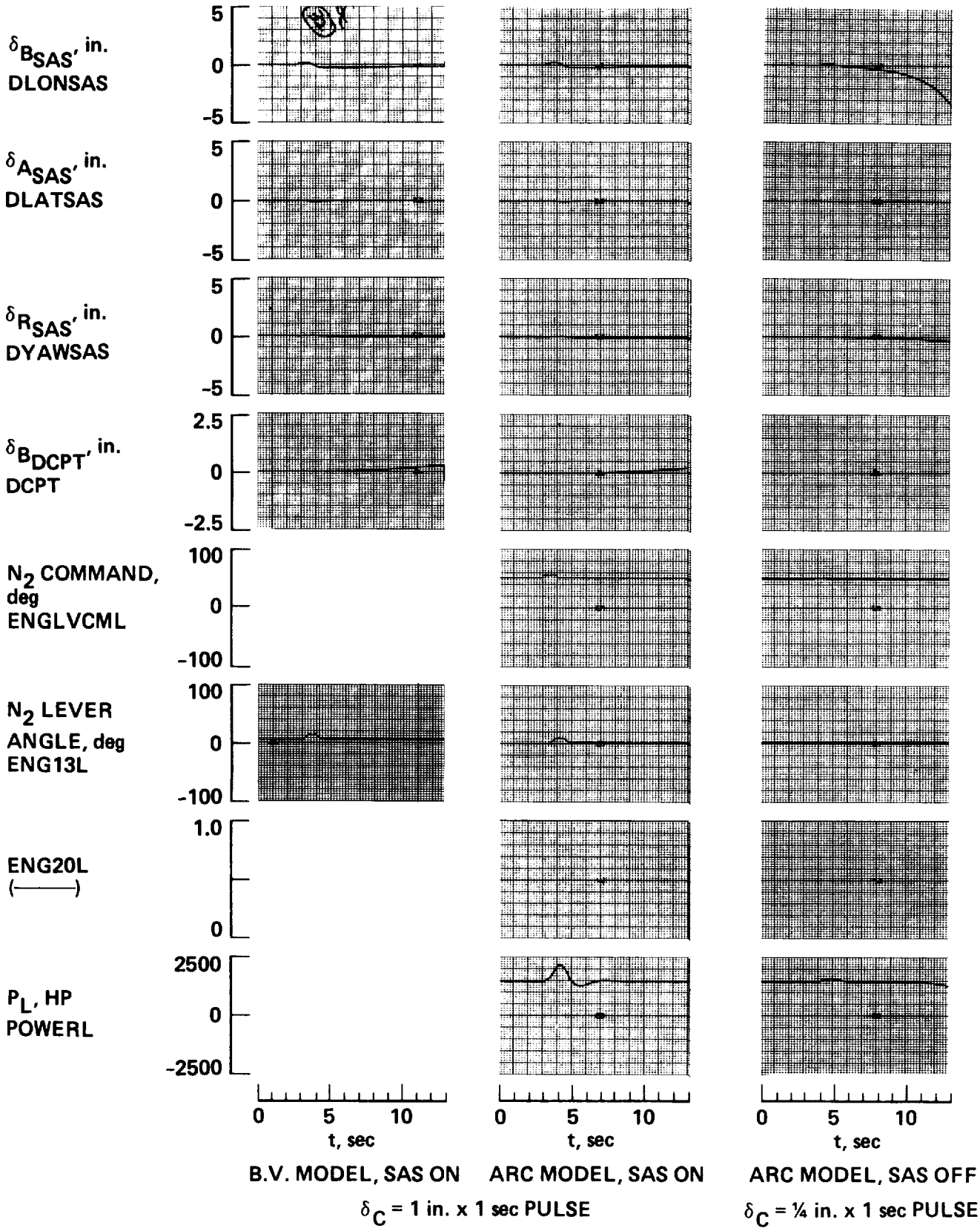

Figure 32.- BV versus ARC simulation response data; V_{eq} = 40 knots.

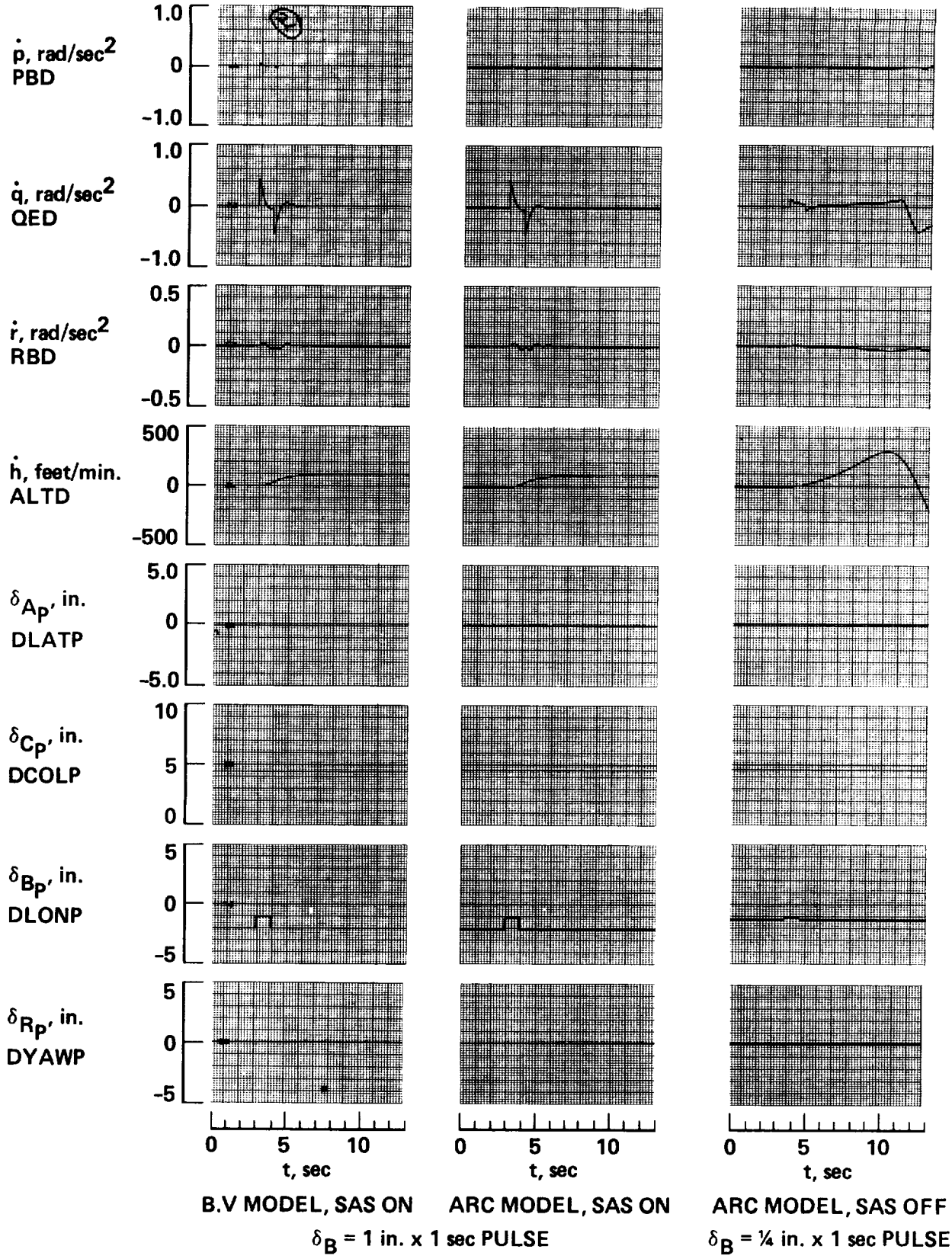

Figure 33.- BV versus ARC simulation response data; V_{eq} = 75 knots.

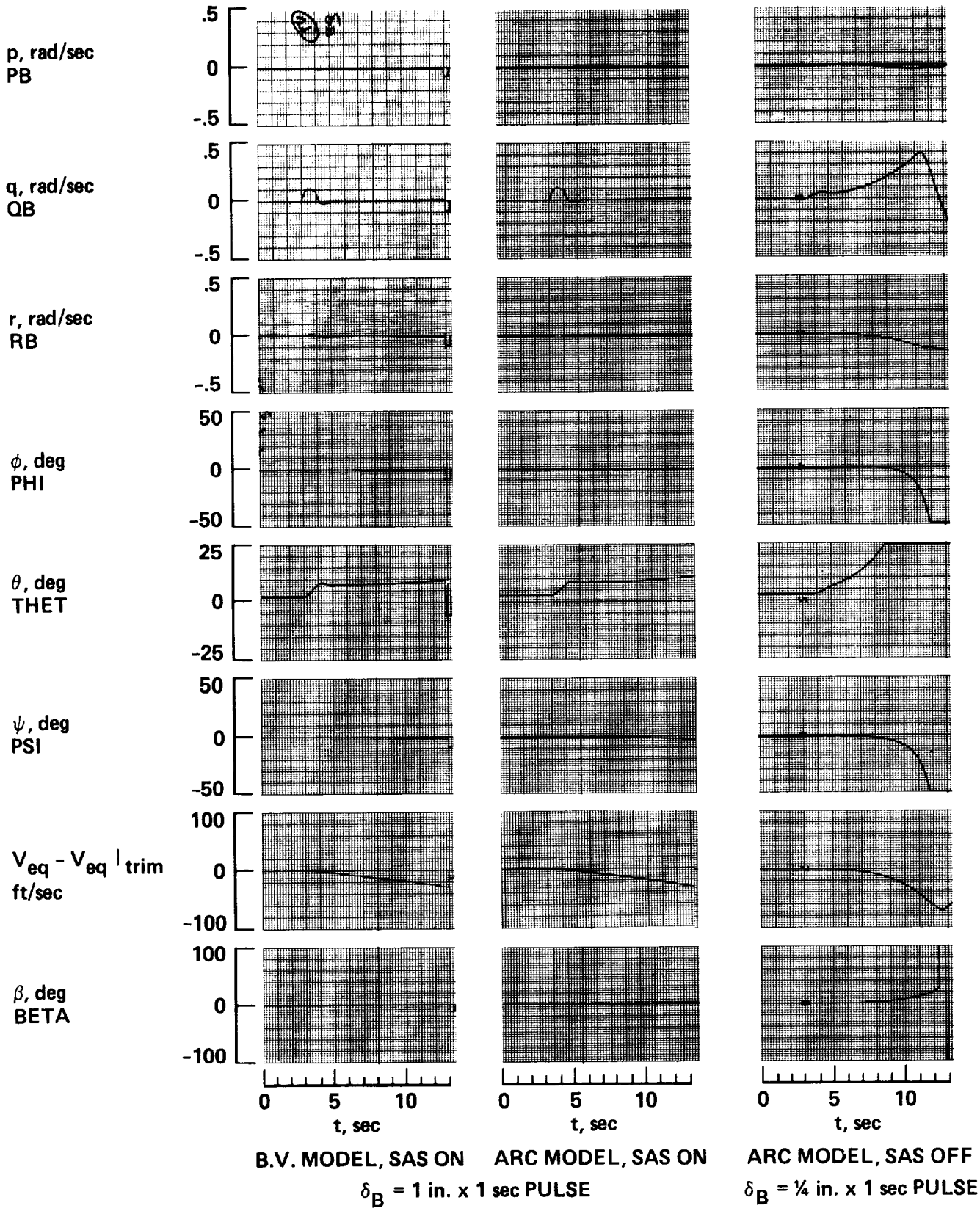

Figure 34.- BV versus ARC simulation response data; V_{eq} = 75 knots.

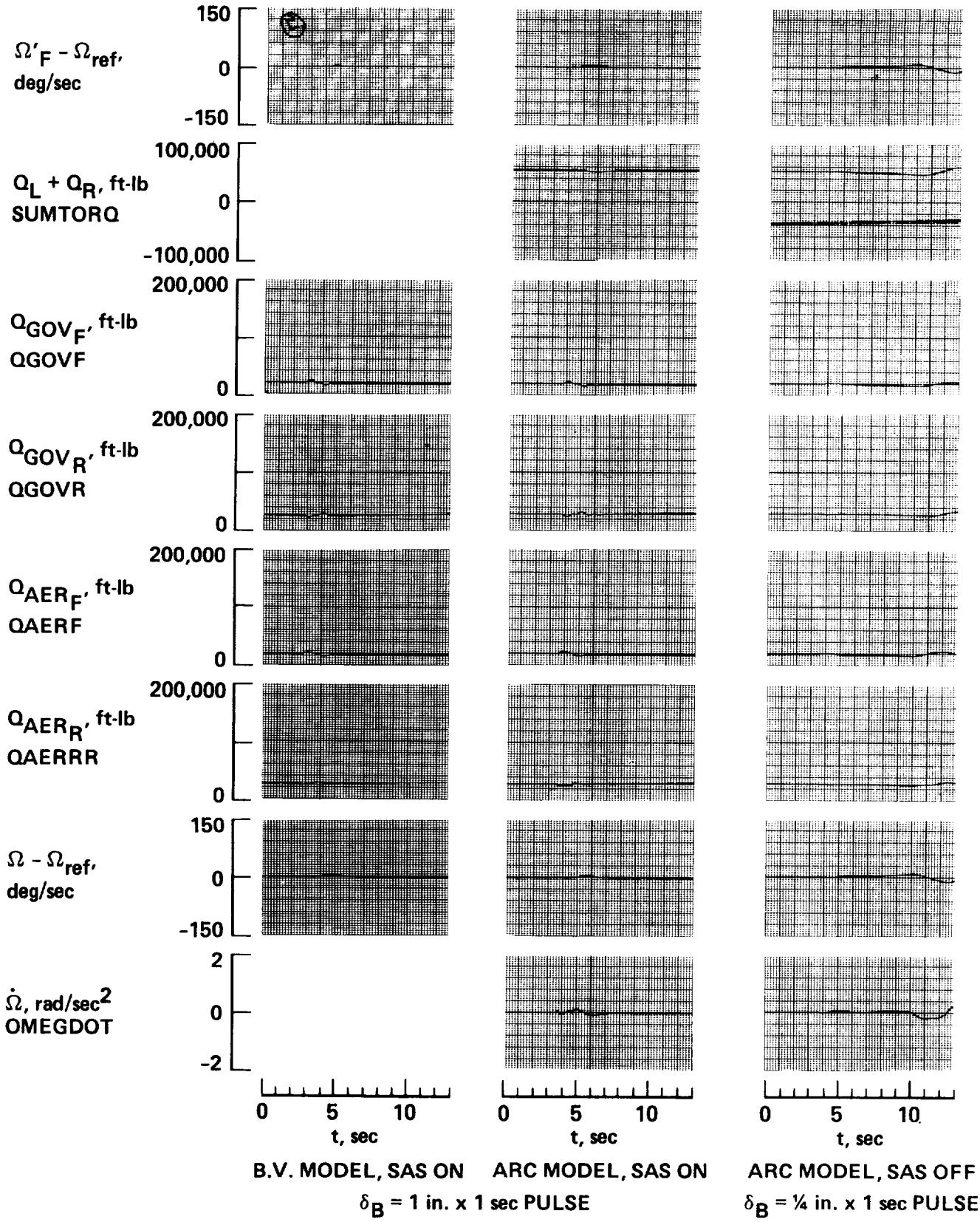

Figure 35.- BV versus ARC simulation response data; V_{eq} = 75 knots.

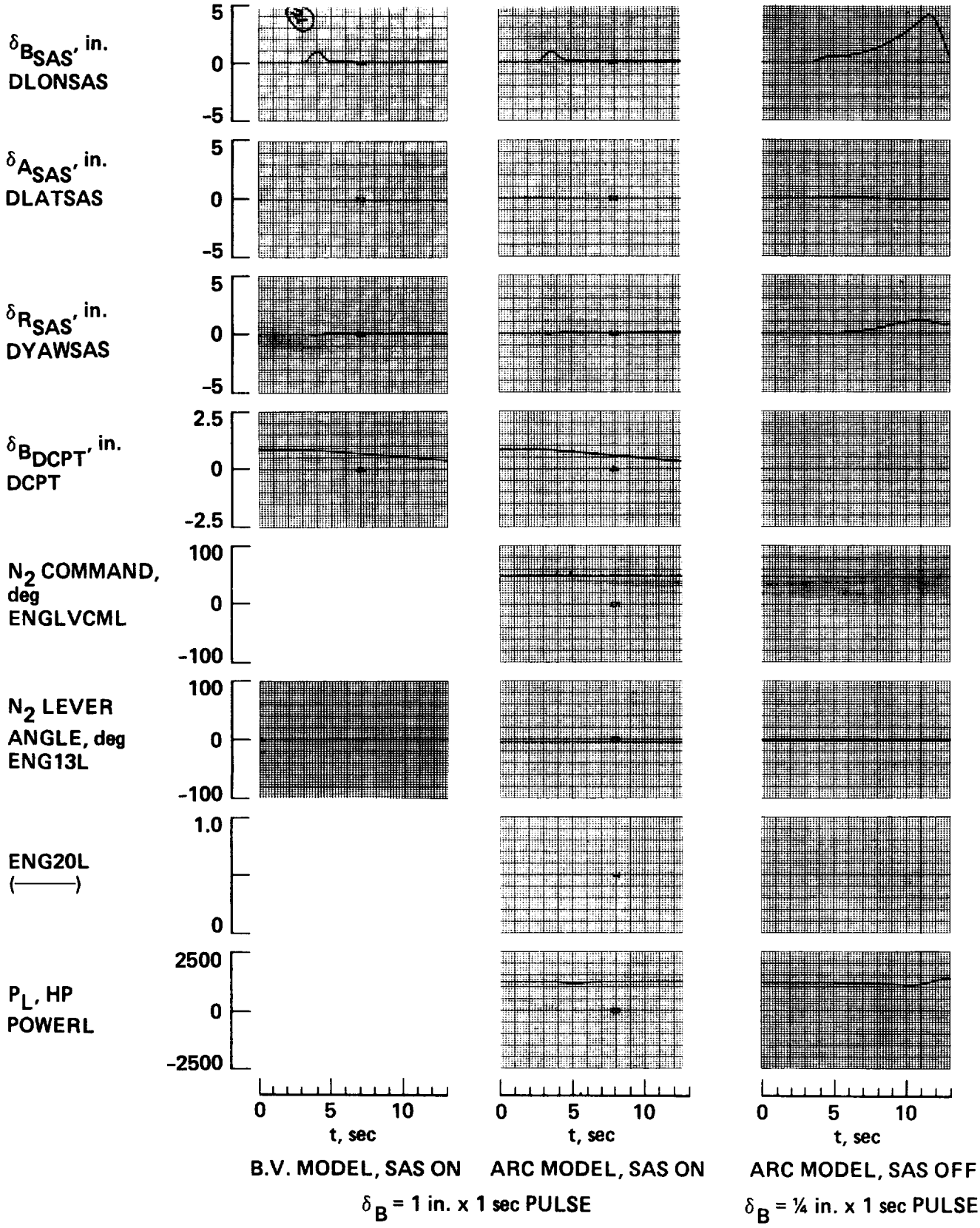

Figure 36.- BV versus ARC simulation response data; V_{eq} = 75 knots.

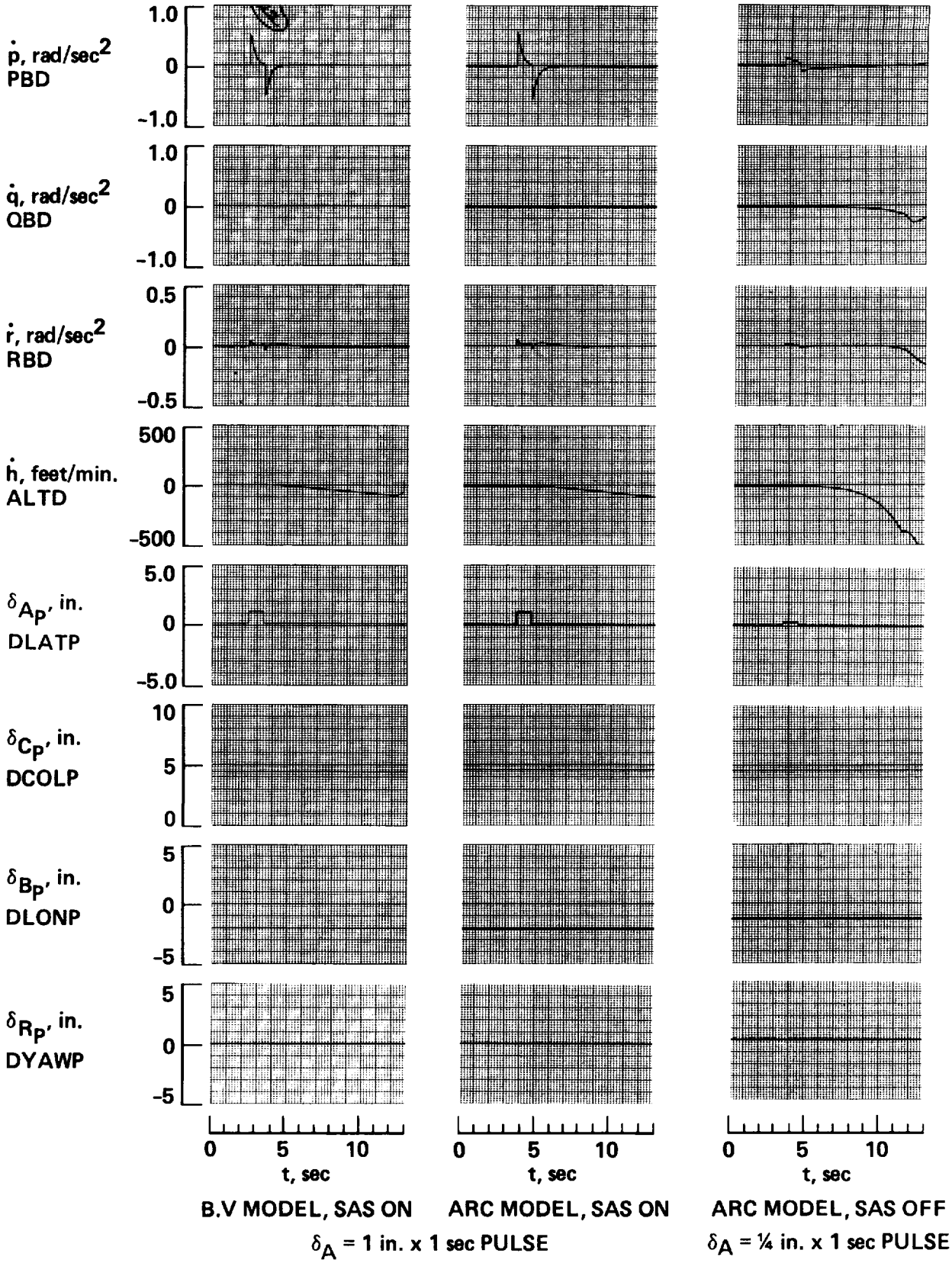

Figure 37.- BV versus ARC simulation response data; V_{eq} = 75 knots.

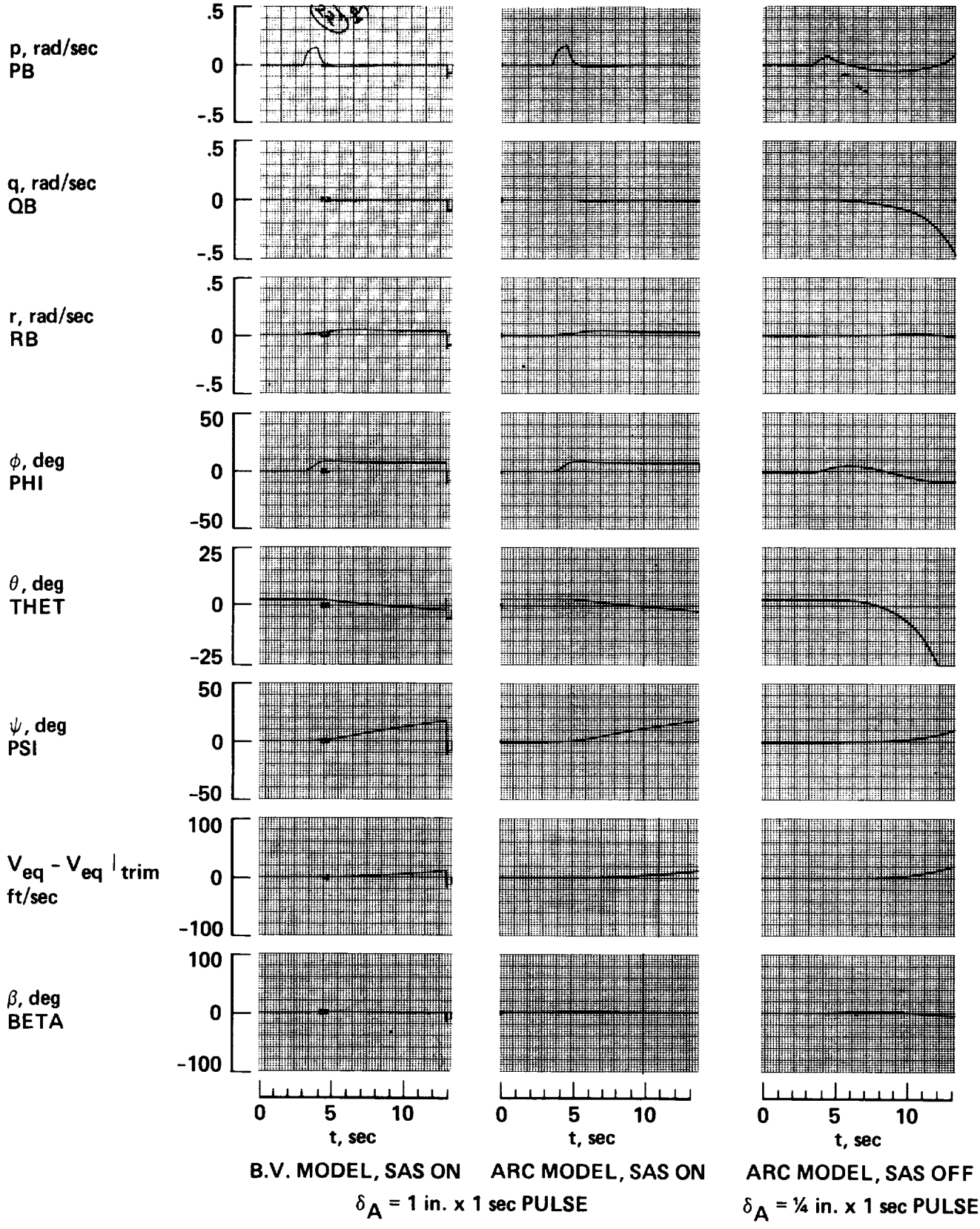

Figure 38.- BV versus ARC simulation response data; V_{eq} = 75 knots.

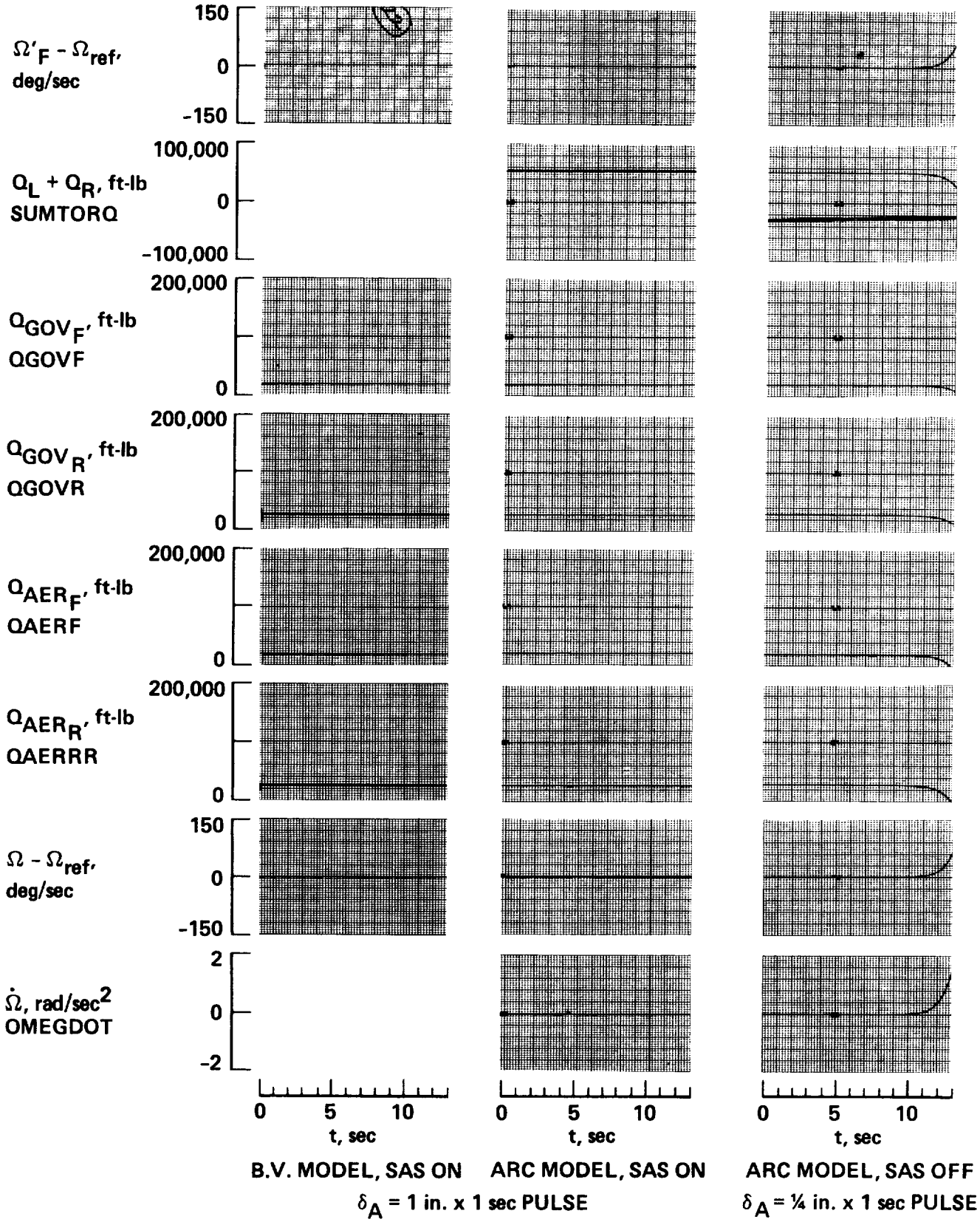

Figure 39.- BV versus ARC simulation response data; V_{eq} = 75 knots.

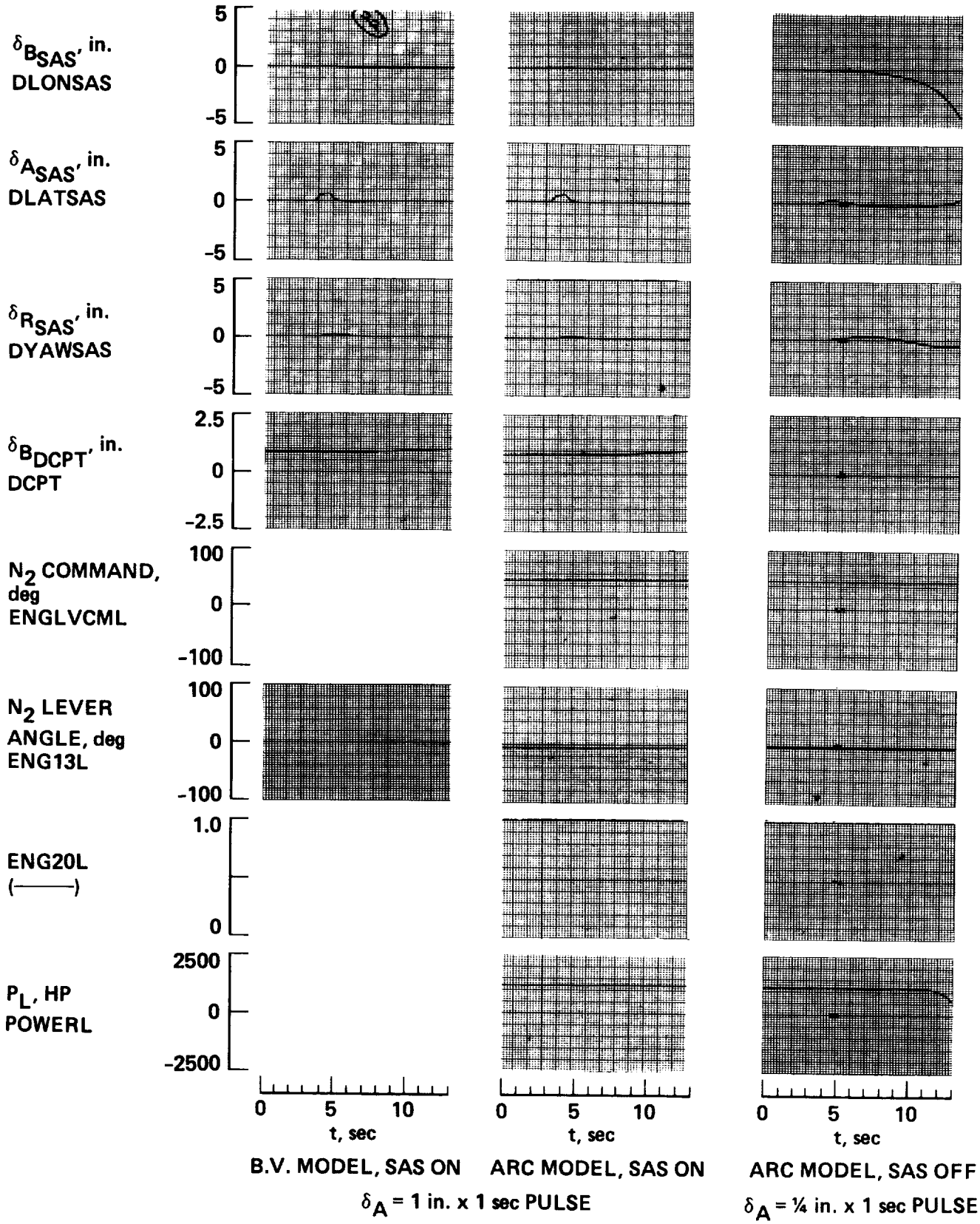

Figure 40.- BV versus ARC simulation response data; V_{eq} = 75 knots.

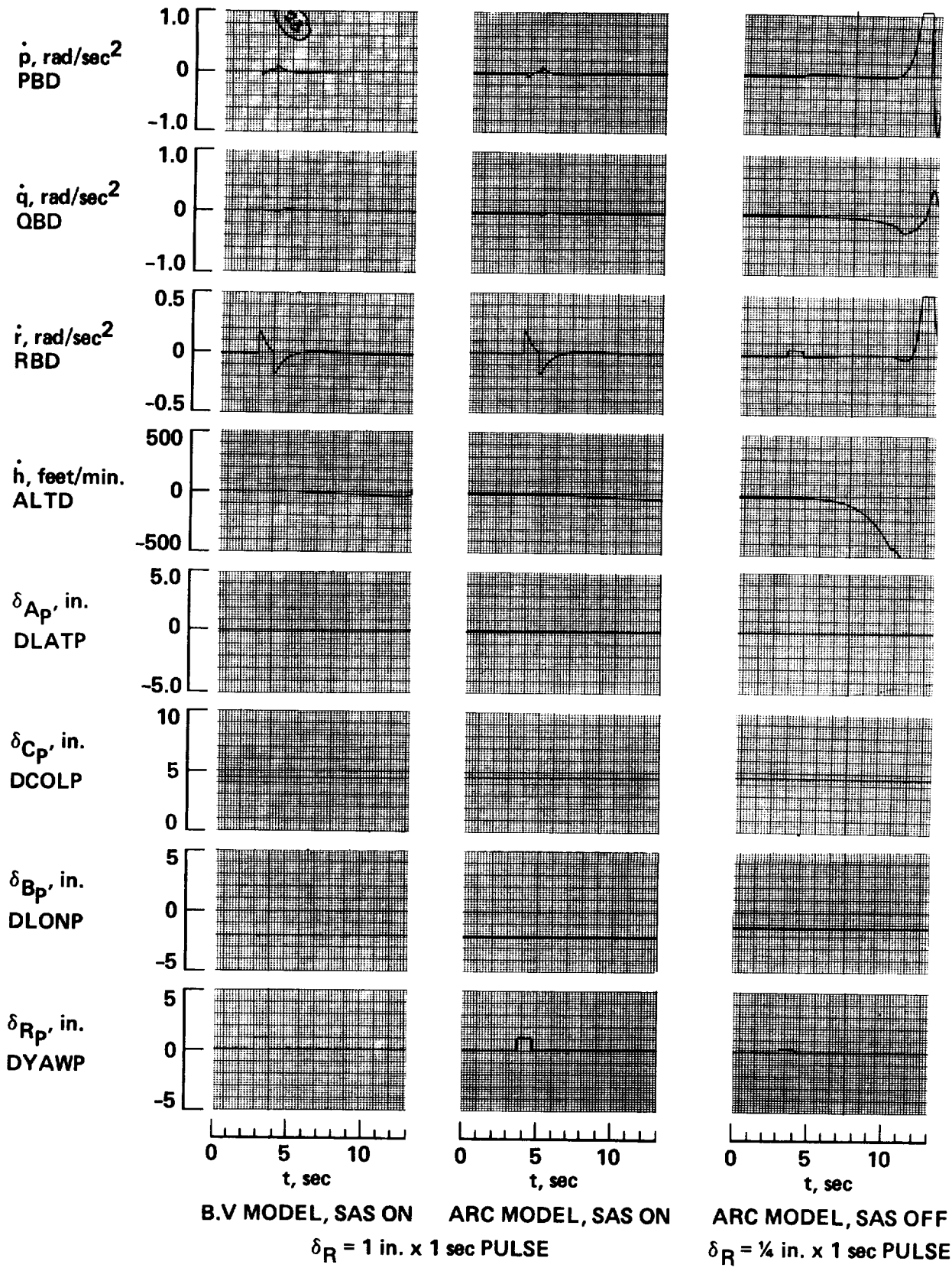

Figure 41.- BV versus ARC simulation response data; V_{eq} = 75 knots.

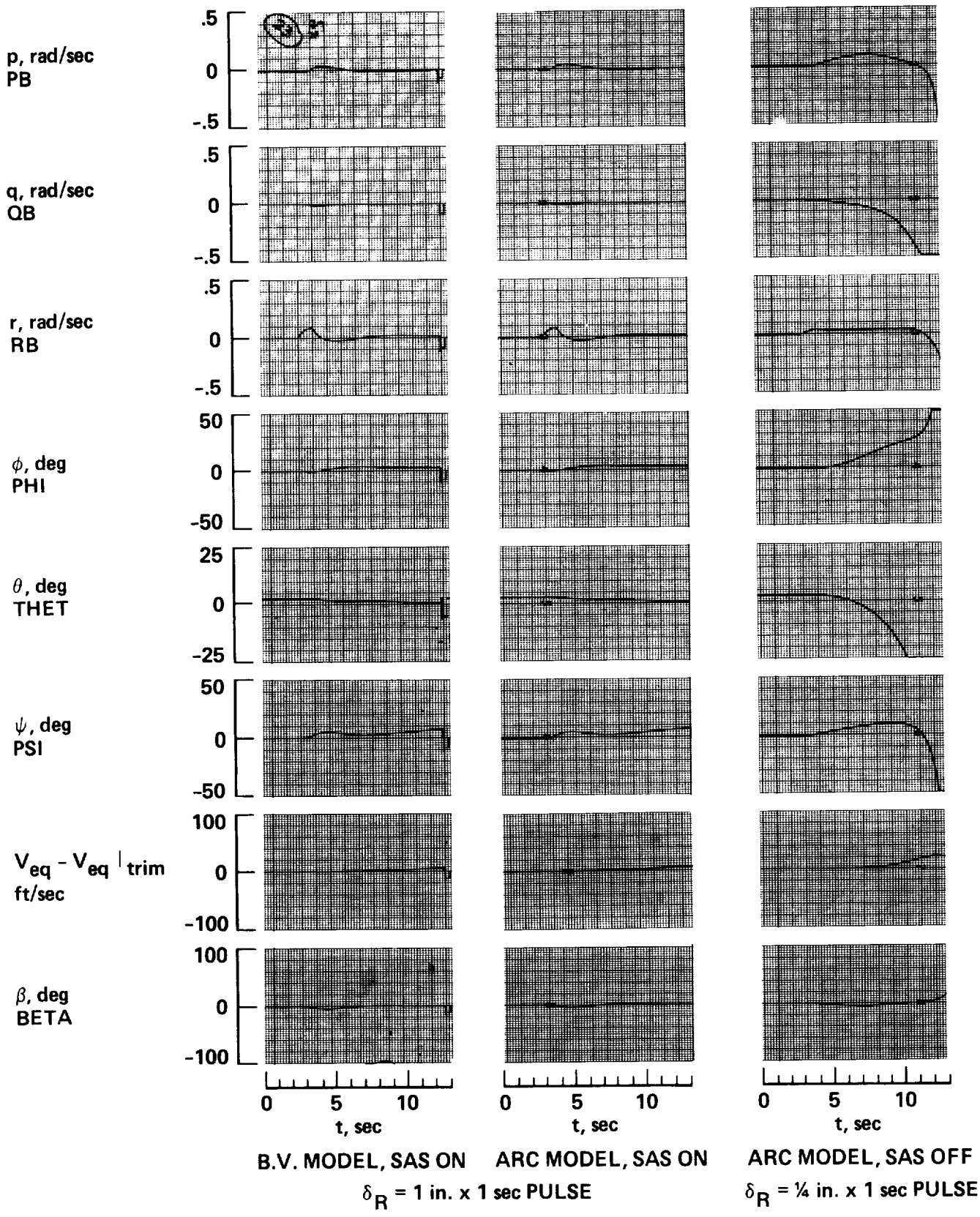

Figure 42.- BV versus ARC simulation response data; V_{eq} = 75 knots.

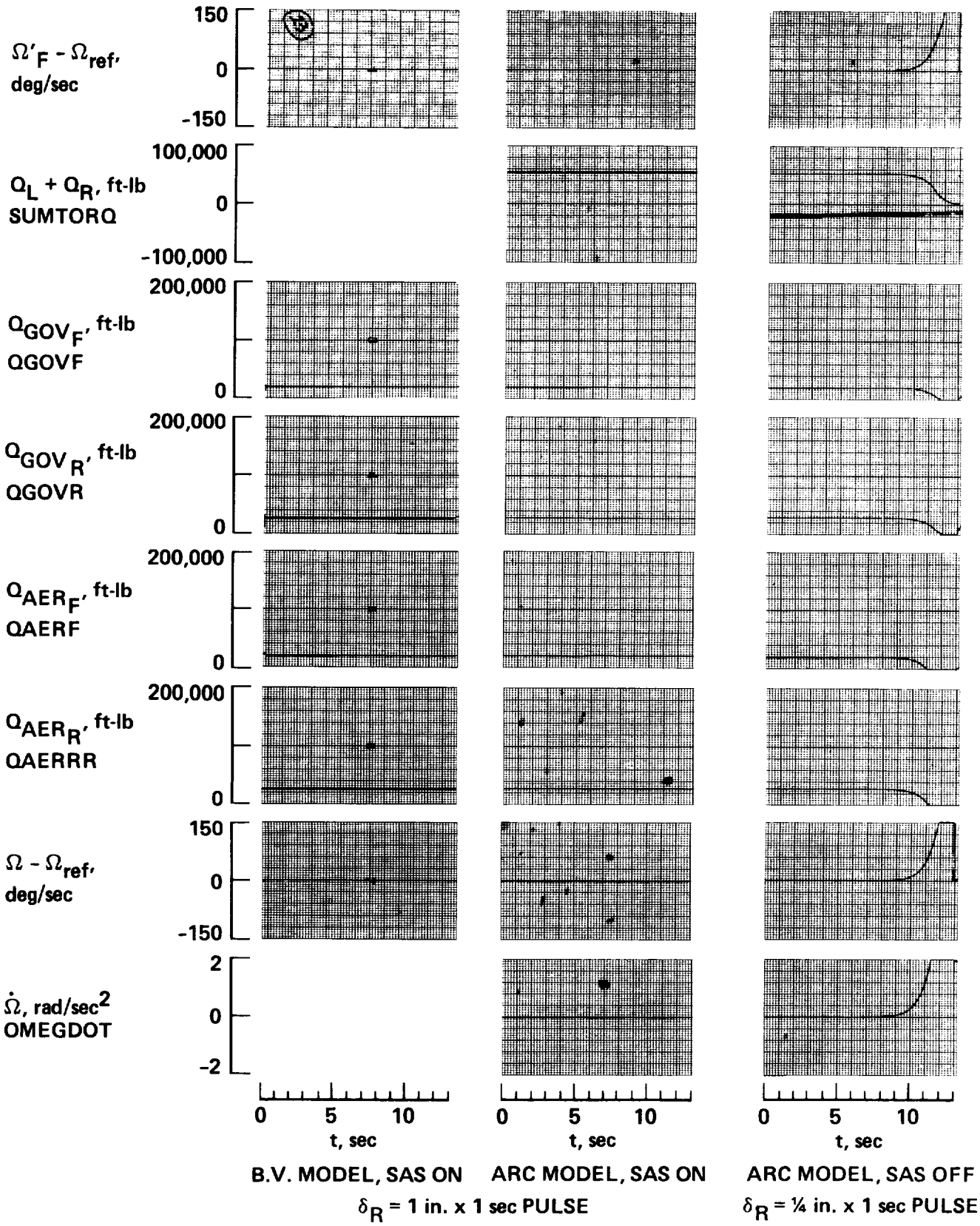

Figure 43.- BV versus ARC simulation response data; V_{eq} = 75 knots.

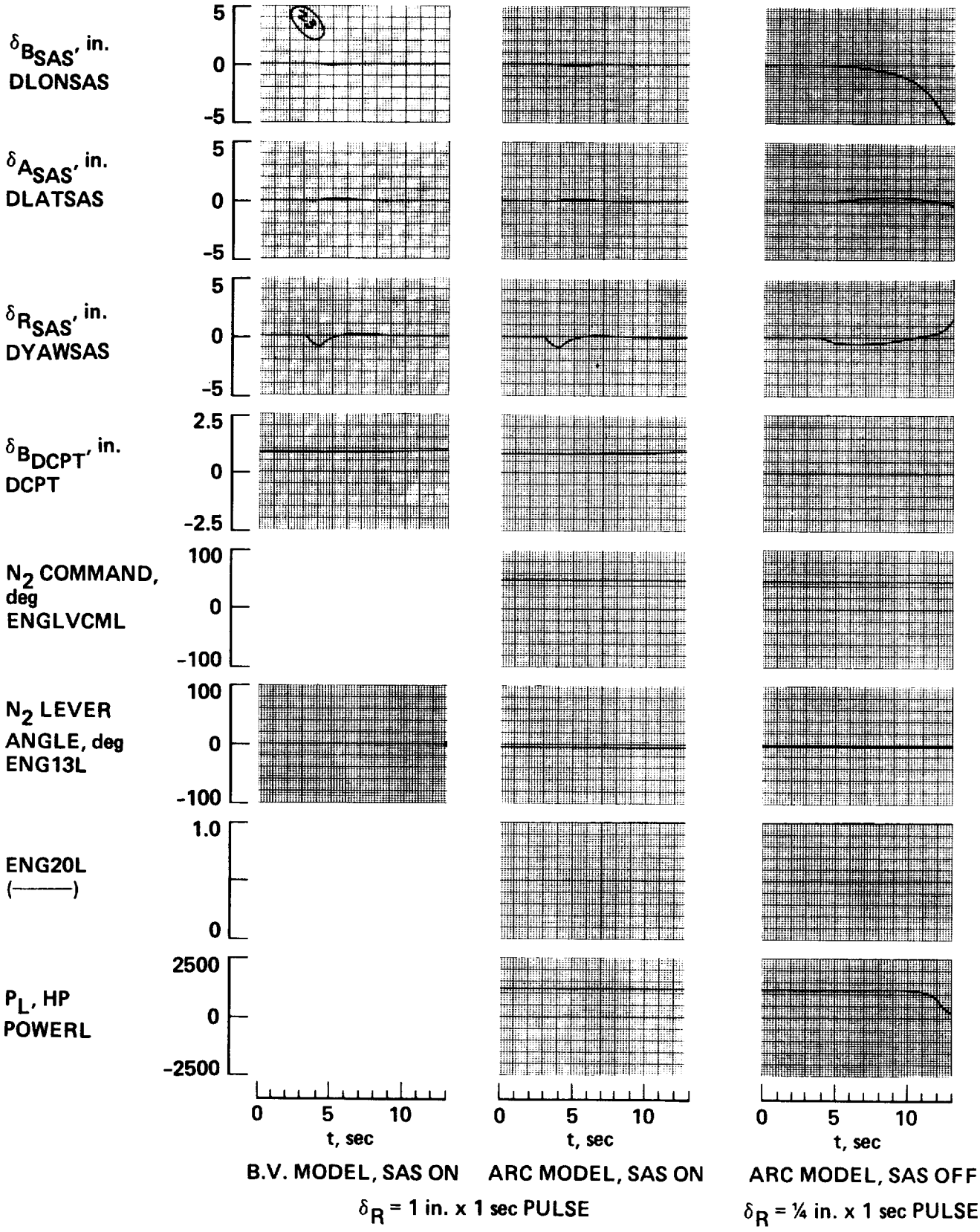

Figure 44.- BV versus ARC simulation response data; V_{eq} = 75 knots.

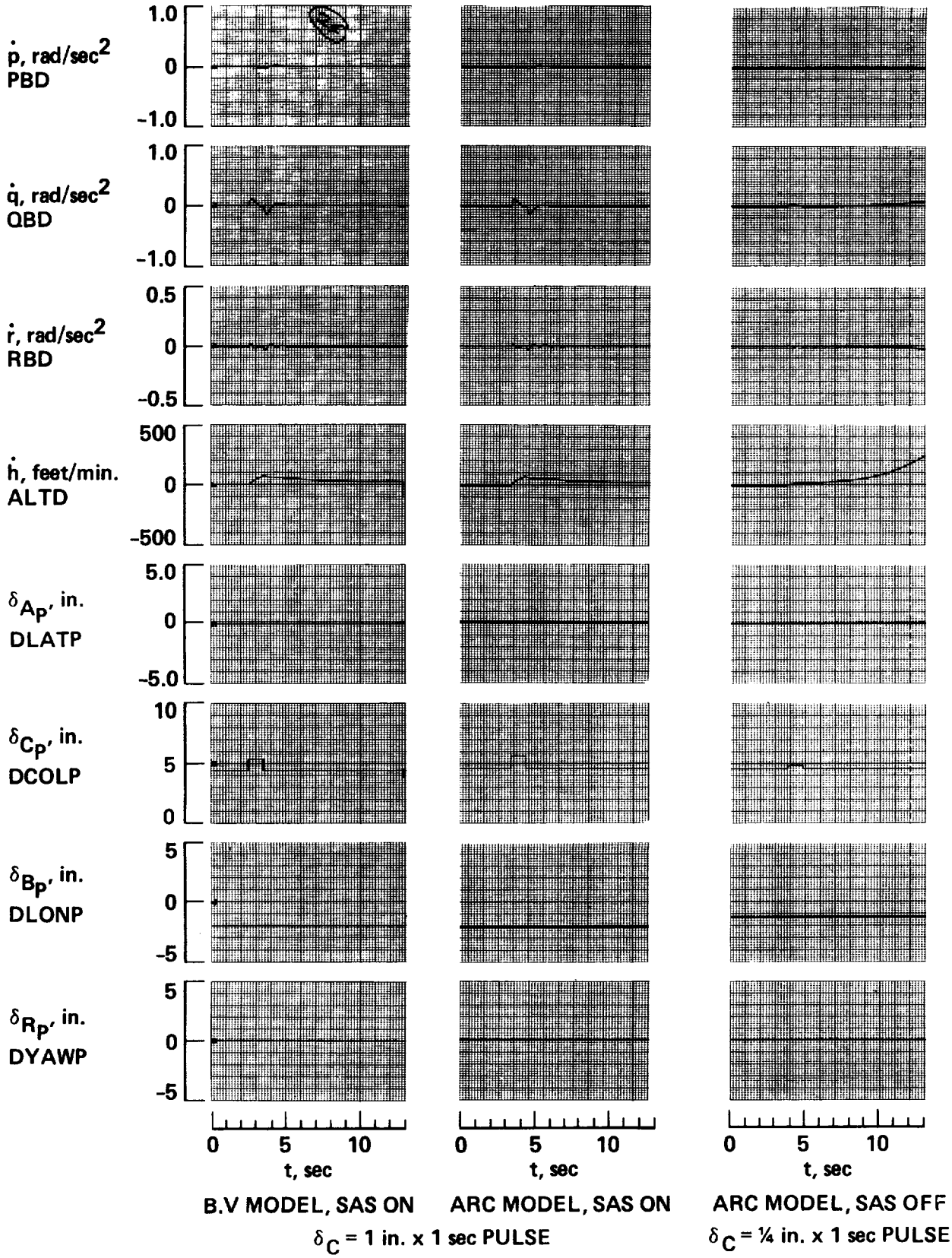

Figure 45.- BV versus ARC simulation response data; V_{eq} = 75 knots.

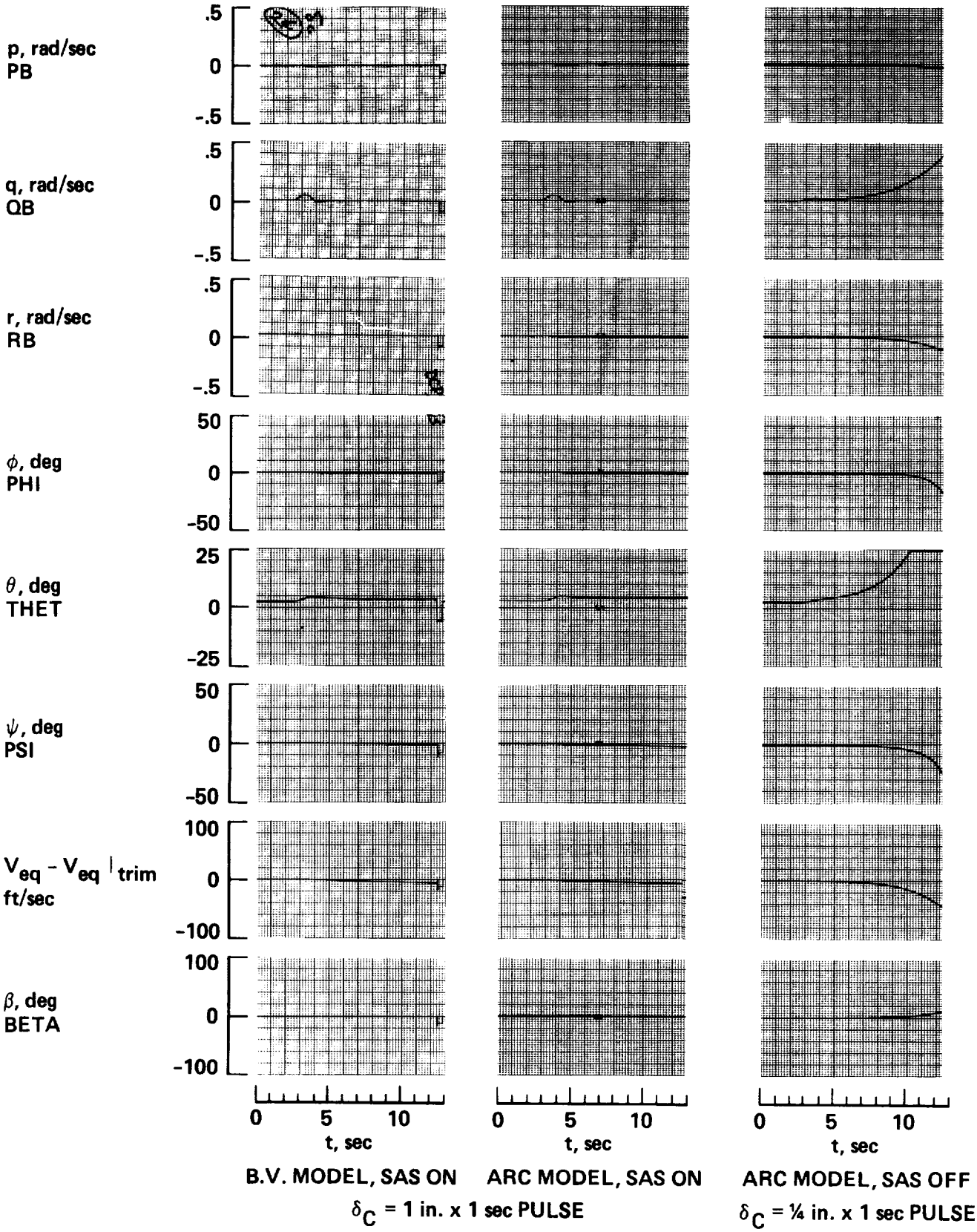

Figure 46.- BV versus ARC simulation response data; V_{eq} = 75 knots.

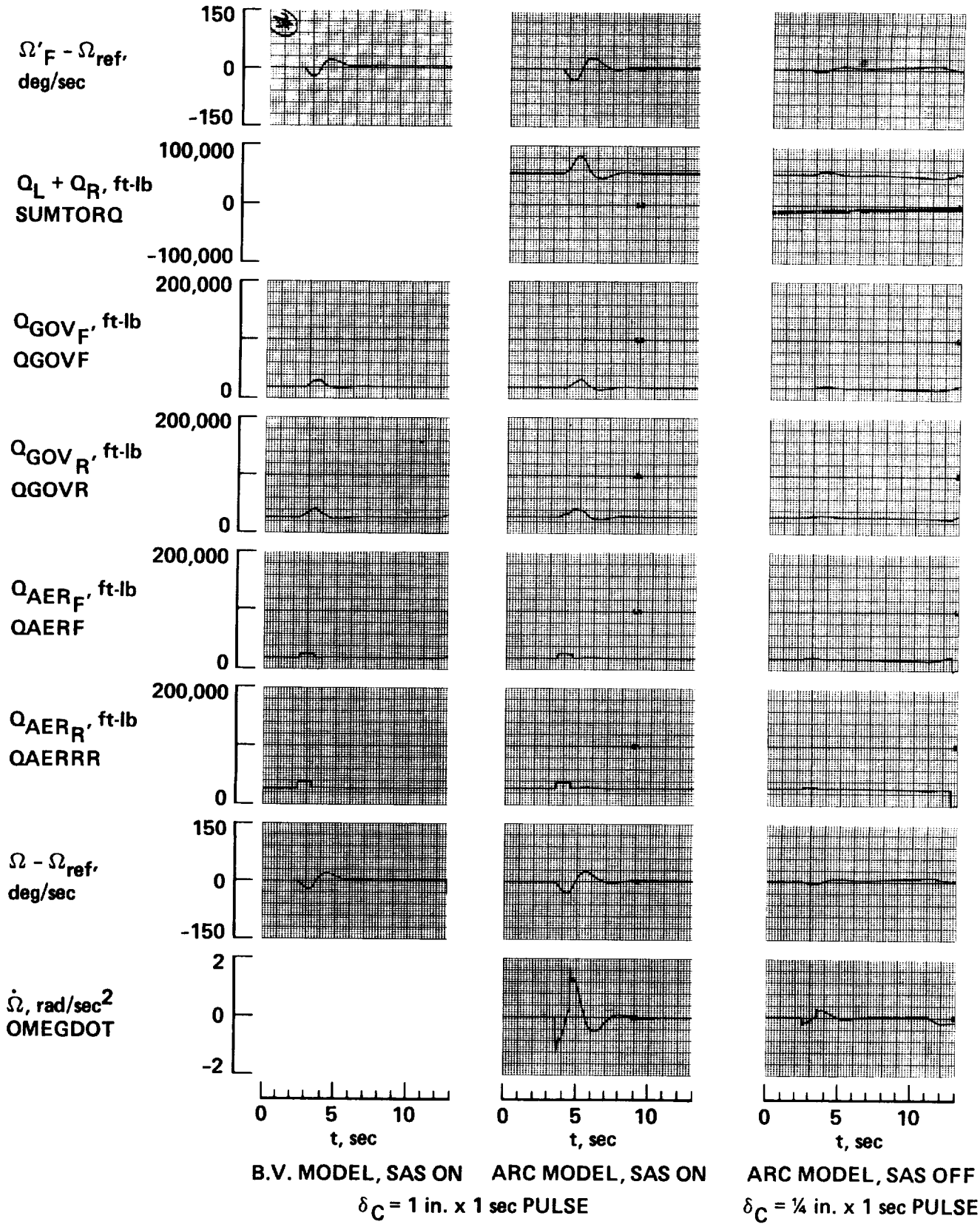

Figure 47.- BV versus ARC simulation response data; V_{eq} = 75 knots.

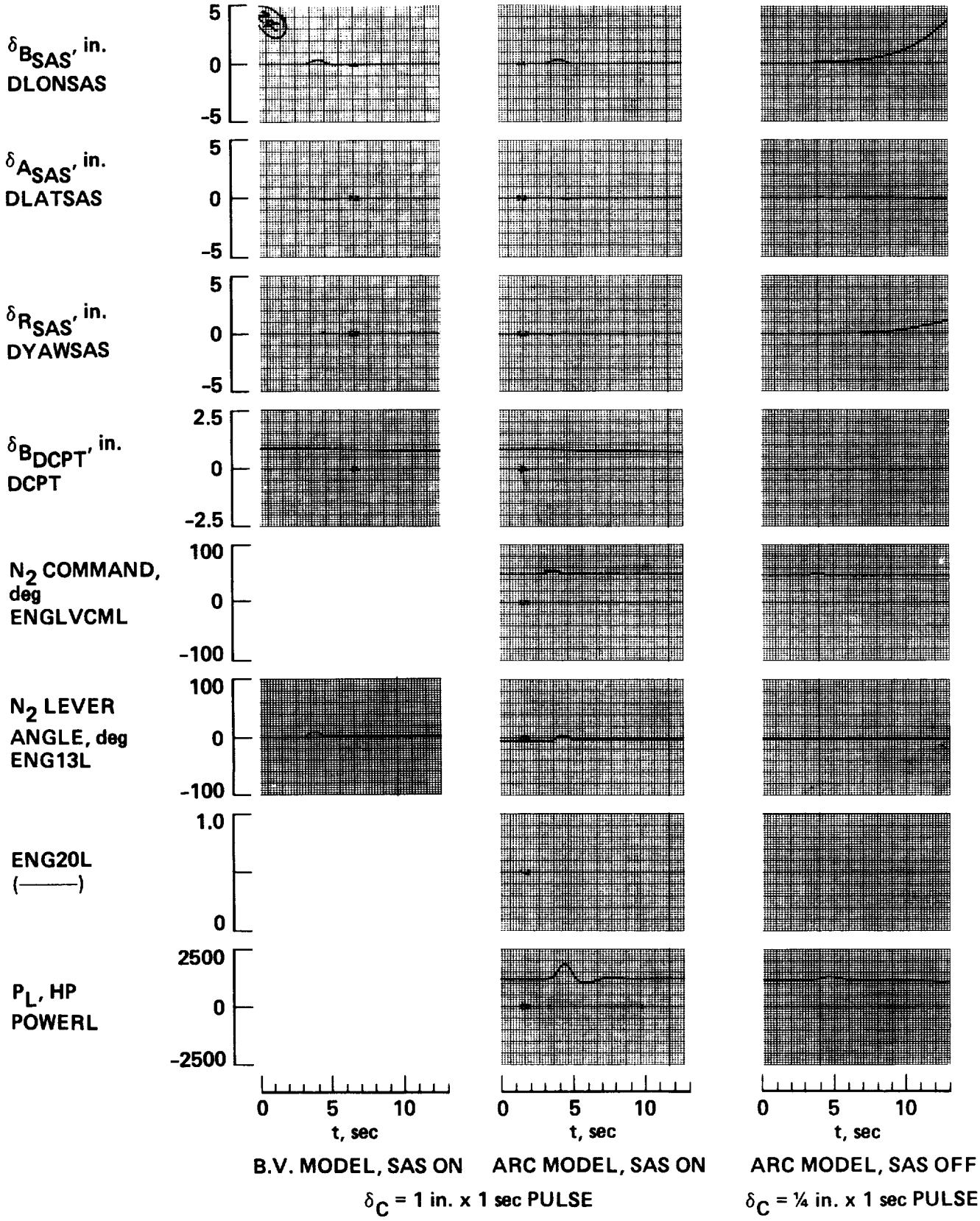

Figure 48.- BV versus ARC simulation response data; V_{eq} = 75 knots.

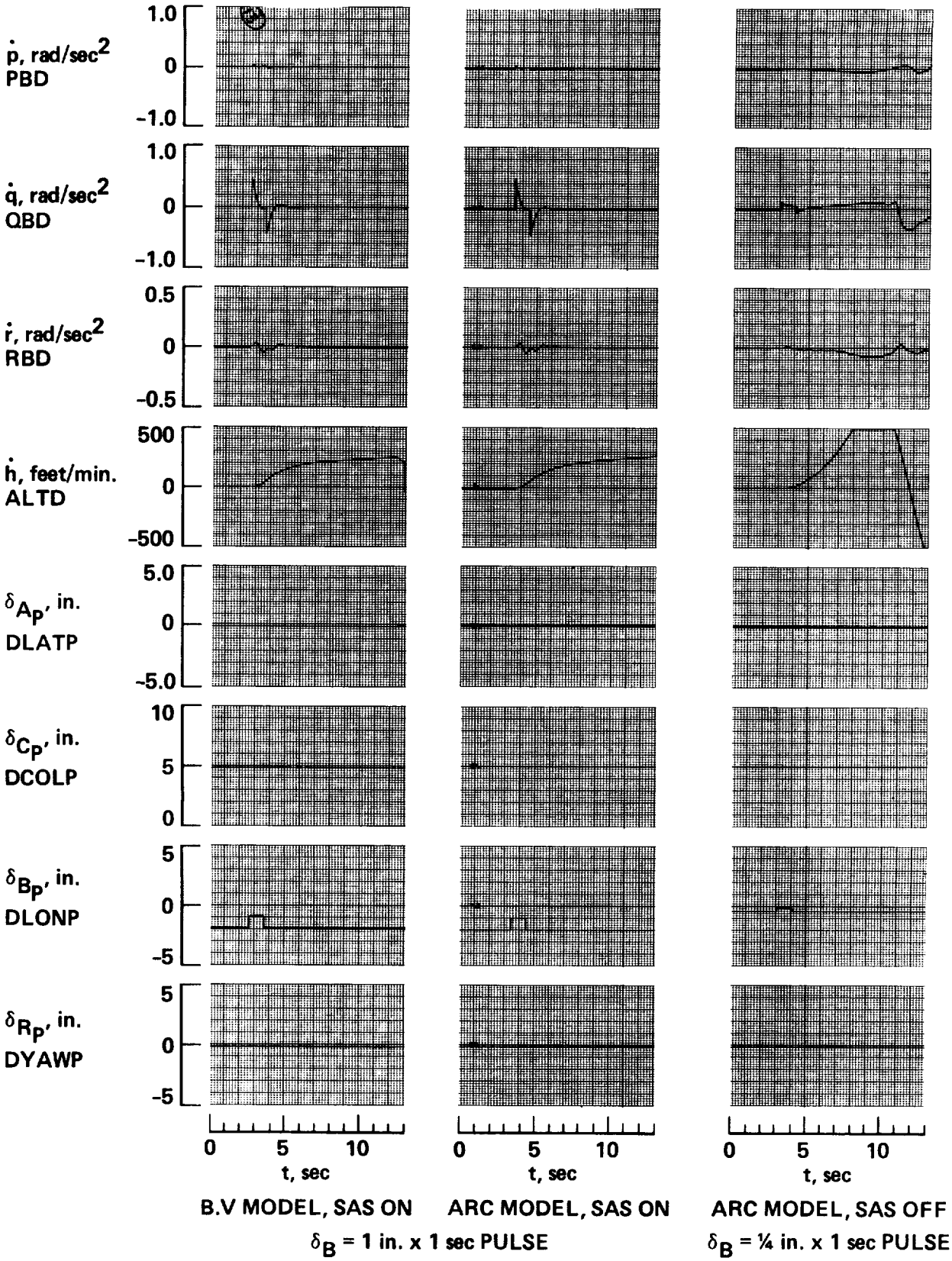

Figure 49.- BV versus ARC simulation response data; V_{eq} = 115 knots.

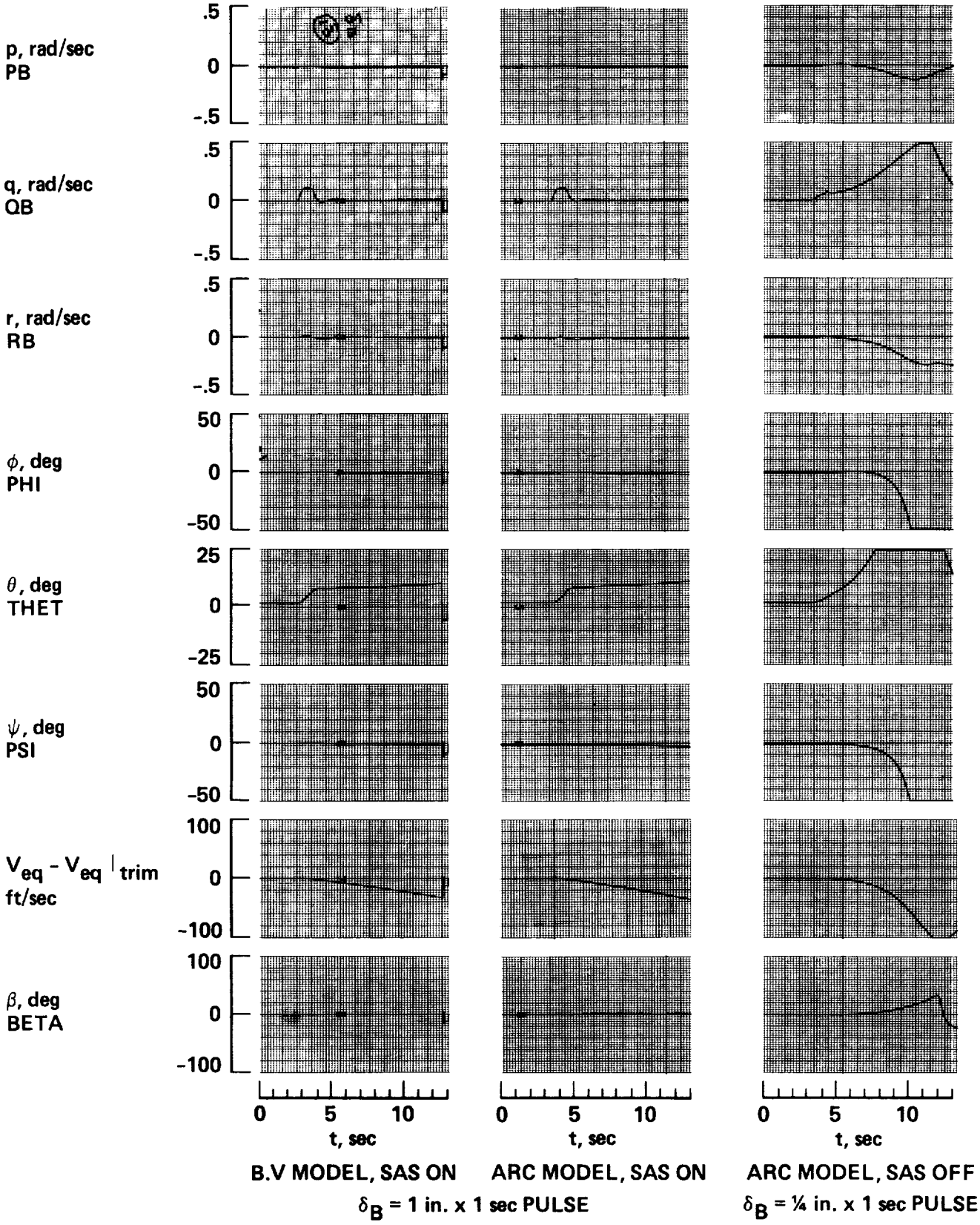

Figure 50.- BV versus ARC simulation response data; V_{eq} = 115 knots.

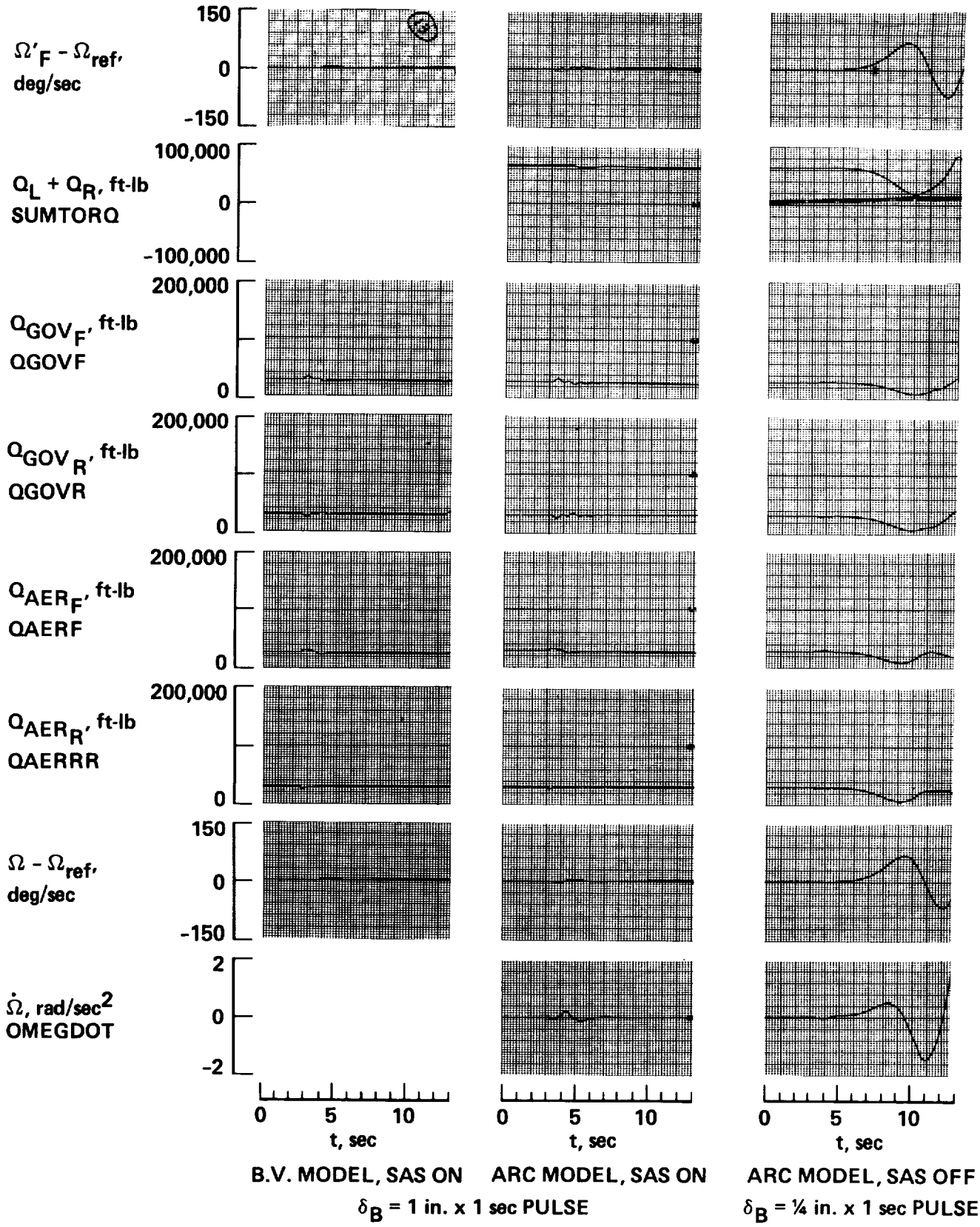

Figure 51.- BV versus ARC simulation response data; V_{eq} = 115 knots.

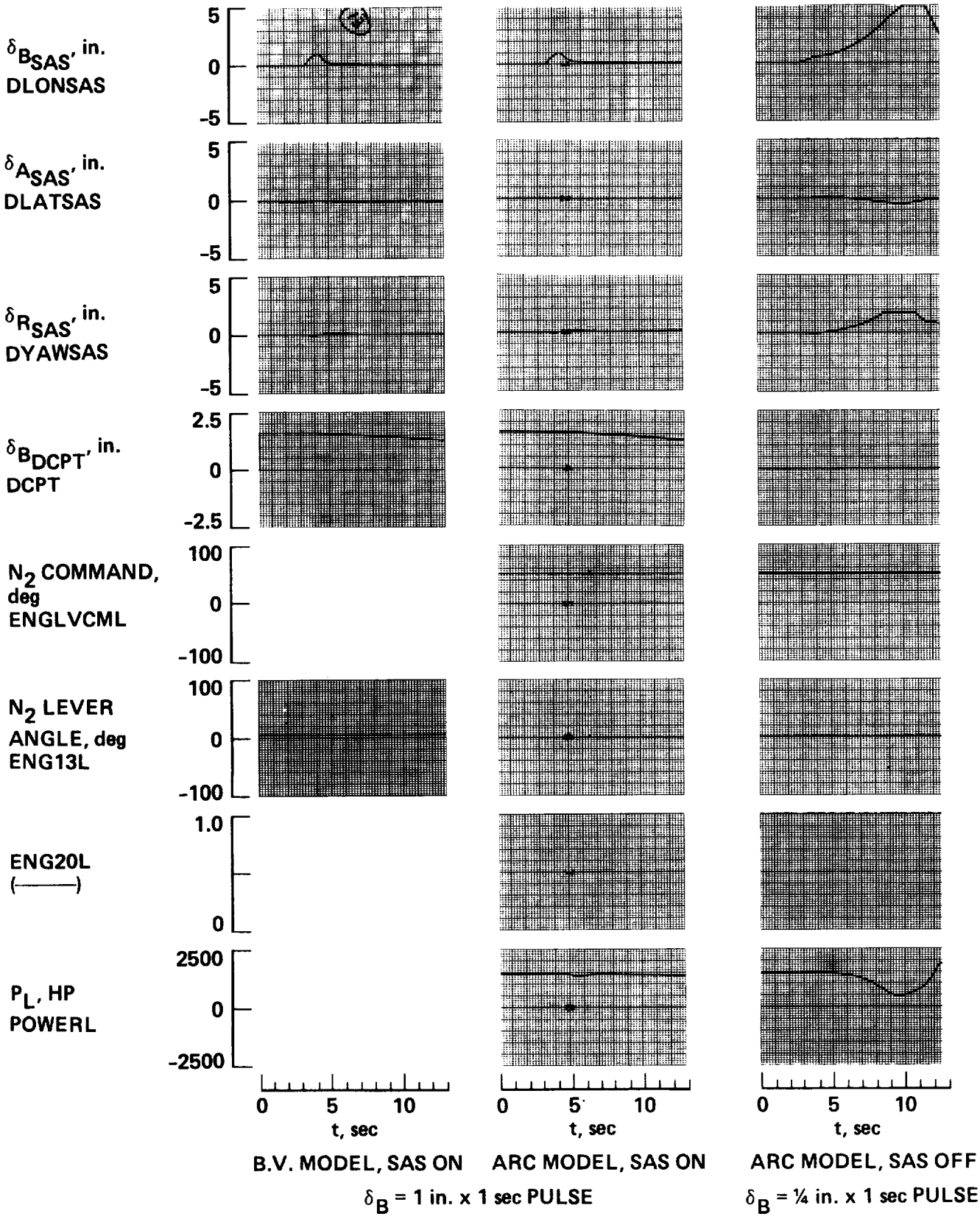

Figure 52.- BV versus ARC simulation response data; V_{eq} = 115 knots.

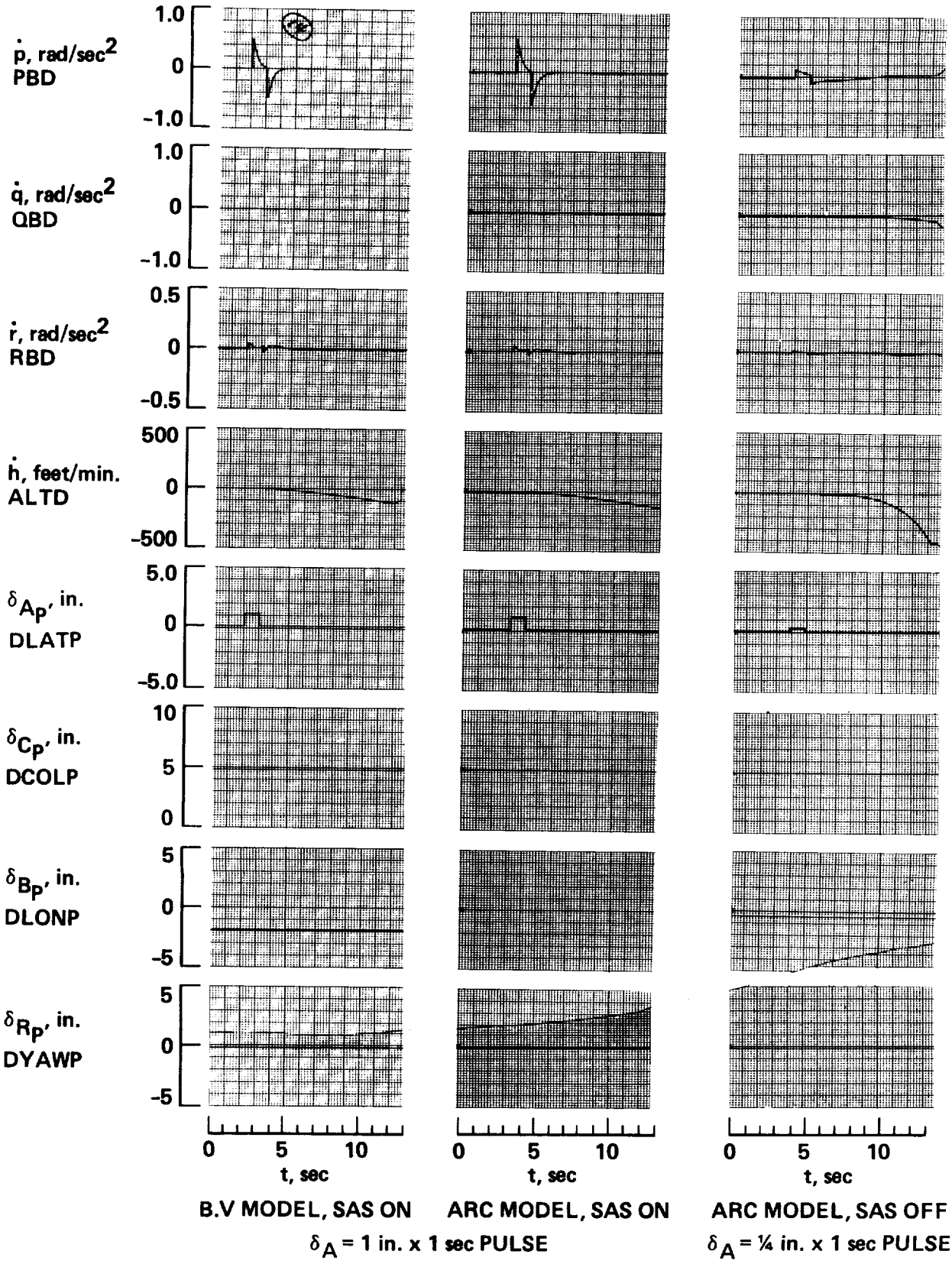

Figure 53.- BV versus ARC simulation response data; V_{eq} = 115 knots.

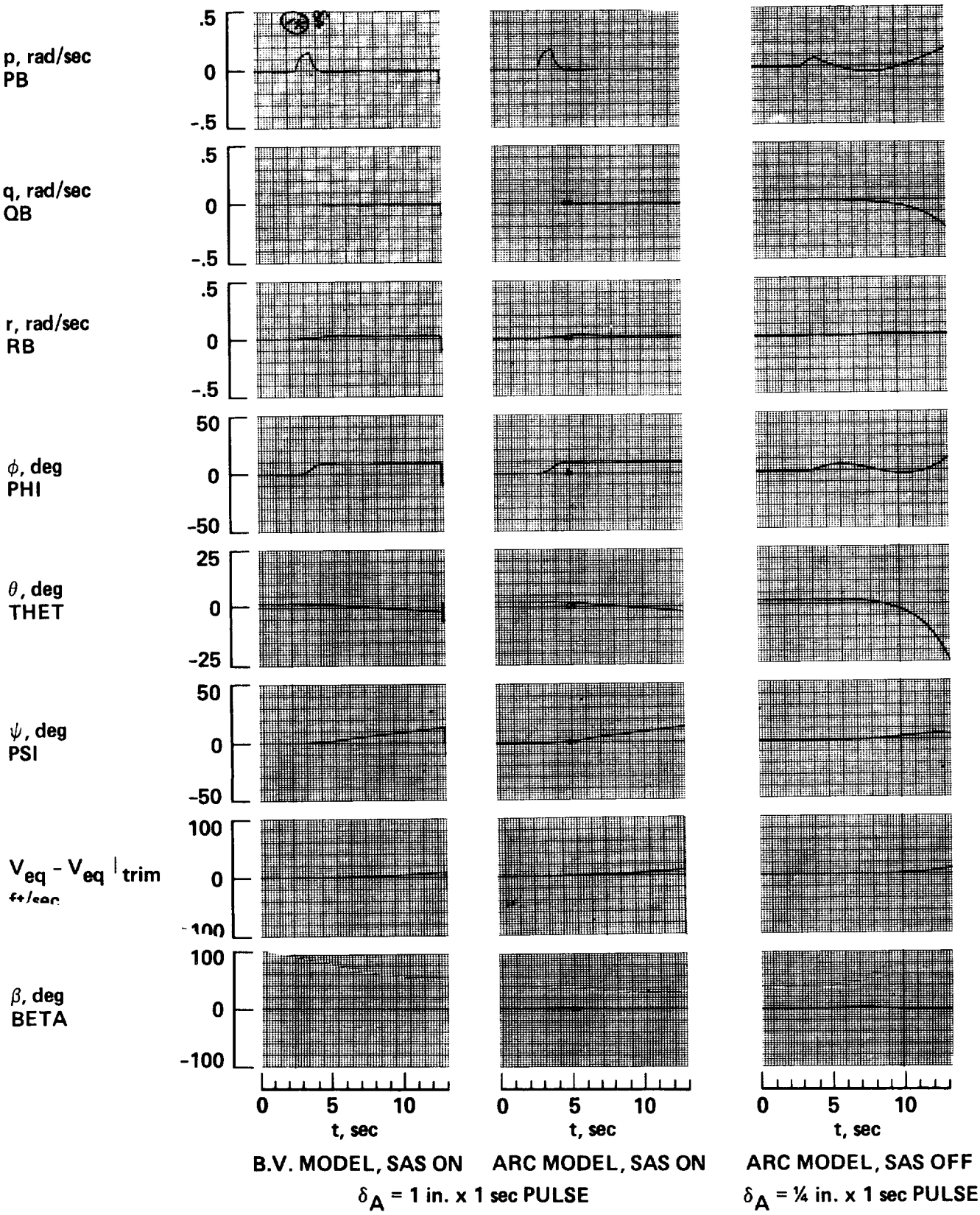

Figure 54.- BV versus ARC simulation response data; V_{eq} = 115 knots.

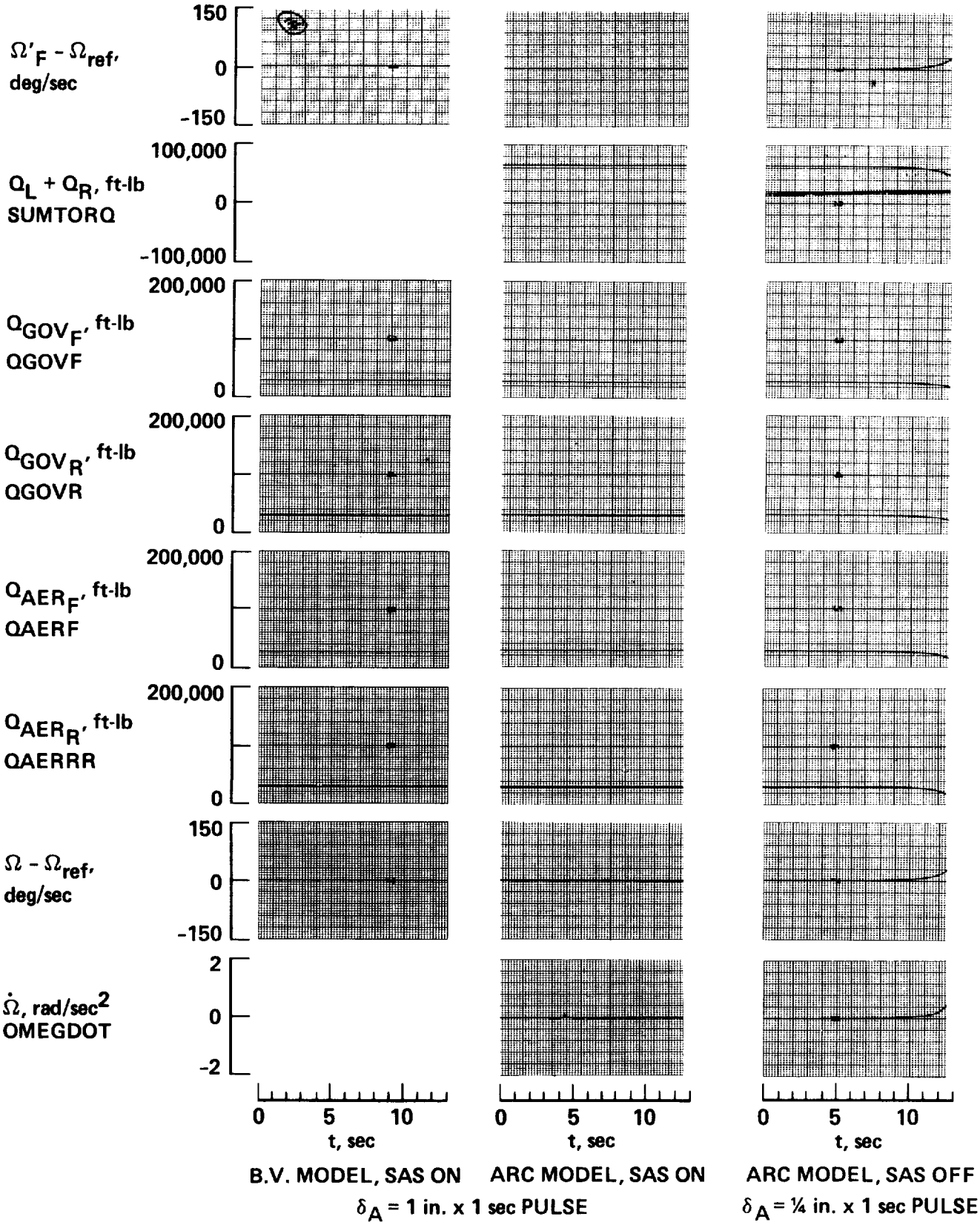

Figure 55.- BV versus ARC simulation response data; V_{eq} = 115 knots.

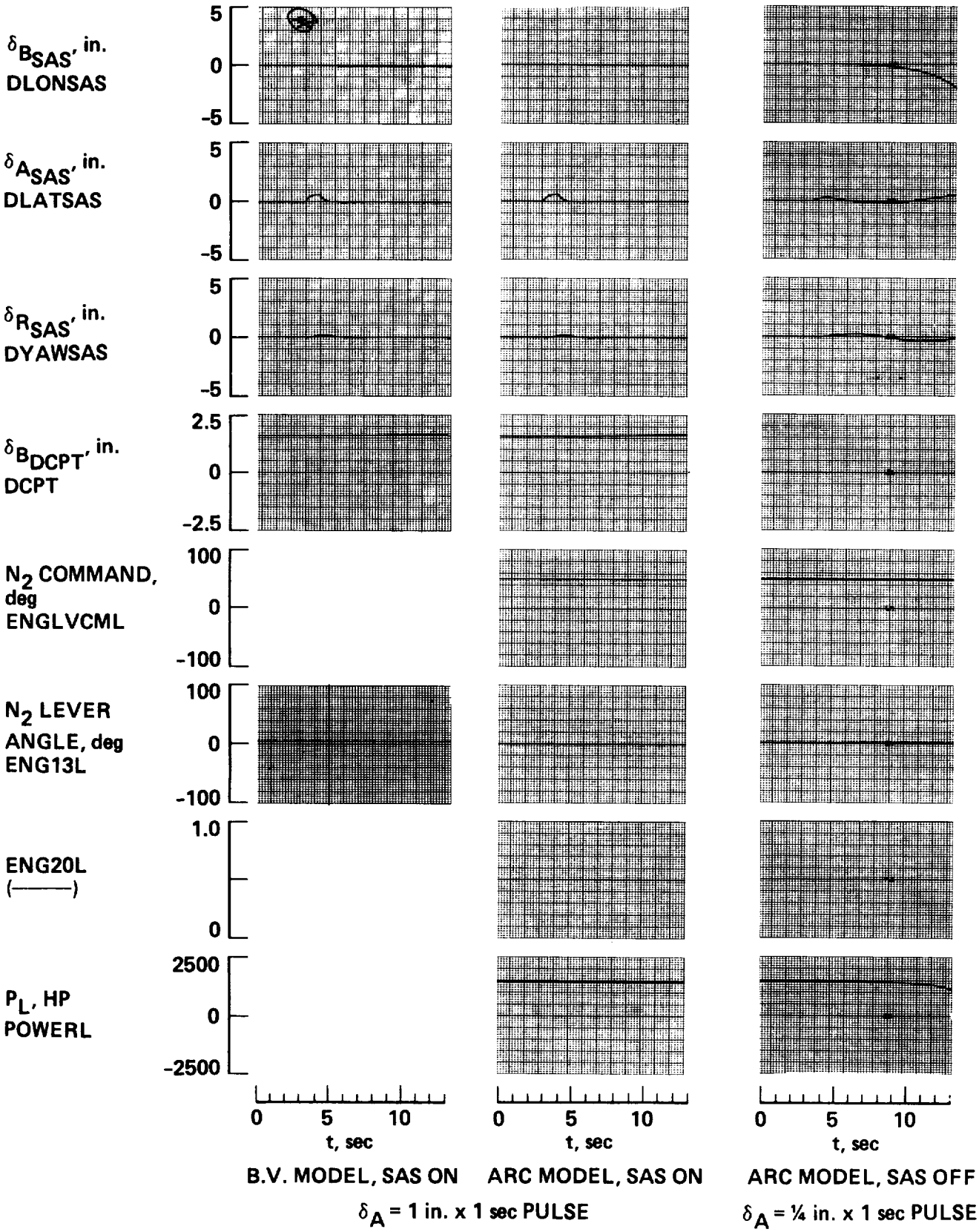

Figure 56.- BV versus ARC simulation response data; V_{eq} = 115 knots.

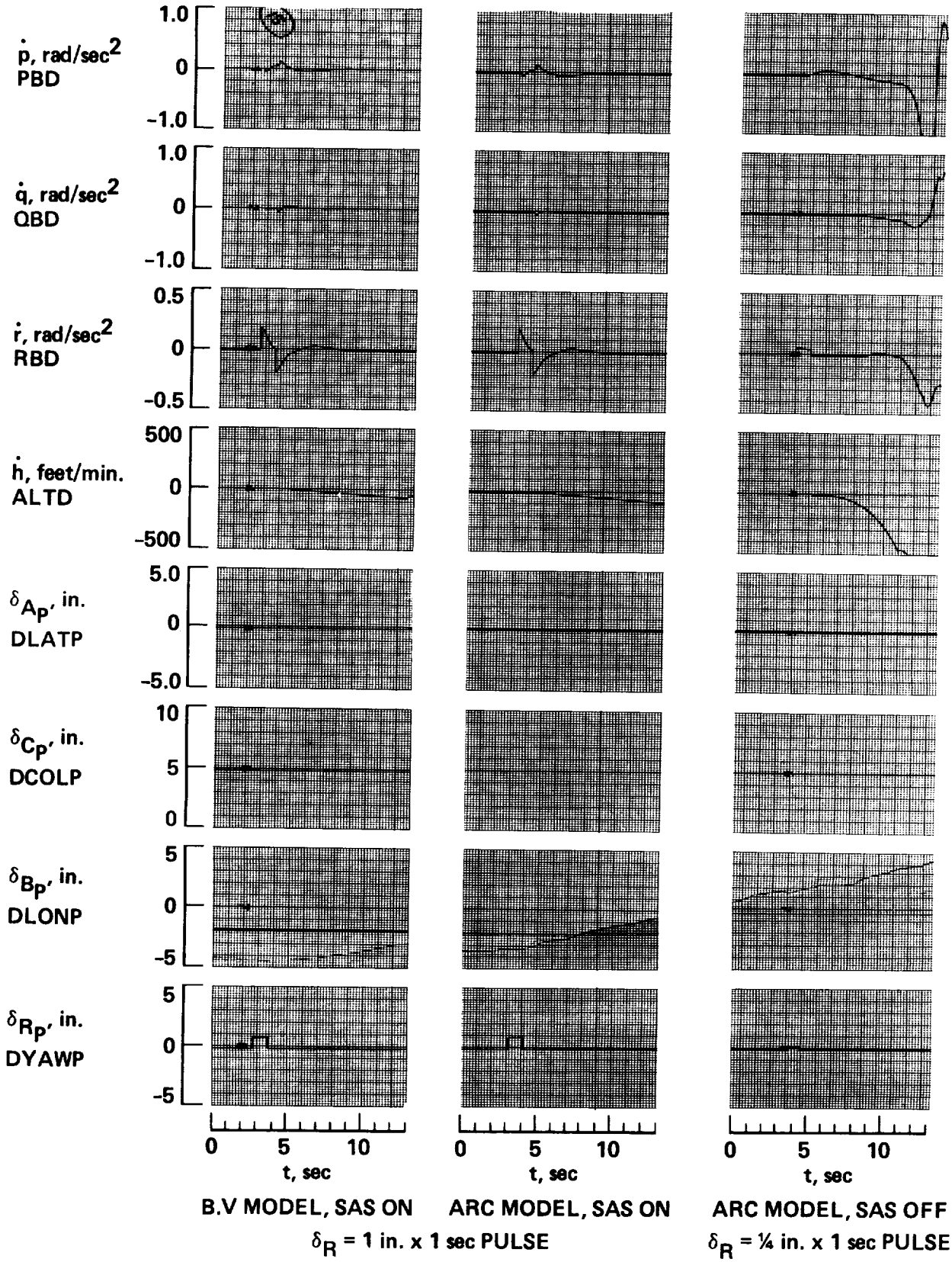

Figure 57.- BV versus ARC simulation response data; V_{eq} = 115 knots.

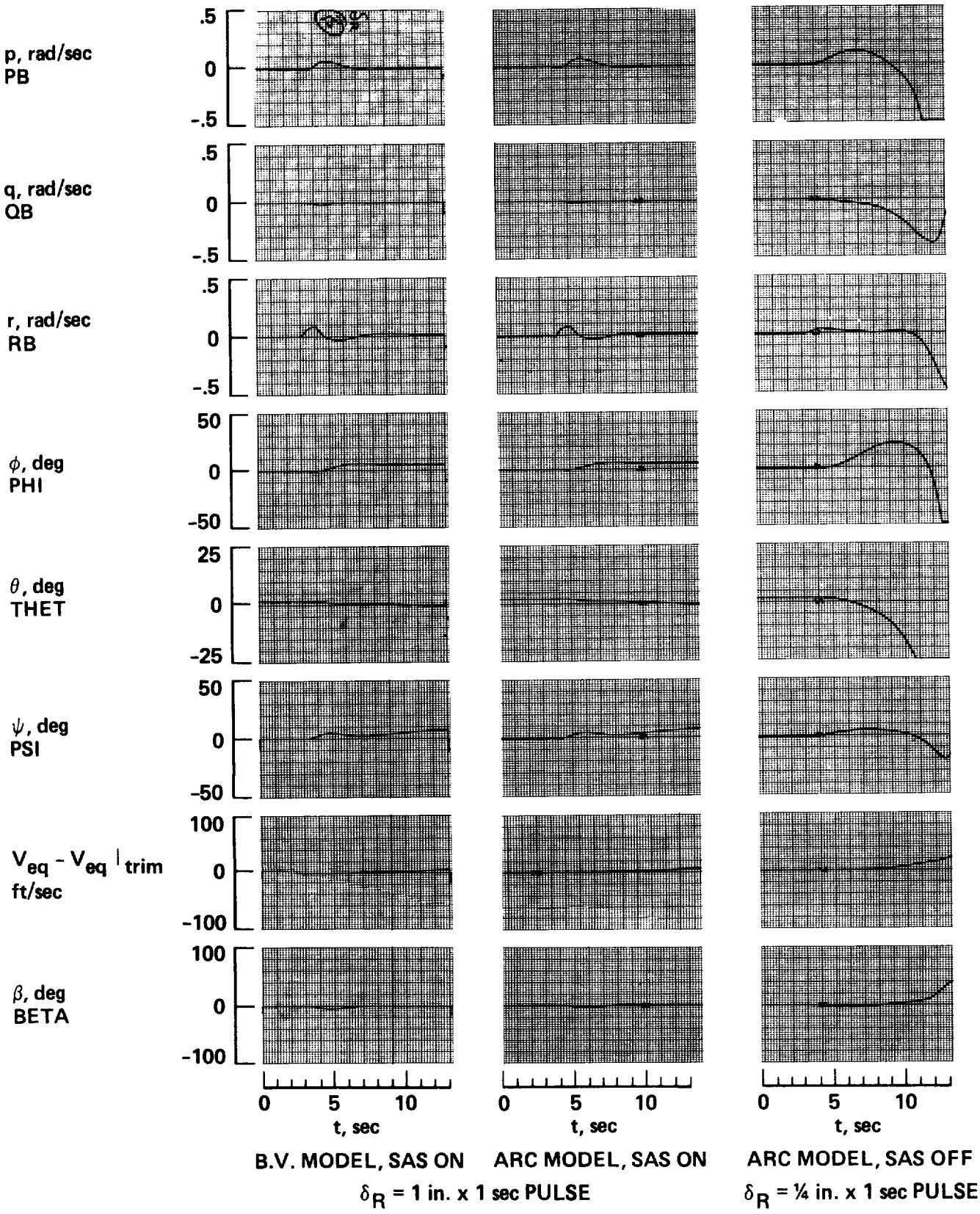

Figure 58.- BV versus ARC simulation response data; V_{eq} = 115 knots.

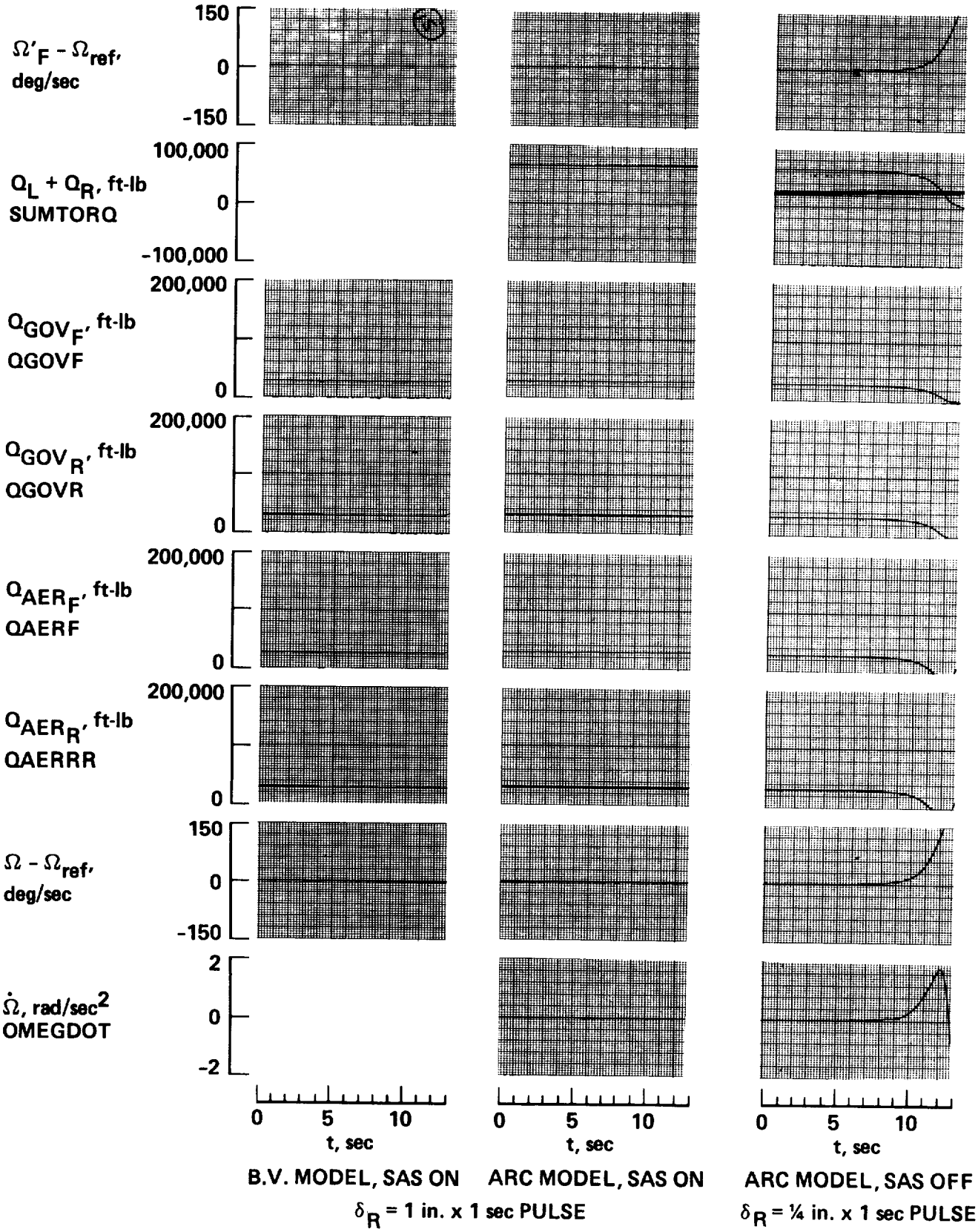

Figure 59.- BV versus ARC simulation response data; V_{eq} = 115 knots.

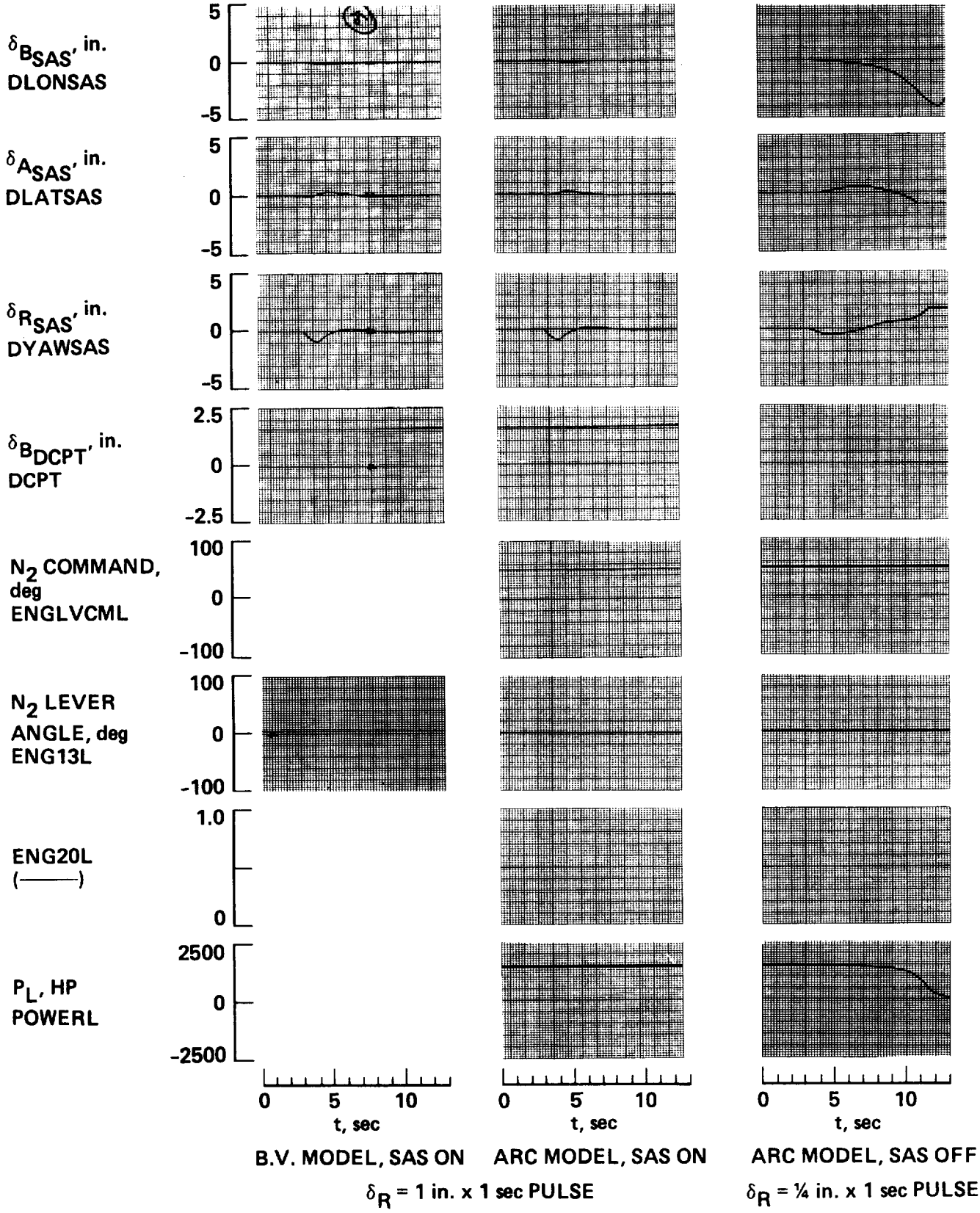

Figure 60.- BV versus ARC simulation response data; V_{eq} = 115 knots.

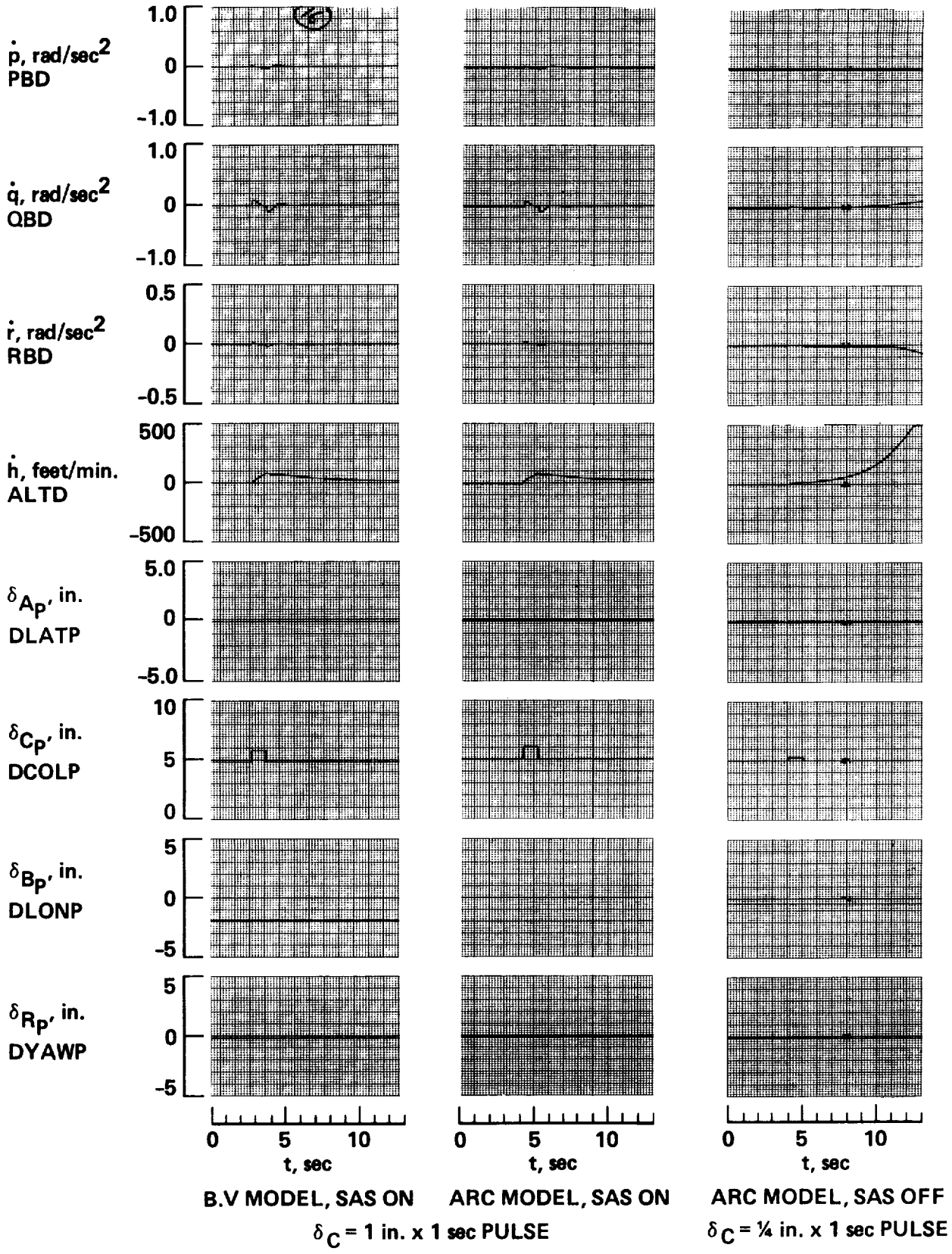

Figure 61.- BV versus ARC simulation response data; V_{eq} = 115 knots.

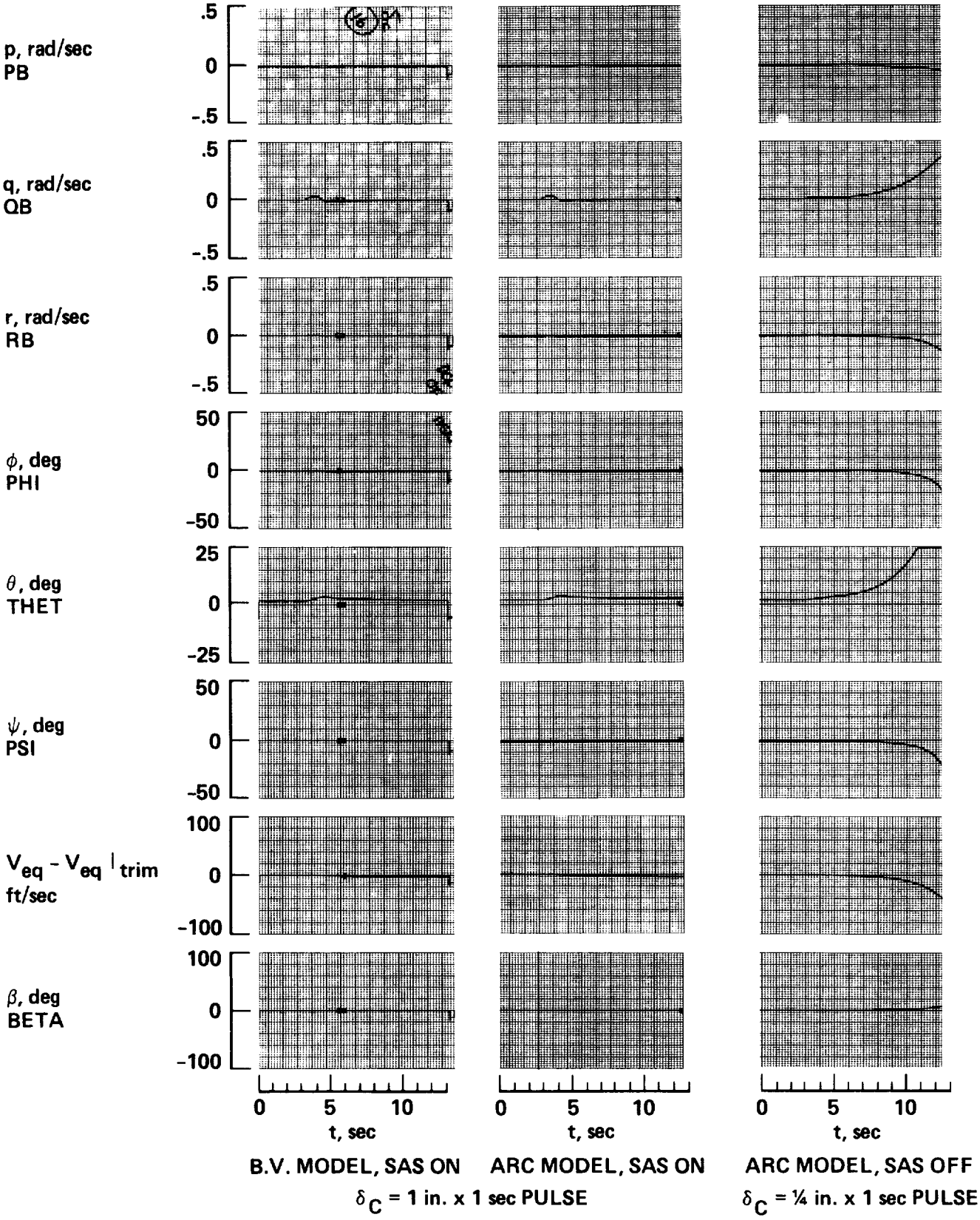

Figure 62.- BV versus ARC simulation response data; V_{eq} = 115 knots.

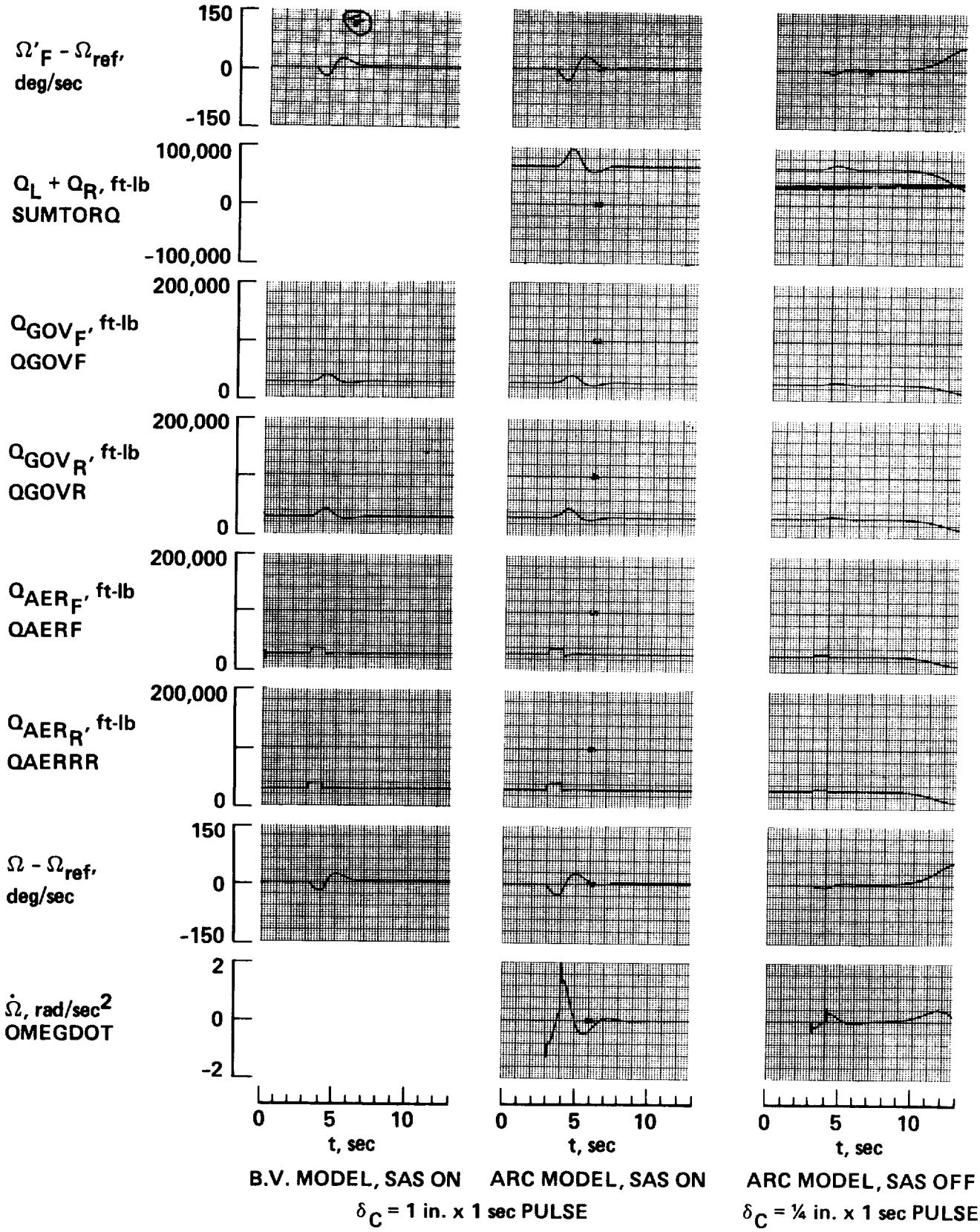

Figure 63.- BV versus ARC simulation response data; V_{eq} = 115 knots.

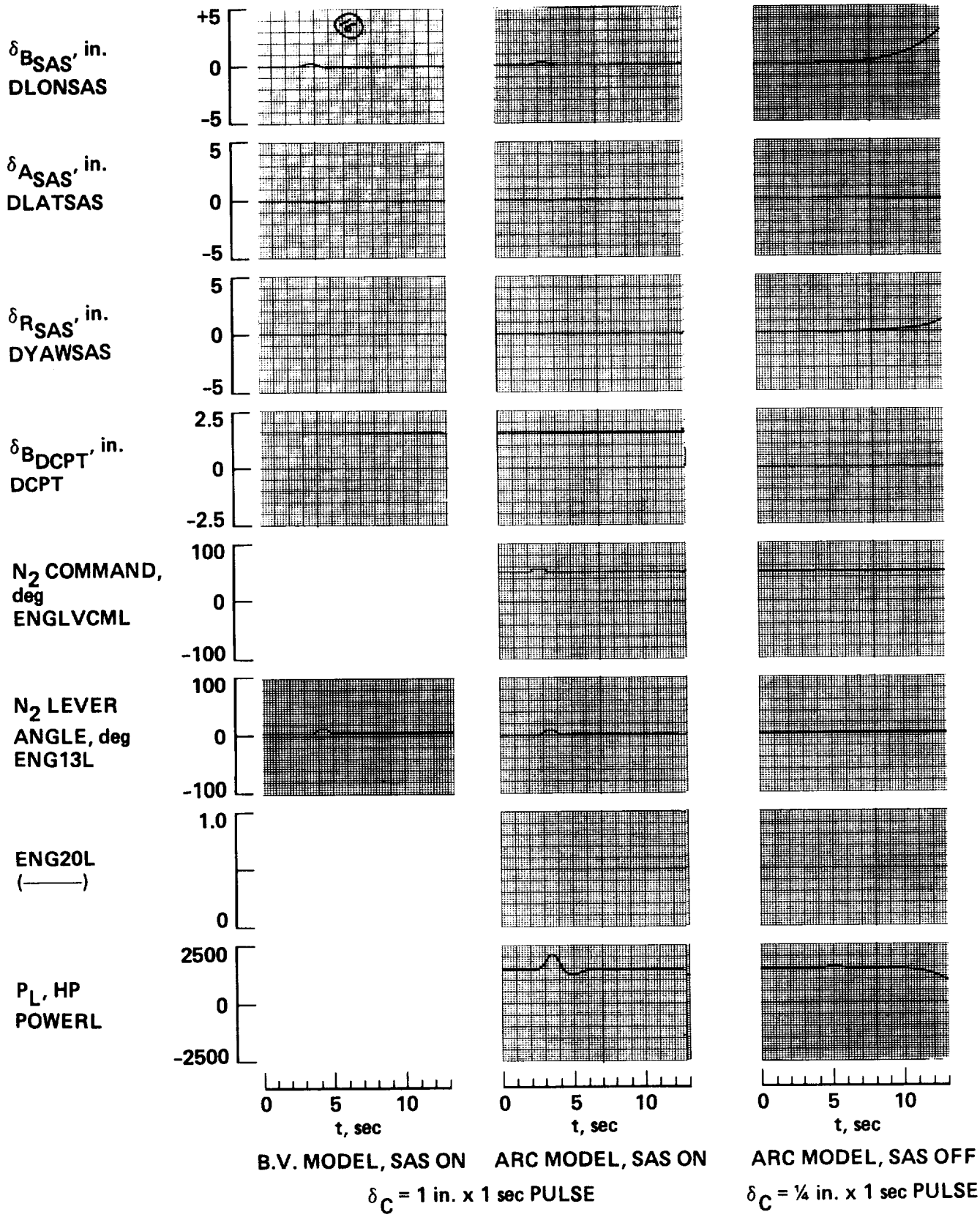

Figure 64.- BV versus ARC simulation response data; V_{eq} = 115 knots.

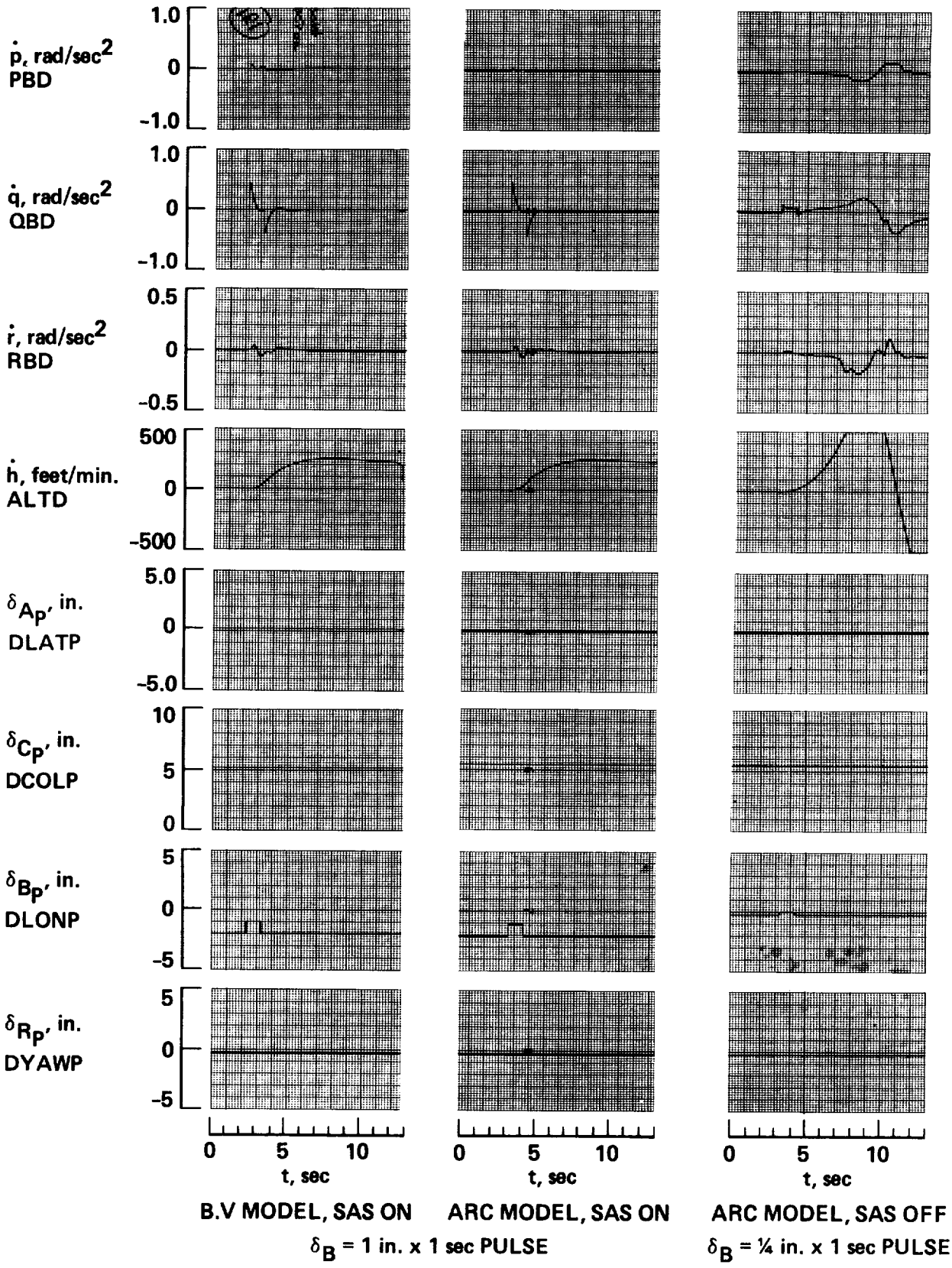

Figure 65.- BV versus ARC simulation response data; V_{eq} = 130 knots.

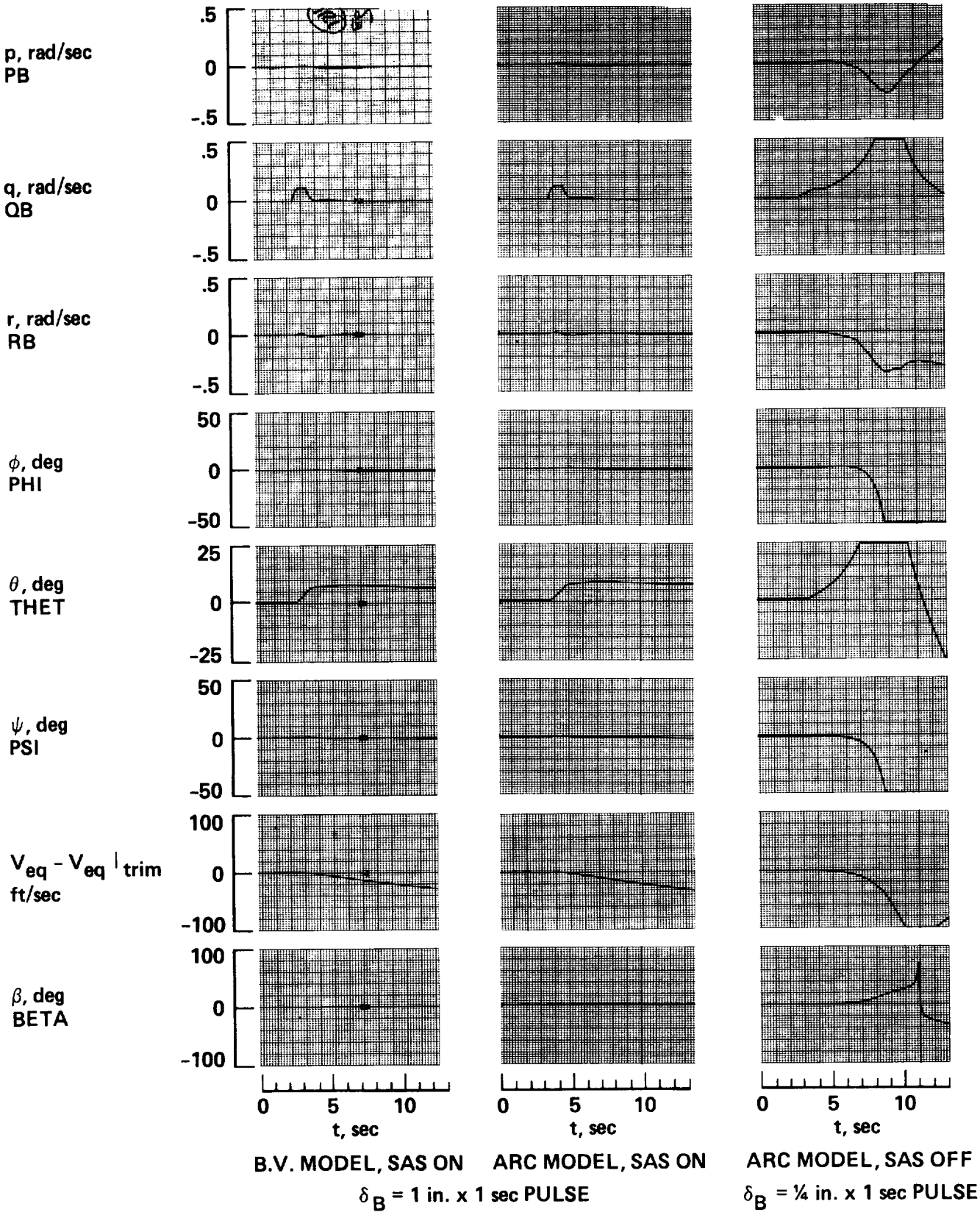

Figure 66.- BV versus ARC simulation response data; V_{eq} = 130 knots.

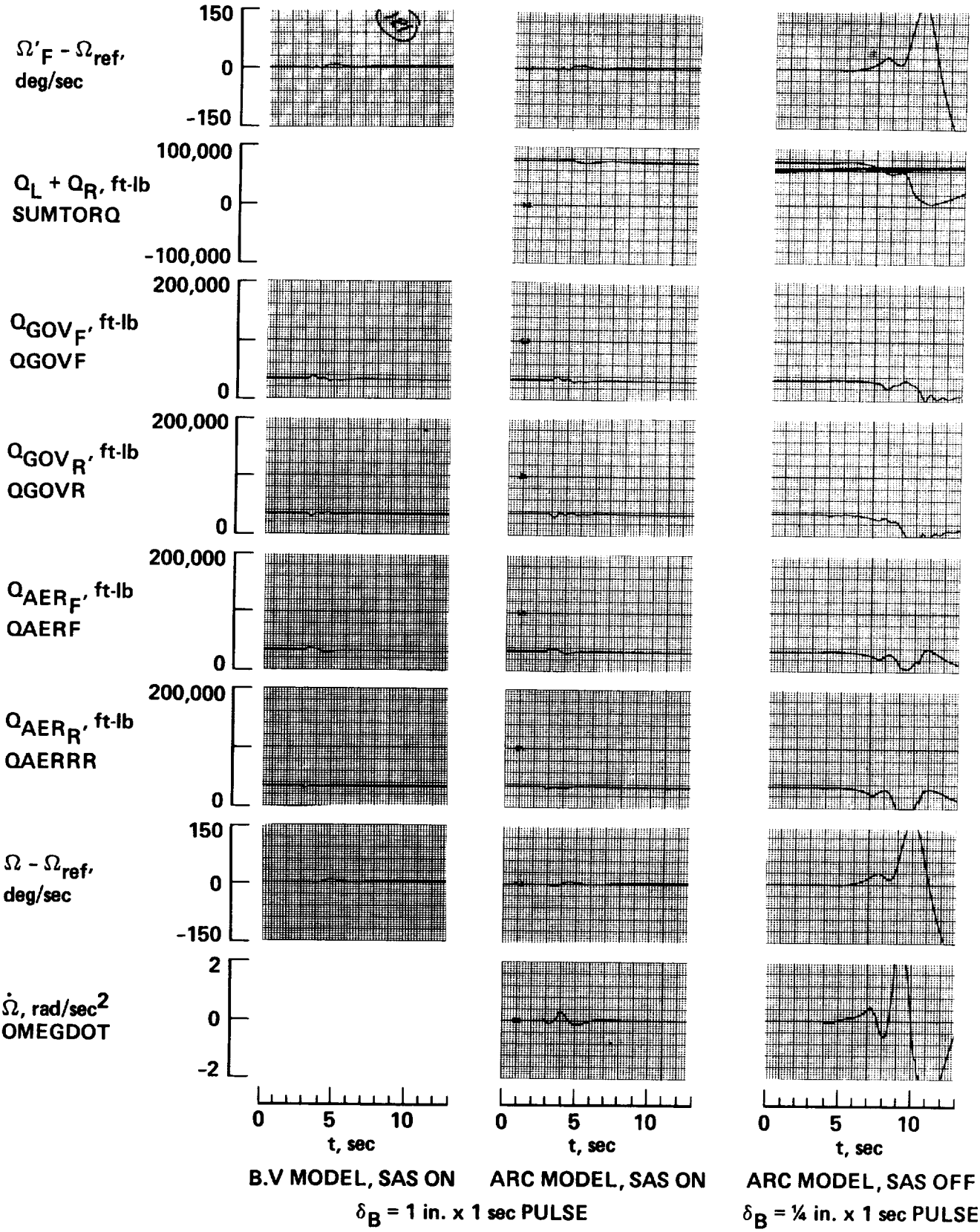

Figure 67.- BV versus ARC simulation response data; V_{eq} = 130 knots.

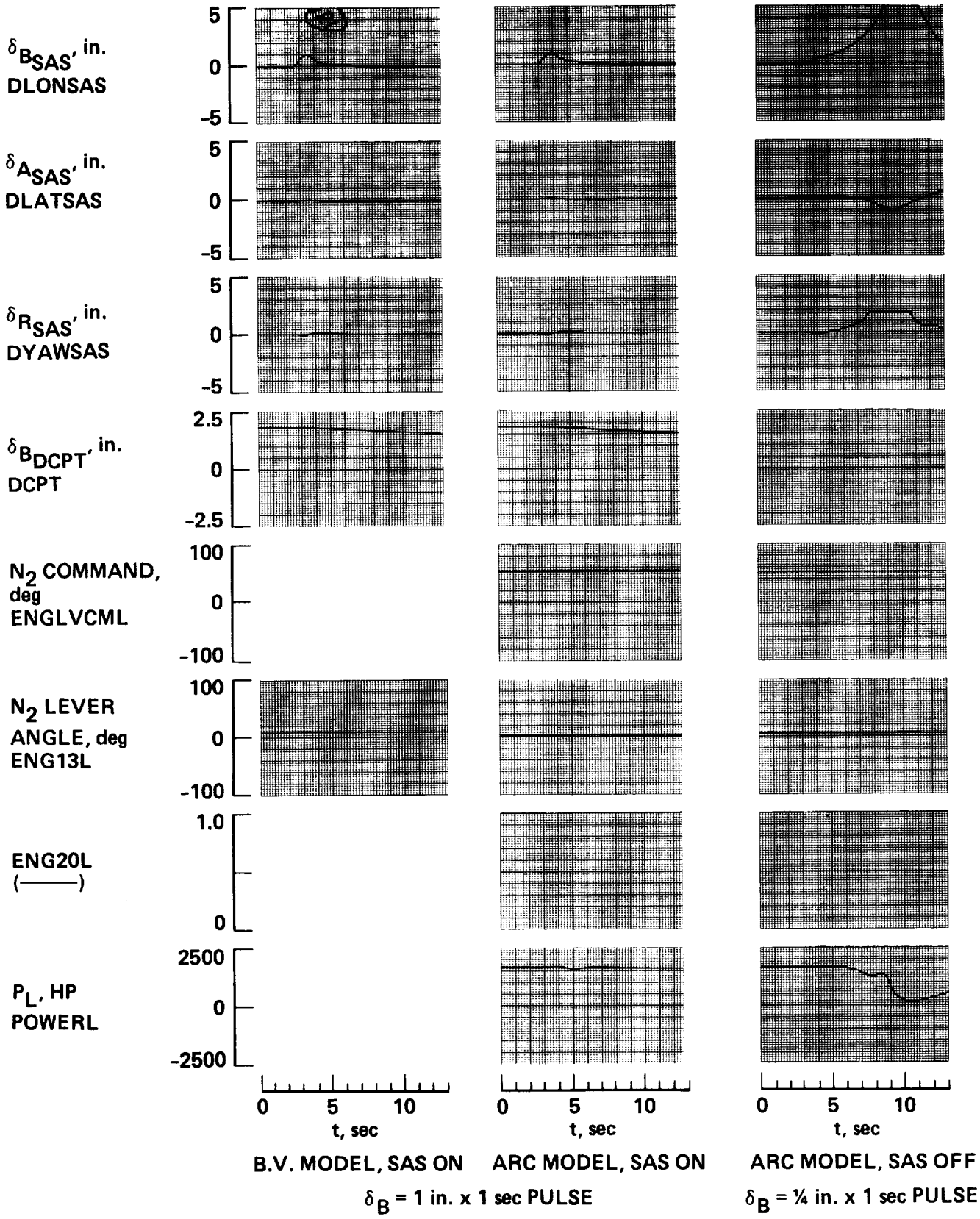

Figure 68.- BV versus ARC simulation response data; V_{eq} = 130 knots.

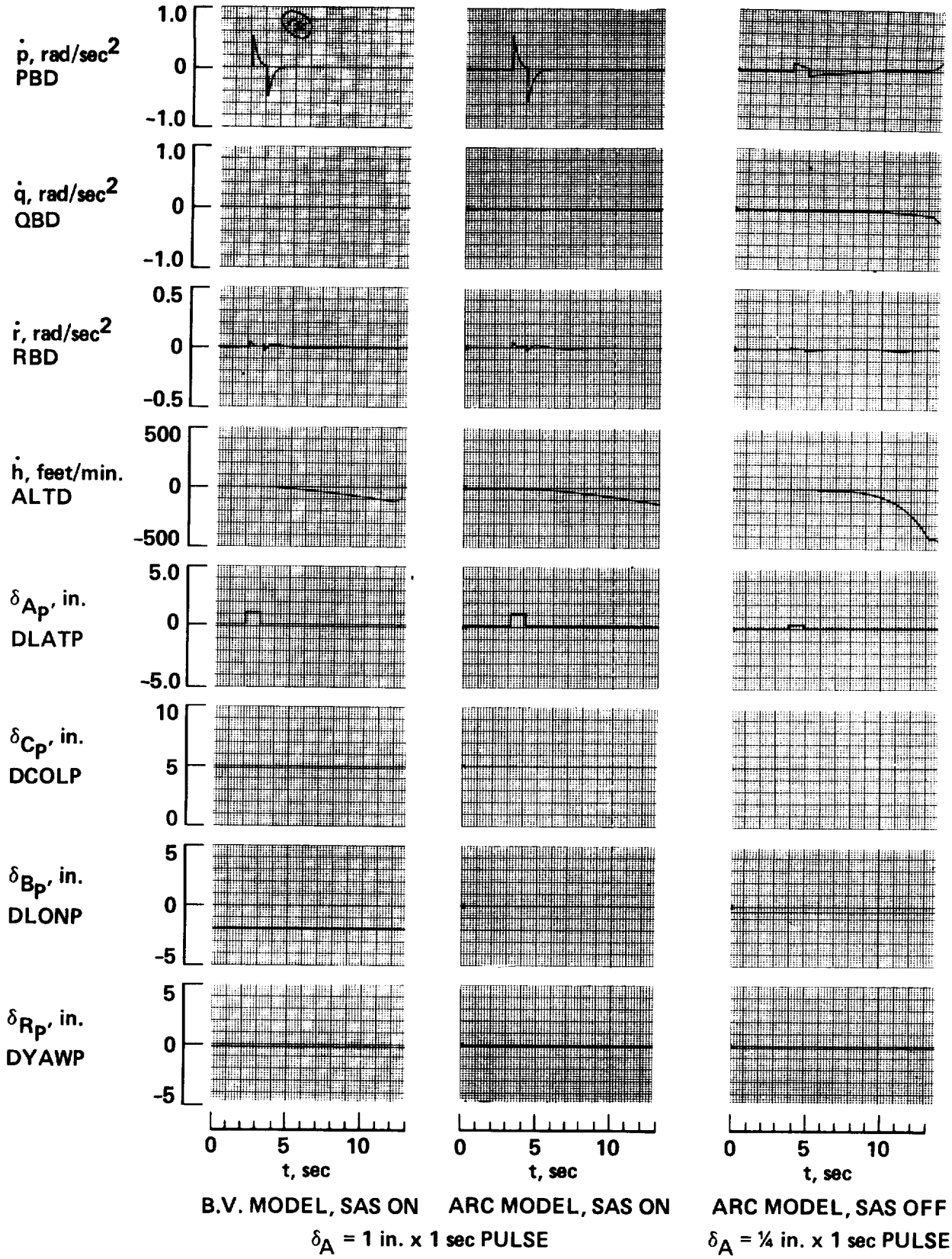

Figure 69.- BV versus ARC simulation response data; V_{eq} = 130 knots.

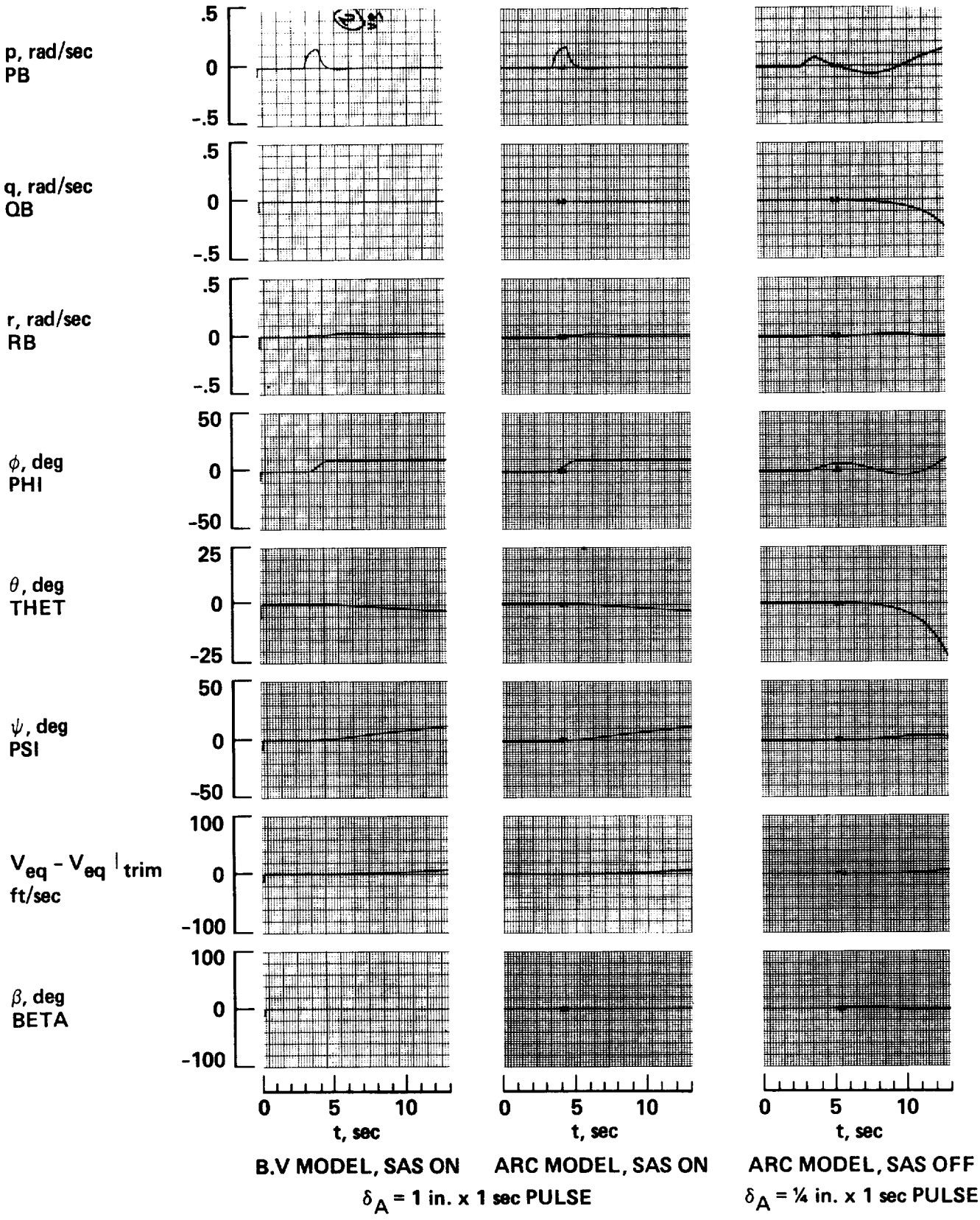

Figure 70.- BV versus ARC simulation response data; V_{eq} = 130 knots.

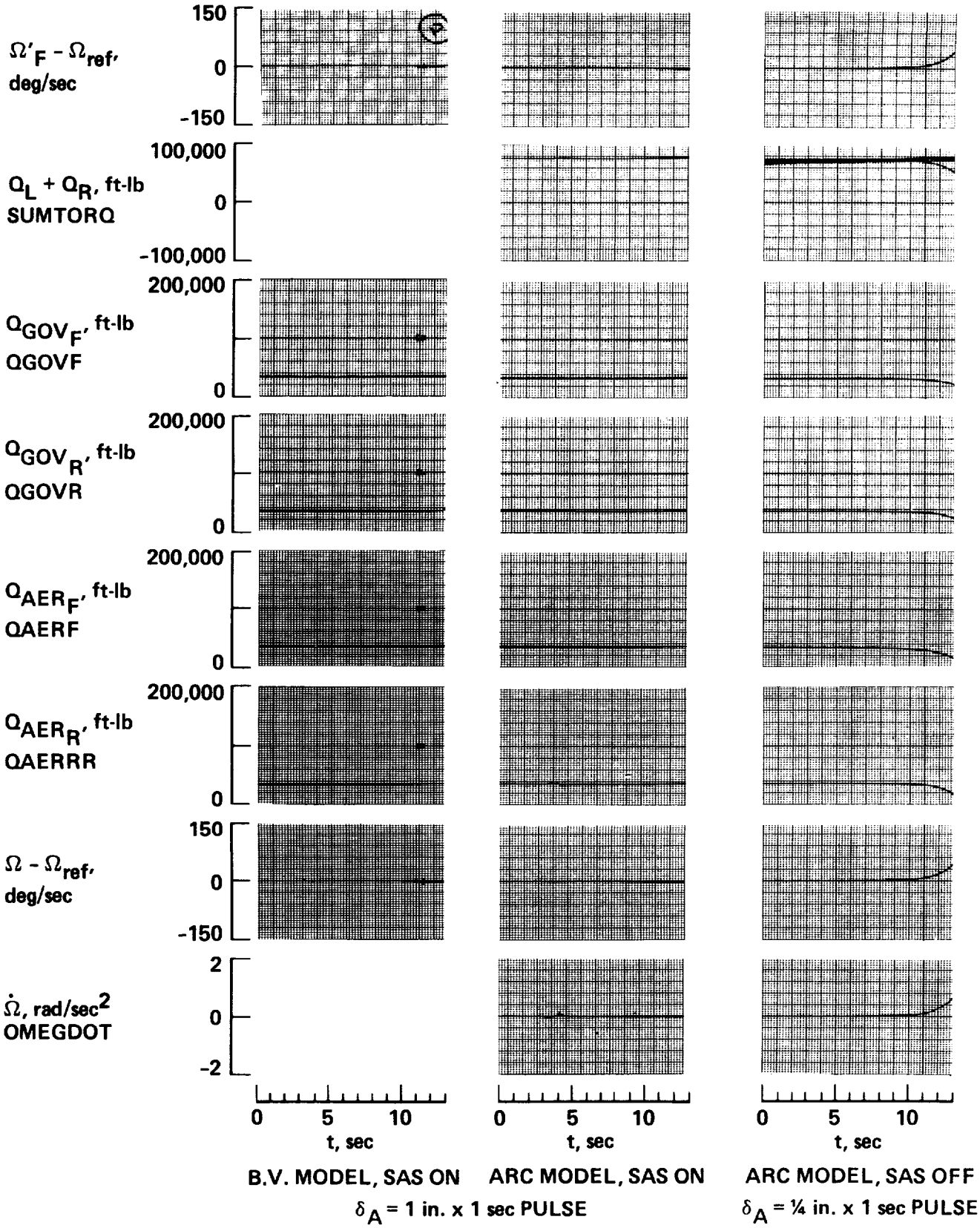

Figure 71.- BV versus ARC simulation response data; V_{eq} = 130 knots.

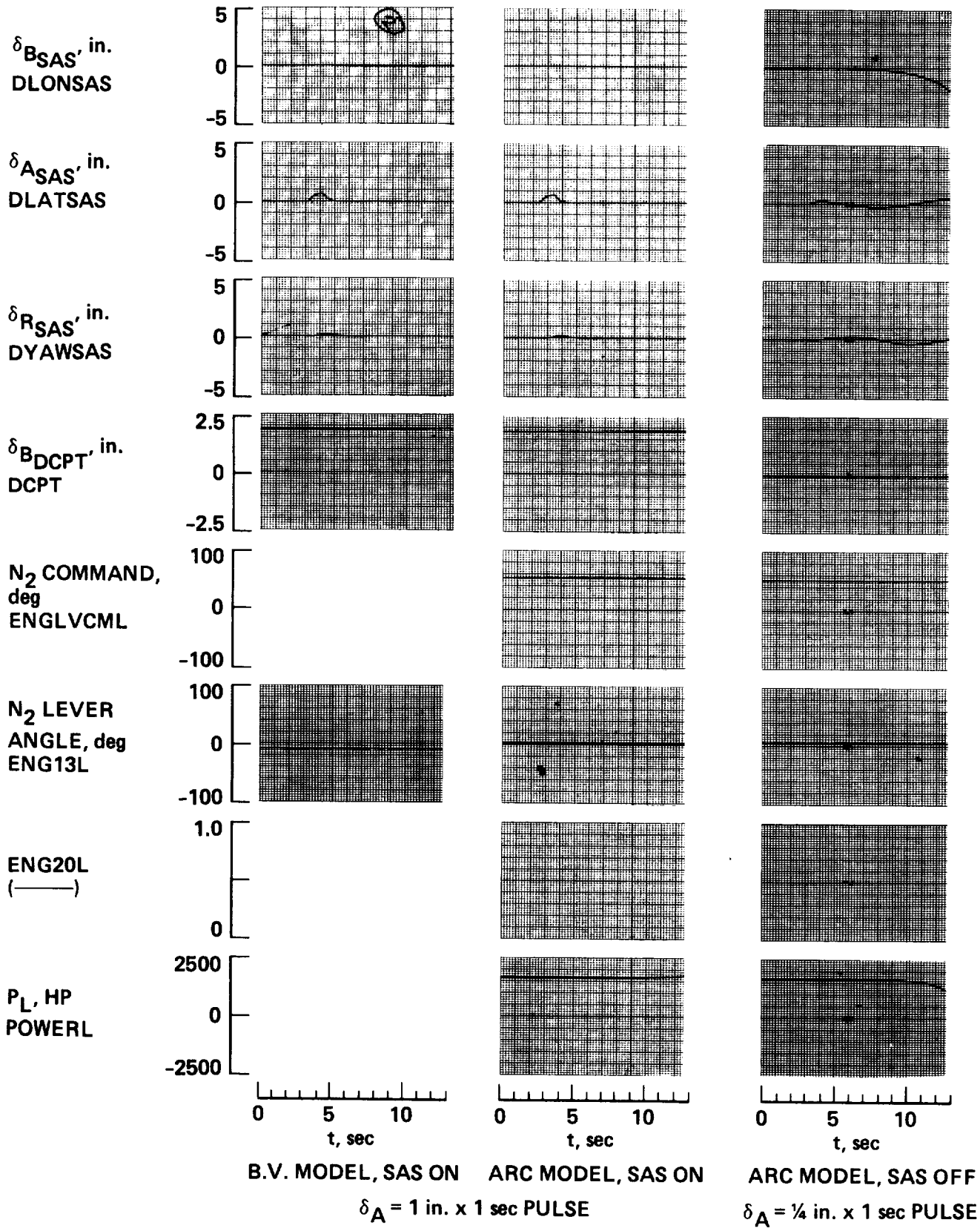

Figure 72.- BV versus ARC simulation response data; V_{eq} = 130 knots.

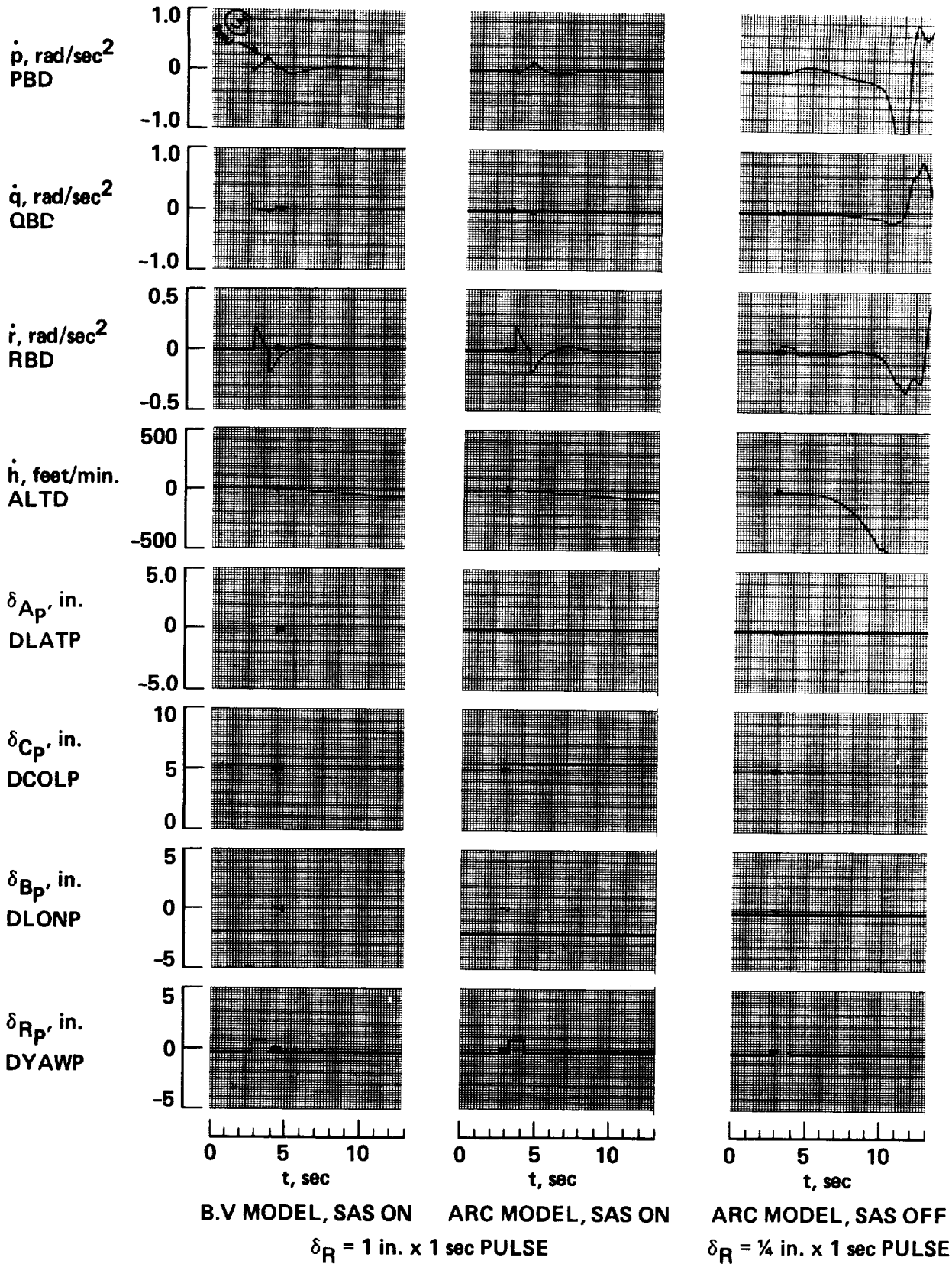

Figure 73.- BV versus ARC simulation response data; V_{eq} = 130 knots.

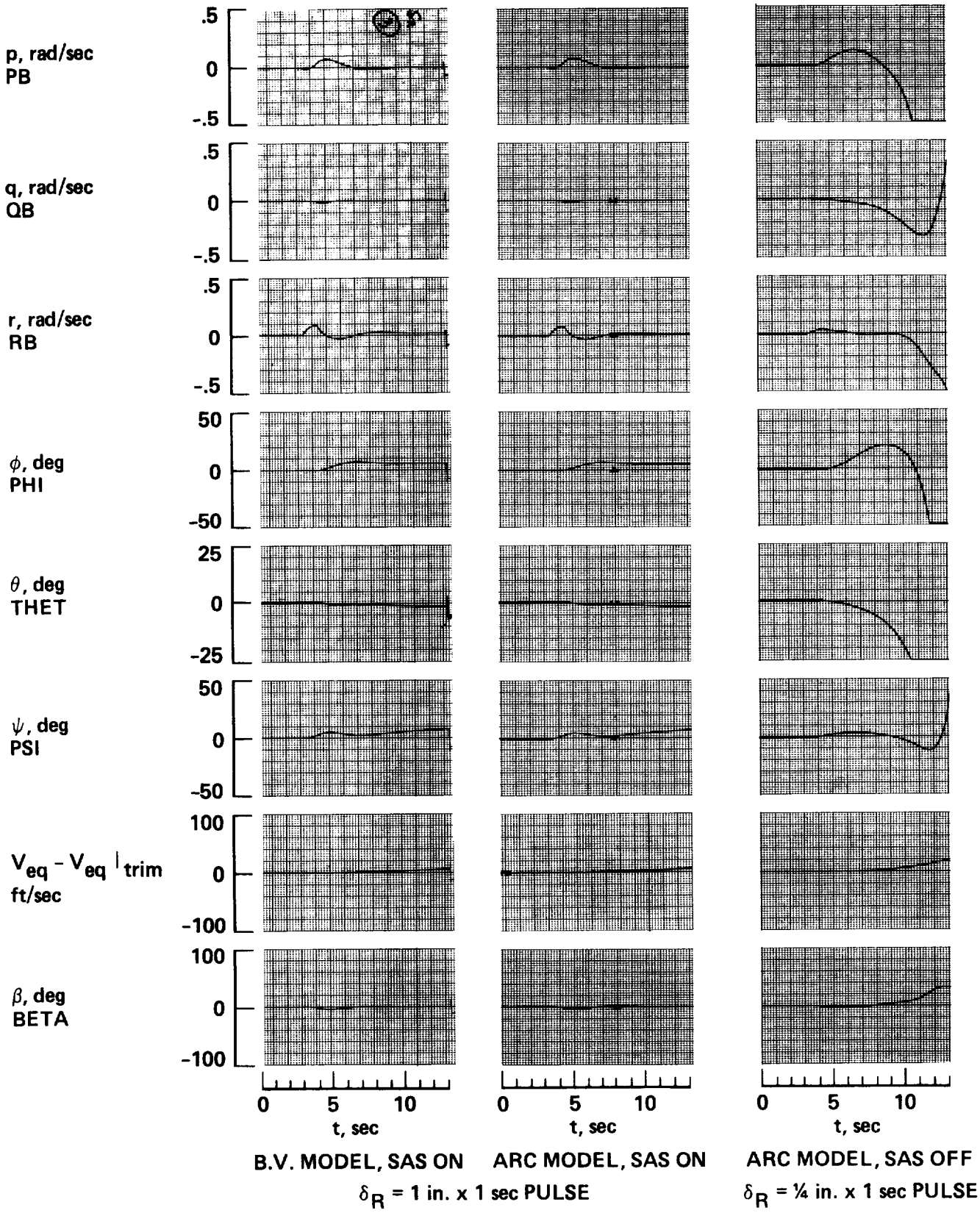

Figure 74.- BV versus ARC simulation response data; V_{eq} = 130 knots.

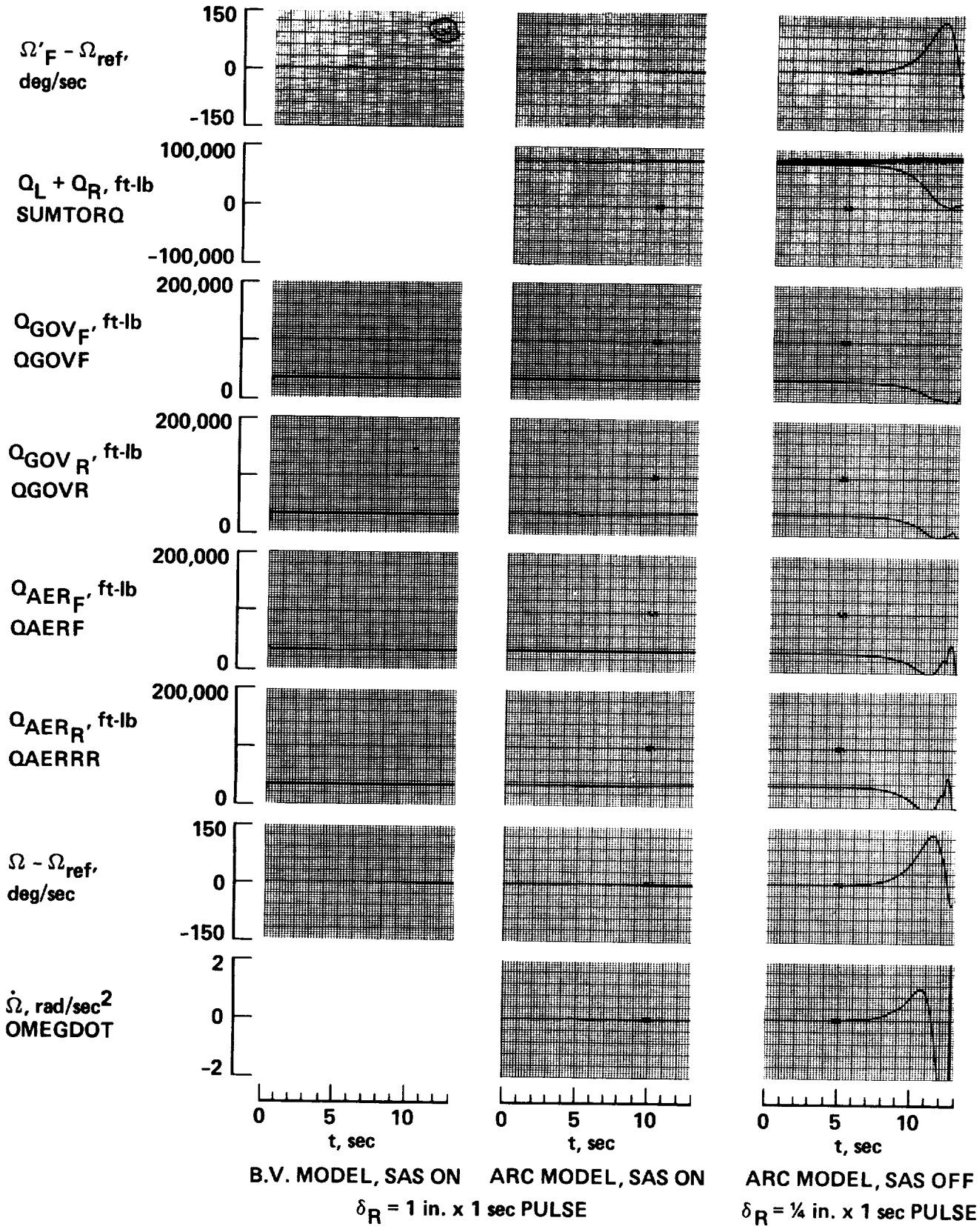

Figure 75.- BV versus ARC simulation response data; V_{eq} = 130 knots.

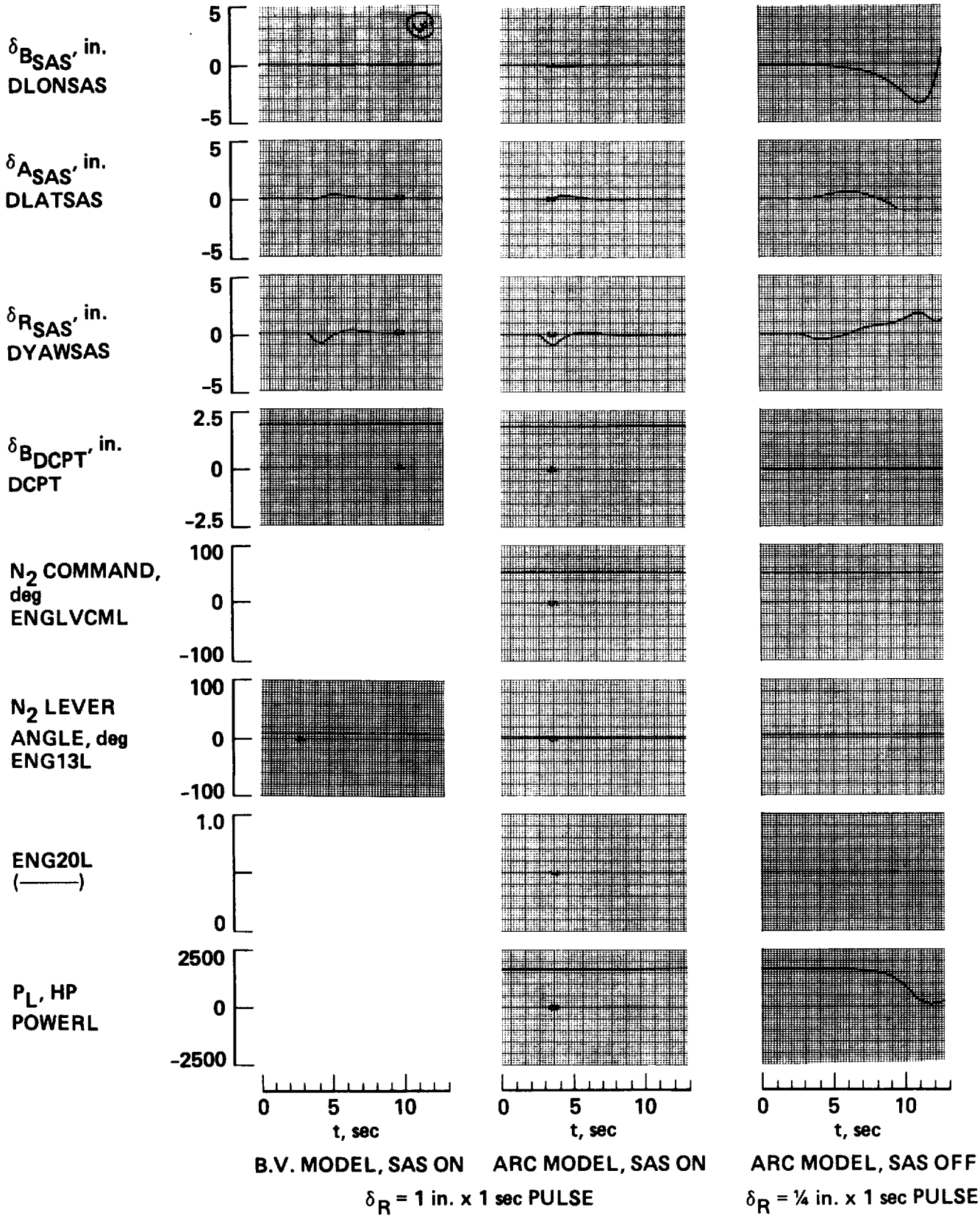

Figure 76.- BV versus ARC simulation response data; V_{eq} = 130 knots.

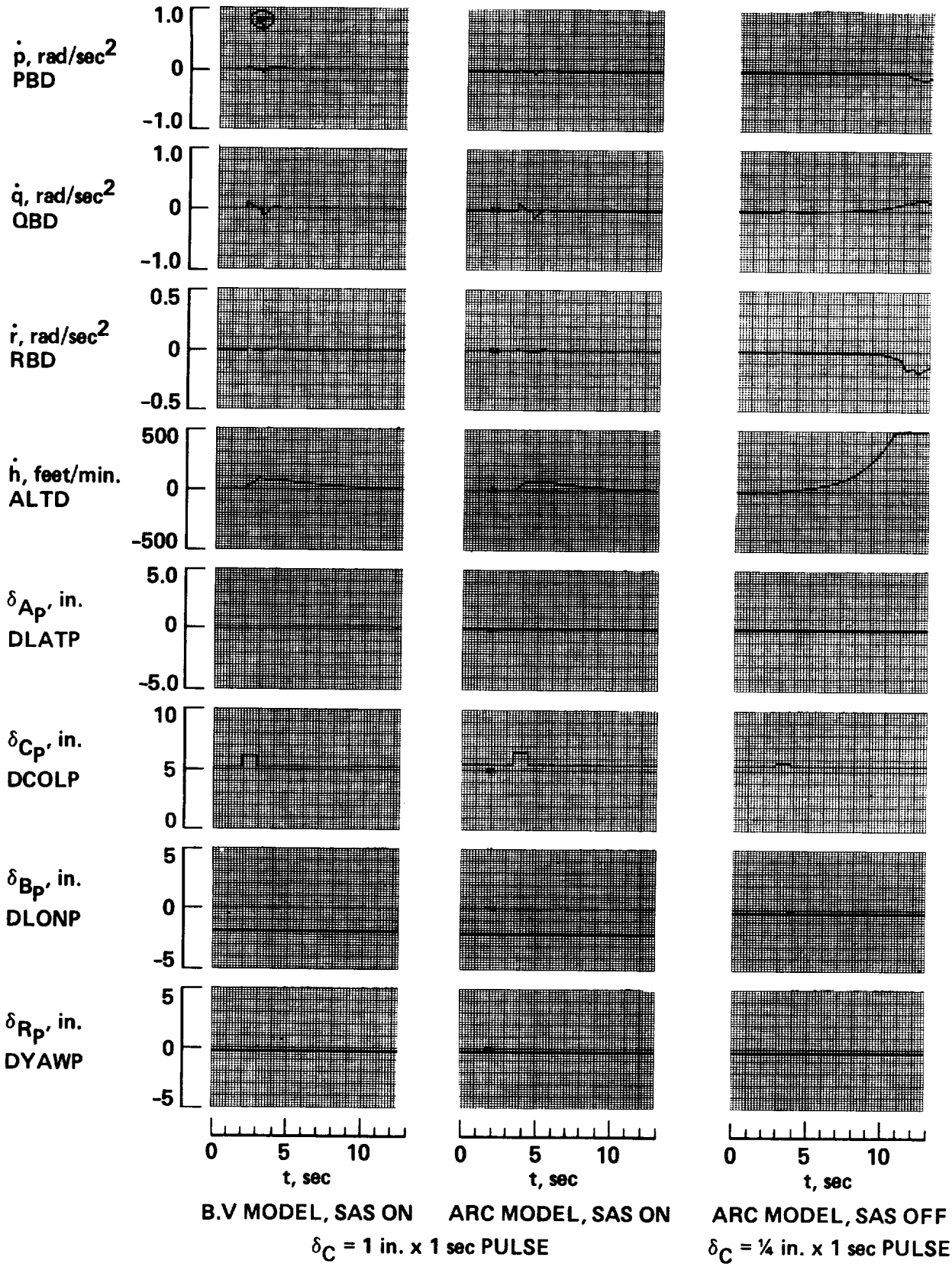

Figure 77.- BV versus ARC simulation response data; V_{eq} = 130 knots.

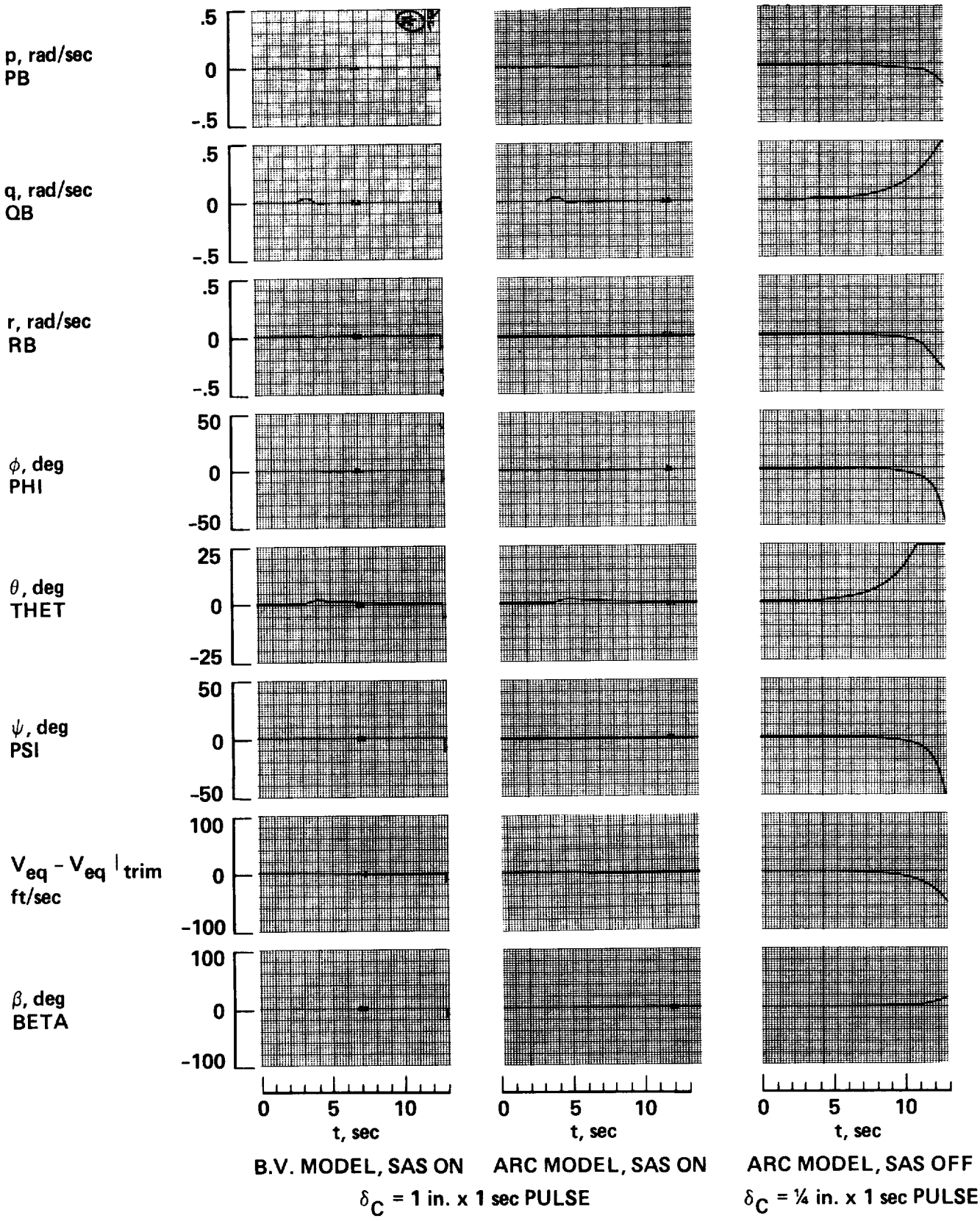

Figure 78.- BV versus ARC simulation response data; V_{eq} = 130 knots.

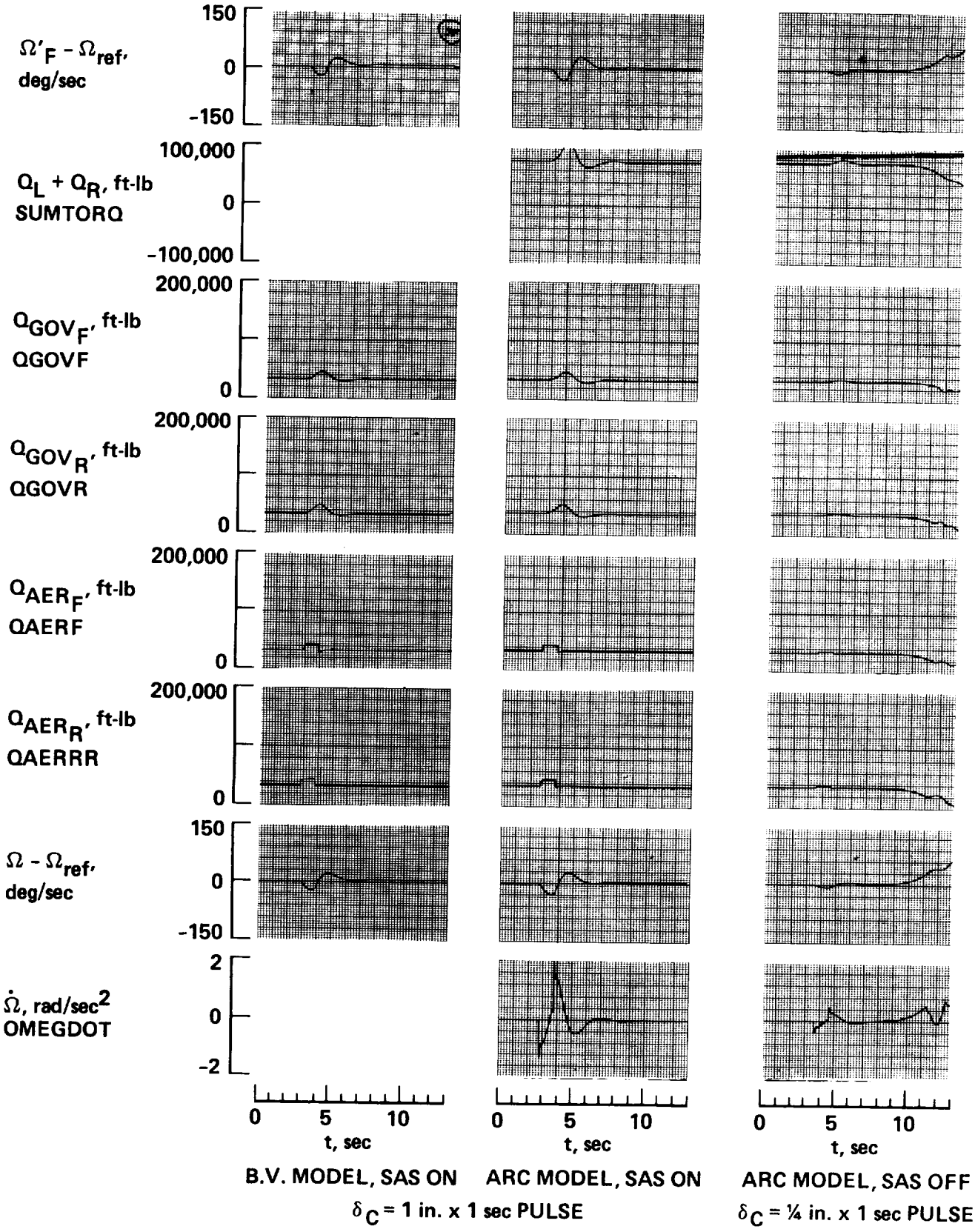

Figure 79.- BV versus ARC simulation response data; V_{eq} = 130 knots.

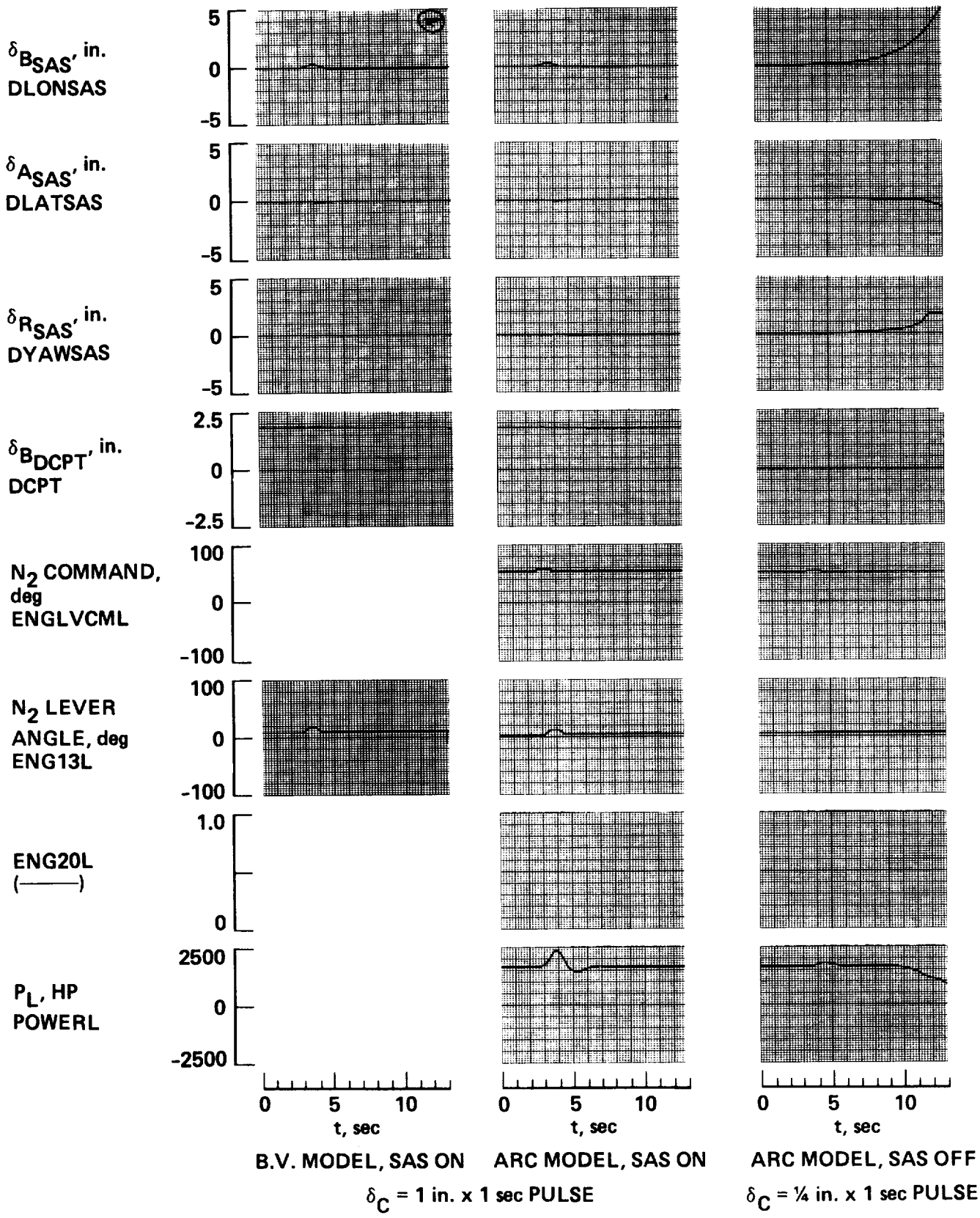

Figure 80.- BV versus ARC simulation response data; V_{eq} = 130 knots.

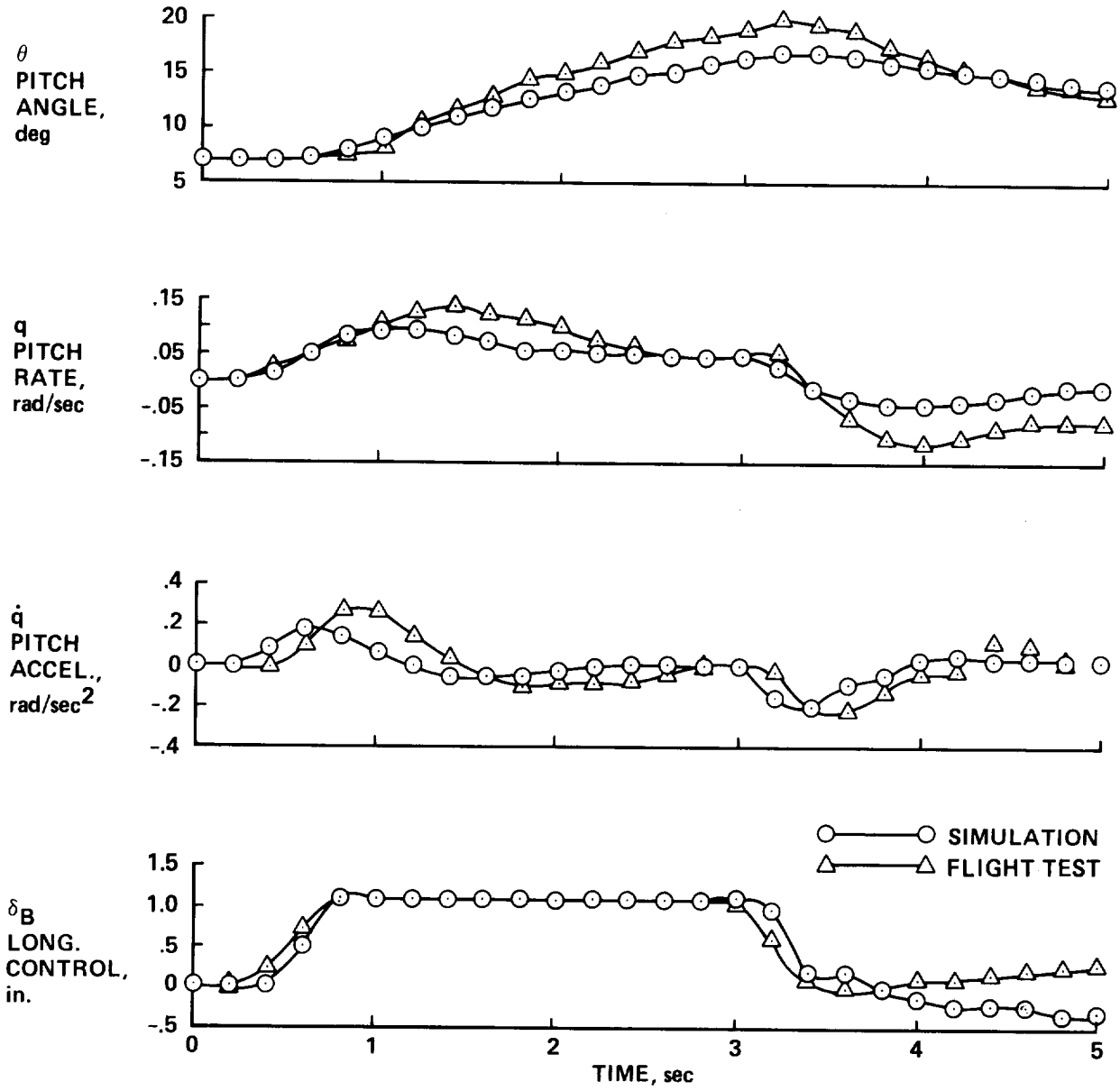

Figure 81.- BV simulation versus flight test dynamic response data (refs. 2,4), hover.

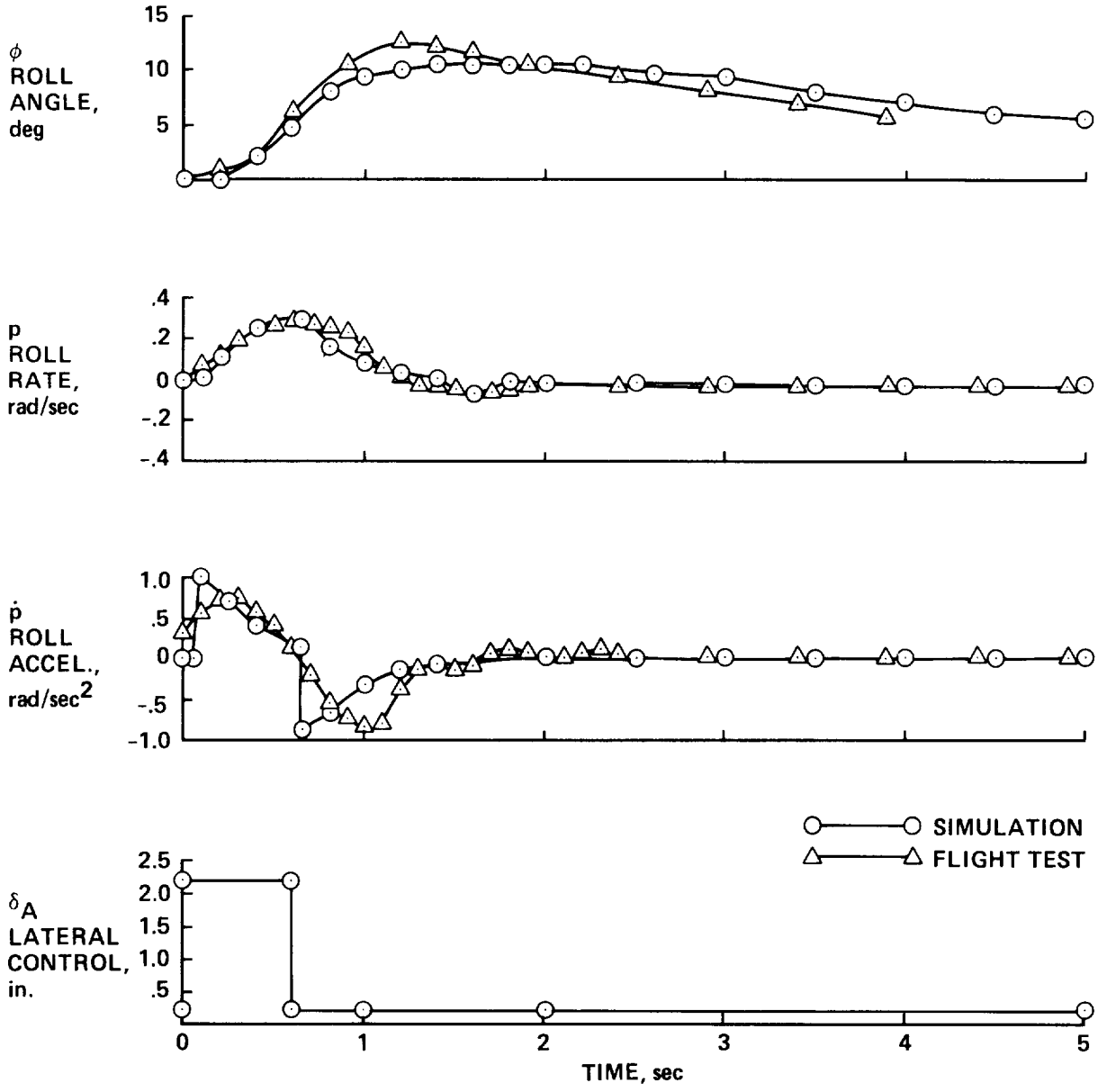

Figure 82.- BV simulation versus flight test dynamic response data (refs. 2,4), V_{eq} = 35 knots.

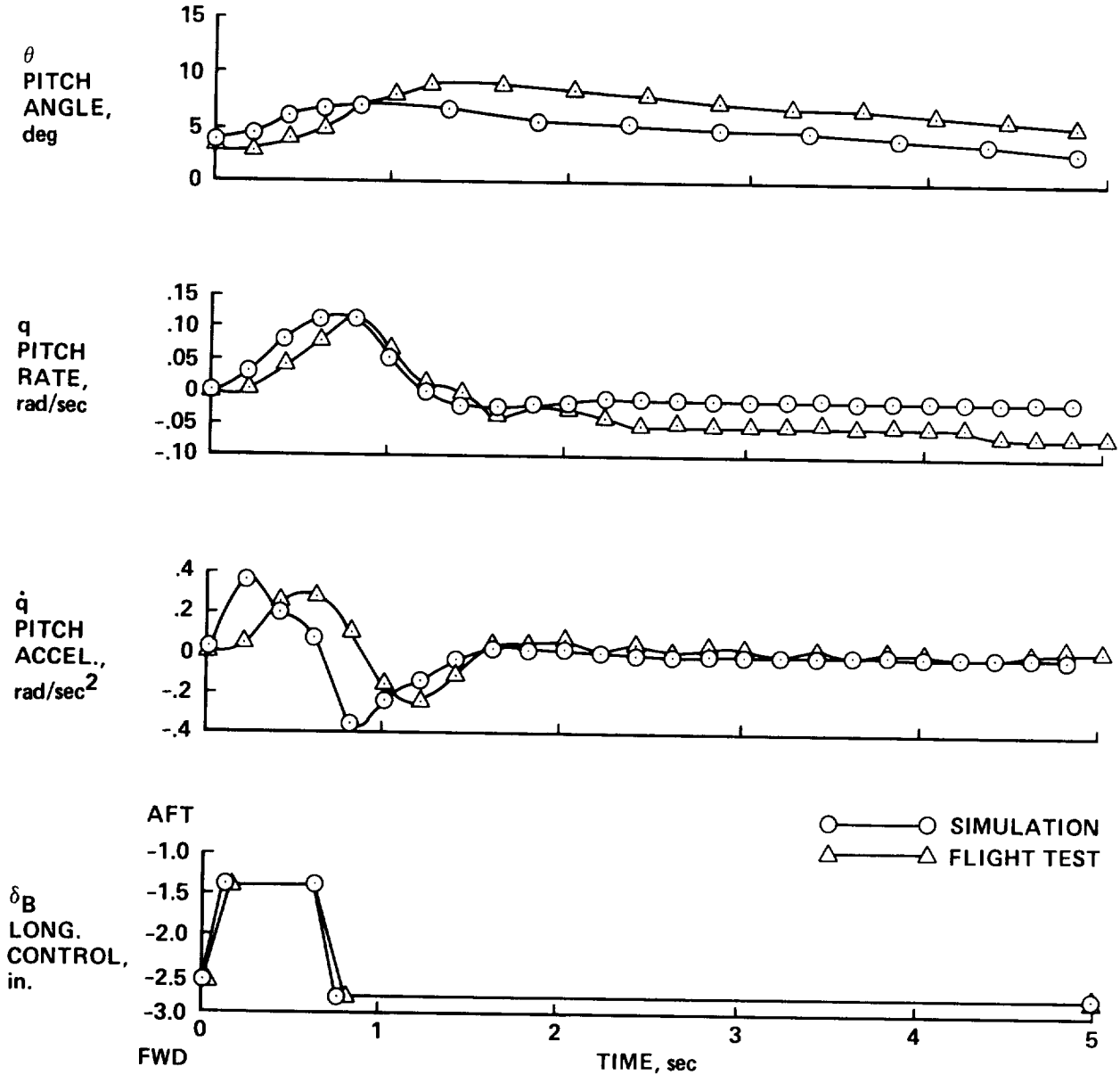

Figure 83.- BV simulation versus flight test dynamic response data (refs. 2,4), V_{eq} = 70 knots.

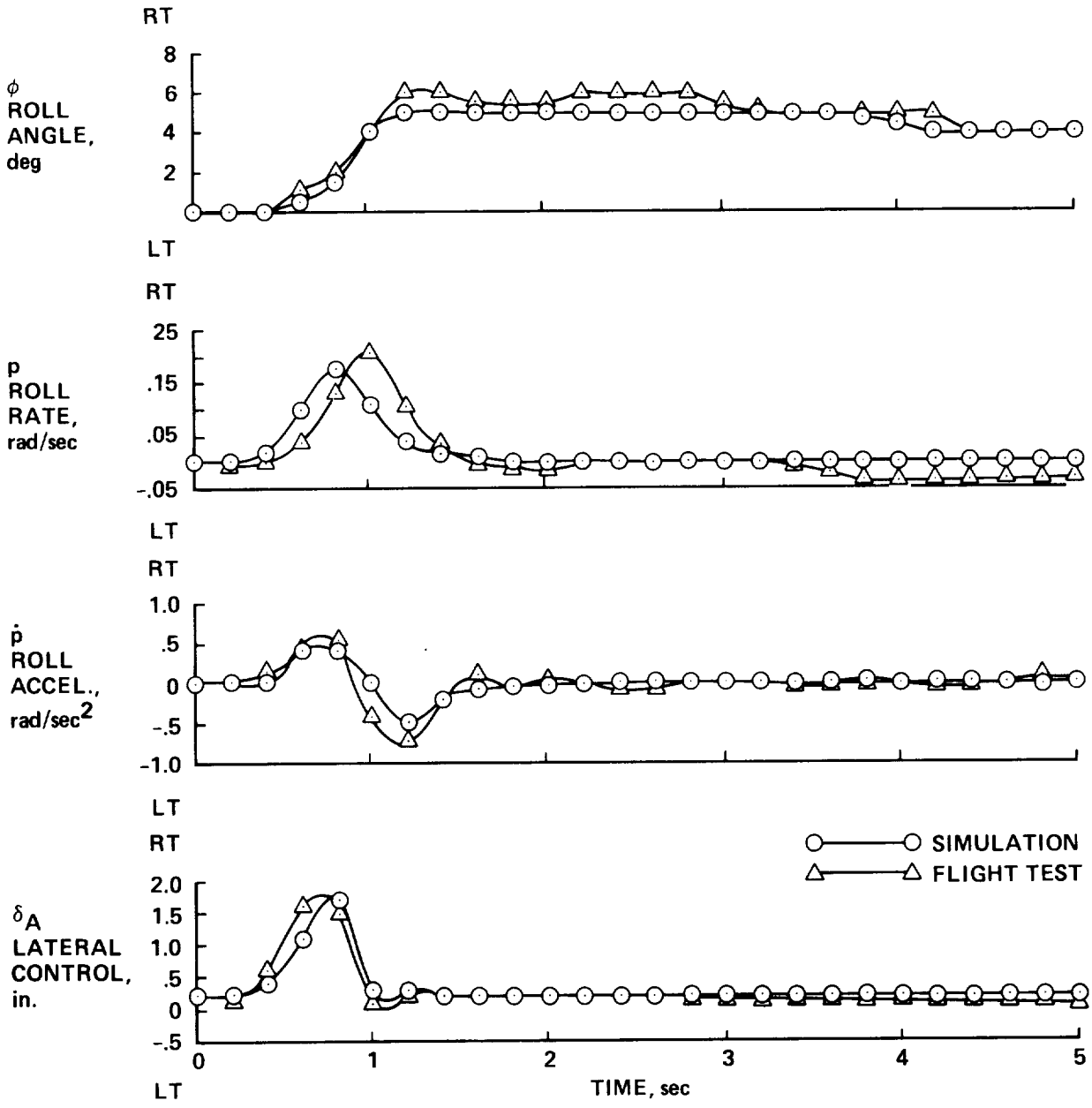

Figure 84.- BV simulation versus flight test dynamic response data (refs. 2,4), V_{eq} = 110 knots.

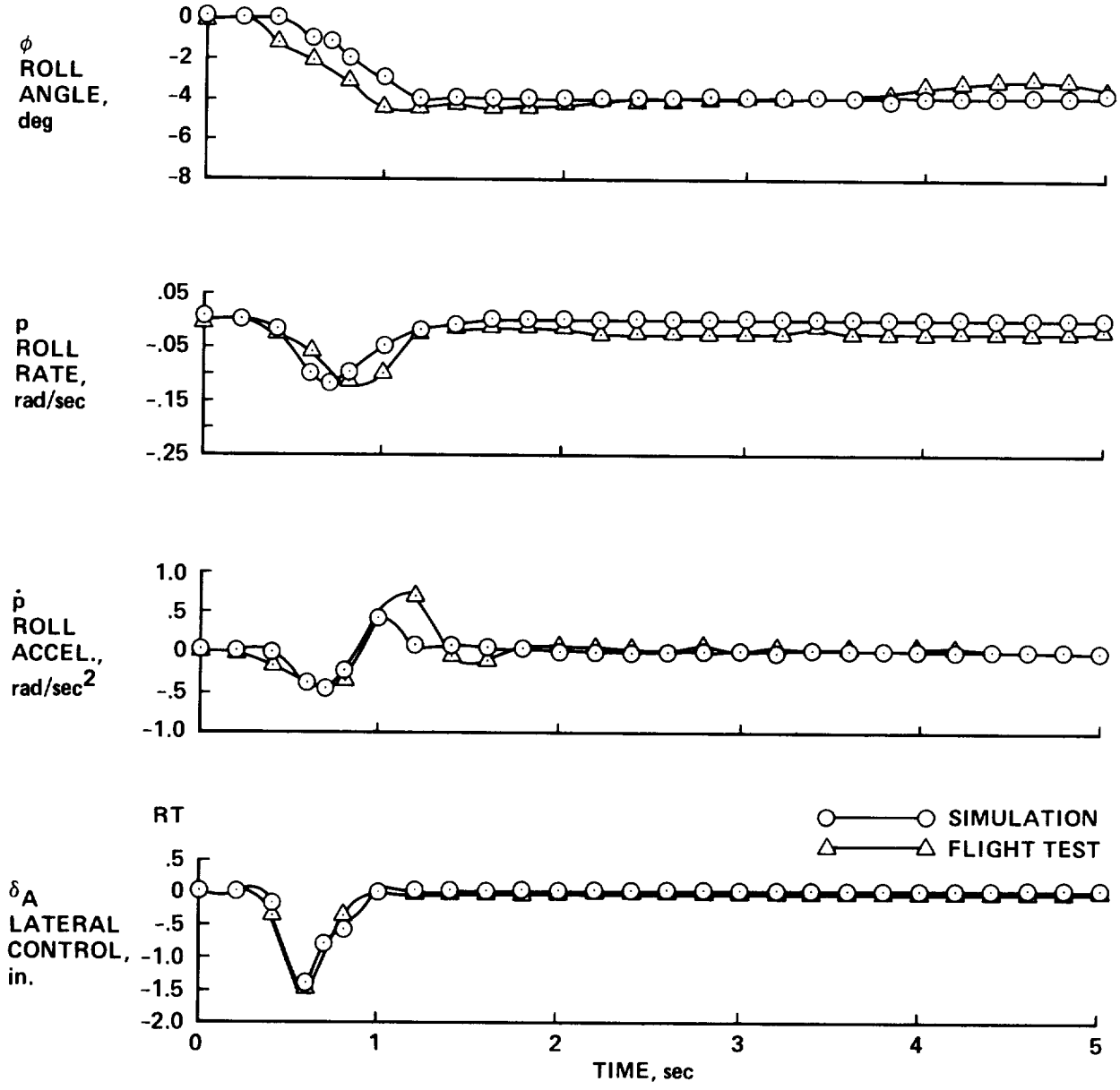

Figure 85.- BV simulation versus flight test dynamic response data (refs. 2,4), V_{eq} = 115 knots.

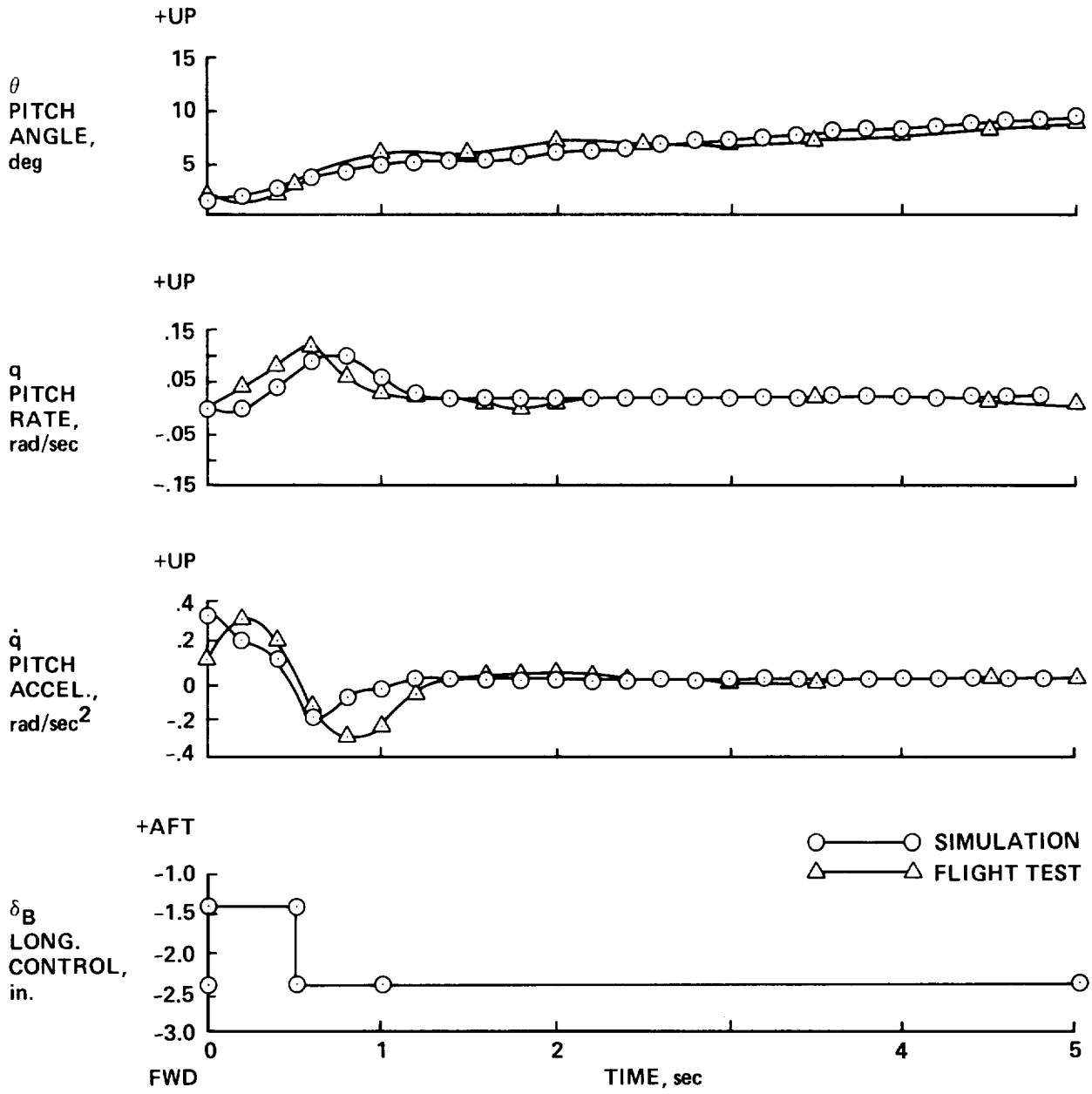

Figure 86.- BV simulation versus flight test dynamic response data (refs. 2,4), V_{eq} = 127 knots.

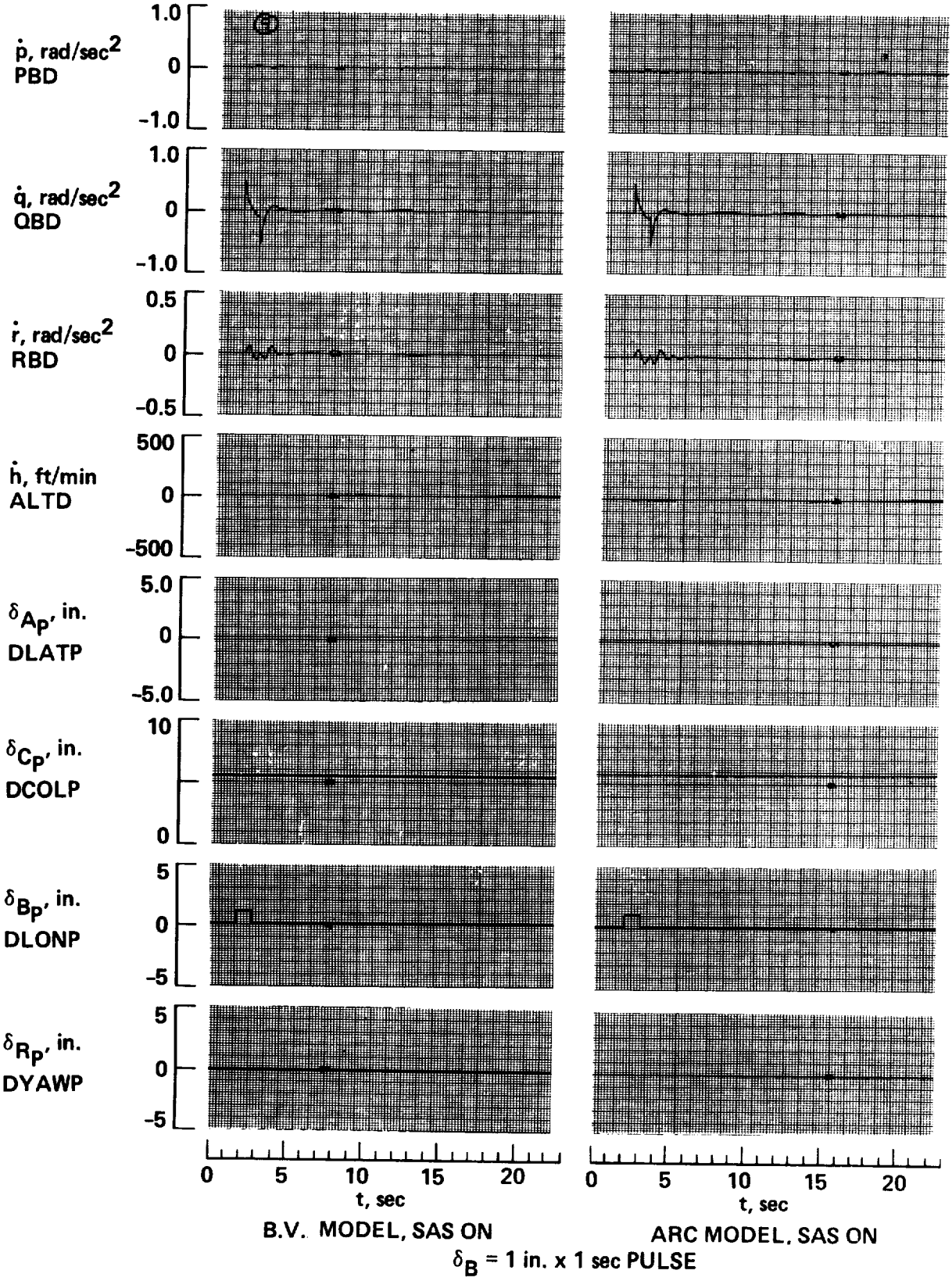

Figure 87.- BV versus ARC simulation response data, slung load attached; hover.

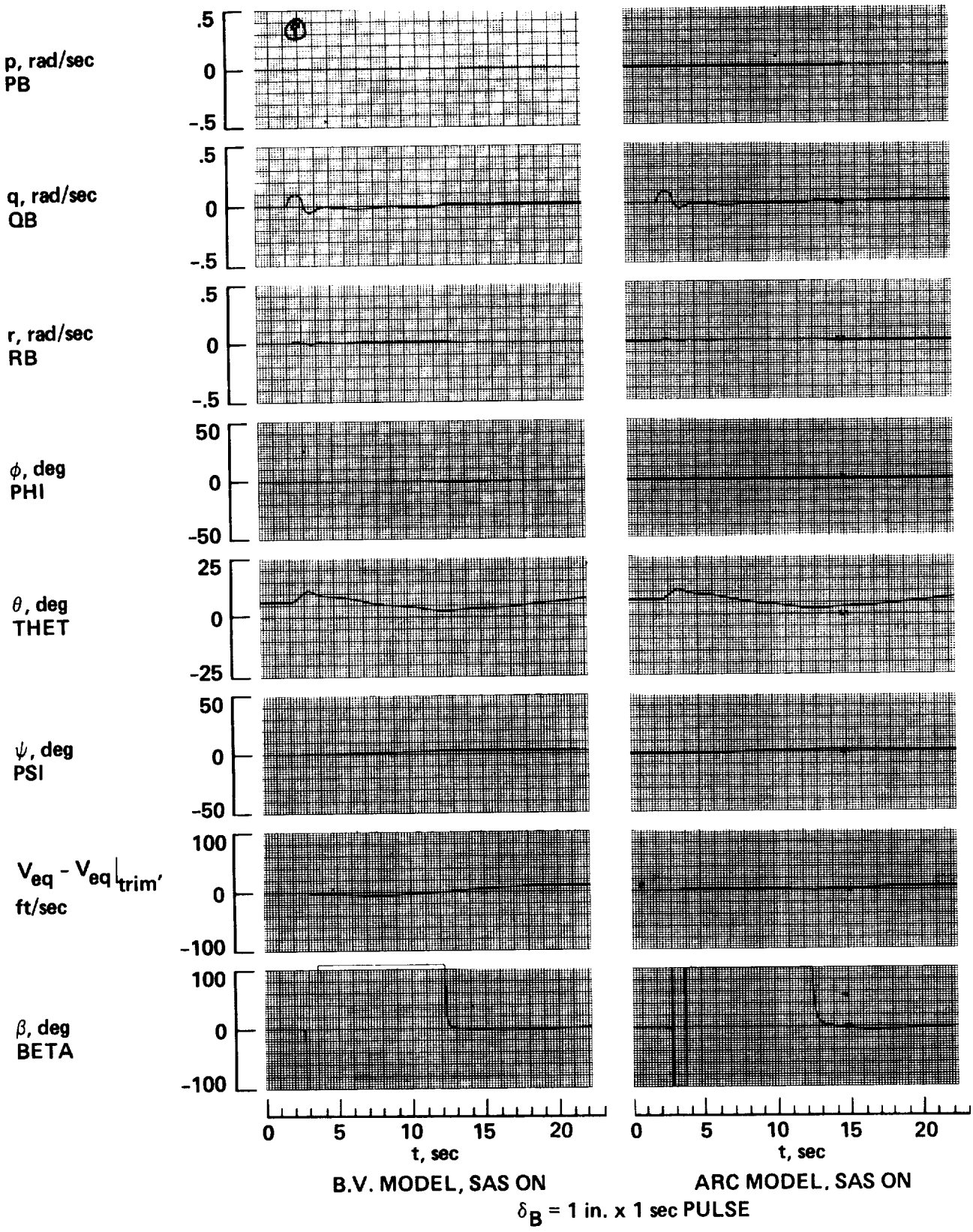

Figure 88.- BV versus ARC simulation response data, slung load attached; hover.

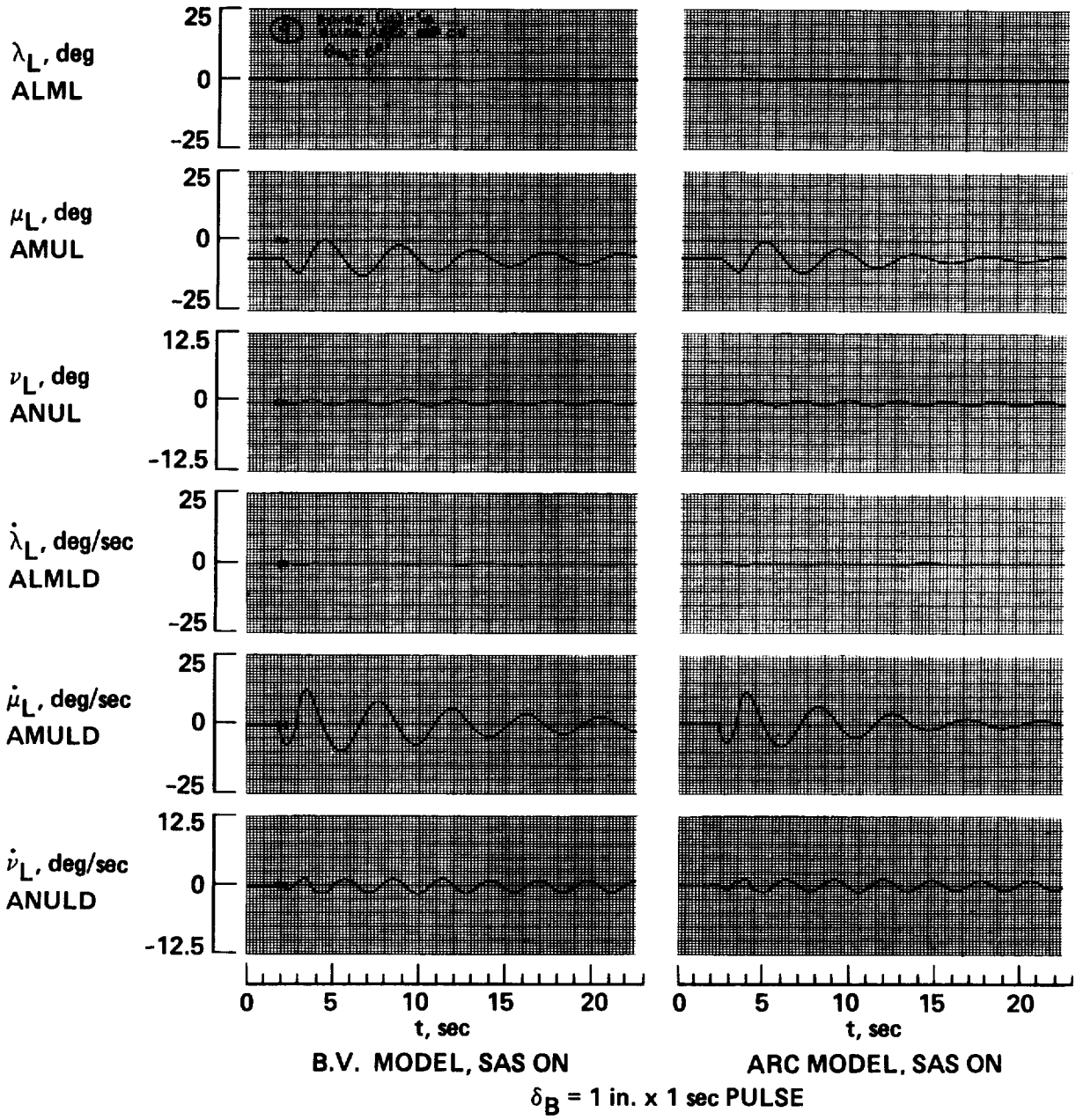

Figure 89.- BV versus ARC simulation response data, slung load attached; hover.

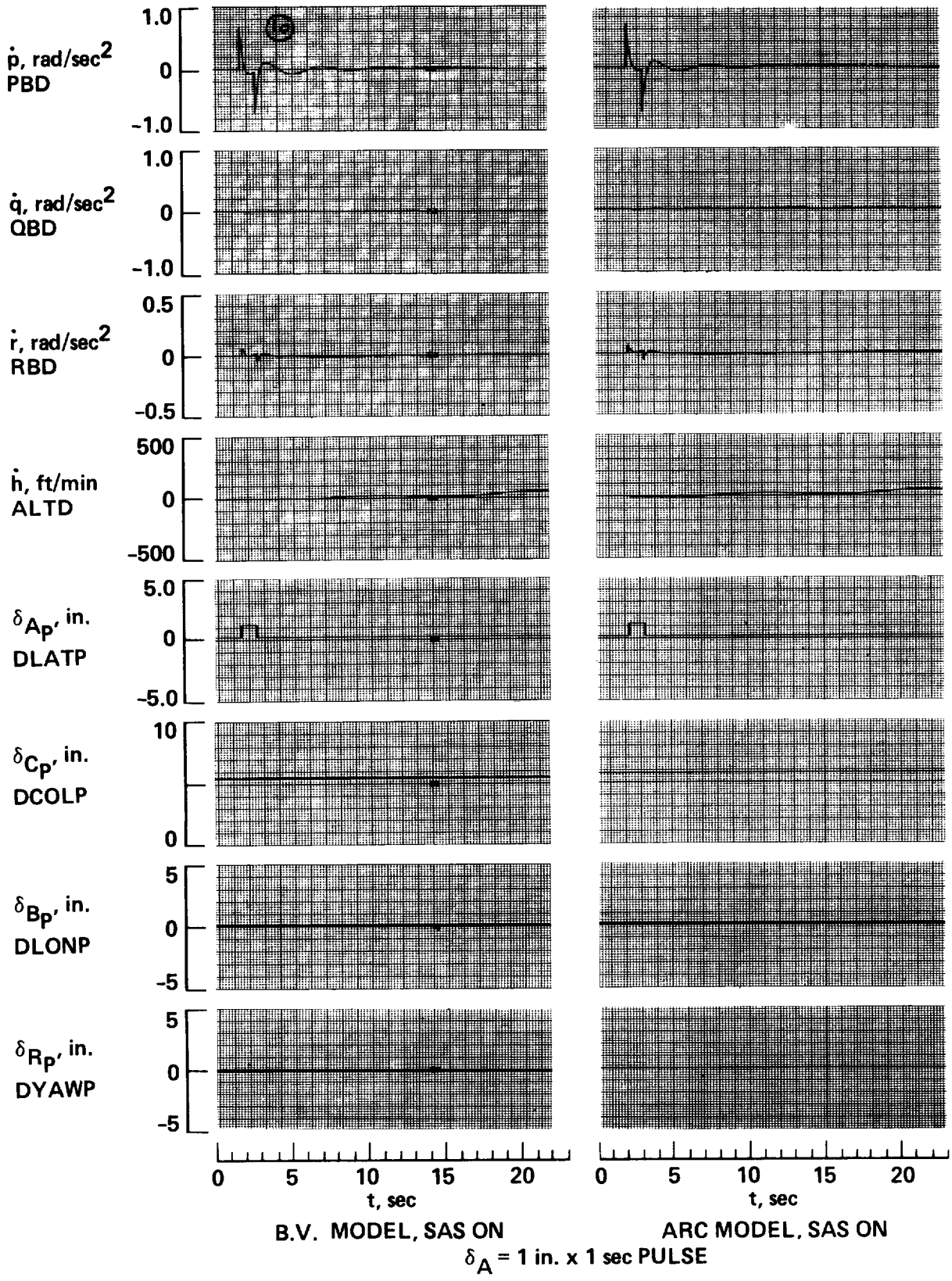

Figure 90.- BV versus ARC simulation response data, slung load attached; hover.

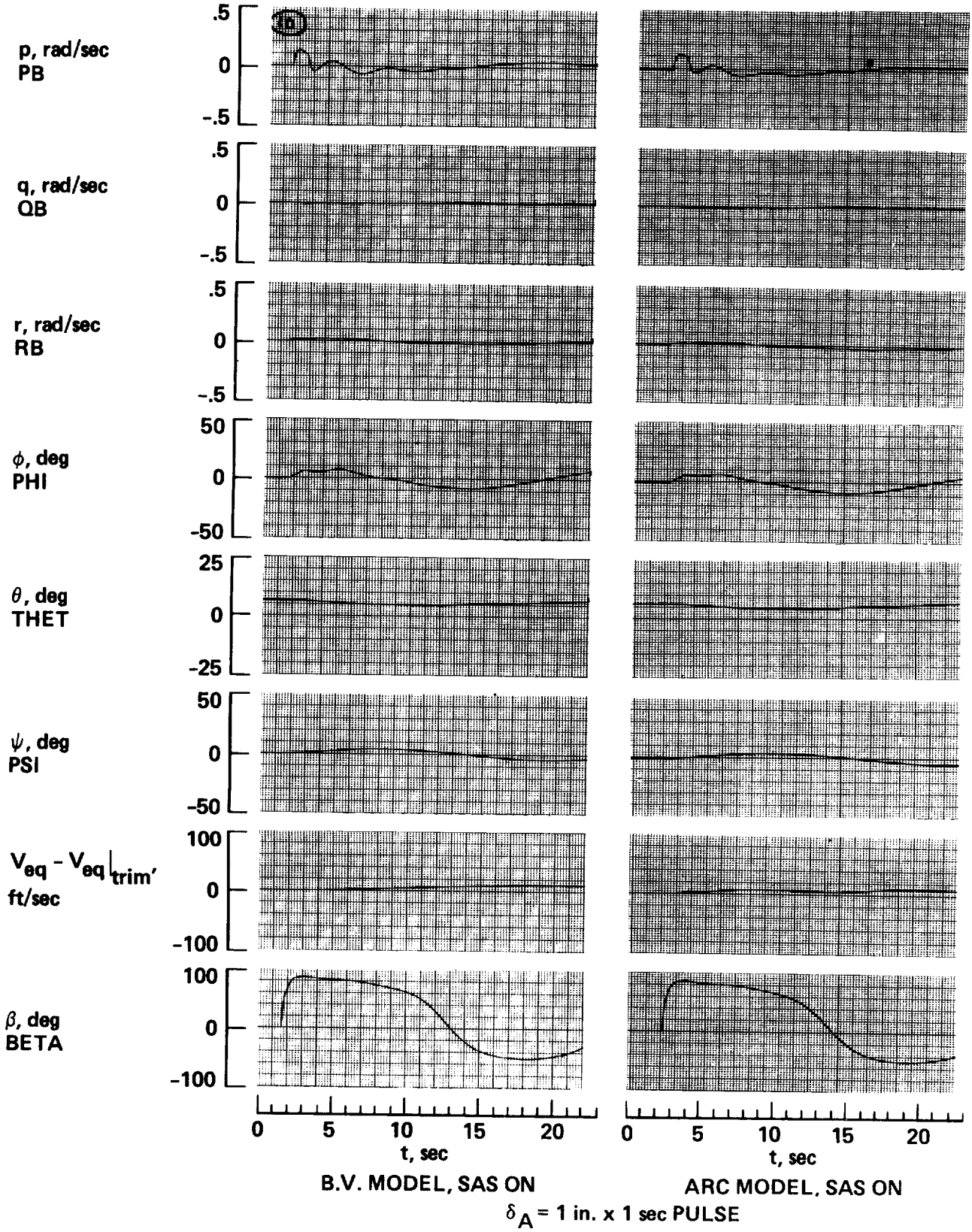

Figure 91.- BV versus ARC simulation response data, slung load attached; hover.

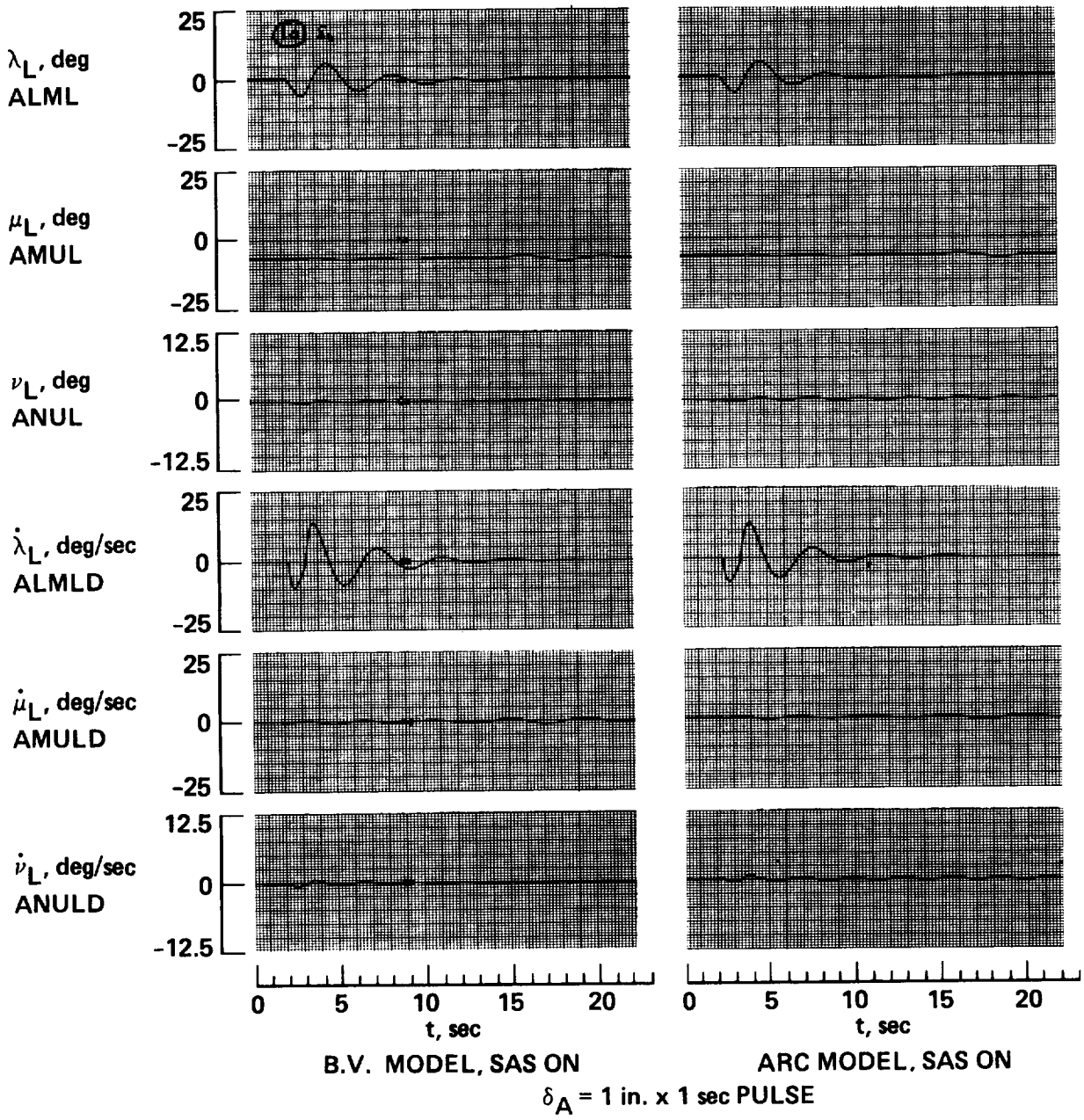

Figure 92.- BV versus ARC simulation response data, slung load attached; hover.

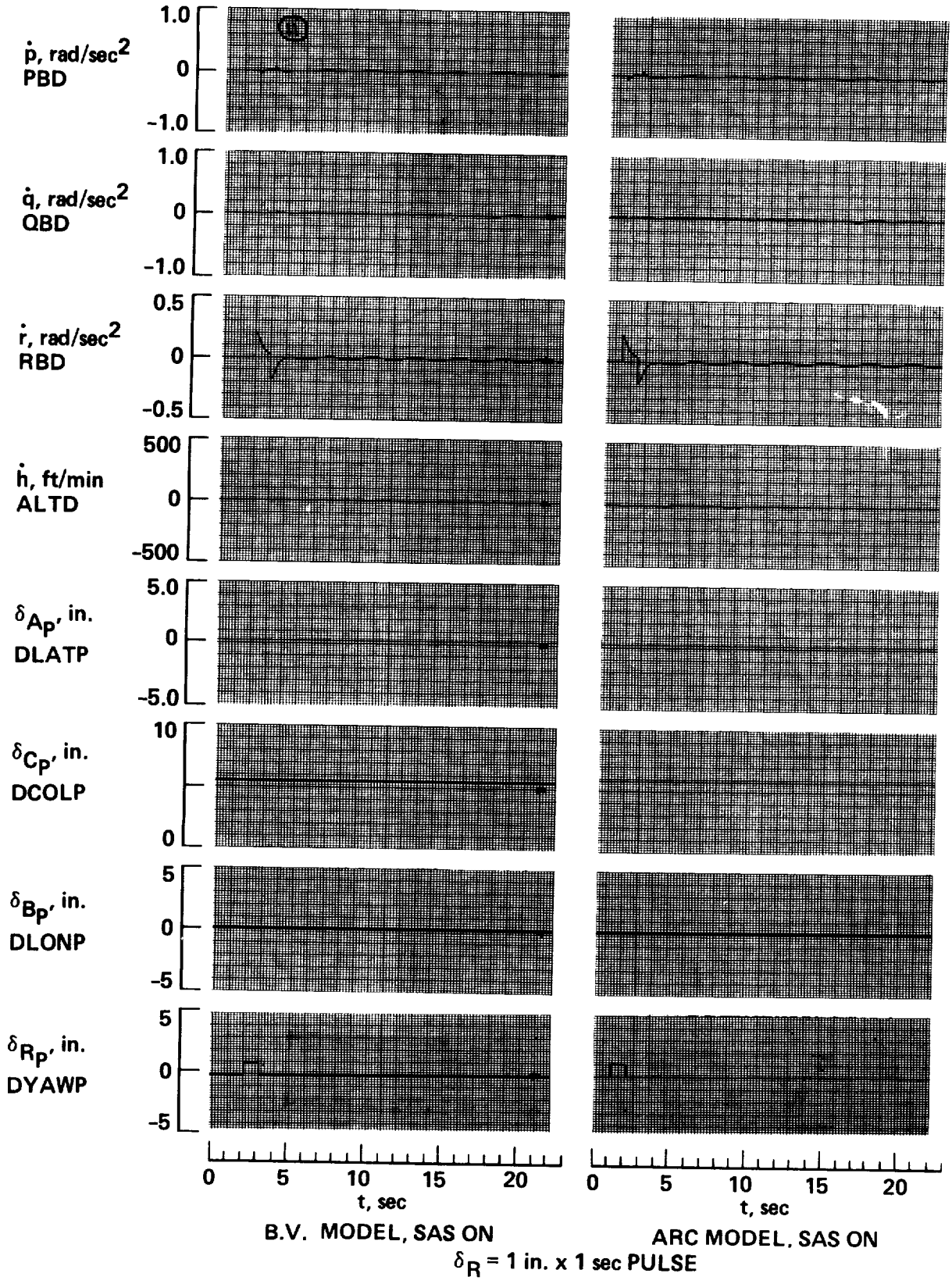

Figure 93.- BV versus ARC simulation response data, slung load attached; hover.

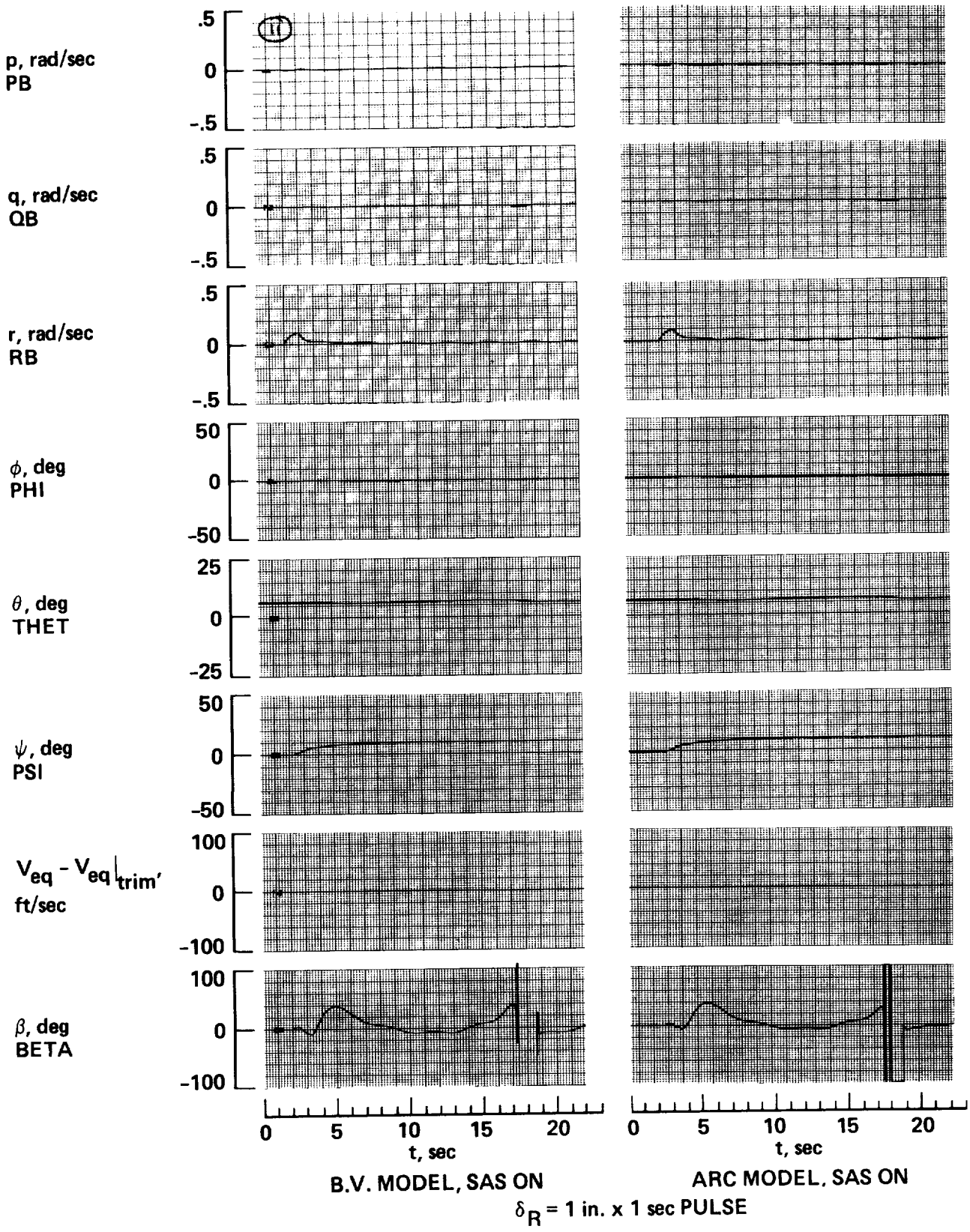

Figure 94.- BV versus ARC simulation response data, slung load attached; hover.

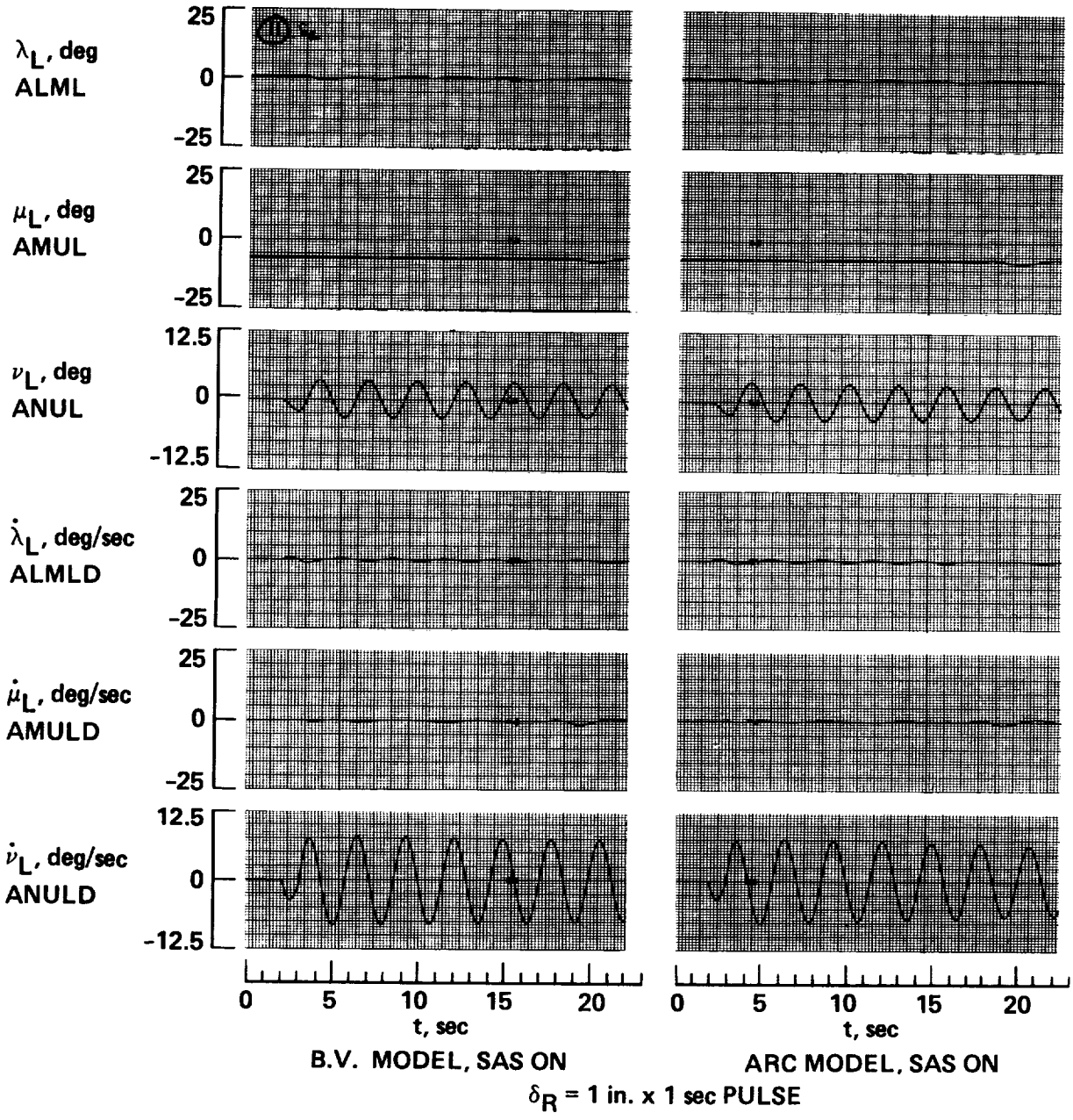

Figure 95.- BV versus ARC simulation response data, slung load attached; hover.

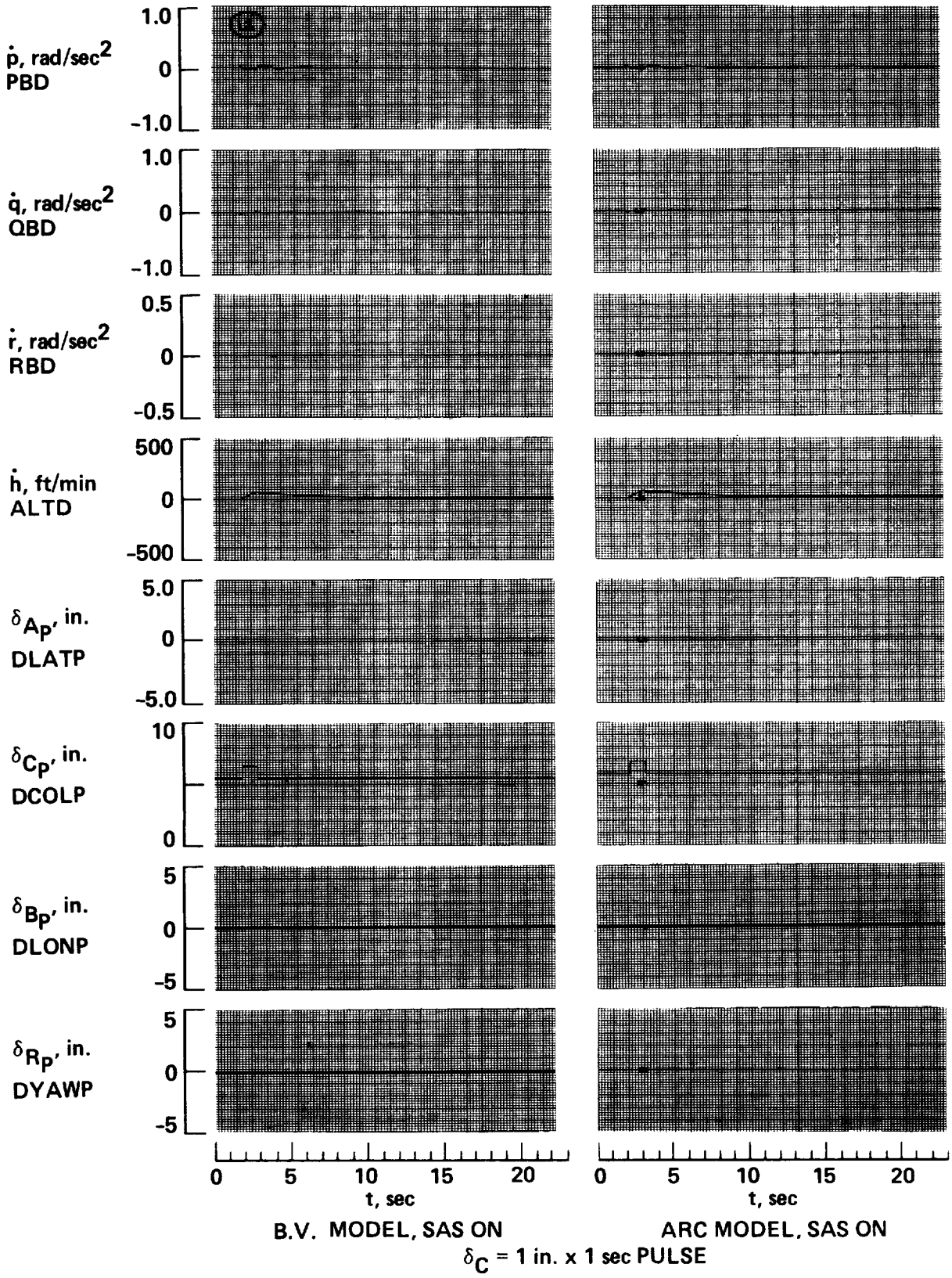

Figure 96.- BV versus ARC simulation response data, slung load attached; hover.

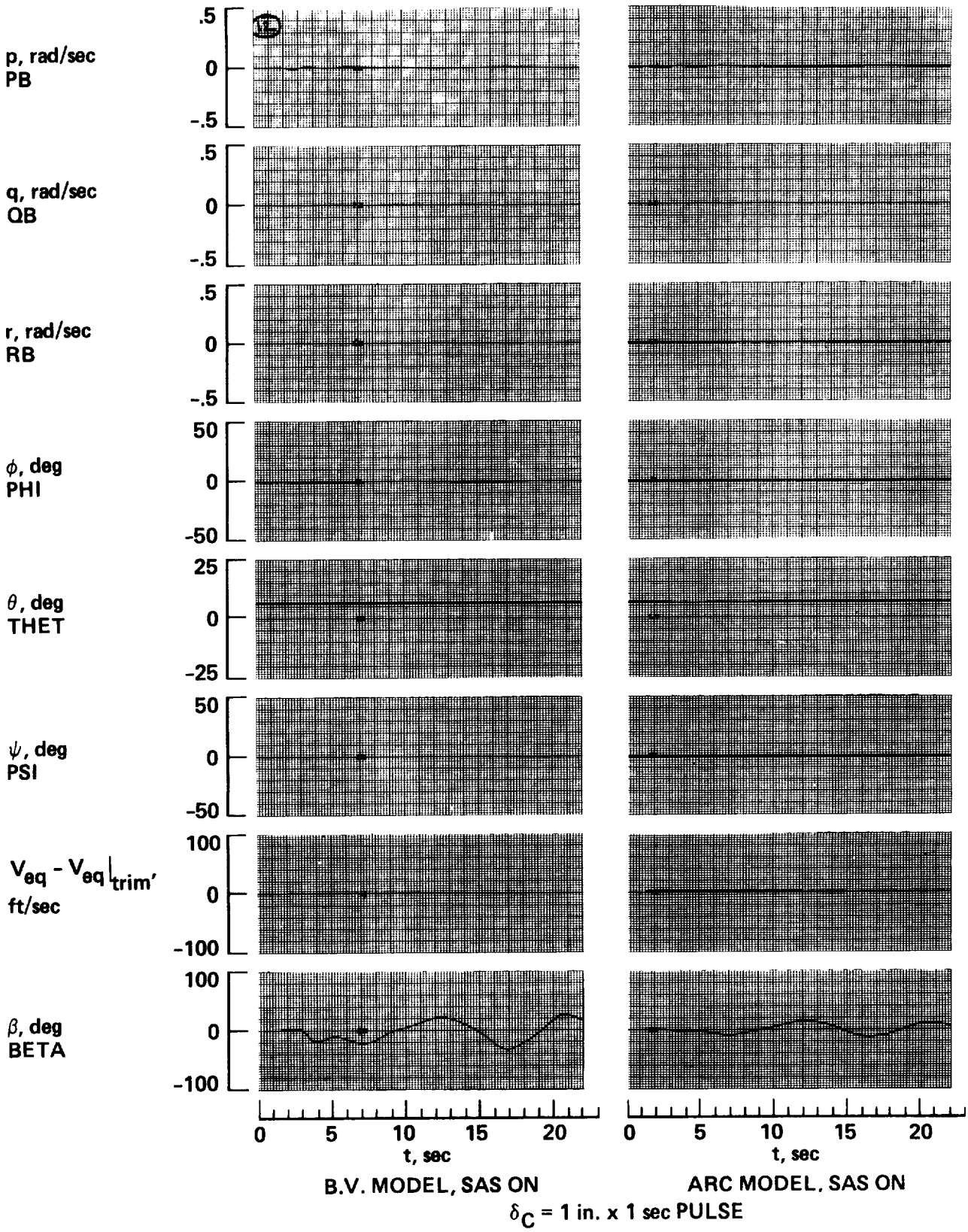

Figure 97.- BV versus ARC simulation response data, slung load attached; hover.

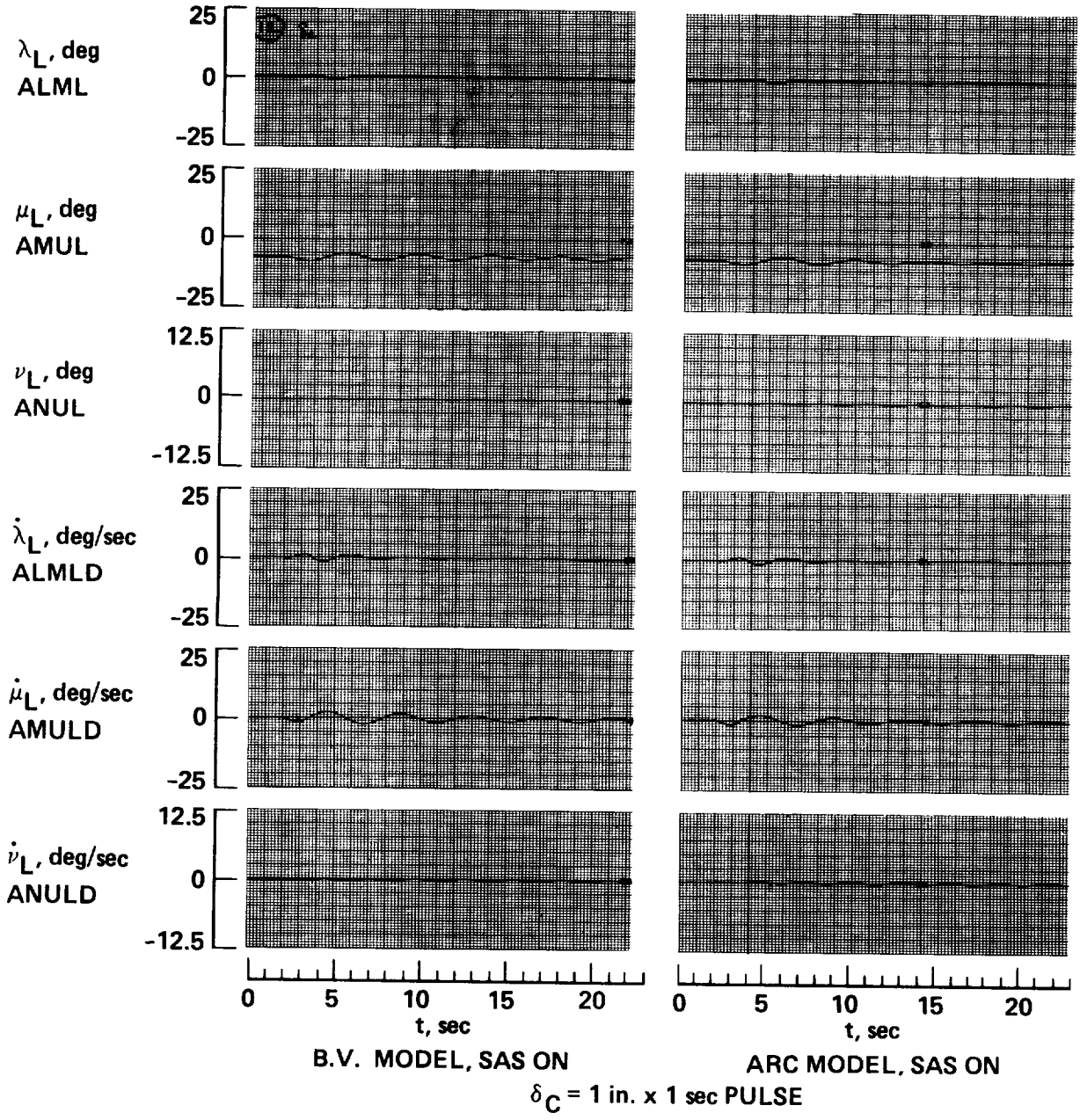

Figure 98.- BV versus ARC simulation response data, slung load attached; hover.

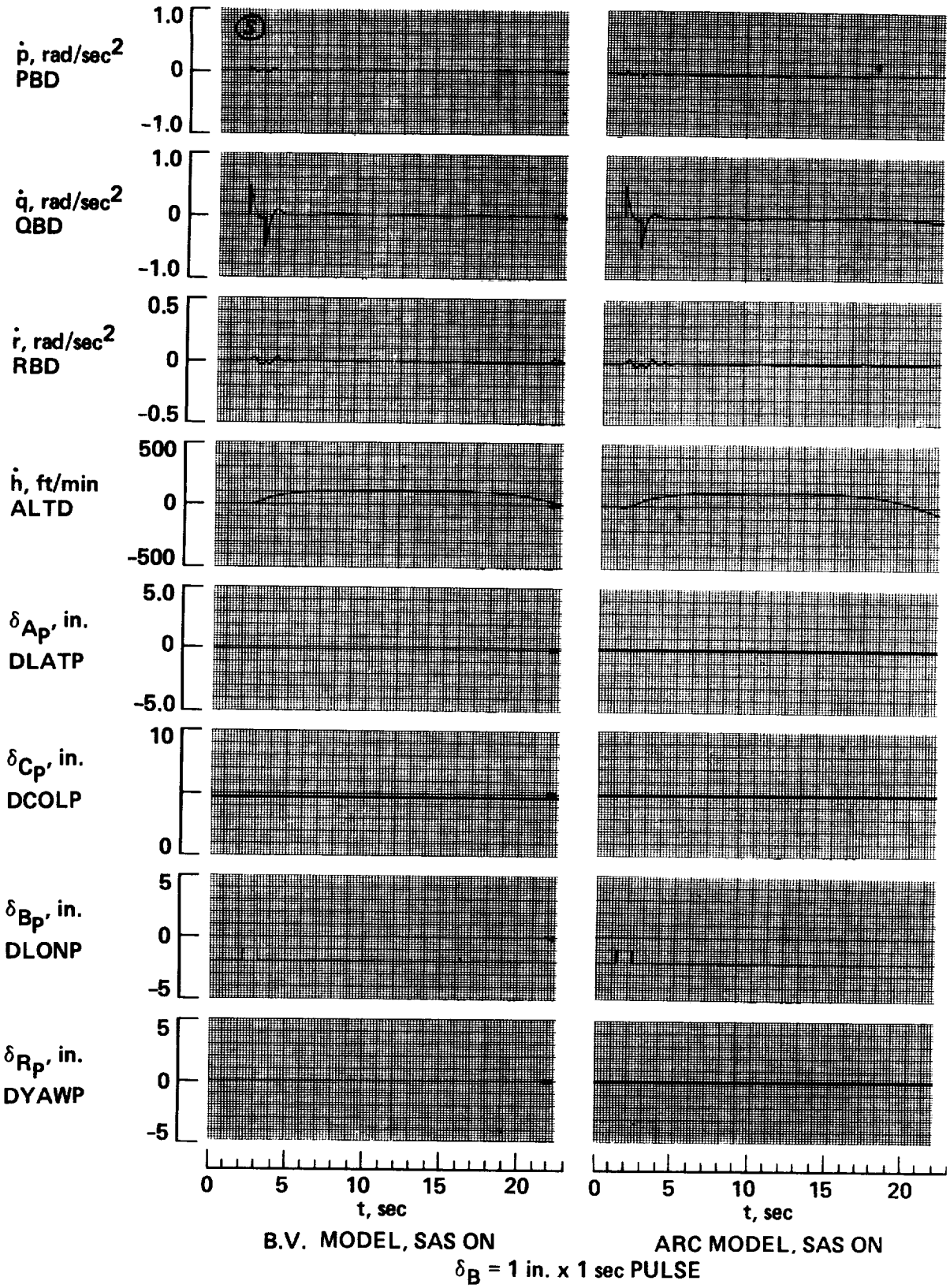

Figure 99.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

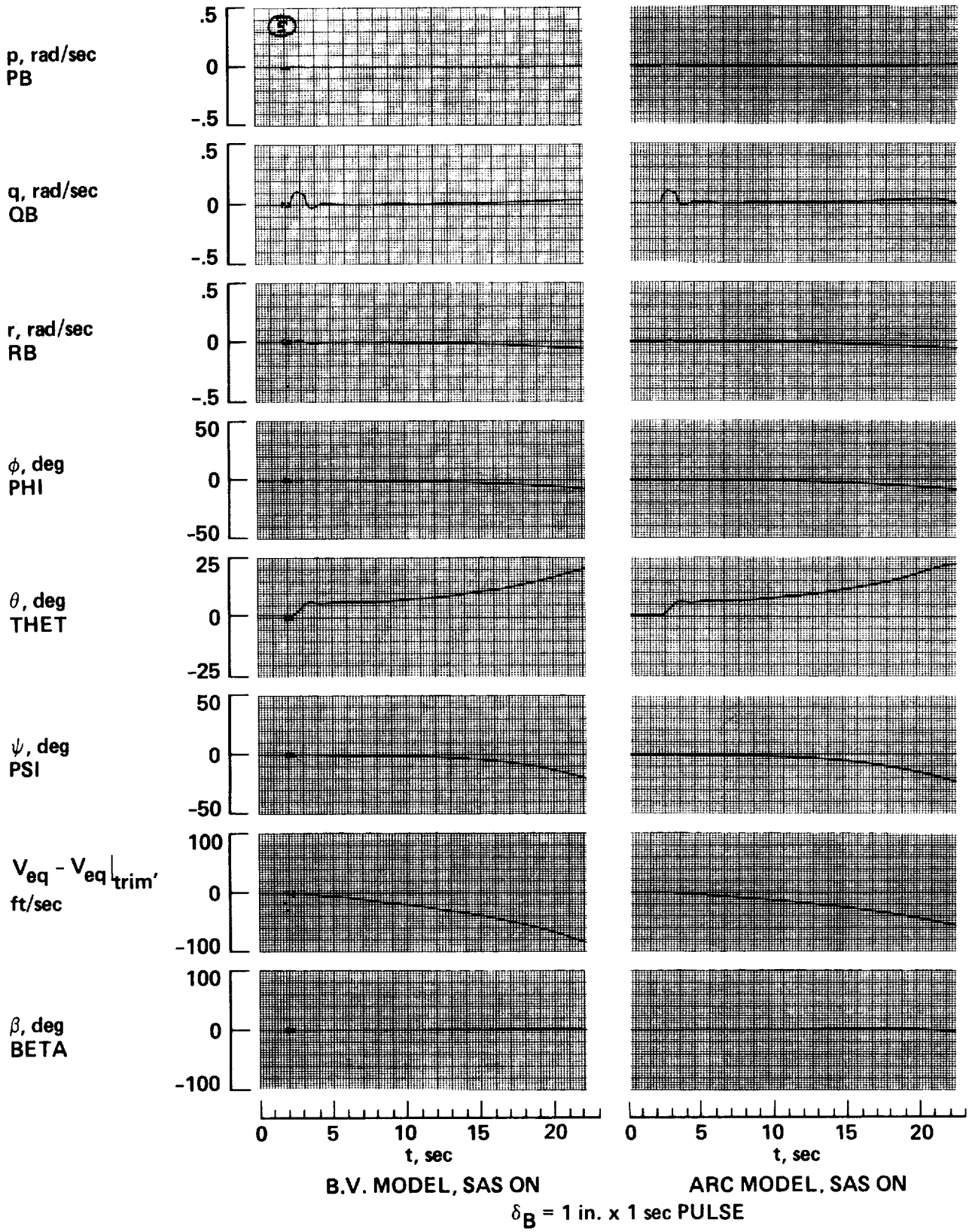

Figure 100.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

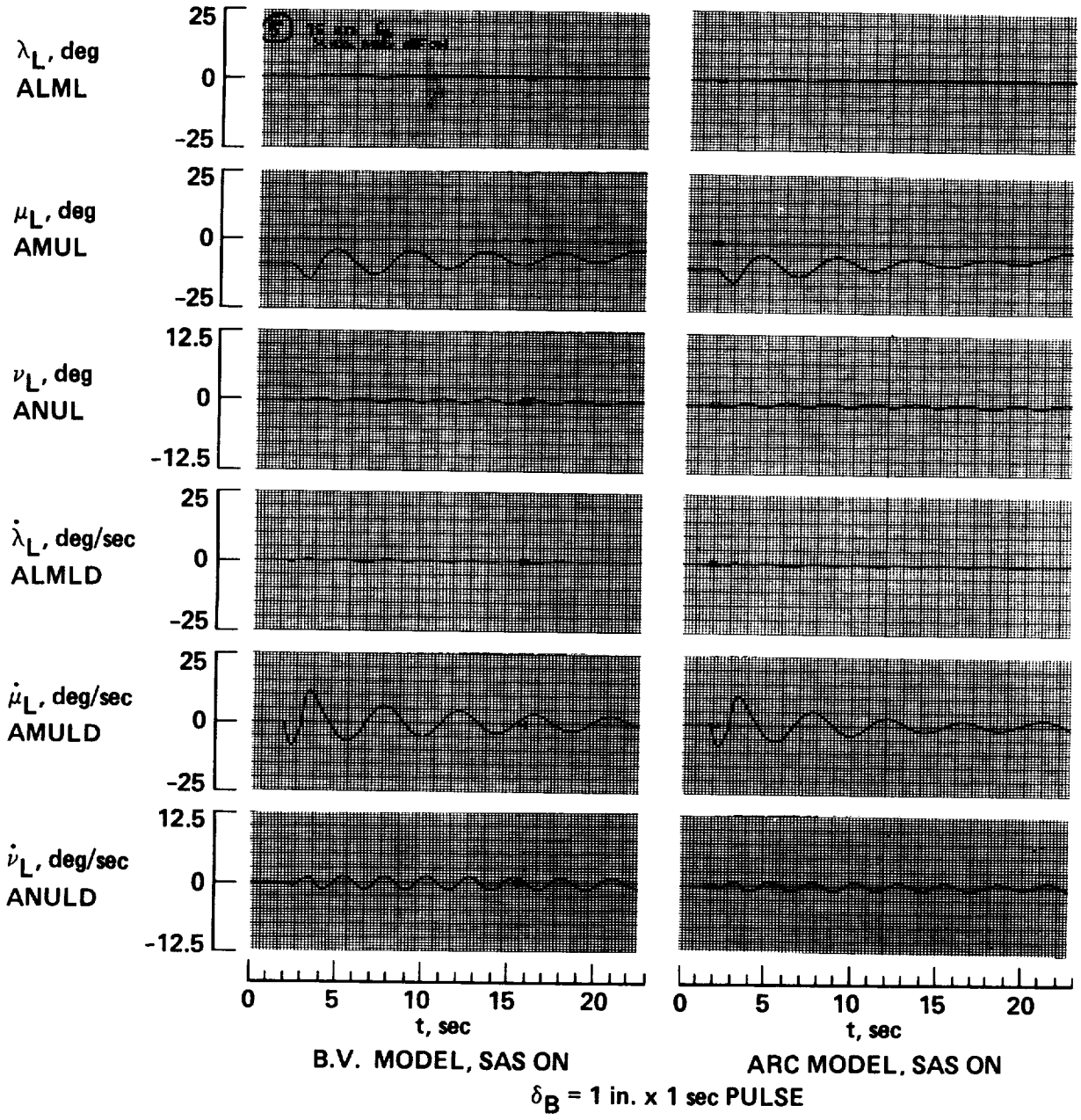

Figure 101.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

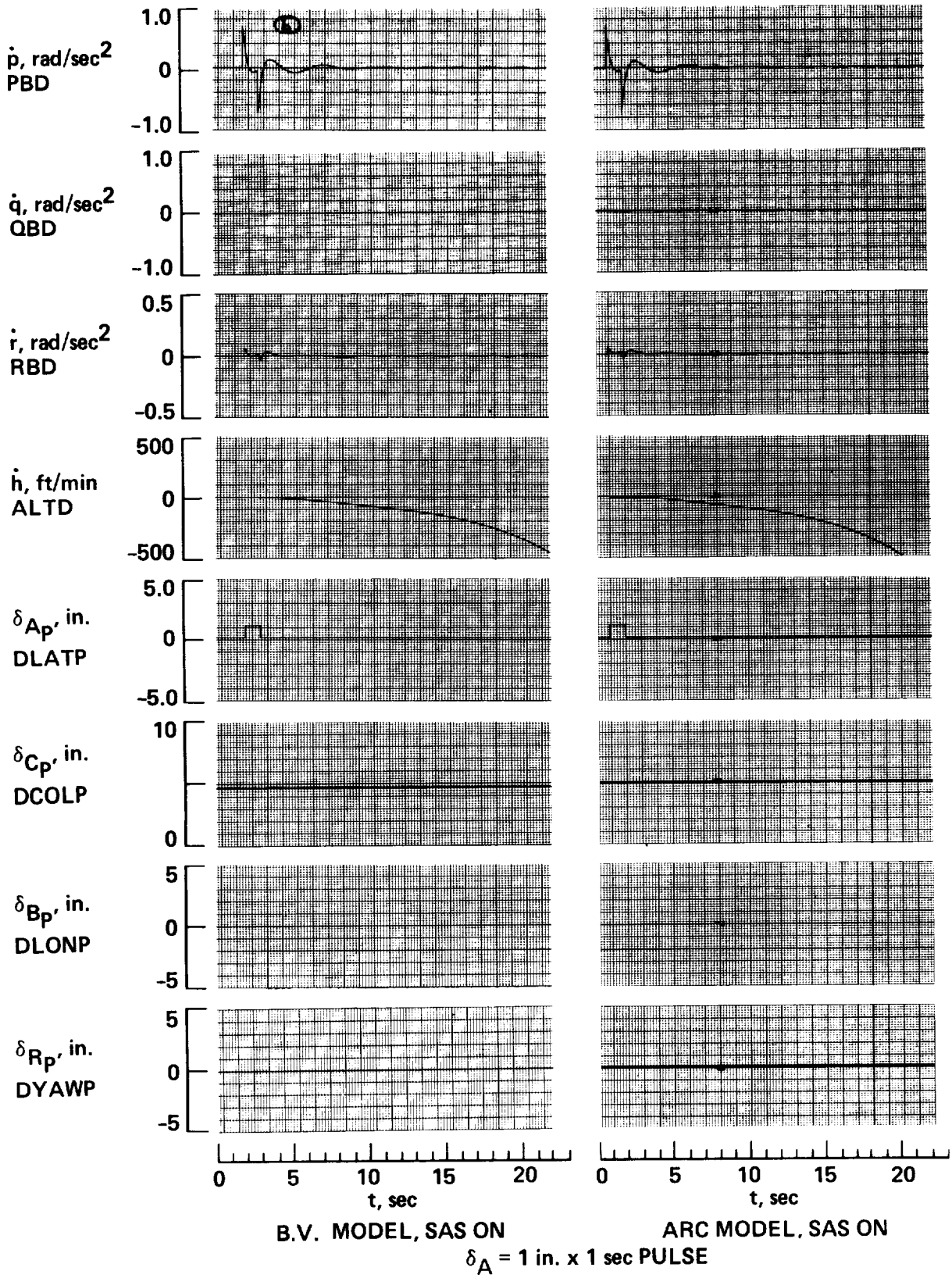

Figure 102.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

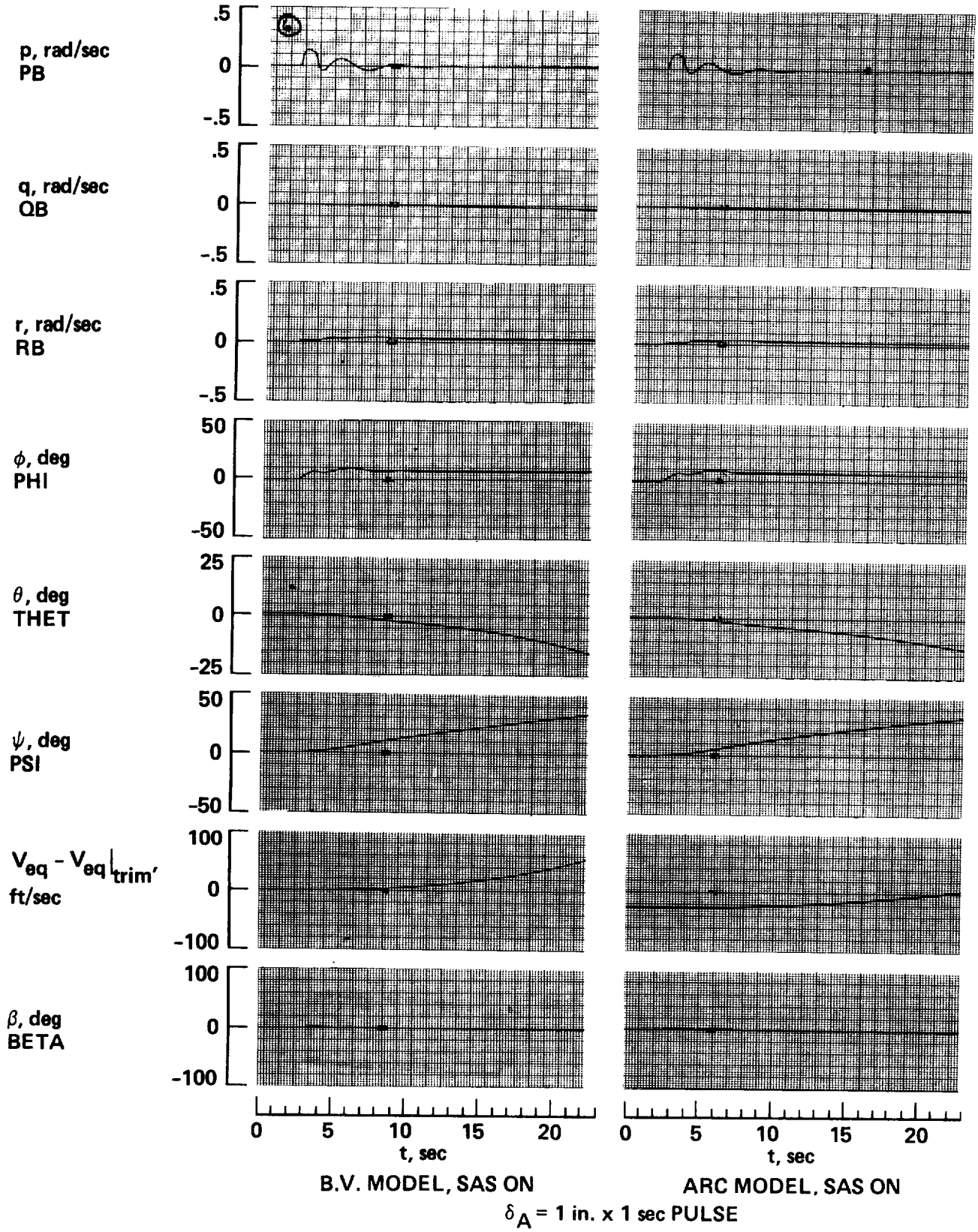

Figure 103.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

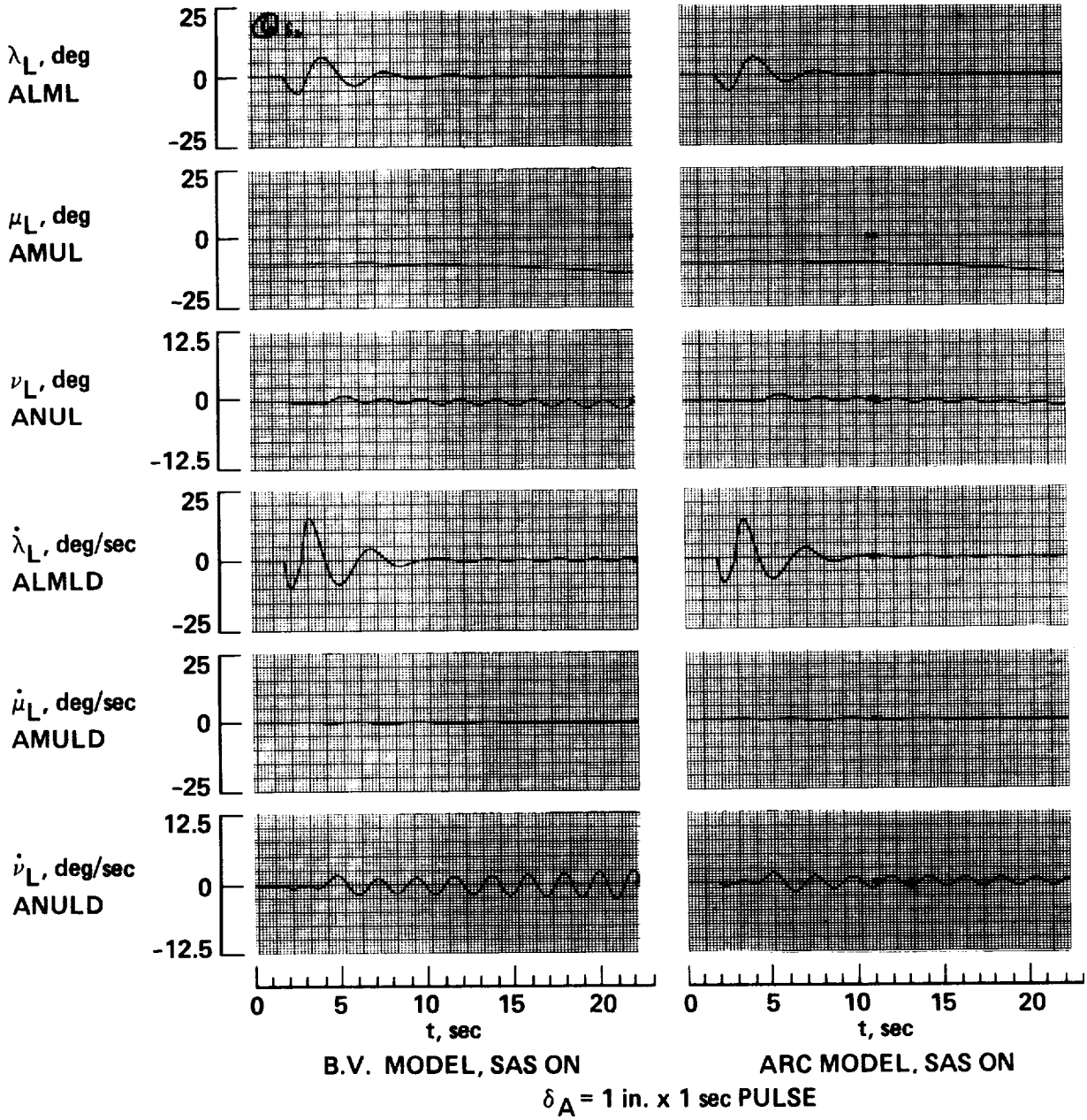

Figure 104.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

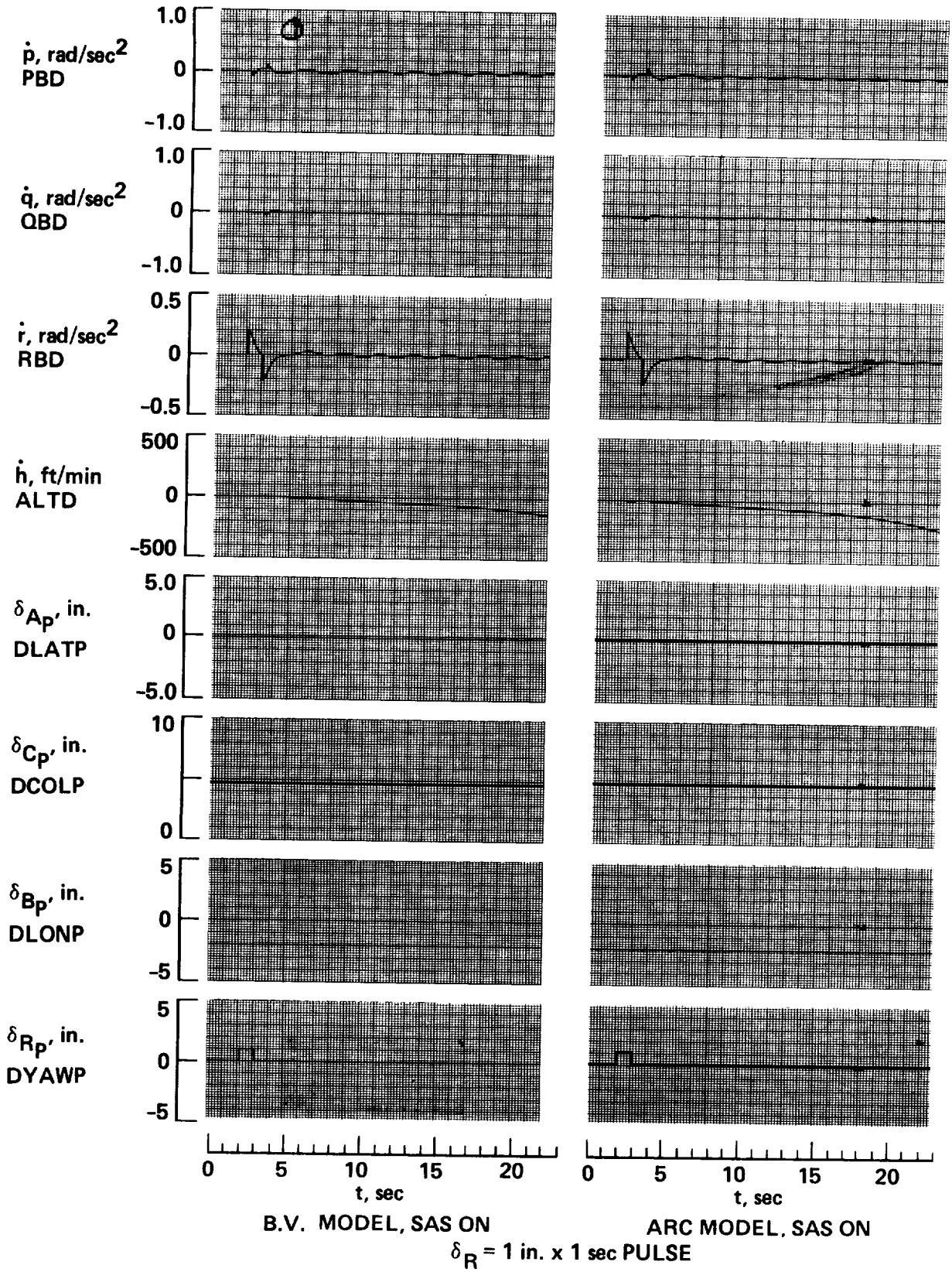

Figure 105.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

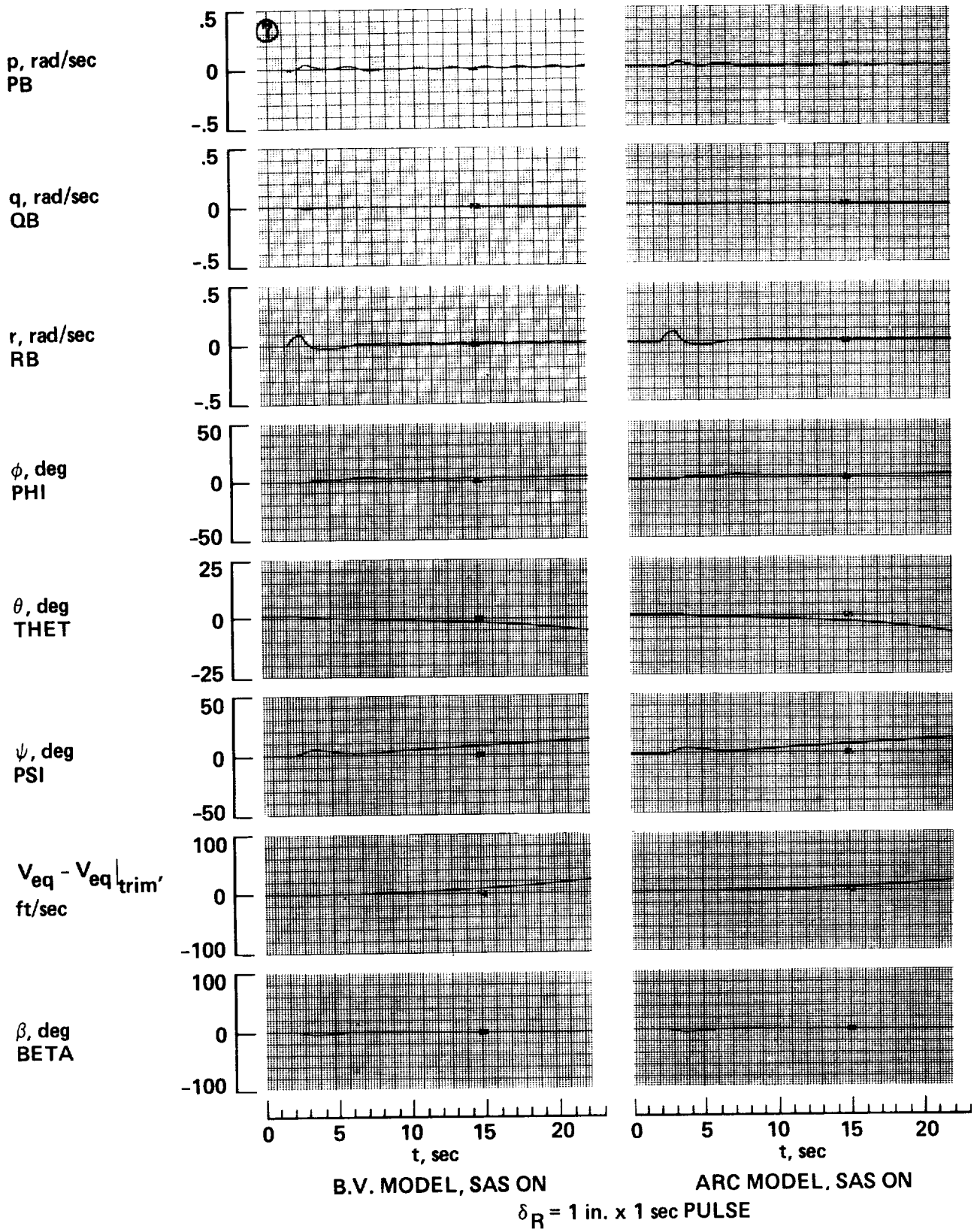

Figure 106.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

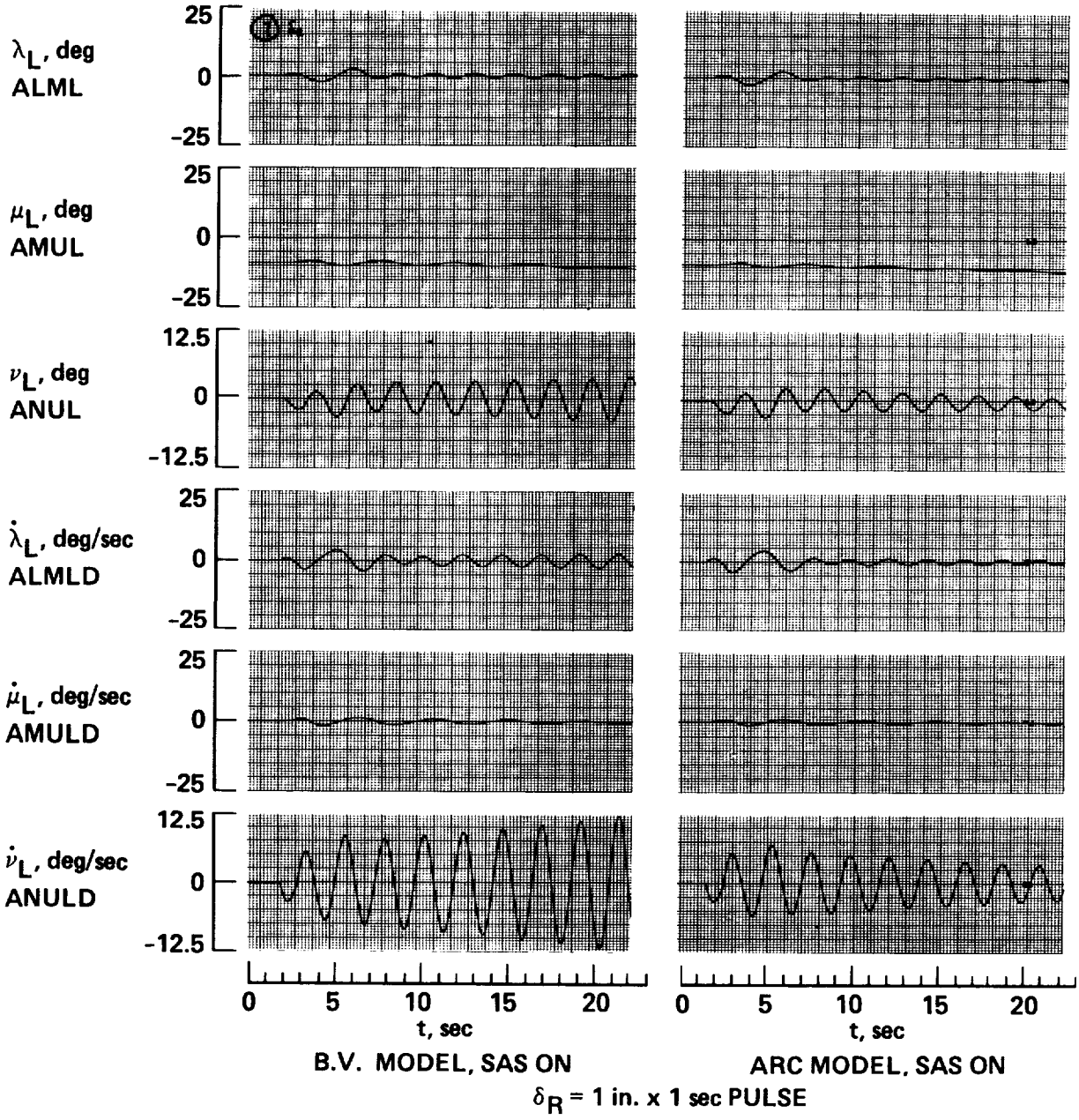

Figure 107.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

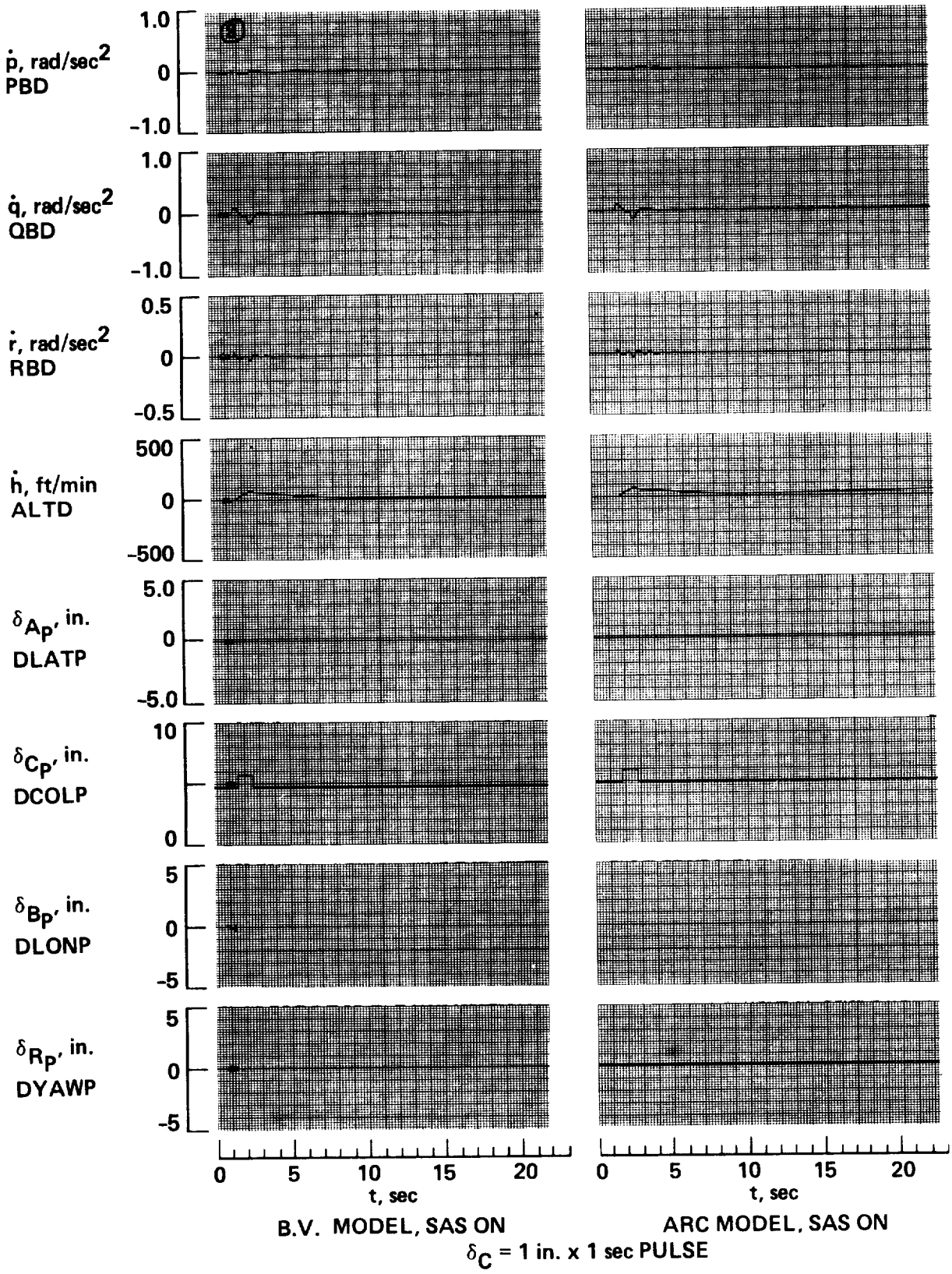

Figure 108.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

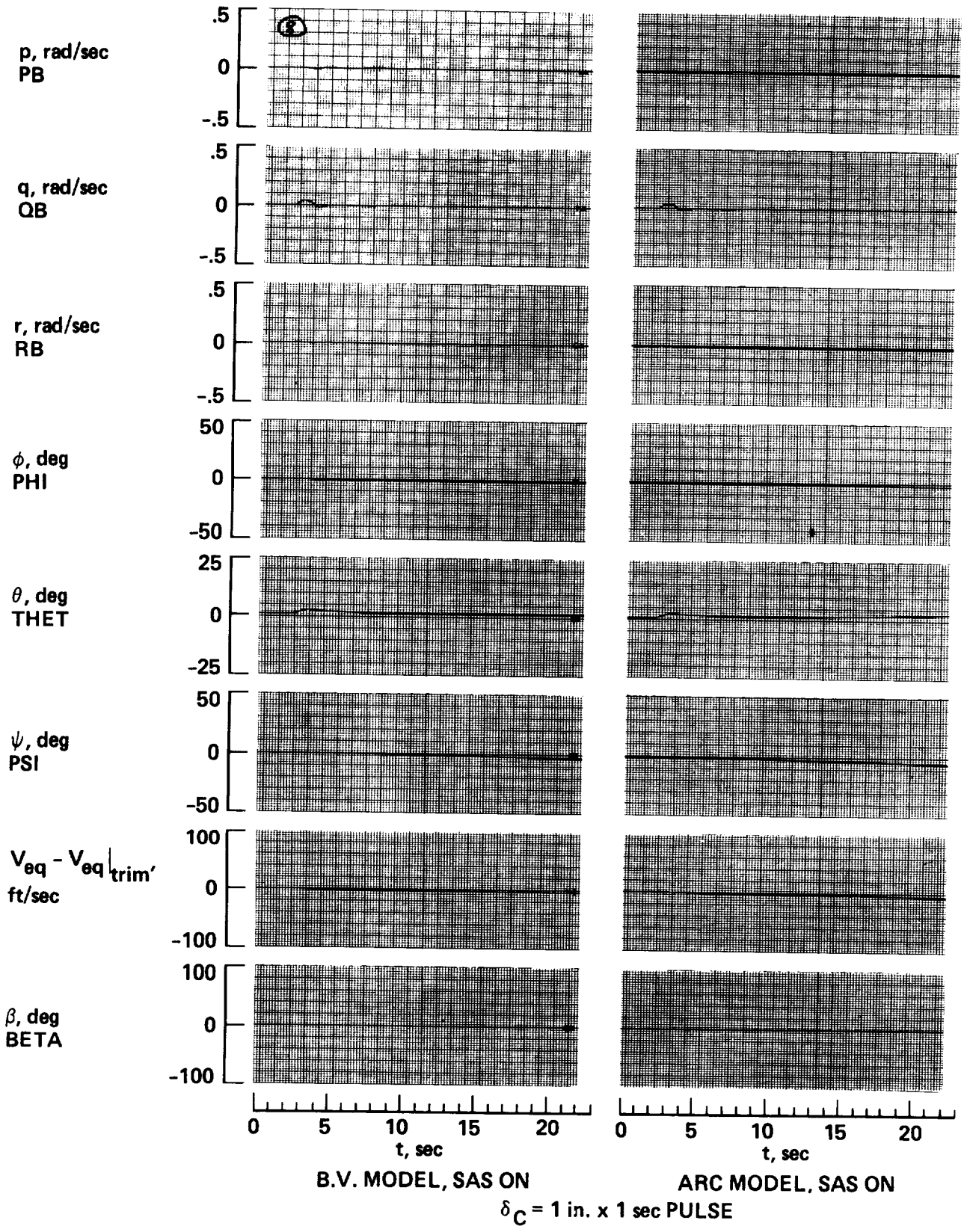

Figure 109.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

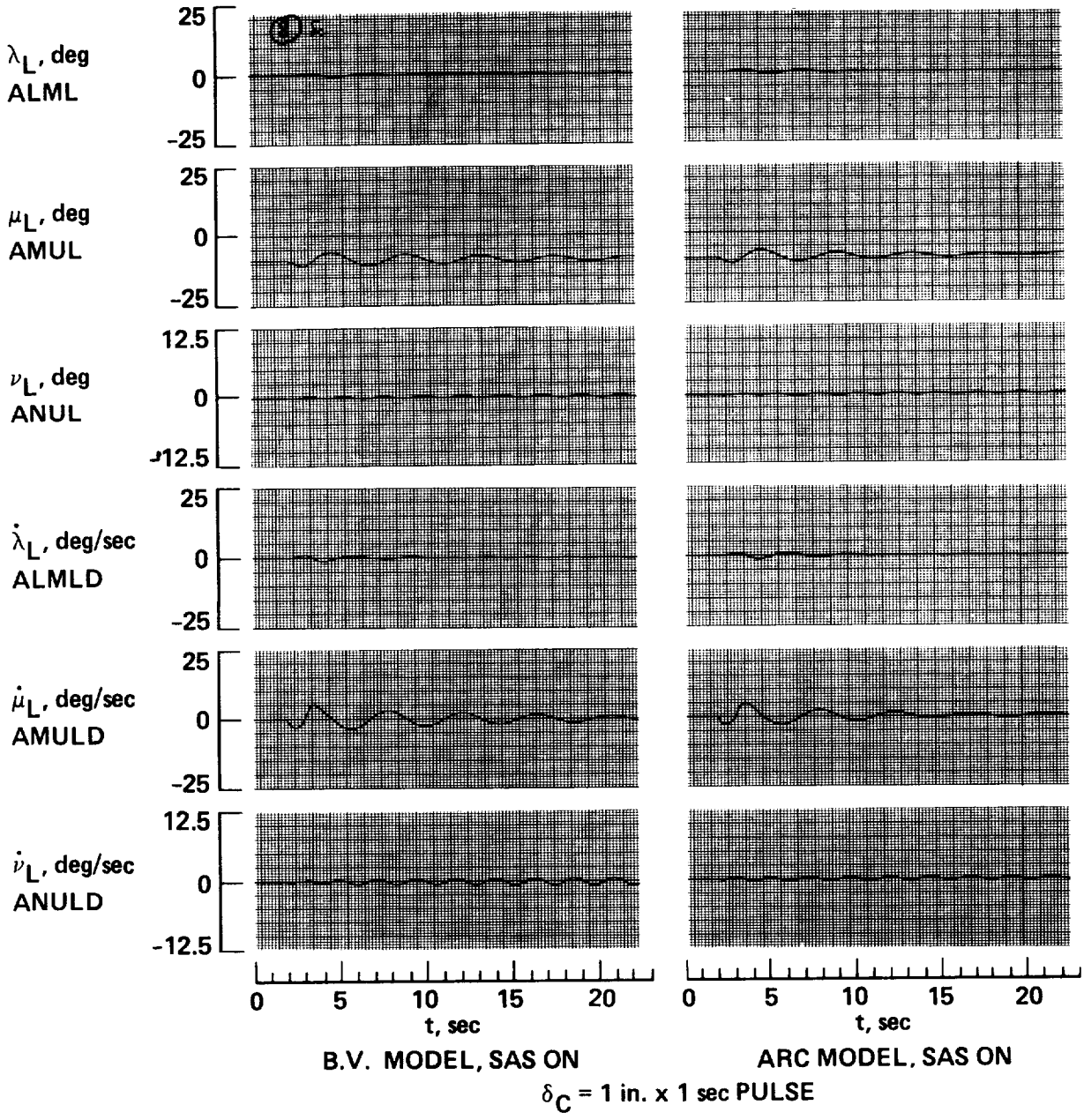

Figure 110.- BV versus ARC simulation response data, slung load attached; V_{eq} = 75 knots.

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16. Abstract

A nonlinear simulation model of the CH-47B helicopter, developed by the Boeing Vertol Company (ref. 1), has been adapted for use in the NASA Ames Research Center (ARC) simulation facility. The model represents the specific configuration of the ARC variable stability CH-47B helicopter (fig. 1) and will be used in ground simulation research and to expedite and verify flight experiment design.

Modeling of the helicopter uses a total force approach in six rigid body degrees of freedom. Rotor dynamics are simulated using the Wheatley-Bailey equations, including steady-state flapping dynamics. Also included in the model is the option for simulation of external suspension, slung-load equations of motion.

Validation of the model (discussed in Volume II of this report) has been accomplished using static and dynamic data from the original Boeing Vertol mathematical model and flight test data from references 2 and 3, as reproduced in reference 4. The model is appropriate for use in real-time piloted simulation and is implemented on the ARC Sigma IX computer where it may be operated with a digital cycle time of 0.03 sec.

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