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AIRCRAFT CONFIGURATION NOISE REDUCTION

VOLUME III Computer Program Source Listing



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FINAL REPORT

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16 Abstract This report discusses use of wing and fuselage structures as noise barriers for shielding aircraft engine noise from the community. The report concerns use of favorable aircraft configurations for community noise reduction of turbojet and turbofan powered aircraft. Significant noise reduction potential is illustrated on a hypothetical engine-over-wing (EOW) configuration using high bypass ratio turbofan engines. Noise shielding estimation procedures are developed for two types of configuration noise reduction concepts; i.e., the EOW and the engine-over-fuselage (EOF). Results are described for a theoretical analysis, a major Boeing/Aeritalia test program, and an empirical analysis of test data. As a result, analytical prediction procedures are defined, computerized, and added to the software previously developed under NASA contract NAS2-6969. The shielding prediction procedures consider individual noise components: inlet fan, compressor, exit fan, core, turbine, and jet noise. A new source, jet/edge interaction noise, can also be predicted using the procedures. The collective software, incorporating the shielding package of this report, can be used to estimate community noise levels of wing and fuselage shielded turbofan or turbojet noise. This report is presented in three volumes. Volume I contains the engineering analysis. Volume II contains a User's Guide for computer programs and other appendices. Volume III contains the complete computer program listing.		
17 Key Words Noise reduction Noise suppression Wing shielding Fuselage shielding Diffraction Refraction	Scattering Community noise Fan noise Core noise Turbine noise Jet noise Jet/edge noise	18 Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Virginia 22151.
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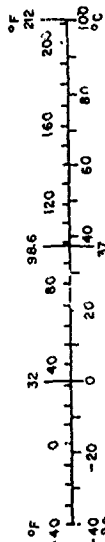
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
ts	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
cu ft	cubic feet	0.02	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

* 1 in = 2.54 (exact) For other exact conversions, see metric tables. See NBS Mon. Publ. 286, Units of Length and Measures, p. 25, 30. Catalog No. C12-10286

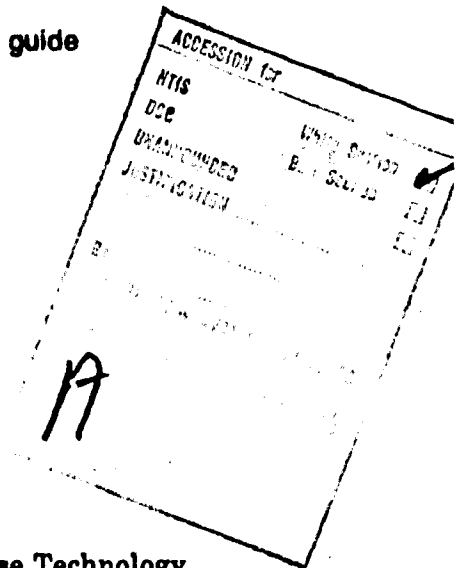
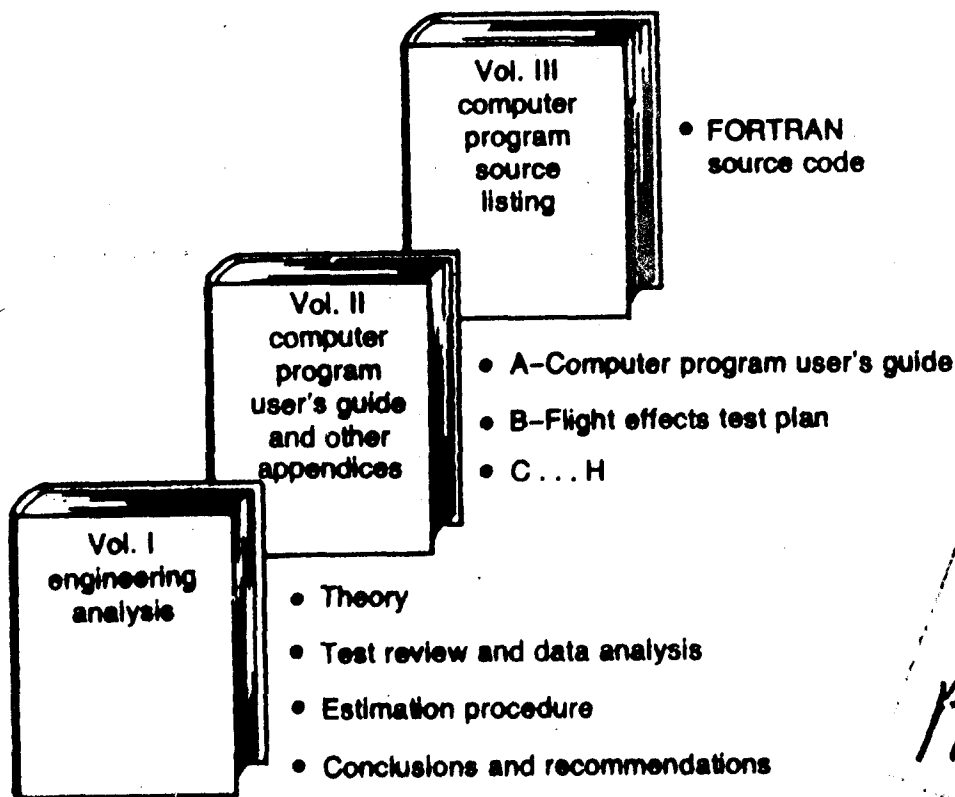
Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



PREFACE

This is one of three volumes of the final report on "Aircraft Configuration Noise Reduction" submitted by the Boeing Commercial Airplane Company, Seattle, Washington, 98124, in fulfillment of Department of Transportation contract DOT-FA74WA-3497, dated 1 August 1974. This work was completed for the ATC Airport Facilities section of the Federal Aviation Administration (DOT). Mr. H. C. True was the Contract Technical Monitor.

The report is divided into three volumes for easy use as shown below:



This report is volume III of the series and was jointly prepared by the Noise Technology Staff of the Boeing Commercial Airplane Company and the Noise Systems Group of Boeing Computer Services, Inc. This volume contains the source code listing of the computer programs for evaluating "Aircraft Configuration Noise Reduction" as defined in the engineering document, volume I. The User's Guide for the programs is contained in appendix A of volume H. The material presented herein is reference data for use in conjunction with the material presented in volumes I and H.

The source code presented is written in FORTRAN IV (ANSI standard) for compilation using the FTN compiler on the CDC6600 KRONOS 2.1 Operating System. The actual program was delivered to the Federal Aviation Administration (DOT) on magnetic tape. The order of the programs listed herein corresponds to that on the tape.

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*MO = Main Overlay Program
 SO = Secondary Overlay Program
 M = Main Program
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 F = Function

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C	ALTHO THEY ARE NOT USED IN THE (0,0) OVERLAY.	PHBNAC	166
C	THEY HAVE VARIABLES IN DATA STATEMENTS THAT CHANGE	PHBNAC	167
C	AFTER FIRST LOADING, AND THESE VALUES ARE	PHBNAC	168
C	OVERRIDDEN WITH INITIAL VALUES WHEN THE OVERLAYS ARE	PHBNAC	169
C	RELOADED, HENCE THEIR REMOVAL TO (0,0) OVERLAY	PHBNAC	170
C	IF(IGRD(1).EQ.IGRD(2))CALL ABSORP	PHBNAC	171

	IF(IGRD(1).EQ.IGRD(2))CALL ANGLES	PHBNAC	173
	IF(IGRD(1).EQ.IGRD(2))CALL CCRSPL	PHBNAC	174
	IF(IGRD(1).EQ.IGRD(2))CALL LININS	PHBNAC	175
	IF(IGRD(1).EQ.IGRD(2))CALL ERRSET(0,0)	PHBNAC	176
C	CALL TO INITIALIZING ROUTINE	PHBNAC	177
5	CALL INITL	PHBNAC	178
C	INPUT ALL PARAMETERS RELATED TO THE GENERAL FORMAT OF THE PROGRAM	PHBNAC	179
C	THESE INPUTS INCLUDE THE FOLLOWING PARAMETERS IN THE GPRAM BLOCK	PHBNAC	180
C		PHBNAC	181
C	ALTP - ALTITUDE OF THE AIRPLANE	PHBNAC	182
C	ALTR - ALTITUDE OF THE SIDELINE OBSERVATIONS	PHBNAC	183
C	SLOPE - CLIMB GRADIENT (TANGENT OF THETA)	PHBNAC	184
C	AMACH - AIRCRAFT MACH NUMBER	PHBNAC	185
C	NOBS - NUMBER OF SIDELINE OBSERVATIONS (MAX. OF 1	PHBNAC	186
C	SLDIST(1-10) - SIDELINE DISTANCES	PHBNAC	187
C	NTENG - NUMBER OF DIFFERENT TYPES OF ENGINES (MAX. OF 1	PHBNAC	188
C	IUNIT - DEFAULT =0 ALL DIMENSIONAL INPUTS AND OUTPUTS IN M	PHBNAC	189
C	=1 IN ENGLISH UNITS	PHBNAC	190
C	READ IN GENERAL INITIALIZING DATA	PHBNAC	191
	CALL INPUTG	PHBNAC	192
	IF (IOD - 1) 7, 7, 5000	PHBNAC	193
7	CONTINUE	PHBNAC	194
C	THIS SECTION CALCULATES THE DOPPLER SHIFT	PHBNAC	195
C		PHBNAC	196
C	CONVERT \$GDATA PARAMETERS TO ENGLISH UNITS FOR COMPUTATION	PHBNAC	197
C		PHBNAC	198
	IF(IUNIT.EQ.10)CALL CONVR(20,11,11)	PHBNAC	199
	DO 52 I=11,117	PHBNAC	200
	DOPSF(I)=F1	PHBNAC	201
	IF(IDOP.EQ.10)GO TO 52	PHBNAC	202
51	DOPSF(I)=F1-AMACH*COS(THETA(I))	PHBNAC	203
52	CONTINUE	PHBNAC	204
	NCAS=NCAS+11	PHBNAC	205
	DO 4 K=1,ND	PHBNAC	206
	IF(FLD(K+25).NE.0.)FLD(K)=ALCG10(FLD(K+25))	PHBNAC	207
4	ZNI(K)=-ZNI(K+25)	PHBNAC	208
45	CONTINUE	PHBNAC	209
	IF(NCAS.NE.11)GO TO 150	PHBNAC	210
C	DETERMINE AND STORE 1/3 OR FULL OCTAVE FREQUENCIES	PHBNAC	211
	IF(ISPTRM.EQ.11)GO TO 20	PHBNAC	212
	NCF=24	PHBNAC	213
	NK=13	PHBNAC	214
	DO 10 I=11,NCF	PHBNAC	215
	BUF(I)=UFREQ(I)	PHBNAC	216
10	BCE(I)=CFREQ(I)	PHBNAC	217
	BUE(25)=UFREQ(25)	PHBNAC	218
	GO TO 40	PHBNAC	219
20	NCF=18	PHBNAC	220
	NK=11	PHBNAC	221
	J=12	PHBNAC	222
	DO 30 I=11,NCF	PHBNAC	223
	BCE(I)=CFREQ(J)	PHBNAC	224
	BUE(I)=JFREQ(J-1)	PHBNAC	225
30	J=J+3	PHBNAC	226
	BUE(19)=CFREQ(25)	PHBNAC	227
40	CONTINUE	PHBNAC	228
	DO 50 I=11,NCF	PHBNAC	229

50	PFREQ(I)=BCF(I)/1000.	PFBNAC	230
150	CONTINUE	PFBNAC	231
C	CONVERT INPUT DATA AND CALCULATE AIRCRAFT-OBSERVER GEOMETRY IF IUM	PFBNAC	232
200	CONTINUE	PFBNAC	233
C	PERFORM THE GEOMETRY CALCULATIONS FOR THE CURRENT CASE	PFBNAC	234
	ICALL =0	PFBNAC	235
C		PFBNAC	236
	CALL OVERLAY(0HEXECIO,1,C,0HRECALL)	PFBNAC	237
	ICALL=1	PFBNAC	238
C	IS TYPE 4 REPORT SPECIFIED (FLIGHTPATH/OBSERVER GEOMETRY)	PFBNAC	239
	IF(IPRT(4).NE.4)GO TO 250	PFBNAC	240
C		PFBNAC	241
C	CONVERT \$GDATA PARAMETERS TO M.K.S. UNITS FOR OUTPUT	PFBNAC	242
C		PFBNAC	243
	IF(IUNIT.EQ.10)CALL CONVR(19,I2,I2)	PFBNAC	244
4835	CALL PRINTH(IPRT(4),LCT,8)	PFBNAC	245
	WRITE(8,4841)	PFBNAC	246
4841	FORMAT(37X,4CHF L I G H T P A T H / O B S E R V E R ,	PFBNAC	247
	*2X,16HG E O M E T R Y)	PFBNAC	248
	WRITE(8,4842)AALT,CH(IUNIT+1,1),AMACH,SLCPE	PFBNAC	249
4842	FORMAT(//10X,16HAIRPORT ALTITUDE,9X,1H=,1X,1PE10.3,A3//	PFBNAC	250
	*10X,20HAIRCRAFT MACH NUMBER,5X,1H=,1X,E10.3,13X,1H=,2X,	PFBNAC	251
	*17HCLIMB GRADIENT,5X,1H=,1X,E10.3,17H FOR (Z .GT. ZR)	PFBNAC	252
	WRITE(8,4843) ALTP,CH(IUNIT+1,1),ALTR,CH(IUNIT+1,1)	PFBNAC	253
4844	FORMAT(10X,20HAIRCRAFT HEIGHT (ZC),5X,1H=,1X,1PE10.3,A3,2X,	PFBNAC	254
	*34HAT T = 0, OBSERVER HEIGHT (ZR) =,1X,E10.3,A3)	PFBNAC	255
	WRITE(8,4845) CZ,CH(IUNIT+1,8),CCV,CH(IUNIT+1,8)	PFBNAC	256
4845	FORMAT(10X,14HSPEED OF SOUND,11X,1H=,1X,1PE10.3,1X,A3,	PFBNAC	257
	1 10H AT (Z0) , ,	PFBNAC	258
	*2X,14HSPEED OF SOUND,8X,1H=,1X,E10.3,1X,A3,3H AT (ZR))	PFBNAC	259
	WRITE(8,4846) CA,CH(IUNIT+1,8)	PFBNAC	260
4846	FORMAT(10X,20HAVERAGE SPEED OF SOUND =,1X,1PE10.3,1X,A3,	PFBNAC	261
	*38H FOR SOUND PROPAGATION OVER RANGE (P))	PFBNAC	262
4847	FORMAT(/47X,24HSIDELINE DISTANCE (Y) =,1X,1PE11.3,A3//12X,	PFBNAC	263
	* 10H TIME (SEC),	PFBNAC	264
	*10X,5HANGLE,8X,15HA/C COORDINATES,5X,21HPROPAGATION LP/P FOR,	PFBNAC	265
	*5X,30HANGLES FOR NOISE EXTRAPOLATION /9X,5HSCOND,7X,5HSCOND,8X,	PFBNAC	266
	*2HX1,10X,1HY,11X,1HZ,6X,10HCDISTANCE F,3X,10HGRD.REFLX.,7X,6HLLTA 1	PFBNAC	267
	* ,9X,6HBETA 2 /10X,4HREC.,7X,5HXMII.,6X,6H(DEG.),7X,1H(A2,1H),	PFBNAC	268
	*8X,1H(A2,1H),8X,1H(A2,1H),22X,6H(DEG.),9X,6H(DEG.)//)	PFBNAC	269
4848	FORMAT(8X,F6.1,6X,F6.1,4X,F7.1,4X,1PE11.3,3(2X,E10.3),2(5X,L10.3))	PFBNAC	270
	LCT=14	PFBNAC	271
	DO 4860 I=1,NOBS	PFBNAC	272
	DO 4860 J=1,17	PFBNAC	273
	IF(LCT.GE.54)GO TO 4851	PFBNAC	274
	IF((J.EQ.11).AND.(LCT.LE.47))GO TO 4852	PFBNAC	275
	IF(J.EQ.1) GO TO 4851	PFBNAC	276
	GO TO 4853	PFBNAC	277
4851	CALL PRINTH(IPRT(4),LCT,8)	PFBNAC	278
	WRITE(8,4841)	PFBNAC	279
	LCT=LCT+1	PFBNAC	280
4852	WRITE(8,4847)SLD!SX(I),CH(IUNIT+1,1),XL(IUNIT+1),XL(IUNIT+1//	PFBNAC	281
	* XL(IUNIT+1)	PFBNAC	282
	LCT=LCT+7	PFBNAC	283
4853	WRITE(8,4848) TPD(J,I),TDS(J,I),ETA(J),APY(I,J),APZ(I,J),PL(I,J),	PFBNAC	284
	* DPND(I,J),G1(I,J),B2(I,J)	PFBNAC	285
	LCT=LCT+1	PFBNAC	286

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4860 CONTINUE
C
C   CONVERT $GDATA PARAMETERS TO ENGLISH UNITS FOR COMPUTATION
C
      IF(IUNIT.EQ.10)CALL CONVR(19,11,11)
250 CONTINUE
350 CONTINUE
      CALL OVERLAY(6HEXEC10,1,C,6HRECALL)
C   SECTION FOR SETTING UP LINKAGE TO THE VARIOUS NOISE
C   COMPONENT MODULES THAT HANDLE BOTH THE INPUT AND CALCULATIONS
      IC=10
      DO 4000 NC=1,NTENG
      NTP=10
      NCOF=NC
C
C   IF SHIELDING IS REQUESTED FOR THAT PARTICULAR
C   CONFIGURATION,READ IN ENGINE/WING GEOM DATA
C
      IF(INSEOW(NC).NE.0)CALL EWGIC
500 CONTINUE
      IF(NTP.GE.NTYPE)GC TO 4000
      IC=IC+11
C
C   GET $NOISIN DATA AND CONVERT TO ENGLISH UNITS FOR COMPUTATION
C
      CALL NINPUT
C
C   PRINT OUT ENG/WING GEOMETRY IF SHIELDING SPECIFIED
C
      IF(NTP.NE.11)GC TO 530
      IF(INSEOW(NCOF).NE.0)CALL EWGCLT(IPRT,IUNIT)
530 CONTINUE
C
C
C   TEST FOR JET EDGE INTERACTION ACISE COMPONENT
C
      IF(ITYPE.EQ.13) GC TO 888
C
C   IF NOISE COMPONENT JET FLOW REFRACTION EFFECTS AND SHIELDING
C   FOR THE PARTICULAR CONFIGURATION IS REQUIRED READ IN COMPONENT
C   SHIELDING DATA. A CONFLICT OCCURS WHEN SHIELDING IS REQUESTED
C   FOR THE COMPONENT AND NOT THE CONFIGURATION.
C
      IF(INSHLD.EQ.0)GO TO 888
      IF(INSEOW(NC).NE.0.AND.INSHLD.NE.0)GC TO 878
      IF(INSEOW(NC).EQ.0.AND.INSHLD.NE.0)WRITE(6,777)ITYPE
777 FORMAT(1H0,60H SHIELDING REQUEST CONFLICT NO ENG/WNG GEOM
      *ITYPE= ,I2)
C   IF PRIMARY AND SECONDARY READ SHIELDING DATA
      IF(ITYPE.LE.2)GO TO 878
      IF(ITYPE.GT.2)INSHLD=C
      GO TO 888
C
878 CALL NSRIO
C
888 GC TO (1100, 1100, 1200, 1100, 1100, 1200, 1500,
      * 1300, 1200, 1300, 1300, 1400, 1500), ITYPE

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1100	CONTINUE	PHBNAC	344
	CALL OVERLAY(6HEXEC20,2,0,6HRECALL)	PHBNAC	345
	GO TO 500	PHBNAC	346
1200	CONTINUE	PHBNAC	347
	CALL OVERLAY(6HEXEC30,3,0,6HRECALL)	PHBNAC	348
	GO TO 500	PHBNAC	349
1300	CONTINUE	PHBNAC	350
	CALL OVERLAY(6HEXEC40,4,0,6HRECALL)	PHBNAC	351
	GO TO 500	PHBNAC	352
1400	CONTINUE	PHBNAC	353
	CALL OVERLAY(6HEXEC50,5,0,6HRECALL)	PHBNAC	354
	GO TO 500	PHBNAC	355
1500	CONTINUE	PHBNAC	356
	CALL OVERLAY(6HEXEC60,6,0,6HRECALL)	PHBNAC	357
	GO TO 500	PHBNAC	358
4000	CONTINUE	PHBNAC	359
C		PHBNAC	360
C	ENG/WIN GEOMETRY DATA IS OUTPUT IN FILE 8 FOR ALL CONFIGURATIONS	PHBNAC	361
C	AFTER FLIGHT PATH/CBSERVER GEOMETRY DATA. HENCE THE FILE MARK AND	PHBNAC	362
	ENDFILE 8	PHBNAC	363
	REWIND 8	PHBNAC	364
C		PHBNAC	365
C	CONVERT ALL PARAMETERS \$GDATA AND \$NCISIN TO MKS UNITS FOR OUTPUT	PHBNAC	366
C		PHBNAC	367
	IF(IUNIT.EQ.10)CALL CNVR(I1,I2,I3)	PHBNAC	368
	DO 4600 K2=I1,NOBS	PHBNAC	369
	DO 4500 K1=I1,NCF	PHBNAC	370
	DO 4500 K3=I1,17	PHBNAC	371
	TSPL(K1,K2,K3)=SSPL(K1,K2,K3)-TSPL(K1,K2,K3)	PHBNAC	372
4500	SPLT(K1,K3)=TSPL(K1,K2,K3)	PHBNAC	373
	CALL PNLSUB(SPLT(1,1),PSPL(1,K2),TPD(1,K2),EPNL(1,K2),	PHBNAC	374
1	SPL2,TEPNL(1,K2),NK,BGG,TCG,FLR,K2,NOBS,IRK(K2,1))	PHBNAC	375
C	CALL NOISO PRINT ROUTINE TO PRINT EITHER TYPE 1 OR DEFAULT	PHBNAC	376
C	REPORT ON THE OUTPUT FILE	PHBNAC	377
	CALL NOISO(IPRT(1),K2,NK,6,CHIN,IUNIT,SLDISX(K2),PFREQ,SPLT(1,1),	PHBNAC	378
	*NCF,14)	PHBNAC	379
4600	CONTINUE	PHBNAC	380
C	IS THE TYPE 2 REPORT SPECIFIED (ASSUMPTIONS ON WHICH THE PREDICTIO	PHBNAC	381
C	IS BASED)	PHBNAC	382
4810	IF(IPRT(2).EQ.2)GO TO 4311	PHBNAC	383
	IF(IPRT(1).NE.16)GO TO 4767	PHBNAC	384
4311	CONTINUE	PHBNAC	385
	EGP=YES	PHBNAC	386
	GRD=YES	PHBNAC	387
	CALL PRINTH(IPRT(2),LCT,6)	PHBNAC	388
	WRITE(6,4820)	PHBNAC	389
4820	FORMAT(50X,32HASSUMPTIONS FOR NCISE PREDICTION //)	PHBNAC	390
	LCT=8	PHBNAC	391
	WRITE(6,4821)	PHBNAC	392
4821	FORMAT(2X,44H1) GEOMETRIC-MEAN PASSBAND FREQUENCIES (KHZ))	PHBNAC	393
	WRITE(6,4822) (PFREQ(I),I=1,NCF)	PHBNAC	394
4822	FORMAT(6X,1PE10.3,11(E10.3)/6X,12E10.3)	PHBNAC	395
	WRITE(6,4823)	PHBNAC	396
4823	FORMAT(1H)	PHBNAC	397
	DO 4825 I=1,NCF	PHBNAC	398
	TCAGR(I)=JAIRAB(I)	PHBNAC	399
4825	CONTINUE	PHBNAC	400

WRITE(6,4824) (FTKM(IUNIT+1,I),I=1,2)	PHBNAC	401
4824 FORMAT(2X,44H2) ATMOSPHERIC ABSORPTION COEFFICIENTS (DB /,2A4)	PHBNAC	402
WRITE(6,4826) (TGAGR(I),I=1,NCF)	PHBNAC	403
4826 FORMAT(6X,12F10.2)	PHBNAC	404
WRITE(6,4827)	PHBNAC	405
4827 FORMAT(/ 2X,25H3) ATMOSPHERIC CONDITIONS)	PHBNAC	406
IG=IATMOS+11	PHBNAC	407
GO TO(4828,4729,4731,4736,4742),IG	PHBNAC	408
4828 WRITE(6,4829)	PHBNAC	409
4829 FORMAT(8X,33HINTERNATIONAL STANDARD ATMOSPHERE)	PHBNAC	410
GO TO 47 50	PHBNAC	411
4729 WRITE(6,4730) DTEMP,CH(IUNIT+1,6),CPRES,CH(IUNIT+1,7),CHUMID	PHBNAC	412
4730 FORMAT(7X,40HINTERNATIONAL STANDARD ATMOSPHERE PLUS (,F6.2,	PHBNAC	413
*5H DEG ,A1,1H,,F7.2,1X,A4,1H,,F7.2,8H PCT RH))	PHBNAC	414
GO TO 4750	PHBNAC	415
4731 WRITE(6,4732) CH(IUNIT+1,6),CH(IUNIT+1,1)	PHBNAC	416
4732 FORMAT(7X,31HTEMPERATURE VS. ALTITUDE (DEG ,A1,1H,,A3,1H))	PHBNAC	417
WRITE(6,4733) (PL,TEMP(I),CO,TALT(I),PR,CC,I=1,NTEMP)	PHBNAC	418
4733 FORMAT(7X,A1,1PE10.3,A1,E10.3,2A1,1X,A1,E10.3,A1,E10.3,2A1,1X,A1,	PHBNAC	419
1 E10.3,A1,E10.3,2A1,1X,A1,E10.3,A1,E10.3,2A1,1X,A1,E10.3,A1,E10.3,	PHBNAC	420
2 2A1)	PHBNAC	421
WRITE(6,4734) CH(IUNIT+1,7),CH(IUNIT+1,1)	PHBNAC	422
4734 FORMAT(7X,27HPRESSURE VS. ALTITUDE (,A4,1H,,A3,1H))	PHBNAC	423
WRITE(6,4735) (PL,PRES(I),CC,PALT(I),PR,CC,I=1,NPRES)	PHBNAC	424
WRITE(6,4736) CH(IUNIT+1,1)	PHBNAC	425
4735 FORMAT(7X,32HREL.HUMIDITY VS. ALTITUDE (PCT ,,A3,1H))	PHBNAC	426
WRITE(6,4737) (PL,RHUMID(I),CC,HALT(I),PR,CC,I=1,NHUMID)	PHBNAC	427
CALL PRINTH(1PRT(2),LCT,6)	PHBNAC	428
WRITE(6,4820)	PHBNAC	429
GO TO 4750	PHBNAC	430
4736 IF(IUNIT.EQ.1) GO TO 4738	PHBNAC	431
CPRES=1.0	PHBNAC	432
CTEMP=288.16	PHBNAC	433
GO TO 4740	PHBNAC	434
4738 CPRES=14.696	PHBNAC	435
CTEMP=518.688	PHBNAC	436
4740 CRHUMD=70.0	PHBNAC	437
4742 WRITE(6,4737) CTEMP,CH(IUNIT+1,6),CPRES,CH(IUNIT+1,7),CRHUMD	PHBNAC	438
4737 FORMAT(7X,27HHOMOGENEOUS ATMOSPHERE CF (,F6.2,5H DEG ,A1,1H,,F8.2,	PHBNAC	439
*1X,A4,1H,,F7.2,8H PCT RH))	PHBNAC	440
4750 WRITE(6,4751)	PHBNAC	441
4751 FORMAT(/2X,42H4) ITEMS CONSIDERED IN NCISE EXTRAPOLATION)	PHBNAC	442
WRITE(6,4752) (PT,I=1,17),(PT,I=1,16)	PHBNAC	443
4752 FORMAT(5X,26HA) SPHERICAL DIVERGENCE ,17A1,5H YES/5X,	PHBNAC	444
* 27HB) ATMOSPHERIC ABSORPTION ,16A1,5H YES)	PHBNAC	445
GRP=YES	PHBNAC	446
IF(IEGA.NE.0)EGP=YN	PHBNAC	447
WRITE(6,4753) (PT,I=1,14),EGP	PHBNAC	448
4753 FORMAT(5X,29HC) EXTRA-GROUND ATTENUATION ,14A1,2X,A3)	PHBNAC	449
WRITE(6,4754) IGRD(IUNIT+1),GRT(IUNIT+1)	PHBNAC	450
4754 FORMAT(8X,31HSOUND PROPAGATION IS DOWNWIND (,12,1X,A4,7H).	PHBNAC	451
IF(IGDR.NE.0)GRP=YN	PHBNAC	452
WRITE(6,4755) (PT,I=1,21),GRP	PHBNAC	453
4755 FORMAT(5X,22HD) GROUND REFLECTION ,21A1,2X,A3)	PHBNAC	454
IF(IGLR.NE.0) GO TO 4757	PHBNAC	455
4756 FORMAT(8X,42H3 DB ADDED TO FREE FIELD SPECTRA INSTEAD.)	PHBNAC	456
GO TO 4758	PHBNAC	457

4757 WRITE(6,4756)	PHBNAC	458
GO TO 4762	PHBNAC	459
4758 WRITE(6,4759)XKN	PHBNAC	460
4759 FORMAT(8X,6HK1/KO=,1PE10.3,58H AND GROUND IMPEDANCE VS. FREQUENCY	PHBNAC	461
*IN HZ DATA CURVES ARE)	PHBNAC	462
WRITE(6,4760)	PHBNAC	463
4760 FORMAT(8X,23H(RE(Z1/ZO), F) DATA ...)	PHBNAC	464
WRITE(6,4733)(PL,ZNR(I),CO,FLD(I+25),PR,CO,I=1,ND)	PHBNAC	465
WRITE(6,4761)	PHBNAC	466
4761 FORMAT(8X, 23H(IM(Z1/ZO), F) DATA ...)	PHBNAC	467
WRITE(6,4733)(PL,ZNR(I),CO,FLD(I+25),PR,CO,I=1,ND)	PHBNAC	468
4762 WRITE(6,4763)	PHBNAC	469
4763 FORMAT(/2X,30H5) NOISE COMPONENTS CONSIDERED,28X,12FNO. OF TIMES)	PHBNAC	470
NJ=0	PHBNAC	471
DO 4765 I=1,13	PHBNAC	472
IF(ICN(I).EQ.0)GO TO 4765	PHBNAC	473
NJ=NJ+1	PHBNAC	474
WRITE(6,4766) ALPH(NJ),PR,(XNAME(J,I),J=1,7),ICN(I)	PHBNAC	475
4766 FURMAT(5X,2A1,1X,7A4,2X,6HMODULE,19X,13)	PHBNAC	476
4765 CONTINUE	PHBNAC	477
4767 CONTINUE	PHBNAC	478
C IS TYPE 3 REPORT SPECIFIED (OBSERVED NOISE PER COMPONENTS)	PHBNAC	479
IF(IPRT(3).NE.3)GO TO 4840	PHBNAC	480
ENDFILE 12	PHBNAC	481
REWIND 12	PHBNAC	482
4830 READ(12,4831) BUFP	PHBNAC	483
4831 FORMAT(33A4)	PHBNAC	484
IF (EOF(12)) 4840, 4832	PHBNAC	485
C360 READ(12,4831,END=4840)BUFP	PHBNAC	486
4832 WRITE(6,4831)BUFP	PHBNAC	487
GO TO 4830	PHBNAC	488
4840 IF(IPRT(4).NE.4)GO TO 4870	PHBNAC	489
4854 READ(8,4831)BUFP	PHBNAC	490
IF (EOF(8)) 4870, 4855	PHBNAC	491
C360 READ(8,4831,END=4870)BUFP	PHBNAC	492
4855 WRITE(6,4831)BUFP	PHBNAC	493
GO TO 4854	PHBNAC	494
C IS TYPE 5 REPORT SPECIFIED (NOISE EXTRAPOLATION CORRECTIONS)	PHBNAC	495
4870 IF(IPRT(5).NE.5)GO TO 4880	PHBNAC	496
4874 READ(9,4831)BUFP	PHBNAC	497
IF (EOF(9)) 4880, 4875	PHBNAC	498
C360 READ(9,4831,END=4880)BUFP	PHBNAC	499
4875 WRITE(6,4831)BUFP	PHBNAC	500
GO TO 4874	PHBNAC	501
C IS TYPE 6 REPORT SPECIFIED (TOTAL NOISE ALL COMPONENTS- FREE-FIELD	PHBNAC	502
4880 IF(IPRT(6).NE.6)GO TO 4890	PHBNAC	503
DO 4882 I=1,NOBS	PHBNAC	504
DO 4881 J=1,I17	PHBNAC	505
DO 4881 L=1,I1,NCF	PHBNAC	506
SPLT(L,J)=5SPL(L,I,J)	PHBNAC	507
4881 CONTINUE	PHBNAC	508
CALL NOISC(IPRT(6),I,NK,I6,CHIN,ILNIT,SLCISX(I),PFREC,SPLT(1,1),	PHBNAC	509
*NCF,I4)	PHBNAC	510
4882 CONTINUE	PHBNAC	511
C IS TYPE 7 REPORT SPECIFIED (FREE-FIELD NOISE PER NOISE COMPONENT)	PHBNAC	512
4890 IF(IPRT(7).NE.7)GO TO 4900	PHBNAC	513
ENDFILE 10	PHBNAC	514

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      REWIND 10
4894 READ(10,4831)BUFP
      IF (EOF(10)) 4900, 4895
C360 READ(10,4831,END=4870)BUFP
4895 WRITE(6,4831)BUFP
      GO TO 4894
4900 CONTINUE
C      TRANSFER TO PICK UP A NEW CASE
      GO TO 5
5000 CONTINUE
      ENDFILE 20
      REWIND 20
      IF(NRN.EQ.0)STOP
C360 CALL LOGDSK
      IF (IOPEN .NE. 0) CALL CLCSMS(13)
      STOP
      END

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PHBNAC 515
PHBNAC 516
PHBNAC 517
PHBNAC 518
PHBNAC 519
PHBNAC 520
PHBNAC 521
PHBNAC 522
PHBNAC 523
PHBNAC 524
PHBNAC 525
PHBNAC 526
PHBNAC 527
PHBNAC 528
PHBNAC 529
PHBNAC 530
PHBNAC 531

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	BLOCK DATA	BLKDATA	
C		BLKDATA	2
C	ITYPE=1 PRIMARY JET	BLKDATA	3
C	=2 PRIMARY AND SECONDARY JET	BLKDATA	4
	COMMON/JETDAT/NJET1,MCODE1,AP1,WP1,VP1,AS2,WS2,VS2,PR1,PA1,	BLKDATA	5
	1 TT1,VAL1,DIAMT1,ANGJT1,ICCR1	BLKDATA	6
C		BLKDATA	7
C	=3 CORE AND TURBINE	BLKDATA	8
	COMMON/COREIN/TT3,PP3,CMF3,EK3,DELT3,J83,	BLKDATA	9
	* ICOR3,LIN3,NTF3,IMA3,LGM3,NWL3,ICP3,ILAY3,TF3(10),	BLKDATA	10
	* PCTA3(10),PLA3(10),ELCH3,EDH3,R1W3(10),TL3(10),CF3,FM3	BLKDATA	11
C		BLKDATA	12
C		BLKDATA	13
	COMMON/TURBIN/BN3,SS3,VTR3,CLS3,DT3,TU3,PMF3,CS3,IC3,ISW3	BLKDATA	14
C		BLKDATA	15
C	=4 COMPRESSOR AND INLET FAN	BLKDATA	16
C	=5 EXIT FAN	BLKDATA	17
	COMMON/FANDAT/NSTG45,NLET45,NAFT45,ICP45,NB45(3),FPR45(3),	BLKDATA	18
	1 DIAM4(3),RSS45(3),AREA5(3),RN145,RTS4,CFPR45,DELT45,	BLKDATA	19
	* N15,BPR5,ICOR4,LIN4,NTF4,IMA4,LGM4,NWL4,ICP4,ILAY4,TF4(10),	BLKDATA	20
	* PCTA4(10),PLA4(10),ELCH4,EDH4,R1W4(10),TL4(10),CF4,FM4,	BLKDATA	21
	* ICOR5,LIN5,NTF5,IMA5,LGM5,NWL5,ICP5,ILAY5,TF5(10),	BLKDATA	22
	* PCTA5(10),PLA5(10),ELCH5,EDH5,R1W5(10),TL5(10),CF5,FM5	BLKDATA	23
C		BLKDATA	24
C	=6 AUGMENTER-WING JET	BLKDATA	25
	COMMON/AUGWNG/GAMA6,TT6,NPR6,DELT6,AD6,DE6,	BLKDATA	26
	* ICOR6,LIN6,NTF6,IMA6,LGM6,NWL6,ICP6,ILAY6,TF6(10),	BLKDATA	27
	* PCTA6(10),PLA6(10),ELCH6,EDH6,R1W6(10),TL6(10),CF6,FM6	BLKDATA	28
C		BLKDATA	29
C	=7 BLCWN-FLAP JET	BLKDATA	30
	COMMON/BLCWIN/PR7,TT7,AN7,DA7,FANG7,DELT7,DL7,HU7,ICCR7	BLKDATA	31
C		BLKDATA	32
C	=8 LIFT-FAN	BLKDATA	33
	COMMON/LFIFAN/NB8,FPR8,DIAM8,RSS8,AREA8,RN18,RTS8,CFPR8,DELT8,	BLKDATA	34
	* ICOR8,LIN8,NTF8,IMA8,LGM8,NWL8,ICP8,ILAY8,TF8(10),PCTA8(10),	BLKDATA	35
	* PLA8(10),ELCH8,EDH8,R1W8(10),TL8(10),CF8,FM8	BLKDATA	36
C		BLKDATA	37
C	=9 EJECTOR - SUPPRESSOR JET	BLKDATA	38
	COMMON/EJECTO/EJECT,NUMTBS,AREA,AR,TS,AMACHJ,AMACHS,CV,	BLKDATA	39
	* PS,PAREA,PTS,PMACHJ,PCV,EJANG,	BLKDATA	40
	* ICOR9,LIN9,NTF9,IMA9,LGM9,NWL9,ICP9,ILAY9,	BLKDATA	41
	* TF9(10),PCTA9(10),PLA9(10),	BLKDATA	42
	* ELCH9,EDH9,R1W9(10),IL9(10),CF9,FM9	BLKDATA	43
C		BLKDATA	44
C	=10 PROPELLER	BLKDATA	45
	COMMON/PROPIN/T10,W10,RPM10,D10,CSLB10,ASUB10,B10,DELT10,	BLKDATA	46
	* ILCR10	BLKDATA	47
C		BLKDATA	48
C	=11 HELICOPTER AND TILT ROTOR	BLKDATA	49
	COMMON/COPTER/T11,Q11,RPM11,B11,CT11,A211,DE11,RN11,	BLKDATA	50
	1 S11,C2E11,DELT11,XLMC11,XM11,NKTR11,CLF11,IRR11,	BLKDATA	51
	* ICOR11	BLKDATA	52
C		BLKDATA	53
C		BLKDATA	54
C	=12 MEASURED DATA INPUTS	BLKDATA	55
	COMMON/MEASIN/NP12,NPS12,NBTA12,CET112,EP12(5),PS112(17),	BLKDATA	56
	* BETA12(5),	BLKDATA	57
		BLKDATA	58

C	*ICOR12	BLKDATA	59
C		BLKDATA	60
C	ITYPE = 13 JET EDGE INTERACTION	BLKDATA	61
C	COMMON/JETEDG/AJS13,DDA13,DDNE13,DHNL13,CJCL13,	BLKDATA	62
	*FLAP13,HD13,EMJ13,TSR13,ICCR13	BLKDATA	63
C		BLKDATA	64
C		BLKDATA	65
C	ENG/WING GEOMETRY AND SHIELDING DATA	BLKDATA	66
C	COMMON/ENGEO/SWPTE,SWLE,DIHED,DCSD,DDX1D,DDX2D,DCXOD,	BLKDATA	67
	*DCY1D,DDY2D,DCYOD,DDLD,DIANI,IES	BLKDATA	68
C		BLKDATA	69
C		BLKDATA	70
C	COMMON/REFRAC/EMJ,TSTSD	BLKDATA	71
C		BLKDATA	72
C	COMMON/UNSHLD/USPLA(19),FSI(19),ALSPL,INUSP	BLKDATA	73
	COMMON/CLABEL/ CH(2,8)	BLKDATA	74
C		BLKDATA	75
C	CONSTANTS USED IN INTERNAL CALCULATIONS	BLKDATA	76
C		BLKDATA	77
C	COMMON /GCONST/ IN,I0,IT1,IT2,FC,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	BLKDATA	78
	* I0,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,POO1,	BLKDATA	79
	* EPS,UNDEF BL,ICL,DPR,RPD,ETA(17),M1,FM1,I17,A,P1	BLKDATA	80
	DIMENSION CFO(11),IOC(11),CP1(4)	BLKDATA	81
	EQUIVALENCE (CFO(1),FC),(IOC(1),IC),(CP1(1),P1)	BLKDATA	82
C		BLKDATA	83
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	BLKDATA	84
C		BLKDATA	85
C	COMMON /GCOMMON/ NCF,NK,DCF(24),TSPL(24,10,17),SPLT(24,17),	BLKDATA	86
	*BLF(25),RETA(17),SPL2(17),TGAGR(24),CUPSF(17)	BLKDATA	87
C		BLKDATA	88
C		BLKDATA	89
C	FREQUENCY BANDS USED BY PROGRAM	BLKDATA	90
C		BLKDATA	91
C	COMMON /GFREQ/ CFREQ(24),UFREQ(25),PFREQ(24)	BLKDATA	92
C		BLKDATA	93
C		BLKDATA	94
C	GENERAL INPUT PARAMETERS	BLKDATA	95
C		BLKDATA	96
C	COMMON /GRAM/ALTP,ALTR,SLOPE,APACH,ALBS,SIDIST(10),NTENG,IUNIT	BLKDATA	97
	* ,ISPTRM,IATMOS,IAIR,UAIRAB(24),NTEMP,TEMP(50),TALT(50)	BLKDATA	98
	* ,NPRES,PRES(50),PALT(50),RHUMID,RALT(50),RHUMID(50),CTEMP	BLKDATA	99
	* ,CPRES,CRHUMD,IEGA,IGDR,DTEMP,DPRES,CHUMID,XKN,ND,FLD(50),	BLKDATA	100
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IFAGE,BCG,TCG,FLR,AALT,EPF	BLKDATA	101
C		BLKDATA	102
C		BLKDATA	103
C	AIRCRAFT-OBSERVER GEOMETRY CUTPLTS	BLKDATA	104
C		BLKDATA	105
C	COMMON /GEOMO/ APY(10,17),APZ(10,17),PD(10,17),LPND(10,17),	BLKDATA	106
	* B1(10,17),B2(10,17),IDS(17,10),TPD(17,10),IRR(10,17)	BLKDATA	107
	* ,APP,TP,RHP,APD,TC,RHC,CA,CZ,TSP(17,10),CCV	BLKDATA	108
C		BLKDATA	109
C	COMMON/SLMSPL/SSPL(24,10,17)	BLKDATA	110
C		BLKDATA	111
C	COMMON/ONECAL/ICALL	BLKDATA	112
C		BLKDATA	113
C	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	BLKDATA	114
		BLKDATA	115

C	COMMON/TMSPL/SPZ(24,17),IB(2,3,13)	BLKDATA	116
	COMMON/ISWK/ISWT(3,13)	BLKDATA	117
	COMMON/ANGLE/PSI(17,10),PSIO(17,10),BETA(17,10)	BLKDATA	118
	COMMON/HEAD/HIN(20),HOUT(20),CHIN(20)	BLKDATA	119
C		BLKDATA	120
C	CONVERSION CONSTANTS	BLKDATA	121
		BLKDATA	122
C	COMMON/GCONVC/C(2,10),SLDISX(10)	BLKDATA	123
	COMMON/CRSPLO/DOB(17),PSCR(17),DPB(408),NPSCR	BLKDATA	124
C	INTERNAL INDICATORS FOR DETERMINING WHERE THE INSTRUCTION	BLKDATA	125
C	COUNTER IS LOCATED	BLKDATA	126
	COMMON/ICPATH/NC(2),NCOF,NTYP,IC,ARN,IARRAY(2)	BLKDATA	127
C	NCAS IS THE NUMBER OF THE CURRENT CASE BEING PROCESSED	BLKDATA	128
C	NCOF IS THE NUMBER OF THE CURRENT CONFIGURATION BEING	BLKDATA	129
C	PROCESSED	BLKDATA	130
C	NTYP IS THE TOTAL NUMBER OF NOISE COMPONENTS PROCESSED	BLKDATA	131
C	FOR THE CURRENT CONFIGURATION	BLKDATA	132
C		BLKDATA	133
	COMMON/SWITCH/NTYPE,ITYPE,NENG,IDCP,[PRT(7),ICN(13),NLOPT	BLKDATA	134
	*,INSEOW(3),INSHLD	BLKDATA	135
C		BLKDATA	136
C	MASS STORAGE (RANDOM DISK I/O) INDECES, COUNTER, AND FLAG	BLKDATA	137
	COMMON /MSIO/ INDX1(40), INDX2(3), INDX3(36), IC1, ICPEN	BLKDATA	138
C	/JETDAT/ DATA	BLKDATA	139
	DATA NJET1,MCUDE1,API,WPI,VP1,AS2,WS2,VS2,PR1,PA1,TT1,VA1,DIAMT1,	BLKDATA	140
	* ANGJT1,ICOR1 /0,1,12*0.0,0/	BLKDATA	141
C	/COREIN/ DATA	BLKDATA	142
	DATA TT3,PP3,CMF3,EK3,DELT3,JB3,	BLKDATA	143
	* ICOR3,LIN3,NTF3,IMA3,LGM3,NWL3,IDP3,ILAY3,TF3	BLKDATA	144
	* PCTA3 ,PLA3 ,ELCH3,EDH3,R1W3 ,TL3 ,CF3,FM3	BLKDATA	145
	* /5*0.0,1*0.0,3*0.0,2,1,10*0.0,100.,9*0.0,34*0.0/	BLKDATA	146
C	/TURBIN/ DATA	BLKDATA	147
	DATA BN3,SS3,VTR3,CLS3,CT3,TU3,PMF3,CS3,IC3,ISW3	BLKDATA	148
	* / 8*0.0,2*0/	BLKDATA	149
C	/FANDAT/ DATA	BLKDATA	150
	DATA NSTG45,NLET45,NAFT45,IDP45,NB45 ,FPR45	BLKDATA	151
	* /0,0,0,0,3*0.0,3*0.0/	BLKDATA	152
	1 DIAM4 ,RSS45 ,AREA5 ,RN145,RIS4,CFPR45,DELT45	BLKDATA	153
	* /3*0.,3*0.,3*0.,0.,0.,0.,0.,0./	BLKDATA	154
	* N15,BPR5,ICOR4,LIN4,NTF4,IMA4,LGM4,NWL4,ICP4,ILAY4,TF4	BLKDATA	155
	* /0,1.,0,0,0,0,0,0,2,1,10*0.0/	BLKDATA	156
	* PCTA4 ,PLA4 ,ELCH4,EDH4,R1W4 ,TL4 ,CF4,FM4	BLKDATA	157
	* /100.,9*0.,10*0.,0.,0.,10*0.,10*0.,0.,0./	BLKDATA	158
	* ICOR5,LIN5,NTF5,IMA5,LGM5,NWL5,ICP5,ILAY5,TF5	BLKDATA	159
	* /0,0,0,0,0,0,2,1,10*0.0/	BLKDATA	160
	* PCTA5 ,PLA5 ,ELCH5,EDH5,R1W5 ,TL5 ,CF5,FM5	BLKDATA	161
	* / 10*0.,10*0.,0.,0.,10*0.,10*0.,0.,0./	BLKDATA	162
C	/AUGWNG/ DATA	BLKDATA	163
	DATA GAMA6,TT6,NPR6,DELT6,AC6,DE6	BLKDATA	164
	* / 1.4,0.,0,0,0.,0.,0.,0./	BLKDATA	165
	* ICOR6,LIN6,NTF6,IMA6,LGM6,NWL6,ICP6,ILAY6,TF6	BLKDATA	166
	* /0,0,0,0,0,0,2,1,10*0.0/	BLKDATA	167
	* PCTA6 ,PLA6 ,ELCH6,EDH6,R1W6 ,TL6 ,CF6,FM6	BLKDATA	168
	* /100.,9*0.,10*0.,0.,0.,10*0.,10*0.,0.,0./	BLKDATA	169
C	/BLOWIN/ DATA	BLKDATA	170
		BLKDATA	171
		BLKDATA	172

DATA	PR7,TT7,AN7,DN7,FANG7,DELT7,DL7,HD7,ICCR7	BLKDATA	173
* / 8*0.,0 /		BLKDATA	174
C /LFTFAN/ DATA		BLKDATA	175
DATA	NB8,FPR8,DIAM8,RSS8,AREA8,RN18,RTS8,CRFPR8,DELTA8,	BLKDATA	176
* ICOR8,LIN8,NTF8,IMA8,LGM8,NWL8,IDP8,ILAY8,TF8 ,PCTA8 ,		BLKDATA	177
* PLA8 ,ELOH8,EDH8,Rlw8 ,TL8 ,CF8,FM8		BLKDATA	178
* /0,8*0.,0,5*0,2,1,10*0.,100.,9*0.,34*0./		BLKDATA	179
C /EJECTD/ DATA		BLKDATA	180
DATA	IEJECT,NUMTBS,AREA,AR,TS,AMACHJ,AMACHS,CV,	BLKDATA	181
* PS,PAREA,PTS,PMACHJ,PCV,EJANG,		BLKDATA	182
*ICOR9,LIN9,NIF9,IMA9,LGM9,NWL9,ICF9,ILAY9,		BLKDATA	183
*TF9 ,PCTA9 ,PLA9 ,		BLKDATA	184
*ELOH9,EDH9,Rlw9 ,TL9 ,CF9,FM9		BLKDATA	185
* /2*0,12*0.,3*0,0,2*0,2,1,10*0.,100.,9*0.,34*0./		BLKDATA	186
C /PROPIN/ DATA		BLKDATA	187
DATA	T10,w10,RPM10,D10,CSUB10,ASUB10,B10,DELT10,	BLKDATA	188
*ICOR10/8*0.0,0/		BLKDATA	189
C /CCPTER/ DATA		BLKDATA	190
DATA	T11,Q11,KPM11,B11,CT11,AB11,DE11,RN11,	BLKDATA	191
1 S11,CEE11,DELT11,XLMC11,XM11,NRTR11,LLF11,IRR11,		BLKDATA	192
*ICOR11 / 13*0.,4*C/		BLKDATA	193
C /MEASIN/ DATA		BLKDATA	194
DATA	NEP12,NPSI12,NBTA12,DELT12,EP12 ,PSI12 ,	BLKDATA	195
* BETA12 ,		BLKDATA	196
*ICOR12 / 3*0,28*C.,0/		BLKDATA	197
C /JETEDG/ DATA		BLKDATA	198
DATA	AJS13/5.7/,DDA13/.7854/,DDNE13/0./,CHNL13/0./,DJCL13/5./,	BLKDATA	199
*FLAP13/0./,HD13/4.0/,EMJ13/0./,TSR13/1./,ICCR13/0/		BLKDATA	200
C /EWGIC/ DATA		BLKDATA	201
DATA	SWPTE,SWPLE,DIHED,DCXOD,DDYCD,DIANI,IES/	BLKDATA	202
* 0.,0.,0.,0.,.1.,.3048,C/		BLKDATA	203
C /REFRAC/ DATA		BLKDATA	204
DATA	EMJ,TSTSO/0.,1./	BLKDATA	205
C /UNSHLD/ DATA		BLKDATA	206
DATA	INUSP/0/	BLKDATA	207
C /CLABEL/ DATA		BLKDATA	208
DATA	CH/4H M.,4H FT,4H MIC,4HO PI,4HRC-A,4HCCBA,4H/SC.,4HR) ,	BLKDATA	209
* 4HM.),1H,1HK,1HR,4HATM.,4HPSIA,3HM/S,3HFPS/		BLKDATA	210
C /GCONST/ DATA		BLKDATA	211
DATA	UNDEF/17770CGG00CG00CG00CG00CB/	BLKDATA	212
C		BLKDATA	213
DATA	IN/5/,IO/6/,IT1/8/,IT2/5/,CFC/0.0,1.0,2.0,3.0,4.0,5.0,6.0,	BLKDATA	214
* 7.0,8.0,9.0,10.C./, 10C/0,1,2,3,4,5,6,7,8,9,10/,CPI/.1,		BLKDATA	215
* .32333333,.5.,CC1/,EPS/1.2E-3/,		BLKDATA	216
* BL/4H /,IGD/1/, DPR/57.29578/,RPD/1.745329E-2/,ETA/10.,		BLKDATA	217
* 20.,30.,40.,50.,60.,70.,80.,90.,100.,110.,120.,130.,140.,		BLKDATA	218
* 150.,160.,170./,M1/-1/,FM1/-1.0/,I17/17/,A/49.02142/		BLKDATA	219
*,PI/3.141592653898/		BLKDATA	220
C /GCOMGN/ DATA		BLKDATA	221
DATA	NCF,NK,BCF ,TSPL ,SPLT ,	BLKDATA	222
*BUF ,RETA ,SPL2 ,TGAGR ,DCPSF		BLKDATA	223
* /2*0,4595*0.,17*1.0/		BLKDATA	224
C /GFREQ/ DATA		BLKDATA	225
DATA	CFREQ /50.11872,63.09573,75.43282,100.0000,125.8925,158.4893,	BLKDATA	226
*199.5262,251.1886,316.2278,398.1072,501.1872,630.9573,794.3282,		BLKDATA	227
*1000.000,1258.925,1584.893,1995.262,2511.886,3162.278,3981.072,		BLKDATA	228
*5011.872,6309.573,7943.282,10000.00/		BLKDATA	229

DATA UFREQ /44.66836,56.23413,70.79458,89.12509,112.2018,141.2538,	BLKDATA	230
*177.8279,223.8721,281.8383,354.8134,446.6836,562.3413,707.9458,	BLKDATA	231
*891.2509,1122.018,1412.538,1778.279,2238.721,2818.383,	BLKDATA	232
*3548.134,4466.836,5623.413,7079.458,8912.509,11220.18/	BLKDATA	233
DATA PFREQ/24*0./	BLKDATA	234
C /GPRAM/ DATA	BLKDATA	235
DATA ALTP,ALTR,SLOPE,AMACH,NCBS,SLDIST ,NTENG,IUNIT	BLKDATA	236
* ,ISPTRM,IATMOS,IAIR,UAIRAB ,NTEMP,TEMP ,TALT	BLKDATA	237
* ,NPRES,PRES ,PALT ,RHUMID,HALT ,RHUMID ,LTEMP	BLKDATA	238
* ,CPRES,CKHUMD,IEGA,IGDR,DTENP,DPRES,DHUMID,XKN,NC,FLD ,	BLKDATA	239
* ZNR ,ZNI ,LINECT,MAXLIN,IPAGE,BGG,TCG,FLK,AALT,EPF	BLKDATA	240
* / 4*0.,1,10*0.,1,0,3*0,24*0.,C,100*0.,0,100*0.,0,100*0.,3*0.,0,1,	BLKDATA	241
*3*0.,4.2,2,150*0.,0,56,0,10.,1C.,9C.,0.,0./	BLKDATA	242
C /GEOMO/ DATA	BLKDATA	243
DATA APY ,APZ ,PD ,DPND ,	BLKDATA	244
* B1 ,B2 ,TDS ,TPD ,IRR	BLKDATA	245
* ,APP,TP,RHP,APU,TO,RHC,CA,CZ,TSP ,CCV	BLKDATA	246
* /170*0.,170*0.,170*0.,170*0.,170*0.,170*0.,170*0.,170*0.,	BLKDATA	247
* 8*0.,171*0./	BLKDATA	248
C /SUMSPL/ DATA	BLKDATA	249
DATA SSPL/4080*0./	BLKDATA	250
C /ONECAL/ DATA	BLKDATA	251
DATA ICALL/C/	BLKDATA	252
C /PNLD/ DATA	BLKDATA	253
DATA PSPL/34C*0./,EPNL/50*0./,JEPNL/50*0./	BLKDATA	254
C /TMSPL/ DATA	BLKDATA	255
DATA SPZ/408*0./,IB/78*0/	BLKDATA	256
C /ISWK/ DATA	BLKDATA	257
DATA ISWT/39*0/	BLKDATA	258
C /ANGLE/ DATA	BLKDATA	259
DATA PSI/170*0./,PSIC/17C*0./,BETA/170*0./	BLKDATA	260
C /HEAC/ DATA	BLKDATA	261
DATA HIN/20C*0./,HCLT/20C*0./,CHIN/20C*0./	BLKDATA	262
C /GCONVC/ DATA	BLKDATA	263
DATA C /3.280833,.3048006,.224505,4.4483,2.204616,.4535937,	BLKDATA	264
* 1.341011,.7457061,1.8,.5555555,14.696,6.804573E-2,8*0./	BLKDATA	265
C /CRSPLS/ DATA	BLKDATA	266
DATA CGB/17*0./,PSCR/17*0./,GPB/408*0./,APSCR/0/	BLKDATA	267
C /ICPATH/ DATA	BLKDATA	268
DATA NCAS, NCOF, NTPY, IC, NRN, IARRAY /C,1,3*0,1,-13/	BLKDATA	269
C /SWITCH/ DATA	BLKDATA	270
DATA NTYPE/1/,ITYPE/C/,NENG/1/,IDCP/0/,IPRT/7*0/,ICN/13*0/,	BLKDATA	271
*NLOPT/0/,INSEOW/3*C/,INSHLD/0/	BLKDATA	272
C /MSIO/ DATA	BLKDATA	273
DATA INDX1 /40*0/, INDX2 /3*0/, INDX3 /36*0/, ICI /0/, IUPEN /0/	BLKDATA	274
END	BLKDATA	275

OVERLAY(EXEC10,1,0)	ONE	2
PROGRAM ONE	ONE	3
COMMON/ONECAL/ICAL	ONE	4
IF(ICAL.EQ.0)GO TO 10	ONE	5
CALL NEXTCR	ONE	6
RETURN	ONE	7
10 CALL FLTGEO(IECE)	ONE	8
IF(IECE.NE.0)CALL ERROR(13,7,15)	ONE	9
RETURN	ONE	10
END	ONE	11

```

OVERLAY(EXEC20,2,C)
PROGRAM TWO
COMMON/SWITCH/NTYPE,ITYPE
IF ((ITYPE .EQ. 1) .OR. (ITYPE .EQ. 2)) GC TO 12
IF (ITYPE .EQ. 4) GC TO 4
IF (ITYPE .EQ. 5) GC TO 5
GC TO 100
12 CALL JET
GC TO 100
4 CALL INLET
GC TO 100
5 CALL AFT
100 CONTINUE
RETURN
END

```

TWO	2
TWO	3
TWO	4
TWO	5
TWO	6
TWO	7
TWO	8
TWO	9
TWO	10
TWO	11
TWO	12
TWO	13
TWO	14
TWO	15
TWO	16

```

OVERLAY(EXEC30,3,0)
PROGRAM THREE
COMMON/SWITCH/NTYPE,ITYPE
IF (ITYPE .EQ. 3) GC TC 3
IF (ITYPE .EQ. 6) GC TC 6
IF (ITYPE .EQ. 9) GC TC 9
GO TO 100
3 CALL COREN
GO TO 100
6 CALL SPECAN
GO TO 100
9 CALL EJECT
100 CONTINUE
RETURN
END

```

```

THREE 2
THREE 3
THREE 4
THREE 5
THREE 6
THREE 7
THREE 8
THREE 9
THREE 10
THREE 11
THREE 12
THREE 13
THREE 14
THREE 15
THREE 16

```

```

OVERLAY(EXEC40,4,0)
PROGRAM FOUR
COMMON/SWITCH/NTYPE,ITYPE
IF (ITYPE .EQ. 8) GO TO 8
IF (ITYPE .EQ. 10) GO TO 10
IF (ITYPE .EQ. 11) GO TO 11
GO TO 100
8 CALL LIFTFN
GO TO 100
10 CALL PROP
GO TO 100
11 CALL COPTR
100 CONTINUE
RETURN
END

```

FOUR	2
FOUR	3
FOUR	4
FOUR	5
FOUR	6
FOUR	7
FOUR	8
FOUR	9
FOUR	10
FOUR	11
FOUR	12
FOUR	13
FOUR	14
FOUR	15
FOUR	16

OVERLAY(EXEC50,5,0)
PROGRAM FIVE
COMMON/SWITCH/NTYPE,ITYPE
IF(ITYPE.EQ.12)CALL MEASRD
RETURN
END

FIVE	2
FIVE	3
FIVE	4
FIVE	5
FIVE	6
FIVE	7

```

OVERLAY(EXEC60,6,0)
PROGRAM SIX
COMMON /SWITCH/ NTYPE, ITYPE
IF (ITYPE .EQ. 7) GO TO 7
IF (ITYPE .EQ. 13) GO TO 13
GO TO 100
7 CALL BLWFLP
GO TO 100
13 CALL JEINT
100 CONTINUE
RETURN
END

```

SIX	2
SIX	3
SIX	4
SIX	5
SIX	6
SIX	7
SIX	8
SIX	9
SIX	10
SIX	11
SIX	12
SIX	13

	PROGRAM DATGEN(OUTPUT=20C2B,TAPE6=CUTPUT,TAPE20=104B,TAPE21=104B,	DATGEN	2
1	TAPE22=104B)	DATGEN	3
C	THIS PROGRAM GENERATES A SUBROUTINE FOR THE FCCTPRINT	DATGEN	4
C	PROGRAM WITH THE NOISE DATA FROM TEE187C STORED IN A DATA	DATGEN	5
C	STATEMENT, THE SIZE AND NAME OF WHICH IS PASSED TO THE	DATGEN	6
C	FTPRT ROUTINE AS ARGUMENTS -E.G. CALL FTPRT(N,DATN)	DATGEN	7
	DIMENSION DI(216),X(18)	DATGEN	8
	DATA IT/0/	DATGEN	9
	DATA KF/22/	DATGEN	10
	DATA KI,KO,KB/20,21,0/	DATGEN	11
	DATA IC,IS,IE,IG/0,0,0,1/	DATGEN	12
	DATA A/11A/	DATGEN	13
	REWIND KI	DATGEN	14
	REWIND KF	DATGEN	15
	REWIND KO	DATGEN	16
	N1=0	DATGEN	17
	WRITE (6,103)	DATGEN	18
103	FORMAT(44H IS IE J1 N1 IC Iw)	DATGEN	19
C	READ DATA FROM CUTPUT FROM TEE187C (TAPE 20) AND WRITE THIS DATA	DATGEN	20
C	OUT ON TAPE 21 AS DATA STATEMENTS	DATGEN	21
C	IC IS THE COUNT OF THE NUMBER OF DATAARRAYS	DATGEN	22
C	IS IS EQUAL TO 1 AT START OF EACHARRAY	DATGEN	23
C	IE IS EQUAL TO THE LAST ELEMENT OF EACH ARRAY	DATGEN	24
C	IG INDICATES THE END OF THE INPLT FILE	DATGEN	25
	DO 1000 I=1,20000,216	DATGEN	26
	J1=0	DATGEN	27
	IC=IC+1	DATGEN	28
	IS=1	DATGEN	29
	IE=IS+215	DATGEN	30
25	I1=1+J1	DATGEN	31
	I2=I1+11	DATGEN	32
0360	READ(KI,100,END=40)(DI(J),J=I1,I2)	DATGEN	33
	READ(KI,100)(DI(J),J=I1,I2)	DATGEN	34
	IF (EOF(KI)) 40, 20	DATGEN	35
100	FORMAT (12A4)	DATGEN	36
20	J1=J1+12	DATGEN	37
	IF(J1.EQ.216)GO TO 60	DATGEN	38
	GO TO 25	DATGEN	39
40	IE=J1+IS-1	DATGEN	40
	Iw=1	DATGEN	41
	WRITE (6,102) IS, IE, J1, N1, IC, Iw	DATGEN	42
102	FORMAT(6I8)	DATGEN	43
	IF(IS.GT.IE)GO TO 1050	DATGEN	44
	IG=2	DATGEN	45
60	CALL WRDATA(DI,1,J1,KC,I1)	DATGEN	46
	IF (IG - 1) 1000, 1000, 1100	DATGEN	47
1000	CONTINUE	DATGEN	48
	Iw=2	DATGEN	49
	WRITE (6,102) IS, IE, J1, N1, IC, Iw	DATGEN	50
1050	IC=IC-1	DATGEN	51
	Iw=3	DATGEN	52
	WRITE (6,102) IS, IE, J1, N1, IC, Iw	DATGEN	53
	J1=216	DATGEN	54
1100	CONTINUE	DATGEN	55
	Iw=4	DATGEN	56
	WRITE (6,102) IS, IE, J1, N1, IC, Iw	DATGEN	57
	REWIND KC	DATGEN	58

C	WRITE PROGRAM HEADER FOR MAIN PROGRAM CF FOOT PRINT	DATGEN	59
	WRITE(KF,241)	DATGEN	60
241	FORMAT(6X,26H SUBROUTINE TEE227(INCODE,NLN))	DATGEN	61
	WRITE(KF,300)	DATGEN	62
300	FORMAT(52HC PROGRAM TEE227A(INPUT,OUTPUT,TAPE5=INPUT,TAPE6,	DATGEN	63
	X 8H=OUTPUT))	DATGEN	64
C	WRITE A COMMENT OF EXPLANATION	DATGEN	65
	WRITE(KF,400)	DATGEN	66
400	FORMAT(52HC THIS PROGRAM HAS BEEN GENERATED AS A MEANS OF /	DATGEN	67
X60HC	CIRCUMVENTING THE NEED FOR INPUT TO TEE227 WHICH IS TO /	DATGEN	68
X	52HC BE RUN UNDER CONTROL OF A REAL TIME SIMULATOR ON /	DATGEN	69
X60HC	THE SIGMA 7. /	DATGEN	70
X60HC	THE 4 NUMBERS REPRESENTED ON EACH LINE OF THE DATA /	DATGEN	71
X62HC	STATEMENT ARE THE OUTPUT OF NOISE LEVEL, ENGINE PRESSURE/	DATGEN	72
X60HC	RATIO, ELEVATION ANGLE, LOG10 OF RANGE, GENERATED BY /	DATGEN	73
X60HC	THE NOISE PREDICTION PROGRAM, TEE187 PER INPUT CASE /	DATGEN	74
X60HC	AND PLACED ON FILE TAPE20, WHICH HAVE BEEN PROCESSED /	DATGEN	75
X60HC	BY THE TEE187C POST-PROCESSOR. THE POST-PROCESSOR /	DATGEN	76
X60HC	INCORPORATES THIS DATA DURING THE GENERATION OF THE /	DATGEN	77
X60HC	MAIN PROGRAM OF TEE227, THE NOISE COUNTDOWN PROGRAM /	DATGEN	78
X62HC	WHICH THE POST-PROCESSOR HAS OUTPUT IN SOURCE CODING ON /	DATGEN	79
X60HC	FILE TAPE22)	DATGEN	80
	WRITE(KF,242)	DATGEN	81
242	FORMAT(6X,23HCOMMON/CCOUNT/NEPR, NL)	DATGEN	82
	WRITE(KF,243)	DATGEN	83
243	FORMAT(6X,38HCOMMON/CCOUNT/AEPR(6),ALRO(9),AALFA(6))	DATGEN	84
	N1=72	DATGEN	85
C	WRITE DIMENSION STATEMENTS FOR DATA ARRAYS	DATGEN	86
	ID1=-71	DATGEN	87
	DC 1200 I=1,IC	DATGEN	88
	Ih=5	DATGEN	89
	WRITE (6,102) IS, IE, J1, N1, IC, Ih	DATGEN	90
	ID=I+9	DATGEN	91
	IF(I.EQ.IC.AND.IE.EQ.C)GO TO 1300	DATGEN	92
	IF(I.EQ.IC)N1=J1/3	DATGEN	93
	Ih=6	DATGEN	94
	WRITE (6,102) IS, IE, J1, N1, IC, Ih	DATGEN	95
	WRITE(KF,700)A,ID,N1	DATGEN	96
700	FORMAT(6X,10H DIMENSION ,A1,I2,IH(I2,IH))	DATGEN	97
	ID1=ID1+72	DATGEN	98
	WRITE(KF,800)ID1,ID	DATGEN	99
800	FORMAT(6X,18HEQUIVALENCE (DATN(I,I4,3H),A,I2,4H(1)))	DATGEN	100
1200	CONTINUE	DATGEN	101
1300	CONTINUE	DATGEN	102
	N=72*(IC-1)+N1	DATGEN	103
	N4=N/4	DATGEN	104
	WRITE(KF,750)N	DATGEN	105
750	FORMAT(6X,15H DIMENSION DATN(I,I4,1H))	DATGEN	106
	WRITE(KF,850)N4,N4,N4,N4	DATGEN	107
850	FORMAT(6X,13H DIMENSION D1(I,I2,2H),,3HD2(I,I2,2H),,3HD3(I,I2,	DATGEN	108
	X2H),,3HD4(I,I2,1H))	DATGEN	109
	DO 950 I=1,IT	DATGEN	110
	READ(KO,900)X	DATGEN	111
900	FORMAT(18A4)	DATGEN	112
	WRITE(KF,900)X	DATGEN	113
950	CONTINUE	DATGEN	114
C	WRITE CALL TO FOOT PRINT SUBROUTINE AND STOP/END	DATGEN	115

```

        WRITE(KF,500)N,N4
500  FORMAT(6X,2HN=,I4/6X,3HN4=,I4)
        WRITE(KF,550)
550  FORMAT(6X,45HCALL FTPRT(N,DATA,N4,D1,D2,D3,D4,IMODE,NLN)
        X/6X,6HRETURN/6X,3HEND)
        REWIND KF
        STOP
        END

```

```

CATGEN 116
CATGEN 117
CATGEN 118
CATGEN 119
CATGEN 120
CATGEN 121
CATGEN 122
CATGEN 123

```

```

SUBROUTINE WRDATA(X,IS,IE,KC,IT)
C   X IS THE DATA ARRAY CONTAINING THE VALUES TO BE WRITTEN OUT
C   IS IS THE STARTING ELEMENT OF THE ARRAY
C   IE IS THE END ELEMENT OF THE ARRAY
C   KO IS THE OUTPUT FILE WHICH THE DATA STATEMENT IS WRITTEN ON
      DIMENSION X(1),Y(3,4),XM(2),XMX(2)
      DATA XM,XMX,DAT,C,BL,SL,A,NA,N/1H ,1H ,1H ,2H X,4HDATA,1H,,1H ,
X      1H/,1H,9,G/
      NA=NA+1
      WRITE(KO,8001)XM,DAT,BL,A,NA,BL,SL
8001 FORMAT(A4,A2,A4,A1,A1,I2,A1,A1)
      IT=IT+1
C   WRITE UP TO 18 CONTINUATION CARDS
      JK=-14
      DO 1000 I=1,18
      JK=JK+12
      J=JK
      DO 100 K=1,4
      K1=K
      J=J+3
      Y(1,K1)=X(J)
      Y(2,K1)=X(J+1)
100  Y(3,K1)=X(J+2)
      CP=C
      IF(I.EQ.J+2)CH=SL
      WRITE(KO,8003)XMX,(BL,(Y(I1,I2),I1=1,3),C,I2=1,3),BL,(Y(I1,4),
X      I1=1,3),CH
      IT=IT+1
8003 FORMAT(A4,A2,4(A1,3A4,A1))
      IF(CP.EQ.SL)GO TO 1100
1000 CONTINUE
1100 CONTINUE
      RETURN
      END

```

```

WRDATA 2
WRDATA 3
WRDATA 4
WRDATA 5
WRDATA 6
WRDATA 7
WRDATA 8
WRDATA 9
WRDATA 10
WRDATA 11
WRDATA 12
WRDATA 13
WRDATA 14
WRDATA 15
WRDATA 16
WRDATA 17
WRDATA 18
WRDATA 19
WRDATA 20
WRDATA 21
WRDATA 22
WRDATA 23
WRDATA 24
WRDATA 25
WRDATA 26
WRDATA 27
WRDATA 28
WRDATA 29
WRDATA 30
WRDATA 31
WRDATA 32
WRDATA 33
WRDATA 34
WRDATA 35

```

PROGRAM TEX227(INPUT=1048,OUTPUT=20028,TAPE5=INPUT,TAPE6=OUTPUT,	TEX227	2
1 TAPE2=1048,TAPE99=20028)	TEX227	3
READ(5,9000)IPLOT	TEX227	4
9000 FCRMAT(I3)	TEX227	5
IF(IPLOT.NE.-1)GO TO 1000	TEX227	6
C THIS IS AN OPTION TO PLOT WITH THE EXISTING TAPE 2	TEX227	7
C THE ENTRY INTO DRIVER BY THIS METHOD GIVES IMODE	TEX227	8
C A VALUE FOR TESTING THAT IT COULD NOT NORMALLY HAVE IN DRIVER	TEX227	9
C THIS ALLOWS A TEST FOR A PLOT OPTION	TEX227	10
C	TEX227	11
CALL DRIVES(D,D,D,D,D,D,D,D,-1)	TEX227	12
GO TO 1010	TEX227	13
1000 CALL TEE227(1,0)	TEX227	14
1010 STOP	TEX227	15
END	TEX227	16

	INTEGER FUNCTION SEARCH(Z,X,ND,M,IS)	TEARCH	2
C	SC0931 SEARCH PS-471 WILINSKI,R.M. 690304 6600	TEARCH	3
C	BINARY SEARCH	TEARCH	4
C		TEARCH	5
	DIMENSION X(2)	TEARCH	6
C	FUNCTION TO HALVE INDEX DURING BINARY SEARCH	TEARCH	7
	IHALF(I) = (I + 1)/2	TEARCH	8
C		TEARCH	9
	N = IABS(M)	TEARCH	10
	SEARCH = 1	TEARCH	11
	I = 1	TEARCH	12
	IF(N .LE. 1)GO TO 24	TEARCH	13
C	INPUT PARAMETER ND MAY BE CHANGED BECAUSE DEG. IS TOO LARGE	TEARCH	14
	ND = MINO(ND,N-1)	TEARCH	15
	IF(M .GE. 0)GO TO 445	TEARCH	16
C	TEST TO PREVENT EXTRAPOLATION WHEN N IS NEGATIVE	TEARCH	17
	IF(ABS(Z+X(1)-X(N)) .LE. ABS(X(1)-X(N)))GO TO 445	TEARCH	18
	IF(ABS(Z-X(1)) .GE. ABS(Z-X(N)))I = N	TEARCH	19
	GO TO 24	TEARCH	20
445	IGO = 1	TEARCH	21
	IF(X(1) .GT. X(2))IGO = C	TEARCH	22
C	DESCENDING X ARRAY	TEARCH	23
C	BINARY SEARCH TO BRACKET Z BETWEEN X(I) AND X(I+1)	TEARCH	24
	I = IHALF(N)	TEARCH	25
	IDLT = 1	TEARCH	26
C	MAIN SEARCH LOOP	TEARCH	27
5	IDLT = IHALF(IDLT)	TEARCH	28
	DIF = X(I) - Z	TEARCH	29
	IF(IGO .EQ. 0)DIF = -DIF	TEARCH	30
	IF(DIF)30,24,20	TEARCH	31
C	X(I) IS EXACT VALUE	TEARCH	32
24	IS = I	TEARCH	33
	GO TO 52	TEARCH	34
C	I TOO LARGE (UNLESS I = 1)	TEARCH	35
20	IF(I - 1)40,40,21	TEARCH	36
21	IF(I - IDLT)22,22,23	TEARCH	37
C	IDLT TOO LARGE (BECAUSE N NOT POWER OF 2)	TEARCH	38
22	IDLT = IHALF(IDLT)	TEARCH	39
23	I = I - IDLT	TEARCH	40
	I=MAXO(I,1)	TEARCH	41
	GO TO 5	TEARCH	42
C	I OK OR TOO SMALL (UNLESS I = N)	TEARCH	43
30	IF(I - N)31,40,40	TEARCH	44
C	Z NOT OUTSIDE RIGHT END OF TABLE	TEARCH	45
31	DIF = X(I+1) - Z	TEARCH	46
	IF(IGO .EQ. 0)DIF = -DIF	TEARCH	47
	IF(DIF)34,36,40	TEARCH	48
C	X(I+1) IS EXACT VALUE	TEARCH	49
36	IS = I + 1	TEARCH	50
	GO TO 52	TEARCH	51
C	I TOO SMALL	TEARCH	52
34	I = I + IDLT	TEARCH	53
	IF(I - N)5,5,35	TEARCH	54
C	IDLT WAS TOO LARGE (BECAUSE N NOT POWER OF 2)	TEARCH	55
35	I = I - IDLT	TEARCH	56
	IDLT = IHALF(IDLT)	TEARCH	57
	GO TO 34	TEARCH	58

```

C      Z BRACKETED BY X(I), X(I+1)
40 IF(ND)44,44,43
C      ND .LE. 0 -- RETURN NEAREST POINT IN TABLE
44 IF(I .EQ. N)GO TO 24
   IF(ABS(Z - X(I)) .LE. ABS(Z - X(I+1)))GO TO 24
   GO TO 36
C      FIND ND + 1 POINTS CENTERED (IF POSSIBLE) AROUND Z
43 I = MINO(MAXO(1, I - (ND - 1)/2), N - ND)
   IS = I
   SEARCH = 0
52 RETURN
   END

```

```

TEARCH 59
TEARCH 60
TEARCH 61
TEARCH 62
TEARCH 63
TEARCH 64
TEARCH 65
TEARCH 66
TEARCH 67
TEARCH 68
TEARCH 69
TEARCH 70

```

	SUBROUTINE ABSORP(RH, T, NBW, NFB, BCF, ALPHA)	ABSORP	2
C	PROGRAM TO COMPUTE ABSORPTION COEFFICIENTS AS DEFINED BY	ABSORP	3
C	SAE-ARP866. THE (RMS) ERROR IN COMPUTING THE COEFFICIENTS IS LESS	ABSORP	4
C	THAN 0.1 DB/1000FT.	ABSORP	5
C		ABSORP	6
C	AUTHOR D. G. DUNN	ABSORP	7
C		ABSORP	8
C		ABSORP	9
C		ABSORP	10
C	INPUTS ARE-	ABSORP	11
C	RH = RELATIVE HUMIDITY IN PERCENT.	ABSORP	12
C	NBW = BANDWIDTH INDICATOR (NBW = 1 FOR FULL OCTAVE-BANDS,	ABSORP	13
C	(NBW = 3 FOR THIRD OCTAVE-BANDS)	ABSORP	14
C	NFB = NUMBER OF FREQUENCY BANDS.	ABSORP	15
C	BCF = THE ARRAY OF BAND CENTER FREQUENCIES.	ABSORP	16
C	T = AMBIENT TEMPERATURE IN DEGREES FARENHEIT	ABSORP	17
C		ABSORP	18
C	OUTPUT IS THE ARRAY OF ABSORPTION COEFFICIENTS (ALPHA)	ABSORP	19
C		ABSORP	20
C	RESTRICTIONS	ABSORP	21
C		ABSORP	22
C	APPLICABLE ONLY TO	ABSORP	23
C	1) STANDARD COMMERCIAL OCTAVES	ABSORP	24
C	2) STANDARD PREFERRED OCTAVES	ABSORP	25
C	3) STANDARD PREFERRED (1/3) OCTAVES	ABSORP	26
C	AND NOT APPLICABLE TO GENERALIZED FREQUENCY BANDS, I.E.	ABSORP	27
C	1) OCTAVES OR (.3)TH DECADE BANDS NOT DEFINED FOR (BCF)	ABSORP	28
C	CONTAINED IN OPEN SET (4000,6788) HZ	ABSORP	29
C	2) (1/3) OCTAVES OR (.1)TH DECADE BANDS NOT DEFINED FOR	ABSORP	30
C	(BCF) CONTAINED IN OPEN SET (4000,5000) HZ	ABSORP	31
C		ABSORP	32
C	ALLOCATE STORAGE FOR OTHER ARRAYS	ABSORP	33
C	DIMENSION ALPHA(1), BCF(1)	ABSORP	34
C	DIMENSION DX1(11), DY1(11), DX2(21), DY2(21), XD(33), YD(33)	ABSORP	35
C	DEFINE CONSTANTS	ABSORP	36
C	DIMENSION XYD9(66), DXY19(22), DXY29(42)	ABSORP	37
C	DATA XYD9 / C., C., 0.25, 0.313, 0.5, 0.704,	ABSORP	38
C	10.75, 0.957, 1.0, 1.0, 1.25, 0.87, 1.5, 0.75, 1.75, 0.65, 2.0, 0.57	ABSORP	39
C	2, 2.25, 0.506, 2.5, 0.45, 2.75, 0.408, 3.0, 0.37, 3.25, 0.337,	ABSORP	40
C	3 3.5, 0.308, 3.75, 0.286, 4.0, 0.269, 4.25, 0.253, 4.5, 0.241,	ABSORP	41
C	4 4.75, 0.232, 5.0, 0.225, 5.25, 0.22, 5.5, 0.214, 5.75, 0.21,	ABSORP	42
C	5 6.0, 0.205, 6.25, 0.201, 6.5, 0.2, 6.75, 0.198, 7.0, 0.195,	ABSORP	43
C	6 7.25, 0.192, 7.5, 0.189, 7.75, 0.186, 8.0, 0.183, 8.25, 0.18,	ABSORP	44
C	DATA DXY19 / 0.0, -2.457, 10., -2.3889,	ABSORP	45
C	1 20., -2.3236, 30., -2.2708, 40., -2.2165, 50., -2.1748, 60., -2.1247,	ABSORP	46
C	2 70., -2.0825, 80., -2.032, 90., -1.9824, 100., -1.9046 /	ABSORP	47
C	DATA DXY29 / 0.0, -1.9482, 5., -1.8426,	ABSORP	48
C	1 10., -1.739, 15.0, -1.6356, 20., -1.5411, 25., -1.4393, 30., -1.341,	ABSORP	49
C	2 35., -1.2562, 40., -1.1716, 45., -1.088, 50., -1.0098, 55., -0.9391,	ABSORP	50
C	3 60., -0.8725, 65., -0.7949, 70., -0.7264, 75., -0.6541, 80., -0.5812,	ABSORP	51
C	4 85., -0.5214, 90., -0.4575, 95., -0.389, 100., -0.3298 /	ABSORP	52
C	DATA ISET9/1/	ABSORP	53
C	IF (ISET9 - 1) 15, 19, 29	ABSORP	54
19	ISET9=2	ABSORP	55
C	I=0	ABSORP	56
C	DO 21 K=1,66,2	ABSORP	57
C	I=I+1	ABSORP	58

21	XD(I)=XYDS(K)	ABSORP	59
	YD(I)=XYDS(K+1)	ABSORP	60
	I=0	ABSORP	61
	DO 23 K=1,22,2	ABSORP	62
	I=I+1	ABSORP	63
	DX1(I)=DXY19(K)	ABSORP	64
23	DY1(I)=DXY19(K+1)	ABSORP	65
	I=0	ABSORP	66
	DO 25 K=1,42,2	ABSORP	67
	I=I+1	ABSORP	68
	DX2(I)=DXY29(K)	ABSORP	69
25	DY2(I)=DXY29(K+1)	ABSORP	70
29	CONTINUE	ABSORP	71
	G1 = TBLU1(T, DX1, DY1, 3, 11)	ABSORP	72
	G2 = TBLU1(T, DX2, DY2, 3, 21)	ABSORP	73
	HA = (RH**.9881) * (10.**G2)	ABSORP	74
	SA1 = (T + 459.688)**0.678674	ABSORP	75
	IF (NBW - 1) 2, 1, 3	ABSORP	76
	1 DLF = .129682	ABSORP	77
	FO = 5198.5	ABSORP	78
	GO TO 4	ABSORP	79
	2 WRITE (6,11) NBW	ABSORP	80
	3 DLF = .05	ABSORP	81
	FO = 4466.8	ABSORP	82
	4 DO 9 I = 1,NBW	ABSORP	83
	ALPHA(I) = 0.0	ABSORP	84
	IF (BCF(I)) 5, 9, 5	ABSORP	85
	5 F = ABS(BCF(I))	ABSORP	86
	X = ALOG10(F)	ABSORP	87
	IF (F .GT. FO) X = X - DLF	ABSORP	88
	A1 = SA1 * (10.** (2.045 * X - 9.38939))	ABSORP	89
	HMOMAX = 10.** (-4.9658 * X - 1.48974)	ABSORP	90
	AMOMAX = 10.** (-.997 * X + G1)	ABSORP	91
	XX = HA / HMOMAX	ABSORP	92
	IF (XX - 6.4) 6, 7, 7	ABSORP	93
	6 AMOL = TBLU1(XX, XD, YD, 3, 33)	ABSORP	94
	GO TO 8	ABSORP	95
	7 AMOL = .2	ABSORP	96
	8 AMOL = AMOL * AMOMAX	ABSORP	97
	ALPHA(I) = A1 + AMOL	ABSORP	98
	9 CONTINUE	ABSORP	99
C	RETURN	ABSORP	100
	11 FORMAT(/2X60HTROUBLE IN SUBROUTINE ABSORP, NO STANDARDS DEFINED F	ABSORP	101
	*CR NBW =,13/2X37HTHIRD OCTAVE-BAND TYPE NCISE ASSUMED./)	ABSORP	102
	END	ABSORP	103
		ABSORP	104

SUBROUTINE AFT		AFT	2
C	AUTHOR	D. F. MELDRUM	AFT
C			AFT
C	PURPOSE	TO PREDICT AFT FAN NOISE FOR THE PHASE B	AFT
C		NASA-AMES FOOTPRINT CONTRACT NAS2-6969.	AFT
C			AFT
C	METHOD	AS DESCRIBED IN REFERENCE 1).	AFT
C			AFT
C	INPUTS	VIA LABELED COMMON FANDAT	AFT
C			AFT
C	NUMSTG	NUMBER OF FAN STAGES	AFT
C		1 & NUMSTG & 3	AFT
C	INLET	SWITCH FOR INLET FAN NOISE	AFT
C		PREDICTION IF POSITIVE.	AFT
C	NAFT	SWITCH FOR AFT FAN NOISE	AFT
C		PREDICTION IF POSITIVE.	AFT
C	ICOPP	SWITCH FOR THE COPPLAR SHIFT	AFT
C		FLIGHT EFFECTS.	AFT
C		0 NO FLIGHT EFFECTS OR COPPLAR SHIFT.	AFT
C		1 COPPLAR SHIFT FOR THE FREQUENCY	AFT
C		CORRECTION ONLY.	AFT
C		2 COPPLAR SHIFT FOR THE FREQUENCY	AFT
C		AND LEVEL CORRECTION.	AFT
C	NB(I)	NUMBER OF FAN BLADES FOR EACH STAGE	AFT
C		WHERE 1 < I < NUMSTG	AFT
C	FPR(I)	FAN PRESSURE RATIO	AFT
C	DIAM(I)	FAN INLET DIAMETER (INLET ONLY) FT	AFT
C	RSS(I)	MINIMUM ROTOR/STATOR SPACING PERCENT	AFT
C	AREA(I)	FAN DISCHARGE AREA (AFT ONLY) FT*FT	AFT
C	RNI	ROTOR SPEED RPM	AFT
C	RTS	RELATIVE TIP MACH NUMBER OF THE	AFT
C		FIRST STAGE WITHOUT INLET GUIDE	AFT
C		VANES (ICV). IF LESS THAN 1	AFT
C		ICV WILL BE ASSUMED FOR THE FIRST	AFT
C		STAGE (INLET FAN ONLY).	AFT
C	CRTPR	FAN PRESSURE RATIO FOR THE	AFT
C		RELATIVE TIP MACH NUMBER OF	AFT
C		1.025 (INLET FAN ONLY)	AFT
C	ANGFAN	ENGINE INCLINATION ANGLE	AFT
C			AFT
C		VIA LABELED COMMON SWITCH	AFT
C			AFT
C	NUMENG	NUMBER OF NOISE SOURCES OF THE SAME	AFT
C		NOISE TYPE.	AFT
C			AFT
C		VIA LABELED COMMON COMMON	AFT
C			AFT
C	NCF	1/3 OCTAVE OF FULL OCTAVE SWITCH	AFT
C		OR NUMBER OF FREQUENCY BANDS (8 OR 24)	AFT
C	RETA(24)	DIRECTIVITY ANGLES	AFT
C			AFT
C		VIA LABELED COMMON CPMAN	AFT
C			AFT
C	AMACH	MACH NUMBER OF THE AIRCRAFT	AFT
C	NOBS	NUMBER OF OBSERVER POSITIONS	AFT
C			AFT
C		VIA LABELED COMMON SUMSPL	AFT
C			AFT

C				AFT	59
C		SSPL	CURRENT TOTAL PREDICTED NOISE FOR NCF	AFT	60
C			(8 OR 24) FREQUENCIES, AT NCBS OBSERVER	AFT	61
C			POSITIONS FOR 17 DIRECTIVITY ANGLES.	AFT	62
C				AFT	63
C		VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLE)		AFT	64
C				AFT	65
C		PSI	17 DIRECTIVITY ANGLES FOR EACH OF	AFT	66
C			NCBS OBSERVER POSITIONS.	AFT	67
C		PSIO	17 DIRECTIVITY ANGLE PROJECTIONS FOR	AFT	68
C			EACH OF NCBS OBSERVER POSITIONS	AFT	69
C		BETA	ELEVATION ANGLE PROJECTION FOR EACH	AFT	70
C			OF NCBS OBSERVER POSITIONS.	AFT	71
C				AFT	72
C		EACH COMPONENT IS WRITTEN ON TAPE OR FILE 10		AFT	73
C		FOR EACH OF NCF BANDS FOR EACH OF NCBS OBSERVER		AFT	74
C		POSITIONS.		AFT	75
C				AFT	76
C	OUTPUTS	VIA LABELED COMMON SUMSPL		AFT	77
C				AFT	78
C		SSPL	CURRENT TOTAL PREDICTED NOISE FOR	AFT	79
C			8 OR 24 FREQUENCIES, AT NCBS OBSERVER	AFT	80
C			POSITIONS FOR 17 DIRECTIVITY ANGLES.	AFT	81
C				AFT	82
C		VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLE)		AFT	83
C				AFT	84
C		PSI	17 DIRECTIVITY ANGLES FOR EACH OF	AFT	85
C			NCBS OBSERVER POSITIONS.	AFT	86
C		PSIO	17 DIRECTIVITY ANGLE PROJECTIONS FOR	AFT	87
C			EACH OF NCBS OBSERVER POSITIONS	AFT	88
C		BETA	ELEVATION ANGLE PROJECTION FOR EACH	AFT	89
C			OF NCBS OBSERVER POSITIONS.	AFT	90
C				AFT	91
C				AFT	92
C	REFERENCES	1) R. J. SAXBY, NASA-AMES FOOTPRINT CONTRACT		AFT	93
C		NAS2-6969 FAN NOISE MODULE, UN-NUMBERED		AFT	94
C		COORDINATION SHEET, DATED 19 JANUARY 1973.		AFT	95
C				AFT	96
C	FUNCTION SUBPRGM	CCS	ESHLDG	PWRSLM	AFT
C					AFT
C					AFT
C	SUBROUTINES	ANGLES	UNIT	FANCS	ZERO
C		WSHOUT	SHLDSP		
C					AFT
C					AFT
C					AFT
C					AFT
C		COMMON /FANDAT/	NLMSTG,NINLET,NAFT,ICDPP,NB(3),FPR(3),		AFT
C		*	DIAM(3),RSS(3),AREA(3),RN1,RTS,CRTFPR,ANGFAN,		AFT
C		*NIS,BPR5,ICOR4,LIN4,NTF4,IMA4,LGM4,NWL4,LOP4,ILAY4,TF4(10),		AFT	106
C		*PCTA4(10),PLA4(10),ELOH4,EDH4,R14(10),TL4(10),CF4,FM4,		AFT	107
C		*ICOR5,LIN5,NTF5,IMA5,LGM5,NWL5,ICF5,ILAY5,TF5(10),		AFT	108
C		*PCTA5(10),PLA5(10),ELOH5,EDH5,R15(10),TL5(10),CF5,FM5		AFT	109
C				AFT	110
C		COMMON/SWITCH/	NTYPE,ITYPE,NENG,ICDP,IPRT(7),ICN(13),ALCPT		AFT
C		*	INSEOW(3),INSHLD		AFT
C		CONSTANTS USED IN INTERNAL CALCULATIONS		AFT	113
C				AFT	114
C		COMMON /GCNST/	IN,IO,IT1,IT2,F0,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,		AFT
C					AFT

	*	IO, I1, I2, I3, I4, I5, I6, I7, I8, I9, I10, P1, P33, P5, P001,	AFT	116
	*	EPS, UNDEF, BL, ICD, OPR, RPD, ETA(17), M1, FM1, I17, A, PI	AFT	117
C			AFT	118
C		VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	AFT	119
C			AFT	120
		COMMON /GCOMMON/ NCF, NK, BCF(24), ISPL(24, 10, 17), SPL1(24, 17),	AFT	121
	*	*BLF(25), RFTA(17), SPL2(17), TGAGR(24), DOPSF(17)	AFT	122
		COMMON /SUMSPL/ SSPL(24, 10, 17)	AFT	123
		COMMON /PNLD/ PSPL(17, 20), EPNL(5, 10), TEPNL(5, 10)	AFT	124
C			AFT	125
C		FREQUENCY BANDS USED BY PROGRAM	AFT	126
C			AFT	127
		COMMON /GFREQ/ CFREQ(24), UFREQ(25), PFREQ(24)	AFT	128
C			AFT	129
C		GENERAL INPUT PARAMETERS	AFT	130
		COMMON /ANGLE/ PSI(17, 10), PSIO(17, 10), RFTA(17, 10)	AFT	131
C			AFT	132
		COMMON /GPRAM/ ALTP, ALTR, SLOPE, AMACH, NCBS, SLDIST(10), ITENG, IUNIT	AFT	133
	*	, ISPTM, IATMUS, IAIR, LAIRAB(24), NTEMP, TEMP(50), TALT(50)	AFT	134
	*	, NPRES, PRES(50), PALT(50), NHLMD, RALT(50), RHUMID(50), CTEMP	AFT	135
	*	, CPRES, CRHUMD, IEGA, IGDR, DTEMP, CPRES, CFUMID, XKN, ND, FLU(50),	AFT	136
	*	ZNR(50), ZNI(50), LINECT, MAXLIN, IFAGE, BCG, TCG, FLR, AALT, CPF	AFT	137
C			AFT	138
C		AIRCRAFT-OBSERVER GEOMETRY CLTPLOTS	AFT	139
C			AFT	140
		COMMON /GEOMO/ APY(10, 17), APZ(10, 17), PC(10, 17), DPND(10, 17),	AFT	141
	*	B1(10, 17), B2(10, 17), TDS(17, 10), TPD(17, 10), IRR(10, 17)	AFT	142
	*	, APP, TP, RHP, APO, TO, RHO, CA, CZ, ISP(17, 10), CCV	AFT	143
C			AFT	144
C		CONVERSION CONSTANTS	AFT	145
C			AFT	146
		COMMON /GCCNVC/ C(2, 10), SLDISX(10)	AFT	147
		COMMON /TMSPL/ SPZ(24, 17), IB(2, 3, 13)	AFT	148
		COMMON /CRSPL/ SUB(17), PSCR(17), DPB(408), APSCR	AFT	149
		COMMON /HEAD/ HIN(20), HOUT(20), CHIN(20)	AFT	150
C		SHIELDING DATA. REQUIRED FOR PRINT OUT	AFT	151
		COMMON /UNSHLD/ USPLA(19), FSI(19), ALSPL, INUSP	AFT	152
C			AFT	153
C			AFT	154
C			AFT	155
		ICN(5)=ICN(5)+1	AFT	156
C			AFT	157
C			AFT	158
		DELTA=ANGFAN*RPD	AFT	159
		CALL ANGLES(NOBS, DELTA)	AFT	160
C			AFT	161
C			AFT	162
C		LOOP FOR THE NUMBER OF OBSERVER POSITIONS	AFT	163
C			AFT	164
		FBPF = FLOAT(NB(1)) * RN1 / 60.	AFT	165
C			AFT	166
C		TEST FOR SHIELDING AND EXIT TO PRINT OUT WING	AFT	167
C		SHIELDING DATA ONCE FOR ALL SIDELINE POSITIONS	AFT	168
		IF (INSHLD.NE.0) CALL WSHOLD(IPRT(7), IO, ITYPE, USPLA, NUSPL, FSI, INUSP)	AFT	169
40		DO 1000 M=1, NOBS	AFT	170
		CALL LINGR(SPL(1, 1), IMA5, LGM5, ELCH5, EDH5, NWL5, RLW5, TL5,	AFT	171
	*	*ILAY5, FM5, IDP5, PSI(1, M), NCF, BCF, PIAS, CF5, PCTAS, NTF5,	AFT	172

	*TFS,DOPSF,SPL2,ILCR5,IB(1,1,ITYPE),LINS,FBPF)	AFT	173
C		AFT	174
	CALL ZERO(SPLT,4C8)	AFT	175
C		AFT	176
C		AFT	177
C		AFT	178
C	CALCULATE THE AFT FAN NOISE PREDICTION	AFT	179
C		AFT	180
	CALL FANNOS(DOPSF, PSI(1,M),SPLT(1,1),IDCP,NUMSTG,0,1,NB,FPR,	AFT	181
	* DIAM,RSS,AREA,RN!,RTS,CRTFPR,0,0,BPR5,NIS)	AFT	182
C		AFT	183
C		AFT	184
	45 CONTINUE	AFT	185
C		AFT	186
C	CONVERT TO A UNIT OR INDEXED SPECTRA	AFT	187
C		AFT	188
	CALL UNIT(150.,17,SPLT(1,1))	AFT	189
	ENG=NENG	AFT	190
	IF(ENG.LE.0.0) ENG=1.C	AFT	191
	DO 50 J=1,17	AFT	192
	DANGLE=PSI0(J,M)	AFT	193
	ELVANG=BETA(J,M)	AFT	194
	ENS=ESHLDG(DANGLE,ELVANG,ENG)	AFT	195
	DO 50 K=1,24	AFT	196
	50 SPLT(K,J)=SPLT(K,J)-ENS	AFT	197
	IF(NCF.EQ.24) GO TO 300	AFT	198
C		AFT	199
C	CONVERT 1/3 OCTAVE TO FULL OCTAVE	AFT	200
C		AFT	201
	DO 200 J=1,17	AFT	202
	DO 200 K=1,8	AFT	203
	TMP = 0.0	AFT	204
	DO 100 L=1,3	AFT	205
	JC = 3*K + L - 3	AFT	206
	100 TMP = PWRSUM(TMP, SPLT(JC,J))	AFT	207
	200 SPLT(K,J) = TMP	AFT	208
C		AFT	209
C		AFT	210
C	ADD TO CURRENT TOTAL AND WRITE ON TAPE 10	AFT	211
C		AFT	212
C		AFT	213
	300 DO 400 J=1,NCF	AFT	214
	DO 400 K=1,17	AFT	215
	400 SPLT(J,K)=SPLT(J,K)-SPZ(J,K)	AFT	216
C		AFT	217
	IF(INSHLD.NE.0)CALL SHLDSP(AMACH,ALTR,ISFTRM,CZ,SLDISX,M,	AFT	218
	*APY,APZ,DOPSF,SPLT,NCF,BCF,SPZ,PSI,ITYPE,ANGFAN,XX)	AFT	219
C		AFT	220
	DO 405 J=1,NCF	AFT	221
	DO 405 K=1,17	AFT	222
	405 SSPL(J,M,K)=PWRSUM(SSPL(J,M,K),SPLT(J,K))	AFT	223
	IF(IPRT(7).NE.7)GO TO 410	AFT	224
	CALL NOISO(IPRT(7),M,NK,10,CHIN,ILNIT,SLDISX(M),PFREQ,SPLT(1,1),	AFT	225
	* NCF,ITYPE)	AFT	226
	410 CONTINUE	AFT	227
	DO 360 JC=1,NCF	AFT	228
	DO 360 KC=1,17	AFT	229

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36C  SPLT(JC,KC)=SPLT(JC,KC)-TSPL(JC,M,KC)
    CALL PNLSUB(SPLT(1,1),PSPL(1,M),TPD(1,M),EPNL(1,M),SPL2,
*TEPNL(1,M),NK,BLG,TCG,FLR,M,NCBS,IRR(M,1))
    IF(IPKT(3).NE.3)GO TO 1000
    CALL NOISO(IPRT(3),M,NK,12,CFIN,ILNIT,SLDISX(M),PFREQ,
*   SPLT(1,1),NCF,ITYPE)
C
C
C
1000 CONTINUE
    RETURN
    END

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AFT 230
AFT 231
AFT 232
AFT 233
AFT 234
AFT 235
AFT 236
AFT 237
AFT 238
AFT 239
AFT 240
AFT 241

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	SUBROUTINE ANGLES(NO,DELTA)	ANGLES	2
C		ANGLES	3
C	GENERAL INPUT PARAMETERS	ANGLES	4
C		ANGLES	5
	COMMON /GPRAM/ALTP,ALTR,SLCPE,APACH,NCBS,X(10),NTENG,IUNIT	ANGLES	6
*	,ISPTRM,IATMGS,IAIR,LAIRAB(24),NTEMP,TEMP(50),TALT(50)	ANGLES	7
*	,NPRES,PRES(50),PALT(50),RHUMID,RALT(50),RHUMID(50),CTEMP	ANGLES	8
*	,CPRES,CRHUMD,IEGA,IGDR,DTEMP,DPRES,DHUMID,XKN,ND,FLD(50),	ANGLES	9
*	ZNR(50),ZNI(50),LINECT,MAXLIN,IPAGE,BCG,TCG,FLR,AALT,EPF	ANGLES	10
C		ANGLES	11
C	AIRCRAFT-OBSERVER GEOMETRY CLTPLTS	ANGLES	12
C		ANGLES	13
	COMMON /GEOMU/ Y(10,17),Z(10,17),P(10,17),DPAC(10,17),	ANGLES	14
*	B1(10,17),B2(10,17),TDS(17,10),TPC(17,10),IRN(10,17)	ANGLES	15
*	,APP,TP,RHP,APO,TD,RHO,CA,CZ,TSF(17,10),CGV	ANGLES	16
C		ANGLES	17
C		ANGLES	18
C		ANGLES	19
	COMMON/ANGLE/ PSI(17,10),PSIC(17,10),BETA(17,10)	ANGLES	20
	COMMON/SDELTD/DT	ANGLES	21
C		ANGLES	22
	COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCP,IPRT(7),ICN(13),NLOPT	ANGLES	23
C		ANGLES	24
C		ANGLES	25
	COMMON/ICPATH/NCAS,NCOF,NTYP,IC,ARN,IARRAY(2)	ANGLES	26
C		ANGLES	27
	DATA IGO/1/	ANGLES	28
	IF(NTYP.NE.1)GO TO 2	ANGLES	29
	IGO=1	ANGLES	30
	IF(ITYPE.EQ.11)IGO=2	ANGLES	31
	GO TO 10	ANGLES	32
2	CONTINUE	ANGLES	33
	IF(ITYPE.NE.11)GO TO 4	ANGLES	34
	IGO=2	ANGLES	35
	GO TO 8	ANGLES	36
4	IF (IGO - 1) 8, 8, 5	ANGLES	37
5	IGO=1	ANGLES	38
	GO TO 10	ANGLES	39
8	CONTINUE	ANGLES	40
	IF(DT.EQ.DELTA) GO TO 2000	ANGLES	41
10	DT=DELTA	ANGLES	42
30	CSDE=COS(DELTA)	ANGLES	43
	SNDE=SIN(DELTA)	ANGLES	44
	DO 100 I=1,N08	ANGLES	45
	DO 100 J=1,17	ANGLES	46
	TEMP1=-(Y(I,J)*CSDE+(Z(I,J)-ALTR)*SNDE)/ABS(P(I,J))	ANGLES	47
	IF(TEMP1.GT.1.1.OR.TEMP1.LT.-1.1) GO TO 1000	ANGLES	48
	IF(TEMP1.GT.1.0) TEMP1=1.0	ANGLES	49
	IF(TEMP1.LT.-1.0) TEMP1=-1.0	ANGLES	50
	PSI(J,I)=ACOS(TEMP1)*57.296	ANGLES	51
	X1NA=-(Y(I,J)*CSDE+(Z(I,J)-ALTR)*SNDE)	ANGLES	52
	IF(X1NA.NE.0.)GO TO 50	ANGLES	53
	PSIO(J,I)=0.	ANGLES	54
	GO TO 60	ANGLES	55
50	CONTINUE	ANGLES	56
	PSIO(J,I)=ATAN2(ABS(X1I),X1NA)	ANGLES	57
	* *57.296	ANGLES	58

```

60  CONTINUE
    ATEM=ABS(Y(I,J)*SNDE-(Z(I,J)-ALTR)*CSDE)
    IF(X(I).GT.0.)GO TO 90
    BETA(J,I)=90.
    IF(ATEM.GT.0.)GO TO 100
    BETA(J,I)=0.
    GO TO 100
90  CONTINUE
    BETA(J,I)=ATAN2(ATEM,ABS
*    (X(I)))*57.296
100 CONTINUE
    GO TO 2000
1000 WRITE(6,1500)
1500 FORMAT(40H THE ARCCOS FOR PSI IS OUT OF RANGE
    STOP
2000 RETURN
    END

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    ANGLES 59
    ANGLES 60
    ANGLES 61
    ANGLES 62
    ANGLES 63
    ANGLES 64
    ANGLES 65
    ANGLES 66
    ANGLES 67
    ANGLES 68
    ANGLES 69
    ANGLES 70
    ANGLES 71
    ) ANGLES 72
    ANGLES 73
    ANGLES 74
    ANGLES 75

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	SUBROUTINE ATMOSP(HGT,PRESUR,TEMPER,RELHUM)	ATMOSP	2
	COMMON/SWITCH/NTYPE,ITYPE,NENG,IDCP,IPAT(7),ICN(13),NLOPT	ATMOSP	3
C		ATMOSP	4
C	AUTHOR G. A. WEST	ATMGSP	5
C		ATMOSP	6
C	PURPOSE TO DETERMINE THE PRESSURE, TEMPERATURE AND RELATIVE	ATMOSP	7
C	HUMIDITY AT A GIVEN ALTITUDE USING EITHER U.S.	ATMOSP	8
C	STANDARD ATMOSPHERIC CCNDITIONS OR USER DEFINED	ATMOSP	9
C	ATMOSPHERE.	ATMOSP	10
C		ATMOSP	11
C	DESCRIPTION OF VARIABLES	ATMOSP	12
C		ATMOSP	13
C	VARIABLES IN COMMON - SEE MAIN PROGRAM	ATMOSP	14
C		ATMOSP	15
C	VARIABLES IN CALLING SEQUENCE	ATMOSP	16
C		ATMOSP	17
C	INPUT	ATMOSP	18
C		ATMOSP	19
C	HGT - ALTITUDE	ATMOSP	20
C		ATMOSP	21
C	OUTPUT	ATMGSP	22
C		ATMOSP	23
C	PRESUR - ATMOSPHERIC PRESSURE	ATMGSP	24
C	TEMPER - TEMPERATURE	ATMOSP	25
C	RELHUM - PERCENT RELATIVE HUMIDITY	ATMOSP	26
C		ATMOSP	27
C	LOCAL VARIABLES	ATMOSP	28
C		ATMOSP	29
C	DUM - WORKING STORAGE FOR SCRTING ROUTINE	ATMOSP	30
C	K - WORKING STORAGE FOR SCRTING ROUTINE	ATMOSP	31
C	NSHUMD - NUMBER OF ENTRIES IN ISA RELATIVE HUMIDITY TABLE	ATMOSP	32
C	NSPRES - NUMBER OF ENTRIES IN ISA PRESSURE TABLE	ATMOSP	33
C	NSTEMP - NUMBER OF ENTRIES IN ISA TEMPERATURE TABLE	ATMOSP	34
C	SAVNAM - CONTAINS THE NAME OF THE CALLING ROUTINE	ATMOSP	35
C	SNAME - CONTAINS THE NAME OF THIS ROUTINE	ATMGSP	36
C	SPALT - TABLE OF ALTITUDES FOR ISA PRESSURES DEFINED IN	ATMOSP	37
C	ARRAY SPRES	ATMOSP	38
C	SPRES - TABLE OF PRESSURES FOR ALTITUDES DEFINED IN	ATMOSP	39
C	ARRAY SPALT	ATMOSP	40
C	SRALT - TABLE OF ALTITUDES FOR ISA RELATIVE HUMIDITIES	ATMOSP	41
C	DEFINED IN ARRAY SRHUMD	ATMOSP	42
C	SRHUMD - TABLE OF RELATIVE HUMIDITIES FOR ALTITUDES DEFINED	ATMOSP	43
C	ARRAY SRALT	ATMOSP	44
C	STALT - TABLE OF ALTITUDES FOR ISA TEMPERATURES DEFINED IN	ATMOSP	45
C	ARRAY STEM	ATMOSP	46
C	STEMP - TABLE OF TEMPERATURES FOR ALTITUDES DEFINED IN	ATMOSP	47
C	ARRAY STALT	ATMOSP	48
C		ATMOSP	49
C		ATMGSP	50
C		ATMOSP	51
C		ATMOSP	52
C		ATMOSP	53
C	GENERAL INPUT PARAMETERS	ATMOSP	54
C		ATMOSP	55
	COMMON /GPRAM/ALTP,ALTR,SLOPE,APACH,NCBS,SLDIST(10),ITENG,IUNIT	ATMOSP	56
*	,ISPTRM,IATMOS,IAIR,LAIRAB(24),NIEMP,TEMP(50),TALT(50)	ATMOSP	57
*	,NPRES,PRES(50),PALT(50),NHLMIC,RALT(50),RHUMID(50),CTEMP	ATMOSP	58

	* ,CPRES,CRHUMD,IEGA,IGDR,DTEMP,CPRES,CHUMID,XKN,AD,FLO(50),	ATMOSP	59
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IPAGE,BCG,TCG,FLR,AALT,EPF	ATMOSP	60
C		ATMCSP	61
C		ATMCSP	62
C	* * * * * STANDARD ATMOSPHERIC TABLES * * * * *	ATMOSP	63
C		ATMOSP	64
	DIMENSION STALT(50),STEMP(50),SPALT(50),SPRES(50),SRALT(50),	ATMOSP	65
	1 SRHUMD(50)	ATMOSP	66
	DATA NSTEMP,NSPRES,NSHUMD/21,21,7/	ATMOSP	67
	DATA STALT/ 0.0, 2000.0, 4000.0, 6000.0, 8000.0, 10000.0,	ATMOSP	68
	1 12000.0, 14000.0, 16000.0, 18000.0, 20000.0, 22000.0,	ATMOSP	69
	2 24000.0, 26000.0, 28000.0, 30000.0, 32000.0, 34000.0,	ATMOSP	70
	3 36000.0, 38000.0, 40000.0, 29*0.0/	ATMOSP	71
	DATA STEMP/518.688, 507.99, 504.43, 497.30, 490.17, 483.04,	ATMOSP	72
	1 475.92, 468.80, 461.67, 454.55, 447.43, 440.32,	ATMOSP	73
	2 433.20, 426.08, 418.97, 411.86, 404.75, 397.64,	ATMOSP	74
	3 390.53, 385.99, 389.99, 29*0.0/	ATMOSP	75
	DATA SPALT/ 0.0, 2000.0, 4000.0, 6000.0, 8000.0, 10000.0,	ATMOSP	76
	1 12000.0, 14000.0, 16000.0, 18000.0, 20000.0, 22000.0,	ATMOSP	77
	2 24000.0, 26000.0, 28000.0, 30000.0, 32000.0, 34000.0,	ATMOSP	78
	3 36000.0, 38000.0, 40000.0, 29*0.0/	ATMOSP	79
	DATA SPRES/14.696, 13.664, 12.692, 11.778, 10.917, 10.108, 9.3486,	ATMOSP	80
	1 8.6361, 7.9688, 7.3438, 6.7586, 6.2124, 5.7025, 5.2272,	ATMOSP	81
	2 4.7844, 4.3726, 3.9901, 3.6352, 3.3064, 3.0044, 2.7300,	ATMOSP	82
	3 29*0.0/	ATMOSP	83
	DATA SRALT/ 0.0, 6561.6, 13123.2, 19684.8, 26246.4, 32808.0,	ATMOSP	84
	1 39369.6, 43*0.0/	ATMOSP	85
	DATA SRHUMD/70.0, 57.0, 44.0, 38.0, 34.0, 23.0, 13.0, 43*0.0/	ATMOSP	86
C		ATMOSP	87
C	HAS USER DEFINED HIS OWN	ATMOSP	88
C	ATMOSPHERIC CONDITIONS	ATMOSP	89
	IF (IATMOS .EQ. 2) GO TO 10	ATMOSP	90
	IF (IATMOS .EQ. 3) GO TO 20	ATMOSP	91
	IF (IATMOS .EQ. 4) GO TO 30	ATMOSP	92
C		ATMOSP	93
C	USE U.S. STANDARD CONDITIONS	ATMOSP	94
	OBTAIN STANDARD PRESSURE	ATMOSP	95
C	5 PRESUR = TBLU1(HGT, SPALT, SPRES, 1, NSPRES)	ATMOSP	96
	OBTAIN STANDARD TEMPERATURE	ATMOSP	97
C	TEMPER = TBLU1(HGT, STALT, STEMP, 1, NSTEMP)	ATMOSP	98
C	OBTAIN STANDARD RELATIVE	ATMOSP	99
C	HUMIDITY	ATMOSP	100
	RELHUM = TBLU1(HGT, SRALT, SRHUMD, 2, NSHUMD)	ATMOSP	101
C	DOES USER WISH TO ADD CONSTANT	ATMOSP	102
C	GRADIENTS TO U.S. STANDARD	ATMOSP	103
C	CONDITIONS	ATMOSP	104
	IF (IATMOS .EQ. 0) GO TO 40	ATMOSP	105
C		ATMOSP	106
	PRESUR = PRESUR + DPRES	ATMOSP	107
	TEMPER = TEMPER + DTEMP	ATMOSP	108
	RELHUM = RELHUM + DHUMID	ATMOSP	109
	GO TO 40	ATMOSP	110
C		ATMOSP	111
C	ATMOSPHERIC CONDITIONS DEFINED	ATMOSP	112
C	BY USER	ATMOSP	113
	IS NPRES WITHIN RANGE	ATMOSP	114
C		ATMOSP	115
	10 IF (NPRES .LE. 50) GO TO 11		
	CALL ERROR(ITYPE, 1, 1)		

	GO TO 16	ATMOSP	116
11	IF (NPRES .GE. 2) GO TO 12	ATMOSP	117
	CALL ERROR(ITYPE,1,2)	ATMOSP	118
	GO TO 16	ATMOSP	119
C		ATMOSP	120
C		ATMOSP	121
C		ATMOSP	122
12	CALL SORTX(PALT,PRES,NPRES)	ATMOSP	123
C		ATMOSP	124
	PRESUR = TBLU1(HGT,PALT,PRES,1,NPRES)	ATMOSP	125
C		ATMOSP	126
	IF (NTEMP .LE. 50) GO TO 13	ATMOSP	127
	CALL ERROR(ITYPE,1,3)	ATMOSP	128
	GO TO 16	ATMOSP	129
13	IF (NTEMP .GE. 2) GO TO 14	ATMOSP	130
	CALL ERROR(ITYPE,1,4)	ATMOSP	131
	GO TO 16	ATMOSP	132
C		ATMOSP	133
C		ATMOSP	134
C		ATMOSP	135
14	CALL SORTX(TALT,TEMP,NTEMP)	ATMOSP	136
C		ATMOSP	137
	TEMPER = TBLU1(HGT,TALT,TEMP,1,NTEMP)	ATMOSP	138
C		ATMOSP	139
	IF (NHUMID .LE. 50) GO TO 15	ATMOSP	140
	CALL ERROR(ITYPE,1,5)	ATMOSP	141
	GO TO 16	ATMOSP	142
15	IF (NHUMID .GE. 2) GO TO 17	ATMOSP	143
	CALL ERROR(ITYPE,1,6)	ATMOSP	144
16	IATMOS = 0	ATMOSP	145
	GO TO 5	ATMOSP	146
C		ATMOSP	147
C		ATMOSP	148
C		ATMOSP	149
17	CALL SORTX(RALT,RHLMID,NHUMID)	ATMOSP	150
C		ATMOSP	151
	RELHUM = TBLU1(HGT,RALT,RHLMID,1,NHUMID)	ATMOSP	152
	GO TO 40	ATMOSP	153
C		ATMOSP	154
C		ATMOSP	155
C		ATMOSP	156
C		ATMOSP	157
C		ATMOSP	158
20	PRESUR = 14.696	ATMOSP	159
	TEMPER = 518.688	ATMOSP	160
	RELHUM = 70.0	ATMOSP	161
	GO TO 40	ATMOSP	162
C		ATMOSP	163
C		ATMOSP	164
30	PRESUR = CPRES	ATMOSP	165
	TEMPER = CTEMP	ATMOSP	166
	RELHUM = CRHUMD	ATMOSP	167
C		ATMOSP	168
40	CONTINUE	ATMOSP	169
	RETURN	ATMOSP	170
	END	ATMOSP	171

	SUBROUTINE AVGALF(Z1,ZN,NBW,NFB,BCF,ALFA,IATMCS)	AVGALF	2
C		AVGALF	3
C	PURPOSE TO CALCULATE THE AVERAGE AIR ABSORPTION COEFFICIENT	AVGALF	4
C		AVGALF	5
C	AUTHOR C. G. DUNN	AVGALF	6
C		AVGALF	7
C		AVGALF	8
	DIMENSION BCF(1),ALFA(1)	AVGALF	9
	DIMENSION SUM(31)	AVGALF	10
	DATA TC/459.688/	AVGALF	11
	DATA SNAME/8H:AVGALF /	AVGALF	12
C		AVGALF	13
	DZ = ZN - Z1	AVGALF	14
	CALL ATMOSP(Z1,DUM,T1,RH1)	AVGALF	15
	T1 = T1 - TC	AVGALF	16
	CALL ABSORP(RH1,T1,NBW,NFB,BCF,ALFA)	AVGALF	17
C	TEST FOR HOMOGENEOUS ATMOSPHERE	AVGALF	18
	IF (IATMCS .GE. 3) GO TO 6	AVGALF	19
	IF (DZ) 2, 6, 2	AVGALF	20
2	CALL ATMOSP(ZN,DUM,TN,RHN)	AVGALF	21
	TN = TN - TC	AVGALF	22
	CALL ABSORP(RHN,TN,NBW,NFB,BCF,SUM)	AVGALF	23
	N = 0.5 * AMAX1(ABS(TN-T1) + ABS(RHN-RH1),20.0)	AVGALF	24
	M = N-1	AVGALF	25
	FM = M	AVGALF	26
	DZ = DZ/FM	AVGALF	27
	DO 3 J=1,NFB	AVGALF	28
	SUM(J) = 0.5 * (SUM(J) + ALFA(J))	AVGALF	29
3	CONTINUE	AVGALF	30
	DO 4 I=2,M	AVGALF	31
	Z = Z1 + DZ * FLCAI(I-1)	AVGALF	32
	CALL ATMOSP(Z,DUM,T,RH)	AVGALF	33
	T = T - TC	AVGALF	34
	CALL ABSORP(RH,T,NBW,NFB,BCF,ALFA)	AVGALF	35
	DO 4 J=1,NFB	AVGALF	36
	SUM(J) = SUM(J) + ALFA(J)	AVGALF	37
4	CONTINUE	AVGALF	38
	DO 5 I=1,NFB	AVGALF	39
	ALFA(I) = SUM(I)/FM	AVGALF	40
5	CONTINUE	AVGALF	41
6	CONTINUE	AVGALF	42
	RETURN	AVGALF	43
	END	AVGALF	44

SUBROUTINE BESJ(X, N, BJ, D, IER)	BESJ	2
C	BESJ	3
C PURPOSE-	BESJ	4
C CCMPUTE THE J BESSEL FUNCTION FOR A GIVEN ARGUMENT AND ORDER.	BESJ	5
C	BESJ	6
C USAGE-	BESJ	7
C CALL BESJ(X, N, BJ, D, IER)	BESJ	8
C	BESJ	9
C DESCRIPTION OF PARAMETERS-	BESJ	10
C X -THE ARGUMENT OF THE J BESSEL FUNCTION DESIRED	BESJ	11
C N -THE ORDER OF THE J BESSEL FUNCTION DESIRED	BESJ	12
C BJ -THE RESULTANT J BESSEL FUNCTION	BESJ	13
C D -THE REQUIRED ACCURACY- SOME FRACTION OF THE J BESSEL FUNCTION	BESJ	14
C IER-RESULTANT ERROR CODE WHERE	BESJ	15
C IER = 0 ... NO ERROR	BESJ	16
C IER = 1 ... REQUIRED ACCURACY NOT OBTAINED	BESJ	17
C IER = 2 ... RANGE OF N COMPARED TO X NOT CORRECT (SEE REMARKS)	BESJ	18
C	BESJ	19
C REMARKS-	BESJ	20
C MAGNITUDE OF (N) MUST BE LESS THAN	BESJ	21
C 20 + ABS(X) * (10 - ABS(X) / 3) ... FOR ABS(X) .LE. 15	BESJ	22
C 90 + ABS(X) / 2 ... FOR ABS(X) .GT. 15	BESJ	23
C	BESJ	24
C SUBPROGRAMS REQUIRED-	BESJ	25
C NONE	BESJ	26
C	BESJ	27
C METHOD-	BESJ	28
C RECURRENCE RELATION TECHNIQUE DESCRIBED BY H. GLOSTEIN AND	BESJ	29
C R.M. THALER, /RECURRENCE TECHNIQUES FOR THE CALCULATION OF	BESJ	30
C BESSEL FUNCTIONS/, M.T.A.C., V13, PP 102-108 AND I.A. STEGUN	BESJ	31
C AND M. ABRAMOWITZ, /GENERATION OF BESSEL FUNCTIONS ON HIGH	BESJ	32
C SPEED COMPUTERS/, M.T.A.C., V11, 1957, PP 255-257.	BESJ	33
C	BESJ	34
C REFERENCE-	BESJ	35
C THE FORTRAN PROGRAM WAS TAKEN FROM ...	BESJ	36
C IBM, /SYSTEM 360 SCIENTIFIC SUBROUTINE PACKAGE (360A-CM-03X)	BESJ	37
C VERSION III PROGRAMMERS MANUAL/, IBM APPLICATION PROGRAM H20-0205-3	BESJ	38
C	BESJ	39
C	BESJ	40
C	BESJ	41
IER = 0	BESJ	42
BJ = 0.	BESJ	43
XT = X	BESJ	44
X = ABS(XT)	BESJ	45
NT = N	BESJ	46
N = IABS(NT)	BESJ	47
IS = MOD(N, 2)	BESJ	48
SS = 1.	BESJ	49
IF (XT) 20, 10, 30	BESJ	50
10 IF (NT) 210, 15, 210	BESJ	51
15 BJ = SS	BESJ	52
GO TO 210	BESJ	53
20 IF (IS) 25, 31, 25	BESJ	54
25 SS = -SS	BESJ	55
GO TO 21	BESJ	56
30 IF (NT) 20, 31, 31	BESJ	57
31 IF (X - 15.) 32, 32, 34	BESJ	58

32 NTEST = 20. + X * (10. - .3333333 * X)	BESJ	59
GO TO 36	BESJ	60
34 NTEST = 90. + .5 * X	BESJ	61
36 IF (N - NTEST) 40, 38, 38	BESJ	62
38 IER = 2	BESJ	63
GO TO 210	BESJ	64
40 N1 = N + 1	BESJ	65
BPREV = 0.	BESJ	66
C	BESJ	67
C COMPUTE STARTING VALUE OF M	BESJ	68
IF (X - 5.) 50, 60, 60	BESJ	69
50 MA = X + 6.	BESJ	70
GO TO 70	BESJ	71
60 MA = 1.4 * X + 60. / X	BESJ	72
70 MB = N + 2 + IFIX(X) / 4	BESJ	73
MZERO = MAX0(MA, MB)	BESJ	74
C	BESJ	75
C SET UPPER LIMIT OF M	BESJ	76
C	BESJ	77
MMAX = NTEST	BESJ	78
100 DO 190 M = MZERO, MMAX, 3	BESJ	79
C	BESJ	80
C SET F(M), F(M-1)	BESJ	81
C	BESJ	82
FM1 = 1.0E-28	BESJ	83
FM = 0.	BESJ	84
ALPHA = 0.	BESJ	85
IF (MOD(M, 2)) 120, 110, 120	BESJ	86
110 JT = -1	BESJ	87
GO TO 130	BESJ	88
120 JT = 1	BESJ	89
130 M2 = M - 2	BESJ	90
DO 160 K = 1, M2	BESJ	91
MK = M - K	BESJ	92
BMK = FLCAT(MK+MK) * FM1 / X - FM	BESJ	93
FM = FM1	BESJ	94
FM1 = BMK	BESJ	95
IF (MK - N - 1) 150, 140, 150	BESJ	96
140 BJ = BMK	BESJ	97
150 JT = -JT	BESJ	98
S = JT + 1	BESJ	99
160 ALPHA = ALPHA + BMK * S	BESJ	100
BMK = (FM1+FM1) / X - FM	BESJ	101
IF (N) 180, 170, 180	BESJ	102
170 BJ = BMK	BESJ	103
180 ALPHA = ALPHA + BMK	BESJ	104
BJ = BJ / ALPHA	BESJ	105
IF (ABS(BJ - BPREV) - ABS(D * BJ)) 200, 200, 190	BESJ	106
190 BPREV = BJ	BESJ	107
IER = 1	BESJ	108
200 BJ = SS * BJ	BESJ	109
210 N = NT	BESJ	110
X = XT	BESJ	111
RETURN	BESJ	112
END	BESJ	113

	SLBRoutine BLWFLP	BLWFLP	2
C	COMMON STORAGE	BLWFLP	3
	DIMENSION PR7(1)	BLWFLP	4
	COMMON/BLWIN/PR7,TT7,AN7,DN7,FANG7,DELT7,DL7,HD7,ICOR7	BLWFLP	5
	COMMON /GCCMGN/ NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),	BLWFLP	6
	*BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)	BLWFLP	7
C		BLWFLP	8
C	GENERAL INPUT PARAMETERS	BLWFLP	9
	COMMON /GPRAM/ALTP,ALTR,SLOPE,AFACH,NOBS,SLDIST(10),NTENG,IUNIT	BLWFLP	10
	* ,ISPTRM,IATMOS,IAIR,UAIRAB(24),NTEMP,TEMP(50),TALT(50)	BLWFLP	11
	* ,NPRES,PRES(50),PALT(50),NHLMD,RALT(50),RHUMID(50),CTEMP	BLWFLP	12
	* ,CPRES,CRHUMD,IEGA,IGDR,DTEMP,CPRES,DHUMID,XKN,NG,FLO(50),	BLWFLP	13
	* ZNR(50),ZNI(50),LINECT,PAXLIN,IFAGE,BCC,TCG,FLK,AALT,EPF	BLWFLP	14
C	AIRCRAFT-OBSERVER GEOMETRY CLTPUTS	BLWFLP	15
	COMMON /GEOMG/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	BLWFLP	16
	* B1(10,17),B2(10,17),TDS(17,10),TPD(17,10),IRR(10,17)	BLWFLP	17
	* ,APP,TP,RHP,APU,TC,RHO,CA,CZ,ISP(17,10),CCV	BLWFLP	18
	COMMON/SWITCH/NTYPE,ITYPE,NENG,IOCP,IPRT(7),ICN(13),NLCPT	BLWFLP	19
	COMMON/SUMSPL/SSPL(24,10,17)	BLWFLP	20
	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	BLWFLP	21
	COMMON/ANGLE/PSI(17,10),PSIC(17,10),BETA(17,10)	BLWFLP	22
	COMMON/HEAD/HIN(20),HCLT(20),CHIN(20)	BLWFLP	23
	COMMON/GFREQ/CFREQ(24),UFREQ(25),PFREQ(24)	BLWFLP	24
	COMMON/GCCNVC/C(2,10),SLCISX(10)	BLWFLP	25
	COMMON/TMSPL/SPZ(24,17),IB(2,3,13)	BLWFLP	26
	COMMON/CRSPLS/UOB(17),PSCR(17),DPB(408),APSCR	BLWFLP	27
C		BLWFLP	28
C	PR7 PRESSURE RATIO	BLWFLP	29
C		BLWFLP	30
C	TT7 TOTAL TEMPERATURE (R)	BLWFLP	31
C		BLWFLP	32
C	AN7 NOZZLE AREA IN SQ. FT.	BLWFLP	33
C		BLWFLP	34
C	DN7 NOZZLE DIAMETER (FT.)	BLWFLP	35
C		BLWFLP	36
C	FANG7 FLAP ANGLE (DEG.)	BLWFLP	37
C	DELT7 ENGINE ATTITUDE ANGLE	BLWFLP	38
C		BLWFLP	39
C	DL7 DIMENSIONLESS DISTANCE BETWEEN NOZZLE AND TARGET PC	BLWFLP	40
C		BLWFLP	41
C	HD7 DIMENSIONLESS HEIGHT I.E., DISTANCE BETWEEN NOZZLE	BLWFLP	42
C	CENTERLINE AND PEAK CHORD LINE	BLWFLP	43
C	ICOR7 CONFIGURATION CORRECTIONS INDICATOR	BLWFLP	44
	DIMENSION FT1(9),SP1(9),XDN(6),VXVC(6),VFA(9),FLA(3),FN3(9),	BLWFLP	45
	* FTH4(14),FVJ4(3),FN4(14,3,3)	BLWFLP	46
	DIMENSION PT3(5),PVJ3(5)	BLWFLP	47
	DIMENSION AZ5(2),FN5(19,3,2),FTH5(19),FTH6(10),FLOLHR(2),FN6(10,2)	BLWFLP	48
	DIMENSION FL7(9),FN7(9)	BLWFLP	49
	DIMENSION STN8(25),FN8(25)	BLWFLP	50
	DATA RPD/.01753/,OPR/57.2957/	BLWFLP	51
	DATA R/53.345/,G/32.174/,PI/3.14159/	BLWFLP	52
	DATA FT1/800.,900.,1000.,1200.,1400.,1600.,1800.,2000.,2500./	BLWFLP	53
	DATA SP1/1.382,1.376,1.369,1.357,1.344,1.333,1.324,1.316,1.302/	BLWFLP	54
	DATA XDN/5.,5.5,6.,6.5,7.,7.2/	BLWFLP	55
	DATA VXVC/1.,.99,.98,.97,.95,.93/	BLWFLP	56
	DATA FLA/0.,15.,45./	BLWFLP	57
	DATA FN3/153.2,157.4,160.,162.6,165.1,167.2,169.2,	BLWFLP	58

* 171.2,172.8/	BLWFLP	55
DATA PT3/553.,495.,474.,439.,404./	BLWFLP	60
DATA PVJ3/426.,624.,758.,925.,1126./	BLWFLP	61
DATA FTH4/0.,30.,60.,80.,90.,100.,110.,120.,130.,140.,150.,	BLWFLP	62
* 160.,170.,180./	BLWFLP	63
DATA FVJ4/2.79588,2.96614,3.05115/	BLWFLP	64
DATA FN4 /-5.,-3.,-5,0.,0.,-3.,-5.,-8,-1.,-1.2,-1.7,	BLWFLP	65
* -2.,-3.,-3.5,	BLWFLP	66
2 -4.,-2.,-5,0.,-5.,-6,-1.,-1.4,-1.6,-2.4,-3.2,-5.,-4.7,-3.2,	BLWFLP	67
3 -3.,0.,1.,0.,-1.,-1.8,-3.5,-5.7,-6.5,-5.,-8,-2.,-1.,-2,	BLWFLP	68
4 -4.,-1.5,-5,0.,5.,5.,8,1.,1.3,2.,2.7,3.,2.5,2.,	BLWFLP	69
5 -2.6,-1.6,-6,0.,2,0.,2,1.,2.,2.2,1.5,0.,-4,0.,	BLWFLP	70
6 -4.5,-3.,1,0.,-1.,-3,-3.1,-5.6,-7.1,-7.6,-6.,6.,1,-1,	BLWFLP	71
7 -4.,6.,1,0.,-1.,3.,4.,5,1.5,2.6,4.,4.2,4.4,4.,	BLWFLP	72
8 -2.5,-8,0.,0.,0.,5.,7,1.,1.5,2.1,2.8,1.3,-4.,2,	BLWFLP	73
9 -5.4,-1.6,-2,0.,-5.,-4,-2.2,-4.5,-6.2,-5.9,-1.,6.,8.,.2/	BLWFLP	74
DATA AZ5/0.,90./	BLWFLP	75
DATA FTH5/0.,10.,20.,30.,40.,50.,60.,70.,80.,90.,100.,110.,120.,	BLWFLP	76
* 130.,140.,150.,160.,170.,180./	BLWFLP	77
DATA FN5 /57 *0.,	BLWFLP	78
1 3.5,4.3,5.2,5.8,6.9,6.5,6.8,6.,5.2,6.8,5.,5.8,5.4,4.,2.4,1.8,	BLWFLP	79
* 1.6,1.3,2.6,	BLWFLP	80
2 3.8,4.5,4.8,5.6,6.2,6.3,7.2,7.4,7.6,8.2,8.5,7.4,6.,6.4,6.8,4.4,	BLWFLP	81
* 2.5,2.5,3.7,	BLWFLP	82
3 3.3,5.2,6.2,7.,5.5,9.2,10.3,11.3,11.5,13.4,10.9,8.4,4.6,-.5,-1.5,	BLWFLP	83
* 3.8,4.9,2.6,2.8/	BLWFLP	84
DATA RL/.377/HK/.078/DR/.052/	BLWFLP	85
DATA FTH6/0.,30.,60.,80.,90.,100.,120.,150.,170.,180./	BLWFLP	86
DATA FLDLHR/ .12,1.0 /	BLWFLP	87
DATA FN6/2.3,1.6,2.8,3.9,4.1,4.4,4.4,4.1,3.9,3.1,10*0.6 /	BLWFLP	88
DATA FL7/0.,5.,10.,15.,20.,30.,40.,45.,67.5/	BLWFLP	89
DATA FN7/.48,.51,.55,.6.,665,.8.,93,1.0,1.31/	BLWFLP	90
DATA VFA/2.092,2.771,2.817,2.868,2.914,2.955,2.993,3.028,3.060 /	BLWFLP	91
DATA STN8/-1.8239,-1.4815,-1.301,-1.222,-1.155,-1.097,-1.046,-1.,	BLWFLP	92
* -.824,-.499,-.602,-.523,-.456,-.398,-.301,-.222,-.155,	BLWFLP	93
* -.097,-.046,0.,.176,.301,.477,.659,.778 /	BLWFLP	94
DATA FN8/-60.,-40.,-29.5,-25.,-22.,-19.7,-18.,-16.6,-14.4,-10.6,	BLWFLP	95
* -9.7,	BLWFLP	96
* -9.2,-9.,-9.1,-9.6,-10.3,-10.8,-11.3,-11.9,-12.4,-14.7,-16.4,	BLWFLP	97
* -19.,-22.5,-23.7 /	BLWFLP	98
DATA C1/3HC1/	BLWFLP	99
DATA C25/5HC1-4/	BLWFLP	100
DATA C1/3HC1/),C11/4HC11/),C111/5HC111/),C1V/4HC1V/),	BLWFLP	101
* C1V/3HC1V/),CEND/4HCEND/	BLWFLP	102
SP7=APD*14.	BLWFLP	103
C2. CALCULATE DENSITY	BLWFLP	104
ICN(7)=ICN(7)+1	BLWFLP	105
DELTA=DEL7*.01745	BLWFLP	106
CALL ANGLES(NU8S,DELTA)	BLWFLP	107
GAMA=TBLU1(TT7,FT1,SP1,1,5)	BLWFLP	108
RT=R*TT7	BLWFLP	109
RHOS = (SP7 / RT) * PR7(1)**((GAMA-1.)/GAMA)	BLWFLP	110
C3. VALCULATE JET VELOCITY VJ	BLWFLP	111
VJ = SQRT((2.*G*RT*GAMA/(GAMA-1.))*(1.-PR7(1)**((1.-GAMA)/GAMA)))	BLWFLP	112
C4. CALCULATE JET MACH NUMBER AMJ	BLWFLP	113
AMJ = SQRT((2./((GAMA-1.))*(PR7(1)**((GAMA-1.)/GAMA) - 1.))	BLWFLP	114
	BLWFLP	115

[illegible]

TGAGR(NB)=TBLU1(ALOG10(TGAGR(NB)),STAB,FNB,1,24)	BLWFLP	173
IF(NCF.EQ.8)TGAGR(NB)=TGAGR(NB)+ 4.8	BLWFLP	174
SPLT(NB,J)=UASPL+TGAGR(NB)-ENS-SFZ(NB,J)	BLWFLP	175
SSPL(NB,I,J)=PWRSUM(SSPL(NB,I,J),SPLT(NB,J))	BLWFLP	176
800 CONTINUE	BLWFLP	177
1000 CONTINUE	BLWFLP	178
IF(IPRT(7).NE.7)GO TO 2200	BLWFLP	179
CALL NUISG(IPRT(7),I,NK,10,CHIN,IUNIT,SLDISX(I),PFREQ,	BLWFLP	180
1 SPLT(1,1),NCF,ITYPE)	BLWFLP	181
2200 CONTINUE	BLWFLP	182
DC 2500 K=1,NCF	BLWFLP	183
DC 2500 J=1,17	BLWFLP	184
2500 SPLT(K,J)=SPLT(K,J)-TSPL(K,I,J)	BLWFLP	185
IF(IPRT(3).NE.3)GO TO 3000	BLWFLP	186
CALL PNLSUB(SPLT(1,1),PSPL(1,1),TFD(1,1),EPNL(1,1),SPL2,	BLWFLP	187
* TEPNL(1,1),NK,600,TCG,FLK, I,NOES,IRR(I,1))	BLWFLP	188
CALL NUISG(IPRT(3),I,NK,12,CHIN,IUNIT,SLDISX(I),	BLWFLP	189
1 PFREQ,SPLT(1,1),NCF,ITYPE)	BLWFLP	190
3000 CONTINUE	BLWFLP	191
4000 CONTINUE	BLWFLP	192
RETURN	BLWFLP	193
END	BLWFLP	194

	SUBROUTINE BUZZSAW(RTS,FBP,F,DIA,XSF,ANGLES,ILEVEL,IDCP,	BUZZSAW	2
	BSCR1,BSCR3,BSARAY)	BUZZSAW	3
C AUTHOR	D. F. MELDRUM	BUZZSAW	4
C		BUZZSAW	5
C METHOD	THE BUZZSAW NOISE IS PREDICTED BY THE USE OF CURVES	BUZZSAW	6
C	AS PER THE REFERENCE GIVEN.	BUZZSAW	7
C	THESE CURVES ARE INTERPOLATED OR EXTRAPOLATED AS	BUZZSAW	8
C	NEEDED IN ORDER TO PREDICT THE NOISE AT 150 FT RADIUS	BUZZSAW	9
C		BUZZSAW	10
C PURPOSE	TO PREDICT THE BUZZSAW NOISE COMPONENT FOR EACH	BUZZSAW	11
C	STAGE OF THE INLET FAN.	BUZZSAW	12
C		BUZZSAW	13
C INPUTS	RTS RELATIVE FAN TIP SPEED IN FT/SEC.	BUZZSAW	14
C	FBPF FUNDAMENTAL BLADE PASSING FREQUENCY HERTZ	BUZZSAW	15
C	DIA FAN INLET DIAMETER IN FEET	BUZZSAW	16
C	XSF SCALE FACTOR FOR THE DCPPLAR SHIFT	BUZZSAW	17
C	ANGLES DIRECTIVITY ANGLES FOR NOISE PREDICTION	BUZZSAW	18
C	ILEVEL SWITCH FOR THE DCPPLAR SHIFT LEVEL	BUZZSAW	19
C	CORRECTION IF NON ZERO	BUZZSAW	20
C	IDOP SWITCH FOR THE DCPPLAR SHIFT FREQUENCY	BUZZSAW	21
C	CORRECTION IF IT SET NON ZERO	BUZZSAW	22
C	BSCR1 CURVE - BUZZSAW - BASIC DATA	BUZZSAW	23
C	BSCR3 CURVE - BUZZSAW - DIRECTIVITY ANGLE	BUZZSAW	24
C		BUZZSAW	25
C	INPUT VIA LABELED COMMON - GFREQ	BUZZSAW	26
C	BANDLM 1/3 OCTAVE BAND LIMITS	BUZZSAW	27
C		BUZZSAW	28
C OUTPUTS	BSARAY TABLE OF BUZZSAW NOISE COMPONENT	BUZZSAW	29
C	THIS NOISE IS ADDED TO ANY NOISE WHICH	BUZZSAW	30
C	MAY ALREADY BE IN BSARAY. THEREFORE IF	BUZZSAW	31
C	ONLY THE BUZZSAW NOISE IS DESIRED THIS	BUZZSAW	32
C	ARRAY MUST BE SET TO ZERO BEFORE CALLING	BUZZSAW	33
C	THIS SUBROUTINE.	BUZZSAW	34
C		BUZZSAW	35
C MODIFICATIONS	FROM TEE205 INTO TEE215 - THIS WAS TAKEN FROM	BUZZSAW	36
C	TEE215 AND CHANGES MADE FOR THE NASA-AMES CONTRACT	BUZZSAW	37
C		BUZZSAW	38
C REFERENCES	COORD SHEET AMEP-M-367 3/17/72 D. MELDRUM TEE205A	BUZZSAW	39
C	ANS-RES-F-327 5/30/72 D. SCHRANK	BUZZSAW	40
C	R. J. SAXBY, NASA-AMES FOOTPRINT CONTRACT	BUZZSAW	41
C	NAS2-6469 FAN NOISE MODULE, UN-NUMBERED	BUZZSAW	42
C	COORDINATION SHEET, DATED 19 JANUARY 1973.	BUZZSAW	43
C		BUZZSAW	44
C FUNCTION SUBPRGM	ALOGIC TBLU1 PWRSUM	BUZZSAW	45
C		BUZZSAW	46
C		BUZZSAW	47
C	COMMON /GFREQ/ CFREQ(24),BANDLM(25)	BUZZSAW	48
C		BUZZSAW	49
C	DIMENSION BSARAY(24,1),BSCR1(1),BSCR3(1)	BUZZSAW	50
C	DIMENSION ANGLES(1),XSF(1)	BUZZSAW	51
C	DATA NFREQ/24/	BUZZSAW	52
C		BUZZSAW	53
C	CALCULATE THE ENGINE SIZE CORRECTION	BUZZSAW	54
C		BUZZSAW	55
C	BS=20.0*ALOG10(DIA)	BUZZSAW	56
C		BUZZSAW	57
C	CALCULATE THE BASIC NOISE FOR THE BUZZSAW NOISE	BUZZSAW	58

C	IX=2	BUZSAW	59
	NUM=BSCR1(IX-1)	BUZSAW	60
	IY=NUM+IX	BUZSAW	61
	BS2=BS+TBLU1(RTS,BSCR1(IX),BSCR1(IY),1,NUM)	BUZSAW	62
	IX=NUM*2+IX+1	BUZSAW	63
	NUM=BSCR1(IX-1)	BUZSAW	64
	IY=NUM+IX	BUZSAW	65
	BS4=BS+TBLU1(RTS,BSCR1(IX),BSCR1(IY),1,NUM)	BUZSAW	66
	IX=NUM*2+IX+1	BUZSAW	67
	NUM=BSCR1(IX-1)	BUZSAW	68
	IY=NUM+IX	BUZSAW	69
	BS8=BS+TBLU1(RTS,BSCR1(IX),BSCR1(IY),1,NUM)	BUZSAW	70
C		BUZSAW	71
C	IDENTIFY THE BANDS WITH DISCRETE TONES	BUZSAW	72
C		BUZSAW	73
	DO 100 K=1,17	BUZSAW	74
	IF(ANGLES(K).LT.0.0-.01) GO TO 100	BUZSAW	75
	IF(ANGLES(K).GT.100.0+.01) GO TO 100	BUZSAW	76
	SF=0.0	BUZSAW	77
	IF(ILEVEL.NE.0) SF=-40.0*ALOG10(>SF(K))	BUZSAW	78
	FREQ=FUPF	BUZSAW	79
	IF(ICUP.NE.0) FREQ=FREQ/XSF(K)	BUZSAW	80
65	AN=10.0*ALOG10(FREQ/10000.0)+24.	BUZSAW	81
C		BUZSAW	82
C	CALCULATE THE BASIC SPECTRUM	BUZSAW	83
C		BUZSAW	84
	DO 200 J = 1,NFREQ	BUZSAW	85
	A=J	BUZSAW	86
	ABAND2=A-AN+3.0	BUZSAW	87
	ABAND4=A-AN+6.0	BUZSAW	88
	ABAND8=A-AN+5.0	BUZSAW	89
	DELTA1 = ABS(ABAND2) * 3.	BUZSAW	90
	DELTA2 = ABS(ABAND4) * 5.	BUZSAW	91
	DELTA3=-5.0*ABAND8	BUZSAW	92
	IF(ABAND8.GT.0.0) DELTA3=3.0*ABAND8	BUZSAW	93
	SPLTOT=BS2+SF-DELTA1	BUZSAW	94
	SPLTMP=BS4+SF-DELTA2	BUZSAW	95
	SPLTOT=PWRSUM(SPLTOT,SPLTMP)	BUZSAW	96
	SPLTMP=BS8+SF-DELTA3	BUZSAW	97
	SPLTOT=PWRSUM(SPLTOT,SPLTMP)	BUZSAW	98
C		BUZSAW	99
	IX=2	BUZSAW	100
	NUM=BSCR3(IX-1)	BUZSAW	101
	IY=NUM+IX	BUZSAW	102
C		BUZSAW	103
C	GENERATE THE TABLE OF BUZZSAW NOISE	BUZSAW	104
C		BUZSAW	105
	BSDATA=SPLTOT+TBLU1(ANGLES(K),BSCR3(IX),BSCR3(IY),1,NUM)	BUZSAW	106
	BSARRAY(J,K)=PWRSUM(BSARRAY(J,K),BSDATA)	BUZSAW	107
200	CONTINUE	BUZSAW	108
100	CONTINUE	BUZSAW	109
	RETURN	BUZSAW	110
	END	BUZSAW	111
		BUZSAW	112

C	COMPLEX FUNCTION CFI(X)	CFI	2
C		CFI	3
C	PURPOSE-	CFI	4
C	COMPUTES THE COMPLEX FRESNEL INTEGRAL OF THE FORM-	CFI	5
C		CFI	6
C	$\text{SQRT}(I * P1) * F(X) = \text{INTEGRAL}(\text{EXP}(I * Z**2) * DZ)$ OVER THE	CFI	7
C	LIMITS (X, +INF.)	CFI	8
C	INPUT-	CFI	9
C	X ... ANY REAL VARIABLE (POSITIVE, ZERO, OR NEGATIVE)	CFI	10
C		CFI	11
C	OUTPUT-	CFI	12
C	F ... COMPLEX RESULT FOR FUNCTION IN THE FORM (A + I*B) WHERE	CFI	13
C	(A, B) ARE REAL NUMBERS.	CFI	14
C		CFI	15
C	AUTHOR- D.G. DUNN (5 SEP. 1974)	CFI	16
C		CFI	17
C	REFERENCE-	CFI	18
C	1) IBM CORP., /SCIENTIFIC SUBROUTINE PACKAGE/, IBM APPLICATION	CFI	19
C	PROGRAM H20-016A-5, 1968, P.371	CFI	20
C	2) HERSHMAN, /COMPUTATION OF FRESNEL INTEGRAL/, MATHEMATICAL TABLES	CFI	21
C	AND OTHER AIDS TO COMPUTATION, VOL.14, NO.72, 1960, P.380	CFI	22
C	3) M. ABRAHAMOWITZ AND I.A. SEGAN, /HANDBOOK OF MATHEMATICAL	CFI	23
C	FUNCTIONS/, DOVER PUBLICATIONS, INC., NEW YORK, 5TH EDIT., 1968	CFI	24
C		CFI	25
C	COMMENTS-	CFI	26
C	1) ARGUMENT (X) REMAINS UNCHANGED	CFI	27
C	2) NO OTHER SUBPROGRAMS REQUIRED OVER STANDARD FORTRAN IV LIBRARY.	CFI	28
C	3) ABSOLUTE ERROR IS LESS THAN 1.2E-7	CFI	29
C		CFI	30
	DATA P5, F4 /0.5, 4.0/	CFI	31
	CFI = (0.5, 0.0)	CFI	32
	Z = X*X	CFI	33
	IF (Z) 50, 50, 10	CFI	34
10	IF (Z - F4) 20, 20, 30	CFI	35
20	C = ABS(X)	CFI	36
	S = Z * C	CFI	37
	Z = 16. - Z*Z	CFI	38
	C = C * ((((((5.100785E-11 * Z + 5.244297E-9) * Z + 5.451182E-7)	CFI	39
	1* Z + 3.273308E-5) * Z + 1.020418E-3) * Z + 1.102544E-2) * Z +	CFI	40
	2 1.840962E-1)	CFI	41
	S = S * ((((((0.677681E-10 * Z + 5.883158E-8) * Z + 5.051141E-6)	CFI	42
	1* Z + 2.441816E-4) * Z + 6.121320E-3) * Z + 8.026490E-2)	CFI	43
	GO TO 40	CFI	44
30	D = COS(Z)	CFI	45
	S = SIN(Z)	CFI	46
	Z = F4 / Z	CFI	47
	A = ((((((18.768258E-4 * Z - 4.169289E-3) * Z + 7.970943E-3) * Z	CFI	48
	1Z - 6.792801E-3) * Z - 3.095341E-4) * Z + 5.972151E-3) * Z -	CFI	49
	2 1.606428E-5) * Z - 2.493322E-2) * Z - 4.444091E-9	CFI	50
	B = ((((((16.633926E-4 * Z + 3.401409E-3) * Z - 7.271690E-3) * Z	CFI	51
	1Z + 7.428246E-3) * Z - 4.027145E-4) * Z - 9.314910E-3) * Z -	CFI	52
	2 1.207998E-6) * Z + 1.994711E-1	CFI	53
	Z = SQRT(Z)	CFI	54
	C = P5 + Z * (D * A + S * B)	CFI	55
	S = P5 + Z * (S * A - D * B)	CFI	56
40	C = SIGN(C, X)	CFI	57
	S = SIGN(S, X)	CFI	58

```
CFI = CMPLX(P5 - P5 * (C + S), P5 * (C - S))  
50 RETURN  
END
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CFI 59  
CFI 60  
CFI 61
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SUBROUTINE CMAXIS(X,Y,IBCD,NCHAR,AXLEN,ANGLE,FIRST,DELTV)		CMAXIS	2
C		CMAXIS	3
C	AUTHOR K.D. JOHNSON	CMAXIS	4
C		CMAXIS	5
C	PURPOSE PLOT AXIS BEGINNING AT(XP,YP) IN ANGLE THETA	CMAXIS	6
C	DIRECTION	CMAXIS	7
C	TIC MARKS ARE AT CENTIMETER INCREMENTS	CMAXIS	8
C	AXIS IS LABELED AT EVERY OTHER TIC MARK	CMAXIS	9
C		CMAXIS	10
C	INPUTS X = BEGINNING X COORDINATE IN CM	CMAXIS	11
C	Y = BEGINNING Y COORDINATE IN CM	CMAXIS	12
C	IBCD = THE TITLE WHICH IS PLACED AT THE FAR END OF	CMAXIS	13
C	THE AXIS	CMAXIS	14
C	NCHAR = THE NUMBER OF CHARACTERS IN THE TITLE IBCD	CMAXIS	15
C	IF NCHAR 0 THE TITLE APPEARS ON POSITIVE SIDE	CMAXIS	16
C	OF AXIS	CMAXIS	17
C	IF NCHAR 10 THE TITLE APPEARS ON NEGATIVE	CMAXIS	18
C	SIDE OF AXIS	CMAXIS	19
C	AXLEN = AXIS LENGTH IN CM	CMAXIS	20
C	FIRST = VALUE OF AXIS AT(XP,YP)	CMAXIS	21
C	DELTV = INCREMENT VALUE(UNITS/CM)	CMAXIS	22
C	ANGLE = ANGLE, IN POSITIVE OR NEGATIVE DEGREES AT	CMAXIS	23
C	WHICH THE AXIS IS DRAWN (+X=0,+Y=90.)	CMAXIS	24
C		CMAXIS	25
C	360	CMAXIS	26
C	DIMENSION IBCD(1),PLABL(2)	CMAXIS	27
C	DIMENSION IBCD(1),PLABL(1)	CMAXIS	28
C	INTEGER CMOV	CMAXIS	29
C	DATA PLABL(1)/4H * /, PLABL(2)/4H 10** /	CMAXIS	30
C	DATA PLABL/8H * 10** /	CMAXIS	31
C	DATA CMOV /2.54001/	CMAXIS	32
C	DATA RADIAN/ 57.29577/	CMAXIS	33
C		CMAXIS	34
C	CONVERT ANGLE TO RADIAN	CMAXIS	35
C		CMAXIS	36
C	THETA=ANGLE/RADIAN	CMAXIS	37
C		CMAXIS	38
C		CMAXIS	39
C	CONVERT SCALE TO UNITS/INCH	CMAXIS	40
C	DELCM=DELTV*CMOV	CMAXIS	41
C		CMAXIS	42
C	MOVE TO START OF AXIS	CMAXIS	43
C	XP=X/CMOV	CMAXIS	44
C	YP=Y/CMOV	CMAXIS	45
C	CALL PLUT(XP,YP,3)	CMAXIS	46
C	LINC=AXLEN	CMAXIS	47
C	COSTH=COS(THETA)	CMAXIS	48
C	SINTH=SIN(THETA)	CMAXIS	49
C	CMCSTH=COSTH/CMOV	CMAXIS	50
C	CMSINTH=SINTH/CMOV	CMAXIS	51
C	XTIC=.07*SINTH	CMAXIS	52
C	YTIC=.07*COSTH	CMAXIS	53
C	CALL PLCT(XP+XTIC,YP+YTIC,2)	CMAXIS	54
C	CALL PLCT(XP-XTIC,YP-YTIC,2)	CMAXIS	55
C	CALL PLCT(XP,YP,2)	CMAXIS	56
C	DO 25 I=1,LINC	CMAXIS	57
C	XP=XP+CMCSTH	CMAXIS	58

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      YP=YP+CMSNTH
      CALL PLOT(XP,YP,2)
      CALL PLOT(XP+XTIC,YP+YTIC,2)
      CALL PLOT(XP-XTIC,YP-YTIC,2)
      CALL PLOT(XP,YP,2)
25  CONTINUE
C  FIND POWER DIVISOR NECESSARY FOR F XX.X LABEL FORMAT
      AMAX=DELTV*AXLEN+FIRST
      IP=MCHAR(AMAX)-2
      INCHR=IABS(NCHAR)
      RINCH = INCHR
      NADD=C
      IF(IP.EQ.0)GO TO 28
      NADD=10
28  NTCHAR=INCHR+NADD
      TNCHAR = NTCHAR
      ISCHAR=ISIGN(1,NCHAR)
      SICCHAR = ISCHAR
      XPL = XP - .13 * TNCHAR * COSTH
      YPL = YP - .13 * TNCHAR * SINTH
      XPL = XPL - .42 * SICCHAR * SINTH
      YPL = YPL + .42 * SICCHAR * COSTH
      CALL SYMBOL(XPL,YPL,.14,IBCD,ANGLE,INCHR)
      IF(NADD.EQ.0)GO TO 29
      XPL = XPL + .13 * RINCH * COSTH
      YPL = YPL + .13 * RINCH * SINTH
      CALL SYMBOL(XPL,YPL,.14,PLABL,ANGLE,8)
      XPL=XPL+1.04*COSTH
      YPL=YPL+1.04*SINTH
      FPN=IP
      CALL NUMBER(XPL,YPL,.14,FPN,ANGLE,-1)
C
C  LABEL VALUES EVERYOTHER CM TIC MARK
C
29  XMAX=C.
      TWODLT=DELTV*2.
30  XMAX=XMAX+TWODLT
      IF(XMAX.LT.AMAX) GO TO 30
      AMAX=XMAX-TWODLT
      XMAX=(AMAX-FIRST)/DELCM
      XP=X/CMPIN
      YP=Y/CMPIN
      XP=XP+XMAX*COSTH
      YP=YP+XMAX*SINTH
      XP = XP - 3. * XTIC * SICCHAR
      YP = YP + 3. * YTIC * SICCHAR
      PCWR=10.**IP
35  FPN=AMAX/PCWR
      FP=ABS(FPN)
      NDEC=1
      IF (FP .NE. 0.) GO TO 40
      CMOV=1
      GO TO 42
40  CMOV=MCHAR(FP)
      IF (CMOV .GT. 0) GO TO 42
      CMOV=2
      NDEC=3

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CMAXIS 59
CMAXIS 60
CMAXIS 61
CMAXIS 62
CMAXIS 63
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CMAXIS 68
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CMAXIS 107
CMAXIS 108
CMAXIS 109
CMAXIS 110
CMAXIS 111
CMAXIS 112
CMAXIS 113
CMAXIS 114
CMAXIS 115

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42  IF(FPN.LT.0.) CMOV=CMOV+1
    XPN = XP - .07 * CCSTH * FLGAT(CMOV)
    YPN = YP - .07 * SINTH * FLCAT(CMOV)
    CALL NUMBER(XPN,YPN,.07,FPN,ANGLE,ANDEC)
    AMAX=AMAX-2.*DELTV
    XP=XP-2.*CMCSTH
    YP=YP-2.*CMSNTH
    IF(AMAX.GE.FIRST) GO TO 35
    RETURN
    END

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CMAXIS 116
CMAXIS 117
CMAXIS 118
CMAXIS 119
CMAXIS 120
CMAXIS 121
CMAXIS 122
CMAXIS 123
CMAXIS 124
CMAXIS 125

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C	SUBROUTINE CONVR(IENTRY,N,L)	CONVR	2
C	INPUT DATA BLOCKS FOR NOISE COMPONENTS	CONVR	3
C	ITYPE DEFINES THE TYPE OF NOISE COMPONENT	CONVR	4
C	ITYPE=1 PRIMARY JET	CONVR	5
C	=2 PRIMARY AND SECONDARY JET	CONVR	6
	COMMON/JETDAT/NJET1,MCODE1,API,WFL,VPL,AS2,WS2,VS2,PR1,PA1,	CONVR	7
	1 TT1,VAL,DIAMT1,ANGJT1,ICCK1	CONVR	8
	DIMENSION JETD(12)	CONVR	9
	EQUIVALENCE (JETD(1),API)	CONVR	10
C	=3 CORE AND TURBINE	CONVR	11
	COMMON/COREIN/TT3,PP3,CMF3,EK3,DELT3,J83,	CONVR	12
	* ICOR3,LIN3,NTF3,IMA3,LGM3,NWL3,ICP3,ILAY3,TF3(10),	CONVR	13
	* PCTA3(10),PLA3(10),ELCH3,EDH3,R1W3(10),TL3(10),CF3,FM3	CONVR	14
C		CONVR	15
	COMMON/TURBIN/ON3,SS3,VTR3,CLS3,CT3,TL3,FMF3,CS3,IC3,ISW3	CONVR	16
C	=4 COMPRESSOR AND INLET FAN	CONVR	17
C	=5 EXIT FAN	CONVR	18
	COMMON/FANDAT/NSIG45,NLET45,NAFT45,ICP45,NB45(3),FPR45(3),	CONVR	19
	1 DIAM4(3),RSS45(3),AREA5(3),KN145,RTS4,CFPR45,DELT45,	CONVR	20
	* NIS,8PR5,ICOR4,LIN4,NTF4,IMA4,LGM4,NWL4,ICP4,ILAY4,TF4(10),	CONVR	21
	* PCTA4(10),PLA4(10),ELCH4,EDH4,R1W4(10),TL4(10),CF4,FM4,	CONVR	22
	* ICOR5,LIN5,NTF5,IMA5,LGM5,NWL5,ICP5,ILAY5,TF5(10),	CONVR	23
	* PCTA5(10),PLA5(10),ELCH5,EDH5,R1W5(10),TL5(10),CF5,FM5	CONVR	24
C	=6 AUGMENTER-WING JET	CONVR	25
	COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCP,IPRT(7),ICN(13),ALGPT	CONVR	26
	COMMON/AUGWNG/GAMA6,TT6,XNPR6,DELT6,ALO,CE6,	CONVR	27
	* ICOR6,LIN6,NTF6,IMA6,LGM6,NWL6,ICP6,ILAY6,TF6(10),	CONVR	28
	* PCTA6(10),PLA6(10),ELCH6,EDH6,R1W6(10),TL6(10),CF6,FM6	CONVR	29
C	=7 BLOWN-FLAP JET	CONVR	30
	COMMON/BLOWIN/PR7,TT7,AN7,DN7,FANG7,DELT7,DL7,HD7,ICCR7	CONVR	31
C	=8 LIFT FAN	CONVR	32
	COMMON/LFTFAN/NB8,FPR8,DIAM8,PSSE,AREA8,RN18,RTS8,CRFPR8,DELT8,	CONVR	33
	* ICOR8,LIN8,NTF8,IMA8,LGM8,NWL8,ICP8,ILAY8,TF8(10),PCTA8(10),	CONVR	34
	* PLA8(10),ELOH8,EDH8,R1W8(10),TL8(10),CF8,FM8	CONVR	35
C	=9 EJECTOR-SUPPRESSOR	CONVR	36
	COMMON/EJECTD/IEJ9,NLM9,AREA9,AR9,IT9,EXNP9,SMACH9,CV9,PS9,	CONVR	37
	* PA9,PTS9,EMACH9,PCV9,DELT9,	CONVR	38
	* ICOR9,LIN9,NTF9,IMA9,LGM9,NWL9,ICP9,ILAY9,TF9(10),PCTA9(10),	CONVR	39
	* PLA9(10),ELOH9,EDH9,R1W9(10),TL9(10),CF9,FM9	CONVR	40
C	=9 LIFT-FAN	CONVR	41
C	=10 PROPELLER	CONVR	42
	COMMON/PROPIN/T10,W10,RPM10,D10,DSL610,ASUB10,B10,DELT10,	CONVR	43
	*ICOR10	CONVR	44
C	=11 HELICOPTER AND TILT ROTOR	CONVR	45
	COMMON/COPTER/T11,Q11,RPM11,B11,LT11,AB11,CE11,RN11,	CONVR	46
	1 S11,CE11,DELT11,XLMC11,XM11,ART11,CLF11,	CONVR	47
	*IRP11,ICOR11	CONVR	48
C		CONVR	49
C	=12 MEASURED DATA INPUTS	CONVR	50
	COMMON/MEASIN/NEP12,NPS112,NBT112,DELT12,EP12(5),PS112(17),	CONVR	51
	* BCTA12(5),	CONVR	52
	*ICOR12	CONVR	53
C		CONVR	54
C	IBM360	CONVR	55
C	THIS ROUTINE HANDLES LINKAGE TO INPUT MODULES FLIGHT-PATH	CONVR	56
C	OBSERVER GEOMETRY MODULE VARIOUS NOISE ESTIMATION MODULES	CONVR	57
		CONVR	58

C	EXTRAPOLATION MODULE	HUMAN RESPONSE MEASUREMENT MODULE	CONVR	59
C	INTERGER XTRANSF		CONVR	60
C			CONVR	61
C	CCONSTANTS USED IN INTERNAL CALCULATIONS		CONVR	62
C			CONVR	63
	COMMON /GCONST/	IN,I0,IT1,IT2,F0,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	CONVR	64
*		10,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,POO1,	CONVR	65
*		EPS,UNDEF,BL,ICD,LPR,RPD,ETA(17),M1,FM1,I17,A,PI	CONVR	66
C			CONVR	67
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING		CONVR	68
C			CONVR	69
	COMMON /GCOMON/	NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),	CONVR	70
*		*BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)	CONVR	71
C			CONVR	72
C	FREQUENCY BANDS USED BY PROGRAM		CONVR	73
C			CONVR	74
	COMMON /GFREQ/	CFREQ(24),UFREQ(25),PFREQ(24)	CONVR	75
C			CONVR	76
C	GENERAL INPUT PARAMETERS		CONVR	77
C			CONVR	78
	COMMON /GPRAM/	ALTP,ALTR,SLOPE,APACH,NCBS,SLDIST(10),NTENG,IUNIT	CONVR	79
*		,ISPTRM,IATMOS,IAIR,LAIRAB(24),ATEMP,TEMP(50),TALT(50)	CONVR	80
*		,NPRES,PRES(50),PALT(50),NHUMID,RALT(50),RHUMID(50),CTEMP	CONVR	81
*		,CPRES,CRHUMC,IEGA,IGDR,CTEMP,DPRES,CHUMID,XKN,ND,FLO(50),	CONVR	82
*		ZNR(50),ZNI(50),LINECT,MAXLIN,IPAGE,BCG,TCG,FLR,AALT,EPF	CONVR	83
C			CONVR	84
C	AIRCRAFT-OBSERVER GEOMETRY OUTPLTS		CONVR	85
C			CONVR	86
	COMMON /GEOMC/	APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	CONVR	87
*		B1(10,17),B2(10,17),TDS(17,10),TPC(17,10),IAR(10,17)	CONVR	88
*		*APP,TP,RHP,APO,TC,RHC,CA,CZ,TSP(17,10),CCV	CONVR	89
C			CONVR	90
C	CONVERSION CONSTANTS		CONVR	91
C			CONVR	92
	COMMON/GCONVC/	C(2,10),SLDISX(10)	CONVR	93
	COMMON/CRSPLS/	DUB(17),PSCR(17),DPB(408),NPSCR	CONVR	94
	COMMON/ICPATH/	NCAS,NGOF,NTYP,IC,ARR,IAARRAY(2)	CONVR	95
C			CONVR	96
C			CONVR	97
	COMMON/HEAD/	HIN(20),HOUT(20),CHIN(20)	CONVR	98
C			CONVR	99
C		C(1,1) FEET PER METER	CONVR	100
C			CONVR	101
C		C(1,2) LBF PER NEWTON	CONVR	102
C			CONVR	103
C		C(1,3) LBS PER KG	CONVR	104
C			CONVR	105
C		C(1,4) HP. PER KILWATT	CONVR	106
C		C(1,6) LBS. PER SQ. IN PER ATMOSPHERE	CONVR	107
C			CONVR	108
C		C(1,5) RANKIN PER KEVIN DEGREE	CONVR	109
C			CONVR	110
	REAL JETD		CONVR	111
	LM2 = L - 2		CONVR	112
	IF (LM2) 1000, 1000, 2		CONVR	113
1000	CONTINUE		CONVR	114
	GU TO(1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20),IENTRY		CONVR	115

2	CONTINUE	CONVR	116
	JETD(4)=JETD(4)*C(N,1)**2	CONVR	117
	JETD(5)=JETD(5)*C(N,3)	CONVR	118
	JETD(6)=JETD(6)*C(N,1)	CONVR	119
1	CONTINUE	CONVR	120
	JETD(1)=JETD(1)*C(N,1)**2	CONVR	121
	JETD(2)=JETD(2)*C(N,3)	CONVR	122
	JETD(3)=JETD(3)*C(N,1)	CONVR	123
	JETD(9)=JETD(9)*C(N,5)	CONVR	124
	JETD(11)=JETD(11)*C(N,1)	CONVR	125
	IF (LM2) 2000, 2CCC, 3	CONVR	126
3	CONTINUE	CONVR	127
	TT3=TT3*C(N,5)	CONVR	128
	CMF3=CMF3*C(N,3)	CONVR	129
	VTR3=VTR3*C(N,1)	CONVR	130
	CLS3=CLS3*C(N,1)	CONVR	131
	DT3=DT3*C(N,1)	CONVR	132
	TL3=TL3*C(N,5)	CONVR	133
	PMF3=PMF3*C(N,3)	CONVR	134
	EDH3=EDH3*C(N,1)	CONVR	135
	DO 301 I=1,21	CONVR	136
301	R1W3(I)=R1W3(I)*C(N,1)	CONVR	137
	IF (LM2) 2CCC, 2CCC, 4	CONVR	138
4	CONTINUE	CONVR	139
	DO 41 I=1,NSTG45	CONVR	140
41	DIAM4(I)=DIAM4(I)*C(N,11)	CONVR	141
	EDH4=EDH4*C(N,1)	CONVR	142
	DO 401 I=1,21	CONVR	143
401	R1W4(I)=R1W4(I)*C(N,1)	CONVR	144
	IF (LM2) 2000, 2CCC, 5	CONVR	145
5	CONTINUE	CONVR	146
	DO 51 I=1,NSTG45	CONVR	147
51	AREA5(I)=AREA5(I)*C(N,1)**2	CONVR	148
	EDH5=EDH5*C(N,1)	CONVR	149
	DO 501 I=1,21	CONVR	150
501	R1W5(I)=R1W5(I)*C(N,1)	CONVR	151
	IF (LM2) 2000, 2CCC, 6	CONVR	152
6	TT6=TT6*C(N,5)	CONVR	153
	AC6=AC6*C(N,1)**2	CONVR	154
	CE6=CE6*C(N,1)	CONVR	155
	ELH6=EDH6*C(N,1)	CONVR	156
	DO 601 I=1,21	CONVR	157
601	R1W6(I)=R1W6(I)*C(N,1)	CONVR	158
	IF (LM2) 2000, 2CCC, 7	CONVR	159
7	CONTINUE	CONVR	160
	TT7=TT7*C(N,5)	CONVR	161
	AN7=AN7*C(N,1)**2	CONVR	162
	DN7=DN7*C(N,1)	CONVR	163
	IF (LM2) 2000, 2CCC, 8	CONVR	164
8	CONTINUE	CONVR	165
	DIAM8=DIAM8*C(N,1)	CONVR	166
	AREA8=AREA8*C(N,1)**2	CONVR	167
	EDH8=EDH8*C(N,1)	CONVR	168
	DO 801 I=1,21	CONVR	169
801	R1W8(I)=R1W8(I)*C(N,1)	CONVR	170
	IF (LM2) 2000, 2CCC, 9	CONVR	171
9	CONTINUE	CONVR	172

	EDH9=EDH9*C(N,1)	CONVR	173
	DC 901 I=1,21	CONVR	174
901	R1W9(I)=R1W9(I)*C(N,1)	CONVR	175
	TT9=TT9*C(N,5)	CONVR	176
	AREA9=AREA9*C(N,1)**2	CONVR	177
	PA9=PA9*C(N,1)**2	CONVR	178
	PS9=PS9*C(N,16)	CONVR	179
	PTS9=PTS9*C(N,5)	CONVR	180
	IF (LM2) 2000, 2000, 10	CONVR	181
10	CONTINUE	CONVR	182
	T10=T10*C(N,2)	CONVR	183
	W10=W10*C(N,4)	CONVR	184
	D10=D10*C(N,1)	CONVR	185
	DSUB10=DSUB10*C(N,1)	CONVR	186
	ASUB10=ASUB10*C(N,1)**2	CONVR	187
	IF (LM2) 2000, 2000, 11	CONVR	188
11	CONTINUE	CONVR	189
	T11=T11*C(N,2)	CONVR	190
	Q11=Q11*C(N,1)*C(N,2)	CONVR	191
	DT11=DT11*C(N,1)	CONVR	192
	AB11=AB11*C(N,1)**2	CONVR	193
	DE11=DE11*C(N,11)	CONVR	194
	IF (LM2) 2000, 2000, 12	CONVR	195
12	CONTINUE	CONVR	196
	IF (LM2) 2000, 2000, 13	CONVR	197
13	CONTINUE	CONVR	198
	IF (LM2) 2000, 2000, 14	CONVR	199
14	CONTINUE	CONVR	200
15	CONTINUE	CONVR	201
16	CONTINUE	CONVR	202
17	CONTINUE	CONVR	203
18	CONTINUE	CONVR	204
19	CONTINUE	CONVR	205
200	DC 250 I=I1,NOBS	CONVR	206
	DO 250 J=I1,I17	CONVR	207
	APY(I,J)=C(N,I1)*APY(I,J)	CONVR	208
	APZ(I,J)=C(N,I1)*APZ(I,J)	CONVR	209
	PD(I,J)=C(N,I1)*PD(I,J)	CONVR	210
250	CONTINUE	CONVR	211
	CA=CA*C(N,I1)	CONVR	212
	CZ=CZ*C(N,I1)	CONVR	213
	COV=COV*C(N,I1)	CONVR	214
C		CONVR	215
20	CONTINUE	CONVR	216
	ALTP=C(N, I1)*ALTP	CONVR	217
	AALT=C(N, I1)*AALT	CONVR	218
	ALTR=C(N, I1)*ALTR	CONVR	219
	DO 110 I=I1,NOBS	CONVR	220
110	SLOIST(I)=C(N, I1)*SLOIST(I)	CONVR	221
	DO 112 I=I1,NTEMP	CONVR	222
	TEMP(I)=C(N, I5)*TEMP(I)	CONVR	223
112	TALT(I)=C(N, I1)*TALT(I)	CONVR	224
	DO 113 I=I1,NPRES	CONVR	225
	PRES(I)=C(N, I6)*PRES(I)	CONVR	226
113	PALT(I)=C(N, I1)*PALT(I)	CONVR	227
	DO 114 I=I1,NHUMID	CONVR	228
114	RALT(I)=C(N, I1)*RALT(I)	CONVR	229

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CTEMP=C(N,15)*CTEMP
CPRES=C(N,16)*CPRES
DTEMP=C(N,15)*DTEMP
DPRES=C(N,16)*DPRES
DO 125 I=1,24
125  UAIRAB(I)=UAIRAB(I)/C(N,11)
2000 RETURN
END

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CONVR 230
CONVR 231
CONVR 232
CONVR 233
CONVR 234
CONVR 235
CONVR 236
CONVR 237

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SUBROUTINE COPTR		COPTR	2
C		COPTR	3
C		COPTR	4
	COMMON /COPTER/ T, Q, THETA, NFL, CT, AB, DE, RN, S, XC, DELTA,	COPTR	5
	* XLC, XM, NROT, LLF, ITR, ICCR	COPTR	6
	COMMON /SWITCH/ NTYPE, ITYPE, NEAG, IDCP, IPRT(7), ICN(13), ALOPT	COPTR	7
	COMMON /GCONST/ IN, IQ, WK1(29), INDEF, BL, ICD, WK2(24)	COPTR	8
	COMMON /GCOMMON/ NFB, NK, BCF(24), XDB(24,10,17), SPL(24,17), F(25)	COPTR	9
	* , RETA(17), SPL2(17), PS(24), SF(17)	COPTR	10
	COMMON /SUMSPL/ TSPL(24,10,17)	COPTR	11
	COMMON /PNLD/ PNL(17,20), EPAL(5,10), TEPNL(5,10)	COPTR	12
	COMMON /GFREQ/ WK3(49), PFREQ(24)	COPTR	13
	COMMON /ANGLE/ PSI(17,10), PSIC(17,10), BETA(17,10)	COPTR	14
	COMMON /GPRAM/ ALTP, ALTR, GRAD, MO, NCBS, X(10), ITENG, IUNIT,	COPTR	15
	* WK4(493), BCG, TCG, FLR, AALT, EPP	COPTR	16
	COMMON /GEOMO/ Y(10,17), ZN(10,17), P(10,17), WK5(680), TPD(17,10)	COPTR	17
	* , IRR(10,17), WK6(3), PSO, TSO, WK7(2), AO, WK8(171)	COPTR	18
	COMMON /GCUNVC/ WK9(20), CX(10)	COPTR	19
	COMMON /THSPL/ CDB(24,17), IB(2,3,13)	COPTR	20
	COMMON /HEAD/ WK10(40), CHIN(20)	COPTR	21
	REAL NBL, MC, MT, MOX, MTE, KM, INDEF, ME	COPTR	22
C		COPTR	23
C	AUTHOR- D.G. DUNN	COPTR	24
C	DATE - 6 AUG 73	COPTR	25
C		COPTR	26
C	PLKPGSE-	COPTR	27
C	TO COMPLETE THE ROTOR NOISE AS DEFINED IN REF. 2	COPTR	28
C		COPTR	29
C	INPUTS- VIA COMMON BLOCKS	COPTR	30
C	0) X ... AIRCRAFT COORDINATES, REF.1	COPTR	31
C	1) Y ... AIRCRAFT COORDINATES, REF. 1	COPTR	32
C	2) ZN ... AIRCRAFT COORDINATES, REF. 1	COPTR	33
C	3) P ... PROPAGATION DISTANCES, REF. 1	COPTR	34
C	4) SF ... DOPPLER-SHIFT FACTORS, REFS. 1 AND 2. SF .GT. 0.	COPTR	35
C	5) F ... CUTOFF-FREQUENCIES FOR PASSBAND FILTERS, HZ. REF.1	COPTR	36
C	8) NFB ... NUMBER OF PASSBANDS. 1 .LE. NFB .LE. 24	COPTR	37
C	10) NOBS ... NUMBER OF OBSERVER POSITIONS. NCBS .GE. 1	COPTR	38
C	11) T ... THRUST PER ROTOR, LBF	COPTR	39
C	12) Q ... SHAFT TORQUE, FT-LBF	COPTR	40
C	13) THETA ... SHAFT SPEED, RPM	COPTR	41
C	14) NROT ... NUMBER OF ROTORS	COPTR	42
C	15) NFL ... NUMBER OF BLADES PER ROTOR	COPTR	43
C	16) DT ... TIP DIAMETER, FT.	COPTR	44
C	17) AB ... BLADE-AREA LF ROTOR, SQ.FT. ... ONE SIDE ONLY	COPTR	45
C	18) DE ... MEAN-AXIAL PROJECTED CHORD AT 0.7 SPAN, FT.	COPTR	46
C	19) RN ... DIMENSIONLESS CENTRIC FOR EQUIVALENT POINT LOAD, REF.2	COPTR	47
C	20) LLF ... LOADING-LAW INDICATOR, REF.2	COPTR	48
C	21) S ... LIFT-CURVE SLOPE, REF.2	COPTR	49
C	22) XC ... CONSTANT, C, IN LEADING LAW. REF.2	COPTR	50
C	23) XM ... CONSTANT, M, IN LEADING LAW. REF.2	COPTR	51
C	24) XLC ... CONSTANT, LC, IN LEADING LAW. REF.2	COPTR	52
C	25) MO ... AIRCRAFT MACH NUMBER	COPTR	53
C	26) GRAD ... CLIMB GRADIENT	COPTR	54
C	27) DELTA ... ANGLE IN DEGREES BETWEEN THRUST VECTOR AND HORIZON.	COPTR	55
C	28) PSO ... STATIC PRESSURE, PSIA	COPTR	56
C	29) TSO ... STATIC TEMPERATURE, DEG.R	COPTR	57
C	30) AO ... SPEED OF SOUND, FTS.	COPTR	58
C	31) ITR ... INDICATOR TO SPECIFY IF THE ROTOR BEING CONSIDERED IS	COPTR	

C	MAIN ROTOR OR TAIL ROTOR. IT EQUALS ZERO FOR MAIN ROTOR	COPTR	59
C	IS NON-ZERO FOR THE TAIL ROTOR.	COPTR	60
C		COPTR	61
C	OUTPUT	COPTR	62
C	1) SPL ... SOUND PRESSURE LEVEL SPECTRA IN DB RE. 20 MICRO-N/SQ.M	COPTR	63
C	AT FREE-FIELD, INDEX (R = 1 M) CONDITIONS.	COPTR	64
C	2) PSI ... DIRECTIVITY ANGLES CORRESPONDING TO EACH SPECTRUM.	COPTR	65
C	3) IEC ... ERROR CODE (PRESENTLY THIS IS A LOCAL VARIABLE)	COPTR	66
C	IEC = 0, NO ERRORS DETECTED	COPTR	67
C	IEC = 1, FOR HELICAL-TIP-MACH NUMBER .GT. 0.93	COPTR	68
C	IEC = 2, FOR (ME*SIN(PSI)/SF) .GT. 1)	COPTR	69
C	IEC = 3, FOR BAD INPUTS	COPTR	70
C		COPTR	71
C	REFERENCE	COPTR	72
C	1) D.G. DUNN, MASTER FLOW CHART FOR NASA CONTRACT NAS 2-6969	COPTR	73
C	(PHASE B) COMPUTING REQUIREMENTS/, BOEING C/S ANS-RES-F-336,	COPTR	74
C	6 DEC 1972.	COPTR	75
C	2) D.G. DUNN, NOISE PREDICTION FOR HELICOPTERS, TILT-ROTOR, AND	COPTR	76
C	PROPELLER AIRCRAFT/, BOEING C/S ANS-RES-F-415, AUGUST 1973	COPTR	77
C		COPTR	78
C	DIMENSION G(24), RES(130), JU(8), XJU(8), DLJ(8), KM(4)	COPTR	79
C	DATA P5,R0,R1,R2,R5,R10,RPD,PI,SC,RC,A1,EPS/.5,0.,1.,2.,5.,10.,	COPTR	80
C	* 1.745329E-2,3.141593,5.0,3.280833,30.35438,1.E-5/	COPTR	81
C	DATA I1,I2,JU /1,2,1,2,3,5,7,10,15,21/	COPTR	82
C	DATA XJU /0.,.30103,.4771212,.69897,.845098,1.,1.170691,1.322219/	COPTR	83
C		COPTR	84
C	CONSTANTS KM = PI/60, 1.+ COS(70 DEG)**2, 4*PI, 10.**.57	COPTR	85
C	DATA KM /5.235988E-2,.21698,12.56637,3.715352/	COPTR	86
C		COPTR	87
C	ICN(11) = ICN(11) + 11	COPTR	88
C	NANG = 17	COPTR	89
C	NRCT = NENG	COPTR	90
C	ROTN = NROT	COPTR	91
C	ERROR CHECK OF INPUT ARGUMENTS	COPTR	92
C	IEC = 3	COPTR	93
C	IF ((IT .LE. RO) .OR. (IQ .LE. RC) .OR. (THETA .LE. RO) .OR.	COPTR	94
C	1 (ROTN .LT. M1) .OR. (INBL .LT. M2) .OR. (INBL .GT. 0.) .OR.	COPTR	95
C	2 (DT .LE. RO) .OR. (AB .LE. RC) .OR. (DE .LE. RO) .OR.	COPTR	96
C	3 (RN .LE. RO) .OR. (RN .GT. M1) .OR. (LLF .LT. 1)) .OR.	COPTR	97
C	4 (LLF .GT. 6) .OR. (S .LE. RC) .OR. (XC .LE. RC) .OR. (XM .LE. RO)	COPTR	98
C	5 .OR. (MO .LT. RO) .OR. (MG .GE. R1) .OR. (PSO .LE. PO) .OR.	COPTR	99
C	6 (TSO .LE. RO) .OR. (AG .LE. RC)) GO TO 135	COPTR	100
C	DO 200 I = 1,NANG	COPTR	101
C	IF (SF(I) .LE. RC) GO TO 135	COPTR	102
C	200 CONTINUE	COPTR	103
C	XX = RC	COPTR	104
C	N = NFB + 11	COPTR	105
C	DO 210 I = 1,N	COPTR	106
C	IF (F(I) .LE. XX) GO TO 135	COPTR	107
C	210 XX = F(I)	COPTR	108
C		COPTR	109
C	INITIALIZATION	COPTR	110
C	IF (ITR) 211, 213, 211	COPTR	111
C	211 ALFA = 1.570796	COPTR	112
C	DO 212 I = 1,NANG	COPTR	113
C	DO 212 J = 1,NUBS	COPTR	114
C	PSI(I,J) = ACOS(X(J) / P(J,I)) + 57.29578	COPTR	115

212 CONTINUE	COPTR	116
GC TO 214	COPTR	117
213 AN = DELTA * RPD	COPTR	118
ALFA = AN - ATAN(GRAD)	COPTR	119
CALL ANGLES(NUBS, AN)	COPTR	120
214 VT = KM(1) * THETA * DT	COPTR	121
MT = VT / AO	COPTR	122
MCX = MC * COS(ALFA)	COPTR	123
SMOX = MOX*MOX	COPTR	124
XX = MT*MT + MO*MO	COPTR	125
YY = MT*MO * SIN(ALFA)	COPTR	126
MTE = (XX * (XX*XX + 6.*YY*YY))**.1666667	COPTR	127
IF (MTE .LE. RC) .OR. (MTE .GT. 0.93)) GC TC 130	COPTR	128
A = R1 + MTE	COPTR	129
B = R1 - MTE	COPTR	130
C = R2 * ALOG(A / B)	COPTR	131
VTE = AO * MTE	COPTR	132
R = P5 * RN * DT	COPTR	133
HC = Q / (T * R)	COPTR	134
ME = KN * MT	COPTR	135
XX = ME*ME + MO*MO	COPTR	136
YY = ME * YY / MT	COPTR	137
ME = (XX * (XX*XX + 6.*YY*YY))**.1666667	COPTR	138
VGX = AO * MOX	COPTR	139
SVOX = VGX*VOX	COPTR	140
V = C.7 * VT	COPTR	141
XX = V*V + (AO*MC)**2	COPTR	142
YY = V * YY / (RN * MT)	COPTR	143
V = (XX * (XX*XX + 6.*YY*YY))**.1666667	COPTR	144
1 CS = R1	COPTR	145
TMPI = R5	COPTR	146
GC TO (10, 2, 3, 4, 5, 6), LLF	COPTR	147
2 SDT = DT*DT	COPTR	148
VI = P5 * (VOX + SQRT(SVCX + A1 * ISO * T / (PSO * SDT)))	COPTR	149
SIG = 1.2732395 * AO / SDI	COPTR	150
XM = 1.3 + 0.4876 * (VI * SC / (S * SIG * VT))	COPTR	151
TMPI = R1 + XM*XM	COPTR	152
GC TO 1C	COPTR	153
3 CS = 0.7396	COPTR	154
TMPI = 3.86	COPTR	155
GC TO 10	COPTR	156
4 CS = 1936.	COPTR	157
HC = 36.	COPTR	158
GC TO 1C	COPTR	159
5 CS = 595.36	COPTR	160
HC = 30.	COPTR	161
GC TO 10	COPTR	162
6 CS = XC*XC	COPTR	163
TMPI = R1 + XM*XM	COPTR	164
HC = XLC	COPTR	165
10 CONTINUE	COPTR	166
FVT = C.28 * V / DE	COPTR	167
FCT = NBL * THETA / 60.	COPTR	168
UVT = VTE * T	COPTR	169
UVT = UVT*LVF / (AB * KM(2))	COPTR	170
URT = ME * T / (KM(3) * RC * R)	COPTR	171
HCT = HD / ME	COPTR	172

IEC = 0	COPTR	172
C	COPTR	174
C LOOP FOR EACH OBSERVER POSITION	COPTR	175
DO 115 JJ = 1, NOBS	COPTR	176
CALL LINCOR(COB(1,1), 0, 0, 0, 0, 0, 0, 0, 0, 0, PSI(1, JJ), NFB, BCF,	COPTR	177
* D, 0, 0, 0, 0, 0, 0, ICCR, IB(1,1, ITYPE), 0, 0)	COPTR	178
C	COPTR	179
C LOOP FOR EACH ANGULAR POSITION RELATIVE TO FLT. PATH	COPTR	180
DO 110 II = 1, NANG	COPTR	181
FV = FVT / SF(II)	COPTR	182
FG = FGT / SF(II)	COPTR	183
UV = UVT / SF(II)	COPTR	184
UR = URT / (SF(II)*SF(II))	COPTR	185
FG = FGT * SF(II)	COPTR	186
C	COPTR	187
C CALCULATE VORTEX NOISE PRESSURE SPECTRUM SHAPE.	COPTR	188
S1 = F(1) / FV	COPTR	189
DO 15 K = 1, NFB	COPTR	190
S2 = F(K+1) / FV	COPTR	191
AS1 = A * S1	COPTR	192
BS1 = B * S1	COPTR	193
AS2 = A * S2	COPTR	194
BS2 = B * S2	COPTR	195
G(K) = ALOG((R1 + AS2*AS2) / (R1 + BS2*BS2)) * (R1 + BS1*BS1)	COPTR	196
* / (R1 + AS1*AS1)) / C	COPTR	197
15 S1 = S2	COPTR	198
XX = PSI(II, JJ) * RFD	COPTR	199
LPSI = COS(XX)	COPTR	200
SPSI = SQRT(R1 - CPSI*CPSI)	COPTR	201
C	COPTR	202
C FINISH-UP VORTEX NOISE PRESSURE SPECTRUM CALCULATION	COPTR	203
PQA = KM(4) * UV * (0.1 + C*SI*CPSI)	COPTR	204
DO 20 K = 1, NFB	COPTR	205
PS(K) = PQA * G(K)	COPTR	206
20 CONTINUE	COPTR	207
C	COPTR	208
C ROTATIONAL NOISE CALCULATION	COPTR	209
QQ = ME * SPSI / SF(II)	COPTR	210
IF (QQ .LE. R1) GO TO 40	COPTR	211
DO 30 K = 1, NFB	COPTR	212
SPL(K, II) = RC	COPTR	213
30 CONTINUE	COPTR	214
IEC = I2	COPTR	215
CALL ERROR(ITYPE, 3, I6)	COPTR	216
GO TO 11C	COPTR	217
C	COPTR	218
C FORM HARMONIC LEVEL DATA CURVE	COPTR	219
40 DO 60 K = 1, 8	COPTR	220
N = JU(K) * IFIX(NBL+P5)	COPTR	221
NP1 = N + 11	COPTR	222
FN = N	COPTR	223
XX = FN * QQ	COPTR	224
L1 = FN - XX - P5	COPTR	225
L1 = MAX0(L1, 11)	COPTR	226
LN = FN + XX + P5	COPTR	227
C	COPTR	228
C CALCULATE BESSEL FUNCTIONS	COPTR	229

CALL JBES(XX,NP1, EPS, BES)	COPTR	230
C SUM LOADING HARMONIC NOISE COMPONENTS	COPTR	231
AN = (CPSI - HO) * BES(NP1)	COPTR	232
AN = AN+AN	COPTR	233
DLJ(K) = AN * AN	COPTR	234
DO 50 L = L1, LN	COPTR	235
FL = L	COPTR	236
NML = N - L	COPTR	237
J = IABS(NML) + 1	COPTR	238
AN = (CPSI - HO * FLOAT(NML) / FN) * BES(J)	COPTR	239
HN = AN*AN * CS * FL**(-TMPI)	COPTR	240
IF (LLF .GT. 3) HN = HN / (R1 + (HC/FL)*(HC/FL))	COPTR	241
50 DLJ(K) = DLJ(K) + HN	COPTR	242
FL = UR * FLOAT(JD(K))	COPTR	243
DLJ(K) = 124.57 + R10 * ALOG10(DLJ(K) * FL*FL)	COPTR	244
60 CONTINUE	COPTR	245
C NOW THAT DATA CURVE IS FORMED, ADD TONES TO VORTEX NOISE SPECTRUM.	COPTR	246
N1 = R1 + F(1) / F0	COPTR	247
DC 105 I = 1, NFB	COPTR	248
N2 = F(I+1) / F0	COPTR	249
IF (N2 - N1) 90, 70, 70	COPTR	250
70 DC 80 J = N1, N2	COPTR	251
XJ = ALOG10(FLOAT(J))	COPTR	252
PS(I) = PS(I) + R10**(.1 * TBL11(XJ, XJD, DLJ, 1, 8))	COPTR	253
80 CONTINUE	COPTR	254
90 XJ = PS(I) * RCTN	COPTR	255
IF (XJ) 100, 100, 95	COPTR	256
95 SPL(I, I) = R10 * ALOG10(XJ) - CDB(I, I)	COPTR	257
TSPL(I, JJ, II) = PHSUM(TSPL(I, JJ, II), SPL(I, I))	COPTR	258
GC TO 105	COPTR	259
100 SPL(I, II) = -CDB(I, II)	COPTR	260
105 N1 = N2 + 1	COPTR	261
110 BETA(I, JJ) = INDEF	COPTR	262
IF (IPRT(7) .NE. 7) GO TO 106	COPTR	263
CALL NUISO(IPRT(7), JJ, NK, 10, CF1N, ILNIT, CX(JJ), PFREQ, SPL(1, 1), NFB,	COPTR	264
* ITYPE)	COPTR	265
106 CONTINUE	COPTR	266
DC 107 J = 1, NANG	COPTR	267
DC 107 I = 1, NFB	COPTR	268
107 SPL(I, J) = SPL(I, J) - XDB(I, JJ, J)	COPTR	269
IF (IPRT(3) .NE. 3) GO TO 115	COPTR	270
CALL PNL SUB(SPL(1, 1), PNL(1, JJ), IFD(1, JJ), EPNL(1, JJ), SPL2,	COPTR	271
* TPNL(1, JJ), NK, BCC, TCG, FLK, JJ, NCBS, IRR(JJ, 1))	COPTR	272
CALL NUISO(IPRT(3), JJ, NK, 12, CF1N, ILNIT, CX(JJ), PFREQ, SPL(1, 1), NFB,	COPTR	273
* ITYPE)	COPTR	274
115 CONTINUE	COPTR	275
120 RETURN	COPTR	276
130 IEC = 11	COPTR	277
135 CALL ERROR(ITYPE, 3, 8)	COPTR	278
GC TO 120	COPTR	279
END	COPTR	280
	COPTR	281
	COPTR	282

C	SLBROUTINE COREN	COREN	2
	COMMON /COREIN/ TT3,PP3,CMF3,EK3,DEL3,J83,	COREN	3
	* ICOR3,LIN3,NTF3,IMA3,LGM3,NWL3,ICP3,ILAY3,TF3(10),	COREN	4
	* PCTA3(10),PLA3(10),ELCH3,EDH3,PLW3(10),TL3(10),CF3,FM3	COREN	5
	COMMON/TURBIN/BN3,SS3,VTR3,CLS3,CT3,TU3,PMF3,CS3,IC3,ISW3	COREN	6
C		COREN	7
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	COREN	8
C		COREN	9
	COMMON /GCOMMON/ NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),	COREN	10
	*BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)	COREN	11
C		COREN	12
C	GENERAL INPUT PARAMETERS	COREN	13
C		COREN	14
	COMMON /GRAM/ALTP,ALTR,SLOPE,AMACH,NCBS,SLDIST(10),NTENG,IUNIT	COREN	15
	* ,ISPRM,IATMDS,IAIK,CAIRAB(24),ATEMP,TEMP(50),TALT(50)	COREN	16
	* ,NPRES,PKRES(50),PALT(50),NHUMID,PAIT(50),RHUMID(50),CTEMP	COREN	17
	* ,CPRES,CRHUMD,LEGA,IGDR,CTEMP,DPRES,DHUMID,XKN,NC,FLD(50),	COREN	18
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IPAGE,BCG,TCG,FLK,AALT,EPF	COREN	19
C		COREN	20
C	AIRCRAFT-OBSERVER GEOMETRY CLTFLTS	COREN	21
C		COREN	22
	COMMON /GEOMD/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	COREN	23
	* B1(10,17),B2(10,17),TDS(17,10),TPD(17,10),IRR(10,17)	COREN	24
	* ,APP,TP,RHP,APD,TC,RHC,CA,CZ,TSF(17,10),CCV	COREN	25
C		COREN	26
C	COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCP,IPRT(7),ICN(13),NLCPT	COREN	27
	* ,INSEQ(3),INSHLD	COREN	28
	COMMON/SLMSPL/SSPL(24,10,17)	COREN	29
	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	COREN	30
	COMMON/ANGLE/PSI(17,10),PSIO(17,10),BETA(17,10)	COREN	31
	COMMON/HEAD/HIN(20),HOUT(20),CHIN(20)	COREN	32
	COMMON/GFREQU/CFREQ(24),CFREQ(25),PFREQ(24)	COREN	33
	COMMON/GCONVC/C(2,10),SLDISX(10)	COREN	34
	COMMON/TMSPL/SPZ(24,17),IB(2,3,13)	COREN	35
	COMMON/UNSHLD/USPLA(19),FSI(19),NLSPL,INUSP	COREN	36
	COMMON/CRSPLS/DOB(17),PSCR(17),DFB(408),NPSCR	COREN	37
	DIMENSION PS3(13),F3(13),SNI(24),F2SN(24)	COREN	38
	DIMENSION FI1(8),FD1(8),FI2(8),FC2(8),TB1(24),TB2(8)	COREN	39
	DIMENSION TT3(1)	COREN	40
	DATA V03/1./,RM3/1./,CC3/1116./	COREN	41
	DATA FD1/-21.,-13.,-4.,-1.5,C.,-1.5,-9.,-19./	COREN	42
	DATA FI1/4C.,60.,9C.,10C.,11C.,12C.,140.,160./	COREN	43
	DATA FD2/-28.,-22.,-6.,-2.5,C.,-2.5,-8.,-26./	COREN	44
	DATA FI2/40.,50.,5C.,10C.,11C.,120.,130.,160./	COREN	45
	DATA TB1/7*0.,5*1.2*2.,3.,4.,5.,6.,8,1.2,1.4,2.,2.9,4.2/	COREN	46
	DATA TB2/3*0.,1.,2.,5,1.2,2.2/	COREN	47
	DATA RPD/1.745329E-2/,DPR/57.29578/	COREN	48
	DATA PS3/40.,50.,6C.,7C.,80.,9C.,100.,110.,120.,	COREN	49
	* 13C.,140.,15C.,16C./	COREN	50
	DATA F3/-7.7,-6.2,-5.3,-4.5,-3.4,-2.0,-0.9,0.,.2,.3,.1,-.1,-.2/	COREN	51
	DATA SNI/-2.0,-1.699,-1.5229,-1.3979,-1.30103,-1.2218,-1.1549,	COREN	52
1	-1.0706,-1.0,-0.82351,-0.69897,-0.52288,-0.39794,	COREN	53
2	-0.30103,-0.22185,-0.1549,-0.07058,0.0,0.17609,0.30103,	COREN	54
3	0.47712,0.60206,0.69897,2.30103/	COREN	55
	DATA F2SN/-38.2,-29.7,-24.7,-21.1,-18.4,-16.3,-14.7,-12.5,-11.0,	COREN	56
		COREN	57
		COREN	58

1	-7.8,-6.3,-5.3,-5.2,-5.5,-5.8,-6.2,-6.8,-7.3,-9.2,-10.8,	COREN	59
2	-13.3,-15.3,-16.9,-45.C /	COREN	60
	ICN(3)=ICN(3)+1	COREN	61
	CLS=CLS3	COREN	62
	VTR=VTR3	COREN	63
	IF(ISH3.EQ. 2)FBPF=555./SQRT(CMF3)	COREN	64
	IF(ISH3.EQ.3)FBPF=BN3*SS3/60.C	COREN	65
	IF((ISH3.NE. 2).AND. (ISH3.NE. 3))FBPF=SQRT(9.25*BN3*SS3/	COREN	66
	* SQRT(CMF3))	COREN	67
	DELTX=DELTX*RPD	COREN	68
	CALL ANGLES(NOBS,DELTX)	COREN	69
	XENG=NENG	COREN	70
	AJ=21.7	COREN	71
	IF(JB3.EQ.2) AJ=30.7	COREN	72
C		COREN	73
C	TEST FOR SHIELDING AND EXIT TO PRINT OUT WING	COREN	74
C	SHIELDING DATA ONCE FOR ALL SIDELINE POSITIONS	COREN	75
C		COREN	76
	IF(INSHLD.NE.0)CALL WSHGLT(IPRT(7),10,ITYPE,USPLA,NUSPL,FSI,INUSP)	COREN	77
	DO 3000 I=1,NOBS	COREN	78
	CALL LINCOR(SPZ(1,1),IMA3,LGM3,ELCH3,EDH3,NWL3,RLW3,	COREN	79
	* TL3,ILAY3,FM3,IDP3,PSI(1,1),ACF,BCF,PLA3,CF3,PCTA3,	COREN	80
	* NTF3,TF3,DOPSF,SPL2,ICOR3,IB(1,1,ITYPE),LIN3,FBPF)	COREN	81
	IF(ISH3.EQ.2)GO TO 950	COREN	82
	IF(VTR3.EQ.0.)VTR=.7*3.1415926*SS3*DT3/60.	COREN	83
	IF(CLS3.EQ.0.)CLS=48.5*SQRT(TL3)	COREN	84
	DO 10 J=1,17	COREN	85
10	SPL2(J)=BN3*SS3/(60.*DOPSF(J))	COREN	86
	XNCF=NCF	COREN	87
	W=10./XNCF*ALOG10(BLF(NCF+1)/BLF(1))	COREN	88
	DO 900 J=1,17	COREN	89
	TEMP1=10.*ALOG10((VTR*CC3/(VC3*CLS))**.3*PMF3/RM3*	COREN	90
	* W/DOPSF(J)**4)	COREN	91
	* + TBLU1(PSI(J,1),F11,FD1,1,8)-10.	COREN	92
	DO 100 N=1,NCF	COREN	93
	BSPL=ALOG10(BLF(N)/SPL2(J))	COREN	94
	TEMX=BSPL	COREN	95
	BSPL=TEMP1-20.*TEMX	COREN	96
	IF(TEMX.LT.0.)BSPL=TEMP1+10.*TEMX	COREN	97
	TGAGR(N)=10.**(.1*BSPL)	COREN	98
100	CONTINUE	COREN	99
C		COREN	100
	TEMP2=10.*ALOG10((VTR/VC3)**.6*(CC3/CLS)**3*(PMF3	COREN	101
	* /RM3)*CS3/DOPSF(J)**4)	COREN	102
	* + TBLU1(PSI(J,1),F12,FD2,1,8) + 56.	COREN	103
	XK3=0.	COREN	104
	IF(IC3.NE.0)XK3=-10.	COREN	105
	TEMP2=TEMP2+XK3	COREN	106
	C3=.1*TEMP2+1.	COREN	107
125	CONTINUE	COREN	108
	ESN=ESHLDG(PSIO(J,1),BETA(J,1),XENG)	COREN	109
	N1=1.+BUF(1)/SPL2(J)	COREN	110
	DO 200 N=1,NCF	COREN	111
	N2=BUF(N+1)/SPL2(J)	COREN	112
	IF((N2-N1).LT.0)GO TO 175	COREN	113
	IF(N1.GT.10)GO TO 175	COREN	114
	DO 150 K=N1,N2	COREN	115

	XK=K	(EN	116
150	TGAGR(N)=TGAGR(N)+10.**(C3-XK)	COREN	117
175	SPLT(N,J)=TGAGR(N)	COREN	118
	IF(SPLT(N,J).LE.0.)GO TO 176	COREN	119
	SPLT(N,J)=10.*ALOG10(SPLT(N,J))	COREN	120
176	N1=N2+1	COREN	121
180	CONTINUE	COREN	122
	IF(NCF.EQ.24)GO TO 190	COREN	123
	DB=TB2(N)	COREN	124
	GO TO 195	COREN	125
190	DB=TB1(N)	COREN	126
195	SPLT(N,J)=SPLT(N,J)+DB+33.2-ESH-SFZ(N,J)	COREN	127
200	CONTINUE	COREN	128
900	CONTINUE	COREN	129
C		COREN	130
	IF(INSHLD.NE.0.AND.ISW3.EQ.3)CALL SHLDSP(AMACH,ALTR,ISPTRM,CZ,	COREN	131
	*SLDIST,I,APY,APZ,DCPSF,SPLT,NCF,BCF,SPZ,PSI,ITYPE,DELT3,ISW3)	COREN	132
C		COREN	133
	IF(ISW3.EQ.3)GO TO 2010	COREN	134
C		COREN	135
950	CONTINUE	COREN	136
C		COREN	137
	DO 2000 J=1,17	COREN	138
	ESN=ESHLDG(PSI(J,I),BETA(J,I),XENG)	COREN	139
	F1PSI=TBLU1(PSI(J,I),PS3,F3,1,13)	COREN	140
	OA = 10.*ALOG10(CMF3*TT3(1)*TT3(1) * PP3**3 / (DCPSF(J)*DOPSF(J)))	COREN	141
1	+ F1PSI + AJ + EK3	COREN	142
	SNTZ=1850./(DOPSF(J)*SQRT(CMF3))	COREN	143
975	CONTINUE	COREN	144
	DO 1000 K=1,NCF	COREN	145
	SNT=BCF(K)/SNTZ	COREN	146
	SNL=ALOG10(SNT)	COREN	147
	F2SNI=TBLU1(SNL,SNI,F2SN,1,24)	COREN	148
	IF(NK.EQ.3) F2SNI=F2SNI-4.8	COREN	149
	TEMPXX=SPLT(K,J)	COREN	150
C		COREN	151
	SPLT(K,J)=OA+F2SNI-ESH-SPZ(K,J)	COREN	152
	IF(ISW3.EQ.2)GO TO 980	COREN	153
	SPLT(K,J)=PWRSUM(SPLT(K,J),TEMPXX)	COREN	154
980	CONTINUE	COREN	155
1000	CONTINUE	COREN	156
2000	CONTINUE	COREN	157
C		COREN	158
	IF(INSHLD.NE.0) CALL SHLDSP(AMACH,ALTR,ISPTRM,CZ,	COREN	159
	*SLDIST,I,APY,APZ,DCPSF,SPLT,NCF,BCF,SPZ,PSI,ITYPE,DELT3,ISW3)	COREN	160
C		COREN	161
2010	DO 2050 J=1,17	COREN	162
	DO 2050 K=1,NCF	COREN	163
2050	SSPL(K,I,J)=PWRSUM(SSPL(K,I,J),SFLT(K,J))	COREN	164
C		COREN	165
2100	IF(IPRT(7).NE.7)GO TO 2200	COREN	166
	CALL NOISO(IPRT(7),I,NK,10,CHIN,ILNIT,SLCISX(I),PFREQ,	COREN	167
1	SPLT(1,1),NCF,ITYPE)	COREN	168
2200	CONTINUE	COREN	169
	DO 2500 K=1,NCF	COREN	170
	DO 2500 J=1,17	COREN	171
2500	SPLT(K,J)=SPLT(K,J)-TSPL(K,I,J)	COREN	172

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IF(IPRT(3).NE.3)GO TO 3000
CALL PNLSUB(SPLT(1,1),PSPL(1,1),TPD(1,1),EPNL(1,1),SPL2,
*   TEPNL(1,1),NK,BCG,TCG,FLR, 1,NOBS,IRR(1,1))
CALL NOISO(IPRT(3),I,NK,12,CHIA,IUNIT,SLCISX(1),
1   PFREQ,SPLT(1,1),NCF,ITYPE)
3000 CONTINUE
RETURN
END

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COREN 173
COREN 174
COREN 175
COREN 176
COREN 177
COREN 178
COREN 179
COREN 180

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C	SLBRoutine CURSPL(ICOR,IB,NB,PA,SP)	CORSPL	2
C	COMMON /GCOMMON/ NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),	CORSPL	3
C	*RUF(25),RETA(17),SPL2(17),TGAGR(24),GCPST(17)	CORSPL	4
C	COMMON/ICPATH/NCAS,NCCF,NTYP,IC,NRN,IARRAY(2)	CORSPL	5
C	COMMON/CRSPLS/DO(17),PS(17),CP(408),NPSCR	CORSPL	6
C	COMMON/SWITCH/NTYPE,ITYPE	CORSPL	7
C		CORSPL	8
C	THIS ROUTINE ALLOWS DB CORRECTION TABLES TO BE PLACED ON FILE	CORSPL	9
C	UPDATED PER CASE PER CONFIGURATION PER NCISE COMPONENT	CORSPL	10
C		CORSPL	11
C	INPUTS	CORSPL	12
C		CORSPL	13
C	ICOR =1 17 VALUE TABLE IS BUILT FOR A SINGLE DB CORRECTION P	CORSPL	14
C	ANGLE FOR ALL BANDS	CORSPL	15
C	=2 24,NPSCR OR 8,NPSCR TABLE OF DB CORRECTIONS TO ALL	CORSPL	16
C	FUR BOTH DIRECTIONALITY AND SOUND LEVEL CHANGES	CORSPL	17
C	NB NUMBER OF FREQUENCY BANDS 24 OR 8	CORSPL	18
C	PA(1-17) 17 DIRECTIONALITY ANGLES	CORSPL	19
C		CORSPL	20
C	OUTPUT	CORSPL	21
C		CORSPL	22
C	SP(24,17) ARRAY OF DB CORRECTIONS	CORSPL	23
C	DIMENSION IB(2,3),DBT(24,17),DCT(17),PST(17),SP(24,17),PA(17)	CORSPL	24
C	DIMENSION RBOX(10)	CORSPL	25
C	DIMENSION RBUF(14)	CORSPL	26
C	DIMENSION DSPL(24),DBN(17),BN(24)	CORSPL	27
C360	REAL*8 FNAM	CORSPL	28
C		CORSPL	29
C	MASS STORAGE (RANDOM DISK I/O) INDECES, COUNTER, AND FLAG	CORSPL	30
C	COMMON /MSIO/ INDX1(40), INDX2(3), INDX3(36), IC1, ICPE	CORSPL	31
C	DATA IL1, IL2, IL3, IRR /40, 3, 36, C/	CORSPL	32
C	DATA ET/1.2E-3/	CORSPL	33
C	DATA IOP/O/	CORSPL	34
C	IRP=1	CORSPL	35
C	IGC=1	CORSPL	36
C	IF(IOP.NE.0)GO TO 1	CORSPL	37
C	W=1.	CORSPL	38
C	IF(NB.EQ.24)W=.3333	CORSPL	39
C	DO 1000 J=1,17	CORSPL	40
C	1000 DBN(J)=1.442695041*ALCG(CGPSF(J))/W	CORSPL	41
C	IOP=1	CORSPL	42
C	NRN=1	CORSPL	43
C	IC1 = 1	CORSPL	44
C360	CALL GETPAR(FNAM,1)	CORSPL	45
C360	CALL DEFINE(13,FNAM,ESPLCOR 8,NRN,140)	CORSPL	46
C		CORSPL	47
C	OPEN RANDOM DISK FILE 13 AND SET FLAG, ICPE, TO INDICATE THE FILE	CORSPL	48
C	IS OPENED.	CORSPL	49
C	CALL LPENMS(13, INDX1, IL1, C)	CORSPL	50
C	IOPEN = 1	CORSPL	51
C		CORSPL	52
C	TURN-OFF FATAL READ ERROR 78 AND 79 SENSE SWITCHES AND TURN-ON	CORSPL	53
C	ERROR COUNTER, IRR	CORSPL	54
C	1 CALL ERRSET(IRR, 1)	CORSPL	55
C	IF(IB(1,NCOF).EQ.0)GO TO 5	CORSPL	56
C	IR=IB(1,NCOF)	CORSPL	57
C		CORSPL	58

IGO=2	CORSPL	59
IF (IR-1) 20, 20, 50	CORSPL	60
C BUILD CORRECTION TABLES	CORSPL	61
5 CONTINUE	CORSPL	62
IB(1,NCOF)=ICOR	CORSPL	63
C	CORSPL	64
C SAVE MAJOR INDEX COUNTER IN STORAGE PROVIDED BY NOISE COMP. ROUTINE	CORSPL	65
IB(2,NCOF) = IC1	CORSPL	66
C	CORSPL	67
C IBM360	CORSPL	68
C360 IB(2,NCOF) = NRN	CORSPL	69
IF (ICOR-1) 10, 10, 40	CORSPL	70
10 CONTINUE	CORSPL	71
C	CORSPL	72
C IBM360	CORSPL	73
C 14 NRN = IB(2,NCOF)	CORSPL	74
C360 WRITE(13,15)(DO(J),J=1,NPSCR)	CORSPL	75
C360 WRITE(13,15)(PS(J),J=1,NPSCR)	CORSPL	76
C	CORSPL	77
C INITIALIZE MINOR AND MAJOR INDEX COUNTERS	CORSPL	78
14 NRN = 1	CORSPL	79
IC1 = IB(2,NCOF)	CORSPL	80
IF (IGO.GT. 1) GO TO 105	CORSPL	81
C	CORSPL	82
C ZERO OUT MINOR INDEX BEFORE WRITING ON DISK FOR 1ST TIME FOR THIS	CORSPL	83
C NOISE COMPONENT	CORSPL	84
95 DC 100 J = 1,IL2	CORSPL	85
INDX2(J) = 0	CORSPL	86
100 CONTINUE	CORSPL	87
C	CORSPL	88
C SET INDICATOR TO WRITE AT END-OF-INFORMATION	CORSPL	89
Ih = 0	CORSPL	90
GO TO 110	CORSPL	91
C	CORSPL	92
C SET INDICATOR TO WRITE IN-PLACE	CORSPL	93
105 Ih = 1	CORSPL	94
C	CORSPL	95
C USE MINOR INDEX	CORSPL	96
110 CALL STINDEX(13, INDX2, IL2)	CORSPL	97
ENCODE(140,15,RBUF)(DC(J),J=1,NPSCR)	CORSPL	98
15 FORMAT(17F8.3,4X)	CORSPL	99
C	CORSPL	100
C WRITE DATA ON DISK	CORSPL	101
CALL WRITMS(13, RBUF, 14, NRN, Ih)	CORSPL	102
NRN=NRN+1	CORSPL	103
ENCODE(140,15,RBUF)(PS(J),J=1,NPSCR)	CORSPL	104
CALL WRITMS(13, RBUF, 14, NRN, Ih)	CORSPL	105
C	CORSPL	106
C USE MAJOR INDEX	CORSPL	107
CALL STINDEX(13, INDX1, IL1)	CORSPL	108
C	CORSPL	109
C WRITE MINOR INDEXES ON DISK	CORSPL	110
CALL WRITMS(13, INDX2, IL2, IC1, Ih)	CORSPL	111
IC1 = IC1 + 1	CORSPL	112
IF (IGO-1) 20, 20, 30	CORSPL	113
20 NRS = 1	CORSPL	114
C	CORSPL	115

```

C READ MINOR INDECS FROM DISK
  CALL READMS(13, INDX2, IL2, IB(2,NCCF))
C
C USE MINOR INDEX
  CALL STINDEX(13, INDX2, IL2)
C360 READ(13,15)(DOT(J),J=1,NPSCR)
C360 READ(13,15)(PST(J),J=1,NPSCR)
C
C READ DATA FROM DISK
  CALL READMS(13, RBUF, 14, NRS)
  DECODE(140,15,RBUF)(DUT(J),J=1,NPSCR)
  IF (IRR.GT. 0) GO TO 300C
  NRS=NRS+1
  CALL READMS(13, RBUF, 14, NRS)
C
C USE MAJOR INDEX
  CALL STINDEX(13, INDX1, IL1)
  DECODE(140,15,RBUF)(PST(J),J=1,NPSCR)
  IF (IRR.GT. 0) GO TO 300C
  IF (IGO-1) 3C, 3C, 25
25 DO 29 J=1,NPSCR
  IF(DO(J).EQ.ET)GO TO 27
  IF(DO(J).EQ.DUT(J))GO TO 27
  DCT(J)=DO(J)
  IRP=2
27 DCT(J)=DCT(J)
  IF(PS(J).EQ.ET)GO TO 28
  IF(PS(J).EQ.PST(J))GO TO 28
  PST(J)=PS(J)
  IRP=2
28 PS(J)=PST(J)
29 CONTINUE
  IF (IRP-1) 3C, 3C, 14
3C CONTINUE
  DO 39 J=1,17
  TSPX=TBLCU1(PA(J),PST,DCT,1,NPSCR)
  DO 38 N=1,NB
  SP(N,J)=SP(N,J)+TSPX
38 CONTINUE
39 CONTINUE
  GC TO 400C
40 IGO=1
C
C IBM36C
C 42 NRN = IB(2,NCCF)
  42 NRN = 1
  IC1 = IB(2,NCCF)
  NMI = NPSCR + 2
  IF (NB.GT. 12) NMI = NMI + NPSCR
  IF (IGO.GT. 1) GO TO 205
195 DO 200 J = 1,NMI
  INDX3(J) = 0
200 CONTINUE
  Iw = 0
  GC TO 210
205 Iw = 1
210 CALL STINDEX(13, INDX3, NMI)

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CURSPL 116
CURSPL 117
CURSPL 118
CURSPL 119
CURSPL 120
CURSPL 121
CURSPL 122
CURSPL 123
CURSPL 124
CURSPL 125
CURSPL 126
CURSPL 127
CURSPL 128
CURSPL 129
CURSPL 130
CURSPL 131
CURSPL 132
CURSPL 133
CURSPL 134
CURSPL 135
CURSPL 136
CURSPL 137
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CURSPL 160
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CURSPL 164
CURSPL 165
CURSPL 166
CURSPL 167
CURSPL 168
CURSPL 169
CURSPL 170
CURSPL 171
CURSPL 172

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NS=1-NB	CORSPL	173
N2=NS	CORSPL	174
DO 45 J=1,NPSCR	CORSPL	175
NS=NS+NB	CORSPL	176
NE=NS-N2	CORSPL	177
IF (NB.GT. 12) GO TO 43	CORSPL	178
C360 WRITE(13,17)(DP(N),N=NS,NE)	CORSPL	179
C 17 FORMAT(24F8.3,8X)	CORSPL	180
ENCODE(100,16,RBUX)(DP(N),N=NS,NE)	CORSPL	181
16 FORMAT(12F8.3,4X)	CORSPL	182
CALL WRITMS(13, RBUX, 10, NRN, Iw)	CORSPL	183
NRN=NRN+1	CORSPL	184
GO TO 45	CORSPL	185
43 NM=NS+11	CORSPL	186
NF=NM+1	CORSPL	187
ENCODE(100,16,RBUX)(DP(N),N=NS,NF)	CORSPL	188
CALL WRITMS(13, RBUX, 10, NRN, Iw)	CORSPL	189
NRN=NRN+1	CORSPL	190
ENCODE(100,16,RBUX)(DP(N),N=NF,NE)	CORSPL	191
CALL WRITMS(13, RBUX, 10, NRN, Iw)	CORSPL	192
NRN=NRN+1	CORSPL	193
45 CONTINUE	CORSPL	194
C360 WRITE(13,15)(PS(J),J=1,NPSCR)	CORSPL	195
ENCODE(140,15,RBUF)(PS(J),J=1,NPSCR)	CORSPL	196
CALL WRITMS(13, RBUF, 14, NRN, Iw)	CORSPL	197
CALL STINDX(13, INDX1, IL1)	CORSPL	198
CALL WRITMS(13, INDX3, NPI, ICI, Iw)	CORSPL	199
ICI = ICI + 1	CORSPL	200
IF (IGO-1) 50, 50, 70	CORSPL	201
50 NRS = 1	CORSPL	202
CALL READMS(13, INDX3, NPI, IB(2,ACGF))	CORSPL	203
CALL STINDX(13, INDX3, NPI)	CORSPL	204
DO 55 J=1,NPSCR	CORSPL	205
IF(NB.EQ.24)GO TO 53	CORSPL	206
C360 READ(13,17)(DBT(N,J),N=1,NB)	CORSPL	207
CALL READMS(13, RBUX, 10, NRS)	CORSPL	208
DECODE(100,16,RBUX)(DBT(N,J),N=1,NB)	CORSPL	209
IF (IRR.GT. 0) GO TO 300C	CORSPL	210
NRS=NRS+1	CORSPL	211
GO TO 54	CORSPL	212
53 CONTINUE	CORSPL	213
CALL READMS(13, RBUX, 10, NRS)	CORSPL	214
DECODE(100,16,RBUX)(DBT(N,J),N=1,12)	CORSPL	215
IF (IRR.GT. 0) GO TO 300C	CORSPL	216
NRS=NRS+1	CORSPL	217
CALL READMS(13, RBUX, 10, NRS)	CORSPL	218
DECODE(100,16,RBUX)(DBT(N,J),N=13,24)	CORSPL	219
IF (IRR.GT. 0) GO TO 300C	CORSPL	220
NRS=NRS+1	CORSPL	221
54 CONTINUE	CORSPL	222
55 CONTINUE	CORSPL	223
C360 READ(13,15)(PST(J),J=1,NPSCR)	CORSPL	224
CALL READMS(13, RBUF, 14, NRS)	CORSPL	225
CALL STINDX(13, INDX1, IL1)	CORSPL	226
DECODE(140,15,RBUF)(PST(J),J=1,NPSCR)	CORSPL	227
IF (IRR.GT. 0) GO TO 300C	CORSPL	228
IF (IGO-1) 70, 70, 60	CORSPL	229

60	CONTINUE	CORSPL	230
	DO 64 J=1,NPSCR	CORSPL	231
	DO 62 N=1,NB	CORSPL	232
	I=(J-1)*NB+N	CORSPL	233
	IF(DP(I).EQ.ET)GO TO 61	CORSPL	234
	IF(DBT(N,J).EQ.DP(I))GO TO 62	CORSPL	235
	DBT(N,J)=DP(I)	CORSPL	236
	IRP=2	CORSPL	237
61	DP(I)=DBT(N,J)	CORSPL	238
62	CONTINUE	CORSPL	239
	IF(PS(J).EQ.ET)GO TO 63	CORSPL	240
	IF(PS(J).EQ.PST(J))GO TO 64	CORSPL	241
	PST(J)=PS(J)	CORSPL	242
	IRP=2	CORSPL	243
63	PS(J)=PST(J)	CORSPL	244
64	CONTINUE	CORSPL	245
	IF (IRP-1) 70, 7C, 42	CORSPL	246
70	CONTINUE	CORSPL	247
	DO 9C J=1,17	CORSPL	248
	DO 75 N=1,NB	CORSPL	249
	DSPL(N)= TBLU2(BCF(N),PA(J),BCF,FST,DBT,1,1,NB,NPSCR,24,17)	CORSPL	250
	DBFC=DBN(J)	CORSPL	251
	IF(ITYPE.EQ.1.OR.ITYPE.EQ.2.OR.ITYPE.EQ.6.OR.ITYPE.EQ.9.OR.ITYPE.	CORSPL	252
	* EQ.12)DBFC=0.	CORSPL	253
75	BN(N)=FLOAT(N)-DBFC	CORSPL	254
	DO 8C N=1,NB	CORSPL	255
80	SP(N,J)=SP(N,J)+TBLU1(FLCAT(N),BN,DSPL,1,NB)	CORSPL	256
9C	CONTINUE	CORSPL	257
	GC TO 4000	CORSPL	258
30C0	CALL ERRGR(ITYPE,6,14)	CORSPL	259
	STOP	CORSPL	260
C		CORSPL	261
C	TURN-ON FATAL READ ERRGR 78 AND 79 SENSE SWITCHES	CORSPL	262
4C0C	CALL ERKSET(IKK, 0)	CORSPL	263
	DO 41C0 J=1,17	CORSPL	264
	DC(J)=ET	CORSPL	265
410C	PS(J)=ET	CORSPL	266
	DC 42C0 N=1,4C8	CORSPL	267
420C	DP(N)=ET	CORSPL	268
	RETURN	CORSPL	269
	END	CORSPL	270

	COMPLEX FUNCTION CPOLAR(A)	CPOLAR	2
C		CPOLAR	3
C	COMPUTES THE POLAR FORM (MAGNITUDE, ANGLE) FOR THE COMPLEX QUANTITY	CPOLAR	4
C	A, (REAL PART, IMAGINARY PART).	CPOLAR	5
C		CPOLAR	6
	COMPLEX A	CPOLAR	7
	DATA PI2 / 1.57079632679494 /	CPOLAR	8
	AMP(X, Y) = ABS(X) * SQRT(1. + (Y/X)*(Y/X))	CPOLAR	9
	AR = REAL(A)	CPOLAR	10
	AI = AIMAG(A)	CPOLAR	11
	T = 0.0	CPOLAR	12
	IF (AR) 20, 10, 20	CPOLAR	13
10	IF (AI) 20, 50, 20	CPOLAR	14
20	T = ATAN2(AI, AR)	CPOLAR	15
	J = ABS(T / PI2) + 0.5	CPOLAR	16
	IF (J - 2 * (J / 2)) 30, 40, 30	CPOLAR	17
30	AR = AMP(AI, AR)	CPOLAR	18
	GO TO 50	CPOLAR	19
40	AR = AMP(AR, AI)	CPOLAR	20
50	CPOLAR = CMPLX(AR, T)	CPOLAR	21
	RETURN	CPOLAR	22
	END	CPOLAR	23

C	SUBROUTINE DATN(N,DATN,N4,D1,D2,D3,D4,IMCDE)	DATN	2
C		DATN	3
C	PURPOSE TO READ IN VARIABLES AND ARRAYS	DATN	4
C	ANS DUMMY VALUES OF ANL TO ELIMINATE BLOCK DATA REQUIRED BY 3	DATN	5
C	ALSO TO SORT AND REARRANGE THE BASIC DATA FROM TEE187C	DATN	6
	COMMON/CGUNT/NEPR,NL	DATN	7
	COMMON/DIGI/IUNIT,IPMDB,IPLCT	DATN	8
	COMMON/CONTNT/AEPR(5),ALRL(9),AALFA(6)	DATN	9
	COMMON/SIZE/NLRC,ALFA	DATN	10
C		DATN	11
	COMMON/LEVELS/ANL(5)	DATN	12
	DIMENSION DATN(1)	DATN	13
	DIMENSION ANS(5)	DATN	14
	DIMENSION D1(1),D2(1),D3(1),D4(1)	DATN	15
	DIMENSION ARG(324)	DATN	16
C	IBM SYS360 + 370	DATN	17
C	REAL*8 ARG	DATN	18
C		DATN	19
C	DATA WILL BE LOADED BY DATA STATEMENTS TO CONSERVE TIME AND	DATN	20
C		DATN	21
C	READ THE SPECIFIC NOISE CL CLR VALUES TO BE EXAMINED	DATN	22
C	AND THE NUMBER OF CONTOUR VALUES	DATN	23
	NAMLIST/DIGIT/ANL,NL,IUNIT,IPMDB,IPLCT	DATN	24
	DATA ANS/85.,90.,95.,100.,105./	DATN	25
C		DATN	26
	NL=5	DATN	27
	DC 1000 I=1,NL	DATN	28
1000	ANL(I)=ANS(I)	DATN	29
	I'((IMODE.EQ.-1)GC TO 1010	DATN	30
	IPMDB=0	DATN	31
	IPLCT=0	DATN	32
	IUNIT=0	DATN	33
	READ(5,DIGIT)	DATN	34
1010	CONTINUE	DATN	35
C		DATN	36
C		DATN	37
C		DATN	38
C	READ NUMBER OF NOISE FUNCTION VALUES TO BE READ	DATN	39
C		DATN	40
C	READ THE ARRAYS OF NOISE LEVEL PARAMETERS NL=FUN(EPR.,ALPHA,LRC)	DATN	41
C	D1, D2, D3, D4	DATN	42
C	DATN IS AN ARRAY SUPPLIED BY TEE187 OF NOISE VALUES	DATN	43
C	EPR VALUES, ALPHA VALUES AND VALUES OF LOG10 RG IN A ONE DIMENSIONAL	DATN	44
C	STRING SUCH THAT THE SETS REPEAT THEIR ORDER	DATN	45
	J=0	DATN	46
	DC 1020 I=1,N,4	DATN	47
	J=J+1	DATN	48
	D1(J)=DATN(I)	DATN	49
	D2(J)=DATN(I+1)	DATN	50
	D3(J)=DATN(I+2)	DATN	51
	D4(J)=DATN(I+3)	DATN	52
1020	CONTINUE	DATN	53
C	SORTS INTO INCREASING ORDER	DATN	54
C	SORT WITH RESPECT TO EPR	DATN	55
	CALL SORTR(D2,D3,D4,N4,D1,DATN(N4+1),DATN(1),ARG)	DATN	56
C	GET THE NUMBER OF DISTINCT EPR'S,ALPHA'S ,LRC'S AND THEIR	DATN	57
C	VALUES AND STORE THEM	DATN	58

C		DATAIN	59
	CALL SQUASH (D2,N4,AEPR,NEPR)	DATAIN	60
	CALL SQUASH(D3,N4,AALFA,NALFA)	DATAIN	61
	CALL SQUASH(D4,N4,ALRC,NLRC)	DATAIN	62
C		DATAIN	63
C		DATAIN	64
C		DATAIN	65
C	OUTPUT SECTION FOR INPUT ACCUSTIC DATA	DATAIN	66
C		DATAIN	67
C		DATAIN	68
	I2=0	DATAIN	69
	DO 1040 I=1,NEPR	DATAIN	70
	IF (MOD(I-1, 2)) 9007, 9006, 9007	DATAIN	71
	9006 WRITE (6,8999)	DATAIN	72
	8999 FORMAT(1H1,/,54X,22HACOUSTIC DATA FUNCTION,/,53X,24HNOISE LEVEL VAL	DATAIN	73
	*UES (DB))	DATAIN	74
	9007 WRITE (6,9008) AEPR(I)	DATAIN	75
	9008 FORMAT(/,10X,34HAT ENGINE PERFORMANCE PARAMETER = ,1PE10.3)	DATAIN	76
	WRITE(6, 9007)	DATAIN	77
	9009 FORMAT(/,55X,24HLOG10 OF RANGE AT CPA)	DATAIN	78
	WRITE (6,9010)	DATAIN	79
	9010 FORMAT(5X,10HELEVATION)	DATAIN	80
	WRITE (6,9011) (ALRO(J), J = 1,NLRC)	DATAIN	81
	9011 FORMAT(7X,5HANGLE,5X,1PE12.3,8E12.3)	DATAIN	82
	9012 FORMAT(5X,1H(DEGREES))	DATAIN	83
	DO 1030 N=1,NALFA	DATAIN	84
	I1=I2+1	DATAIN	85
	I2=I1+NLRC-1	DATAIN	86
	WRITE(6, 9013) AALFA(N),(D1(K),K=I1,I2)	DATAIN	87
	9013 FORMAT(/,4X,1PE10.3,2X,CPF10.1,8F12.1)	DATAIN	88
	1030 CONTINUE	DATAIN	89
	1040 CONTINUE	DATAIN	90
C		DATAIN	91
C		DATAIN	92
	CALL SWITCH(NEPR, NL, NLRC, NALFA, D1, C2)	DATAIN	93
C		DATAIN	94
C		DATAIN	95
C	OUTPUT SECTION FOR TRANSCRIPED INPUT ARRAY	DATAIN	96
C		DATAIN	97
C		DATAIN	98
	WRITE (6,9016)	DATAIN	99
	9016 FORMAT(1H1,/,/,)	DATAIN	100
	WRITE(6, 9014)	DATAIN	101
	9014 FORMAT(4CX,51HTABLE OF DEVELOPED VALUES FOR LOG10 OF RANGE AT CPA)	DATAIN	102
	WRITE(6, 9015)	DATAIN	103
	9015 FORMAT(46X,43HBASED ON THE PRECEDING INPUT ACCUSTIC DATA)	DATAIN	104
	I4=0	DATAIN	105
	DO 1060 I=1,NL	DATAIN	106
	WRITE(6, 9017)ANI(I)	DATAIN	107
	9017 FORMAT(/,/,44X,26HVALUES FOR NOISE LEVEL OF ,F5.1,5H DB)	DATAIN	108
	WRITE(6, 9018)	DATAIN	109
	9018 FORMAT(/, 7X,9HELEVATION,30X,28HENGINE PERFORMANCE PARAMETER)	DATAIN	110
	WRITE(6, 9019)	DATAIN	111
	9019 FORMAT(9X,5HANGLE)	DATAIN	112
	WRITE(6, 9020) (AEPR(J),J=1,NEPR)	DATAIN	113
	9020 FORMAT(7X,9H(DEGREES),2X,1PE15.3,5E15.3)	DATAIN	114
	WRITE (6,9013)	DATAIN	115

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DO 1050 K=1,NALFA
I3=I4+1
I4=I3+NEPR-1
WRITE(6,9021) AALFA(K),(D2(L),L=I3,I4)
9021 FORMAT(6X,1H(,1PE10.3,2H) ,4X,E10.3,(5E15.3))
1050 CONTINUE
1060 CCNTINUE

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C
C

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RETURN
END

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DATAIN 116
DATAIN 117
DATAIN 118
DATAIN 119
DATAIN 120
DATAIN 121
DATAIN 122
DATAIN 123
DATAIN 124
DATAIN 125
DATAIN 126

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FUNCTION DPSD(F,SBO,CBO,SB1,TA,SEIS,R,DRN,CO,KN,LOF,ZNR,ZNI,ND)
C
C COMPUTES THE ACOUSTIC GROUND REFLECTION ANOMALY FOR POWER SPECTRAL
C DENSITIES
C
REAL KN, KOR, LF, LDF
DIMENSION LDF(1),ZNR(1),ZNI(1)
DIMENSION RPX(2),WX(2),Z(2)
COMPLEX FW, W, RP, ZN, FX, DF, SB1, TA
COMMON/BLK97/ZN,RP,W,FX
EQUIVALENCE (RPX(1), RP), (WX(1), W), (Z(1), ZN)
DATA ZERO, ONE, EPS, TPI /0.,1.,1.2E-5,6.2831853071796/
TA = (0.,0.)
DPSD = ONE
TSBOS = ONE - KN*KN
KOR = TPI * F * R / CO
DA = KOR * DRN
LF = ALOG10(F)
Z(1)= TBLU1(LF, LDF, ZNR, 2, ND)
Z(2)= TBLU1(LF, LDF, ZNI, 2, ND)
IF ((ABS(Z(1))-ONE) .LE. EPS .AND. ABS(Z(2)) .LE. EPS) GO TO 9
1 RP = ZN * SBO + SB1
IF (ABS(RPX(1))+ABS(RPX(2)) - EPS) 2, 2, 4
2 IF (ABS(TSBOS) - EPS) 10, 10, 11
10 RP = (ZN - ONE) / (ZN + ONE)
GO TO 5
11 RP = (-1.,0.)
GO TO 5
4 RP = (RP - (SB1+SB1)) / RP
5 W = ZN * (ONE - RP) * CBO
W = W * W
IF (ABS(WX(1))+ABS(WX(2)) - EPS) 6, 6, 7
6 FX = (0.,0.)
GO TO 8
7 W = (0.,1.) * ((KOR+KOR)*SEIS) / W
FX = FW(W)
8 TA = (RP + FX * (ONE - RP)) / (ONE + DRN)
DP = ONE + TA * CMPLX(COS(DA), -SIN(DA))
DPSD = REAL(DP * CCAJG(DP))
9 RETURN
END

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```

DPSD      2
DPSD      3
DPSD      4
DPSD      5
DPSD      6
DPSD      7
DPSD      8
DPSD      9
DPSD     10
DPSD     11
DPSD     12
DPSD     13
DPSD     14
DPSD     15
DPSD     16
DPSD     17
DPSD     18
DPSD     19
DPSD     20
DPSD     21
DPSD     22
DPSD     23
DPSD     24
DPSD     25
DPSD     26
DPSD     27
DPSD     28
DPSD     29
DPSD     30
DPSD     31
DPSD     32
DPSD     33
DPSD     34
DPSD     35
DPSD     36
DPSD     37
DPSD     38
DPSD     39
DPSD     40
DPSD     41
DPSD     42

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	SUBROUTINE DRIVES(D1,D2,X1,X2,Y1,Y2,SUM,SLNL,IMODE)	DRIVES	2
C	PURPOSE TO SIMULATE THE OUTPUT OF THE AMES FSAA SIMULATOR	DRIVES	3
C	BY GIVING COORDINATES OF THE FLIGHT PATH (Y,Z),THE ENGINE	DRIVES	4
C	PRESSURE RATIO(EPR),THE DIRECTIVITY ANGLE(SCI) AND THE ENGINE	DRIVES	5
C	ATTITUDE ANGLE(DE)	DRIVES	6
	COMMON/CGUNT/NEPR,NL	DRIVES	7
	COMMON/DIGI/IUNIT,IPNDB,IPLCT	DRIVES	8
	COMMON/CONTNT/AEPR(6),ALRO(5),AALFA(6)	DRIVES	9
	COMMON/LEVELS/ANL(5)	DRIVES	10
	COMMON/ASD/SD(3),NSL	DRIVES	11
	COMMON/SIZE/NLRO,NALFA	DRIVES	12
	COMMON/FLIGHT/IMODEQ,DXQ,DYQ,DZQ,DSCIQ,DCEQ,CEPRQ	DRIVES	13
	COMMON/RESULT/X1Q,X2Q,Y1Q,Y2Q,SLNQ,SLNLQ,IECQ	DRIVES	14
	DIMENSION X1Q(5),X2Q(5),Y1Q(5),Y2Q(5),SUMQ(5),SLNLQ(3),IECQ(5)	DRIVES	15
	DIMENSION XP(1020),YP(1020),PS(306),FP(306)	DRIVES	16
	DIMENSION DX(100),DY(100),DZ(100),DEPR(100),DCE(100)	DRIVES	17
	DIMENSION S(20),DDX(20),DDY(20),DDZ(20),DCEPR(20),DDDE(20)	DRIVES	18
	DIMENSION D1(1),D2(1),TITLE(16)	DRIVES	19
	DIMENSION X1(5),X2(5),Y1(5),Y2(5)	DRIVES	20
	DIMENSION IEC(5),SUM(5),SDS(3),SLNL(3)	DRIVES	21
	DIMENSION PN(2),EM(2)	DRIVES	22
	DIMENSION SPP(100)	DRIVES	23
	DATA II,III/ 1,1/	DRIVES	24
	DATA EM /3HEPN, 3H PN/	DRIVES	25
	DATA PN/3H M.,3HFT./	DRIVES	26
	NAMLIST/DIGSIM/NFPP,DX,DY,DZ,DEPR,DCE,DSCI,SD,NSL	DRIVES	27
	1,ND,DS,DDX,DDY,DDZ,DDEPR,DDDE,ALS,NLF,ISTCP	DRIVES	28
C	INITIALIZE THE FLIGHT PATH VALUES	DRIVES	29
	DATA ND,S(1)/0,C.0/	DRIVES	30
	DATA NFPP,NLN/25,5/	DRIVES	31
	DATA DX/100*0.0/	DRIVES	32
	DATA DY/100.,200.,300.,400.,500.,600.,700.,800.,900.,1000.,1200.,	DRIVES	33
	11400.,1600.,1800.,2000.,2300.,2600.,3000.,4000., 5000.,6000.,7000.	DRIVES	34
	2,8000.,9000.,10000.,75*10000.C/	DRIVES	35
	DATA DZ/1.0,1.0,1.0,50.,100.,150.,200.,300.,400.,500.,600.,700.,	DRIVES	36
	1800.,900.,1000.,1200.,1400.,1800.,1900.,2000.,2100.,2200.,2300.,	DRIVES	37
	22400.,25000.,75*0.C/	DRIVES	38
	DATA DEPR/15*2.0,1.9,1.8,1.7,1.6,1.5,1.6,1.7,1.8,1.9,2.0,75*1.9/	DRIVES	39
	DATA DCE /10*20.0,5*15.0,5*10.0,5*0.0,75*0.0/	DRIVES	40
	DATA DSCI/110.0/	DRIVES	41
	DATA NSL1,SDS/3,1.0,152.4,463.3/	DRIVES	42
	DATA ISTOP/0/	DRIVES	43
C		DRIVES	44
C	PUSH FLIGHT PARAMETERS INTO SUBROUTINE VALUES	DRIVES	45
	IF (IMODE .EQ. -1) GO TO 1100	DRIVES	46
	NSL=NSL1	DRIVES	47
	NLS=1	DRIVES	48
	NLF=NL	DRIVES	49
	IF (IPNDB .EQ. 1) III=2	DRIVES	50
	IF (IUNIT .EQ. 1) II=2	DRIVES	51
	IC=0	DRIVES	52
	DO 999 I=1,NSL	DRIVES	53
999	SD(I)=SDS(I)	DRIVES	54
1000	CONTINUE	DRIVES	55
	READ(5, 9000) TITLE	DRIVES	56
	IC=IC+1	DRIVES	57
	READ(5,DIGSIM)	DRIVES	58

NLN=NLF-NLS+1	DRIVES	59
IF(IC.EQ.1)GO TO 1010	DRIVES	60
CALL RESTRT(D1,D2,NEPR,NL,NLRC,NALFA,NLS,NLF)	DRIVES	61
1010 CONTINUE	DRIVES	62
IF (NO .EQ. 0) GO TO 1040	DRIVES	63
DO 1020 I=2,ND	DRIVES	64
1020 S(I)=S(I-1)+SQRT((DDX(I)-DDX(I-1))**2+(DDY(I)-DDY(I-1))**2)	DRIVES	65
SP=S(I)	DRIVES	66
DX(I)=DDX(I)	DRIVES	67
DY(I)=DDY(I)	DRIVES	68
DZ(I)=DDZ(I)	DRIVES	69
DEPR(I)=DDEPR(I)	DRIVES	70
DDE(I)=DODE(I)	DRIVES	71
SPP(I)=0.0	DRIVES	72
DO 1030 I=2,NFPP	DRIVES	73
SP=SP+DS	DRIVES	74
SPP(I)=SP	DRIVES	75
DX(I)=TBLU1(SP,S,DDX,1,ND)	DRIVES	76
DY(I)=TBLU1(SP,S,DDY,1,ND)	DRIVES	77
DZ(I)=TBLU1(SP,S,DDZ,1,ND)	DRIVES	78
DEPR(I)=TBLU1(SP,S,DDEPR,1,ND)	DRIVES	79
DDE(I)=TBLU1(SP,S,DODE,1,ND)	DRIVES	80
1030 CONTINUE	DRIVES	81
1040 CONTINUE	DRIVES	82
CALL VDIM(D1,D2,NEPR,NL,NLRC,NALFA,NLS,NLF)	DRIVES	83
IF(IPL0T.EQ.0) GO TO 1050	DRIVES	84
WRITE(2, 9000)TITLE	DRIVES	85
9000 FORMAT(18A4)	DRIVES	86
NFF=NFPP-1	DRIVES	87
WRITE (2,9001)NFF,NLN,NSL,(SC(K2),K2=1,NSL)	DRIVES	88
9001 FORMAT (3I5,3F10.0)	DRIVES	89
WRITE (2,9002) (ANL(K3),K3=NLS,NLF)	DRIVES	90
9002 FORMAT(1PE15.6,4E15.6,15)	DRIVES	91
1050 CONTINUE	DRIVES	92
DO 1080 I=1,NFPP	DRIVES	93
IF(I/2*2.EQ.I) GO TO 1060	DRIVES	94
WRITE(6, 9003)TITLE	DRIVES	95
1060 CCNTINUE	DRIVES	96
9003 FORMAT(1H1,30X,18A4)	DRIVES	97
C	DRIVES	98
DSCIQ=DSCI	DRIVES	99
IMODEQ=IMODE	DRIVES	100
DXQ=DX(I)	DRIVES	101
DYQ=DY(I)	DRIVES	102
DZQ=DZ(I)	DRIVES	103
DEPRQ=DEPR(I)	DRIVES	104
DCEQ=DDE(I)	DRIVES	105
CALL VALUE2(D1,D2,NEPR,NL,NLRC,NALFA,NLS,NLF)	DRIVES	106
DO 1031 J=NLS,NLF	DRIVES	107
X1(J)=X1Q(J)	DRIVES	108
X2(J)=X2Q(J)	DRIVES	109
Y1(J)=Y1Q(J)	DRIVES	110
Y2(J)=Y2Q(J)	DRIVES	111
SUM(J)=SUMQ(J)	DRIVES	112
IEC(J)=IECQ(J)	DRIVES	113
1031 CCNTINUE	DRIVES	114
DO 1032 J=1,NSL	DRIVES	115

1032	SLNL(J)=SLNLQ(J)	DRIVES	116
	IF (I.EQ. 1) GO TO 1070	DRIVES	117
	IF (IPLOT.EQ.0) GO TO 1070	DRIVES	118
	WRITE (2,9022) DX(I),DY(I),SPP(I),(SLNL(IZ),IZ=1,NSL)	DRIVES	119
9022	FORMAT(1PE15.6,5E15.6)	DRIVES	120
	WRITE(2, 9002)(X1(K),X2(K),Y1(K),Y2(K),SUM(K),IEC(K),K=NLS,NLF)	DRIVES	121
1070	CONTINUE	DRIVES	122
	WRITE(6, 9004)	DRIVES	123
9004	FORMAT(1P)	DRIVES	124
	WRITE(6, 9004)	DRIVES	125
	WRITE(6, 9005) DX(I),DY(I),C2(I),PN(II)	DRIVES	126
9005	FORMAT(10X,30HAIRCRAFT CCORDINATES (X,Y,Z) =,1PE10.3,3H , ,E10.3,	DRIVES	127
	* 3H , ,E10.3,5H (,A3,2H)	DRIVES	128
	WRITE (6,9004)	DRIVES	129
	WRITE(6,8998)SPP(I),PN(II)	DRIVES	130
8998	FORMAT(9X,31H DISTANCE ALONG FLIGHT TRACK = ,1PE10.3,2X,A3)	DRIVES	131
	WRITE(6, 9004)	DRIVES	132
	WRITE (6, 9006) DDE(I),DSCI	DRIVES	133
9006	FORMAT(10X,23HENGINE ATTITUDE ANGLE =,1PE10.2,3H (DEGREES) , DIRE	DRIVES	134
	*CTIVITY ANGLE = ,E10.2,11H (DEGREES))	DRIVES	135
	WRITE(6, 9004)	DRIVES	136
	WRITE (6, 9007) DEPR(I)	DRIVES	137
9007	FORMAT(10X,31HENGINE PERFORMANCE PARAMETER = ,1PE10.3)	DRIVES	138
	WRITE(6, 9004)	DRIVES	139
	DO 1075 JKL=1,NSL	DRIVES	140
	WRITE (6,9008) EM(III),SLNL(JKL),SD(JKL),PN(II)	DRIVES	141
9008	FORMAT(10X,15HNOISE LEVEL IN ,A3,5HDE = ,F6.1,16H AT A SIDELINE ,	DRIVES	142
	*11HDISTANCE OF,1PE10.3,1X,A3)	DRIVES	143
1075	CONTINUE	DRIVES	144
	WRITE(6, 9004)	DRIVES	145
	WRITE(6, 9004)	DRIVES	146
	WRITE (6, 9009)	DRIVES	147
9009	FORMAT(34X,14HCONTOUR POINTS)	DRIVES	148
	WRITE(6, 9004)	DRIVES	149
	WRITE (6, 9010)	DRIVES	150
9010	FORMAT(2X,	DRIVES	151
	* 110H NOISE LEVEL LEFT CONTOUR POINT RIGHT CONTOUR	DRIVES	152
	LOOK POINT ACCUMULATED AREA ERRCR CODE)	DRIVES	153
	WRITE (6, 9011) EM(III),PN(II),PN(II),PN(II),PN(II),PN(II)	DRIVES	154
9011	FORMAT(5X,1H(,A3,3HDB),10X,1H(,A3,1H),7X,1H(,A3,1H),11X,1H(,A3,	DRIVES	155
	* 1H),7X,1H(,A3,1H),10X,8H(SQUARE ,A3,3H))	DRIVES	156
	WRITE(6, 9004)	DRIVES	157
	WRITE (6, 9012) (ANL(J),X1(J),Y1(J),X2(J),Y2(J),SUM(J),IEC(J),J=NL	DRIVES	158
	1S,NLF)	DRIVES	159
9012	FORMAT(4X,CPF3.1,7X,1PE10.3,2X,E10.3,6X,E10.3,2X,E10.3,8X,E10.3,	DRIVES	160
	* 14X,15)	DRIVES	161
1080	CONTINUE	DRIVES	162
	IF (ISTOP.EQ. 1) GO TO 1090	DRIVES	163
	GO TO 1000	DRIVES	164
1090	CONTINUE	DRIVES	165
	IF (IPLOT .LE. 0) GO TO 1120	DRIVES	166
1100	CONTINUE	DRIVES	167
1110	CONTINUE	DRIVES	168
	CALL PLOTIT(XP,YP,PS,rP,102,2,5)	DRIVES	169
1120	CONTINUE	DRIVES	170
	RETURN	DRIVES	171
	END	DRIVES	172

	SUBROUTINE EDGED1(NPSIX,PSIX,BCFIF, USPLIF,CZ,THP,	EDGED1	2
1	GAM,RUPP,THOPP,ETAP,PSIO,PSIOP,BW,TLE,	EDGED1	3
2	PS2)	EDGED1	4
C		EDGED1	5
C	TITLE	EDGED1	6
C	EDGE DIFFRACTION	EDGED1	7
C		EDGED1	8
C	PURPOSE	EDGED1	9
C	THIS SUBROUTINE CALCULATES THE EDGE DIFFRACTION BY THE FOLLOWING	EDGED1	10
C	CALCULATIONS	EDGED1	11
C	BANDWIDTH EFFECT TERMS	EDGED1	12
C	WAVE NUMBER	EDGED1	13
C	PATH LENGTH DIFFERENCES	EDGED1	14
C	PHASE DIFFERENCE FOR INCIDENT AND IMAGE FIELDS	EDGED1	15
C	REFERENCE PRESSURE FOR DIFFRACTED FIELD	EDGED1	16
C	DIFFRACTED PRESSURE FIELDS	EDGED1	17
C	LEADING EDGE ADDITIONAL DIFFRACTED PRESSURE FIELD	EDGED1	18
C	SUMMATION OF DIFFRACTED FIELDS THAT INCLUDES BANDWIDTH EFFECTS	EDGED1	19
C		EDGED1	20
C	INPUT - CALLING SEQUENCE	EDGED1	21
C	NPSIX NUMBER OF DIRECTIVITY ANGLES PSIX	EDGED1	22
C	PSIX DIRECTIVITY ANGLES AT WHICH USPLIF IS GIVEN	EDGED1	23
C	BCFIF CENTER FREQUENCY	EDGED1	24
C	USPLIF THE USPL FOR THE FREQUENCY BCF	EDGED1	25
C	CZ AMBIENT SPEED OF SOUND	EDGED1	26
C	GAM TRANSFORMED WAVE NUMBER	EDGED1	27
C	RUPP MAGNITUDE OF TRANSFORMED SOURCE POSITION	EDGED1	28
C	THOPP PHASE OF TRANSFORMED SOURCE POSITION	EDGED1	29
C	ETAP TRANSFORMED OBSERVER ANGLE (ETA)	EDGED1	30
C	PSIO DIRECTIVITY ANGLE FOR DIFFRACTED INCIDENT FIELD	EDGED1	31
C	PSIOP DIRECTIVITY ANGLE FOR DIFFRACTED IMAGE FIELD	EDGED1	32
C	BW FILTER BAND WIDTH	EDGED1	33
C	TLE LEADING EDGE TERM	EDGED1	34
C		EDGED1	35
C	OUTPUT	EDGED1	36
C	PS2 SHIELDED MEAN SQUARE PRESSURE	EDGED1	37
C		EDGED1	38
C	DIMENSION PSIX(1),USPLIF(1),	EDGED1	39
1	A(3),B(3),C(3),D(3)	EDGED1	40
C	COMPLEX CFI,ALP1,BET1,BET2	EDGED1	41
C	DIMENSION RALP1(2),RBET1(2),RBET2(2)	EDGED1	42
C	EQUIVALENCE (RALP1(1),ALP1), (RBET1(1),BET1), (RBET2(1),BET2)	EDGED1	43
C	COMPLEX CPOLAR	EDGED1	44
C	DATA DEGRAD, RADDEG, PI, EPS /1.745329251943E-2, 57.295779513082,	EDGED1	45
C	* 3.1415926535898, 1.E-10/	EDGED1	46
C		EDGED1	47
C	COMPUTE BANDWIDTH EFFECT ERM	EDGED1	48
C		EDGED1	49
C	Q = 10.**(1.5*BW)	EDGED1	50
C	FA = .5*(Q + 1./Q)	EDGED1	51
C	FB = .5*(Q - 1./Q)	EDGED1	52
C		EDGED1	53
C	COMPUTE WAVENUMBER	EDGED1	54
C		EDGED1	55
C	WKP = 2.*PI*GAM*BCFIF / CZ	EDGED1	56
C		EDGED1	57
C	COMPUTE PATHLENGTH DIFFERENCES	EDGED1	58

C	A2=ABS(2.*WKP*HCPP*COS(ETAP*DEGRAD))	EDGED1	59
	BL = SIN(.5*(THP - THOPP)*DEGRAD)	EDGED1	60
	CL = SIN(.5*(THP + THOPP)*DEGRAD)	EDGED1	61
	AL = SQRT(A2)	EDGED1	62
	AB =AL*BL	EDGED1	63
	AC =AL*CL	EDGED1	64
C		EDGED1	65
C	COMPUTE PHASE DIFFERNECE FOR INCIDENT AND IMAGE FIELDS	EDGED1	66
C		EDGED1	67
	DL = SIN(THP*DEGRAD) * SIN(THOPP*DEGRAD)	EDGED1	68
	GAM1= A2*DL	EDGED1	69
C		EDGED1	70
C	COMPUTE REFERENCE PRESSURE FOR DIFFRACTED FIELD	EDGED1	71
C	A TABLE LOOK-UP IS PERFORMED ON PSIX VERSUS USPLIF USING TBLU1	EDGED1	72
C		EDGED1	73
	USPLO = TBLU1(PSIC,PSIX,USPLIF,2,NPSIX)	EDGED1	74
	USPLOP = TBLU1(PSICP,PSIX,USPLIF,2,NPSIX)	EDGED1	75
	PO = 10.**(.C5*USPLO)	EDGED1	76
	POP = 10.**(.C5*USPLOP)	EDGED1	77
C		EDGED1	78
C	COMPUTE DIFFRACTED PRESSURE FIELDS WHERE SUBROUTINE CFI IS USED	EDGED1	79
C	WHICH COMPUTES THE FRESNEL INTEGRAL TIMES THE SQUARE ROOT OF	EDGED1	80
C	THE IMAGINARY UNIT TIMES PI	EDGED1	81
C		EDGED1	82
	ALP1= PO * CFI(AB)	EDGED1	83
	BET1= POP* CFI(AC)	EDGED1	84
C		EDGED1	85
C	CONTINUE WHEN A2 IS NOT NEAR ZERO	EDGED1	86
C		EDGED1	87
100	ALP1=CPOLAR(ALP1)	EDGED1	88
	BET1=CPOLAR(BET1)	EDGED1	89
	N = 1	EDGED1	90
	A(1)=RALP1(1)*RALP1(1) + RBET1(1)*RBET1(1)	EDGED1	91
	B(1)= 2.* RALP1(1)*RBET1(1)	EDGED1	92
	C(1) = GAM1	EDGED1	93
	D(1) = RBET1(2) - RALP1(2)	EDGED1	94
C		EDGED1	95
C	COMPUTE LEADING EDGE ADDITIONAL DIFFRACTED PRESSURE FIELD	EDGED1	96
C		EDGED1	97
	IF(AL.EQ.0.)GO TO 200	EDGED1	98
	IF(TLE.EQ.0.) GO TO 200	EDGED1	99
	N = 3	EDGED1	100
	BET2=0.3989422*TLE*((PO*BL+POP*CL)/AL)*CMPLX(1.,1.)	EDGED1	101
	BET2=CPOLAR(BET2)	EDGED1	102
	A(1) = RALP1(1)*RALP1(1)	EDGED1	103
	A(2) = RBET1(1)*RBET1(1)	EDGED1	104
	A(3) = RBET2(1)*RBET2(1)	EDGED1	105
	B(2) = 2.*RALP1(1)*RBET2(1)	EDGED1	106
	B(3) = 2.*RBET1(1)*RBET2(1)	EDGED1	107
	C(2)=-A2*.5	EDGED1	108
	C(3) = C(2) - C(1)	EDGED1	109
	D(2) = RBET2(2) - RALP1(2)	EDGED1	110
	D(3) = RBET2(2) - RBET1(2)	EDGED1	111
C		EDGED1	112
C	SUM DIFFRACTED FIELDS	EDGED1	113
C	DETERMINE SHIELDED MEAN SQUARE PRESSURE	EDGED1	114
		EDGED1	115

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C
200 PS2 = 0.
   DO 300 J=1,N
   TERM=B(J)*COS(C(J)*FA-D(J))
   CJFB = C(J)*FB
   IF( CJFB.EQ.0.) GO TO 250
   TERM = TERM * SIN( CJFB ) / CJFB
290 PS2=PS2+TERM+A(J)
300 CONTINUE
C
1000 RETURN
   END

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EDGED I 116
EDGED I 117
EDGED I 118
EDGED I 119
EDGED I 120
EDGED I 121
EDGED I 122
EDGED I 123
EDGED I 124
EDGED I 125
EDGED I 126
EDGED I 127

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SUBROUTINE EEDGE(M,IEDGE,ITYPE,	EEDGEUM	2
1 U,V,W,E1,E2,E3,RC,THO,ROV,Q,DL1,ALP,ALPO,AF)	EEDGEUM	3
C TITLE	EEDGEUM	4
C ENGINE EDGE GEOMETRY	EEDGEUM	5
C PURPOSE	EEDGEUM	6
C THIS SUBROUTINE CALCULATES ENGINE/EDGE GEOMETRY WHICH CONSISTS OF	EEDGEUM	7
C CALCULATING THE FOLLOWING	EEDGEUM	8
C UNIT VECTORS FOR WING EDGES AND ENGINE RELATIVE TO HALF PLANE	EEDGEUM	9
C ENGINE CENTERLINE ORIENTATION RELATIVE TO EDGES	EEDGEUM	10
C FLOW INCIDENT ANGLE	EEDGEUM	11
C INLET OR NOZZLE COORDINATES RELATIVE TO EDGE	EEDGEUM	12
C INPUT - CALL SEQUENCE	EEDGEUM	13
C IEDGE = 1 FOR TRAILING EDGE	EEDGEUM	14
C 2 FOR LEADING EDGE	EEDGEUM	15
C 3 FOR TIP EDGE	EEDGEUM	16
C ITYPE = 4 FOR INLET FAN NOISE	EEDGEUM	17
C NOT 4 FOR DISCHARGE TURBOMACHINERY NOISE	EEDGEUM	18
C INPUT - COMMON	EEDGEUM	19
C EWGED - ALL VARIABLES ARE USED	EEDGEUM	20
C REFRAC - IWE ONLY IS USED	EEDGEUM	21
C OUTPUT	EEDGEUM	22
C U,V,W UNIT VECTORS FOR WING EDGE	EEDGEUM	23
C E1,E2,E3 COORDINATE SYSTEM UNIT VECTORS FIXED TO ENGINE SUCH THAT	EEDGEUM	24
C E1 IS PARALLEL TO HALF-PLANE	EEDGEUM	25
C RC,THO POLAR COORDINATES OF INLET OR NOZZLE RELATIVE TO EDGE	EEDGEUM	26
C ROV VECTOR OF INLET OR NOZZLE	EEDGEUM	27
C Q VECTOR DEPENDING ON EDGE TYPE	EEDGEUM	28
C DL1,ALP ENGINE CENTERLINE ORIENTATION ANGLES RELATIVE TO EDGE	EEDGEUM	29
C ALPO FLOW INCIDENT ANGLE	EEDGEUM	30
C NOTE	EEDGEUM	31
C ALL ANGLES INPUT AND OUTPUT ARE IN DEGREES	EEDGEUM	32
C DIMENSION U(3),V(3),W(3),E1(3),E2(3),E3(3),RCV(3),	EEDGEUM	33
1 Q(3),AF(3)	EEDGEUM	34
C COMMON/ENGEO/ SWPTE,SWPLE,DIMED,DDSD,DDX1D,DDX2D,DDXOD,DDY1D,	EEDGEUM	35
1 DDY2D,DDYOD,DDLD,DIANI	EEDGEUM	36
C COMMON/REFRAC/EMJ,TSTSC,IWE(3),CFASS,BETA(10),CPSI(10),NASRC	EEDGEUM	37
C DATA DEGRAD, RADDEG /1.745329251943E-2, 57.295779514082/	EEDGEUM	38
C UNIT VECTOR COMPUTATION	EEDGEUM	39
C COMPUTE U AND V DEPENDING UPON EDGE TYPE	EEDGEUM	40
C IF IEDGE = 2) 100,200,400	EEDGEUM	41
C COMPUTE Q VECTOR FOR THE TRAILING EDGE	EEDGEUM	42
C 100 Q(1) = 0.	EEDGEUM	43
C Q(2) = -DDX1D	EEDGEUM	44
	EEDGEUM	45
	EEDGEUM	46
	EEDGEUM	47
	EEDGEUM	48
	EEDGEUM	49
	EEDGEUM	50
	EEDGEUM	51
	EEDGEUM	52
	EEDGEUM	53
	EEDGEUM	54
	EEDGEUM	55
	EEDGEUM	56
	EEDGEUM	57
	EEDGEUM	58

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      Q(3) = -DDY1D
      ALP = -SWPTE
      GO TO 300

C
C      COMPUTE Q VECTOR FOR THE LEADING EDGE
C
200 Q(1) = C.
    Q(2) = DDX2D
    Q(3) = -DDY2D
    ALP = -SWPLE

C
C      COMPUTE U AND V FOR TRAILING OR LEADING EDGE
C
300 SN = SIGN(1.,Q(2))
    U(1) = SN*COS( ALP*DEGRAD )
    U(2) = SN*SIN( ALP*DEGRAD )
    U(3) = U(1) * TAN( DIHED*DEGRAD )
    CALL VECN( U )
    DGT = DOTP(Q,U)
    V(1) = Q(1) - DGT *U(1)
    V(2) = Q(2) - DGT*U(2)
    V(3) = Q(3) - DGT *U(3)
    CALL VECN( V )
    GO TO 500

C
C      COMPUTE U AND V FOR TIP EDGE
C
400 BETAX= ATAN( (DDY1D-DDY2D) / ( CDX1D+CDX2D ) )
    U(1) = 0.
    U(2) = - COS( BETAX)
    U(3) = - SIN( BETAX)
    V(1) = COS( DIHED*DEGRAD )
    V(2) = 0.
    V(3) = SIN( DIHED*DEGRAD )

C
C      COMPUTE W, E1, E2 AND E3
C
500 CALL CRUSP(W,U,V)
    E2(1) = C.
    E2(2) = 1.
    E2(3) = 0.
    CALL CRUSP(E1,E2,W)
    CALL VECN(E1)
    CALL CRUSP(E2,E1,E2)

C
C      COMPUTE ENGINE CENTERLINE ORIENTATION ANGLES RELATIVE TO EDGE
C
    DLT = ATAN2( W(2), -V(2) ) *RADDEG
    ALP = ASIN( U(2) ) *RADDEG

C
C      COMPUTE FLOW INCIDENT ANGLE
C
    DCT = DOTP(E2,W)
    Q(1) = DCT * W(1) - E2(1)
    Q(2) = DCT * W(2) - E2(2)
    Q(3) = DCT * W(3) - E2(3)
    CALL VECN( Q )

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EEGEUM 55
EEGEUM 60
EEGEUM 61
EEGEUM 62
EEGEUM 63
EEGEUM 64
EEGEUM 65
EEGEUM 66
EEGEUM 67
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EEGEUM 109
EEGEUM 110
EEGEUM 111
EEGEUM 112
EEGEUM 113
EEGEUM 114
EEGEUM 115

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C	ALPO = ACOS(DOTP(Q,V)) * RADDEG	EEGEUM	116
C	STORE UNIT VECTOR IN DIRECTION OF AMBIENT FLOW	EEGEUM	117
C		EEGEUM	118
	AF(1)=Q(1)	EEGEUM	119
	AF(2)=Q(2)	EEGEUM	120
	AF(3)=Q(3)	EEGEUM	121
C		EEGEUM	122
C	COMPUTE NOZZLE OR INLET POLAR COORDINATES RELATIVE TO EDGE	EEGEUM	123
C		EEGEUM	124
	XCP = DDXXD	EEGEUM	125
	IF(IYPE.EQ.4) XCP = XCP - DDLC	EEGEUM	126
C		EEGEUM	127
C	COMPUTE VECTOR DEPENDING UPON EDGE TYPE	EEGEUM	128
C		EEGEUM	129
	IF(IEDGE - 2) 7CC,8CC,9CC	EEGEUM	130
C		EEGEUM	131
C	TRAILING EDGE	EEGEUM	132
C		EEGEUM	133
	7CC Q(1) = C.	EEGEUM	134
	Q(2) = -(DDXXD - XCP)	EEGEUM	135
	Q(3) = -(DDYYD + DDYCD)	EEGEUM	136
	GO TO 1000	EEGEUM	137
C		EEGEUM	138
C	LEADING EDGE	EEGEUM	139
C		EEGEUM	140
	8CC Q(1) = C.	EEGEUM	141
	Q(2) = DDXXD + XCP	EEGEUM	142
	Q(3) = -(DDYYD + DDYCD)	EEGEUM	143
	GO TO 1000	EEGEUM	144
C		EEGEUM	145
C	TIP EDGE	EEGEUM	146
C		EEGEUM	147
	9CC Q(1) = DDSD	EEGEUM	148
	Q(2) = XCP	EEGEUM	149
	Q(3) = - DDYCD + DDSD* TAN(DIHEC*DECRAD)	EEGEUM	150
C		EEGEUM	151
C	COMPUTE THE COORDINATES	EEGEUM	152
C		EEGEUM	153
	100C DOT = DOTP(Q, U) * DIANI	EEGEUM	154
	DO 1010 I = 1,3	EEGEUM	155
	Q(I) = Q(I) * DIANI	EEGEUM	156
	RCV(I) = Q(I) - DOT * U(I)	EEGEUM	157
	101C CONTINUE	EEGEUM	158
	RC = SQRT(RCV(1)*RCV(1) + RCV(2)*RCV(2) + RCV(3)*RCV(3))	EEGEUM	159
	THC = ACOS(DOTP(RCV,V) / RC) * RADDEG	EEGEUM	160
C		EEGEUM	161
	RETURN	EEGEUM	162
	END	EEGEUM	164

SUBROUTINE EGACAL(D, BETA, NFB, F, ATN)
VERSION B DATE 19 DEC 72.

REFERENCE- D.G. DUNN, /NOTICE OF REVISIONS FOR EGA ROUTINES/,
TECHNICAL MEMO ANSFTM-2, 14 DEC 1972.

PROGRAM TO CALCULATE THE EXTRA GROUND ATTENUATION DUE TO THE TUR-
BULENT BOUNDARY LAYER OF THE AIR NEAR THE GROUND PLANE. REFER TO
FIGURE 3 OF SAE-AIR876A AND FIGURE 4 OF SAE-AIR923.
THE RMS CALCULATION ERROR IS LESS THAN 0.1 DB WITH RESPECT TO
FIGURE 3 OF SAE-AIR876A. THE DECAY TERM FOR ELEVATION ANGLE BETA
REPRESENTS THE BEST FIT FOR FIGURE 4 OF SAE-AIR923.

INPUTS. D = DISTANCE BETWEEN SOURCE AND OBSERVER IN FT.
BETA = ELEVATION ANGLE IN DEG BETWEEN THE HORIZONTAL
GROUND PLANE AND THE OBSERVERS LINE OF SIGHT TO
THE NOISE SOURCE (OBSERVER ON THE GROUND)
NFB = NUMBER OF FREQUENCY BANDS
F = AN ARRAY OF (NFB) BAND CENTER FREQUENCIES IN HZ.

OUTPUT. ATN = THE ARRAY OF EXTRA GROUND ATTENUATION VALUES FOR
EACH FREQUENCY BAND.

ALLOCATE STORAGE FOR OTHER ARRAYS

DIMENSION F(1), ATN(1), EGA(7), C1(6), C2(6), C3(6), C4(6), C0(6), C(8,6)
1, DANG(5), DF(5,6)
REAL LBCF(7)
DOUBLE PRECISION SUM, POW, DTERM
DATA LBCF /0., 1.724546, 2.025592, 2.326602, 2.627632, 2.928667,
1 3.229682/
DATA EGA /7*0./
DATA DANG /0., 2., 10., 20., 45./
DATA DF /1., 1., .186, .163, 0., 1., 1., .297, .183, 0., 1., 1., .352, .188,
1 0., 1., .406, .198, 0., 1., 1., .468, .214, 0., 1., 1., .534, .235, 0./
DATA C0 /2.550075, 3.7005097, 4.854333, 6.1758828, 7.3126577,
1 8.7609523/
DATA C /7.4685316, 9.8170563, -116.11669, -513.50033, 3593.272, 25113.8
227, -87306.197, -795555.28, 9.0470852, 20.067737, -121.04562, -1147.6826
3, 3896.0422, 58647.28, -102929.41, -1900833.5, 11.494171, 22.452758,
4-131.24292, -1178.1871, 4059.3326, 60285.59, -189376.69, -2006965.9,
514.913511, 23.003503, -202.45769, -1217.1785, 6686.1366, 60729.708,
6-178956.35, -1992028.1, 16.605834, 18.789958, -187.864, -797.87204,
75607.9789, 35470.374, -135688.42, -1079105.8, 19.031016, 13.761267,
8-243.34348, -832.97531, 7773.8292, 45614.595, -203312.87, -1620027.1/
DATA C1 /2.4072E-3, 3.4204E-3, 4.608E-3, 5.872E-3, 7.24E-3, 8.192E-3/
DATA C2 /5.0, 7.2, 10.0, 12.0, 15.0, 16.0/
DATA C3 /-1.966, -10.276, -7.443, -8.124, -4.632, -5.356/
DATA C4 /3.041, 3.075, 3.1303, 3.1205, 3.0196, 2.9982/
X = ABS(D)
IF (X - 1.) 2, 2, 1
1 J = BETA / 90.
ANG = ABS(BETA - 90. * FLCAT(J))
IF (MOD(J,2) .NE. 0) ANG = 90. - ANG
IF (ANG - 45.) 4, 2, 2
2 DO 3 I = 1, NFB
ATN(I) = 0.
3 CONTINUE

EGACAL 2
EGACAL 3
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EGACAL 12
EGACAL 13
EGACAL 14
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EGACAL 56
EGACAL 57
EGACAL 58

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      GO TO 20
4  IF (X - 250.) 5, 5, 7
5  DO 6 J = 1,6
    EGA(J+1) = C1(J) * X
6  CONTINUE
    GO TO 13
7  X = ALOG10(X)
    IF (X - 3.6) 10, 8, 8
8  DO 9 J = 1,6
    EGA(J+1) = C2(J) * (1. - EXP(C3(J) * (X - C4(J))))
9  CONTINUE
    GO TO 13

C
C  COMPUTE EGA BY THE TAYLOR SERIES LEAST-SQUARE-FIT.
10 N = 8
    XX = X - 3.0789521
    DO 12 J = 1,6
      POW = 1.
      SUM = C0(J)
      DO 11 I = 1,N
        POW = POW * XX / FLCAT(I)
        DTERM = POW * C(I,J)
11  SUM = SUM + DTERM
      EGA(J+1) = SUM
12 CONTINUE
13 DO 14 J = 1,6
    EGA(J+1) = EGA(J+1) * TBLL1(ANG, DANG, DF(1,J), 1, 5)
14 CONTINUE
    DO 15 I = 1,NF8
      X = ABS(F(I))
      IF (X - 1.) 15, 15, 16
15  ATN(I) = 0.
      GO TO 19
16  X = ALOG10(X)
      IF (X - LBCF(7)) 18, 17, 17
17  ATN(I) = EGA(7)
      GO TO 19
18  ATN(I) = TBLL1(X, LBCF, EGA, 1, 7)
19 CONTINUE
20 RETURN
    END

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EGACAL	59
EGACAL	60
EGACAL	61
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EGACAL	95
EGACAL	96
EGACAL	97
EGACAL	98
EGACAL	99

SUBROUTINE EJECT		EJECT	
C AUTHOR	D. F. MELORUM	EJECT	2
C		EJECT	3
C PURPOSE	TO PREDICT JET NOISE FOR MULTIPLE ELEMENT/TUBE	EJECT	4
C	NOZZLES FOR THE PHASE B	EJECT	5
C	NASA-AMES FOOTPRINT CONTRACT NAS2-6969.	EJECT	6
C		EJECT	7
C		EJECT	8
C METHOD	AS DESCRIBED IN REFERENCE 1).	EJECT	9
C		EJECT	10
C INPUTS	VIA LABELED COMMON	EJECT	11
C		EJECT	12
C		EJECT	13
C	VIA LABELED COMMON SWITCH	EJECT	14
C		EJECT	15
C	NUMENG NUMBER OF NOISE SOURCES OF THE SAME	EJECT	16
C	NOISE TYPE.	EJECT	17
C		EJECT	18
C	VIA LABELED COMMON COMMON	EJECT	19
C		EJECT	20
C	NCF 1/3 OCTAVE OF FULL OCTAVE SWITCH	EJECT	21
C	OR NUMBER OF FREQUENCY BANDS (8 OR 24)	EJECT	22
C	RETA(24) DIRECTIVITY ANGLES	EJECT	23
C		EJECT	24
C	VIA LABELED COMMON GPRAM	EJECT	25
C		EJECT	26
C	MACH MACH NUMBER OF THE AIRCRAFT	EJECT	27
C	NOBS NUMBER OF OBSERVER POSITIONS	EJECT	28
C		EJECT	29
C	VIA LABELED COMMON SUMSPL	EJECT	30
C		EJECT	31
C	SSPL CURRENT TOTAL PREDICTED NOISE FOR NCF	EJECT	32
C	(8 OR 24) FREQUENCIES, AT NOBS OBSERVER	EJECT	33
C	POSITIONS FOR 17 DIRECTIVITY ANGLES.	EJECT	34
C		EJECT	35
C	VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES	EJECT	36
C		EJECT	37
C	PSI 17 DIRECTIVITY ANGLES FOR EACH OF	EJECT	38
C	NOBS OBSERVER POSITIONS.	EJECT	39
C	PSIC 17 DIRECTIVITY ANGLE PROJECTIONS FOR	EJECT	40
C	EACH OF NOBS OBSERVER POSITIONS	EJECT	41
C	BETA ELEVATION ANGLE PROJECTION FOR EACH	EJECT	42
C	OF NOBS OBSERVER POSITIONS.	EJECT	43
C		EJECT	44
C	EACH COMPONENT IS WRITTEN ON TAPE OR FILE 10	EJECT	45
C	FOR EACH OF NCF BANDS FOR EACH OF NOBS OBSERVER	EJECT	46
C	POSITIONS.	EJECT	47
C		EJECT	48
C OUTPUTS	VIA LABELED COMMON SUMSPL	EJECT	49
C		EJECT	50
C	SSPL CURRENT TOTAL PREDICTED NOISE FOR	EJECT	51
C	8 OR 24 FREQUENCIES, AT NOBS OBSERVER	EJECT	52
C	POSITIONS FOR 17 DIRECTIVITY ANGLES.	EJECT	53
C		EJECT	54
C	VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES	EJECT	55
C		EJECT	56
C	PSI 17 DIRECTIVITY ANGLES FOR EACH OF	EJECT	57
C	NOBS OBSERVER POSITIONS.	EJECT	58

C	PSIO	17 DIRECTIVITY ANGLE PROJECTIONS FOR	EJECT	59
C		EACH OF NCBS OBSERVER POSITIONS	EJECT	60
C	BETA	ELEVATION ANGLE PROJECTION FOR EACH	EJECT	61
C		OF NCBS OBSERVER POSITIONS.	EJECT	62
C			EJECT	63
C			EJECT	64
C	FUNCTION SUBPRGM	CCS ESHLDG PRSRUM	EJECT	65
C			EJECT	66
C	SUBROUTINES	ANGLES MENC22 ZERO	EJECT	67
C			EJECT	68
C			EJECT	69
C			EJECT	70
	COMMON /EJECTD/	IEJECT,NUMTBS,AREA,AR,TS,AMACHJ,AMACHS,CV,	EJECT	71
	*	PS,PAAREA,PTS,PMACHJ,PCV,EJANG,	EJECT	72
	*	IGCR9,LIN9,NTF9,IMA9,LGM9,NHL9,ICF9,ILAYS,	EJECT	73
	*	TF9(10),PCTAS(10),PLAS(10),	EJECT	74
	*	ELOH9,EDH9,R1H9(10),TL9(10),CF9,FH9	EJECT	75
C			EJECT	76
C			EJECT	77
	COMMON/SWITCH/	NTYPE,ITYPE,NENC,IDCF,IPRT(7),ICN(13),ALLPT	EJECT	78
C			EJECT	79
	COMMON/TMSPL/	SPZ(24,17),IB(2,3,13)	EJECT	80
C		CONSTANTS USED IN INTERNAL CALCULATIONS	EJECT	81
C			EJECT	82
	COMMON /GCONST/	IN,IG,IT1,IT2,FO,FL,F2,F3,F4,F5,F6,F7,F8,F9,F10,	EJECT	83
	*	10,11,12,13,14,15,16,17,18,19,110,P1,P33,P5,POUL,	EJECT	84
	*	EPS,UNDEF,BL,ICD,CPR,RPC,STA(17),ML,FML,I17,A,PI	EJECT	85
C			EJECT	86
C		VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	EJECT	87
C			EJECT	88
	COMMON /GCCOMN/	ACF,NK,BCH(24),TSPL(24,10,17),SPLT(24,17),	EJECT	89
	*BUF(25),	RETA(17),SPL2(17),TGAGR(24),CLPSF(17)	EJECT	90
	COMMON/SUMSPL/	SSPL(24,10,17)	EJECT	91
	COMMON/PNLD/	PSPL(17,20),EPNL(5,10),TEPNL(5,10)	EJECT	92
C			EJECT	93
C		FREQUENCY BANDS USED BY PROGRAM	EJECT	94
C			EJECT	95
	COMMON /GFREQ/	CFREQ(24),LFREQ(25),PFREQ(24)	EJECT	96
C			EJECT	97
C		GENERAL INPUT PARAMETERS	EJECT	98
	COMMON/ANGLE/	PSI(17,10),PSIO(17,10),BETA(17,10)	EJECT	99
C			EJECT	100
	COMMON /GPRAM/	ALTP,ALTR,SLOPE,AMACH,ACBS,SLDIST(10),ITENG,IUNIT	EJECT	101
	*	ISPTKM,IAIMOS,IAIR,CAIRAB(24),NTEMP,TEMP(50),TALT(50)	EJECT	102
	*	NPRES,PRES(50),PALT(50),NHUMID,RALT(50),RHUMID(50),CTEMP	EJECT	103
	*	CPRES,CRHUMD,IEGA,IGCR,CTEMP,DPAES,CHUMID,XKN,ND,FLO(50),	EJECT	104
	*	ZNR(50),ZNI(50),LINECT,MAXLIN,IFAGE,BCG,TCG,FLR,AALT,EPF	EJECT	105
C			EJECT	106
C		AIRCRAFT-OBSERVER GEOMETRY CALCULATIONS	EJECT	107
C			EJECT	108
	COMMON /GEOMU/	APY(10,17),APZ(10,17),PC(10,17),DPND(10,17),	EJECT	109
	*	B1(10,17),B2(10,17),TDS(17,10),TFC(17,10),IRR(10,17)	EJECT	110
	*	APP,TP,RHP,APC,TC,RHC,CA,CZ,TSP(17,10),CCV	EJECT	111
C			EJECT	112
C		CONVERSION CONSTANTS	EJECT	113
C			EJECT	114
	COMMON/GCONVC/	C(2,10),SLDISX(10)	EJECT	115

C	COMMON/HEAD/HIN(20),HCUT(20),CHIN(20)	EJECT	116
C		EJECT	117
C	DIMENSION PSZ(24,17)	EJECT	118
C		EJECT	119
C	ICN(9)=ICN(9)+1	EJECT	120
C		EJECT	121
C		EJECT	122
C	DELTA=EJANG*RPD	EJECT	123
	ALPHA=DELTA-ATAN(SLCPE)	EJECT	124
	AN=NLMTBS	EJECT	125
	CALL ANGLES(NOBS,DELTA)	EJECT	126
C		EJECT	127
C		EJECT	128
C	LOOP FOR THE NUMBER OF OBSERVER POSITIONS	EJECT	129
C		EJECT	130
C	40 DO 1000 M=1,NOBS	EJECT	131
C		EJECT	132
C		EJECT	133
C		EJECT	134
C	CALCULATE THE PRE MERGE JET NOISE PREDICTION	EJECT	135
C		EJECT	136
	CALL MERGEZ(IEJECT,1,AREA,TS,APACH,J,CV,AN,AMACHS,AR,PS,CZ,	EJECT	137
	* APO,PSI(1,M),CFREQ(1),SPLT(1,1),FBPF)	EJECT	138
	CALL LI.CCR(SPLT(1,1),IMAS,LGM9,ELCH9,EDHS,NWL9,K1-9,T19,	EJECT	139
	*ILAY9,FM9,IDP9,PSI(1,M),NCF,BCF,PLA9,CF9,PCTA9,NTF9,TF9,	EJECT	140
	*DOPSF,SPI2,ICOR9,IB(1,1,ITYPE),LINS,FBPF)	EJECT	141
C		EJECT	142
C		EJECT	143
C	45 CONTINUE	EJECT	144
C		EJECT	145
C	CONVERT TO A UNIT OR INDEXED SPECTRA	EJECT	146
C		EJECT	147
	ENG=NENG	EJECT	148
	IF(ENG.LE.0.C) ENG=1.C	EJECT	149
	DO 50 J=1,17	EJECT	150
	ELVANG=BETA(J,M)	EJECT	151
	DANGLE=PSIG(J,M)	EJECT	152
	ENS=ESHLOG(DANGLE,ELVANG,ENG)	EJECT	153
	DO 50 K=1,24	EJECT	154
	50 SPLT(K,J)=SPLT(K,J)-ENS	EJECT	155
	IF(NCF.EQ.24) GO TO 300	EJECT	156
C		EJECT	157
C	CONVERT 1/3 OCTAVE TO FULL OCTAVE	EJECT	158
C		EJECT	159
	DO 200 J=1,17	EJECT	160
	DO 200 K=1,8	EJECT	161
	SPLT(K,J) = SPLT(3*K-1,J) + 4.8	EJECT	162
	200 CONTINUE	EJECT	163
C		EJECT	164
C		EJECT	165
C	ADD TO CURRENT TOTAL AND WRITE ON TAPE 10	EJECT	166
C		EJECT	167
C		EJECT	168
	300 DO 400 J=1,NCF	EJECT	169
	DO 350 K=1,17	EJECT	170
	350 SPLT(J,K)=SPLT(J,K)-SPZ(J,K)	EJECT	171
	400 CONTINUE	EJECT	172

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CALCULATE THE POSTMERGE JET NOISE PREDICTION

CALL MENOZZ(IJEET,2,AREA,PTS,PMACHJ,PCV,ALPHA,AMACH,AR,PAREA,
* CZ,APD,PSI(1,M),CFREQ(1),PSZ(1,1),FBPF)

CONVERT TO A UNIT OR INDEXED SPECTRA

ENG=NENG
IF(ENG.LE.0.0) ENG=1.0
DO 550 J=1,17
ELVANG=BETA(J,M)
DANGLE=PSIO(J,M)
ENS=ESHLDG(DANGLE,ELVANG,ENG)
DO 550 K=1,24
50 PSZ(K,J)=PSZ(K,J)-ENS
IF(NCF.EQ.24) GO TO 700

CONVERT 1/3 OCTAVE TO FULL OCTAVE

DO 600 J=1,17
DO 600 K=1,8
PSZ(K,J) = PSZ(3*K-1,J) + 4.8
00 CONTINUE

ADD TO CURRENT TOTAL AND WRITE ON TAPE 10

CC DO 800 J=1,NCF
DO 750 K=1,17
SPLT(J,K)=PWRSUM(SPLT(J,K),PSZ(J,K))
50 SSPL(J,M,K)=PWRSUM(SSPL(J,M,K),SPLT(J,K))
0 CONTINUE
IF(IPRT(7).NE.7)GO TO 410
CALL NOISO(IPRT(7),M,NK,10,CHIN,ILNIT,SLDISX(M),PFREQ,SPLT(1,1),
* NCF,ITYPE)
0 CONTINUE
DO 360 JC=1,NCF
DO 360 KC=1,17
SPLT(JC,KC)=SPLT(JC,KC)+TSPL(JC,M,KC)
CALL PNLSUB(SPLT(1,1),PSPL(1,M),TPD(1,M),EPNL(1,M),SPL2,
*TEPNL(1,M),NK,BCG,TCG,FLR,M,NCBS,IRR(M,1))
IF(IPRT(3).NE.3)GO TO 1000
CALL NOISO(IPRT(3),M,NK,12,CHIN,ILNIT,SLDISX(M),PFREQ,
* SPLT(1,1),NCF,ITYPE)

00 CONTINUE
RETURN
END

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EJECT 173
EJECT 174
EJECT 175
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EJECT 224
EJECT 225
EJECT 226

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	SUBROUTINE EDGEOM(X,Y,ZEDN,DELT3,U,V,W,THO,DLT,ALP,	EDGEOM	2
1	ETA,TH,PSIO,PN)	EDGEOM	3
C		EDGEOM	4
C	TITLE	EDGEOM	5
C	EDGE/OBSERVER GEOMETRY	EDGEOM	6
C		EDGEOM	7
C	PURPOSE	EDGEOM	8
C	THIS SUBROUTINE DEFINES THE EDGE/OBSERVER GEOMETRY CONSISTING OF	EDGEOM	9
C	THE FOLLOWING BASIC STEPS	EDGEOM	10
C	UNIT VECTOR FOR SOUND PROPAGATION	EDGEOM	11
C	DIRECTION ANGLES RELATIVE TO EDGE	EDGEOM	12
C	DIRECTIVITY ANGLE GRAZING WING EDGE	EDGEOM	13
C		EDGEOM	14
C	INPUT - CALL SEQUENCE	EDGEOM	15
C	X,Y,ZEDN, AIRCRAFT COORDINATES RELATIVE TO OBSERVER	EDGEOM	16
C	DELT3 ENGINE INCLINATION ANGLE RELATIVE TO HORIZON	EDGEOM	17
C	U,V,W UNIT VECTORS FOR WING EDGE	EDGEOM	18
C	THO ANGLE OF POLAR COORDINATE OF INLET OR NOZZLE RELATIVE TO	EDGEOM	19
C	EDGE	EDGEOM	20
C	DLT,ALP ENGINE CENTER LINE ORIENTATION ANGLES RELATIVE TO EDGE	EDGEOM	21
C		EDGEOM	22
C	OUTPUT	EDGEOM	23
C	ETA,TH DIRECTION ANGLES RELATIVE TO EDGE	EDGEOM	24
C	PSIO DIRECTIVITY GRAZING ANGLE	EDGEOM	25
C	PN UNIT VECTOR FOR SOUND PROPAGATION	EDGEOM	26
C		EDGEOM	27
C	NOTE	EDGEOM	28
C	ALL INPUT AND OUTPUT ANGLES ARE IN DEGREES	EDGEOM	29
C		EDGEOM	30
C	DIMENSION U(3),V(3),W(3),PN(3)	EDGEOM	31
C	DATA DEGRAD, RADDEG /1.745329251943E-2, 57.295779513082/	EDGEOM	32
C		EDGEOM	33
C	COMPUTE UNIT VECTOR FOR SOUND PROPAGATION	EDGEOM	34
C		EDGEOM	35
C	SIND3 = SIN(DELT3*DEGRAD)	EDGEOM	36
C	COSD3 = COS(DELT3*DEGRAD)	EDGEOM	37
C	PN(1) = X	EDGEOM	38
C	PN(2) = -Y*COSD3 - ZEDN*SIND3	EDGEOM	39
C	PN(3) = Y*SIND3 - ZEDN*COSD3	EDGEOM	40
C	CALL VECN(PN)	EDGEOM	41
C		EDGEOM	42
C	COMPUTE DIRECTION ANGLES	EDGEOM	43
C		EDGEOM	44
C	ETA = ASIN(DOTP(PN,U))*RADDEG	EDGEOM	45
C	TH = ATAN2(-DOTP(PN,W),DOTP(PN,V))*RADDEG	EDGEOM	46
C		EDGEOM	47
C	COMPUTE GRAZING ANGLE	EDGEOM	48
C		EDGEOM	49
C	PSIO = 180. - ACOS(COS(ALP*DEGRAD)*COS(ETA*DEGRAD)*COS((THO-OLT)*	EDGEOM	50
1	DEGRAD) - SIN(ALP*DEGRAD)*SIN(ETA*DEGRAD))*RADDEG	EDGEOM	51
C		EDGEOM	52
C	RETURN	EDGEOM	53
C	END	EDGEOM	54

C	SUBROUTINE EPNLI(PNL,T,N,H,TC,CNF,ANS,IGLPNL)	EPNLI	2
C	DIMENSION T(2), PNL(2), ANS(5)	EPNLI	3
C	PURPOSE	EPNLI	4
C	TO COMPUTE EFFECTIVE PERCEIVED NOISE LEVEL. COMPUTATION INVOLVES	EPNLI	5
C	INTEGRATION OF THE PNL-TIME HISTORY OVER THE LIMITS (PNLN,PNLX)	EPNLI	6
C	AND (TN, TX), I.E.	EPNLI	7
C		EPNLI	8
C	EPNL = PNLX + 10 * ALOG10((1 / TO) *	EPNLI	10
C	INTEGRAL(ANTILOG(0.1 * (PNL - PNLX)) * DT))	EPNLI	11
C		EPNLI	12
C	WHERE	EPNLI	13
C	PNLX = MAXIMUM PNL	EPNLI	14
C	PNLN = AMAX1(PNLX - H, CNL)	EPNLI	15
C	TN = MINIMUM TIME WHEN PNL = PNLN	EPNLI	16
C	TX = MAXIMUM TIME WHEN PNL = PNLN	EPNLI	17
C		EPNLI	18
C	INPUTS	EPNLI	19
C	1) T ... ARRAY OF (N) TIME VALUES, EACH CORRESPONDING TO THE	EPNLI	20
C	TIME WHEN A (PNL) VALUE IS OBSERVED.	EPNLI	21
C	2) PNL ... ARRAY OF (N) PNL VALUES FOR THE TIME HISTORY.	EPNLI	22
C	3) N ... NUMBER OF POINTS FOR THE TIME HISTORY	EPNLI	23
C	4) TO ... NORMALIZING TIME CONSTANT IN THE INTEGRAL FORMULA.	EPNLI	24
C	NORMALLY THIS IS TEN SECONDS	EPNLI	25
C	5) H ... PNL INCREMENT DOWN FROM THE MAXIMUM (PNLX) USED TO	EPNLI	26
C	DETERMINE THE INTEGRATION LIMITS IF (PNLX .GT.	EPNLI	27
C	(CNL + H)). NORMALLY (H) IS TEN PNOB.	EPNLI	28
C	6) CNF ... CUTOFF OR NOISE FLOOR USED AS AN ADDITIONAL CONSTRAINT	EPNLI	29
C	IN DETERMINING THE INTEGRATION LIMITS. FUNCTIONS ONLY	EPNLI	30
C	IF (PNLX .LE. (CNF+H)).	EPNLI	31
C		EPNLI	32
C	OUTPUT	EPNLI	33
C	1) EPNL ... THE EFFECTIVE PNL IN (EPNOB)	EPNLI	34
C	2) PNLN	EPNLI	35
C	PNLX ... MIN/MAX PNL USED IN THE INTEGRATION FORMULA	EPNLI	36
C	3) TN	EPNLI	37
C	TX ... MIN,MAX TIME USED IN THE INTEGRATION FORMULA	EPNLI	38
C	4) IGLPNL ... FUNCTION VALUE USED AS AN ERROR CODE.	EPNLI	39
C	= 0 FOR NO ERROR	EPNLI	40
C	= 1 FOR BAD INPUTS, RESULTS SET TO OMEGA, I.E. 1.E75	EPNLI	41
C	= 2 INTEGRATION LIMITS ARE UNDEFINED, RESULTS ARE	EPNLI	42
C	SET TO OMEGA.	EPNLI	43
C		EPNLI	44
C	REMARKS	EPNLI	45
C	1) ASSUMES LINEAR VARIATION BETWEEN POINTS (T, PNL) FOR INTERPOLA-	EPNLI	46
C	TION, EXTRAPOLATION, AND COMPUTATION OF THE INTEGRAL.	EPNLI	47
C	2) INPUTS (TO, H, N) MUST BE GREATER THAN (0., 0., 2).	EPNLI	48
C		EPNLI	49
C		EPNLI	50
C	LOGICAL A, B	EPNLI	51
C	DATA I1,I2, F0, F1 F1C, C1, OMEGA /1,2,0.,1.,10.,.23025851,1.E75/	EPNLI	52
C	TCX(X1,X2,Y1,Y2) = (X1*(Y2-PNLN) + X2*(PNLN-Y1)) / (Y2-Y1)	EPNLI	53
C	TA(X1) = X1 * XPMIDX(C3) * DT	EPNLI	54
C	EPNL = OMEGA	EPNLI	55
C	TN=OMEGA	EPNLI	56
C	TX=OMEGA	EPNLI	57
C		EPNLI	58

```

      PNLN=OMEGA
      PNLX=OMEGA
      IGLPNL = 11
C
C ERROR CHECKS
      IF ((N .LE. 12) .OR. (TC .LE. FC) .OR. (H .LE. FO)) GO TO 160
      IGLPNL = 12
C
C SORT POINTS WITH RESPECT TO INCREASING (T) AND FIND (PNLX)
      K( = N - 11
      DO 20 K = 1,KE
      JS = K + 11
      DO 20 J = JS,N
      IF (T(J) - T(K)) 10, 20, 20
10  DT = T(J)
      T(J) = T(K)
      T(K) = DT
      DT = PNL(J)
      PNL(J) = PNL(K)
      PNL(K) = DT
20  CONTINUE
      MT = 11
      PNLX = PNL(1)
      DO 50 K = 12,N
      IF (PNLX - PNL(K)) 30, 40, 50
30  PNLX = PNL(K)
40  MT = K
50  CONTINUE
      IF ((MT .LE. 11) .OR. (MT .GE. N) .OR. (PNLX .LE. CNF)) GO TO 160
      PNLN = AMAX1(PNLX - H, CNF)
      CC = EXP(C1 * (PNLN - PNLX))
      I = -11
      SUM = FC
C
C PERFORM INTEGRATION
C CHECK FOR END POINTS BEING ABOVE (PNLN), AND CALC. AREA IF SO BY
C USING LINEAR EXTRAPOLATION.
      IF (PNL(1) .LE. PNLN) GO TO 80
      IF (PNL(2) - PNL(1)) 160, 160, 60
60  TN = TCX(T(1), T(2), PNL(1), PNL(2))
      DT = T(1) - TN
      C3 = C1 * (T(1) - PNLN)
70  SUM = SUM + A(CO)
      IF ( ) 80, 100, 100
80  TX = -TX
      IF (PNL(N) .LE. PNLN) GO TO 100
      J = N - 11
      I = 1 + 11
      IF (PNL(J) - PNL(N)) 160, 160, 90
90  TX = TCX(T(J), T(N), PNL(J), PNL(N))
      DT = TX - T(N)
      C3 = C1 * (PNL(N) - PNLN)
      GO TO 70
100 CONTINUE
C
C LOOP OVER ALL POINTS AND SUM AREAS IF ABOVE (PNLN)
      DO 140 J = 12,N

```

```

      PNLN  59
      PNLX  60
      IGLPNL  61
      EPNL  62
      EPNL  63
      EPNL  64
      EPNL  65
      EPNL  66
      EPNL  67
      EPNL  68
      EPNL  69
      EPNL  70
      EPNL  71
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      EPNL 100
      EPNL 101
      EPNL 102
      EPNL 103
      EPNL 104
      EPNL 105
      EPNL 106
      EPNL 107
      EPNL 108
      EPNL 109
      EPNL 110
      EPNL 111
      EPNL 112
      EPNL 113
      EPNL 114
      EPNL 115

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```

I = J - 11
A = PNL(I) .GT. PNLN
B = PNL(J) .GT. PNLN
IF (A .AND. B) GO TC 110
IF (B .AND. (.NOT. A)) GO TC 120
IF (A .AND. (.NOT. B)) GO TC 130
GO TO 140
110 DT = T(J) - T(I)
C2 = EXP(C1 * (PNL(I) - PNLX))
C3 = C1 * (PNL(J) - PNL(I))
SUM = SUM + DA(C2)
GO TO 140
120 TT = TCX(T(I), T(J), PNL(I), PNL(J))
TN = AMIN1(TN, TT)
DT = T(J) - TT
C3 = C1 * (PNL(J) - PNLN)
GO TO 135
130 IT = TCX(T(I), T(J), PNL(I), PNL(J))
TX = AMAX1(TX, IT)
DT = IT - T(I)
C3 = C1 * (PNL(I) - PNLN)
135 SUM = SUM + DA(C0)
140 CCNTINUE
150 SUM = SUM / TC
IF (SUM .LE. FC) GO TC 160
EPNL = F10 * ALOG10(SUM) + PNLX
IGLPNL = 0
ANS(1)=EPNL
ANS(2)=PNLN
ANS(3)=PNLX
ANS(4)=TN
ANS(5)=TX
160 RETURN
END

```

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EPNLI 116
EPNLI 117
EPNLI 118
EPNLI 119
EPNLI 120
EPNLI 121
EPNLI 122
EPNLI 123
EPNLI 124
EPNLI 125
EPNLI 126
EPNLI 127
EPNLI 128
EPNLI 129
EPNLI 130
EPNLI 131
EPNLI 132
EPNLI 133
EPNLI 134
EPNLI 135
EPNLI 136
EPNLI 137
EPNLI 138
EPNLI 139
EPNLI 140
EPNLI 141
EPNLI 142
EPNLI 143
EPNLI 144
EPNLI 145
EPNLI 146
EPNLI 147
EPNLI 148
EPNLI 149

```

SUBROUTINE ERROR(ITYPE,INDX1,INX2)		ERROR	2
C		ERROR	3
C	AUTHOR M.A. JAEGER	ERROR	4
C		ERROR	5
C	PURPOSE TO WRITE ERROR MESSAGES	ERROR	6
C		ERROR	7
C	METHOD THE CALLING SEQUENCE PARAMETERS ARE AS FOLLOWS	ERROR	8
C	ITYPE IDENTIFIES THE NOISE TYPE CURRENTLY BEING PREDICTED	ERROR	9
C	INDX1 IDENTIFIES THE ROUTINE IN WHICH THE ERROR WAS FOUND	ERROR	10
C	INDX2 IDENTIFIES THE STATEMENT TO BE PRINTED.	ERROR	11
C	ERRORS THAT ARE FATAL CAUSE A PROGRAM STOP, OTHERWISE A RETURN TO	ERROR	12
C	THE ROUTINE CALLING ERROR AND A RETURN TO ITS CALLING ROUTINE	ERROR	13
C	WITHOUT CONTINUING CALCULATION	ERROR	14
C		ERROR	15
C		ERROR	16
C		ERROR	17
C		ERROR	18
C		ERROR	19
C	DIMENSION TYPNAM(4,13)	ERROR	20
C	DIMENSION SUBNAM(2, 7)	ERROR	21
C	DATA IGUTAP/ 6/	ERROR	22
C	DATA SUBNAM/4HATMO,4HSP ,	ERROR	23
C	* 4HBLWF,4HLP ,	ERROR	24
C	* 4HCOPT,4HR ,	ERROR	25
C	* 4HLINC,4HOR ,	ERROR	26
C	* 4HPRCP,4H ,	ERROR	27
C	* 4HCORS,4HPL ,	ERROR	28
C	* 4HMAIN,4H /	ERROR	29
C	DATA TYPNAM/4HPRIM,4HARY,4HJET,4H ,	ERROR	30
C	* 4HPRI,4HAND,4HSEC,4HJET ,	ERROR	31
C	* 4HCOKE,4HAND,4HTLRB,4HINE ,	ERROR	32
C	* 4HCOMP,4HAND,4HINLT,4HFAN ,	ERROR	33
C	* 4HEXIT,4HFAN,4H ,4H ,	ERROR	34
C	* 4HAUGH,4HENTC,4HRI,4HNG ,	ERROR	35
C	* 4HBLOW,4HNF,4HAP,4H ,	ERROR	36
C	* 4HEJEC,4HTOR,4HSLPP,4HRESR ,	ERROR	37
C	* 4HLIFT,4HFAN,4H ,4H ,	ERROR	38
C	* 4HPROP,4HELLE,4HR ,4H ,	ERROR	39
C	* 4HHELI,4HCOPT,4HER ,4H ,	ERROR	40
C	* 4HMEAS,4HURED,4H DAT,4HA ,	ERROR	41
C	* 4HFLIG,4HHTG,4HECPE,4HTRY /	ERROR	42
C	WRITE(IGUTAP,5)(TYPNAM(I,ITYPE),I=1,4)	ERROR	43
C	5 FORMAT(4H ERR,4HOR D,4HETEC,4HTED,4HIN P,4HREDI,4HCTIC,4HNOF,4H	ERROR	44
C	* ,4A4,4HNOI,4HSEI,4HTYPE)	ERROR	45
C	WRITE(IGUTAP,2010)(SUBNAM(I,INDX1),I=1,2)	ERROR	46
C	2010 FORMAT(1X,4HERRO,4HRRRO,4HUTIN,4HCA,4HLLCD,4HFRD,4HMSU,4HBRDU,	ERROR	47
C	*4HTINE,1X,2A4)	ERROR	48
C	GO TO (10,20,30,40,50,60,70,80,90,100,110,120,	ERROR	49
C	*130,140,150,160),INDX2	ERROR	50
C	10 WRITE(IGUTAP,1010)	ERROR	51
C	GO TO 2000	ERROR	52
C	20 WRITE(IGUTAP,1020)	ERROR	53
C	GO TO 2000	ERROR	54
C	30 WRITE(IGUTAP,1030)	ERROR	55
C	GO TO 2000	ERROR	56
C	40 WRITE(IGUTAP,1040)	ERROR	57
C	GO TO 2000	ERROR	58
C	50 WRITE(IGUTAP,1050)		

GO TO 2000	ERROR	59
60 WRITE(IOUTAP,106C)	ERROR	60
GO TO 2000	ERROR	61
70 CONTINUE	ERROR	62
GO TO 2000	ERROR	63
80 WRITE(IOUTAP,108C)	ERROR	64
GO TO 2000	ERROR	65
90 WRITE(IOUTAP,109C)	ERROR	66
GO TO 2000	ERROR	67
100 WRITE(IOUTAP,110C)	ERROR	68
GO TO 2000	ERROR	69
110 WRITE(IOUTAP,111C)	ERROR	70
GO TO 2000	ERROR	71
120 WRITE(IOUTAP,108C)	ERROR	72
GO TO 2000	ERROR	73
130 WRITE(IOUTAP,113C)	ERROR	74
GO TO 2000	ERROR	75
140 WRITE(IOUTAP,114C)	ERROR	76
GO TO 2000	ERROR	77
150 WRITE(IOUTAP,115C)	ERROR	78
STOP	ERROR	79
160 WRITE(IOUTAP,116C)	ERROR	80
1010 FORMAT(106HCTOO MANY ENTRIES IN ALTITUDE VS TEMPERATURE TABLE. MA	ERROR	81
1XIMUM ALLOWED IS FIFTY. ISA ATMOSPHERE IS ASSUMED.)	ERROR	82
1020 FORMAT(103HCTOO MANY ENTRIES IN ALTITUDE VS PRESSURE TABLE. MA	ERROR	83
1XIMUM ALLOWED IS FIFTY. ISA ATMOSPHERE IS ASSUMED.)	ERROR	84
1030 FORMAT(112HCTOO MANY ENTRIES IN ALTITUDE VS RELATIVE HUMIDITY TABL	ERROR	85
1E. MAXIMUM ALLOWED IS FIFTY. ISA ATMOSPHERE IS ASSUMED.)	ERROR	86
1040 FORMAT(105H0ALTITUDE VS TEMPERATURE TABLE IS UNDEFINED. MUST HAVE	ERROR	87
1 AT LEAST TWO ENTRIES. ISA ATMOSPHERE IS ASSUMED.)	ERROR	88
1050 FORMAT(102H0ALTITUDE VS PRESSURE TABLE IS UNDEFINED. MUST HAVE AT	ERROR	89
1 LEAST TWO ENTRIES. ISA ATMOSPHERE IS ASSUMED.)	ERROR	90
1060 FORMAT(108H0ALTITUDE VS RELATIVE HUMIDITY TABLE IS UNDEFINED. MUS	ERROR	91
1T HAVE AT LEAST TWO ENTRIES. ISA ATMOSPHERE ASSUMED.)	ERROR	92
1080 FORMAT(40H EFFECTIVE TIP MACH NUMBER OUT OF RANGE, /	ERROR	93
* 33HGREATER THAN .93 OR LESS THAN 0.)	ERROR	94
1090 FORMAT(50H TOO MANY TARGET FREQUENCIES SPECIFIED FOR LINING. /	ERROR	95
* 25H ONLY FIRST TEN ARE USED.)	ERROR	96
1100 FORMAT(65HCTOO MANY WALLS SPECIFIED IN FAN LINING. ONLY FIRST	ERROR	97
1 TEN ARE USED)	ERROR	98
1110 FORMAT(44HONO WALLS HAVE BEEN DEFINED FOR FAN LINING.)	ERROR	99
1130 FORMAT(1H ,35HERROR WRITING RANCCM FILE JOB ABORT)	ERROR	100
1140 FORMAT(1H ,35HERROR READING RANCCM FILE JOB ABORT)	ERROR	101
1150 FORMAT(33H0***FATAL ERROR*** EAC GEOMETRY.)	ERROR	102
1160 FORMAT(70H *** WARNING *** PROGRAM CAPABILITIES EXCEEDED,I.E. (ME/	ERROR	103
*SF) GREATER THAN ONE)	ERROR	104
2000 CONTINUE	ERROR	105
RETURN	ERROR	106
END	ERROR	107

FUNCTION ESHLDG(PSI, BETA, XE)	ESHLDG	2
DATA F1, HPI, RPD /1.C, 1.570796, 1.745329E-2/	ESHLDG	3
ESHLDG = -10. * ALG10(XE)	ESHLDG	4
CP = COS(RPD * PSI)	ESHLDG	5
SP = SQRT(F1 - CP*CP)	ESHLDG	6
IF (SP .LE. 3.4E-4) GO TO 10	ESHLDG	7
CTP = F1 + CP / SP	ESHLDG	8
ESHLDG = ESHLDG * (F1 - 2. * (COS(HPI * (BETA / 90.))**0.8)**6) /	ESHLDG	9
1 (XE * (F1 + CTP*CTP))	ESHLDG	10
10 RETURN	ESHLDG	11
END	ESHLDG	12

SUBROUTINE EWGIG

PURPOSE TO READ ENGINE/WING GEOMETRY I/C FOR
WING SHIELDING PACKAGE

INPUT

SWPTE TRAILING EDGE SWEEP ANGLE(DEG) DEFAULT=0.
SWPLE LEADING EDGE SWEEP ANGLE(DEG) =0.
DIHED WING DIHEDRAL ANGLE(DEG) =0.
DDSD DIMENSIONLESS DISTANCE BETWEEN ENGINE C.L.
AND WING TIP
DDX1D DIMENSIONLESS DISTANCE IN AXIAL DIRECTION
TO T.E. FROM POINT ON TOP OF WING
DDX2D DIMENSIONLESS DISTANCE IN AXIAL DIRECTION
TO L.E. FROM POINT ON TOP OF WING
DCXOD DIMENSIONLESS DISTANCE IN AXIAL DIRECTION
FROM NOZZLE EXIT PLANE TO POINT ON TOP OF WING DEF=0
DDY1D DIMENSIONLESS DISTANCE NORMAL TO ENGINE C.L.
FROM TOP OF WING TO T.E.
DDY2D DIMENSIONLESS DISTANCE NORMAL TO ENGINE C.L.
FROM TOP OF WING TO L.E.
DCYOD DIMENSIONLESS DISTANCE BETWEEN TOP OF WING
AND ENGINE C.L. DEFAULT=.1
DDLD DIMENSIONLESS ENGINE LENGTH
DIANI DIAMETER OF NOZZLE INLET (FT)DEFAULT=.3048
DIANE DIAMETER OF NOZZLE (M,FT)

COMMON/GCONST/IN

COMMON /GPRAM/ALTP,ALTK,SLCPE,AMACH,NCBS,SLOIST(10),NTENG,IUNIT

COMMON/EWGEO/SWPTE,SWPLE,DIHED,DCSD,DCX1D,DCX2D,DCXOD,

*DDY1D,DDY2D,DDYOD,DDLD,DIANI,IES

COMMON/ICPATH/NCAS,NCCF

DIMENSION WKP(13,3)

EQUIVALENCE (SEI,IES)

NAMELIST/EWDATA/SWPTE,SWPLE,DIHED,DCX1D,DCX2D,DCXOD,DCSD,

*DDY1D,DDY2D,DDYOD,DDLD,DIANE,IES

TEST AND STORE DATA FOR FIRST CASE

IFI NCAS.EQ.1)GO TO 1CC

RESTORE DATA

SWPTE =WKP(1,NCOF)

SWPLE =WKP(2,NCOF)

DIHED =WKP(3,NCOF)

DDSD =WKP(4,NCOF)

DDX1D =WKP(5,NCOF)

DCX2D =WKP(6,NCOF)

DCXOD =WKP(7,NCOF)

DDY1D =WKP(8,NCOF)

DDY2D =WKP(9,NCOF)

DDYOD =WKP(10,NCOF)

DDLD =WKP(11,NCOF)

EWGIG 2
EWGIG 3
EWGIG 4
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EWGIG 45
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EWGIG 47
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EWGIG 49
EWGIG 50
EWGIG 51
EWGIG 52
EWGIG 53
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EWGIG 55
EWGIG 56
EWGIG 57
EWGIG 58

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      DIANE =WKP(12,NCCF)
      SEI=WKP(13,NCOF)
100 READ(IN,EMDATA)
      WKP( 1,NCOF)=SWPTE
      WKP( 2,NCOF)=SWPLE
      WKP( 3,NCOF)=DIHED
      WKP( 4,NCOF)=DDSD
      WKP( 5,NCOF)=DDX1D
      WKP( 6,NCOF)=DDX2D
      WKP( 7,NCOF)=DDX0D
      WKP( 8,NCOF)=DDY1D
      WKP( 9,NCOF)=DDY2D
      WKP(10,NCOF)=DDY0D
      WKP(11,NCOF)=DDL D
      WKP(12,NCOF)=DIANE
      WKP(13,NCOF)=SEI
      DIANI=DIANE
      IF(IUNIT.EQ.0)DIANI=DIANI*3.280833
      RETURN
      END

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EWGIO 59
EWGIO 60
EWGIO 61
EWGIO 62
EWGIO 63
EWGIO 64
EWGIO 65
EWGIO 66
EWGIO 67
EWGIO 68
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EWGIO 70
EWGIO 71
EWGIO 72
EWGIO 73
EWGIO 74
EWGIO 75
EWGIO 76
EWGIO 77
EWGIO 78

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	SUBROUTINE EWGOUT(IPRT,ILNIT)	EWGOUT	2
C		EWGOUT	3
C	PURPOSE	EWGOUT	4
C	THIS SUBROUTINE PRINTS THE ENGINE / WING GEOMETRY VARIABLES.	EWGOUT	5
C	THESE VARIABLES ARE AVAILABLE IN COMMON EWGEC.	EWGOUT	6
C	THE PRINTOUT IS ON LOGICAL UNIT 10 UNLESS THE ARRAY REPORT	EWGOUT	7
C	INDICATOR IPRT(7) IS NOT 7 IN WHICH CASE THE PRINTOUT IS ON 6.	EWGOUT	8
C		EWGOUT	9
C	INPUT - CALLING SEQUENCE	EWGOUT	10
C	IPRT - ARRAY OF REPORT INDICATORS, ONLY 7 IS USED	EWGOUT	11
C	ILNIT - 0 MKS UNITS	EWGOUT	12
C	1 ENGLISH UNITS	EWGOUT	13
C		EWGOUT	14
C	INPUT - COMMON	EWGOUT	15
C	EWGEC - ALL VARIABLES ARE PRINTED	EWGOUT	16
C		EWGOUT	17
C	DIMENSION IPRT(7)	EWGOUT	18
C	COMMON/ EWGEC/ SWPTE,SWPLE,DIHED,CCSD,CCX1C,CCX2D,CCXOC,DDY1C,	EWGOUT	19
C	1 DDY2D,DDYCD,DDLC,DIANI	EWGOUT	20
C	DIMENSION IUD(2)	EWGOUT	21
C	DATA IUD /3H M.,3H FT/	EWGOUT	22
C		EWGOUT	23
C	DETERMINE OUTPUT UNIT	EWGOUT	24
C		EWGOUT	25
C	ICUT=8	EWGOUT	26
C	IF(IPRT(7).NE.7)ICUT=6	EWGOUT	27
C		EWGOUT	28
C	SET THE UNIT FOR DIANI	EWGOUT	29
C		EWGOUT	30
C	IF(ILNIT.NE.0)GO TO 25	EWGOUT	31
C	IL = IUD(1)	EWGOUT	32
C	DIANE=DIANI*.3048006	EWGOUT	33
C	GO TO 50	EWGOUT	34
C	25 IL = IUD(2)	EWGOUT	35
C	DIANE=DIANI	EWGOUT	36
C		EWGOUT	37
C	PRINT TITLING INFORMATION	EWGOUT	38
C		EWGOUT	39
C	50 CALL PRINTH(IPRT(7),LCT,ICUT)	EWGOUT	40
C		EWGOUT	41
C	PRINT THE VARIABLES IN COMMON	EWGOUT	42
C		EWGOUT	43
C	WRITE(ICUT,100) SWPTE,DIANE,IL,SWPLE,DDLC,DIHED,CCSD,CCXOD,CCX1D,	EWGOUT	44
C	1 DDX2D,DDYOD,DDY1C,DDY2D	EWGOUT	45
C	100 FORMAT(1HC,39X,38HENGINE / WING GEOMETRY //	EWGOUT	46
C	1 20X,16H1.E. SWEEP ANGLE,5X,1H=,F6.1,4H DEG,16X,	EWGOUT	47
C	2 15HNOZZLE DIA. (D),5X,1H=,F7.2,A3/	EWGOUT	48
C	3 20X,16H1.E. SWEEP ANGLE,5X,1H=,F6.1,4H DEG,16X,	EWGOUT	49
C	4 15HENGINE LENGTH (L/D),5X,1H=,F7.2/	EWGOUT	50
C	5 20X,22HWING DIHEDRAL ANGLE =,F6.1,4H DEG,16X,	EWGOUT	51
C	6 25HDIST. TO WING TIP (S/D) =,F7.2///	EWGOUT	52
C	7 41X,17HAXIAL DISTANCE (NOZZLE REL. TO WING)///	EWGOUT	53
C	8 21X,8HXO / D =,F7.2,17X,8HX1 / C =,F7.2,17X,8HX2 / D =,F7.2	EWGOUT	54
C	9 ///41X,40HVERTICAL DISTANCES (NOZZLE REL. TO WING)///	EWGOUT	55
C	* 21X,8HYO / D =,F7.2,17X,8HY1 / C =,F7.2,17X,8HY2 / D =,F7.2)	EWGOUT	56
C		EWGOUT	57
C	RETURN	EWGOUT	58

END

EWGOUT

59

	SUBROUTINE FAAISO(F,FREQ,K,FC)	FAAISO	2
C	FAAISO MASTERS,R.M. APS-104A APRIL 1969	FAAISO	3
C	SUBROUTINE FAAISO CALCULATES THE TONE CORRECTION TO A	FAAISO	4
C	SPECTRUM FROM A KNOWLEDGE OF THE TONAL IRREGULARITIES.	FAAISO	5
C	THE METHOD IS THAT DEFINED BY THE ISC/FAA CURVES OF REFERENCE 1.	FAAISO	6
C-----	REFERENCE 1. DEPARTMENT OF TRANSPORTATION, FEDERAL AVIATION	FAAISO	7
C-----	REGULATIONS, TITLE 14, CHAPTER 1, PART 36 **	FAAISO	8
C-----	NOISE STANDARDS- AIRCRAFT TYPE CERTIFICATION **	FAAISO	9
C-----	FEDERAL AVIATION ADMINISTRATION, NOV. 3, 1969.	FAAISO	10
C	F-----ARRAY OF TONAL IRREGULARITIES	FAAISO	11
C	FREQ-----ARRAY OF 1/3 OCTAVE BAND FREQUENCIES	FAAISO	12
C	K-----NUMBER OF BANDS	FAAISO	13
C	FC-----ARRAY OF TONE CORRECTIONS	FAAISO	14
C	TEST FOR FREQUENCY IN THE RANGE 500 TO 5000 HZ AND F IN	FAAISO	15
C	RANGE OF 3 TO 20DB	FAAISO	16
	DIMENSION F(24),FREQ(24),FC(24)	FAAISO	17
	DO 1I=1,K	FAAISO	18
	IF(F(1).GE.3.)GO TO 2	FAAISO	19
	FC(1)=0.	FAAISO	20
	GO TO 1	FAAISO	21
2	IF (500..LE.FREQ(1).AND.FREQ(1).LE.5000.) GO TO 3	FAAISO	22
C	FREQUENCY NOT IN THE RANGE,TEST FOR VALUE OF F AND FIND FC	FAAISO	23
	IF (F(1).LT.20.) GO TO 4	FAAISO	24
	FC(1)=3.3333333333	FAAISO	25
	GO TO 1	FAAISO	26
4	FC(1)=F(1)/6.	FAAISO	27
	GO TO 1	FAAISO	28
3	IF (F(1).LT.20.) GO TO 5	FAAISO	29
	FC(1)=6.6666666666	FAAISO	30
	GO TO 1	FAAISO	31
5	FC(1)=F(1)/3.	FAAISO	32
1	CONTINUE	FAAISO	33
	RETURN	FAAISO	34
	END	FAAISO	35

	SUBROUTINE FANNOS(SF,ANGLES,ARRAY,IDOPP,NUMSTG,NINLET,NAFT,NB,FPR,	FANNOS	2
	* DIAM,RSS,AREA,RNI,RTS,CRTFPR,DELTA,BPR,NI)	FANNOS	3
C AUTHOR	D. F. MELDRUM	FANNOS	4
C		FANNOS	5
C PURPOSE	TO PREDICT INLET FAN NOISE, AND/OR	FANNOS	6
C	AFT FAN NOISE FOR THE PHASE B NASA-AMES	FANNOS	7
C	FOOTPRINT CONTRACT NAS2-6969. NOISE IS PREDICTED	FANNOS	8
C	AT 150 FEET AS A SINGLE NOISE SOURCE WITHOUT	FANNOS	9
C	SHIELDING EFFECTS.	FANNOS	10
C		FANNOS	11
C METHOD	AS DESCRIBED IN REFERENCE 1)	FANNOS	12
C		FANNOS	13
C INPUTS	VIA THE CALL	FANNOS	14
C		FANNOS	15
C	SF SCALE FACTOR FOR THE DOPPLAR S FT	FANNOS	16
C	ANGLES DIRECTIVITY ANGLES FOR NOISE PREDICTION	FANNOS	17
C		FANNOS	18
C	NUMSTG NUMBER OF FAN STAGES	FANNOS	19
C	1 & NUMSTG & 3	FANNOS	20
C	NINLET SWITCH FOR INLET FAN NOISE	FANNOS	21
C	PREDICTION IF POSITIVE.	FANNOS	22
C	NAFT SWITCH FOR AFT FAN NOISE	FANNOS	23
C	PREDICTION IF POSITIVE.	FANNOS	24
C	IDOPP SWITCH FOR THE DOPPLAR SHIFT	FANNOS	25
C	FLIGHT EFFECTS.	FANNOS	26
C	0 NO FLIGHT EFFECTS OR DOPPLAR SHIFT.	FANNOS	27
C	1 DOPPLAR SHIFT FOR THE FREQUENCY	FANNOS	28
C	CORRECTION ONLY.	FANNOS	29
C	2 DOPPLAR SHIFT FOR THE FREQUENCY	FANNOS	30
C	AND LEVEL CORRECTION.	FANNOS	31
C	NB(I) NUMBER OF FAN BLADES FOR EACH STAGE	FANNOS	32
C	WHERE 1 & I & NUMSTG	FANNOS	33
C	FPR(I) FAN PRESSURE RATIO	FANNOS	34
C	DIAM(I) FAN INLET DIAMETER (INLET ONLY) FT	FANNOS	35
C	RSS(I) MINIMUM ROTOR/STATOR SPACING	FANNOS	36
C	AREA(I) FAN DISCHARGE AREA (AFT ONLY) FT*FT	FANNOS	37
C	RNI ROTOR SPEED RPM	FANNOS	38
C	RTS RELATIVE TIP MACH NUMBER OF THE	FANNOS	39
C	FIRST STAGE WITHOUT INLET GUIDE	FANNOS	40
C	VANES (IGV). IF LESS THAN 1	FANNOS	41
C	IGV WILL BE ASSUMED FOR THE FIRST	FANNOS	42
C	STAGE (INLET FAN ONLY).	FANNOS	43
C	CRTFPR FAN PRESSURE RATIO FOR THE	FANNOS	44
C	RELATIVE TIP MACH NUMBER OF	FANNOS	45
C	1.025 (INLET FAN ONLY)	FANNOS	46
C	ANGFAN ENGINE INCLINATION ANGLE	FANNOS	47
C		FANNOS	48
C		FANNOS	49
C OUTPUTS	ARRAY INLET FAN NOISE PREDICTION FOR 24	FANNOS	50
C	FREQUENCIES AT 17 ANGLES AND OR	FANNOS	51
C	AFT FAN NOISE PREDICTION FOR 24	FANNOS	52
C	FREQUENCIES AT 17 ANGLES	FANNOS	53
C		FANNOS	54
C		FANNOS	55
C REFERENCES	1) R. J. SAXBY, NASA-AMES FOOTPRINT CONTRACT	FANNOS	56
C	NAS2-6969 FAN NOISE MODULE, UN-NUMBERED	FANNOS	57
C	COORDINATION SHEET, DATED 19 JANUARY 1973.	FANNOS	58

C				FANNOS	59	
C	SUBROUTINES	BLZSAH	FANPED	RESCAL	FANNOS	60
C				FANNOS	61	
C				FANNOS	62	
	DIMENSION NB(3),FPR(3),DIAM(3),RSS(3),AREA(3)			FANNOS	63	
	DIMENSION SF(1),ANGLES(1),	FEPF(3)		FANNOS	64	
	DIMENSION ARRAY(24,17)			FANNOS	65	
	DIMENSION ADTCR1(7),ADTCR3(21),BDTCR1(5),BDTCR3(29),ABBCR1(5),			FANNOS	66	
*	ABBCR3(13),BBBCR1(5),BBBCR3(29),ARSCRV(10),			FANNOS	67	
*	CBSCR1(39),CBSCR3(11)			FANNOS	68	
	DATA ADTCR1/3.0,0.1,C.425,1.C,73.C,83.5,83.5/			FANNOS	69	
	DATA ADTCR3/10.0,0.0,2C.C,3C.C,4C.0,50.0,60.0,70.0,80.0,90.0,			FANNOS	70	
*	100.0,2.0,2.C,1.8,1.5,1.C,C.0,-2.0,-5.0,-10.0,			FANNOS	71	
*	-16.2/			FANNOS	72	
	DATA BDTCR1/2.0,0.1,1.C,75.5,56.5/			FANNOS	73	
	DATA BDTCR3/14.C,4C.0,50.0,6C.C,70.0,80.0,90.0,100.0,110.0,120.0,			FANNOS	74	
*	130.C,140.C,150.C,16C.C,170.0,-21.0,-15.0,-9.0,-7.0,			FANNOS	75	
*	-5.0,-3.0,-1.C,C.C,C.C,-1.0,-4.0,-7.0,-11.0,-15.0/			FANNOS	76	
	DATA ABBCR1/2.0,0.1,1.0,66.C,82.5/			FANNOS	77	
	DATA ABBCR3/6.0,10.0,60.C,70.0,8C.C,50.0,100.0,0.0,0.0,-2.0,-5.0,			FANNOS	78	
*	-10.0,-16.C/			FANNOS	79	
	DATA BBBCR1/2.0,C.1,1.C,73.5,53.5/			FANNOS	80	
	DATA BBBCR3/14.C,4C.C,50.0,60.0,70.0,80.0,90.0,100.0,110.0,120.0,			FANNOS	81	
*	130.C,140.C,150.C,16C.C,170.0,-22.0,-16.0,-1C.0,-6.0,			FANNOS	82	
*	-4.0,-2.0,-1.0,C.C,C.C,-2.0,-4.0,-7.0,-12.0,-17.0/			FANNOS	83	
	DATA ARSCRV/2.0,30.0,300.C,1C.C,C.0,2.0,30.0,300.0,5.0,0.0/			FANNOS	84	
	DATA CBSCR1/6.0,0.0,.9999,1.C,1.C85,1.19,1.435,0.0,0.0,55.0,82.0,			FANNOS	85	
*	82.C,77.0,6.C,0.0,.9999,1.0,1.135,1.19,1.435,0.0,0.0,			FANNOS	86	
*	55.C,88.C,88.0,83.C,6.0,0.0,.9999,1.0,1.24,1.295,			FANNOS	87	
*	1.435,C.C,C. .55.C,83.C,83.0,80.5/			FANNOS	88	
	DATA CBSCR3/5.0,10.0,5C.C,7C.C,8C.C,100.0,-16.0,0.0,0.0,-2.0,-18./			FANNOS	89	
	DATA ISWTH/1/			FANNOS	90	
	ILEVEL=0			FANNOS	91	
	IDCP=C			FANNOS	92	
	IF(IDOPP.GE.1) IDCP=1			FANNOS	93	
	IF(IDOPP.EQ.1) ILEVEL=1			FANNOS	94	
	IF(ISWTH.EQ.0) GC TC 122			FANNOS	95	
	ISWTH=0			FANNOS	96	
	NUM=ADTCR1(1)			FANNOS	97	
	CALL RESCAL(NUM,ADTCR1(2))			FANNOS	98	
	NUM=ABBCR1(1)			FANNOS	99	
	CALL RESCAL(NUM,ABBCR1(2))			FANNOS	100	
	IAT=1			FANNOS	101	
	NUM=ARSCRV(IAT)			FANNOS	102	
	CALL RESCAL(NUM,ARSCRV(IAT+1))			FANNOS	103	
	IAT=IAT+2*NUM+1			FANNOS	104	
	NUM=ARSCRV(IAT)			FANNOS	105	
	CALL RESCAL(NUM,ARSCRV(IAT+1))			FANNOS	106	
	NUM=BDTCR1(1)			FANNOS	107	
	CALL RESCAL(NUM,BDTCR1(2))			FANNOS	108	
	NUM=BBBCR1(1)			FANNOS	109	
	CALL RESCAL(NUM,BBBCR1(2))			FANNOS	110	
122	IF(CRTFPR.LE.0.0) CRTFPR=0.0			FANNOS	111	
C				FANNOS	112	
C				FANNOS	113	
	IF(NUMSTG.GT.3) GC TC 6CC			FANNOS	114	
	IF(NUMSTG.LT.1) GC TC 6CC			FANNOS	115	

C	IF((NINLET.LE.0).AND.(NAFT.LE.0)) GO TO 600	FANNUS	116
C		FANNOS	117
C	130 FPRCRT=CRFPR	FANNOS	118
C		FANNOS	119
C		FANNOS	120
C		FANNOS	121
C		FANNOS	122
	NBUZZ=0	FANNOS	123
	IF(RTS.LT.1.0) NBUZZ=1	FANNOS	124
	IGV=NBUZZ	FANNOS	125
	IF(RTS.GT.0.) IGV=0	FANNOS	126
	DO 200 I = 1,NLMSTG	FANNOS	127
C		FANNOS	128
C	CALCULATE THE FUNDAMENTAL BLADE PASSING FREQUENCY.	FANNOS	129
C		FANNOS	130
	BLADES=NB(I)	FANNOS	131
	FBPF(I)=RN1*BLADES/60.0	FANNOS	132
C		FANNOS	133
	IF(NINLET.LE.0) GO TO 175	FANNOS	134
C		FANNOS	135
C	CALCULATE THE INLET FAN NOISE COMPONENTS.	FANNOS	136
C		FANNOS	137
	CRT=FPRCRT	FANNOS	138
	CALL FANPED(1,CRT,DIAM(I),FPR(I),FBPF(I),RSS(I),SF,ANGLES,	FANNOS	139
	* IGV,ILEVEL,IDCP,NI,BFR,DELTA,	FANNOS	140
	* ADTCR1,ADTCR3,ABBCR1,ABBCR3,ARSCRV,ARRAY)	FANNOS	141
	IF(I.NE.1) GO TO 175	FANNOS	142
	IF(NBUZZ.EQ.0) CALL BUZZSAW(RTS,FBPF(I),DIAM(I),SF,	FANNOS	143
	* ANGLES,ILEVEL,IDCP,	FANNOS	144
	* CBSCR1,CBSCR3,ARRAY)	FANNOS	145
	175 IF(NAFT.LE.0) GO TO 195	FANNOS	146
	CRT=FPRCRT	FANNOS	147
C		FANNOS	148
C	CALCULATE THE AFT FAN NOISE COMPONENTS.	FANNOS	149
C		FANNOS	150
	CALL FANPED(0,CRT,APEA(I),FPR(I),FBPF(I),RSS(I),SF,ANGLES,	FANNOS	151
	* IGV,ILEVEL,IDCP,NI,BFR,DELTA,	FANNOS	152
	* BCTCR1,BCTCR3,BBBCR1,BBBCR3,ARSCRV,ARRAY)	FANNOS	153
	195 FPRCRT=0.0	FANNOS	154
	IGV=1	FANNOS	155
	200 CONTINUE	FANNOS	156
	600 RETURN	FANNOS	157
	END	FANNOS	158

	SUBROUTINE FANPED(ICCDE,FPRCRT,DIAM,FPR,FBNF,RSS,XSF,ANGLES,	FANPED	2
	* NIGV,ILEVEL,IOCP,NI,BPR,DELTA,	FANPED	3
	* DTCR1,DTCR3,BBCR1,BBCR3,RSCRV,SPLCUT)	FANPED	4
C	AUTHOR D. F. MELDRUM	FANPED	5
C		FANPED	6
C		FANPED	7
C	PURPOSE TO PREDICT THE DISCRETE TONES AND BROADBAND NOISE	FANPED	8
C	COMPONENTS FOR EACH STAGE FOR INLET FAN NOISE OR FOR	FANPED	9
C	THE AFT FAN NOISE.	FANPED	10
C		FANPED	11
C	METHOD THE DISCRETE TONES AND BROADBAND NOISE IS PREDICTED	FANPED	12
C	FOR THE INLET FAN OR THE AFT FAN	FANPED	13
C	BY THE USE OF CURVES AS PER THE REFERENCE GIVEN.	FANPED	14
C	THESE CURVES ARE INTERPOLATED OR EXTRAPOLATED AS	FANPED	15
C	NEEDED IN ORDER TO PREDICT THE NOISE AT 150 FT RADIUS	FANPED	16
C		FANPED	17
C	INPUTS ICCDE INDICATOR FOR INLET FAN NOISE OR AFT FAN	FANPED	18
C	NOISE. POSITIVE INDICATES INLET FAN NOISE	FANPED	19
C	OTHERWISE THE AFT FAN IS ASSUMED.	FANPED	20
C	FPRCRT CRITICAL FAN PRESSURE RATIO USED TO INDIC	FANPED	21
C	WHETHER OR NOT INLET GUIDE VANES ARE USED	FANPED	22
C	NOT. IF LESS THAN OR EQUAL TO ONE NO	FANPED	23
C	INLET GUIDE VANES ARE ASSUMED.	FANPED	24
C	DIAM FAN INLET DIAMETER OR AFT NOZZLE AREA	FANPED	25
C	FPR FAN PRESSURE RATIO.	FANPED	26
C	FBNF FUNDAMENTAL BLADE PASSING FREQUENCY	FANPED	27
C	RSS ROTOR-STATOR SPACING IN PERCENT	FANPED	28
C	XSF SCALE FACTOR FOR THE DOPPLER SHIFT	FANPED	29
C	ANGLES DIRECTIVITY ANGLES FOR NOISE PREDICTION	FANPED	30
C	NIGV INLET GUIDE VANE SWITCH ON IF	FANPED	31
C	SET NON ZERO	FANPED	32
C	ILEVEL SWITCH FOR THE DOPPLER SHIFT LEVEL	FANPED	33
C	CORRECTION IF NON ZERO	FANPED	34
C	IOCP SWITCH FOR THE DOPPLER SHIFT FREQUENCY	FANPED	35
C	CORRECTION IF IT SET NON ZERO	FANPED	36
C	DTCR1 CURVE - DISCRETE TONES - BASIC DATA	FANPED	37
C	DTCR3 CURVE - DISCRETE TONES - DIRECTIVITY ANGLE	FANPED	38
C	BBCR1 CURVE - BROADBAND - BASIC DATA	FANPED	39
C	BBCR3 CURVE - BROADBAND - DIRECTIVITY ANGLE	FANPED	40
C	RSCRV CURVE - ROTOR-STATOR SPACING CORRECTION	FANPED	41
C		FANPED	42
C	INPUT VIA LABELED COMMON - CFREQ	FANPED	43
C	BANDLM 1/3 OCTAVE BAND LIMITS	FANPED	44
C		FANPED	45
C	OUTPUTS SPLCUT TABLE OF PREDICTED NOISE FOR FAN NOISE	FANPED	46
C	PREDICTION. THIS ARRAY MUST BE SET TO	FANPED	47
C	ZERO BEFORE PROCESSING EACH CASE. TO RUN	FANPED	48
C	SEVERAL STAGES CALL ONCE FOR EACH STAGE	FANPED	49
C	AND THE NOISE FOR EACH STAGE WILL BE ADDED	FANPED	50
C	TO THIS ARRAY WHICH SHOULD BE ZERO FOR THE	FANPED	51
C	FIRST STAGE OR WILL HAVE THE SUM OF THE	FANPED	52
C	PREVIOUS STAGES.	FANPED	53
C		FANPED	54
C	MODIFICATIONS FROM TEE205 INTL TEE215 - THIS WAS TAKEN FROM	FANPED	55
C	TEE215 AND CHANGES MADE FOR THE NASA-AMES CONTRACT	FANPED	56
C		FANPED	57
C	REFERENCES COORD SHEET ASEP-P-367 3/17/72 D. MELDRUM TEE205A	FANPED	58

C	ANS-RES-F-327	5/30/72 D. SCHRANK	FANPED	59
C	R. J. SAXBY, NASA-AMES FOOTPRINT CONTRACT		FANPED	60
C	NAS2-6969 FAN NOISE MODULE, UN-NUMBERED		FANPED	61
C	COORDINATION SHEET, DATED 19 JANUARY 1973.		FANPED	62
C	FUNCTION SUBPRGM ALOG10 TBLL1 PWRSLM		FANPED	63
C			FANPED	64
C	COMMON /GFREQ/ CFREQ(24),BANDLM(25)		FANPED	65
C			FANPED	66
C	DIMENSION DTCR1(1),DTCR3(1),BBCR1(1),		FANPED	67
	* BBCR3(1),RSCRV(1),SPLCLT(24,1)		FANPED	68
	DIMENSION SPL(24),ANGLES(1),XSF(1)		FANPED	69
	DIMENSION CNI(3)		FANPED	70
C			FANPED	71
	DATA CNI/1.0,3.0,4.0/		FANPED	72
	DATA NANGLE/17/,NFREQ/24/		FANPED	73
C			FANPED	74
C			FANPED	75
C			FANPED	76
C			FANPED	77
C			FANPED	78
C	TEST FOR INLET FAN NOISE OR FOR AFT FAN NOISE		FANPED	79
C			FANPED	80
	IGV=0		FANPED	81
	DELTLT=0.		FANPED	82
	DELTLB=0.		FANPED	83
	ACON=C.		FANPED	84
	IF(ILEVEL.NE.0) ACON=-4C.		FANPED	85
C			FANPED	86
	IF(ICODE.LE.0) GO TO 5C		FANPED	87
C			FANPED	88
C	INLET FAN NOISE		FANPED	89
C			FANPED	90
	SF=20.0		FANPED	91
	IF(NIGV.NE.0) IGV=1		FANPED	92
	GC TO 100		FANPED	93
C			FANPED	94
C	AFT FAN NOISE		FANPED	95
C			FANPED	96
	5C SF=10.0		FANPED	97
	IF(NIGV.NE.0) IGV=2		FANPED	98
C			FANPED	99
C			FANPED	100
	IF(NI.GT.3) GO TO 10C		FANPED	101
	IF(NI.LE.0) GO TO 10C		FANPED	102
	IF(BPR.GE.10.0) GC TO 10C		FANPED	103
	IF(BPR.LE.0.5) DELTLT=-7.8		FANPED	104
	IF(DELTLT.EQ.C.C) DELTLT=B.C*ALOG10(BPR/10.0)		FANPED	105
	DELTLT=DELTLT/CNI(NI)		FANPED	106
	DETLTB=DELTLT*0.5		FANPED	107
C			FANPED	108
C	CALCULATE THE ENGINE SIZE CORRECTION.		FANPED	109
C			FANPED	110
	10C SF=SF*ALOG10(DIAM)		FANPED	111
	ALGFPR=ALOG10(FPR-1.0)		FANPED	112
C			FANPED	113
C	CALCULATE THE BASIC NCISE		FANPED	114
			FANPED	115

C	IX=2	FANPED	116
	NUM=DTCR1(1)	FANPED	117
	IY=NUM+IX	FANPED	118
	DT=TBLU1(ALGFPR,DTCR1(IX),DTCR1(IY),1,NUM)	FANPED	119
	IF(NIGV.NE.0) GO TO 105	FANPED	120
	IF(ICLDE.LE.0) GO TO 105	FANPED	121
	IF(FPRCRT.GE.FPR) GO TO 105	FANPED	122
C	ALGCR1=ALOG10(FPRCRT-1.0)	FANPED	123
	CT=TBLU1(ALGCR1,DTCR1(IX),DTCR1(IY),1,NUM)	FANPED	124
	CT=DT-30.56*(ALGFPR-ALGCR1)	FANPED	125
C	105 DT=DT+SF+DELTLT+DELTA	FANPED	126
	NUM=BBCH1(1)	FANPED	127
	IY=NUM+IX	FANPED	128
	BB=SF+DELT1B+TBLU1(ALGFPR,BBCH1(IX),BBCH1(IY),1,NUM)	FANPED	129
C		FANPED	130
C	CALCULATE THE ROTOR-SLATCH SPACING CONNECTION.	FANPED	131
C		FANPED	132
	ALGRSS=ALOG10(RSS)	FANPED	133
	I2=2	FANPED	134
	NUM=RSCR1(I2-1)	FANPED	135
	IY=NUM+I2	FANPED	136
	RSSDT=TBLU1(ALGRSS,RSCR1(I2),RSCR1(IY),1,NUM)	FANPED	137
	I2=NUM*2+I2+1	FANPED	138
	NUM=RSCR1(I2-1)	FANPED	139
	IY=NUM+I2	FANPED	140
	RSSBB=TBLU1(ALGRSS,RSCR1(I2),RSCR1(IY),1,NUM)	FANPED	141
	DT=DT+RSSDT	FANPED	142
	IF(IGV.EQ.1) DT=DT-0.0	FANPED	143
	BB=BB+RSSBB	FANPED	144
	IF(IGV.EQ.2) BB=BB+3.	FANPED	145
	GO 210 J=1,NANGLE	FANPED	146
C		FANPED	147
C	IDENTIFY BANDS WITH DISCRETE TONES	FANPED	148
C		FANPED	149
	DO 110 I=1,NFREQ	FANPED	150
110	SPL(I)=0.0	FANPED	151
C		FANPED	152
	FREQ=FBPF	FANPED	153
	IF(IQUP.NE.0) FREQ=FREQ/XSF(J)	FANPED	154
	I1=BANDLM(1)/FREQ	FANPED	155
	IF(I1.LE.0) I1=1	FANPED	156
	I2=BANDLM(25)/FREQ	FANPED	157
	IF(I2.LE.0) GO TO 145	FANPED	158
C		FANPED	159
	DO 140 I=I1,I2	FANPED	160
	FREQ=I	FANPED	161
	FREQ=FBPF*FREQ	FANPED	162
	IF(IQUP.NE.0) FREQ=FREQ/XSF(J)	FANPED	163
	IF(FREQ.LT.BANDLM(I)) GO TO 140	FANPED	164
	DO 120 K=1,NFREQ	FANPED	165
	IBAND=K	FANPED	166
	IF(FREQ.LE.BANDLM(K+1)) GO TO 130	FANPED	167
120	CONTINUE	FANPED	168
	GO TO 145	FANPED	169
		FANPED	170
		FANPED	171
		FANPED	172

130	VALUE= -1	FANPEC	173
	VALUE= 3.0*VALUE	FANPEC	174
	IF((I. Q.1).AND.(IGV.NE.C)) VALLE=VALUE+6.	FANPEC	175
	SPL(IB ND)=PWRSUM(SPL(IBAND),DT+VALUE)	FANPEC	176
140	CONTIN E	FANPEC	177
C		FANPEC	178
C	IDENTI Y THE REFERENCE BAND FOR BROADBAND NOISE	FANPEC	179
C		FANPEC	180
145	FREQ=F PF*2.0	FANPEC	181
	IF(IDO .NE.0) FREQ=FREQ/XSF(J)	FANPEC	182
155	AN=10. *ALOG10(FREQ/10000.0)+24.0	FANPEC	183
C		FANPEC	184
C	CALCULATE THE BASIC SPECTRUM	FANPEC	185
C		FANPEC	186
160	DO 200 I=1,NFREQ	FANPEC	187
	DTFREQ SPL(I)	FANPEC	188
	IF(ILE EL.NE.0) DTFREQ=DTFREQ-40.0*ALOG10(XSF(J))	FANPEC	189
	BAND=I	FANPEC	190
	BAND=B ND-AN	FANPEC	191
	BBFREQ BAND	FANPEC	192
	IF(BAN .GT.0.0) BBFREQ=-2.0*BAND	FANPEC	193
	BBFREQ BBFREQ+BB	FANPEC	194
	BBFREQ BBFREQ+ACON*ALOG10(XSF(J))	FANPEC	195
C		FANPEC	196
C	GENERA E TABLE OF NOISE COMPONENTS	FANPEC	197
C		FANPEC	198
	NUM=DT R3(1)	FANPEC	199
	IY=NUM IX	FANPEC	200
	DTDATA DTFREQ+TBLU1(ANGLES(J),DTCR3(IX),DTCR3(IY),1,NUM)	FANPEC	201
	NLM=BB R3(1)	FANPEC	202
	IY=NUM IX	FANPEC	203
	BBDATA BBFREQ+TBLU1(ANGLES(J),BBCR3(IX),BBCR3(IY),1,NUM)	FANPEC	204
	SPLTMP PWRSUM(BBDATA,DTDATA)	FANPEC	205
	SPLOUT I,J)=PWRSUM(SPLTMP,SPLCLT(I,J))	FANPEC	206
200	CONTIN E	FANPEC	207
210	CONTIN E	FANPEC	208
	RETURN	FANPEC	209
	END	FANPEC	210

C	ROUTINE TO SOLVE FLIGHT PATH SEGMENT GEOMETRY POINTS FOR CALCULATING NOISE EXTRAPOLATION CORRECTIONS.	FLTGEC	2
C		FLTGEC	3
C		FLTGEC	4
C		FLTGEC	5
C		FLTGEC	6
C		FLTGEC	7
C		FLTGEC	8
C	CONSTANTS USED IN INTERNAL CALCULATIONS	FLTGEC	9
C		FLTGEC	10
C	COMMON /GCONST/ IN,IO,I11,I12,FC,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	FLTGEC	11
C	* IO,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,P001,	FLTGEC	12
C	* EPS,LNDEF,BL,ICC,CFR,RPC,ETA(17),M1,FM1,I17,A,PI	FLTGEC	13
C		FLTGEC	14
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	FLTGEC	15
C		FLTGEC	16
C	COMMON /GCOMMON/ NCF,NK,BCF(24),TSFL(24,10,17),SPLT(24,17),	FLTGEC	17
C	* BUF(25),RETA(17),SPL2(17),TGAGR(24),CLPSF(17)	FLTGEC	18
C		FLTGEC	19
C	FREQUENCY BANDS USED BY PROGRAM	FLTGEC	20
C		FLTGEC	21
C	COMMON /GFREQ/ CFREQ(24),UFREQ(25),PFREQ(24)	FLTGEC	22
C		FLTGEC	23
C	GENERAL INPUT PARAMETERS	FLTGEC	24
C		FLTGEC	25
C	COMMON /GPRAM/ ZO,ZR,GRAD,AMALH,L,SLDIST(10),ITENG,IUNIT	FLTGEC	26
C	* ,ISITRM,IAFMGS,IAIK,LAIRAE(24),NTEMP,TEMP(50),TALT(50)	FLTGEC	27
C	* ,NPRES,PRES(50),PALT(50),NHLAID,RALT(50),RHUMID(50),CTEMP	FLTGEC	28
C	* ,CPRES,CRHUMD,IEGA,IGUR,DTEMP,CPRES,CHUMID,XKN,AC,FLD(50),	FLTGEC	29
C	* ZNR(50),ZNI(50),LINECT,MAXLIN,IPAGE,BCG,TCG,FLR,AALT,EPE	FLTGEC	30
C		FLTGEC	31
C	AIRCRAFT-OBSERVER GEOMETRY CALCULATIONS	FLTGEC	32
C		FLTGEC	33
C	COMMON /GECMO/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	FLTGEC	34
C	* B1(10,17),B2(10,17),TDS(17,10),TPC(17,10),IRR(10,17)	FLTGEC	35
C	* ,APF,TP,RHP,APD,TO,RHC,CA,CZ,ISP(17,10),CCV	FLTGEC	36
C		FLTGEC	37
C	CONVERSION CONSTANTS	FLTGEC	38
C		FLTGEC	39
C	INPUTS:-	FLTGEC	40
C	A) I=NSLD NUMBER OF SIDELINE POINTS ON WHICH CALCULATIONS ARE	FLTGEC	41
C	TO BE BASED -MAXIMUM OF 10	FLTGEC	42
C	SLDIST(1-10) SIDELINE DISTANCE BETWEEN FLIGHT TRACK AND OBSERVER	FLTGEC	43
C	ON THE GROUND.	FLTGEC	44
C	ZO = ALTP .. AIRCRAFT HEIGHT ABOVE THE GROUND WHEN AT (Y=0).	FLTGEC	45
C	*RESTRICTION* 0. .LE. ZR .LE. ZO	FLTGEC	46
C	ZR =ALTR ... OBSERVER HEIGHT ABOVE THE GROUND	FLTGEC	47
C	*RESTRICTION* 0. .LE. ZO	FLTGEC	48
C	GRAD=SLOPE.. CLIMB GRADIENT FOR (Z ZO, ZR).	FLTGEC	49
C		FLTGEC	50
C	OUTPUTS:-	FLTGEC	51
C	EACH OUTPUT ARRAY CONSIST OF A MAXIMUM OF 170 ELEMENTS(10 SIDELINE	FLTGEC	52
C	POINTS TIMES 17 ANGLES)	FLTGEC	53
C	APY(10,17).. AIRCRAFT COORDINATE IN DIRECTION OF FLIGHT PATH	FLTGEC	54
C	PROJECTION ON THE GROUND.	FLTGEC	55
C	APZ(10,17).. AIRCRAFT VERTICAL COORDINATE ABOVE THE GROUND.	FLTGEC	56
C	PD(10,17)... DISTANCE FOR SOUND PROPAGATION.	FLTGEC	57
C	DPND(10,17) RELATIVE INCREASE IN PATH LENGTH FOR GROUND REFLECTED.	FLTGEC	58

C		SIGNAL, I.E. $DPA = CP / P$	FLTGED	59
C	B1(10,17) ...	ANGLE OF INCIDENCE IN RADIAN OF GROUND REFLECTED	FLTGED	60
C		SIGNAL RELATIVE TO GRAZING INCIDENCE.	FLTGED	61
C	B2(10,17) ...	ELEVATION ANGLE IN RADIAN USED IN EXTRA-GROUND-	FLTGED	62
C		ATTENUATION FORMULA.	FLTGED	63
C	IKK(10,17) ..	ERROR CODE	FLTGED	64
C		RR = -1 FOR PD= C AND NOISE LEVELS ARE TO BE SET TO	FLTGED	65
C		PLUS INFINITY.	FLTGED	66
C		= 0 FOR NO ERROR DETECTED	FLTGED	67
C		= 1 FOR NO SOLUTION AND NOISE LEVELS ARE TO BE	FLTGED	68
C		SET TO INDEFINITE.	FLTGED	69
C			FLTGED	70
C	REMARKS		FLTGED	71
C	1) OBSERVER COORDINATES ARE (C, C, ZR)		FLTGED	72
C	2) AIRCRAFT COORDINATES ARE (X, Y, Z) EXCEPT WHEN AT THE VISUAL		FLTGED	73
C	OVERHEAD REFERENCE (X, 0, ZC).		FLTGED	74
C	3) Z .GE. ZR. IF AN INITIAL CALCULATION SHOWS THAT Z .LT. ZR,		FLTGED	75
C	Z WILL BE SET TO ZR AND THE CLIMB GRADIENT WILL BE TREATED AS		FLTGED	76
C	IF IT WERE ZERO.		FLTGED	77
C			FLTGED	78
	ZRZ=ZR+HALT		FLTGED	79
	ZCZ=ZC+HALT		FLTGED	80
	CALL ATMOSEP(ZRZ,APP,TP,RHP)		FLTGED	81
	CALL ATMOSEP(ZCZ,APG,TC,RHC)		FLTGED	82
	CZ=A*SQRT(TC)		FLTGED	83
	COV=A*SQRT(TP)		FLTGED	84
	CA=P5*(Z+COV)		FLTGED	85
	VO=CZ*ACH		FLTGED	86
	DO 200 J=11,117		FLTGED	87
	DO 200 I=11,L		FLTGED	88
	S2T = F1 + GRAD*GRAD		FLTGED	89
	CT = F1 / SQRT(S2T)		FLTGED	90
	S2T = (GRAD*GRAD) / S2T		FLTGED	91
	X=SLDIS(I)		FLTGED	92
	XS = X		FLTGED	93
	ZNO = ZO - ZR		FLTGED	94
	IEC=IC		FLTGED	95
	Y = -P * ZNO * S2T		FLTGED	96
	A1 = ETA(J)		FLTGED	97
	SA1 = SIN(A1)		FLTGED	98
	T = A*SA1		FLTGED	99
	IF (T - EPS) 120, 120, 10		FLTGED	100
10	IF (AP (T - F1) - EPS) 25, 20, 20		FLTGED	101
20	TA1 = TAN(A1)		FLTGED	102
	Y = Y - CT * SQRT(XS + (ZNO*CT)*(ZNO*CT)) / TA1		FLTGED	103
25	ZN = NO + Y * GRAD		FLTGED	104
	IF (Z - 100, 30, 30		FLTGED	105
30	ZNS = ZN*ZN		FLTGED	106
	PS = S + Y*Y + ZNS		FLTGED	107
	P = SQRT(PS)		FLTGED	108
	Z = Z + ZR		FLTGED	109
	IF (P - 40, 160, 40		FLTGED	110
40	R = -P * Z * ZR / PS		FLTGED	111
	IF (AP (R) - RPD) 50, 50, 50		FLTGED	112
50	UPN = SQRT(F1 - R) - F1		FLTGED	113
	GO TO 60		FLTGED	114
60	FK = 0		FLTGED	115

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      BK = -PS * R
      DPN = BK
70  FK = FK + F1
      FTK = FK + FK
      BK = R * BK * (FTK - F1) / FTK
      DPN = DPN + BK
      IF (ABS(BK) - EPS*ABS(DPN)) 80, 80, 70
80  ZNP = Z + ZR
      B1(I,J) = ATAN2(ABS(ZNP), SQRT(PS-ZNS))*CPR
      B2(I,J) = ASIN(ABS(ZN / P))*DPR
90  IRR(I,J) = IEC
      APY(I,J) = Y
      APZ(I,J) = Z
      PD(I,J) = P
      DPN(I,J) = DPN
      GO TO 1000
100 ZN = F0
      Y = F0
      IF (ABS(T - F1) - EPS) 30, 110, 110
110 Y = -X / TA1
      IF (ABS(GRAD) .LT. EPS) GO TO 30
      T = -ZN0 / GRAD
      IF (ABS(T) .GT. ABS(Y)) Y = T
      GO TO 30
120 ZN = F0
      Y = F0
      IF (ABS(X) - EPS) 130, 130, 150
130 IF (ABS(GRAD) - EPS) 30, 140, 140
140 Y = -ZN0 / GRAD
      GO TO 30
150 IEC = I1
      GO TO 90
160 IEC = M1
      GO TO 90
1000 CONTINUE
      IF(VG)1800,1700,1800
1700 TPD(J,I)=UNDEF
      TSP(J,I)=UNDEF
      TDS(J,I)=UNDEF
      GO TO 2000
1800 DZ=APZ(I,J)-Z0
      DS=SIGN(SQRT(APY(I,J)*APY(I,J)+DZ*DZ),APY(I,J))
      TDS(J,I)=DS/VC
      TPD(J,I)=PD(I,J)/CA+TDS(J,I)
      TSP(J,I)=PD(I,J)/CA
      IF(J.EQ.I1) GO TO 1820
      TSP(J,I)=TSP(J,I)+ABS(DSL-DS)/VC
      GO TO 1830
1820 DSL=DS
1830 CONTINUE
2000 CONTINUE
      RETURN
      END

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FLTGEO 116
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FLTGEO 165
FLTGEO 166
FLTGEO 167
FLTGEO 168

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SUBROUTINE FOTCNT(X,Y,VNOISE,FPATH,AREA,NP,NL,NDIM,TITLE)		FOTCNT	2
C		FOTCNT	3
C		FOTCNT	4
C	AUTHOR K.D. JOHNSON	FOTCNT	5
C	PURPOSE TO PLOT NOISE FOOTPRINT CONTOURS WITHIN A SPECIFIED	FOTCNT	6
C	PLOT AREA WITH COORDINATE TRANSFORMATION SUCH THAT	FOTCNT	7
C	X GRAPH = Y PLOTTER	FOTCNT	8
C	Y GRAPH = X PLOTTER	FOTCNT	9
C		FOTCNT	10
C	METHOD SCALE X-VERTICAL AND Y-HORIZONTAL TO UNITS/CM	FOTCNT	11
C	DRAW CONTINUOUS CONTOURS IF POINT TO POINT PROJECTION	FOTCNT	12
C	REMAINS IN PLOT AREA. AXIS ARE DRAWN TO INTERSECT	FOTCNT	13
C	AT POINT (0,0).	FOTCNT	14
C		FOTCNT	15
C	INPUTS X ARRAY OF VERTICAL PLOT COORDINATES	FOTCNT	16
C	X(NP,LR,NL) WHERE LR=1(RIGHT),LR=2(LEFT)	FOTCNT	17
C	OF FLIGHT PATH	FOTCNT	18
C	Y ARRAY OF HORIZONTAL PLOT COORDINATES	FOTCNT	19
C	VNOISE ARRAY OF NOISE LEVEL VALUES	FOTCNT	20
C	AREA ARRAY OF AREAS UNDER CONTOURS	FOTCNT	21
C	FPATH ARRAY OF FLIGHT PATH COORDINATES	FOTCNT	22
C	NP NUMBER OF DATA POINTS EACH SIDE OF CONTOUR	FOTCNT	23
C	NL NUMBER OF NOISE LEVEL CONTOURS	FOTCNT	24
C	NDIM TOTAL LENGTH OF X,Y,FPATH FIRST DIMENSION	FOTCNT	25
C		FOTCNT	26
C	DIMENSIONS FOR INPUT ARRAYS	FOTCNT	27
C		FOTCNT	28
C	DIMENSION TEMP(200)	FOTCNT	29
C	DIMENSION X(NDIM,2,5),Y(NDIM,2,5),AREA(5),VNOISE(5),FPATH(NDIM,2)	FOTCNT	30
C		FOTCNT	31
C	360	FOTCNT	32
C	COMMON /PLT/ SCALV,YLENM,XLENM,CFFIN ,LABELX(10),LABELY(10),	FOTCNT	33
C	1 AXUNIT,NLABEL(2),SCALC,IWRITE	FOTCNT	34
C	DIMENSION XY(4,2),TITLE(18)	FOTCNT	35
C		FOTCNT	36
C	COMMON /PLT/ SCALV,YLENM,XLENM,CFFIN ,LABELX(4),LABELY(4),	FOTCNT	37
C	1 AXUNIT,NLABEL(1),SCALC,IWRITE	FOTCNT	38
C	DIMENSION XY(4,2),TITLE(8)	FOTCNT	39
C	SCALV MAY BE SET BY USER. IF NOT SCALV WILL BE COMPUTED	FOTCNT	40
C	YLENM,XLENM MUST BE SET TO MAXIMUM OVERALL PLOT DIMENSIONS (IN DIMITS)	FOTCNT	41
C	EQUIVALENCE (X1,XY(1,1)),(X2,XY(2,1)),(X3,XY(3,1)),(X4,XY(4,1)),	FOTCNT	42
C	1 (Y1,XY(1,2)),(Y2,XY(2,2)),(Y3,XY(3,2)),(Y4,XY(4,2))	FOTCNT	43
C	INTEGER BLANK,AXUNIT	FOTCNT	44
C	INTEGER UP,DOWN	FOTCNT	45
C	LOGICAL IWRITE	FOTCNT	46
C	DATA ZERO/0.0/	FOTCNT	47
C	DATA BLANK/4H / ,BLANK/4H /	FOTCNT	48
C	DATA RADIAN/57.29577/	FOTCNT	49
C		FOTCNT	50
C	INITIALIZE	FOTCNT	51
C	UP=3	FOTCNT	52
C	DOWN=2	FOTCNT	53
C	DELT=0.	FOTCNT	54
C	XMIN=10.E10	FOTCNT	55
C	YMIN=10.E10	FOTCNT	56
C	SCALU=SCALV	FOTCNT	57
C	SET BORDERS IN CENTIMETERS	FOTCNT	58

*55X,25HT00 SMALL CR TIC LARGE TIC/55X,27HPRODUCE COMPREHENSIVE PLOT	FOTCNT	116
*S)	FOTCNT	117
DELTV=SCALL	FOTCNT	118
C	FOTCNT	119
C XMON-YMIN MUST BE IN WHOLE CM INCREMENTS	FOTCNT	120
XMIN=FLOAT(IFIX((XMIN-DELTV)/DELTV))*DELTV	FOTCNT	121
YMIN=FLOAT(IFIX((YMIN-DELTV)/DELTV))*DELTV	FOTCNT	122
C	FOTCNT	123
31 XMAX=DELTV*XLEN+ XMIN	FOTCNT	124
YMAX=DELTV*YLEN+ YMIN	FOTCNT	125
WRITE(6,1005) AXUNIT,XMIN,XMAX,YMIN,YMAX	FOTCNT	126
1005 FORMAT(1H0,39X,17HPLOT BOUNDARIES (,A4,1H),8X,11PX MINIMUM =	FOTCNT	127
*1PE10.3/70X,11HX MAXIMUM =,E10.3/70X,11HY MINIMUM =,E10.3/70X,	FOTCNT	128
*11HY MAXIMUM = ,E10.3)	FOTCNT	129
C	FOTCNT	130
C IF WRITE FLAG ON PRINT CONTOURS	FOTCNT	131
C	FOTCNT	132
IF(IWRITE) GO TO 35	FOTCNT	133
DO 32 I=1,NL	FOTCNT	134
WRITE(6,1006) TITLE	FOTCNT	135
C 360	FOTCNT	136
C1006 FORMAT(1H1,29X,18A4)	FOTCNT	137
1006 FORMAT(1H1,29X,8A10)	FOTCNT	138
WRITE(6,1002) VNCISE(I),NLABEL,AXUNIT	FOTCNT	139
C 360	FOTCNT	140
C1002 FORMAT(1HC,48X,11HCONTCUR AT ,F5.0,1X,2A4,1X,2HIN,1X,A4//	FOTCNT	141
1002 FORMAT(1H0,50X,F5.0,1X,A8,11HCONTCUR IN ,A4//	FOTCNT	142
1 41X,4HLEFT,33X,5HRIGHT)	FOTCNT	143
WRITE(6,1003) (X(J,1,1),Y(J,1,1),X(J,2,1),Y(J,2,1),J=1,NP)	FOTCNT	144
1003 FORMAT(26X,1PE13.3,3X,E13.3,10X,2E16.3)	FOTCNT	145
WRITE(6,1004) ARFA(I),AXUNIT	FOTCNT	146
1004 FORMAT(///40X,28HTOTAL AREA WITHIN CONTCUR = ,1PE11.4,5H SQ. ,A4)	FOTCNT	147
32 CONTINUE	FOTCNT	148
C	FOTCNT	149
C POSITION PLOTTER	FOTCNT	150
C	FOTCNT	151
35 YP=1./CMPIN	FOTCNT	152
CALL PLOT(0.,-10.,-3)	FOTCNT	153
CALL PLOT(0.,YP,-3)	FOTCNT	154
XP=SIDE/CMPIN	FOTCNT	155
YP=BOTTOM/CMPIN	FOTCNT	156
CALL PLOT(XP,YP,-3)	FOTCNT	157
C PLOT AND LABEL AXIS WITH CM TIC MARKS	FOTCNT	158
C Y AXIS TO CROSS X AXIS AT (0,0)	FOTCNT	159
DELCM=DELTV*CMPIN	FOTCNT	160
XP=ZERO	FOTCNT	161
YP=ZERO	FOTCNT	162
IF(XMIN.GE.ZERO)GO TO 40	FOTCNT	163
YP=-XMIN/DELTV	FOTCNT	164
40 YMOVIN=YP/CMPIN	FOTCNT	165
C PLOT Y AXIS	FOTCNT	166
C	FOTCNT	167
C 360	FOTCNT	168
C I=10	FOTCNT	169
I=4	FOTCNT	170
42 IF(LABELY(I).NE.BLANK)GO TO 44	FOTCNT	171
I=I-1	FOTCNT	172

```

      GC TO 42
C 380
C44  NC=I*4
44   NC=I*10
      CALL CMAXIS(0., YP ,LABELY,-NC ,YLEN,0.0,YMIN,DELTV)
C
C
C X AXIS TO CROSS Y AXIS AT (0,0)
      YP=ZERC
      IF(YMIN.GE.ZERO)GC TO 45
      XP= -YMIN/DELTV
45   XMOVIN=XP/CMPIIN
C
C PLOT X AXIS
C     I=10
      I=4
46   IF(LABELX(I).NE.BLANK)GC TO 48
      I=I-1
      GC TO 46
C 360
C48  NC=I*4
48   NC=I*10
      CALL CMAXIS(XP,C.,LABELX,NC,XLEN,90.,XMIN,DELTV)
C
C START PLOTTING CONTROLS
C
C INITIALIZE
      L=0
50   L=L+1
      IGO=0
      IF(L.GT.NL)GC TO 100
      ISIDE=1
      IBEG=1
      IEND=NP
      IPEN=UP
      INC=1
60   J=IBEG
      IGO=IGO+1
61   XP=X(J,ISIDE,L)
      YP=Y(J,ISIDE,L)
C
C DO NOT PLOT POINT IF OUT OF RANGE
C
      IF((XP.LT.XMIN).OR.XP.GT.XMAX).OR.(YP.LT.YMIN.OR.YP.GT.YMAX))
1    GC TO 75
      IF(IPEN.EQ.DOWN) GC TO 64
      IF(IJ.EQ.IBEG) GC TO 64
C POINT IN RANGE BUT PREVIOUS POINT WAS OUT
C IF NOT FIRST POINT MOVE PEN TO BORDER AND PLOT TO POINT WITH PEN DOWN
C
      XA=XL
      YA=YL
610  XLIM=ZERO
      YLIM=ZERO
      IF(XA.LT.XMIN) XLIM=XMIN
      IF(XA.GT.XMAX) XLIM=XMAX
      IF(YA.LT.YMIN) YLIM=YMIN

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FOTCNT 173
FOTCNT 174
FOTCNT 175
FOTCNT 176
FOTCNT 177
FOTCNT 178
FOTCNT 179
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FOTCNT 222
FOTCNT 223
FOTCNT 224
FOTCNT 225
FOTCNT 226
FOTCNT 227
FOTCNT 228
FOTCNT 229

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      IF(YA.GT.YMAX) YLIM=YMAX
C
C  FIND POINT AT WHICH CONTOUR INTERSECTS PLOT BORDER
C
      X1=XLIM
      X2=XLIM
      Y1=YLIM
      Y2=YLIM
      IF(XLIM.NE.ZERO) GO TO 62
      X1=XMIN
      X2=XMAX
62    IF(YLIM.NE.ZERO) GO TO 63
      Y1=YMIN
      Y2=YMAX
63    CALL INTRCP(XY,XO,YO,IERR)
      IF(IERR.GT.0) GO TO 62C
      XO=(XO-XMIN)/DELCM
      YO=(YO-YMIN)/DELCM
C
C  MOVE PEN TO BORDER INTERSECT WITH PEN IN CURRENT POSITION
C
      CALL PLOT(YO,XO,IPEN)
620  IF(IPEN.EQ.UP) GO TO 63C
C  PEN WAS DOWN - RAISE PEN - SKIP OUT OF RANGE POINT
C
640  IPEN=LP
      XL=XP
      YL=YP
      GO TO 65
C
C  PEN WAS UP - GO PLOT FROM BORDER TO POINT
C
630  IPEN=DOWN
C
C  SCALE TO CM AND CONVERT TO PLOT INCHES
C
64    XL=XP
      YL=YP
      XP=(XP-XMIN)/DELCM
      YP=(YP-YMIN)/DELCM
      CALL PLOT(YP,XP,IPEN)
      IPEN=DOWN
65    J=J+INC
      IF(J.GT.0.AND.J.LE.NP) GO TO 61
C
C  PLOT CONTOURS RIGHT TO LEFT, LEFT TO RIGHT TO MAXIMIZE PLOTTER
C  EFFICIENCY
C
      GC TO(71,72,73,50),IGC
71    IBEG=NP
      IEND=1
      ISIDE=2
      INC=-1
      GO TO 80
72    IBEG=1
      IEND=NP
      ISIDE=2
      INC=1

```

FOTCNT	230
FOTCNT	231
FOTCNT	232
FOTCNT	233
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FOTCNT	274
FOTCNT	275
FOTCNT	276
FOTCNT	277
FOTCNT	278
FOTCNT	279
FOTCNT	280
FOTCNT	281
FOTCNT	282
FOTCNT	283
FOTCNT	284
FOTCNT	285
FOTCNT	286

```

      IPEN=UP
      L=L+1
      IF(L.GT.NL)GO TO 100
      GC TO 60
73    IBEG=NP
      IEND=1
      ISIDE=1
      INC=-1
      GO TO 80
75    IF(IPEN.EQ. UP ) GC TO 640
C     CURRENT POINT OUT OF RANGE - LAST POINT IN
C     PLOT TO BORDER WITH PEN DOWN
C
      XA=XP
      YA=YP
      GO TO 610
80    IF(IPEN.EQ.UP) GC TO 60
      IPEN=UP
      IF(XP.EQ.X(IBEG,ISIDE,L)/DELCM.AND.YP.EQ.Y(IBEG,ISIDE,L)/DELCM)
1     IPEN=DOWN
      GC TO 60
C
C     ALL NOISE LEVELS PLOTTED
C
C     PLOT FLIGHT PATH AS SERIES OF ARROW HEADS POINTING IN DIRECTION
C     OF FLIGHT
C
100   XL= ZERO
      YL=.0001
      DO 120 I=1,NP
      XP=FPATH(I,1)
      YP=FPATH(I,2)
      IF((XP.LT.XMIN.OR.XP.GT.XMAX).OR.(YP.LT.YMIN.OR.YP.GT.YMAX))
100   GO TO 110
      A=XP-XL
      B=YP-YL
      THETA=ASIN(A/SQRT(A**2+B**2))*RADIANS
      IF(B.GE.ZERO) THETA=THETA-90.
      XPP=(YP-YMIN)/DELCM
      YPP=(XP-XMIN)/DELCM
      CALL SYMBOL(XPP,YPP,.04,IARROW,THETA,-1)
110   XL=XP
      YL=YP
120   CONTINUE
C
C     DRAW TITLE AT TOP OF PAGE
C
      XP=(XLN+1.)/CMPIN
C 360
C
      I=18
      I=8
125   IF(TITLE(I).NE.BLNK) GC TO 130
      I=I-1
      IF(I.LE.0) GO TO 130
      GO TO 125
130   IF(I.EQ.0) GO TO 135
C 360

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FOTCNT 287
FOTCNT 288
FOTCNT 289
FOTCNT 290
FOTCNT 291
FOTCNT 292
FOTCNT 293
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FOTCNT 338
FOTCNT 339
FOTCNT 340
FOTCNT 341
FOTCNT 342
FOTCNT 343

```

```

C      I=I*4
      I=I*10
      YP = .5 * (YLEN / CMPIN - .16 * FLOAT(I))
      CALL SYMBOL(YP,XP,.16,TITLE,C.0,1)
135  CONTINUE

```

```

C
C LABEL CONTOURS AT 1/3 TOTAL RANGE ON LEFT SIDE
C

```

```

      IP= NP/3
      DO 150 I=1,NL
      FPN= VNOISE(I)
      XP=(Y(IP,2,I)-YMIN)/DELCM
      YP=(X(IP,2,I)-XMIN)/DELCM
      CALL NUMBER(XP,YP,CHRHT,FPN,C.0,-1)
      XP = XP + CHRHT * FLCAT(MCHAR(FPN))
      CALL SYMBOL(XP,YP,CHRHT,ALABEL,0.0,8)
150  CONTINUE

```

```

C
C DRAW LEGEND
C ALL PEN MOVEMENTS COMPUTED IN INCHES
C

```

```

      XL=YLEN/CMPIN-2.
      YP=-CHRHT
      CALL SYMBOL(XL,YP,CHRHT,7HCONTCLR,0.0,7)
      XP=XL+1.1
      CALL SYMBOL(XP,YP,CHRHT,4HAREA,0.0,4)
      YP=YP-.15
      CALL SYMBOL(XL,YP,CHRHT,ALABEL,0.0,8)
      XP=XL+1.0
      CALL SYMBOL(XP,YP,CHRHT,3HSQ.,0.0,3)
      XP=XL+1.4
      CALL SYMBOL(XP,YP,CHRHT,AXUNIT,0.0,4)
      DO 175 I=1,NL
      FPN=VNOISE(I)
      XP = XL + .4 - CHRHT * FLCAT(MCHAR(FPN))
      YP=YP-.20
      CALL NUMBER(XP,YP,CHRHT,FPN,C.0,-1)
      FPN=AREA(I)
      IP=MCHAR(FPN)-1
      FPN=FPN/10.**IP
      XP=XL+ 1.0
      CALL NUMBER(XP,YP,CHRHT,FPN,C.0,3)
      XP = XP + 5. * CHRHT
      CALL SYMBOL(XP,YP,CHRHT,1HE,0.0,1)
      XP=XP+CHRHT
      FPN=IP
      CALL NUMBER(XP,YP,CHRHT,FPN,0.0,-1)
175  CONTINUE

```

```

C
C DRAW SCALE ANNOTATION IN FAR RIGHT CORNER

```

```

      XP=XL
      YP=YP-.25
      CALL SYMBOL(XP,YP,CHRHT,11HSCALE=1 CM/ ,0.0,11)
      NC=MCHAR(DELTIV)+1
      XP=XL+11.*CHRHT
      CALL NUMBER(XP,YP,CHRHT,DELTIV,C.0,-1)
      XP = XP + CHRHT * FLOAT(NC)

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FOTCNT	344
FOTCNT	345
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FOTCNT	391
FOTCNT	392
FOTCNT	393
FOTCNT	394
FOTCNT	395
FOTCNT	396
FOTCNT	397
FOTCNT	398
FOTCNT	399
FOTCNT	400

```

      CALL SYMBOL(XP,YP,CHRRF,AXUNIT,C.C,4)
C
C PAGE UP PAPER
C ALLOW 2 INCHES BETWEEN PLOTS
C
      XP=(YLEN+SIDE)/CMPIN+.2.
      YP=      -BOTTM/CMPIN
      CALL PLOT(XP,YP,-3)
      RETURN
      END

```

```

FLTCNT 401
FOTCNT 402
FOTCNT 403
FOTCNT 404
FOTCNT 405
FOTCNT 406
FOTCNT 407
FOTCNT 408
FOTCNT 409
FOTCNT 410

```

	SUBROUTINE FTPRT(N,DATN,N4,D1,D2,D3,D4,IMCDE,NLN)	FTPRT	2
C	PURPOSE TO PREPARE A NOISE CONTOUR SCHEME WITH PARAMETERS	FTPRT	3
C	ENGINE PRESSURE RATIO, OFF AXIS RANGE, NOISE LEVEL AND ELEVATION.	FTPRT	4
C		FTPRT	5
C	NLS STARTING NOISE CONTOUR	FTPRT	6
C	NLF LAST NOISE CONTOUR TO BE EXAMINED	FTPRT	7
C	METHOD THE DATA IS READ IN AND CONVERTED TO A FUNCTION	FTPRT	8
C	LOG(RC)=FUN(EPR,Z,NL) ARRANGED INTO TABLES OF LOG(RC) VALUES	FTPRT	9
C	FOR EACH SPECIFIC NOISE LEVEL TO BE EXAMINED. THEN FOR EACH	FTPRT	10
C	SET OF FLIGHT PARAMETERS, TABLE LOOK UP ROUTINES ARE USED TO GET	FTPRT	11
C	THE VALUE OF LOG(RC) FOR EACH NOISE LEVEL. THE X, Y AND	FTPRT	12
C	DIFFERENTIAL AREA CAN THEN BE CALCULATED FROM ONE POINT TO	FTPRT	13
C	THE SUCCESSIVE POINT AND STORED AS A SUM FOR EACH NOISE LEVEL.	FTPRT	14
	COMMON/VALNL/NLST,NLFT	FTPRT	15
	COMMON/SIZE/NLRO,NALFA	FTPRT	16
	COMMON/COUNT/NEPR,NL	FTPRT	17
	COMMON/CONTNT/AEPR(6),ALRO(9),AALFA(6)	FTPRT	18
	DIMENSION X1(5),X2(5),Y1(5),Y2(5),SUM(5)	FTPRT	19
	DIMENSION SLNL(3)	FTPRT	20
	DIMENSION DATN(1),D1(1),D2(1),D3(1),D4(1)	FTPRT	21
	CALL DATAIN(N,DATN,N4,D1,D2,D3,D4,IMCDE)	FTPRT	22
	IF(IMODE.NE.-1) GO TO 1000	FTPRT	23
	NLS=NLST	FTPRT	24
	NLF=NLFT	FTPRT	25
	CALL VDIM(D1,D2,NEPR,NL,NLRO,NALFA,NLS,NLF)	FTPRT	26
	RETURN	FTPRT	27
1000	CONTINUE	FTPRT	28
C	DATIN READS IN THE APPROPRIATE DATA VIA DATA STATEMENTS THEN	FTPRT	29
C	SORTS AND FINDS THE DISTINCT VALUES OF THE INPUTS FROM THE 187	FTPRT	30
	CALL DRIVES(D1,D2,X1,X2,Y1,Y2,SLN,SLNL,IMCDE)	FTPRT	31
C	DRIVER IS A TEMPORARY SUBROUTINE TO SIMULATE THE OUTPUT OF THE	FTPRT	32
C	SIMULATOR BY SUPPLYING SAMPLE FLIGHT COORDINATES	FTPRT	33
	RETURN	FTPRT	34
	END	FTPRT	35

	COMPLEX FUNCTION FW(W)	FW	2
C		FW	3
C	COMPUTES BOUNDARY LOSS FACTOR	FW	4
C		FW	5
	COMPLEX W, X, A, S	FW	6
	DIMENSION XP(2), AP(2), SP(2)	FW	7
	REAL K	FW	8
	DOUBLE PRECISION AA(2), SS(2), T1, T2, T	FW	9
	EQUIVALENCE (XP(1),X), (AP(1),A), (SP(1),S)	FW	10
	DATA ZERO,ONE,P5,EPS,PI,T1 /C.,1.,-.5,1.2E-7 ,3.1415926535898,1/	FW	11
	K = ZERO	FW	12
	X = W	FW	13
	XX = XP(1)*XP(1) + XP(2)*XP(2)	FW	14
	IF (XX - 100.) 100, 200, 200	FW	15
C		FW	16
C	SERIES FORM NO.1, ARG MAG .LT. 10.	FW	17
100	AA(1) = ONE	FW	18
	AA(2) = ZERO	FW	19
	SS(1) = ONE	FW	20
	SS(2) = ZERO	FW	21
101	K = K + ONE	FW	22
	T = K + K	FW	23
	T = (T - ONE) / ((T + ONE) * K)	FW	24
	T1 = AA(1)	FW	25
	T2 = AA(2)	FW	26
	AA(1) = T * (T1 * XP(1) - T2 * XP(2))	FW	27
	AA(2) = T * (T1 * XP(2) + T2 * XP(1))	FW	28
	AP(1) = AA(1)	FW	29
	AP(2) = AA(2)	FW	30
	SS(1) = SS(1) + AA(1)	FW	31
	SS(2) = SS(2) + AA(2)	FW	32
	SP(1) = SS(1)	FW	33
	SP(2) = SS(2)	FW	34
	AX = ABS(AP(1)) + ABS(AP(2))	FW	35
	SX = ABS(SP(1)) + ABS(SP(2))	FW	36
	IF (AX - EPS * SX) 102, 102, 101	FW	37
102	FW = ONE - CEXP(-X) * ((X+X) * 5 - (0.,1.) * CSQRT(PI * X))	FW	38
	GO TO 300	FW	39
C		FW	40
C	CONTINUED FRACTION FORM NO.2, ARG MAG .GE. 10.	FW	41
200	A = P5 / (X - 2.5 - 3. / (X - 4.5 - 7.5 / (X - 6.5 - 10.803 / (X - 4.269))))	FW	42
	FW = (P5 + A) / (X + P5 + A)	FW	43
300	RETURN	FW	44
	END	FW	45

SUBROUTINE GRDRFX(F,NFB,ITCNE,R,DRN,BO,CO,KN,ND,LDF,ZNR,ZNI,DSPL)		GRDRFX	2
C		GRDRFX	3
C	ROUTINE TO COMPUTE GROUND REFLECTION CORRECTIONS (DSPL) TO BE ADDED	GKDRFX	4
C	TO FREE-FIELD ACOUSTIC SPECTRA IN ORDER TO OBTAIN THE EFFECT OF A	GRDRFX	5
C	REFLECTING GROUND PLANE. (11 MAY 1972 BY D.G. DUNN)	GKCRFX	6
C		GRDRFX	7
C	REFERENCE	GP RFX	8
C	1) P.B. GUNCLEY, /PROPAGATION OF JET ENGINE NOISE NEAR A POROUS	GRDRFX	9
C	SURFACE/, JOURNAL OF SOUND AND VIBRATION, VOL13, C1970, PP27-35.	GRDRFX	10
C	2) D.G. DUNN, /COMPUTER MODULE FOR GROUND REFLECTION EFFECTS/,	GRDRFX	11
C	BOEING COORDINATION SHEET ANS-RES-F-321, MAY 1972	GKDRFX	12
C		GRDRFX	13
C	INPUTS	GKCRFX	14
C	1) F ... ARRAY OF FREQUENCIES (HZ) TO BE USED IN THE CALCULA-	GRDRFX	15
C	TION. *RESTRICTION* F .GT. ZERO AND IF (ITCNE .LE. 0)	GKDRFX	16
C	THE CORRECTIONS ARE ASSUMED TO APPLY TO BROAD-BAND,	GRDRFX	17
C	CONSTANT-PERCENTAGE-BAND SPECTRA. THE VALUES FOR (F)	GRDRFX	18
C	ARE THE GEOMETRIC-MEAN FREQUENCIES FOR THE PASS BANDS,	GRDRFX	19
C	POSITIVE (NON-ZERO), AND ORDERED IN MONOTONIC INCREA-	GKCRFX	20
C	SING VALUE.	GRDRFX	21
C	2) NFB ... NUMBER OF FREQUENCIES OR LEVELS TO BE CORRECTED.	GRDRFX	22
C	*RESTRICTION* IF (ITCNE .GT. 0) NFB .GE. 1, OTHERWISE	GKDRFX	23
C	NFB .GE. 2	GKDRFX	24
C	3) ITCNE ... INDICATOR TO SPECIFY THE TYPE OF SPECTRA.	GKDRFX	25
C	ITCNE .LT. 0 FOR BROAD-BAND, CONSTANT-PERCENTAGE-BAND	GRDRFX	26
C	SPECTRA INTEGRAL EQUATION 88 OF REF.2	GKCRFX	27
C	ITCNE .EQ. 0 FOR SAME EXCEPT USE APPROXIMATION EQ.8C	GKDRFX	28
C	ITCNE .GT. 0 FOR TONES OR POWER SPECTRAL DENSITY	GRDRFX	29
C	TYPE LEVELS. SEE EQ.8A OF REF.2	GKCRFX	30
C		GRDRFX	31
C	4) R ... DISTANCE FOR PROPAGATION (DIRECT PATH) IN FEET.	GRDRFX	32
C	5) DRN ... RELATIVE PATH LENGTH DIFFERENCE FOR REFLECTED SIGNAL,	GKCRFX	33
C	IF. DRN = DR/R	GKDRFX	34
C	6) BO ... INCIDENT ANGLE FOR REFLECTED SIGNAL IN DEGREES.	GRDRFX	35
C		GRDRFX	36
C	INPUTS VIA COMMON BLOCK /BLK98/	GRDRFX	37
C	7) CO ... SPEED OF SOUND (FT/SEC) OVER PROPAGATION PATHS.	GKDRFX	38
C	8) KN ... MAGNITUDE OF WAVE NUMBER RATIO, IE. KN = AUS(K1/K0),	GKCRFX	39
C	K0 = 2*PI * F / CO, K1 = K0 * (A + 1/3) FOR GROUND.	GRDRFX	40
C	*RESTRICTION* KN .GT. 0.	GKDRFX	41
C	9) ND ... NUMBER OF DATA POINTS FOR THE GROUNDS NORMALIZED-	GKDRFX	42
C	COMPLEX IMPEDANCE CURVE.	GRDRFX	43
C	*RESTRICTION* 3 .LE. ND .LE. 50	GKCRFX	44
C	10) LDF ... ARRAY OF VALUES, LCG10(F), FOR THE IMPEDANCE DATA	GKCRFX	45
C	CURVE, Z1/Z0 VERSUS LCG10(F).	GKDRFX	46
C	11) ZNR ... ARRAY OF DIMENSIONLESS IMPEDANCE VALUES (REAL PART)	GRDRFX	47
C	FOR THE DATA CURVE, IE. ZNR=RE(Z1/Z0)	GRDRFX	48
C	*RESTRICTION* ZNR .GE. ZERO	GRDRFX	49
C	12) ZNI ... SAME EXCEPT THE IMAGINARY PARTS, IE. ZNI=IM(Z1/Z0)	GKDRFX	50
C		GRDRFX	51
C	OUTPUT	GKDRFX	52
C	13 DSPL ... ARRAY OF SPL CORRECTIONS. (DB)	GKCRFX	53
C		GKDRFX	54
C	REMARKS	GKDRFX	55
C	1) REQUIRES ROUTINES- DPSD, FM, CFCLAR, TELUI, TERPI, SEARCH	GKCRFX	56
C		GRDRFX	57
C		GKCRFX	58

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DOUBLE PRECISION S1, S2
REAL KN, LDF
DIMENSION F(1), DSPL(1), AP(2)
DIMENSION LDF(1), ZNR(1), ZNI(1)
COMPLEX CPOLAR, SB1, A
COMPLEX ZN, RP, W, FX
COMMON/BLK97/ZN, RP, W, FX
EQUIVALENCE (AP(1), A)
DATA ONE, ZERO, TEN, EPS, CMEGA, RPD /1., 0., 10., 1.E-3, 750.,
* 1.745329251943E-2 /

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C

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1C SBO = BC*RPD
   CBO = COS(SBO)
   SBO = SIN(SBO)
   CBI = CBO / KN
   SBIS = ONE - CBI*CB1
   IF (SBIS) 11, 12, 12
11 SB1 = CMPLX(ZERO, -SQRT(-SBIS))
   GO TO 13
12 SB1 = CMPLX(SQRT(SBIS), ZERO)
13 IF (ITONE) 20, 20, 40
20 ETA = (F(NFB) / F(1))**(.5 / FLCAT(NFB - 1))
   IF (ITONE .GE. C) GO TO 8C
   SRF = 7.07 * (R * DRN / CO) * (ETA - ONE / ETA)
   DO 30 K = 1, NFB
   FL = F(K) / ETA
   FL = F(K) * ETA
   NSR = AMAX1(3.0, SRF * F(K)) + C.5
   N1 = NSR+NSR
   FN1 = N1
   CX = (FL - FL) / FN1
   S1 = ZERO
   N1 = N1 - 1
   DO 21 J = 1, N1, 2
   FTEM=FL+FLOAT(J)*DX
   STEM=DPSD(FTEM, SBO, CBO, SB1, A, SBIS, R, DRN, CO, KN, LDF, ZNR, ZNI, ND)
   S1=S1+STEM
21 CONTINUE
   S2 = ZERO
   N1 = N1 - 1
   DO 22 J = 2, N1, 2
   FTEM=FL+FLOAT(J)*DX
   STEM=DPSD(FTEM, SBO, CBO, SB1, A, SBIS, R, DRN, CO, KN, LDF, ZNR, ZNI, ND)
   S2=S2+STEM
22 CONTINUE
   STEM=DPSD(FL, SBO, CBO, SB1, A, SBIS, R, DRN, CO, KN, LDF, ZNR, ZNI, ND)
   FTEM=DPSD(FU, SBO, CBO, SB1, A, SBIS, R, DRN, CO, KN, LDF, ZNR, ZNI, ND)
   S = (STEM + FTEM + 4.0C*S1 + S2+S2) / (3. * FN1)
   DSPL(K) = TEN * ALCG1C(S)
3C CONTINUE
   GO TO 10C
4C DO 7C K = 1, NFB
   S = DPSD(F(K), SBO, CBO, SB1, A, SBIS, R, DRN, CO, KN, LDF, ZNR, ZNI, ND)
   IF (S) 5C, 5C, 6C
5C DSPL(K) = -OMEGA
   GO TO 7C
6C DSPL(K) = TEN * ALCG10(S)

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GKDRFX 59
GKDRFX 60
GKDRFX 61
GKDRFX 62
GKDRFX 63
GKDRFX 64
GKDRFX 65
GKDRFX 66
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GKDRFX 69
GKDRFX 70
GKDRFX 71
GKDRFX 72
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GKDRFX 102
GKDRFX 103
GKDRFX 104
GKDRFX 105
GKDRFX 106
GKDRFX 107
GKDRFX 108
GKDRFX 109
GKDRFX 110
GKDRFX 111
GKDRFX 112
GKDRFX 113
GKDRFX 114
GKDRFX 115

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70	CONTINUE	GRDRFX	116
	GO TO 100	GRDRFX	117
80	FU = 3.1415926535896 * R * DRN / CO	GRDRFX	118
	FL = FU * (ETA - ONE / ETA)	GRDRFX	119
	FU = FU * (ETA + ONE / ETA)	GRDRFX	120
	DO 90 K = 1,NFB	GRDRFX	121
	P1 = FL * F(K)	GRDRFX	122
	P2 = FU * F(K)	GRDRFX	123
	S = DPSD(F(K),SBO,CBC,SBI,A,SBIS,R,DRN,CO,KN,LDF,ZNR,ZN[,ND)	GRDRFX	124
	A = CPOLAR(A)	GRDRFX	125
	S = ONE+AP(1)*AP(1) + (AP(1)+AP(1)) * CCS(P2-AP(2)) * SIN(P1)/P1	GRDRFX	126
	DSPL(K) = TEN * ALOG10(S)	GRDRFX	127
C	IF(R.NE.150.)GO TO 90	GRDRFX	128
C	AP(2)=AP(2)/RPD	GRDRFX	129
C	WRITE(6,120)F(K),DSPL(K),ZN,A,RP,h,FX	GRDRFX	130
120	FORMAT(3X2F9.1,1PE11.3,9E11.3)	GRDRFX	131
90	CONTINUE	GRDRFX	132
100	RETURN	GRDRFX	133
	END	GRDRFX	134

C	SLBKOLTIME INITL	INITL	2
C	INPUT DATA BLOCKS FOR NOISE COMPCNENTS	INITL	3
C	ITYPE DEFINES THE TYPE CF NOISE COMPCNENT	INITL	4
C	ITYPE=1 PRIMARY JET	INITL	5
C	=2 PRIMARY AND SECONDARY JET	INITL	6
	COMMON/JETDAT/NJET1,MCCDEL,AP1,WFL,VFL,AS2,WS2,VS2,PR1,PA1,	INITL	7
	1 TT1,VAL,DIAMT1,ANGJT1,ICCR1	INITL	8
C	=3 CORE AND TURBINE	INITL	10
	COMMON/COREIN/TT3,PP3,CMF3,EK3,DELT3,Jd3,	INITL	11
	* ICOR3,LIN3,NTF3,IMA3,LGM3,AHL3,ICP3,ILAY3,TF3(10),	INITL	12
	* PCTA3(10),PLA3(10),ELCH3,ECH3,RLW3(10),TL3(10),CF3,FM3	INITL	13
C	=4 COMPRESSOR AND INLET FAN	INITL	14
C	=5 EXIT FAN	INITL	15
C	=6 AUGMENTER-WING JET	INITL	16
	COMMON/SWITCH/NTYPE,ITYPE,AREG,ICCF,IPRT(7),ICN(13),ALCPT	INITL	17
	COMMON/AUGWNG/GAMA6,TT6,NPR6,DELT6,AC6,DE6,	INITL	18
	* ICOR6,LIN6,NTF6,IMA6,LGM6,AHL6,ICP6,ILAY6,TF6(10),	INITL	19
	* PCTA6(10),PLA6(10),ELCH6,ECH6,RLW6(10),TL6(10),CF6,FM6	INITL	20
C	=7 BLOWN-FLAP JET	INITL	21
C	=8 EJECTOR - SUPPRESSOR JET	INITL	22
C	=9 LIFT-FAN	INITL	23
C	=10 PROPELLER	INITL	24
	COMMON/PROPIN/T10,W10,RPM10,C10,CSL010,ASUB10,B10,CELT10,	INITL	25
	*ICOR10	INITL	26
C	=11 HELICOPTER AND TILT RCTOR	INITL	27
	COMMON/COPTER/T11,Q11,RPM11,B11,CT11,AB11,CE11,RN11,	INITL	28
	1 S11,CEE11,DELT11,XLMC11,XPM11,ARTH11,LLF11,	INITL	29
	*IRR11,ICOR11	INITL	30
C		INITL	31
C	THIS ROUTINE'S FUNCTION IS TO INSURE CORRECT INITIALIZATION	INITL	32
C	BEFORE EACH DATA CASE IS STARTED	INITL	33
C	INFORMATION DESCRIBING THE DATA CASE (HEADING INFORMATION)	INITL	34
C		INITL	35
C	CONSTANTS USED IN INTERNAL CALCULATIONS	INITL	36
C		INITL	37
	COMMON /GCONST/ IN,IC,IT1,IT2,FC,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	INITL	38
	* IC,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,POOL,	INITL	39
	* EPS,UNDEF,BL,ICG,CPR,RFC,ETA(17),PI,FM1,I17,A,PI	INITL	40
C		INITL	41
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	INITL	42
C		INITL	43
	COMMON /GCOMMON/ NCF,NK,BCF(24),TSFL(24,10,17),SPLT(24,17),	INITL	44
	*BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)	INITL	45
C		INITL	46
C	FREQUENCY BANDS USED BY PROGRAM	INITL	47
C		INITL	48
	COMMON /GFREQ/ CFREQ(24),UFREQ(25),PFREQ(24)	INITL	49
C		INITL	50
C	GENEAL INPUT PARAMETERS	INITL	51
C		INITL	52
	COMMON /GPRAM/ALTP,ALTF,SLOPE,AMACH,NCBS,SLDIST(10),NTENG,IUNIT	INITL	53
	* ,ISPTRM,IATMOS,IAIR,UAIRAE(24),NTEMP,TEMP(50),TALT(50)	INITL	54
	* ,NPRES,PRES(50),PALT(50),NLMIC,RLT(50),RHUMID(50),CTEMP	INITL	55
	* ,CPRES,CRHUMD,IEGA,IGDR,CTEMP,DPRES,DHUMID,XKN,NC,FLU(50),	INITL	56
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IFAGE,BCC,TCG,FLR,AALT,FPF,ISFE	INITL	57
C		INITL	58

C	AIRCRAFT-OBSERVER GEOMETRY CLTPUTS	INITL	59
C		INITL	60
	COMMON /GEOKD/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	INITL	61
	* B1(10,17),B2(10,17),TDS(17,10),TPD(17,10),IRR(10,17)	INITL	62
	*,APP,TP,RHP,APD,TQ,RHQ,CA,CZ,TSP(17,10),COV	INITL	63
C		INITL	64
C	CONVERSION CONSTANTS	INITL	65
C		INITL	66
	COMMON/GCONVC/C(2,10),SLDISX(10)	INITL	67
	COMMON/CRSPLS/DOB(17),PSCR(17),DFB(408),NPSCR	INITL	68
C		INITL	69
	COMMON/ICPATH/NCAS,NCCF,NTYP,IC,NRA,IARRAY(2)	INITL	70
	COMMON /HEAD/ HIN(20),HOUT(20),CHIN(20)	INITL	71
	COMMON/SUMSPL/SSPL(24,10,17)	INITL	72
	REWIND 8	INITL	73
	REWIND 9	INITL	74
	REWIND 10	INITL	75
	REWIND 12	INITL	76
	DC 50 I=1,24	INITL	77
	DC 50 J=1,10	INITL	78
	DC 50 K=1,17	INITL	79
50	SSPL(I,J,K)=F0	INITL	80
	DC 100 I=1,13	INITL	81
100	ICN(I)=10	INITL	82
	ISFE = 10	INITL	83
	IF(NCAS.NE.10)GO TO 2000	INITL	84
	CEE11=24.4	INITL	85
	XMM11=2.0	INITL	86
	XLMC11=30.0	INITL	87
	RN11=C.8	INITL	88
	LLF11=2	INITL	89
	S11=5.0	INITL	90
	REWIND 20	INITL	91
	ND=3	INITL	92
	ZNR(1)=3.7	INITL	93
	ZNR(2)=3.7	INITL	94
	ZNR(3)=3.7	INITL	95
	ZNI(26)=11.7	INITL	96
	ZNI(27)=4.0	INITL	97
	ZNI(28)=-3.7	INITL	98
	FLD(26)=100.	INITL	99
	FLD(27)=1000.	INITL	100
	FLD(28)=10000.	INITL	101
	DC 200 I=1,20	INITL	102
	F IN(I)=8L	INITL	103
	HOUT(I)=8L	INITL	104
200	C F IN(I)=8L	INITL	105
	DC 300 I=1,17	INITL	106
300	WETA(I)=ETA(I)*RPD	INITL	107
	RETURN	INITL	108
2000	DC 400 J=1,17	INITL	109
400	COPSF(J)=F1	INITL	110
	RETURN	INITL	111
	END	INITL	112

SUBROUTINE INLET		INLET	
C	AUTHOR	D. F. MELDRUM	INLET 2
C			INLET 3
C	PURPOSE	TO PREDICT INLET FAN NOISE FOR THE PHASE B	INLET 4
C		NASA-AMES FOOTPRINT CONTRACT NASA-6969.	INLET 5
C			INLET 6
C	METHOD	AS DESCRIBED IN REFERENCE 1).	INLET 7
C			INLET 8
C	INPUTS	VIA LABELED COMMON FANDAT	INLET 9
C			INLET 10
C	NUMSTG	NUMBER OF FAN STAGES	INLET 11
C		1 & NUMSTG & 3	INLET 12
C	NINLET	SWITCH FOR INLET FAN NOISE	INLET 13
C		PREDICTION IF POSITIVE.	INLET 14
C	NAFT	SWITCH FOR AFT FAN NOISE	INLET 15
C		PREDICTION IF POSITIVE.	INLET 16
C	IDOPP	SWITCH FOR THE DOPPLER SHIFT	INLET 17
C		FLIGHT EFFECTS.	INLET 18
C		0 NO FLIGHT EFFECTS OR DOPPLER SHIFT.	INLET 19
C		1 DOPPLER SHIFT FOR THE FREQUENCY	INLET 20
C		CORRECTION ONLY.	INLET 21
C		2 DOPPLER SHIFT FOR THE FREQUENCY	INLET 22
C		AND LEVEL CORRECTION.	INLET 23
C	NB(I)	NUMBER OF FAN BLADES FOR EACH STAGE	INLET 24
C		WHERE 1 & I & NUMSTG	INLET 25
C	FPR(I)	FAN PRESSURE RATIO	INLET 26
C	DIAM(I)	FAN INLET DIAMETER (INLET ONLY) FT	INLET 27
C	RSS(I)	MINIMUM ROTOR/STATOR SPACING PERCENT	INLET 28
C	AREA(I)	FAN DISCHARGE AREA (AFT ONLY) FT*FT	INLET 29
C	RNI	ROTOR SPEED RPM	INLET 30
C	RTS	RELATIVE TIP MACH NUMBER OF THE	INLET 31
C		FIRST STAGE WITHOUT INLET GUIDE	INLET 32
C		VANES (IGV). IF LESS THAN 1	INLET 33
C		IGV WILL BE ASSUMED FOR THE FIRST	INLET 34
C		STAGE (INLET FAN ONLY).	INLET 35
C	CRTEPR	FAN PRESSURE RATIO FOR THE	INLET 36
C		RELATIVE TIP MACH NUMBER OF	INLET 37
C		1.025 (INLET FAN ONLY)	INLET 38
C	ANGFAN	ENGINE INCLINATION ANGLE	INLET 39
C			INLET 40
C		VIA LABELED COMMON SWITCH	INLET 41
C			INLET 42
C	NUMENG	NUMBER OF NOISE SOURCES OF THE SAME	INLET 43
C		NOISE TYPE.	INLET 44
C			INLET 45
C		VIA LABELED COMMON COMMON	INLET 46
C			INLET 47
C	NCF	1/3 OCTAVE OF FULL OCTAVE SWITCH	INLET 48
C		OR NUMBER OF FREQUENCY BANDS (8 OR 24)	INLET 49
C	RETA(24)	DIRECTIVITY ANGLES	INLET 50
C			INLET 51
C		VIA LABELED COMMON GPRAM	INLET 52
C			INLET 53
C	AMACH	MACH NUMBER OF THE AIRCRAFT	INLET 54
C	NOBS	NUMBER OF OBSERVER POSITIONS	INLET 55
C			INLET 56
C			INLET 57
C		VIA LABELED COMMON SLMSP	INLET 58

C			INLET	59
C			INLET	60
C	SSPL	CURRENT TCTAL PREDICTED NOISE FOR NCF	INLET	61
C		(8 OR 24) FREQUENCIES, AT NCBS OBSERVER	INLET	62
C		POSITIONS FOR 17 DIRECTIVITY ANGLES.	INLET	63
C		VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES	INLET	64
C			INLET	65
C	PSI	17 DIRECTIVITY ANGLES FOR EACH OF	INLET	66
C		NCBS OBSERVER POSITIONS.	INLET	67
C	PSIO	17 DIRECTIVITY ANGLE PROJECTIONS FOR	INLET	68
C		EACH OF NCBS OBSERVER POSITIONS	INLET	69
C	BETA	ELEVATION ANGLE PROJECTION FOR EACH	INLET	70
C		OF NCBS OBSERVER POSITIONS.	INLET	71
C			INLET	72
C		EACH COMPONENT IS WRITTEN ON TAPE OR FILE 10	INLET	73
C		FOR EACH OF NCF BANDS FOR EACH OF NCBS OBSERVER	INLET	74
C		POSITIONS.	INLET	75
C			INLET	76
C	OUTPUTS	VIA LABELED COMMON SLMSPL	INLET	77
C			INLET	78
C	SSPL	CURRENT TCTAL PREDICTED NOISE FOR	INLET	79
C		8 OR 24 FREQUENCIES, AT NCBS OBSERVER	INLET	80
C		POSITIONS FOR 17 DIRECTIVITY ANGLES.	INLET	81
C			INLET	82
C		VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES	INLET	83
C			INLET	84
C	PSI	17 DIRECTIVITY ANGLES FOR EACH OF	INLET	85
C		NCBS OBSERVER POSITIONS.	INLET	86
C	PSIO	17 DIRECTIVITY ANGLE PROJECTIONS FOR	INLET	87
C		EACH OF NCBS OBSERVER POSITIONS	INLET	88
C	BETA	ELEVATION ANGLE PROJECTION FOR EACH	INLET	89
C		OF NCBS OBSERVER POSITIONS.	INLET	90
C			INLET	91
C			INLET	92
C	REFERENCES	1) R. J. SAXBY, NASA-AMES FCCTPRINT CONTRACT	INLET	93
C		NAS2-6969 FAX NOISE MODULE, UN-NUMBERED	INLET	94
C		COORDINATION SHEET, DATED 19 JANUARY 1973.	INLET	95
C			INLET	96
C	FUNCTION SUBPRGM	CCS ESHLEC PHRSUM	INLET	97
C			INLET	98
C	SUBROUTINES	ANGLES LNIT FANCS ZERO	INLET	99
C			INLET	100
C			INLET	101
C			INLET	102
C			INLET	103
C			INLET	104
C			INLET	105
C		COMMON /FANDAT/ NLMSTG, NINLET, NAFT, IDCPP, NB(3), FPR(3),	INLET	106
C		* DIAM(3), RSS(3), AREA(3), RN1, RTS, CRTFPR, ANGFA,	INLET	107
C		* N15, BPR5, ICOR4, LIN4, NTF4, IMA4, LGM4, NNL4, ICP4, ILAY4, TF4(10),	INLET	108
C		* PCTA4(10), PLA4(10), ELOH4, EDH4, R1W4(10), TL4(10), CF4, FM4,	INLET	109
C		* ICOR5, LIN5, NTF5, IMA5, LGM5, NNL5, ICP5, ILAY5, TF5(10),	INLET	110
C		* PCTA5(10), PLA5(10), ELCH5, EDH5, R1W5(10), TL5(10), CF5, FM5	INLET	111
C		COMMON/SWITCH/NTYPE, ITYPE, NENG, IDC, IPRT(7), ION(13), ALLPT	INLET	112
C		*, INSEOW(3), INSHLD	INLET	113
C		CCONSTANTS USED IN INTERNAL CALCULATIONS	INLET	114
C			INLET	115

	COMMON /GCONST/ IN,IO,IT1,IT2,F0,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	INLET	116
	* IO,II,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,POOL,	INLET	117
	* EPS,UNDEF,BL,ICC,CPR,RPD,ETA(17),M1,FMI,I17,A,PI	INLET	118
C		INLET	119
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	INLET	120
C		INLET	121
	COMMON /GCOMMON/ NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),	INLET	122
	*BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)	INLET	123
	COMMON/SUMSPL/SSPL(24,10,17)	INLET	124
	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	INLET	125
C		INLET	126
C	FREQUENCY BANDS USED BY PROGRAM	INLET	127
C		INLET	128
	COMMON /GFREQ/ CFREQ(24),UFREQ(25),PFREQ(24)	INLET	129
C		INLET	130
C	GENERAL INPUT PARAMETERS	INLET	131
	COMMON/ANGLE/PSI(17,10),PSIG(17,10),BETA(17,10)	INLET	132
C		INLET	133
	COMMON /GPRAM/ALTP,ALTR,SLOPE ANACH,NCBS,SLDIST(10),ITENG,IUNIT	INLET	134
	* ,ISPTRM,IATMOS,IAIR,CAIRAB(2),ATEMP,TEMP(50),TALT(50)	INLET	135
	* ,NPRES,PRES(50),PALT(50),NLMIC,RALT(50),RHUMIC(50),CTEMP	INLET	136
	* ,CPRES,CRHUMD,IEGA,IGOR,CTEMP,CPRES,DHUMIC,XKN,NL,FLO(50),	INLET	137
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IFAGE,BGG,TCG,FLA,AALT,PPF	INLET	138
C		INLET	139
C	AIRCRAFT-OBSERVER GEOMETRY CLTPLES	INLET	140
C		INLET	141
	COMMON /GEOMG/ APY(10,17),APZ(10,17),PD(10,17),CPND(10,17),	INLET	142
	* B1(10,17),B2(10,17),TDS(17,10),TFD(17,10),IRR(10,17)	INLET	143
	* ,APP,TP,RHP,APG,IG,RHC,CA,CZ,TSF(17,10),CCV	INLET	144
C		INLET	145
C	CONVERSION CONSTANTS	INLET	146
C		INLET	147
	COMMON/GCONVC/C(2,10),SLDISX(10)	INLET	148
	COMMON/TMSPL/SPZ(24,17),IB(2,3,13)	INLET	149
	COMMON/UNSHLD/USPLA(19),FSI(19),NUSPL,INUSP	INLET	150
	COMMON/CRSPLS/DOH(17),PSCR(17),DPB(408),NFSCH	INLET	151
	COMMON/HEAD/HIN(20),HOUT(20),LHIN(20)	INLET	152
C		INLET	153
C		INLET	154
C		INLET	155
	ICN(4)=ICN(4)+1	INLET	156
C		INLET	157
C		INLET	158
	DELTA=ANGFAN*KPD	INLET	159
	CALL ANGLES(NOBS,DELTA)	INLET	160
C		INLET	161
C		INLET	162
C	LOOP FOR THE NUMBER OF OBSERVER POSITIONS	INLET	163
C		INLET	164
	FBNP = FLOAT(NB(1)) * RN1 / 60.	INLET	165
C		INLET	166
C	TEST FOR SHIELDING AND EXIT TO PRINT OUT WING	INLET	167
C	SHIELDING DATA ONCE FOR ALL SIDELINE POSITIONS	INLET	168
	IF(INSHLD.NE.0)CALL WSHOUT(IPRT(7),10,ITYPE,USPLA,NUSPL,FSI,INUSP)	INLET	169
40	DO 1000 M=1,NOBS	INLET	170
	CALL LINGCR(SPZ(1,1),INA4,LGM4,ELCH4,EDH4,NwL4,Rlw4,TL4,	INLET	171
	* ILAY4,FM4,IDP4,PSI(1,M),ACF,BCF,PLA4,	INLET	172

C	* CF4,PCTA4,NTF4,TF4,DOPSF,SPL2,ICOR4,IB(1,1,ITYPE),LIN4,FBPF)	INLET	173
C	CALL ZERO(SPLT,408)	INLET	174
C		INLET	175
C		INLET	176
C		INLET	177
C	CALCULATE THE INLET FAN NOISE PREDICTION	INLET	178
C		INLET	179
C	CALL FANNOS(DOPSF, PSI(1,M),SPLT(1,1),IDCP,NUMSTG,1,0,NB,FPR,	INLET	180
C	* DIAM,RSS,AREA,RN1,RTS,CRTFPR,0.0,BPR5,NI5)	INLET	181
C		INLET	182
C		INLET	183
C	45 CONTINUE	INLET	184
C		INLET	185
C	CCNVERT TO A UNIT OR INDEXED SPECTRA	INLET	186
C		INLET	187
C	CALL UNIT(150.,17,SPLT(1,1))	INLET	188
C	ENG=NENG	INLET	189
C	IF(ENG.LE.0.0) ENG=1.0	INLET	190
C	ELVANG=90.0	INLET	191
C	DANGLE=-45.0	INLET	192
C	ENS=ESHLDG(DANGLE,ELVANG,ENG)	INLET	193
C	DC 50 J=1,17	INLET	194
C	DO 50 K=1,24	INLET	195
C	50 SPLT(K,J)=SPLT(K,J)-ENS	INLET	196
C	IF(NCF.EQ.24) GC TC 300	INLET	197
C		INLET	198
C	CCNVERT 1/3 OCTAVE TC FULL OCTAVE	INLET	199
C		INLET	200
C	DC 200 J=1,17	INLET	201
C	DO 200 K=1,8	INLET	202
C	TMP = 0.	INLET	203
C	DC 100 L=1,3	INLET	204
C	JC = 3 * K + L - 3	INLET	205
C	100 TMP = PWRSUM(TMP, SPLT(JC,J))	INLET	206
C	200 SPLT(K,J) = TMP	INLET	207
C		INLET	208
C		INLET	209
C	ADD TC CURRENT TOTAL AND WRITE ON TAPE 10	INLET	210
C		INLET	211
C		INLET	212
C	300 DC 400 J=1,NCF	INLET	213
C	DO 400 K=1,17	INLET	214
C	400 SPLT(J,K)=SPLT(J,K)-SPZ(J,K)	INLET	215
C		INLET	216
C	IF(INSHLD.NE.0)CALL SHLDSP(AMACH,ALTR,ISPTRM,CZ,SLDISX,M,	INLET	217
C	*APY,APZ,DOPSF,SPLT,NCF,BCF,SPZ,PSI,ITYPE,ANGFAN,XX)	INLET	218
C		INLET	219
C	DC 405 J=1,NCF	INLET	220
C	DO 405 K=1,17	INLET	221
C	405 SSPL(J,M,K)=PWRSUM(SSPL(J,M,K),SPLT(J,K))	INLET	222
C	IF(IPRT(7).NE.7)GC TC 410	INLET	223
C	CALL NOISO(IPRT(7),M,NK,10,CHIA,ILNIT,SLDISX(M),PFREQ,SPLT(1,1),	INLET	224
C	* NCF,ITYPE)	INLET	225
C	410 CCNTINUE	INLET	226
C	DO 360 JC=1,NCF	INLET	227
C	DC 360 KC=1,17	INLET	228
C		INLET	229

```

360  SPLT(JC,KC)=SPLT(JC,KC)-TSPL(JC,M,KC)
      CALL PNLSUB(SPLT(1,1),PSPL(1,M),TFD(1,M),EPNL(1,M),SPL2,
*TEPNL(1,M),NK,UCG,TCG,FLR,M,ALBS,IRR(M,1))
      IF(IPRT(3).NE.3)GO TO 1000
      CALL NOISC(IPRT(3),M,NK,12,CHIN,ILNIT,SLCISX(M),PFREQ,
*   SPLT(1,1),NCF,ITYPE)
C
C
C
1000 CONTINUE
      RETURN
      END

```

```

INLET  230
INLET  231
INLET  232
INLET  233
INLET  234
INLET  235
INLET  236
INLET  237
INLET  238
INLET  239
INLET  240
INLET  241

```

C	SUBROUTINE INPUTG	INPUTG	2
C	CONSTANTS USED IN INTERNAL CALCULATIONS	INPUTG	3
C	COMMON /GCONST/ IN, I0, IT1, IT2, FC, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10,	INPUTG	4
	* I0, I1, I2, I3, I4, I5, I6, I7, I8, I9, I10, P1, P33, P5, P001,	INPUTG	5
	* EPS, UNDEF, BL, ICG, DPR, RFD, ETA(17), M1, FM1, I17, A, PI	INPUTG	6
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	INPUTG	7
C	COMMON /GCOMMON/ NCF, NK, BCF(24), TSFL(24, 10, 17), SPLT(24, 17),	INPUTG	8
C	* BUF(25), RETA(17), SPL2(17), TGAGR(24), CCPSF(17)	INPUTG	9
C	FREQUENCY BANDS USED BY PROGRAM	INPUTG	10
C	COMMON /GFREQ/ CFREQ(24), UFREQ(25), PFREQ(24)	INPUTG	11
	COMMON /SUMSPL/ SSPL(24, 10, 17)	INPUTG	12
	COMMON /PNLD/ PSPL(17, 20), EPAL(5, 10), TEPAL(5, 10)	INPUTG	13
	COMMON /ANGLE/ PSI(17, 10), PSIO(17, 10), BETA(17, 10)	INPUTG	14
C	GENERAL INPUT PARAMETERS	INPUTG	15
C	COMMON /GPRAM/ ALTP, ALTR, SLOPE, AMACH, NCBS, SLDIST(10), NTENG, IUNIT	INPUTG	16
	* , ISPTRM, IATMOS, IAIR, LAIRAB(24), NTEMP, TEMP(50), TALT(50)	INPUTG	17
	* , NPRES, PRES(50), PALT(50), ARLMID, RALT(50), RHUMID(50), CTEMP	INPUTG	18
	* , CPRES, CRHUMD, IECA, IGOR, DTEMP, DPRES, DHUMID, XKN, ND, FLL(50),	INPUTG	19
	* ZNR(50), ZNL(50), LINECT, MAXLIN, IPAGE, BCG, TCG, FLR, AALT, EPP, ISFE	INPUTG	20
C	WING SHIELDING, JET REFRACTION EMPIRICISMS AND CONDITIONS	INPUTG	21
C	COMMON /REFRAC/ EMJ, TSTSO, IWED(3), FASS(24), TETA(24), CPSIG(24), NASRG,	INPUTG	22
	* ASF, IWSFE	INPUTG	23
	DIMENSION FLD(25), ZNI(25)	INPUTG	24
	EQUIVALENCE (FLD(1), FLL(26)), (ZNI(1), ZNL(26))	INPUTG	25
C	AIRCRAFT-OBSERVER GEOMETRY CALCULS	INPUTG	26
C	COMMON /GEOMC/ APY(10, 17), APZ(10, 17), PC(10, 17), DPND(10, 17),	INPUTG	27
	* B1(10, 17), B2(10, 17), TDS(17, 10), TFD(17, 10), IRR(10, 17)	INPUTG	28
	* , APP, TP, RHP, APC, TC, RHC, CA, CZ, TSF(17, 10), CCV	INPUTG	29
C	CONVERSION CONSTANTS	INPUTG	30
C	COMMON /GCONVC/ C(2, 10), SLDISX(10)	INPUTG	31
	COMMON /CRSPLS/ DGB(17), PSCR(17), CFB(408), NPSCR	INPUTG	32
	COMMON /ICPATH/ NCAS, NCOF, NTYP, IC, NNA, IARRAY(2)	INPUTG	33
	COMMON /SWITCH/ NTYPE, ITYPE, NENG, IDCP, IPRT(7), ICN(13), ILCPT	INPUTG	34
	* , INSECH(3), INSHLD	INPUTG	35
C	COMMON /HEAD/ HIN(20), HCLT(20), CHIN(20)	INPUTG	36
	DIMENSION IOUT(7)	INPUTG	37
	DATA ALTPG, ALTGG/2*G./	INPUTG	38
	NAMLIST /GDATA/ ALTPG, ALTGG, SLOPE, AMACH, NCBS, SLDIST, NTENG, IUNIT,	INPUTG	39
	* ISPTRM, IATMOS, IAIR, LAIRAB, NTEMP, TEMP, TALT, NLGPT, ISFE,	INPUTG	40
	* NPRES, PRES, PALT, ARLMID, RALT, RHUMID, CTEMP, INSECH,	INPUTG	41
	* CPRES, CRHUMD, IECA, IGOR, DTEMP, DPRES, DHUMID, XKN, ND, FLD,	INPUTG	42
	* ZNR, ZNI, LINECT, MAXLIN, IPAGE, BCG, TCG, FLR, AALT, EPP, IDCP, IOUT	INPUTG	43
C	READ IN CASE HEADING CARD UP TO EC CLETS - ONE CARD AS FIRST INPUT	INPUTG	44
		INPUTG	45
		INPUTG	46
		INPUTG	47
		INPUTG	48
		INPUTG	49
		INPUTG	50
		INPUTG	51
		INPUTG	52
		INPUTG	53
		INPUTG	54
		INPUTG	55
		INPUTG	56
		INPUTG	57
		INPUTG	58

C	EACH CASE - SUCCEEDING CASE CARDS MAYBE BLANK IF INITIAL HEADING IS	INPUTG	59
C	THROUGHOUT RUN	INPUTG	60
C360	READ(IN,1000,END=200)HIN	INPUTG	61
	READ(IN,1000)HIN	INPUTG	62
	IF (EOF(IN)) 200, 100	INPUTG	63
100	CONTINUE	INPUTG	64
	IF(NCAS .EQ. 10)GO TO 25	INPUTG	65
	IF(HIN(11).EQ.BL.AND.HIN(12).EQ.BL.AND.HIN(9).	INPUTG	66
1	EQ.BL.AND.HIN(10).EQ.BL.AND.HIN(12).EQ.BL)GO TO 60	INPUTG	67
25	CONTINUE	INPUTG	68
	DO 50 I=11,20	INPUTG	69
50	HCUT(I)=HIN(I)	INPUTG	70
60	CONTINUE	INPUTG	71
C	READ IN DATA FOR GENERAL DESCRIPTION OF CASE	INPUTG	72
	READ(IN,GDATA)	INPUTG	73
	IWSFE = ISFE	INPUTG	74
	ALTP=ALTPG	INPUTG	75
	ALTR=ALTRG	INPUTG	76
C	ADD PRINT REPORTS INDICATOR VALUES TO NAMELIST GDATA AND COMMON	INPUTG	77
C	BLOCK SWITCH	INPUTG	78
C	THERE ARE 7 DIFFERENT REPORTS AVAILABLE AS OPTIONS PLUS A DEFAULT	INPUTG	79
C	OPTION. THESE REPORTS MAY BE REQUESTED BY INPUTTING VALUES 1 THRU	INPUTG	80
C	7 INTO A 7 ELEMENT ARRAY ICUT IN ANY ORDER OR ANY SUBSET DURING	INPUTG	81
C	THE INITIALIZATION PHASE OF INPLT. I.E. ICUT(1)=5,7,4,2	INPUTG	82
C	IN THE ABOVE EXAMPLE 4 TYPES OF REPORTS WOULD BE GENERATED	INPUTG	83
C	THE FOLLOWING ARE THE 7 TYPES OF REPORTS INDICATED BY A PARTICULAR	INPUTG	84
C	VALUE	INPUTG	85
C	=1 TOTAL NOISE AT SIDELINE DISTANCES PLUS NOISE TIME HISTORY	INPUTG	86
C	=2 ASSUMPTIONS ON WHICH THE PREDICTION IS BASED	INPUTG	87
C	=3 NOISE AT SIDELINE DISTANCES PER COMPONENT	INPUTG	88
C	=4 FLIGHT PATH/OBSERVER GEOMETRY	INPUTG	89
C	=5 EXTRAPOLATION CORRECTIONS	INPUTG	90
C	=6 TOTAL FREE FIELD NOISE AT (R=1 M)	INPUTG	91
C	=7 FREE FIELD NOISE AT(R=1 M) PER COMPONENT	INPUTG	92
C	THE DEFAULT OPTION PRINTS A REPORT GIVING THE TITLE FOLLOWED	INPUTG	93
C	BY THE NOISE-TIME HISTORY FOR THE TOTAL NOISE AT EACH SIDELIN	INPUTG	94
C	PLUS (=2) THE ASSUMPTIONS	INPUTG	95
C	SET UP REPORT OPTIONS FOR PRINTOUT	INPUTG	96
	DO 125 I=11,NOBS	INPUTG	97
125	SLDISX(I)=SLDIST(I)	INPUTG	98
	DO 130 I=1,7	INPUTG	99
130	IPRT(I)=0	INPUTG	100
	IPK=0	INPUTG	101
	DO 160 I=1,7	INPUTG	102
	DO 150 J=1,7	INPUTG	103
	IF(IGLT(I).NE .J)GO TO 150	INPUTG	104
	IPRT(J)=J	INPUTG	105
	IPK=J	INPUTG	106
	GO TO 160	INPUTG	107
150	CCONTINUE	INPUTG	108
160	CONTINUE	INPUTG	109
	IF(IPK.EQ.0)IPKT(1)=8	INPUTG	110
170	CCONTINUE	INPLTG	111
C	WRITE(IT1,GDATA)	INPUTG	112
	RETURN	INPUTG	113
200	ICD=I2	INPUTG	114
	RETURN	INPUTG	115

1000 FORMAT(20A4)
END

INPUTG 116
INPUTG 117

```

      SUBROUTINE INTRCP(XY,X,Y,IERR)
C
C  AUTHOR          K.D. JOHNSON
C
C  PURPOSE         TO CALCULATE THE POINT OF INTERSECTION OF 2 LINES
C                  DEFINED BY THE SET OF COORDINATES  XY
C
C  METHOD          POINT SLOPE
C
C  INPUT          XY          COORDINATE ARRAY WHERE
C                      XY(1)-XY(2) DEFINE END POINTS OF LINE 1
C                      XY(3)-XY(4) DEFINE END POINTS OF LINE 2
C
C  OUTPUT         X          X INTERCEPT
C                  Y          Y INTERCEPT
C
C  ERROR CODE     IERR      G= INTERCEPT RETURNED
C                      1= NO INTERCEPT POSSIBLE
C
C      DIMENSION  XY(4,2)
C
C  INITIALIZE
C      IERR=0
C      X1=XY(1,1)
C      X2=XY(2,1)
C      X3=XY(3,1)
C      X4=XY(4,1)
C      Y1=XY(1,2)
C      Y2=XY(2,2)
C      Y3=XY(3,2)
C      Y4=XY(4,2)
C      SAME=.00001
C      IGO=1
C      T=X2-X1
C      IF(ABS(T).LT.SAME) GO TO 1G
C      S12=(Y2-Y1)/T
C      GO TO 12
10      IGO=2
12      T=X3-X4
C      IF(ABS(T).LT.SAME) GO TO 60
C      S34=(Y3-Y4)/T
C      IF (IGO-1) 25, 25, 50
C
C  COMPUTE INTERCEPT IF SLOPES ARE NOT EQUAL OR INFINITE
C
25      IF(ABS(S12 - S34).LT.SAME) GO TO 90
C      X= (Y4 - Y1 + S12*X1 - S34*X4)/(S12 - S34)
30      Y= S12 * (X - X1) + Y1
C      GO TO 99
C
C  COMPUTE INTERCEPT WHERE  X=X1=X2
C
50      X=X1
C      IF(ABS(X3-X4).LT.SAME) GO TO 90
C      Y= S34 * (X - X4) + Y4
C      GO TO 99
C

```

```

INTRCP      2
INTRCP      3
INTRCP      4
INTRCP      5
INTRCP      6
INTRCP      7
INTRCP      8
INTRCP      9
INTRCP     10
INTRCP     11
INTRCP     12
INTRCP     13
INTRCP     14
INTRCP     15
INTRCP     16
INTRCP     17
INTRCP     18
INTRCP     19
INTRCP     20
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INTRCP     26
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INTRCP     28
INTRCP     29
INTRCP     30
INTRCP     31
INTRCP     32
INTRCP     33
INTRCP     34
INTRCP     35
INTRCP     36
INTRCP     37
INTRCP     38
INTRCP     39
INTRCP     40
INTRCP     41
INTRCP     42
INTRCP     43
INTRCP     44
INTRCP     45
INTRCP     46
INTRCP     47
INTRCP     48
INTRCP     49
INTRCP     50
INTRCP     51
INTRCP     52
INTRCP     53
INTRCP     54
INTRCP     55
INTRCP     56
INTRCP     57
INTRCP     58

```

C COMPUTE INTERCEPT WHERE $X=X3=X4$

C

60 $X=X3$

IF(ABS(X1-X2).LT.SAME) GO TO 90

GO TO 30

C

C NO INTERCEPT POSSIBLE WITHIN REASONABLE RANGE IF EVER

C

90 IERR=1

C

99 RETURN

END

INTRCP 59

INTRCP 60

INTRCP 61

INTRCP 62

INTRCP 63

INTRCP 64

INTRCP 65

INTRCP 66

INTRCP 67

INTRCP 68

INTRCP 69

INTRCP 70

```

SUBROUTINE JBES(ARG, N, EPS, BES)
C
C ROUTINE TO CALCULATE BESSEL FUNCTIONS OF ORDERS (0 THRU N-1).
C
C *NOTE*
C ASSUMES POSITIVE ARGUMENT AND ORDER N.
  DIMENSION BES(1)
  DATA I1, I2, I3, F1, EC, E1 /1, 2, 0., 1., .C2, 5.E-3/
  X = ABS(ARG)
  IF (X - EC) 10, 40, 40
10 BES(1) = F1
  DO 20 K = 1, N
    BES(K+1) = FC
20 CONTINUE
30 GO TO 50
40 M = X
    DO 50 K = 1, 12
      MP1 = M + 11
      CALL BESJ(X, M, BES(MP1), EPS, IER)
50 M = MP1
      M = X
      IF (M) 80, 80, 60
60 DO 70 I = 1, M
      K = M + 11 - I
      BES(K) = FLAT(K) * (BES(K+1)+BES(K+1)) / X - BES(K+2)
70 CONTINUE
80 M = M + 12
      IF (M - N) 100, 90, 90
90 RETURN
100 I = -I1
      NM1 = N + 1
      S = E1 * (ABS(BES(NM1)) + ABS(BES(NM1)))
      DO 140 K = M, NM1
        KP1 = K + 11
        BES(KP1) = FLAT(K-1) * (BES(K)+BES(K)) / X - BES(K-1)
        IF (ABS(BES(KP1)) - S) 110, 130, 130
110 IF (I) 120, 150, 150
120 I = I + 11
      GO TO 140
130 I = -I1
140 CONTINUE
      GO TO 90
150 DO 160 I = KP1, NM1
      BES(I+1) = 10
160 CONTINUE
      GO TO 90
END

```

```

JBES      2
JBES      3
JBES      4
JBES      5
JBES      6
JBES      7
JBES      8
JBES      9
JBES     10
JBES     11
JBES     12
JBES     13
JBES     14
JBES     15
JBES     16
JBES     17
JBES     18
JBES     19
JBES     20
JBES     21
JBES     22
JBES     23
JBES     24
JBES     25
JBES     26
JBES     27
JBES     28
JBES     29
JBES     30
JBES     31
JBES     32
JBES     33
JBES     34
JBES     35
JBES     36
JBES     37
JBES     38
JBES     39
JBES     40
JBES     41
JBES     42
JBES     43
JBES     44
JBES     45
JBES     46
JBES     47
JBES     48

```

C	SUBROUTINE JEINT	JEINT	2
C		JEINT	3
C	PURPOSE JET/EDGE INTERACTION NOISE PREDICTION	JEINT	4
C	FOR AN ENGINE OVER WING CONFIGURATION	JEINT	5
C	THE PROCEDURE IS BASED ON THEORETICAL	JEINT	6
C	AND EMPIRICAL ANALYSIS SHOWN IN THE BEING REFERENCES	JEINT	7
C	REF. FILLER, PREDICTION SCHEME FOR ENGINE JET EXHAUST	JEINT	8
C	FLOW-WING/FLAP INTERACTION NOISE ANS-RES-670 DEC 74	JEINT	9
C	DUNN, A/C CONFIGURATION NOISE REDUCTION CONTRACT	JEINT	10
C	DOT-FA74WA-3497, PROGRESS REPORT 7 FEB 75	JEINT	11
C		JEINT	12
C	INPUT	JEINT	13
C	AJS13 JET SPREADING ANGLE (DEG). DEFAULT=5.7	JEINT	14
C	DDA13 DIMENSIONLESS DISCHARGE AREA. DEFAULT=.7854	JEINT	15
C	DDNE13 DIMENSIONLESS DISTANCE BETWEEN NOZZLE EXIT	JEINT	16
C	TO THE WING/FLAP SYSTEMS TRAILING EDGE	JEINT	17
C	DHNL13 DIMENSIONLESS NOZZLE LIP HEIGHT ABOVE WING SURFACE	JEINT	18
C	DJCL13 DIMENSIONLESS JET CORE LENGTH. DEFAULT=5.0	JEINT	19
C	EMJ13 JET MACH NUMBER	JEINT	20
C	FLAP13 NOMINAL FLAP ANGLE ANGLE OF ATTACK	JEINT	21
C	HD13 HYDRAULIC DIAMETER OF JET NOZZLE (M OR FT)	JEINT	22
C	TSR13 JET STATIC TEMPERATURE RATIO	JEINT	23
C	ICOR13 =0 INDICATES NO CONFIGURATION CORRECTIONS	JEINT	24
C	=1 CORRECTIONS ARE A FUNCTION OF DIRECTIVITY	JEINT	25
C	=2 CORRECTIONS ARE A FUNCTION OF DIRECTIVITY	JEINT	26
C	AND FREQUENCY	JEINT	27
C		JEINT	28
C	INPUT GENERAL	JEINT	29
C	ALTR OBSERVER HEIGHT ABOVE GROUND	JEINT	30
C	AMACH A/C MACH NO	JEINT	31
C	AP0 AMBIENT PRESSURE AT A/C ALTITUDE	JEINT	32
C	APY A/C COORDINATE IN DIRECTION OF FLIGHT PATH	JEINT	33
C	PROJECTED ON THE GROUND	JEINT	34
C	APZ A/C HEIGHT ABOVE GROUND	JEINT	35
C	BCF GEOMETRIC MEAN FREQUENCIES FOR SPECTRA	JEINT	36
C	CZ AMBIENT SPEED OF SOUND AT A/C ALTITUDE	JEINT	37
C	DCPSF DOPPLER SHIFT FACTOR	JEINT	38
C	ISPTM FILTER BANDWIDTH INDEX 1=FULL, IF 0=1/3 O/B SPL	JEINT	39
C	NCF NUMBER OF CENTER FREQ.	JEINT	40
C	NENG NO OF ENGINES	JEINT	41
C	NOBS NUMBER OF OBSERVER POSITIONS	JEINT	42
C	SLO1ST SIDE LINE DISTANCE	JEINT	43
C	SLOPE A/C CLIMB GRADIENT	JEINT	44
C		JEINT	45
C	OUTPUT SPLT FINAL SOUND PRESSURE LEVEL, 1/1 OR 1/3 O/B SPECTRA	JEINT	46
C	AT EACH DIRECTIVITY ANGLE POSITION, FREE FIELD R=1M	JEINT	47
C	SSPL THE SUM OF SPLT AT EACH OBSERVER POSITION	JEINT	48
C		JEINT	49
C	COMMON/JLTEDG/AJS13,DDA13,DDNE13,DHNL13,DJCL13,	JEINT	50
C	*FLAP13,HD13,EMJ13,TSR13,ICOR13	JEINT	51
C		JEINT	52
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	JEINT	53
C		JEINT	54
C	COMMON /COMMON/ NCF,NK,BCF(24),TSFL(24,10,17),SPLT(24,17),	JEINT	55
C	*BLF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)	JEINT	56
C		JEINT	57
C	COMMON/GCONVC/C(2,10),SIDISX(10)	JEINT	58

C		JEINT	59
C	GENERAL INPUT PARAMETERS	JEINT	60
C		JEINT	61
	COMMON/ANGLE/PSI(17,10)	JEINT	62
	COMMON /GPRAM/ALTP,ALTR,SLOPE,AMACH,ACBS,SLODIST(10),NTENG,IUNIT	JEINT	63
	* ,ISPTRM,IATMOS,IAIR,LAIRAB(24),AJEMP,TEMP(50),TALT(50)	JEINT	64
	* ,NPRES,PKES(50),PALT(50),AHLMIC,RALT(50),RHUMID(50),CTEMP	JEINT	65
	* ,CPRES,CRHUMD,IFGA,IGDR,DTEMP,CPRES,CHUMID,XKN,NC,FLO(50),	JEINT	66
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IFAGE,BCG,TCG,FLR,AALT,EPF	JEINT	67
C		JEINT	68
C	AIRCRAFT-OBSERVER GEOMETRY CL1PLTS	JEINT	69
C		JEINT	70
	COMMON /GEOML/ APY(10,17),APZ(10,17),PD(10,17),DPNC(10,17),	JEINT	71
	* B1(10,17),B2(10,17),TDS(17,10),TFD(17,10),IRR(10,17)	JEINT	72
	* ,APP,TP,RHP,APQ,TC,RHC,CA,CZ,TSP(17,10),CCV	JEINT	73
C		JEINT	74
	COMMON/GFREQ/CFREQ(24),UFREQ(25),FFREQ(24)	JEINT	75
C		JEINT	76
	COMMON/HEAD/HIN(20),HGLT(20),CHIN(20)	JEINT	77
C		JEINT	78
	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	JEINT	79
C		JEINT	80
	COMMON/SUMSPL/SSPL(24,10,17)	JEINT	81
C		JEINT	82
	COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCP,IPRT(7),ICN(13),ALCPT	JEINT	83
C		JEINT	84
	COMMON/TMSPL/SPZ(24,17),IB(2,3,13)	JEINT	85
C		JEINT	86
	DATA CO,PSO,HD2,DTCR/1116.4,14.696,10.76,.01745329/	JEINT	87
	ICN(13) = ICN(13) + 1	JEINT	88
C		JEINT	89
C	JETSPEED OF SOUND	JEINT	90
	CJ= CO*SQRT(TSR13)	JEINT	91
C		JEINT	92
C	JET VELOCITY	JEINT	93
	VJ=EMJ13*CJ	JEINT	94
C		JEINT	95
C	AMBIENT VELOCITY	JEINT	96
	VC=AMACH*CZ	JEINT	97
C		JEINT	98
C	REL JET VELOCITY	JEINT	99
	FLAPR=FLAP13*DTOR	JEINT	100
	ALPHA=FLAPR-ATAN(SLOPE)	JEINT	101
	VJR= SQRT(VJ*VJ-2.*VJ*VC*CCS(ALPHA)+VC*VC)	JEINT	102
C		JEINT	103
C	CHARACTERISTIC FREQUENCY	JEINT	104
	D=HD13	JEINT	105
	IF(IUNIT.EQ.C) D=3.280833*HD13	JEINT	106
	FC= VJ /D *1.8/(13.+DDNE13)	JEINT	107
C		JEINT	108
C	CHARACTERISTIC REFERENCE SOUND LEVEL	JEINT	109
C		JEINT	110
	AENG=NENG	JEINT	111
	CCZ=CO/CZ	JEINT	112
	PZPSO=APQ*APQ/(PSO*PSC)	JEINT	113
	TSOTS=1./((TSR13*TSR13)	JEINT	114
	ARO= ODA13*D*D/RQ2	JEINT	115

[illegible]

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DO 240 NF=1,NCF
DO 240 J=1,17
240 SPLT(NF,J)= SPLT(NF,J)-TSPL(NF,I,J)
CALL PNL3LB(SPLT(1,1),PSPL(1,1),IPC(1,1),EPNL(1,1),SPL2,
*TEPNL(1,1),NK,BCG,TCG,FLR,I,NCBS,IRR(1,1))
IF(IPRT(3).NE.3)GO TO 300
CALL NOISO(IPRT(3),I,NK,12,CHIN,ILN1,SLDISX(1),PFREQ,
*SPLT(1,1),NCF,ITYPE)
300 CONTINUE
RETURN
END

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JEINT 173
JEINT 174
JEINT 175
JEINT 176
JEINT 177
JEINT 178
JEINT 179
JEINT 180
JEINT 181
JEINT 182
JEINT 183

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SUBROUTINE JET			JET	2
C	AUTHOR	D. F. MELDRUM	JET	3
C			JET	4
C	PURPOSE	TO PREDICT JET NOISE FOR THE PHASE B	JET	5
C		NASA-AMES FOOTPRINT CONTRACT NAS2-6969.	JET	6
C			JET	7
C	METHOD	AS DESCRIBED IN REFERENCES 1) AND 2).	JET	8
C			JET	9
C	INPUTS	VIA LABELED COMMON JETDAT	JET	10
C			JET	11
C	NJET	CODE FOR METHOD OF JET NOISE PREDICTION	JET	12
C		0 NO JET NOISE PREDICTION	JET	13
C		1 REQUIRES AP, PR, PA, TT, AND VA	JET	14
C		2 REQUIRES WP, PR, PA, TT, AND VA	JET	15
C		3 REQUIRES AP, WP, VP, AND VA	JET	16
C		OPTIONALLY AS, VS, AND WS MAY BE INPUT	JET	17
C		FOR A BYPASS ENGINE. (REQUIRED FOR	JET	18
C		PROCESSING SECONDARY JET NOISE.)	JET	19
C		NOT 0, 1, 2, OR 3 THE DATA WILL BE	JET	20
C		INSPECTED TO DETERMINE THE PROPER	JET	21
C		METHOD. WILL BE ASSUMED TO BE	JET	22
C		3 IF PR, PA, AND TT ARE ALL ZERO, OR	JET	23
C		2 IF AP IS ZERO, OR	JET	24
C		1 IF WP IS ZERO.	JET	25
C	MCODE	CODE FOR USE OF THE STROUHAL CURVES	JET	26
C		1 FOR FLIGHT	JET	27
C		2 FOR GROUND	JET	28
C		3 FOR MIXED	JET	29
C	AP	PRIMARY JET NOZZLE AREA	FT*FT	JET
C	WP	PRIMARY JET WEIGHT FLOW	LBS/SEC	JET
C	VP	PRIMARY JET VELOCITY (REL)	FT/SEC	JET
C	AS	SECONDARY JET NOZZLE AREA	FT*FT	JET
C	WS	SECONDARY JET WEIGHT FLOW	LBS/SEC	JET
C	VS	SECONDARY JET VELOCITY (REL)	FT/SEC	JET
C	PR	NOZZLE PRESSURE RATIO (PT/PA)		JET
C	PA	AMBIENT PRESSURE	LB/FT/FT	JET
C	TT	JET TOTAL TEMPERATURE	DEG R	JET
C	VA	VELOCITY OF THE AIRCRAFT	FT/SEC	JET
C	DIAMET	EFFECTIVE DIAMETER (OPTIONAL		JET
C		INPUT FOR ALL METHODS)	FT	JET
C	ANGJET	ENGINE INCLINATION ANGLE		JET
C				JET
C				JET
C		VIA LABELED COMMON SWITCH		JET
C				JET
C	NUMENG	NUMBER OF NOISE SOURCES OF THE SAME		JET
C		NOISE TYPE.		JET
C				JET
C		VIA LABELED COMMON COMMON		JET
C				JET
C	NCF	1/3 OCTAVE OF FULL OCTAVE SWITCH		JET
C		OR NUMBER OF FREQUENCY BANDS (8 OR 24)		JET
C	RETA(24)	DIRECTIVITY ANGLES		JET
C				JET
C		VIA LABELED COMMON GPRAM		JET
C				JET
C	AMACH	MACH NUMBER OF THE AIRCRAFT		JET
C				JET

C	NOBS	NUMBER OF OBSERVER POSITIONS	JET	59
C			JET	60
C	VIA LABELED COMMON SPLSPL		JET	61
C			JET	62
C	SSPL	CURRENT TOTAL PREDICTED NOISE FOR NCF	JET	63
C		(8 OR 24) FREQUENCIES, AT NCBS OBSERVER	JET	64
C		POSITIONS FOR 17 DIRECTIVITY ANGLES.	JET	65
C			JET	66
C	VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES		JET	67
C			JET	68
C	PSI	17 DIRECTIVITY ANGLES FOR EACH OF	JET	69
C		NOBS OBSERVER POSITIONS.	JET	70
C	PSIC	17 DIRECTIVITY ANGLE PROJECTIONS FOR	JET	71
C		EACH OF NCBS OBSERVER POSITIONS	JET	72
C	BETA	ELEVATION ANGLE PROJECTION FOR EACH	JET	73
C		OF NCBS OBSERVER POSITIONS.	JET	74
C			JET	75
C		EACH COMPONENT IS WRITTEN ON TAPE OR FILE 10	JET	76
C		FOR EACH OF NCF BANDS FOR EACH OF NCBS OBSERVER	JET	77
C		POSITIONS.	JET	78
C			JET	79
C	OUTPUTS	VIA LABELED COMMON SPLSPL	JET	80
C			JET	81
C	SSPL	CURRENT TOTAL PREDICTED NOISE FOR	JET	82
C		8 OR 24 FREQUENCIES, AT NCBS OBSERVER	JET	83
C		POSITIONS FOR 17 DIRECTIVITY ANGLES.	JET	84
C			JET	85
C	VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES		JET	86
C			JET	87
C	PSI	17 DIRECTIVITY ANGLES FOR EACH OF	JET	88
C		NOBS OBSERVER POSITIONS.	JET	89
C	PSIC	17 DIRECTIVITY ANGLE PROJECTIONS FOR	JET	90
C		EACH OF NCBS OBSERVER POSITIONS	JET	91
C	BETA	ELEVATION ANGLE PROJECTION FOR EACH	JET	92
C		OF NCBS OBSERVER POSITIONS.	JET	93
C			JET	94
C			JET	95
C	REFERENCES	1) R. J. SAXBY, JET NOISE PREDICTION PROCEDURE	JET	96
C		FOR THE NASA-AMES FOOTPRINT CONTRACT NAS2-6969,	JET	97
C		UN-NUMBERED COORDINATION SHEET, DATED	JET	98
C		17 JANUARY 1973.	JET	99
C			JET	100
C	FUNCTION SUBPRGM	COS ESHLDC FWSUM	JET	101
C			JET	102
C	SUBROUTINES	ANGLES UNIT JETNCS ZERO	JET	103
C			JET	104
C			JET	105
C			JET	106
C	COMMON /JETDAT/	NJET,MCLUE,AF,WF,VF,AS,WS,VS,	JET	107
C	*	PK,PA,TT,VA,DIAMET,ANGJET,ICCR1	JET	108
C			JET	109
C	COMMON/SWITCH/	NTYPE,ITYPE,NENG,ICCF,IPRT(7),ICN(13),NLEPT	JET	110
C	*	,INSEOW(3),INSHLD	JET	111
C	COMMON/SHLDJT/SPLP	(24,17),SPLS(24,17)	JET	112
C			JET	113
C	CONSTANTS USED IN INTERNAL CALCULATIONS		JET	114
C			JET	115

[illegible]

CALL ZERO(SPLT,408)	JET	173
CALL ZERO(SPLP,408)	JET	174
CALL ZERO(SPLS,408)	JET	175
CALL ZERO(DSPL,408)	JET	176
C	JET	177
C	JET	178
C	JET	179
C	JET	180
C	JET	181
CALCULATE THE JET NOISE PREDICTION	JET	182
CALL JETNOS(PSI(1,M),SPLT(1,1))	JET	183
C	JET	184
C	JET	185
45 CONTINUE	JET	186
C	JET	187
C	JET	188
C	JET	189
CONVERT TO A UNIT OR INDEXED SPECTRA	JET	190
CALL UNIT(150.,17,SPLT(1,1))	JET	191
CALL UNIT(150.,17,SPLP(1,1))	JET	192
CALL UNIT(150.,17,SPLS(1,1))	JET	193
ENG=NENG	JET	194
IF(ENG.LE.0.C) ENG=1.0	JET	195
DO 50 J=1,17	JET	196
ELVANG=BETA(J,M)	JET	197
DANGLE=PSIO(J,M)	JET	198
ENS=ESHLDG(DANGLE,ELVANG,ENG)	JET	199
DO 50 K=1,24	JET	200
SPLP(K,J)=SPLP(K,J)-ENS	JET	201
SPLS(K,J)=SPLS(K,J)-ENS	JET	202
50 SPLT(K,J)=SPLT(K,J)-ENS	JET	203
IF(NCF.EQ.24) GO TO 25C	JET	204
C	JET	205
C	JET	206
C	JET	207
CONVERT 1/3 OCTAVE TO FULL OCTAVE	JET	208
DO 200 J=1,17	JET	209
DO 200 K=1,8	JET	210
TMP = 0.	JET	211
DO 100 L=1,3	JET	212
JC = 3 * K + L - 3	JET	213
100 TMP = PWRSUM(TMP, SPLT(JC,J))	JET	214
200 SPLT(K,J) = TMP	JET	215
C	JET	216
DO 22 J=1,17	JET	217
DO 22 K=1,8	JET	218
TMP = 0.	JET	219
DO 11 L=1,3	JET	220
JC = 3 * K + L - 3	JET	221
11 TMP = PWRSUM(TMP, SPLP(JC,J))	JET	222
22 SPLP(K,J) = TMP	JET	223
IF(ITYPE.NE.2)GO TO 55	JET	224
DO 44 J=1,17	JET	225
DO 44 K=1,8	JET	226
TMP = 0.	JET	227
DO 33 L=1,3	JET	228
JC = 3 * K + L - 3	JET	229
33 TMP = PWRSUM(TMP, SPLS(JC,J))		
44 SPLS(K,J) = TMP		
55 CONTINUE		

C	250 IF(INSHLD.EQ.0) GO TO 300	JET	230
	CALL JNSA(APY,APZ,ALTR,BCF,CZ,DELTA,DIAMET,VP,VS,	JET	231
	* SLDIST,M,NCF,SPLP,SPLS,SPLT,ITYPE,CSPL,IUNIT)	JET	232
C		JET	233
C		JET	234
C	ADD TO CURRENT TOTAL AND WRITE ON TAPE 10	JET	235
C		JET	236
C		JET	237
	300 DO 400 J=1,NCF	JET	238
	DO 250 K=1,17	JET	239
	SPLP(J,K)=SPLP(J,K)-SPZ(J,K)	JET	240
	SPLS(J,K)=SPLS(J,K)-SPZ(J,K)	JET	241
	SPZ(J,K)=SPZ(J,K)+DSPL(J,K)	JET	242
	SPLT(J,K)=SPLT(J,K)-SPZ(J,K)	JET	243
	350 SSPL(J,M,K)=PWRSLM(SSPL(J,M,K),SFLT(J,K))	JET	244
	400 CONTINUE	JET	245
	IF(IPRT(7).NE.7)GO TO 410	JET	246
	CALL NOISO(IPRT(7),M,NK,10,CHIN,IUNIT,SLDISX(M),PFREQ,SPLT(1,1),	JET	247
	* NCF,ITYPE)	JET	248
	410 CONTINUE	JET	249
	DO 360 JC=1,NCF	JET	250
	DO 360 KC=1,17	JET	251
	360 SPLT(JC,KC)=SPLT(JC,KC)-TSPL(JC,M,KC)	JET	252
	CALL PNLSUB(SPLT(1,1),PSPL(1,M),TPC(1,M),EPNL(1,M),SPL2,	JET	253
	*TEPNL(1,M),NK,BCG,TCG,FLR,M,NCBS,IRR(M,1))	JET	254
	IF(IPRT(3).NE.3)GO TO 1000	JET	255
	CALL NOISO(IPRT(3),M,NK,12,CHIN,IUNIT,SLDISX(M),PFREQ,	JET	256
	* SPLT(1,1),NCF,ITYPE)	JET	257
C		JET	258
C		JET	259
C		JET	260
	1000 CONTINUE	JET	261
	RETURN	JET	262
	END	JET	263
		JET	264

SUBROUTINE JETNOS(ANGLES,SPL)			JETNOS	2
C AUTHOR	D. F. MELDRUM		JETNOS	3
C			JETNOS	4
C PURPOSE	TO PREDICT JET NOISE FOR THE PHASE B NASA-AMES		JETNOS	5
C	FOOTPRINT CONTRACT NAS2-6969. NOISE IS PREDICTED		JETNOS	6
C	AT 150 FEET AS A SINGLE SOURCE WITHOUT		JETNOS	7
C	SHIELDING EFFECTS.		JETNOS	8
C			JETNOS	9
C METHOD	AS DESCRIBED IN REFERENCE 1).		JETNOS	10
C			JETNOS	11
C INPUTS	VIA THE CALL		JETNOS	12
C			JETNOS	13
C	ANGLES	DIRECTIVITY ANGLES	JETNOS	14
C			JETNOS	15
C	VIA LABELED COMMON JETDAT		JETNOS	16
C			JETNOS	17
C	NJET	CODE FOR METHOD OF JET NOISE PREDICTION	JETNOS	18
C		0 NO JET NOISE PREDICTION	JETNOS	19
C		1 REQUIRES AP, PR, PA, TT, AND VA	JETNOS	20
C		2 REQUIRES WP, PR, PA, TT, AND VA	JETNOS	21
C		3 REQUIRES AP, WP, VP, AND VA	JETNOS	22
C		OPTIONALLY AS, VS, AND WS MAY BE INPUT	JETNOS	23
C		FOR A BYPASS ENGINE. (REQUIRED FOR	JETNOS	24
C		PROCESSING SECONDARY JET NOISE.)	JETNOS	25
C		INSPECTED TO DETERMINE THE PROPER	JETNOS	26
C		METHOD. WILL BE ASSUMED TO BE	JETNOS	27
C		3 IF PR, PA, AND TT ARE ALL ZERO, OR	JETNOS	28
C		2 IF AP IS ZERO, OR	JETNOS	29
C		1 IF WP IS ZERO.	JETNOS	30
C	MCODE	CODE FOR USE OF THE STRUHAL CURVES	JETNOS	31
C		1 FOR FLIGHT	JETNOS	32
C		2 FOR GROUND	JETNOS	33
C		3 FOR MIXED	JETNOS	34
C	AP	PRIMARY JET NOZZLE AREA	FT*FT	JETNOS 35
C	WP	PRIMARY JET WEIGHT FLOW	LBS/SEC	JETNOS 36
C	VP	PRIMARY JET VELOCITY (REL)	FT/SEC	JETNOS 37
C	AS	SECONDARY JET NOZZLE AREA	FT*FT	JETNOS 38
C	WS	SECONDARY JET WEIGHT FLOW	LBS/SEC	JETNOS 39
C	VS	SECONDARY JET VELOCITY (REL)	FT/SEC	JETNOS 40
C	PR	NOZZLE PRESSURE RATIO (PT/PA)		JETNOS 41
C	PA	AMBIENT PRESSURE	LB/FT/FT	JETNOS 42
C	TT	JET TOTAL TEMPERATURE	DEG R	JETNOS 43
C	VA	VELOCITY OF THE AIRCRAFT	FT/SEC	JETNOS 44
C	DIAMET	EFFECTIVE DIAMETER (OPTIONAL		JETNOS 45
C		INPUT FOR ALL METHODS)	FT	JETNOS 46
C	ANGJET	ENGINE INCLINATION ANGLE		JETNOS 47
C				JETNOS 48
C OUTPUTS	SPL	SPECTRA PREDICTED FOR JET NOISE		JETNOS 49
C				JETNOS 50
C REFERENCES	1) R. J. SAXBY, JET NOISE PREDICTION PROCEDURE		JETNOS	51
C	FOR THE NASA-AMES FOOTPRINT CONTRACT NAS2-6969,		JETNOS	52
C	UN-NUMBERED COORDINATION SHEET, DATED		JETNOS	53
C	17 JANUARY 1973.		JETNOS	54
C			JETNOS	55
C FUNCTION SUBPRGM	ATAN	SQRT	CGS	JETNOS 56
C				JETNOS 57
C	COMMON /JETDAT/ NJET,MCODE,AP,WP,VP,AS,WS,VS,		JETNOS	58

	*	PR,PA,TT,VA,CIAMET,ANGJET	JETNUS	59
C			JETNUS	60
C		ARRAYS FOR PRIMARY AND SECONDARY SPL USED IN JET NOISE SHIELDING	JETNUS	61
		COMMON/SHLDJT/SPLP(24,17),SPLS(24,17)	JETNUS	62
C			JETNUS	63
		COMMON /GPRAM/ DLM6(2),GRAD	JETNUS	64
		DIMENSION TID(8,19,24),ANGLES(17),SPL(24,17)	JETNUS	65
		DIMENSION D01(8,19),D02(8,19),D03(8,19),D04(8,19),D05(8,19),	JETNUS	66
	*	D06(8,19),D07(8,19),D08(8,19),D09(8,19),D10(8,19),	JETNUS	67
	*	D11(8,19),D12(8,19),D13(8,19),D14(8,19),D15(8,19),	JETNUS	68
	*	D16(8,19),D17(8,19),D18(8,19),D19(8,19),D20(8,19),	JETNUS	69
	*	D21(8,19),D22(8,19),D23(8,19),D24(8,19)	JETNUS	70
		EQUIVALENCE(TID(1,1,1),D01(1,1)),(TID(1,1,2),D02(1,1)),	JETNUS	71
	*	(TID(1,1,3),D03(1,1)),(TID(1,1,4),D04(1,1)),	JETNUS	72
	*	(TID(1,1,5),D05(1,1)),(TID(1,1,6),D06(1,1)),	JETNUS	73
	*	(TID(1,1,7),D07(1,1)),(TID(1,1,8),D08(1,1)),	JETNUS	74
	*	(TID(1,1,9),D09(1,1)),(TID(1,1,10),D10(1,1)),	JETNUS	75
	*	(TID(1,1,11),D11(1,1)),(TID(1,1,12),D12(1,1)),	JETNUS	76
	*	(TID(1,1,13),D13(1,1)),(TID(1,1,14),D14(1,1)),	JETNUS	77
	*	(TID(1,1,15),D15(1,1)),(TID(1,1,16),D16(1,1)),	JETNUS	78
	*	(TID(1,1,17),D17(1,1)),(TID(1,1,18),D18(1,1)),	JETNUS	79
	*	(TID(1,1,19),D19(1,1)),(TID(1,1,20),D20(1,1)),	JETNUS	80
	*	(TID(1,1,21),D21(1,1)),(TID(1,1,22),D22(1,1)),	JETNUS	81
	*	(TID(1,1,23),D23(1,1)),(TID(1,1,24),D24(1,1))	JETNUS	82
		DATA D01/-13.90, -5.10,-14.10,-16.50,-16.33,-16.20,-18.67,-19.33,	JETNUS	83
	*	-13.40, -6.33,-13.93,-16.20,-16.33,-16.83,-18.67,-19.33,	JETNUS	84
	*	-13.00, -7.47,-13.60,-15.93,-16.20,-17.37,-18.67,-19.37,	JETNUS	85
	*	-12.40, -7.83,-13.33,-15.60,-16.07,-17.50,-18.67,-19.50,	JETNUS	86
	*	-11.50, -8.00,-13.13,-15.20,-15.87,-17.37,-18.67,-19.67,	JETNUS	87
	*	-10.60, -7.83,-12.60,-14.77,-15.47,-16.77,-18.43,-19.63,	JETNUS	88
	*	-9.40, -7.40,-12.13,-14.27,-14.73,-16.10,-17.67,-18.93,	JETNUS	89
	*	-8.20, -6.47,-11.50,-13.50,-14.03,-15.10,-16.77,-17.93,	JETNUS	90
	*	-6.80, -5.13,-10.50,-12.57,-13.00,-14.03,-15.37,-16.33,	JETNUS	91
	*	-5.10, -3.77, -8.97,-11.33,-11.63,-12.70,-13.77,-14.47,	JETNUS	92
	*	-3.30, -2.33, -7.40, -9.70, -9.97,-11.00,-12.13,-12.47,	JETNUS	93
	*	-2.00, -.83, -5.77, -7.87, -7.77, -7.90, -9.47, -9.80,	JETNUS	94
	*	-1.20, .83, -3.27, -4.33, -3.00, -3.80, -4.33, -2.67,	JETNUS	95
	*	.50, 2.43, .20, -.23, 2.00, 1.13, 1.13, 3.23,	JETNUS	96
	*	2.30, 4.10, 4.83, 5.07, 6.00, 5.67, 5.67, 6.00,	JETNUS	97
	*	5.50, 5.87, 7.13, 7.33, 7.63, 8.00, 8.17, 6.67,	JETNUS	98
	*	7.00, 5.67, 6.73, 7.20, 8.00, 6.50, 7.00, 5.00,	JETNUS	99
	*	7.50, 5.50, 6.30, 7.10, 8.40, 5.20, 5.80, 3.20,	JETNUS	100
	*	-12.50,-14.50,-13.70,-13.00,-11.60,-14.90,-14.30,-16.70/	JETNUS	101
		DATA D02/-11.40, -6.20,-14.00,-16.50,-17.20,-17.20,-19.00,-19.00,	JETNUS	102
	*	-11.00, -6.90,-13.80,-16.30,-17.00,-17.50,-19.00,-19.00,	JETNUS	103
	*	-10.60, -7.60,-13.60,-16.10,-16.90,-17.90,-19.00,-19.00,	JETNUS	104
	*	-10.00, -8.10,-13.40,-15.80,-16.70,-18.00,-19.00,-19.00,	JETNUS	105
	*	-9.10, -6.30,-13.20,-15.40,-16.40,-17.80,-19.00,-19.00,	JETNUS	106
	*	-8.20, -8.20,-12.70,-14.90,-15.90,-17.20,-18.80,-18.80,	JETNUS	107
	*	-7.00, -7.80,-12.20,-14.30,-15.10,-16.50,-18.10,-18.10,	JETNUS	108
	*	-5.80, -6.90,-11.50,-13.50,-14.30,-15.50,-17.20,-17.20,	JETNUS	109
	*	-4.40, -5.60,-10.50,-12.50,-13.20,-14.40,-15.80,-15.80,	JETNUS	110
	*	-2.70, -4.20, -9.00,-11.20,-11.80,-12.90,-14.10,-14.10,	JETNUS	111
	*	-2.40, -2.70, -7.40, -9.50,-10.00,-11.00,-12.10,-12.10,	JETNUS	112
	*	-1.90, -1.10, -5.60, -7.50, -7.60, -7.80, -9.10, -9.10,	JETNUS	113
	*	-1.30, .60, -3.00, -4.00, -3.00, -3.60, -4.00, -2.00,	JETNUS	114
	*	1.00, 2.30, .50, .20, 2.00, 1.50, 1.50, 3.80,	JETNUS	115

*	3.30,	4.10,	5.00,	5.40,	6.00,	6.00,	6.00,	6.00,	JETNUS	116	
*	5.70,	5.90,	7.30,	7.60,	7.80,	8.00,	8.00,	6.00,	JETNUS	117	
*	6.00,	6.00,	7.00,	7.20,	7.50,	6.00,	6.00,	4.00,	JETNUS	118	
*	6.20,	6.00,	6.70,	6.80,	7.00,	4.00,	4.00,	2.00,	JETNUS	119	
*	-13.80,	-14.00,	-13.40,	-13.20,	-13.00,	-16.00,	-16.00,	-16.00,	JETNUS	120	
*	DATA D03/-	13.40,	-7.40,	-13.80,	-16.60,	-17.90,	-18.00,	-19.33,	-18.80,	JETNUS	121
*		-13.00,	-7.47,	-13.67,	-16.40,	-17.67,	-18.17,	-19.33,	-18.67,	JETNUS	122
*		-12.60,	-7.73,	-13.60,	-16.27,	-17.60,	-18.43,	-19.33,	-18.63,	JETNUS	123
*		-12.00,	-8.37,	-13.47,	-16.00,	-17.33,	-18.50,	-19.33,	-18.50,	JETNUS	124
*		-11.10,	-8.60,	-13.27,	-15.60,	-16.93,	-18.23,	-19.33,	-18.33,	JETNUS	125
*		-10.20,	-8.20,	-12.80,	-15.03,	-16.33,	-17.63,	-19.17,	-17.97,	JETNUS	126
*		-9.00,	-8.20,	-12.27,	-14.33,	-15.47,	-16.50,	-18.53,	-17.27,	JETNUS	127
*		-7.80,	-7.33,	-11.50,	-13.50,	-14.57,	-15.90,	-17.63,	-16.47,	JETNUS	128
*		-6.40,	-6.07,	-10.50,	-12.43,	-13.40,	-14.77,	-16.23,	-15.07,	JETNUS	129
*		-4.70,	-4.63,	-9.03,	-11.07,	-11.97,	-13.10,	-14.43,	-13.73,	JETNUS	130
*		-2.90,	-3.07,	-7.40,	-9.30,	-10.03,	-11.00,	-12.07,	-11.73,	JETNUS	131
*		-1.60,	-1.37,	-5.43,	-7.13,	-7.43,	-7.70,	-8.73,	-8.40,	JETNUS	132
*		-.60,	.37,	-2.73,	-3.67,	-3.00,	-3.40,	-3.67,	-1.33,	JETNUS	133
*		1.10,	2.17,	.80,	.63,	2.00,	1.87,	1.87,	4.37,	JETNUS	134
*		2.40,	4.10,	5.17,	5.73,	6.00,	6.33,	6.33,	6.00,	JETNUS	135
*		5.50,	5.93,	7.47,	7.80,	7.97,	8.00,	7.83,	5.33,	JETNUS	136
*		6.00,	6.33,	7.27,	7.20,	7.00,	5.50,	5.00,	3.00,	JETNUS	137
*		6.40,	6.60,	7.20,	6.50,	6.00,	3.20,	2.40,	.70,	JETNUS	138
*		-13.60,	-13.40,	-12.80,	-13.50,	-14.00,	-16.80,	-17.60,	-19.30,	JETNUS	139
*	DATA D04/-	11.20,	-8.10,	-13.50,	-16.80,	-18.40,	-18.60,	-19.67,	-18.40,	JETNUS	140
*		-10.60,	-8.03,	-13.52,	-16.50,	-18.33,	-18.83,	-19.67,	-18.33,	JETNUS	141
*		-10.20,	-7.87,	-13.60,	-16.43,	-18.30,	-18.96,	-19.67,	-18.27,	JETNUS	142
*		-9.60,	-8.63,	-13.53,	-16.20,	-17.97,	-19.00,	-19.67,	-18.00,	JETNUS	143
*		-8.70,	-8.90,	-13.33,	-15.80,	-17.47,	-18.67,	-19.67,	-17.67,	JETNUS	144
*		-7.90,	-8.93,	-12.90,	-15.70,	-16.77,	-18.07,	-19.53,	-17.13,	JETNUS	145
*		-6.60,	-8.60,	-12.33,	-14.37,	-15.83,	-17.30,	-18.97,	-16.43,	JETNUS	146
*		-5.40,	-7.77,	-11.50,	-13.50,	-14.83,	-16.30,	-18.07,	-15.73,	JETNUS	147
*		-4.00,	-6.53,	-10.50,	-12.37,	-13.60,	-15.13,	-16.67,	-14.73,	JETNUS	148
*		-2.30,	-5.07,	-9.07,	-10.93,	-12.13,	-13.30,	-14.77,	-13.37,	JETNUS	149
*		-2.00,	-3.43,	-7.40,	-9.10,	-10.07,	-11.00,	-12.03,	-11.37,	JETNUS	150
*		-1.30,	-1.63,	-5.27,	-6.77,	-7.27,	-7.60,	-8.37,	-7.70,	JETNUS	151
*		-.10,	.13,	-2.47,	-3.33,	-3.00,	-3.20,	-3.33,	-.67,	JETNUS	152
*		1.10,	2.03,	1.10,	1.07,	2.00,	2.23,	2.23,	4.93,	JETNUS	153
*		3.00,	4.10,	5.33,	6.07,	6.00,	6.67,	6.67,	6.00,	JETNUS	154
*		4.70,	5.97,	7.63,	8.13,	8.13,	8.00,	7.67,	4.67,	JETNUS	155
*		5.50,	6.67,	7.53,	7.20,	6.50,	5.00,	4.00,	2.00,	JETNUS	156
*		6.20,	7.30,	7.40,	6.20,	5.00,	1.60,	.30,	-.70,	JETNUS	157
*		-13.80,	-12.70,	-12.60,	-13.80,	-15.10,	-18.20,	-19.70,	-20.70,	JETNUS	158
*	DATA D05/-	11.10,	-9.30,	-13.20,	-16.70,	-19.00,	-19.50,	-20.00,	-18.00,	JETNUS	159
*		-10.70,	-8.60,	-13.40,	-16.60,	-19.00,	-19.50,	-20.00,	-18.00,	JETNUS	160
*		-10.30,	-8.00,	-13.60,	-16.60,	-19.00,	-19.50,	-20.00,	-17.90,	JETNUS	161
*		-9.70,	-8.90,	-13.60,	-16.40,	-18.60,	-19.50,	-20.00,	-17.50,	JETNUS	162
*		-8.80,	-9.20,	-13.40,	-16.00,	-18.00,	-19.10,	-20.00,	-17.00,	JETNUS	163
*		-7.90,	-9.30,	-13.00,	-15.30,	-17.20,	-18.50,	-19.90,	-16.30,	JETNUS	164
*		-6.70,	-9.00,	-12.40,	-14.40,	-16.20,	-17.70,	-19.40,	-15.60,	JETNUS	165
*		-5.50,	-8.20,	-11.50,	-13.50,	-15.10,	-16.70,	-18.50,	-15.00,	JETNUS	166
*		-4.10,	-7.00,	-10.50,	-12.30,	-13.80,	-15.50,	-17.10,	-14.20,	JETNUS	167
*		-2.40,	-5.50,	-9.10,	-10.80,	-12.30,	-13.50,	-15.10,	-13.00,	JETNUS	168
*		-1.40,	-3.80,	-7.40,	-8.90,	-10.10,	-11.00,	-12.00,	-11.00,	JETNUS	169
*		-.20,	-1.90,	-5.10,	-6.40,	-7.10,	-7.50,	-8.00,	-7.00,	JETNUS	170
*		.30,	-.10,	-2.20,	-3.00,	-3.00,	-3.00,	-3.00,	0.00,	JETNUS	171
*		.80,	1.90,	1.40,	1.50,	2.00,	2.60,	2.60,	5.50,	JETNUS	172

*	2.50,	4.10,	5.50,	6.40,	6.00,	7.00,	7.00,	6.00,	JETNOS	173
*	5.10,	6.00,	7.80,	8.40,	8.30,	8.00,	7.50,	4.00,	JETNOS	174
*	4.60,	7.00,	7.80,	7.20,	6.00,	4.50,	3.00,	1.00,	JETNOS	175
*	4.00,	8.20,	7.80,	6.00,	3.60,	.90,	-1.60,	-1.70,	JETNOS	176
*	-16.00,	-11.80,	-12.20,	-14.00,	-16.20,	-19.10,	-21.60,	-21.70,	JETNOS	177
*	DATA D06/	-12.10,	-6.50,	-11.90,	-15.20,	-18.00,	-18.40,	-19.17,	JETNOS	178
*		-11.60,	-8.33,	-12.07,	-15.20,	-18.00,	-18.50,	-19.17,	JETNOS	179
*		-11.10,	-8.13,	-12.27,	-15.17,	-18.00,	-18.47,	-19.17,	JETNOS	180
*		-10.50,	-8.87,	-12.23,	-14.93,	-17.63,	-18.43,	-19.17,	JETNOS	181
*		-9.60,	-9.07,	-12.03,	-14.53,	-17.07,	-18.13,	-19.17,	JETNOS	182
*		-8.70,	-8.97,	-11.60,	-13.87,	-16.30,	-17.67,	-19.10,	JETNOS	183
*		-7.50,	-8.53,	-11.00,	-13.03,	-15.30,	-16.97,	-18.73,	JETNOS	184
*		-6.30,	-7.63,	-10.07,	-12.10,	-14.17,	-16.00,	-18.00,	JETNOS	185
*		-4.90,	-6.40,	-8.97,	-10.93,	-12.87,	-14.83,	-16.73,	JETNOS	186
*		-3.20,	-4.87,	-7.53,	-9.43,	-11.33,	-12.90,	-14.57,	JETNOS	187
*		-1.40,	-3.20,	-5.80,	-7.50,	-9.20,	-10.40,	-11.67,	JETNOS	188
*		-.50,	-1.30,	-3.57,	-4.97,	-6.17,	-6.93,	-9.67,	JETNOS	189
*		.30,	.53,	-.83,	-1.50,	-1.73,	-2.10,	-2.50,	JETNOS	190
*		1.50,	2.33,	2.30,	2.50,	2.67,	3.23,	3.40,	JETNOS	191
*		3.20,	4.07,	5.27,	6.07,	6.00,	7.00,	7.33,	JETNOS	192
*		3.70,	5.03,	6.57,	7.20,	7.50,	7.50,	7.33,	JETNOS	193
*		3.50,	5.00,	6.23,	6.07,	5.30,	4.50,	3.67,	JETNOS	194
*		3.20,	5.00,	5.70,	5.10,	3.20,	1.50,	.30,	JETNOS	195
*		-16.80,	-15.00,	-14.30,	-14.80,	-16.80,	-18.50,	-19.70,	JETNOS	196
*	DATA D07/	-7.53,	-7.50,	-10.30,	-13.50,	-18.00,	-17.60,	-18.33,	JETNOS	197
*		-7.53,	-8.07,	-10.73,	-13.80,	-17.00,	-17.50,	-18.33,	JETNOS	198
*		-7.53,	-8.27,	-10.93,	-13.73,	-17.00,	-17.43,	-18.33,	JETNOS	199
*		-7.53,	-8.83,	-10.87,	-13.47,	-16.66,	-17.37,	-18.33,	JETNOS	200
*		-7.47,	-8.93,	-10.67,	-13.07,	-16.13,	-17.17,	-18.33,	JETNOS	201
*		-7.00,	-8.63,	-10.20,	-12.43,	-15.40,	-16.83,	-18.30,	JETNOS	202
*		-6.33,	-8.07,	-9.60,	-11.67,	-14.40,	-16.23,	-18.07,	JETNOS	203
*		-5.50,	-7.07,	-8.63,	-10.70,	-13.23,	-15.30,	-17.50,	JETNOS	204
*		-4.36,	-5.80,	-7.43,	-9.57,	-11.93,	-14.17,	-16.37,	JETNOS	205
*		-2.70,	-4.23,	-5.97,	-8.07,	-10.37,	-12.30,	-14.03,	JETNOS	206
*		-1.00,	-2.60,	-4.20,	-6.10,	-8.30,	-9.80,	-11.33,	JETNOS	207
*		.63,	-.70,	-2.03,	-3.53,	-5.23,	-6.37,	-7.33,	JETNOS	208
*		1.93,	1.17,	.53,	0.00,	-.47,	-1.20,	-2.00,	JETNOS	209
*		2.83,	2.76,	3.20,	3.50,	3.33,	3.87,	4.20,	JETNOS	210
*		3.17,	4.03,	5.03,	5.73,	6.00,	7.00,	7.67,	JETNOS	211
*		3.00,	4.07,	5.33,	6.00,	6.70,	7.00,	7.17,	JETNOS	212
*		1.47,	3.00,	4.67,	4.93,	4.60,	4.50,	4.33,	JETNOS	213
*		-.20,	1.80,	4.00,	3.80,	2.60,	2.10,	1.40,	JETNOS	214
*		-20.20,	-18.10,	-16.00,	-16.20,	-17.40,	-17.90,	-18.60,	JETNOS	215
*	DATA D08/	-8.40,	-7.20,	-9.20,	-12.70,	-16.00,	-16.60,	-17.50,	JETNOS	216
*		-8.40,	-7.80,	-9.40,	-12.40,	-16.00,	-16.50,	-17.50,	JETNOS	217
*		-8.40,	-8.40,	-9.60,	-12.30,	-16.00,	-16.40,	-17.50,	JETNOS	218
*		-8.40,	-8.80,	-9.50,	-12.00,	-15.70,	-16.30,	-17.50,	JETNOS	219
*		-8.30,	-8.60,	-9.30,	-11.60,	-15.20,	-16.20,	-17.50,	JETNOS	220
*		-7.60,	-8.30,	-8.80,	-11.00,	-14.50,	-16.00,	-17.50,	JETNOS	221
*		-6.60,	-7.60,	-8.20,	-10.30,	-13.50,	-15.50,	-17.40,	JETNOS	222
*		-5.50,	-6.50,	-7.20,	-9.30,	-12.30,	-14.60,	-17.00,	JETNOS	223
*		-4.30,	-5.20,	-5.90,	-8.20,	-11.00,	-13.50,	-16.00,	JETNOS	224
*		-2.70,	-3.60,	-4.40,	-6.70,	-9.40,	-11.70,	-13.50,	JETNOS	225
*		-1.10,	-2.00,	-2.60,	-4.70,	-7.40,	-9.20,	-11.00,	JETNOS	226
*		.50,	-.10,	-.50,	-2.10,	-4.30,	-5.80,	-7.00,	JETNOS	227
*		1.90,	1.80,	1.90,	1.50,	.80,	-.30,	-1.50,	JETNOS	228
*		2.80,	3.20,	4.10,	4.50,	4.00,	4.50,	5.00,	JETNOS	229

*	3.00, 4.00, 4.60, 5.40, 6.00, 7.00, 8.00, 4.00,	JETNOS	230
*	2.50, 3.10, 4.10, 4.80, 5.90, 6.50, 7.00, -1.00,	JETNOS	231
*	0.00, 1.00, 3.10, 3.80, 3.90, 4.50, 5.00, -4.00,	JETNOS	232
*	-2.30, -1.10, 1.90, 2.80, 1.80, 2.40, 2.90, -6.80,	JETNOS	233
*	-22.30, -21.10, -18.10, -17.20, -18.20, -17.60, -17.10, -26.70,	JETNOS	234
*	DATA C09/ -6.90, -6.10, -8.80, -11.90, -15.80, -15.50, -15.00, -15.20,	JETNOS	235
*	-6.90, -6.70, -9.03, -11.77, -15.67, -15.27, -15.00, -14.87,	JETNOS	236
*	-6.90, -7.30, -9.20, -11.70, -15.60, -15.07, -15.00, -14.70,	JETNOS	237
*	-6.83, -7.67, -9.07, -11.47, -15.30, -14.87, -15.00, -14.40,	JETNOS	238
*	-6.80, -7.67, -8.80, -11.07, -14.76, -14.67, -15.00, -14.17,	JETNOS	239
*	-6.27, -7.23, -8.27, -10.43, -14.00, -14.40, -15.00, -13.87,	JETNOS	240
*	-5.47, -6.57, -7.60, -9.67, -12.97, -13.93, -14.93, -13.47,	JETNOS	241
*	-4.57, -5.60, -6.60, -8.67, -11.70, -13.13, -14.67, -12.83,	JETNOS	242
*	-3.53, -4.47, -5.30, -7.50, -10.26, -12.13, -13.93, -11.63,	JETNOS	243
*	-2.20, -3.06, -3.83, -5.97, -8.53, -10.53, -12.00, -9.93,	JETNOS	244
*	-.77, -1.56, -2.03, -3.97, -6.40, -8.30, -10.00, -7.00,	JETNOS	245
*	.77, .33, .07, -1.30, -3.47, -5.03, -6.50, -1.17,	JETNOS	246
*	2.23, 2.33, 2.53, 1.93, .93, -.20, -1.33, 5.17,	JETNOS	247
*	2.80, 3.47, 4.33, 4.50, 4.00, 4.50, 5.00, 6.00,	JETNOS	248
*	2.67, 3.67, 4.47, 5.20, 5.96, 6.83, 7.67, 3.67,	JETNOS	249
*	2.00, 2.57, 3.30, 4.37, 5.83, 6.33, 6.67, -1.33,	JETNOS	250
*	-.33, .50, 1.77, 2.60, 3.27, 3.50, 3.67, -4.33,	JETNOS	251
*	-2.70, -1.50, .30, .90, .80, .60, .40, -7.30,	JETNOS	252
*	-22.70, -21.50, -19.70, -19.20, -19.20, -19.40, -19.60, -27.30,	JETNOS	253
*	DATA D10/ -5.50, -5.00, -8.60, -11.20, -15.50, -14.30, -12.50, -13.60,	JETNOS	254
*	-5.40, -5.60, -8.67, -11.13, -15.33, -14.03, -12.50, -13.23,	JETNOS	255
*	-5.40, -6.20, -8.80, -11.11, -15.20, -13.73, -12.50, -13.00,	JETNOS	256
*	-5.37, -6.53, -8.63, -10.93, -14.90, -13.43, -12.50, -12.70,	JETNOS	257
*	-5.30, -6.53, -8.30, -10.53, -14.33, -13.13, -12.50, -12.43,	JETNOS	258
*	-4.93, -6.17, -7.73, -9.87, -13.50, -12.80, -12.50, -12.13,	JETNOS	259
*	-4.33, -5.53, -7.00, -9.03, -12.43, -12.37, -12.47, -11.73,	JETNOS	260
*	-3.63, -4.70, -6.00, -8.03, -11.10, -11.67, -12.33, -11.17,	JETNOS	261
*	-2.77, -3.73, -4.70, -6.80, -9.53, -10.77, -11.87, -10.27,	JETNOS	262
*	-1.70, -2.53, -3.27, -5.23, -7.67, -9.37, -10.50, -8.87,	JETNOS	263
*	-.43, -1.13, -1.47, -3.23, -5.40, -7.40, -9.00, -6.00,	JETNOS	264
*	1.03, .77, .63, -.50, -2.63, -4.27, -6.00, .33,	JETNOS	265
*	2.57, 2.87, 3.17, 2.37, 1.07, -.10, -1.17, 5.33,	JETNOS	266
*	2.80, 3.73, 4.57, 4.50, 4.00, 4.50, 5.00, 6.00,	JETNOS	267
*	2.33, 3.33, 4.13, 5.00, 5.93, 6.67, 7.33, 3.33,	JETNOS	268
*	1.50, 2.03, 2.50, 3.93, 5.76, 6.17, 6.33, -1.67,	JETNOS	269
*	-.67, 0.00, .43, 1.40, 2.63, 2.50, 2.33, -4.67,	JETNOS	270
*	-2.90, -1.80, -1.70, -1.10, -.70, -1.30, -1.60, -7.90,	JETNOS	271
*	-22.90, -21.80, -21.70, -21.10, -20.70, -21.30, -21.60, -27.90,	JETNOS	272
*	DATA D11/ -4.00, -3.90, -8.00, -10.50, -15.20, -13.20, -10.00, -12.00,	JETNOS	273
*	-3.90, -4.50, -8.30, -10.50, -15.00, -12.80, -10.00, -11.60,	JETNOS	274
*	-3.90, -5.10, -8.40, -10.50, -14.80, -12.40, -10.00, -11.30,	JETNOS	275
*	-3.80, -5.40, -8.20, -10.40, -14.50, -12.00, -10.00, -11.00,	JETNOS	276
*	-3.80, -5.40, -7.80, -10.00, -13.90, -11.60, -10.00, -10.70,	JETNOS	277
*	-3.60, -5.10, -7.20, -9.30, -13.00, -11.20, -13.00, -10.40,	JETNOS	278
*	-3.20, -4.50, -6.40, -8.40, -11.90, -10.80, -10.00, -10.00,	JETNOS	279
*	-2.70, -3.80, -5.40, -7.40, -10.50, -10.20, -10.00, -9.50,	JETNOS	280
*	-2.00, -3.00, -4.10, -6.10, -8.80, -9.40, -9.80, -8.90,	JETNOS	281
*	-1.20, -2.00, -2.70, -4.50, -6.80, -8.20, -9.00, -7.80,	JETNOS	282
*	-.10, -.70, -.90, -2.50, -4.40, -6.50, -8.00, -5.00,	JETNOS	283
*	1.30, 1.20, 1.20, .30, -1.80, -3.50, -5.50, .50,	JETNOS	284
*	2.90, 3.40, 3.80, 2.80, 1.20, 0.00, -1.00, 5.50,	JETNOS	285
*	2.80, 4.00, 4.80, 4.50, 4.00, 4.50, 7.00, 3.00,	JETNOS	286

*	2.00,	3.00,	3.80,	4.80,	5.90,	6.50,	7.00,	3.00,	JETNOS	287
*	1.00,	1.50,	1.70,	3.50,	5.70,	6.00,	6.00,	-2.00,	JETNOS	288
*	-1.00,	-.50,	-.90,	.20,	2.00,	1.50,	1.00,	-5.00,	JETNOS	289
*	-3.10,	-2.30,	-3.30,	-3.10,	-1.70,	-3.30,	-3.80,	-8.00,	JETNOS	290
*	-23.10,	-22.30,	-23.40,	-23.10,	-21.80,	-23.30,	-23.80,	-28.00,	JETNOS	291
DATA D12/	-3.00,	-4.10,	-8.10,	-10.80,	-14.80,	-12.90,	-10.60,	-12.40,	JETNOS	292
*	-2.93,	-4.40,	-8.13,	-10.53,	-14.33,	-12.20,	-10.33,	-11.80,	JETNOS	293
*	-2.93,	-4.73,	-8.13,	-10.33,	-13.80,	-11.63,	-10.03,	-11.30,	JETNOS	294
*	-2.87,	-4.87,	-7.87,	-10.00,	-13.20,	-11.07,	-9.73,	-10.80,	JETNOS	295
*	-2.87,	-4.77,	-7.43,	-9.40,	-12.37,	-10.47,	-9.40,	-10.30,	JETNOS	296
*	-2.73,	-4.47,	-6.80,	-8.60,	-11.27,	-9.90,	-9.10,	-9.80,	JETNOS	297
*	-2.43,	-3.94,	-6.00,	-7.60,	-10.10,	-9.30,	-8.77,	-9.23,	JETNOS	298
*	-2.10,	-3.30,	-5.00,	-6.47,	-8.63,	-8.53,	-8.47,	-8.63,	JETNOS	299
*	-1.60,	-2.60,	-3.67,	-4.73,	-6.97,	-7.57,	-8.00,	-7.90,	JETNOS	300
*	-1.07,	-1.70,	-2.20,	-3.43,	-5.03,	-6.30,	-7.07,	-6.73,	JETNOS	301
*	-.20,	-.47,	-.40,	-1.47,	-2.80,	-4.63,	-5.93,	-3.93,	JETNOS	302
*	1.20,	1.43,	1.67,	.97,	-.50,	-2.00,	-3.63,	1.67,	JETNOS	303
*	2.60,	3.27,	3.80,	3.07,	1.97,	1.03,	.33,	5.67,	JETNOS	304
*	1.20,	2.70,	4.17,	3.07,	4.00,	4.50,	5.00,	5.43,	JETNOS	305
*	0.00,	1.50,	2.20,	4.07,	5.23,	5.83,	6.33,	2.23,	JETNOS	306
*	-.47,	.33,	-.40,	2.50,	4.83,	5.00,	5.00,	-2.33,	JETNOS	307
*	-1.33,	-1.00,	-.97,	0.00,	2.00,	1.67,	-.67,	-5.33,	JETNOS	308
*	-2.20,	-2.40,	-1.70,	-2.60,	-.90,	-1.50,	-6.60,	-8.10,	JETNOS	309
*	-22.20,	-22.30,	-21.70,	-22.60,	-20.90,	-21.50,	-26.60,	-28.10,	JETNOS	310
DATA C13/	-2.00,	-4.40,	-8.20,	-11.00,	-14.60,	-12.40,	-11.50,	-12.70,	JETNOS	311
*	-1.97,	-4.30,	-7.97,	-10.57,	-13.67,	-11.60,	-10.67,	-12.00,	JETNOS	312
*	-1.97,	-4.37,	-7.87,	-10.16,	-12.80,	-10.86,	-10.07,	-11.30,	JETNOS	313
*	-1.93,	-4.33,	-7.53,	-9.60,	-11.90,	-10.13,	-9.47,	-10.60,	JETNOS	314
*	-1.93,	-4.13,	-7.07,	-8.80,	-10.83,	-9.33,	-8.80,	-9.90,	JETNOS	315
*	-1.87,	-3.83,	-6.40,	-7.90,	-9.53,	-8.60,	-8.20,	-9.20,	JETNOS	316
*	-1.66,	-3.37,	-5.60,	-.80,	-8.30,	-7.80,	-7.53,	-8.47,	JETNOS	317
*	-1.50,	-2.80,	-4.60,	-5.53,	-6.77,	-6.86,	-6.93,	-7.77,	JETNOS	318
*	-1.20,	-2.20,	-3.23,	-3.37,	-5.13,	-5.73,	-6.20,	-6.90,	JETNOS	319
*	-.93,	-1.40,	-1.70,	-2.37,	-3.27,	-4.40,	-5.13,	-5.77,	JETNOS	320
*	-.30,	-.23,	.10,	-.43,	-1.20,	-2.76,	-3.86,	-2.87,	JETNOS	321
*	1.10,	1.67,	2.13,	1.63,	.80,	-.50,	-1.77,	2.83,	JETNOS	322
*	2.30,	3.13,	3.80,	3.33,	2.73,	2.07,	1.67,	5.83,	JETNOS	323
*	-.40,	1.40,	3.53,	4.17,	4.00,	4.50,	5.00,	4.87,	JETNOS	324
*	-2.00,	0.00,	.67,	3.33,	4.57,	5.17,	5.67,	1.47,	JETNOS	325
*	-1.93,	-.83,	-.17,	1.50,	3.97,	4.00,	4.00,	-2.67,	JETNOS	326
*	-1.67,	-1.50,	-1.03,	-.20,	2.00,	1.83,	-2.33,	-5.67,	JETNOS	327
*	-2.00,	-2.20,	-1.80,	-1.80,	0.00,	-.40,	-8.80,	-8.50,	JETNOS	328
*	-22.00,	-22.20,	-21.80,	-21.80,	-20.00,	-20.40,	-28.80,	-28.50,	JETNOS	329
DATA C14/	-1.00,	-4.40,	-8.00,	-11.40,	-14.20,	-12.00,	-12.00,	-13.30,	JETNOS	330
*	-1.00,	-4.20,	-7.80,	-10.60,	-13.00,	-11.00,	-11.00,	-12.20,	JETNOS	331
*	-1.00,	-4.00,	-7.60,	-10.00,	-11.80,	-10.10,	-10.10,	-11.30,	JETNOS	332
*	-1.00,	-3.80,	-7.20,	-9.20,	-10.60,	-9.20,	-9.20,	-10.40,	JETNOS	333
*	-1.00,	-3.50,	-6.70,	-8.20,	-9.30,	-8.20,	-8.20,	-9.50,	JETNOS	334
*	-1.00,	-3.20,	-6.00,	-7.20,	-7.80,	-7.30,	-7.30,	-8.60,	JETNOS	335
*	-.90,	-2.80,	-5.20,	-6.00,	-6.50,	-6.30,	-6.30,	-7.70,	JETNOS	336
*	-.90,	-2.30,	-4.20,	-4.60,	-4.90,	-5.20,	-5.40,	-6.90,	JETNOS	337
*	-.60,	-1.80,	-2.80,	-2.00,	-3.30,	-3.90,	-4.40,	-5.90,	JETNOS	338
*	-.80,	-1.10,	-1.20,	-1.30,	-1.50,	-2.50,	-3.20,	-4.60,	JETNOS	339
*	-.40,	0.00,	.60,	.60,	.40,	-.90,	-1.80,	-1.80,	JETNOS	340
*	1.00,	1.90,	2.60,	2.30,	2.10,	1.00,	.10,	4.00,	JETNOS	341
*	2.00,	3.00,	3.80,	3.60,	3.50,	3.10,	3.00,	6.00,	JETNOS	342
*	-2.00,	.10,	2.90,	4.00,	4.00,	4.50,	5.00,	4.30,	JETNOS	343

*	-4.00,	-1.50,	.90,	2.60,	3.90,	4.50,	5.00,	.70,	JETNUS	344
*	-4.00,	-2.00,	-1.10,	.50,	3.10,	3.00,	3.00,	-3.00,	JETNUS	345
*	-4.00,	-2.00,	-1.10,	-.40,	2.00,	2.00,	-4.00,	-6.00,	JETNUS	346
*	-4.00,	-2.00,	-1.20,	-1.40,	.80,	.90,	-11.20,	-8.90,	JETNUS	347
*	-24.00,	-22.00,	-21.20,	-21.50,	-19.20,	-19.10,	-31.20,	-28.90,	JETNUS	348
DATA D15/	-3.00,	-5.30,	-7.80,	-10.30,	-12.80,	-11.40,	-11.90,	-12.50,	JETNUS	349
*	-3.00,	-5.13,	-7.53,	-9.67,	-11.67,	-10.50,	-11.03,	-11.53,	JETNUS	350
*	-2.97,	-4.97,	-7.37,	-9.20,	-10.70,	-9.73,	-10.30,	-10.67,	JETNUS	351
*	-2.73,	-4.60,	-6.87,	-8.40,	-9.63,	-8.90,	-9.47,	-9.80,	JETNUS	352
*	-2.50,	-4.17,	-6.30,	-7.47,	-8.50,	-8.00,	-8.57,	-8.87,	JETNUS	353
*	-2.27,	-3.73,	-5.60,	-6.53,	-7.23,	-7.17,	-7.63,	-7.93,	JETNUS	354
*	-1.97,	-3.23,	-4.83,	-5.47,	-6.10,	-6.20,	-6.57,	-6.97,	JETNUS	355
*	-1.73,	-2.63,	-3.87,	-4.20,	-4.70,	-5.17,	-5.57,	-6.00,	JETNUS	356
*	-1.47,	-2.03,	-2.60,	-2.17,	-3.30,	-3.90,	-4.47,	-4.83,	JETNUS	357
*	-1.40,	-1.87,	-1.13,	-1.20,	-1.67,	-2.47,	-3.13,	-3.40,	JETNUS	358
*	-1.10,	-.17,	.83,	.73,	.10,	-.80,	-1.53,	-.87,	JETNUS	359
*	-.97,	1.73,	2.63,	2.40,	2.07,	1.23,	.47,	4.00,	JETNUS	360
*	2.33,	3.00,	3.53,	3.47,	3.50,	3.23,	3.17,	5.67,	JETNUS	361
*	-1.23,	-.10,	2.13,	3.43,	4.00,	4.47,	5.00,	4.20,	JETNUS	362
*	-3.17,	-1.50,	.95,	2.10,	3.60,	4.33,	5.00,	.17,	JETNUS	363
*	-3.33,	-2.00,	-1.40,	.07,	2.40,	2.60,	2.77,	-3.46,	JETNUS	364
*	-3.30,	-1.67,	-1.57,	-1.37,	0.00,	-.17,	-4.17,	-6.33,	JETNUS	365
*	-3.30,	-2.00,	-1.80,	-3.10,	-2.40,	-2.70,	-10.80,	-9.10,	JETNUS	366
*	-23.30,	-22.00,	-21.80,	-23.10,	-22.40,	-22.80,	-30.90,	-29.10,	JETNUS	367
DATA D16/	-5.00,	-6.40,	-7.60,	-9.10,	-11.10,	-10.60,	-11.70,	-12.00,	JETNUS	368
*	-5.00,	-6.07,	-7.27,	-8.73,	-10.33,	-10.00,	-11.07,	-10.87,	JETNUS	369
*	-4.93,	-5.53,	-7.13,	-8.40,	-9.60,	-9.37,	-10.50,	-10.03,	JETNUS	370
*	-4.47,	-5.40,	-6.53,	-7.60,	-8.67,	-8.60,	-9.73,	-9.20,	JETNUS	371
*	-4.00,	-4.83,	-5.90,	-6.73,	-7.70,	-7.80,	-8.93,	-8.23,	JETNUS	372
*	-3.53,	-4.27,	-5.20,	-5.87,	-6.66,	-7.04,	-7.97,	-7.27,	JETNUS	373
*	-3.03,	-3.67,	-4.47,	-4.93,	-5.70,	-6.10,	-6.83,	-6.23,	JETNUS	374
*	-2.57,	-2.97,	-3.53,	-3.80,	-4.50,	-5.13,	-5.73,	-5.10,	JETNUS	375
*	-2.13,	-2.27,	-1.00,	-2.33,	-3.30,	-3.90,	-4.53,	-3.77,	JETNUS	376
*	-2.00,	-1.43,	-1.00,	-1.10,	-1.83,	-2.43,	-3.07,	-2.20,	JETNUS	377
*	-1.80,	.33,	1.07,	.87,	-.20,	-.70,	-1.27,	.06,	JETNUS	378
*	-.93,	1.57,	2.67,	2.50,	2.03,	1.47,	.83,	4.00,	JETNUS	379
*	2.67,	3.00,	3.27,	3.33,	3.50,	3.37,	3.33,	5.33,	JETNUS	380
*	-.67,	-.30,	1.36,	2.87,	4.00,	4.43,	5.00,	4.10,	JETNUS	381
*	-2.33,	-1.50,	-1.03,	1.60,	3.30,	4.17,	5.00,	-.37,	JETNUS	382
*	-2.67,	-2.00,	-1.70,	-.37,	1.70,	2.20,	2.53,	-3.93,	JETNUS	383
*	-2.67,	-1.33,	-2.03,	-2.33,	-2.00,	-2.33,	-4.33,	-6.67,	JETNUS	384
*	-2.70,	-2.00,	-2.40,	-4.10,	-5.60,	-6.50,	-11.30,	-9.30,	JETNUS	385
*	-22.70,	-22.00,	-22.30,	-24.10,	-25.70,	-26.40,	-31.30,	-29.30,	JETNUS	386
DATA D17/	-7.10,	-7.10,	-7.10,	-8.10,	-9.60,	-10.20,	-11.70,	-11.20,	JETNUS	387
*	-7.00,	-7.00,	-7.00,	-7.80,	-9.00,	-9.50,	-11.10,	-10.20,	JETNUS	388
*	-6.90,	-6.90,	-6.90,	-7.60,	-8.50,	-9.00,	-10.70,	-9.40,	JETNUS	389
*	-6.20,	-6.20,	-6.20,	-6.80,	-7.70,	-8.30,	-10.00,	-8.60,	JETNUS	390
*	-5.50,	-5.50,	-5.50,	-6.00,	-6.90,	-7.60,	-9.30,	-7.60,	JETNUS	391
*	-5.50,	-5.50,	-4.80,	-5.20,	-6.10,	-6.90,	-8.30,	-6.60,	JETNUS	392
*	-4.10,	-4.10,	-4.10,	-4.40,	-5.30,	-6.00,	-7.10,	-5.50,	JETNUS	393
*	-3.40,	-3.30,	-3.20,	-3.40,	-5.30,	-5.10,	-5.90,	-4.20,	JETNUS	394
*	-2.80,	-2.50,	-2.20,	-2.50,	-3.30,	-3.90,	-4.60,	-2.70,	JETNUS	395
*	-2.60,	-1.60,	-1.00,	-1.00,	-2.00,	-2.40,	-3.00,	-1.00,	JETNUS	396
*	-2.50,	-.50,	1.30,	1.00,	-.50,	-.70,	-1.00,	1.00,	JETNUS	397
*	.90,	1.40,	2.70,	2.60,	2.00,	1.70,	1.20,	4.00,	JETNUS	398
*	3.00,	3.00,	3.00,	3.20,	3.50,	3.50,	3.50,	5.00,	JETNUS	399
*	0.00,	-.50,	.60,	2.30,	4.00,	4.40,	5.00,	4.00,	JETNUS	400

*	-1.50, -1.50, -1.10, 1.10, 3.00, 4.00, 5.00, -.90,	JETNOS	401
*	-2.00, -2.00, -2.00, -.80, 1.00, 1.80, 2.30, -4.40,	JETNOS	402
*	-2.00, -1.00, -2.50, -3.30, -4.00, -4.50, -4.50, -7.00,	JETNOS	403
*	-2.00, -2.00, -3.00, -5.60, -9.10, -10.70, -11.50, -9.60,	JETNOS	404
*	-22.00, -22.00, -23.00, -25.60, -29.20, -30.70, -31.50, -29.50,	JETNOS	405
DATA C18/	-6.30, -6.20, -6.80, -7.90, -9.70, -9.50, -10.00, -10.70,	JETNOS	406
*	-5.93, -6.33, -6.60, -7.60, -9.00, -8.93, -9.73, -9.80,	JETNOS	407
*	-5.67, -6.37, -6.50, -7.33, -8.43, -8.50, -9.47, -9.10,	JETNOS	408
*	-5.00, -5.37, -5.93, -6.60, -7.67, -7.86, -9.00, -8.34,	JETNOS	409
*	-4.37, -4.70, -5.27, -5.87, -6.87, -7.23, -8.40, -7.40,	JETNOS	410
*	-3.73, -4.03, -4.57, -5.07, -6.03, -6.60, -7.60, -6.40,	JETNOS	411
*	-3.17, -3.40, -3.83, -5.67, -5.20, -5.67, -6.60, -5.33,	JETNOS	412
*	-2.67, -2.73, -2.93, -3.17, -4.17, -4.73, -5.60, -4.13,	JETNOS	413
*	-2.20, -2.00, -1.80, -2.13, -3.07, -3.60, -4.40, -2.80,	JETNOS	414
*	-1.97, -1.23, -.40, -.60, -1.67, -1.93, -2.67, -1.00,	JETNOS	415
*	-1.63, -.07, 1.70, 1.40, -.07, -.07, -.67, 1.00,	JETNOS	416
*	1.60, 2.03, 3.07, 3.00, 2.33, 1.97, 1.63, 3.50,	JETNOS	417
*	4.00, 3.33, 2.93, 3.07, 3.33, 3.50, 3.67, 4.67,	JETNOS	418
*	1.00, .30, .60, 1.90, 3.33, 4.10, 5.00, 3.50,	JETNOS	419
*	-.83, -1.13, -1.33, .33, 2.03, 3.33, 4.67, -.93,	JETNOS	420
*	-1.27, -1.67, -2.43, -1.67, -.20, 1.03, 2.03, -4.60,	JETNOS	421
*	-1.27, -.83, -2.73, -3.80, -4.67, -5.67, -6.33, -7.33,	JETNOS	422
*	-1.27, -1.70, -3.00, -5.70, -9.40, -11.80, -14.50, -10.00,	JETNOS	423
*	-21.27, -21.70, -23.00, -25.70, -29.30, -31.90, -34.50, -30.00,	JETNOS	424
DATA C19/	-5.50, -5.70, -6.20, -7.80, -9.50, -8.80, -8.60, -10.10,	JETNOS	425
*	-4.87, -5.67, -6.20, -7.40, -9.00, -8.37, -8.37, -9.40,	JETNOS	426
*	-4.43, -5.83, -6.10, -7.07, -8.37, -8.00, -8.23, -8.80,	JETNOS	427
*	-3.80, -4.53, -5.67, -6.40, -7.63, -7.43, -8.00, -8.07,	JETNOS	428
*	-3.23, -3.90, -5.03, -5.73, -6.83, -6.87, -7.50, -7.20,	JETNOS	429
*	-2.67, -3.27, -4.33, -4.93, -5.97, -6.30, -6.90, -6.20,	JETNOS	430
*	-2.23, -2.70, -3.57, -4.00, -5.10, -5.33, -6.10, -5.17,	JETNOS	431
*	-1.94, -2.17, -2.67, -2.93, -4.03, -4.37, -5.30, -4.07,	JETNOS	432
*	-1.60, -1.50, -1.40, -1.77, -2.83, -3.30, -4.20, -2.90,	JETNOS	433
*	-1.33, -.87, .20, -.20, -1.33, -1.47, -2.33, -1.00,	JETNOS	434
*	-.77, .37, 2.10, 1.80, .37, .47, -.33, 1.00,	JETNOS	435
*	2.30, 2.67, 3.43, 3.40, 2.67, 2.23, 2.07, 3.00,	JETNOS	436
*	5.00, 3.67, 2.87, 2.93, 3.17, 3.50, 3.83, 4.33,	JETNOS	437
*	2.00, 1.10, .60, 1.50, 2.67, 3.80, 5.00, 3.00,	JETNOS	438
*	-.17, -.77, -1.57, -.43, 1.07, 2.67, 4.33, -.97,	JETNOS	439
*	-.53, -1.33, -2.87, -2.53, -1.40, .27, 1.77, -4.80,	JETNOS	440
*	-.53, -.67, -2.97, -4.30, -5.33, -6.83, -8.17, -7.67,	JETNOS	441
*	-.70, -1.30, -2.90, -6.00, -9.10, -13.50, -17.80, -10.20,	JETNOS	442
*	-20.70, -21.30, -22.80, -26.00, -29.20, -33.60, -37.80, -30.20,	JETNOS	443
DATA C20/	-4.40, -5.80, -6.00, -7.80, -9.80, -8.20, -7.00, -9.60,	JETNOS	444
*	-2.80, -5.00, -5.80, -7.20, -9.00, -7.80, -7.00, -9.00,	JETNOS	445
*	-3.20, -4.30, -5.70, -6.80, -8.30, -7.50, -7.00, -8.50,	JETNOS	446
*	-2.60, -3.70, -5.40, -6.20, -7.60, -7.00, -7.00, -7.80,	JETNOS	447
*	-2.10, -3.10, -4.80, -5.60, -6.80, -6.50, -6.60, -7.00,	JETNOS	448
*	-1.60, -2.50, -4.10, -4.80, -5.90, -6.00, -6.20, -6.00,	JETNOS	449
*	-1.30, -2.00, -3.30, -3.80, -5.00, -5.00, -5.60, -5.00,	JETNOS	450
*	-1.20, -1.60, -2.40, -2.70, -3.90, -4.00, -5.00, -4.00,	JETNOS	451
*	-1.00, -1.00, -1.00, -1.40, -2.60, -3.00, -4.00, -3.00,	JETNOS	452
*	-.70, -.50, .80, .20, -1.00, -1.00, -2.00, -1.00,	JETNOS	453
*	.10, .80, 2.50, 2.20, .80, 1.00, 0.00, 1.00,	JETNOS	454
*	3.00, 3.30, 3.80, 3.80, 3.00, 2.50, 2.50, 2.50,	JETNOS	455
*	6.00, 4.00, 2.80, 2.80, 3.00, 3.50, 4.00, 4.00,	JETNOS	456
*	3.00, 1.50, .60, 1.10, 2.00, 3.50, 5.00, 2.50,	JETNOS	457

*	.50, -.40, -1.80, -1.20, .10, 2.00, 4.00, -1.00,	JETNUS	458
*	.20, -1.00, -3.30, -3.40, -2.60, -.50, 1.50, -5.00,	JETNOS	459
*	.20, -.50, -3.20, -4.80, -6.00, -8.00, -10.00, -8.00,	JETNOS	460
*	.20, -1.00, -3.30, -6.20, -9.50, -15.30, -21.40, -10.90,	JETNLS	461
*	-19.80, -21.00, -23.30, -26.20, -29.50, -35.40, -41.00, -30.90/	JETNOS	462
*	DATA C21/ -5.10, -6.80, -7.10, -8.20, -9.30, -7.70, -7.00, -9.90,	JETNOS	463
*	-4.53, -5.97, -6.80, -7.63, -8.63, -7.53, -7.00, -9.00,	JETNUS	464
*	-4.13, -5.33, -6.57, -7.17, -8.00, -7.30, -6.97, -8.33,	JETNOS	465
*	-3.73, -4.80, -6.13, -6.57, -7.30, -6.93, -6.93, -7.53,	JETNOS	466
*	-3.40, -4.23, -5.50, -5.93, -6.47, -6.40, -6.60, -6.67,	JETNUS	467
*	-3.07, -3.67, -4.73, -5.03, -5.50, -5.80, -6.13, -5.67,	JETNUS	468
*	-2.80, -3.07, -3.80, -3.90, -4.47, -4.80, -5.47, -4.67,	JETNLS	469
*	-2.47, -2.40, -2.70, -2.63, -3.27, -3.73, -4.70, -3.67,	JETNUS	470
*	-1.47, -1.26, -1.10, -1.17, -1.90, -2.60, -3.60, -2.67,	JETNOS	471
*	.20, .17, .87, .60, -.33, -.67, -1.67, -.96,	JETNOS	472
*	.90, 1.53, 2.83, 2.53, 1.47, 1.33, .33, 1.00,	JETNOS	473
*	2.33, 2.87, 3.70, 3.87, 3.33, 2.83, 2.93, 2.66,	JETNUS	474
*	3.57, 2.67, 2.37, 2.67, 3.10, 3.67, 4.27, 4.00,	JETNOS	475
*	1.17, .57, -.27, .57, 1.93, 3.50, 5.00, 2.66,	JETNUS	476
*	-.63, -1.56, -2.83, -1.90, -.10, 2.00, 4.17, 1.00,	JETNOS	477
*	-.87, -2.20, -4.30, -4.07, -2.83, -.50, 1.67, -5.00,	JETNOS	478
*	-.87, -2.00, -4.60, -5.60, -6.00, -7.17, -8.33, -8.00,	JETNOS	479
*	-1.00, -2.10, -4.90, -7.10, -9.40, -13.60, -18.20, -11.00,	JETNUS	480
*	-21.00, -22.10, -24.90, -27.20, -29.40, -33.50, -38.10, -31.00/	JETNOS	481
*	DATA C22/ -5.60, -7.30, -8.40, -5.60, -9.10, -7.50, -7.00, -9.90,	JETNUS	482
*	-5.27, -6.93, -7.80, -8.07, -8.27, -7.27, -7.00, -9.00,	JETNUS	483
*	-5.07, -6.37, -7.43, -7.53, -7.70, -7.10, -6.93, -8.17,	JETNLS	484
*	-4.87, -5.90, -6.87, -6.93, -7.00, -6.87, -6.87, -7.27,	JETNOS	485
*	-4.70, -5.37, -6.20, -6.27, -6.13, -6.30, -6.60, -6.33,	JETNUS	486
*	-4.53, -4.83, -5.37, -5.27, -5.10, -5.60, -6.06, -5.33,	JETNOS	487
*	-4.30, -4.13, -4.30, -4.00, -3.93, -4.60, -5.33, -4.33,	JETNOS	488
*	-3.73, -3.20, -3.00, -2.57, -2.63, -3.47, -4.40, -3.33,	JETNLS	489
*	-1.93, -1.53, -1.20, -.93, -1.20, -2.20, -3.20, -2.33,	JETNOS	490
*	1.10, .83, .93, 1.00, .33, -.33, -1.33, -.93,	JETNOS	491
*	1.70, 2.27, 3.17, 2.87, 2.13, 1.67, .67, 1.00,	JETNUS	492
*	1.67, 2.43, 3.60, 3.93, 3.67, 3.17, 3.37, 2.83,	JETNUS	493
*	1.13, 1.33, 1.93, 2.53, 3.20, 3.83, 4.53, 4.00,	JETNOS	494
*	-.67, -.77, -1.13, .63, 1.87, 3.50, 5.00, 2.83,	JETNUS	495
*	-1.77, -2.73, -3.87, -2.60, -.30, 2.00, 4.33, -1.00,	JETNUS	496
*	-1.93, -3.40, -5.30, -4.73, -3.07, -.50, 1.83, -5.00,	JETNUS	497
*	-1.93, -3.50, -6.00, -6.40, -6.00, -6.33, -6.66, -8.00,	JETNOS	498
*	-2.00, -3.60, -6.80, -8.20, -8.90, -11.90, -14.70, -10.80,	JETNOS	499
*	-22.00, -23.60, -26.80, -28.30, -28.90, -31.90, -34.60, -30.80/	JETNOS	500
*	DATA C23/ -6.00, -8.50, -9.40, -9.30, -8.50, -7.20, -7.20, -10.20,	JETNUS	501
*	-6.00, -7.90, -8.80, -8.50, -7.90, -7.00, -7.00, -9.00,	JETNOS	502
*	-6.00, -7.40, -8.30, -7.90, -7.40, -6.90, -6.90, -8.00,	JETNUS	503
*	-6.00, -7.00, -7.60, -7.30, -6.70, -6.80, -6.80, -7.00,	JETNOS	504
*	-6.00, -6.50, -6.90, -6.60, -5.80, -6.20, -6.60, -6.00,	JETNOS	505
*	-6.00, -6.00, -6.00, -5.50, -4.70, -5.40, -6.00, -5.00,	JETNOS	506
*	-5.80, -5.20, -4.80, -4.10, -3.40, -4.40, -5.20, -4.00,	JETNOS	507
*	-5.00, -4.00, -3.30, -2.50, -2.00, -3.20, -4.10, -3.00,	JETNOS	508
*	-2.40, -1.80, -1.30, -.70, -.50, -1.80, -2.80, -2.00,	JETNUS	509
*	2.00, 1.50, 1.00, 1.40, 1.00, 0.00, -1.00, -.90,	JETNUS	510
*	2.50, 3.00, 3.50, 3.20, 2.80, 2.00, 1.00, 1.00,	JETNUS	511
*	1.00, 2.00, 3.50, 4.00, 4.00, 3.50, 3.80, 3.00,	JETNUS	512
*	-1.30, 0.00, 1.50, 2.40, 3.30, 4.00, 4.80, 4.00,	JETNOS	513
*	-2.50, -2.10, -2.00, -.50, 1.80, 3.50, 5.00, 3.00,	JETNUS	514

*	-2.90, -3.90, -4.90, -3.30, -.50, 2.00, 4.50, -1.00,	JETNUS	515
*	-3.00, -4.60, -6.30, -5.40, -3.30, -.50, 2.00, -5.00,	JETNUS	516
*	-3.00, -5.00, -7.40, -7.20, -6.00, -5.50, -5.00, -8.00,	JETNUS	517
*	-3.00, -5.40, -8.40, -8.90, -8.70, -10.60, -12.30, -11.00,	JETNUS	518
*	-23.00, -25.40, -28.40, -29.00, -28.70, -30.70, -32.20, -31.00/	JETNUS	519
DATA D24/	-7.00, -9.40, -10.40, -9.60, -8.00, -6.80, -7.30, -10.10,	JETNUS	520
*	-6.93, -8.87, -9.80, -8.93, -7.53, -6.73, -7.00, -9.00,	JETNUS	521
*	-6.93, -8.43, -9.17, -8.27, -7.10, -6.70, -6.87, -8.00,	JETNUS	522
*	-7.13, -8.10, -8.33, -7.67, -6.40, -6.73, -6.73, -7.00,	JETNUS	523
*	-7.30, -7.63, -7.60, -6.93, -5.46, -6.10, -6.60, -5.83,	JETNUS	524
*	-7.47, -7.17, -6.63, -5.73, -4.30, -5.20, -5.93, -4.67,	JETNUS	525
*	-7.30, -6.27, -5.30, -4.20, -2.87, -4.20, -5.07, -3.67,	JETNUS	526
*	-6.27, -4.80, -3.60, -2.43, -1.37, -2.93, -3.80, -2.67,	JETNUS	527
*	-2.87, -2.07, -1.40, -.47, .20, -1.40, -2.40, -1.67,	JETNUS	528
*	2.90, 2.17, 1.07, 1.80, 1.67, .33, -.67, -.87,	JETNUS	529
*	3.30, 3.73, 3.83, 3.53, 3.47, 2.33, 1.33, 1.00,	JETNUS	530
*	.33, 1.57, 3.40, 4.07, 4.33, 3.83, 4.23, 3.17,	JETNUS	531
*	-3.73, -1.33, 1.07, 2.27, 3.40, 4.17, 5.07, 4.00,	JETNUS	532
*	-4.00, -3.43, -2.87, -1.03, 1.73, 3.50, 5.00, 3.17,	JETNUS	533
*	-4.03, -5.07, -5.93, -5.07, -.70, 2.00, 4.67, -1.00,	JETNUS	534
*	-4.07, -5.80, -7.30, -6.07, -3.53, -.50, 2.17, -5.00,	JETNUS	535
*	-4.07, -6.50, -8.80, -8.00, -6.00, -4.67, -3.33, -8.00,	JETNUS	536
*	-4.10, -7.20, -10.30, -9.80, -8.40, -8.70, -8.80, -11.00,	JETNUS	537
*	-24.00, -27.20, -30.30, -29.80, -28.40, -28.70, -28.80, -31.10/	JETNUS	538
C	ALPHA=(ANGJET*1.745325E-2)-ATAN(GRAD)	JETNUS	539
	ICCODE=NJET	JETNUS	540
	IF((NJET.GT.0).AND.(NJET.LE.3)) GC TC 250	JETNUS	541
	IF(WS.NE.0.) DIAMET=0.	JETNUS	542
	ICCODE=3	JETNUS	543
	IF((PR.LE.0.0).AND.(PA.LE.0.0).AND.(TT.LE.0.0)) GL TC 250	JETNUS	544
	IF(WP.LE.0.0) ICCDE=1	JETNUS	545
	IF(AP.LE.0.0) ICCDE=2	JETNUS	546
250	CALL JETPED(MCODE,ICCODE,PR,PA,TT,VA,AF,WP,VP,DIAMET,AS,VS,ALPHA,	JETNUS	547
	*SPL,TIC,ANGLES,SPLP)	JETNUS	548
	IF((ICCODE.NE.3).OR.(WS.EQ.0.0)) GC TC 500	JETNUS	549
	AE=AP+AS	JETNUS	550
	RHOE=WS/(AS*VS)	JETNUS	551
C		JETNUS	552
C		JETNUS	553
	VE=VP*SQRT((1.+(AS/AP)*((VS/VP)**2))/(1.+AS/AP))	JETNUS	554
C		JETNUS	555
C		JETNUS	556
	WE=RHOE*AE*(VE)	JETNUS	557
C		JETNUS	558
	CALL JETPED(MCODE,ICCODE,PR,PA,TT,VA,AE,WE,VE,0.0,0.0,VS,ALPHA,	JETNUS	559
	*SPL,TIC,ANGLES,SPLS)	JETNUS	560
500	CONTINUE	JETNUS	561
	RETURN	JETNUS	562
	END	JETNUS	563
		JETNUS	564

SUBROUTINE JETPED (ISN, IOPT, PR, PA, TT, V, A8, WA, *VA, DIAMET, A82, V2, ALPHA, SPL, TID, TTHETA, SPLPOS)		JETPED	2
C	AUTHOR D. F. MELDRUM	JETPED	3
C		JETPED	4
C	METHOD JET NOISE IS PREDICTED BY THE USE OF SEVERAL CURVES	JETPED	5
C	THESE CURVES ARE INTERPOLATED OR EXTRAPOLATED AS	JETPED	6
C	NEEDED IN ORDER TO PREDICT THE NOISE AT 150 FT. RADIUS	JETPED	7
C		JETPED	8
C	PURPOSE TO PREDICT THE JET NOISE PRODUCED BY 1) PRIMARY JET,	JETPED	9
C	2) SECONDARY JET.	JETPED	10
C		JETPED	11
C	INPUTS	JETPED	12
C	ISN CODE FOR STRUCTURAL CURVE REQUIRED	JETPED	13
C	1 FOR FLIGHT SPECTRUM CURVE	JETPED	14
C	2 FOR GROUND SPECTRUM CURVE	JETPED	15
C	3 FOR AVERAGE OF 1 AND 2	JETPED	16
C	IOPT CODE FOR TYPE OF INPUT DATA	JETPED	17
C	1 A8 PR PA TT VELOCITY (DIAMET)	JETPED	18
C	2 WA PR PA TT VELOCITY (DIAMET)	JETPED	19
C	3 A8 WA VA VELOCITY (DIAMET A82	JETPED	20
C	VA2 WA2)	JETPED	21
C	4 SECONDARY (3)	JETPED	22
C	PR NOZZLE PRESSURE RATIO	JETPED	23
C	PA STATIC PRESSURE	JETPED	24
C	TT TOTAL TEMPERATURE OF EXHAUST GAS	JETPED	25
C	V AIRCRAFT VELOCITY	JETPED	26
C	A8 CROSS-SECTIONAL AREA OF THE NOZZLE EXIT	JETPED	27
C	WA WEIGHT FLOW OF EXHAUST GAS	JETPED	28
C	VA VELOCITY OF JET EXHAUST, ABSOLUTE TO NOZZLE	JETPED	29
C	DIAMET DIAMETER OF NOZZLE - IF ZERO OR NEGATIVE	JETPED	30
C	THE DIAMETER WILL BE CALCULATED FROM THE	JETPED	31
C	NOZZLE AREA	JETPED	32
C	A82 SECONDARY AREA (SEE A8)	JETPED	33
C	V2 SECONDARY ABSOLUTE VELOCITY OF JET EXHAUST	JETPED	34
C	ALPHA ENGINE ATTITUDE ANGLE TO THE OBSERVER	JETPED	35
C	TID DIRECTIVITY CORRECTION CURVE	JETPED	36
C	TTHETA DIRECTIVITY ANGLES	JETPED	37
C		JETPED	38
C	INPUT VIA LABELED COMMON - GFREQ	JETPED	39
C		JETPED	40
C	TFREQ 1/3 OCTAVE BAND CENTER FREQUENCIES	JETPED	41
C		JETPED	42
C	OUTPUTS	JETPED	43
C	SPL SOUND PRESSURE LEVEL SPECTRA FOR JET NOISE	JETPED	44
C		JETPED	45
C	SPLPOS MATRIX (24,17) OF UNSHIELDED SPECTRA	JETPED	46
C	EITHER PRIMARY OR SECONDARY JET	JETPED	47
C	MODIFICATIONS FROM PROGRAM DESCRIBED IN D6-25490 MADE INTO	JETPED	48
C	SUBROUTINE BY D. F. MELDRUM 4/15/72 FOR TEE215	JETPED	49
C	TAKEN FROM TEE215 AND MADE CHANGES FOR THE	JETPED	50
C	NASA-AMES CONTRACT	JETPED	51
C		JETPED	52
C	REFERENCES D6-25490 1/10/72 P. SCHORR	JETPED	53
C	R. J. SAXBY, JET NOISE PREDICTION PROCEDURE	JETPED	54
C	FOR THE NASA-AMES FOOTPRINT CONTRACT NAS2-6969,	JETPED	55
C	UN-NUMBERED COORDINATION SHEET, DATED	JETPED	56
C	17 JANUARY 1973	JETPED	57
C		JETPED	58

[illegible]

	* 162.3,163.9,166.1,168.5,171.1/	JETP	116
C		JETPL	117
C	DENSITY CORRECTION EXPONENT	JETPED	118
C		JETPED	119
	DATA TVRN/500.,1500.,1600.,1700.,1800.,1900.,2000.,2100.,	JETPED	120
	* 2200./	JETPED	121
	DATA TDBN/-0.40,1.4,1.59,1.77,1.88,1.95,1.99,2.00,2.0/	JETPED	122
C		JETPED	123
C	STROUHAL SPECTRUM GROUND FLIGHT MIXED	JETPED	124
C		JETPED	125
	DATA TCB/-33.5,-16.7,-12.5,-9.8,-8.,-5.5,-4.8,-4.8,-5.,	JETPED	126
1	-5.8,-8.7,-15.5,-45.3/	JETPED	127
	DATA TSN/ .01,.04,.06,.08,.1,.15,.2,.25,.3,.4,.7,2.,100./	JETPED	128
	DATA TCB2/ -34.,-19.,-11.8,-9.5,-6.7,-5.8,-5.,-7.3,-10.9,	JETPED	129
1	-14.5,-20.6,-26.6,-45.2/	JETPED	130
	DATA TSN2/ .01,.025,.04,.05,.08,.1,.2,.5,1.,2.,5.,10.,100./	JETPED	131
	DATA TCB3/ -38.,-14.5,-10.8,-7.7,-5.6,-5.2,-5.8,-7.3,	JETPED	132
1	-10.7,-15.3,-39.5/	JETPED	133
	DATA TSN3/ .01,.07,.1,.15,.25,.4,.6,1.,2.,4.,100./	JETPED	134
	DATA ISWCH/0/	JETPED	135
C		JETPED	136
C	IF(ISWCH.NE.0) GO TO 33	JETPED	137
	ISWCH=1	JETPED	138
		JETPED	139
C		JETPED	140
	DC 34 I=1,36	JETPED	141
	SNLX(I)=ALOG10(SNX(I))	JETPED	142
	IF(I.GT.24) GO TO 34	JETPED	143
	DEFREQ(I)=ALOG10(TFREQ(I)*2.C/1000.)	JETPED	144
	IF(I.GT.19) GO TO 34	JETPED	145
	ATHEA(I)=(I-1)*1C	JETPED	146
	IF(I.GT.13) GO TO 34	JETPED	147
	TSN1(I)=ALOG10(TSN(I))	JETPED	148
	TSN21(I)=ALOG10(TSN2(I))	JETPED	149
	IF(I.GT.11) GO TO 34	JETPED	150
	TSN31(I)=ALOG10(TSN3(I))	JETPED	151
34	CCNTINUE	JETPED	152
C		JETPED	153
C		JETPED	154
	33 IF(IOPT.EQ.3) GO TO 27	JETPED	155
C		JETPED	156
C		JETPED	157
	GMMA=TBLU1(ALOG10(TT),TTEMP,TGMMA,1,20)	JETPED	158
	GAMEX=(GMMA-1.)/GMMA	JETPED	159
	GAMX=(1.-GMMA)/GMMA	JETPED	160
	RHO=(PA/(53.35*TT))*PR**GAMEX	JETPED	161
	VJET=SQRT((64.4/GAMEX)*53.35*TT*(1.-PR**GAMX))	JETPED	162
	VR=SQRT(VJET*VJET-2.0*VJET*V*CO\$(ALPHA)+V*V)	JETPED	163
	VR1=ALOG10(VR)	JETPED	164
	IF (IOPT .EQ. 2) GO TO 25	JETPED	165
	XMACH=SQRT((2./(GMMA-1.))*((PR**GAMEX)-1.))	JETPED	166
3	IF (XMACH .LE. 1.) GO TO 20	JETPED	167
	AREA=(A8*PR**((1./GMMA)*(2./(GMMA+1.))*((1./GMMA-1.))))/	JETPED	168
1	SORT(((GMMA+1.)/(GMMA-1.))*((1.-PR**GAMX)))	JETPED	169
	GC TO 35	JETPED	170
20	AREA=A8	JETPED	171
	GC TO 35	JETPED	172

25	AREA=WA/(RHO*VJET)	JETPED	173
	GO TO 35	JETPED	174
C		JETPED	175
C		JETPED	176
27	VR=SQRT(VA*VA-2.*VA*V* $\cos(\text{ALPHA})$ +V*V)	JETPED	177
29	AREA =A8	JETPED	178
	RHO=WA/(A8*VA)	JETPED	179
C		JETPED	180
C	DETERMINE OASPL = DB + B	JETPED	181
C		JETPED	182
35	VR1=ALOG10(VR)	JETPED	183
	DB=TBLU1(VR1,TVR,TDB,1,12)	JETPED	184
	AN=TBLU1(VR,TVRN,TDBN,1,9)	JETPED	185
	B=10.*(ALOG10(AREA)+AN*ALOG10(RHC))	JETPED	186
	DE=SQRT(AREA)*1.13	JETPED	187
	IF(DIAMET.GT.0.C) DE=DIAMET	JETPED	188
	DO 800 IOT=1,17	JETPED	189
	DO 800 IOB=1,24	JETPED	190
43	FREQ=TFREQ(IOB)	JETPED	191
	THETA=TTHEA(IOT)	JETPED	192
	SN=FREQ*CE/VR	JETPED	193
	SN1=ALOG10(SN)	JETPED	194
	FREQDE=ALOG10(FREQ*DE/1000.)	JETPED	195
C		JETPED	196
C		JETPED	197
	DELTA=0.	JETPED	198
	IF(IOPT.NE.3) GO TO 44	JETPED	199
	IF(A82.LE.0.) GO TO 44	JETPED	200
	IF(V2.LE.C.) GO TO 44	JETPED	201
	ABSRAT=ABS((VA-V2)/VA)	JETPED	202
	IF(ABSRAT.LT.0.1) RETURN	JETPED	203
	AREARO=A82/AREA	JETPED	204
	SNX(1) = FREQ * DE / VA	JETPED	205
	SNX1 = ALOG10(SNX(1))	JETPED	206
	IF ((AREARO .LT. 1.) .AND. (SNX(1) .LT. 0.067)) AREARO = 1.	JETPED	207
	AN=TBLU2(SNX1,AREARO,SNLX,AREAX,TVARE,1,1,36,6,36,6)	JETPED	208
	DELTA=AN*10.*ALOG10(ABSRAT)	JETPED	209
C		JETPED	210
C		JETPED	211
44	CONTINUE	JETPED	212
C		JETPED	213
	IF (ISN .EQ. 1) GO TO 47	JETPED	214
	IF (ISN .EQ. 3) GO TO 45	JETPED	215
	IF (ISN.NE.2) GO TO 47	JETPED	216
	CB=TBLU1(SN1,TSN1,TCB,1,13)	JETPED	217
	GO TO 156	JETPED	218
45	CB=TBLU1(SN1,TSN21,TCB2,1,13)	JETPED	219
	GO TO 156	JETPED	220
47	CB=TBLU1(SN1,TSN31,TCB3,1,11)	JETPED	221
156	IF (VR-3000.) 49,49,28	JETPED	222
28	VR=3000.	JETPED	223
	GO TO 49	JETPED	224
38	IF (VR-500.) 39,39,49	JETPED	225
39	VR=500.	JETPED	226
CONTINUE		JETPED	227
49	XIC=TBLU3(VR,THETA,FREQDE,TRV,ATHETA,DEFREQ,TID,1,1,1,	JETPED	228
*	8,19,24,8,19,24)	JETPED	229

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8002 SPLPED=DB+B+CB+XID+DELTA-4.8
C
  SPLPOS(IOB,IOT)=SPLPED
  SPL(IOB,IOT)=PWRSUM(SPL(IOB,ICT),SPLPED)
800 CONTINUE
  RETURN
C
C
  END

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JETPED 230
JETPED 231
JETPED 232
JETPED 233
JETPED 234
JETPED 235
JETPED 236
JETPED 237
JETPED 238

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	SUBROUTINE JNSA(APY,APZ,ALTR,BCF,CZ,DELTA,DIAMT1,VP,VS,	JNSA	2
	* SLDIST,M,NCF,SPLP,SPLS,SPLT,ITYPE,DSPL,IUNIT)	JNSA	3
C		JNSA	4
C	PURPOSE TO PREDICT THE JET NOISE SHIELDING ATTENUATION FOR	JNSA	5
C	AN ENGINE-OVER-WING CONFIGURATION	JNSA	6
C	THE ATTENUATIONS ARE TO BE SUBTRACTED FROM	JNSA	7
C	PREDICTED UNSHIELDED JET NOISE SPECTRA AT INDEXED	JNSA	8
C	CONDITIONS	JNSA	9
C		JNSA	10
C	INPUT	JNSA	11
C	APY ARRAY OF A/C COORDINATE IN DIRECTION OF	JNSA	12
C	FLIGHT PATH PROJECTION ON THE GROUND(FT)	JNSA	13
C	APZ ARRAY OF A/C VERTICAL COORDINATE ABOVE THE GROUND	JNSA	14
C	SLDIST SIDELINE POSITION OF OBSERVER	JNSA	15
C	ALTR OBSERVER HEIGHT ABOVE THE GROUND	JNSA	16
C	BCF GEOMETRIC MEAN FREQUENCIES(HZ)	JNSA	17
C	CZ AMBIENT SPEED OF SOUND(FPS) AT A/C ALTITUDE	JNSA	18
C		JNSA	19
C	JET NOISE UNSHIELDED SPECTRUM	JNSA	20
C	SPLP FOR PRIMARY JET(TURBOJET,ITYPE=0) AND	JNSA	21
C	SPLS FOR BULK FLOW JET TURBOFAN CANNULAR NOZZLE,	JNSA	22
C	ITYPE (ITYPE=1)	JNSA	23
C		JNSA	24
C	INPUT PRIMARY JET	JNSA	25
C	DELTA ENGINE INCLINATION ANGLE(RAD)	JNSA	26
C	DIAMT1 DIAMETER OF NOZZLE (FT)	JNSA	27
C	DSL1 DIMENSIONLESS SHIELD LENGTH PARALLEL TO	JNSA	28
C	EXHAUST AXIS FROM NOZZLE EXIT PLANE	JNSA	29
C	VP VELOCITY OF JET EXHAUST RELATIVE TO NOZZLE(FPS)	JNSA	30
C	INPUT SECONDARY JET	JNSA	31
C	DIAMT2 DIAMETER OF NOZZLE(FT)	JNSA	32
C	DSL2 DIMENSIONLESS SHIELD LENGTH PARALLEL TO	JNSA	33
C	EXHAUST AXIS FROM NOZZLE EXIT PLANE	JNSA	34
C	VS VELOCITY OF JET EXHAUST RELATIVE TO NOZZLE(FPS)	JNSA	35
C		JNSA	36
C		JNSA	37
C	DIMENSION APY(10,17),APZ(10,17),BCF(24),SLDIST(10),DSPL(24,17),	JNSA	38
C	* SPLP(24,17),SPLS(24,17),SPLT(24,17)	JNSA	39
C		JNSA	40
C	COMMON/JNSHLD/DIAMT2,DSL1,DSL2	JNSA	41
C		JNSA	42
C	PRIMARY JET CASE(TURBOJET)	JNSA	43
C		JNSA	44
C	CONSTANT TERM OF REFERENCE CORRELATION TERM	JNSA	45
C		JNSA	46
C	CONST =DSL1*6.0E-7*CZ*CZ/(32.174*VP)+DSL1*2700.*DIAMT1*DIAMT1*	JNSA	47
C	*32.174/(CZ*CZ*VP)	JNSA	48
C	SND=SIN(DELTA)	JNSA	49
C	CSDE=COS(DELTA)	JNSA	50
C		JNSA	51
C	CALCULATE JET NOISE SHIELDING ATTENUATION(PRIMARY JET)	JNSA	52
C		JNSA	53
C	CALL JNSASPI(APY,APZ,ALTR,BCF,SLDIST,P,NCF,CONST,SND,CSDE,DSPL)	JNSA	54
C		JNSA	55
C	STORE SHIELDED JET NOISE SPECTRUM THAT IS	JNSA	56
C	UNSHIELDED PRIMARY JET NOISE SPECTRUM MINUS	JNSA	57
C	THE JET NOISE SHIELDING(PRIMARY)ATTENUATION	JNSA	58

C		JNSA	59
	DO 300 J=1,17	JNSA	60
	DC 300 I=1,NCF	JNSA	61
	SPLP(I,J)= SPLP(I,J)-DSPL(I,J)	JNSA	62
	300 CONTINUE	JNSA	63
C		JNSA	64
C	CHECK FOR PRIMARY AND SECONDARY(TURBOFANS	JNSA	65
C	WITH CANNULAR NOZZLES)	JNSA	66
C		JNSA	67
	IF(ITYPE.EQ.2)GO TO 200	JNSA	68
	66 RETURN	JNSA	69
	200 CONTINUE	JNSA	70
C		JNSA	71
C	SECONDARY JET CASE(TURBOFAN)	JNSA	72
C	CONSTANT TERM OF CORRELATION TERM	JNSA	73
C		JNSA	74
	DIAMTS=DIAMT2	JNSA	75
	IF(IGNIT.EQ.0)DIAMTS=DIAMT2*3.280833	JNSA	76
	CONST=DSL2*6.0E-7*CZ*CZ/(32.174*VS)+DSL2*2700.*DIAMTS*DIAMTS*	JNSA	77
	*32.174/(CZ*CZ*VS)	JNSA	78
C		JNSA	79
C	CALCULATE JET NOISE SHIELDING ATTENUATION SECONDARY JET	JNSA	80
C		JNSA	81
	CALL JNSASP(APY,APZ,ALTR,BCF,SLDIST,M,NCF,CONST,SNCE,CSCE,CSPL)	JNSA	82
C		JNSA	83
C	FROM THE UNSHIELDED SPECTRUM SLIPPED ON AN ENERGY BASIS(SPLT)	JNSA	84
C	IS SUBTRACTED THE SHIELDED SPECTRUMS(PRIMARY AND SECONDARY)	JNSA	85
C	GIVING THE JET SHIELDING ATTENUATION	JNSA	86
C		JNSA	87
	DO 400 J=1,17	JNSA	88
	DC 400 I=1,NCF	JNSA	89
	SPLS(I,J)=SPLS(I,J)-DSPL(I,J)	JNSA	90
	DSPL(I,J)=SPLT(I,J)-10.*ALOG10(10.**(.1*SPLP(I,J))+	JNSA	91
	*10.**(.1*SPLS(I,J)))	JNSA	92
	400 CONTINUE	JNSA	93
	GO TO 66	JNSA	94
	END	JNSA	95

	SUBROUTINE JNSASP(APY,APZ,ALTR,BCF,SLDIST,M,NCF,CONST,	JNSASP	2
	* SNDE,CSDE,CSPL)	JNSASP	3
C		JNSASP	4
C	PURPOSE TO CALCULATE THE JET NOISE SHIELDING ATTENUATION	JNSASP	5
C	FOR AN EDW CONFIGURATION FOR BOTH TURBOJETS AND	JNSASP	6
C	TURBOFANS USING CO-AXIAL NOZZLES	JNSASP	7
C		JNSASP	8
C	INPUT APY ARRAY OF A/C COORDINATE IN DIRECTION OF	JNSASP	9
C	FLIGHT PATH PROJECTION ON THE GROUND(FT)	JNSASP	10
C	APZ ARRAY OF A/C VERTICAL COORDINATE ABOVE GROUND	JNSASP	11
C	ALTR OBSERVER HEIGHT ABOVE THE GROUND	JNSASP	12
C	BCF GEOMETRIC MEAN FREQUENCIES ARRAY	JNSASP	13
C	SLDIST SIDELINE POSITION OF OBSERVER	JNSASP	14
C	M NO. OF SIDELINE OBSERVER POSITIONS	JNSASP	15
C	NCF NO. OF GEOMETRIC MEAN FREQUENCIES	JNSASP	16
C	CONST CONSTANT PART OF REFERENCE CORRELATION TERM	JNSASP	17
C	SNDE SINE OF THE ENGINE INCLINATION ANGLE	JNSASP	18
C	CSDE COSINE OF ENGINE INCLINATION ANGLE	JNSASP	19
C		JNSASP	20
C	OUTPUT DSPL ARRAY OF JET NOISE SHIELDING ATTENUATION	JNSASP	21
C		JNSASP	22
C	DIMENSION APY(10,17),APZ(10,17),BCF(24),CSPL(24,17),SLDIST(10)	JNSASP	23
C		JNSASP	24
C	FOR EACH FREQUENCY A FUNCTION OF EACH REFERENCE CORRELATION	JNSASP	25
C	TERM ITERATE FOR EACH A/C POSITION RELATIVE TO THE OBSERVER	JNSASP	26
C		JNSASP	27
C	DO 200 I=1,NCF	JNSASP	28
C	ZCE0=CONST*BCF(I)	JNSASP	29
C		JNSASP	30
C	ITERATE FOR EACH A/C POSITION RELATIVE TO THE OBSERVER	JNSASP	31
C	THAT IS FOR EACH OF 17 DIRECTION ANGLES	JNSASP	32
C		JNSASP	33
C	DO 100 J=1,17	JNSASP	34
C	ZEN=APZ(M,J)-ALTR	JNSASP	35
C	ARG1=SQRT(APY(M,J)*APY(M,J)+ZEN*ZEN)	JNSASP	36
C	ARG2=-APY(M,J)*CSDE-ZEN*SNDE	JNSASP	37
C		JNSASP	38
C	DIRECTION ANGLE CALCULATION	JNSASP	39
C		JNSASP	40
C	THETA=1.570796327	JNSASP	41
C	IF(ARG1.GT.0.0)THETA=ACOS(ARG2/ARG1)	JNSASP	42
C	DEN=SQRT(SLDIST(M)*SLDIST(M)+APY(M,J)*APY(M,J)+ZEN*ZEN)	JNSASP	43
C	ETA=ASIN(SLDIST(M)/DEN)	JNSASP	44
C		JNSASP	45
C	DIRECTIVITY EFFECT	JNSASP	46
C		JNSASP	47
C	ZFE=C.0	JNSASP	48
C	CRK=3.1415926-THETA	JNSASP	49
C	IF(ABS(GRK).GT.1.0E-3)ZEE=ZCE0*CLS(ETA)/(1.+.033*(THETA/GRK)**4)	JNSASP	50
C		JNSASP	51
C	JET NOISE SHIELDING ATTENUATION	JNSASP	52
C		JNSASP	53
C	100 DSPL(I,J)= 10.*ALCG1C(1.+ZEE)	JNSASP	54
C	200 CONTINUE	JNSASP	55
C	RETURN	JNSASP	56
C	END	JNSASP	57

C	SLBRCUTINE LGMTRY(NW,RADII,TLENG,EDH,TLOVH)	LGMTRY	2
C		LGMTRY	3
C	AUTHOR G. A. WEST	LGMTRY	4
C		LGMTRY	5
C	PURPOSE TO CALCULATE THE EFFECTIVE DUCT HEIGHT AND THE	LGMTRY	6
C	RATIO OF TREATED AREA TO CROSS SECTIONAL AREA	LGMTRY	7
C	FOR A DUCT LINING	LGMTRY	8
C		LGMTRY	9
C	DESCRIPTION OF VARIABLES	LGMTRY	10
C		LGMTRY	11
C	VARIABLES IN COMMON - SEE MAIN PROGRAM	LGMTRY	12
C		LGMTRY	13
C	VARIABLES IN CALLING SEQUENCE	LGMTRY	14
C		LGMTRY	15
C	INPUT	LGMTRY	16
C		LGMTRY	17
C	NW - NUMBER OF WALLS IN LINING	LGMTRY	18
C	RADII - RADII OF WALLS IN LINING	LGMTRY	19
C	TLENG - TREATMENT LENGTH OF WALLS IN LINING	LGMTRY	20
C		LGMTRY	21
C	OUTPUT	LGMTRY	22
C		LGMTRY	23
C	EDH - EFFECTIVE DUCT HEIGHT	LGMTRY	24
C	TLOVH - RATIO OF TREATMENT LENGTH TO EFFECTIVE DUCT HEIGHT	LGMTRY	25
C		LGMTRY	26
C	LOCAL VARIABLES	LGMTRY	27
C		LGMTRY	28
C	AFLOW - CROSS SECTIONAL FLOW AREA	LGMTRY	29
C	I - GENERAL DC LCCP INDEX	LGMTRY	30
C	LASTW - INDEX OF INNERMOST WALL THAT IS TREATED ON BOTH	LGMTRY	31
C	SIDES	LGMTRY	32
C	PI - MATHEMATICAL CONSTANT	LGMTRY	33
C	SUM - SUMMATION OF TREATMENT LENGTH OF ALL WALLS	LGMTRY	34
C	TAREA - TOTAL TREATED AREA	LGMTRY	35
C	TL - AVERAGE TREATMENT LENGTH	LGMTRY	36
C	TLMAX - MAXIMUM TREATMENT LENGTH OF A WALL	LGMTRY	37
C	TLMIN - MINIMUM TREATMENT LENGTH OF A WALL	LGMTRY	38
C		LGMTRY	39
C		LGMTRY	40
C	DIMENSION RADII(1),TLENG(1)	LGMTRY	41
C		LGMTRY	42
C	DATA PI/3.14159265/	LGMTRY	43
C		LGMTRY	44
C		LGMTRY	45
C		LGMTRY	46
C	AFLOW = PI * RADII(1) * RADII(1)	LGMTRY	47
C	IF (NW .GT. 1) AFLOW = AFLOW - PI * RADII(NW) * RADII(NW)	LGMTRY	48
C		LGMTRY	49
C		LGMTRY	50
C	TAREA = 0.0	LGMTRY	51
C	DO 10 I=1,NW	LGMTRY	52
C	TAREA = TAREA + 2.0 * PI * RADII(I) * TLENG(I)	LGMTRY	53
C	10 CONTINUE	LGMTRY	54
C		LGMTRY	55
C		LGMTRY	56
C	IF (NW .LE. 2) GO TO 25	LGMTRY	57
C		LGMTRY	58

C		INTERIOR WALLS	LGMTRY	55
	LASTW = NW - 1		LGMTRY	56
	DO 20 I=2, LASTW		LGMTRY	57
	TAREA = TAREA + 2.0 * PI * RADII(I) * TLENG(I)		LGMTRY	58
	20 CONTINUE		LGMTRY	59
C		CALCULATE RATIO OF TREATED AREA	LGMTRY	60
C		TO CROSS SECTIONAL FLOW AREA	LGMTRY	61
C		(L/H)	LGMTRY	62
	25 TLOVH = 0.325 * TAREA / AFLGH		LGMTRY	63
C		CALCULATE THE APPARENT TREATMENT	LGMTRY	64
C		LENGTH (LI)	LGMTRY	65
	TLMAX=MLENG(I)		LGMTRY	66
	IF(NW .EQ. 1) GO TO 40		LGMTRY	67
	TLMIN = TLMAX		LGMTRY	68
	SUM = 0.0		LGMTRY	69
	DO 30 I=1, NW		LGMTRY	70
	IF(TLENG(I) .GT. TLMAX) TLMAX = TLENG(I)		LGMTRY	71
	IF (TLENG(I) .LT. TLMIN) TLMIN = TLENG(I)		LGMTRY	72
	SUM = SUM + TLENG(I)		LGMTRY	73
	30 CONTINUE		LGMTRY	74
C		IF THE RATIO OF THE LONGEST WALL	LGMTRY	75
C		TO THE SHORTEST WALL IS GREATER	LGMTRY	76
C		THAN 1.5 THE APPARENT TREATMENT	LGMTRY	77
C		LENGTH IS EQUAL TO THE LONGEST	LGMTRY	78
C		WALL. OTHERWISE IT IS EQUAL TO	LGMTRY	79
C		THE AVERAGE LENGTH	LGMTRY	80
	IF (TLMAX/TLMIN .GE. 1.5) GO TO 40		LGMTRY	81
	TL = SUM / FLOAT(NW)		LGMTRY	82
	GO TO 50		LGMTRY	83
C			LGMTRY	84
	40 TL = TLMAX		LGMTRY	85
C		CALCULATE EFFECTIVE DUCT HEIGHT	LGMTRY	86
	50 ED = TL / (TLOVH / 0.65)		LGMTRY	87
C			LGMTRY	88
	RETURN		LGMTRY	89
	END		LGMTRY	90

SUBROUTINE LIFTFN			LIFTFN	2
C	AUTHOR	D. F. MELDAM	LIFTFN	3
C			LIFTFN	4
C	PURPOSE	TO PREDICT LIFT FAN NOISE FOR THE PHASE B	LIFTFN	5
C		NASA-AMES FOOTPRINT CONTRACT NASA-6969.	LIFTFN	6
C			LIFTFN	7
C	METHOD	AS DESCRIBED IN REFERENCE 1).	LIFTFN	8
C			LIFTFN	9
C	INPUTS	VIA LABELED COMMON LFTFAN	LIFTFN	10
C			LIFTFN	11
C	NB	NUMBER OF FAN BLADES FOR EACH STAGE	LIFTFN	12
C		WHERE 1 & 1 & NUMSTG	LIFTFN	13
C	FPR	FAN PRESSURE RATIO	LIFTFN	14
C	DIAM	FAN INLET DIAMETER (INLET ONLY) FT	LIFTFN	15
C	RSS	MINIMUM ROTOR/STATOR SPACING PERCENT	LIFTFN	16
C	AREA	FAN DISCHARGE AREA (AFT ONLY) FT*FT	LIFTFN	17
C	RN1	ROTOR EEC RPM	LIFTFN	18
C	RTS	RELATIVE TIP MACH NUMBER OF THE	LIFTFN	19
C		FIRST STAGE WITHOUT INLET GUIDE	LIFTFN	20
C		VANES (IGV). IF LESS THAN 1	LIFTFN	21
C		IGV WILL BE ASSUMED FOR THE FIRST	LIFTFN	22
C		STAGE (INLET FAN ONLY).	LIFTFN	23
C	CRTPR	FAN PRESSURE RATIO FOR THE	LIFTFN	24
C		RELATIVE TIP MACH NUMBER OF	LIFTFN	25
C		1.025 (INLET FAN ONLY)	LIFTFN	26
C	ANGLFT	ENGINE INCLINATION ANGLE	LIFTFN	27
C			LIFTFN	28
C		VIA LABELED COMMON SWITCH	LIFTFN	29
C			LIFTFN	30
C	NUMENG	NUMBER OF NOISE SOURCES OF THE SAME	LIFTFN	31
C		NOISE TYPE.	LIFTFN	32
C			LIFTFN	33
C		VIA LABELED COMMON COMMON	LIFTFN	34
C			LIFTFN	35
C	NCF	1/3 OCTAVE OF FULL OCTAVE SWITCH	LIFTFN	36
C		OR NUMBER OF FREQUENCY BANDS (8 OR 24)	LIFTFN	37
C	RETA(24)	DIRECTIVITY ANGLES	LIFTFN	38
C			LIFTFN	39
C		VIA LABELED COMMON GPRAM	LIFTFN	40
C			LIFTFN	41
C	AMACH	MACH NUMBER OF THE AIRCRAFT	LIFTFN	42
C	NOBS	NUMBER OF OBSERVER POSITIONS	LIFTFN	43
C			LIFTFN	44
C		VIA LABELED COMMON SPLSPL	LIFTFN	45
C			LIFTFN	46
C	SSPL	CURRENT TOTAL PREDICTED NOISE FOR NCF	LIFTFN	47
C		(8 OR 24) FREQUENCIES, AT NOBS OBSERVER	LIFTFN	48
C		POSITIONS FOR 17 DIRECTIVITY ANGLES.	LIFTFN	49
C			LIFTFN	50
C		VIA LABELED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES	LIFTFN	51
C			LIFTFN	52
C	PSI	17 DIRECTIVITY ANGLES FOR EACH OF	LIFTFN	53
C		NOBS OBSERVER POSITIONS.	LIFTFN	54
C	PSIO	17 DIRECTIVITY ANGLE PROJECTIONS FOR	LIFTFN	55
C		EACH OF NOBS OBSERVER POSITIONS	LIFTFN	56
C	BETA	ELEVATION ANGLE PROJECTION FOR EACH	LIFTFN	57
C		OF NOBS OBSERVER POSITIONS.	LIFTFN	58

C					LIFTFN	59
C					LIFTFN	60
C					LIFTFN	61
C					LIFTFN	62
C					LIFTFN	63
C	OUTPUTS	VIA LABLED COMMON SLPSPL			LIFTFN	64
C					LIFTFN	65
C		SSPL	CURRENT TCTAL PREDICTED NCISE FOR		LIFTFN	66
C			8 OR 24 FREQUENCIES, AT NCBS OBSERVER		LIFTFN	67
C			POSITIONS FOR 17 DIRECTIVITY ANGLES.		LIFTFN	68
C					LIFTFN	69
C		VIA LABLED COMMON ANGLE (SET UP BY SUBROUTINE ANGLES			LIFTFN	70
C					LIFTFN	71
C		PSI	17 DIRECTIVITY ANGLES FOR EACH OF		LIFTFN	72
C			NCBS OBSERVER POSITIONS.		LIFTFN	73
C		PSIO	17 DIRECTIVITY ANGLE PROJECTIONS FOR		LIFTFN	74
C			EACH OF NCBS OBSERVER POSITIONS		LIFTFN	75
C		BETA	ELEVATION ANGLE PROJECTION FOR EACH		LIFTFN	76
C			OF NCBS OBSERVER POSITIONS.		LIFTFN	77
C					LIFTFN	78
C					LIFTFN	79
C	FUNCTION SUBPRGM	COS	ESHLDG	PMSUM	LIFTFN	80
L					LIFTFN	81
C	SUBROUTINES	ANGLES	UNIT	FANCS	LIFTFN	82
C				ZERC	LIFTFN	83
C					LIFTFN	84
C					LIFTFN	85
C					LIFTFN	86
C					LIFTFN	87
C					LIFTFN	88
C					LIFTFN	89
C		COMMON /LFTFN/	NB,FPR,DIAM,RSS,AREA,RN1,RTS,CRTFPR,ANGLFT,		LIFTFN	90
C		*ICOR8,LINE,NTF8,IMAB,LGM8,NWL8,ICP8,ILAY8,TF8(10),			LIFTFN	91
C		*PCTA8(10),PLA8(10),ELGH8,EDH8,R18(10),TL8(10),CF8,FH8			LIFTFN	92
C		COMMON/SWITCH/NTYPE,ITYPE,NEAG,IDCP,IPRT(7),ICN(13),NLOPT			LIFTFN	93
C		CCONSTANTS USED IN INTERNAL CALCULATIONS			LIFTFN	94
C					LIFTFN	95
C		COMMON /GCONST/	IN,I0,IT1,IT2,FC,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,		LIFTFN	96
C		*	I0,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,P001,		LIFTFN	97
C		*	EPS,UNDEF,BL,ICD,DPR,RPO,ETA(17),ML,FH1,I17,A,PI		LIFTFN	98
C					LIFTFN	99
C		VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING			LIFTFN	100
C					LIFTFN	101
C		COMMON /GCOMMON/	NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),		LIFTFN	102
C		*BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)			LIFTFN	103
C		COMMON/SUMSPL/SSPL(24,10,17)			LIFTFN	104
C		COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)			LIFTFN	105
C					LIFTFN	106
C		FREQUENCY BANDS USED BY PROGRAM			LIFTFN	107
C					LIFTFN	108
C		COMMON /GFREQ/	CFREQ(24),UFREQ(25),PFREQ(24)		LIFTFN	109
C					LIFTFN	110
C		GENERAL INPUT PARAMETERS			LIFTFN	111
C		COMMON/ANGLE/PSI(17,10),PSIO(17,10),BETA(17,10)			LIFTFN	112
C					LIFTFN	113
C		COMMON /GPRAM/ALTP,ALTR,SLOPE,APACH,NCBS,SLDIST(107),ITENG,IUNIT			LIFTFN	114
C		* ,ISPTM,IATMOS,IAIR,UAIRAB(24),NTENP,TEMP(50),TALT(50)			LIFTFN	115

* ,NPRES,PRES(50),PALT(50),NHLPID,RAIT(50),RHUPID(50),CTEMP	LIFTFN	116
* ,CPRES,CRHUMD,IEGA,IGDR,CTENF,DPRES,CHUMID,XKN,ND,FLD(50),	LIFTFN	117
* ZNR(50),ZNI(50),LINECT,MAXLIN,IFAGE,BCG,TCG,FLR,AALT,EPF	LIFTFN	118
C	LIFTFN	119
C AIRCRAFT-OBSERVER GEOMETRY CLTPUTS	LIFTFN	120
C	LIFTFN	121
COMMON /GEOHQ/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	LIFTFN	122
* B1(10,17),B2(10,17),TDS(17,10),TPC(17,10),IRR(10,17)	LIFTFN	123
* ,APP,TP,RHP,APD,TO,RHO,CA,CZ,TSP(17,10),CGV	LIFTFN	124
C	LIFTFN	125
C CONVERSION CONSTANTS	LIFTFN	126
C	LIFTFN	127
COMMON/GCONVC/C(2,10),SLDISX(10)	LIFTFN	128
COMMON/TMSPL/SPZ(24,17),IB(2,3,13)	LIFTFN	129
COMMON/CRSPLS/DOB(17),PSCR(17),DFE(408),NPSCR	LIFTFN	130
COMMON/HEAD/HIN(20),HCUT(20),CHIN(20)	LIFTFN	131
C	LIFTFN	132
C	LIFTFN	133
DIMENSION DEPND(17),VCVTIP(17)	LIFTFN	134
C	LIFTFN	135
C	LIFTFN	136
DATA VOV TIP/.0000,.0125,.0250,.0375,.0500,.0625,.0750,.0875,	LIFTFN	137
* .1000,.1125,.1250,.1375,.1500,.1625,.1750,.2000,	LIFTFN	138
* .2125/	LIFTFN	139
DATA DEPND/ 0.10, 1.50, 2.80, 3.95, 4.85, 5.60, 6.25, 6.75,	LIFTFN	140
* 7.15, 7.50, 7.80, 8.00, 8.17, 8.28, 8.32, 8.38,	LIFTFN	141
* 8.38/	LIFTFN	142
C	LIFTFN	143
C	LIFTFN	144
C	LIFTFN	145
ICN(8)=ICN(8)+1	LIFTFN	146
C	LIFTFN	147
C	LIFTFN	148
DELTA=ANGLFT*RPD	LIFTFN	149
CALL ANGLES(NOBS,DELTA)	LIFTFN	150
C	LIFTFN	151
C	LIFTFN	152
NINLET=C	LIFTFN	153
NAFT=C	LIFTFN	154
IF(DIAM.GT.0.0) NINLET=1	LIFTFN	155
IF(AREA.GT.0.0) NAFT=1	LIFTFN	156
VO=(AMACH*CZ)*SIN(DELTA-ATAN(SLCFE))	LIFTFN	157
DX=DIAM	LIFTFN	158
IF(NINLET.LE.0) DX=SQRT(AREA/PI)	LIFTFN	159
VTIP=DX*RN1*PI/60.C	LIFTFN	160
IF (VTIP .LE. 0.) GO TO 40	LIFTFN	161
DELD=TBLC1(VO/VTIP,VCVTIP,DEPND,1,17)	LIFTFN	162
DELD=0.0	LIFTFN	163
C	LIFTFN	164
C	LIFTFN	165
C LOOP FOR THE NUMBER OF OBSERVER POSITIONS	LIFTFN	166
C	LIFTFN	167
40 CONTINUE	LIFTFN	168
F8PF = FLGAT(NB) * RN1 / 60.	LIFTFN	169
DO 1000 M=1,NOBS	LIFTFN	170
CALL LINCOR(SPZ(1,1),IMAG,LGM8,ELCH8,EDH8,NHL8,R1W8,TL8,	LIFTFN	171
* ILAY8,FMB,IDP8,PSI(1,M),ACF,ECF,PLA8,	LIFTFN	172

C	* CF8,PCTA8,NTF8,TF8,DOPSF,SFL2,ICOR8,IB(1,1,ITYPE),LIN8,FBPF)	LIFTFN	173
		LIFTFN	174
C	CALL ZERO(SPLT,4C8)	LIFTFN	175
C		LIFTFN	176
C		LIFTFN	177
C		LIFTFN	178
C	CALCULATE THE INLET FAN NOISE PREDICTION	LIFTFN	179
C		LIFTFN	180
	CALL FANNOS(DOPSF, PSI(1,M),SPLT(1,1),IDCP,1,NINLET,NAFT,NB,FPR,	LIFTFN	181
	* DIAM,RSS,AREA,RN1,RTS,CRTFPR,DELCP,0.0,0)	LIFTFN	182
C		LIFTFN	183
C		LIFTFN	184
	45 CONTINUE	LIFTFN	185
C		LIFTFN	186
C	CCONVERT TO A UNIT OR INDEXED SPECTRA	LIFTFN	187
C		LIFTFN	188
	CALL UNIT(150.,17,SPLT(1,1))	LIFTFN	189
	ENG=NENG	LIFTFN	190
	IF(ENG.LE.0.0) ENG=1.0	LIFTFN	191
	ELVANG=90.0	LIFTFN	192
	DANGLE=-45.0	LIFTFN	193
	ENS=ESHLOG(DANGLE,ELVANG,ENG)	LIFTFN	194
	DO 50 J=1,17	LIFTFN	195
	DC 50 K=1,24	LIFTFN	196
	50 SPLT(K,J)=SPLT(K,J)-ENS	LIFTFN	197
	IF(NCF.EQ.24) GO TO 300	LIFTFN	198
C		LIFTFN	199
C	CCONVERT 1/3 OCTAVE TO FULL OCTAVE	LIFTFN	200
C		LIFTFN	201
	DC 200 J=1,17	LIFTFN	202
	DC 200 K=1,8	LIFTFN	203
	TMP = 0.	LIFTFN	204
	DO 100 L=1,3	LIFTFN	205
	JC = 3 * K + L - 3	LIFTFN	206
	100 TMP = PWSUM(TMP, SPLT(JC,J))	LIFTFN	207
	200 SPLT(K,J) = TMP	LIFTFN	208
C		LIFTFN	209
C		LIFTFN	210
C	ADD TO CURRENT TOTAL AND WRITE ON TAPE 10	LIFTFN	211
C		LIFTFN	212
	300 DC 400 J=1,NCF	LIFTFN	213
	DC 350 K=1,17	LIFTFN	214
	SPLT(J,K)=SPLT(J,K)-SPZ(J,K)	LIFTFN	215
	350 SSPL(J,M,K)=PWSUM(SSPL(J,M,K),SPLT(J,K))	LIFTFN	216
	400 CONTINUE	LIFTFN	217
	IF(IPRT(7).NE.7)GO TO 410	LIFTFN	218
	CALL NOISO(IPRT(7),M,NK,10,CHIN,ILNIT,SLDISX(M),PFREQ,SPLT(1,1),	LIFTFN	219
	* NCF,ITYPE)	LIFTFN	220
	410 CONTINUE	LIFTFN	221
	DC 360 JC=1,NCF	LIFTFN	222
	DC 360 KC=1,17	LIFTFN	223
	360 SPLT(JC,KC)=SPLT(JC,KC)-TSPL(JC,M,KC)	LIFTFN	224
	CALL PNL SUB(SPLT(1,1),PSPL(1,M),TFC(1,M),EPNL(1,M),SPL2,	LIFTFN	225
	*TEPNL(1,M),NK,BCC,TCG,FLR,M,ACBS,IRR(M,1))	LIFTFN	226
	IF(IPRT(3).NE.3)GO TO 1000	LIFTFN	227
	CALL NOISO(IPRT(3),M,NK,12,CHIN,ILNIT,SLDISX(M),PFREQ,	LIFTFN	228
		LIFTFN	229

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      *  SPLT(1,1),NCF,ITYPE!
C
C
C
1000 CONTINUE
      RETURN
      END

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LIFTFN 230
LIFTFN 231
LIFTFN 232
LIFTFN 233
LIFTFN 234
LIFTFN 235
LIFTFN 236

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	SUBROUTINE LINCOR(SP,I1,I2,A1,A2,I3,A3,A4,I4,A5,I5,A6,I6,A7,	LINCOR	2
	* A8,A9,A10,I7,A11,A12,A13,I8,I9,I10,A14)	LINCOR	3
C	SP=SPZ I1=IMA& (& DENOTES NCISE MODULE NUMBER)	LINCOR	4
C	I2=LGM& A1=ELOH& A2=EDH& I3=NWL& A3=R1W& A4=TL&	LINCOR	5
C	I4=ILAY& A5=FM& I5=IDP& A6=PSI(1,1) I6=NCF	LINCOR	6
C	A7=BCF A8=PLA& A9=CF& A10=PCTA& I7=NTF& A11=TF&	LINCOR	7
C	A12=DOPSF A13=SPL2 I8=ICCR& I9=I8(1,1,ITYPE) I10=LIN&	LINCOR	8
C	A14=FBPF	LINCOR	9
	COMMON/ICPATH/NCAS,NCCF,NTYP,IC,ARN, IARRAY(2)	LINCOR	10
	COMMON/SWITCH/NTYPE,ITYPE	LINCOR	11
	COMMON/ISWK/ISWT(3,13)	LINCOR	12
	DIMENSION SP(24,17),A3(1),A4(1),A6(17),A7(24),A8(1),	LINCOR	13
	* A10(1),A11(1),A12(1),A13(1),I9(2,3)	LINCOR	14
	DIMENSION SCR(17),SET(17)	LINCOR	15
	DATA SCR/17*1.0/	LINCOR	16
	ISWT(NCOF,ITYPE)=C	LINCOR	17
	DO 2 N=1,24	LINCOR	18
	DO 2 J=1,17	LINCOR	19
2	SP(N,J)=C.	LINCOR	20
	IF(I10 .EQ. 0)GO TO 100	LINCOR	21
	IF(I7 .LE. 10)GO TO 4	LINCOR	22
	CALL ERROR(ITYPE,4,9)	LINCOR	23
	I7=10	LINCOR	24
4	CONTINUE	LINCOR	25
	IF(I7 .GT. 0)GO TO 5	LINCOR	26
	I7=1	LINCOR	27
	A11(1)=A14	LINCOR	28
	A10(1)=100.0	LINCOR	29
5	CONTINUE	LINCOR	30
	IF(I1 .EQ. 1 .OR. I2 .EQ. 0)GO TO 10	LINCOR	31
	IF(I3 .LE. 10) GO TO 6	LINCOR	32
	CALL ERROR(ITYPE,4,10)	LINCOR	33
	GO TO 100	LINCOR	34
6	CONTINUE	LINCOR	35
	IF(I3 .EQ. 1)GO TO 10	LINCOR	36
	IF (I3 .GE. 2) GO TO 7	LINCOR	37
	CALL ERROR(ITYPE,4,11)	LINCOR	38
	GO TO 100	LINCOR	39
7	CONTINUE	LINCOR	40
	DO 8 I=1,I3	LINCOR	41
8	A3(I)=-A3(I)	LINCOR	42
	CALL SORTX(A3,A4,I3)	LINCOR	43
	DO 9 I=1,I3	LINCOR	44
9	A3(I)=-A3(I)	LINCOR	45
10	CONTINUE	LINCOR	46
	DO 11 I=1,17	LINCOR	47
	SET(I)=A12(I)	LINCOR	48
	IF(ITYPE.EQ.6.OR.ITYPE.EQ.9)SET(I)=SCR(I)	LINCOR	49
11	CONTINUE	LINCOR	50
	CALL LINING(SP(1,1),I1,I2,A1,A2,I3,A3,A4,I4,A5,I5,A6,I6,A7,	LINCOR	51
	* A8,A9,A10,I7,A11,SET,A13)	LINCOR	52
	GO TO 12	LINCOR	53
100	CONTINUE	LINCOR	54
12	CONTINUE	LINCOR	55
	IF(I8.EQ.0)GO TO 18	LINCOR	56
17	CALL CORSP(I8,I9(1,1),I6,A6,SP(1,1))	LINCOR	57
18	CONTINUE	LINCOR	58

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      IF(I10.NE.0)ISWT(NCOF,ITYPE)=10
      IF(I8.NE.0)ISWT(NCOF,ITYPE)=10
C     WRITE(10,3)ISWT(NCOF,ITYPE)
      3 FORMAT(1X,12HLINCOR ISWT=,I10)
20 RETURN
END

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LINCOR      59
LINCOR      60
LINCOR      61
LINCOR      62
LINCOR      63
LINCOR      64

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	SUBROUTINE LINING(ATNSPC,IUDMAX,LGECM,ELCH,H,NW,RADII,TLNG,ILAY,	LINING	2
	* DMCHNO,IDOPT,DANGLE,NCF,BCF,PEAK,SVEL,PCT,NTF,TF,DOPSFT,SPLC)	LINING	3
C		LINING	4
C	AUTHOR G. A. WEST, REVISED 21 JUN 72 BY D.G. DUNN	LINING	5
C		LINING	6
C	PURPOSE TO CALCULATE LINING ATTENUATION SPECTRA	LINING	7
C		LINING	8
C	DESCRIPTION OF VARIABLES	LINING	9
C		LINING	10
C	VARIABLES IN COMMON - SEE MAIN PROGRAM	LINING	11
C		LINING	12
C	VARIABLES IN CALLING SEQUENCE	LINING	13
C		LINING	14
C	INPUT	LINING	15
C		LINING	16
C	IUDMAX - SPECIFIES WHETHER THE PROGRAM CALCULATES OR USER	LINING	17
C	DEFINES THE PEAK LINING ATTENUATION. EQUALS 0 IF	LINING	18
C	PROGRAM CALCULATES, 1 IF USER DEFINES PEAK	LINING	19
C	LGECM - SPECIFIES WHETHER THE LINING ATTENUATION IS	LINING	20
C	CALCULATED USING THE LINING GEOMETRY OR EFFECTIVE	LINING	21
C	DUCT HEIGHT AND RATIO OF TREATMENT LENGTH TO DUCT	LINING	22
C	HEIGHT. EQUALS 1 FOR LINING GEOMETRY, 0 FOR	LINING	23
C	EFFECTIVE DUCT HEIGHT AND RATIO OF TREATMENT LENGTH	LINING	24
C	TO DUCT HEIGHT	LINING	25
C	ELCH - RATIO OF TREATMENT LENGTH TO EFFECTIVE DUCT HEIGHT	LINING	26
C	H - EFFECTIVE DUCT HEIGHT	LINING	27
C	NW - NUMBER OF WALLS IN LINING	LINING	28
C	RADII - RADII OF WALLS IN LINING	LINING	29
C	TLNG - TREATMENT LENGTH OF WALLS	LINING	30
C	ILAY - = FOR SINGLE WALL LINING =2 FOR DOUBLE WALL	LINING	31
C	DMCHNO - DUCT MACH NUMBER	LINING	32
C	IDOPT - INDICATES THE DESIGN POINT OPTION. EQUALS 1 FOR	LINING	33
C	SINGLE DESIGN POINT. 2 FOR MULTIPLE DESIGN POINT	LINING	34
C	DANGLE - DIRECTIVITY ANGLE OF LINING	LINING	35
C	NCF - NUMBER OF BANDS IN SPECTRUM	LINING	36
C	BCF - ARRAY OF CENTER FREQUENCIES FOR BANDS IN SPECTRUM	LINING	37
C	PEAK - PEAK ATTENUATION OF LINING DEFINED BY USER	LINING	38
C	SVEL - SPEED OF SOUND IN DUCT	LINING	39
C	PCT - PERCENTAGE OF LINING TREATED FOR THE TARGET	LINING	40
C	FREQUENCIES DEFINED IN ARRAY TF	LINING	41
C	NTF - NUMBER OF TARGET FREQUENCIES IN ARRAY TF	LINING	42
C	TF - ARRAY OF TARGET FREQUENCIES	LINING	43
C	DOPSFT - DOPPLER SHIFT FACTOR, IE. 1.0 - AMACH * COS(THETA)	LINING	44
C		LINING	45
C	OUTPUT	LINING	46
C	ATNSPC - LINING ATTENUATION SPECTRUM	LINING	47
C	SPLC - PEAK ATTENUATION WHICH INCLUDES EFFECT OF DUCT	LINING	48
C	MACH NUMBER, DESIGN RELEASE GATE, DIRECTIVITY ANGLE	LINING	49
C	AND PERCENTAGE OF TOTAL LINING THAT IS TREATED	LINING	50
C	FOR EACH TARGET FREQUENCY.	LINING	51
C		LINING	52
C	LOCAL VARIABLES	LINING	53
C		LINING	54
C	ALFHC - LOGARITHM (BASE 10) OF RATIO OF	LINING	55
C	((FREQUENCY * DUCT HEIGHT)/SPEED OF SOUND IN DUCT)	LINING	56
C	ALLOH - LOGARITHM BASE 10 OF RATIO OF TREATMENT LENGTH TO	LINING	57
C	DUCT HEIGHT	LINING	58

C	CONSTC	- COMPOSITE CORRECTION FACTOR WHICH INCLUDES THE	LINING	59
C		EFFECT OF DUCT MACH NUMBER, DESIGN RELEASE DATE	LINING	60
C		AND DIRECTIVITY ANGLE	LINING	61
C	DANGLEC	- CORRECTION FACTOR FOR DIRECTIVITY ANGLE	LINING	62
C	DUCTYC	- CORRECTION FACTOR FOR DUCT MACH NUMBER	LINING	63
C	EDH	- EFFECTIVE DUCT HEIGHT	LINING	64
C	F9X	- ARRAY OF RATIOS OF TREATMENT LENGTH TO DUCT HEIGHT	LINING	65
C		(LOG BASE 10)	LINING	66
C	F9Y	- ARRAY OF RATIOS OF ((TARGET FREQ * EFFECTIVE DUCT	LINING	67
C		HEIGHT)/ SONIC VELOCITY) (LOG BASE 10)	LINING	68
C	F9Z	- ARRAY OF PEAK ATTENUATIONS FOR CORRESPONDING	LINING	69
C		VALUES IN F9X AND F9Y	LINING	70
C	MD	- MACH NUMBER ARRAY FOR ATTENUATION CORRECTION FOR DUCT	LINING	71
C	LC	- LOG10(G) VALUES IN ATTENUATION CORRECTION TABLE	LINING	72
C	LNTF	- FT H/C DIMENSIONLESS TARGET FREQ FOR ATTENUATION COR	LINING	73
C	F10X	- MACH ARRAY FOR K CORRECTION TABLE FOR SINGLE LIN	LINING	74
C	F10Y	- K VALUES FOR SINGLE LAYER LININGS	LINING	75
C	F11X	- SAME AS F10X FOR DOUBLE LININGS	LINING	76
C	F11Y	- SAME AS F10Y FOR DOUBLE LININGS	LINING	77
C	F13X	- ARRAY OF DIRECTIVITY ANGLES FOR CORRESPONDING	LINING	78
C		CORRECTION FACTORS IN F13Y	LINING	79
C	F13Y	- ARRAY OF DIRECTIVITY ANGLE CORRECTION FACTORS	LINING	80
C		FOR CORRESPONDING DIRECTIVITY ANGLES IN F13X	LINING	81
C	I	- GENERAL DC LCCP INDEX	LINING	82
C	J	- GENERAL DC LCCP INDEX	LINING	83
C	SPLMAX	- PEAK LINING ATTENUATION	LINING	84
C	TLOVH	- RATIO OF TREATMENT LENGTH TO EFFECTIVE DUCT HEIGHT	LINING	85
C			LINING	86
	REAL MD(13),LNTF(4),LC(13,4)		LINING	87
	DIMENSION ATNSPC(24,17),DCPSFT(1)		LINING	88
	DIMENSION BCF(1),PEAK(1),PCT(1),TF(1),SPLC(1)		LINING	89
	DIMENSION DANGLE(1)		LINING	90
	DIMENSION F10X(4),F10Y(4,2)		LINING	91
C			LINING	92
	DIMENSION RADII(1),TLNG(1)		LINING	93
	DIMENSION F9X(1),F9Y(6),F9Z(6,11)		LINING	94
	DIMENSION F11X(2),F11Y(2)		LINING	95
	DIMENSION F13X(11),F13Y(11)		LINING	96
C			LINING	97
	DATA ZERO /0.0/		LINING	98
	DATA F9X/-1.0,-0.6,-0.6,-0.4,-0.2,0.0,0.2,0.4,0.6,0.8,1.0/		LINING	99
	DATA F9Y/-0.4,-0.2,0.0,0.2,0.4,0.6/		LINING	100
	DATA F9Z/ 1.3, 2.1, 2.5, 2.5, 2.1, 1.0,		LINING	101
1	2.5, 3.1, 3.5, 3.4, 2.6, 2.3,		LINING	102
2	4.0, 4.4, 4.7, 4.4, 3.7, 3.1,		LINING	103
3	5.6, 6.0, 6.2, 5.7, 4.8, 4.1,		LINING	104
4	7.8, 8.2, 8.2, 7.4, 6.2, 5.3,		LINING	105
5	10.7,11.2,10.9, 9.6, 8.1, 6.9,		LINING	106
6	15.5,15.5,14.4,12.3,10.3, 8.8,		LINING	107
7	22.0,22.0,19.3,16.0,13.4,11.2,		LINING	108
8	31.0,30.0,26.3,23.0,17.4,14.6,		LINING	109
9	46.5,43.0,37.0,29.5,23.5,18.5,		LINING	110
A	70.0,63.0,53.0,41.0,31.0,24.5/		LINING	111
	DATA F10X/-0.4,-0.4,-0.8,1.0/		LINING	112
	DATA F10Y/4*1.0,-.85,-.55,2*1.0/		LINING	113
	DATA F11X/-0.4,-0.4/		LINING	114
	DATA F11Y/.85,.9/		LINING	115

DATA MD/-.8,-.6,-.5,-.4,-.3,-.2,-.1,0,.1,.2,.3,.4,.6 /	LINING	110
DATA LNTF/-.60206,-.30103,C.,.30103/	LINING	117
DATA LC /.4942,.4928,.4814,.4609,.4216,.3522,.2201,0.,	LINING	118
1 -.1175,-.2006,-.2652,-.3170,-.4001,.2253,.2227,.2175,	LINING	119
2 .1959,.1644,.1206,.06446,C.,-.05799,-.1096,-.1549,	LINING	120
3 -.1972,-.2782,.06070,.05690,.05308,.04922,.04139,	LINING	121
4 .02938,.01703,C.,-.02411,-.04672,-.06651,-.08672,	LINING	122
5 .1273,13*C. /	LINING	123
DATA F13X/30.0,50.0,70.0,90.0,110.0,115.0,120.0,130.0,140.0,150.0,	LINING	124
1 160.0/	LINING	125
DATA F13Y/0.45,0.70,0.88,1.00, 1.00, 0.98, 0.90, 0.62, 0.42, 0.25,	LINING	126
1 0.21/	LINING	127
C	LINING	128
C	LINING	129
C	HAS THE USER DEFINED THE	130
C	MAXIMUM ATTENUATION FOR EACH	131
C	TARGET FREQUENCY	132
DC 5 N=1,NCF	LINING	133
DC 5 J=1,17	LINING	134
5 ATNSPL(N,J)=ZERO	LINING	135
FK=1.0	LINING	136
IF (ILDMAX .EQ. 1) GO TO 35	LINING	137
C	PROGRAM IS TO CALCULATE MAXIMUM	138
C	ATTENUATION	139
C	LINING	140
C	HAS USER DEFINED THE EFFECTIVE	141
C	DUCT HEIGHT AND RATIO OF	142
C	TREATMENT LENGTH TO DUCT HEIGHT	143
C	OR IS THE PROGRAM TO CALCULATE	144
C	THESE QUANTITIES FROM LINING	145
C	GEOMETRY	146
EDH = H	LINEAL	147
TLOVH = ELCH	LINING	148
IF (LGFCM .EQ. 1) CALL LGMTRY(AN,RADII,TLNG,EDH,TLOVH)	LINING	149
ALLOP = ALG10(TLOVH)	LINING	150
C	CALCULATE THE EFFECT OF DUCT	151
C	MACH NUMBER ON LINING	152
C	LINING	153
* OBTAIN K CORRECTION	LINING	154
10 CONTINUE	LINING	155
IF (ILAY.EQ.1)GO TO 20	LINING	156
FK=TBLU1(CMCHNO,F11X,F11Y,1,2)	LINING	157
GO TO 30	LINING	158
20 FK=TBLU1(CMCHNO,F1CX,F1CY(1,IDCF1),1,4)	LINING	159
30 CONTINUE	LINING	160
C CALC (SPLC) ARRAY	LINING	161
C	OBTAIN CORRECTION FOR	162
C	DIRECTIVITY ANGLE	163
FDC = EDH / SVEL	LINING	164
35 CONTINUE	LINING	165
DC 100 J=1,17	LINING	166
DANGLC=TBLU1(DANGLE(J),F13X,F13Y,2,11)	LINING	167
CONSTC=.01*DANGLC	LINING	168
DC 60 I=1,NTF	LINING	169
C=1.0	LINING	170
SPLMAX = PEAK(I)	LINING	171
IF (ILDMAX .EQ. 1) GO TO 50	LINING	172
ALFMC = ALG10(TF(I) * FDC)		

LINING	173
LINING	174
LINING	175
LINING	176
LINING	177
LINING	178
LINING	179
LINING	180
LINING	181
LINING	182
LINING	183
LINING	184
LINING	185
LINING	186
LINING	187

C	SUBROUTINE LININS(SPLC,TF,NTF,ATN,BCF,NCF,FK,DSFC)		LININS	2
C	AUTHOR	D.G. DUNN	LININS	3
C		DATE- 13 JUNE 1972	LININS	4
C	PURPOSE	TO CALCULATE THE LINING ATTENUATION SPECTRUM SHAPE	LININS	5
C		FOR MULTIPLE TARGET FREQUENCIES INCLUDING THE	LININS	6
C		DOPPLER SHIFT.	LININS	7
C			LININS	8
C	DESCRIPTION OF VARIABLES		LININS	9
C			LININS	10
C	INPUTS		LININS	11
C	1) SPLC	... ARRAY OF PEAK ATTENUATION AT EACH TARGET FREQUENCY	LININS	12
C		IN (DB). INCLUDES EFFECTS OF DUCT MACH NUMBER,	LININS	13
C		DESIGN RELEASE DATE, DIRECTIVITY ANGLE, AND PER-	LININS	14
C		CENTAGE OF TOTAL LINING THAT IS TREATED FOR EACH	LININS	15
C		TARGET FREQUENCY.	LININS	16
C	2) TF	... ARRAY OF TARGET FREQUENCIES. (HZ)	LININS	17
C	3) NTF	... NUMBER OF TARGET FREQUENCIES.	LININS	18
C	4) BCF	... GEOMETRIC-MEAN FREQUENCIES FOR CONSTANT-PERCENTAGE-	LININS	19
C		BAND ATTENUATION SPECTRUM. (HZ)	LININS	20
C	5) NCF	... NUMBER OF BANDS FOR ATTENUATION SPECTRUM.	LININS	21
C	6) W	... BANDWIDTH IN OCTAVES	LININS	22
C	7) DSFC	... DOPPLER SHIFT FACTOR, IE.	LININS	23
C		DSFC = CNE - AMACH * CCS(THETA)	LININS	24
C			LININS	25
C	OUTPUTS		LININS	26
C	1) ATN	... ARRAY OF (DB) VALUES FOR ATTENUATION SPECTRUM.	LININS	27
C			LININS	28
C			LININS	29
C			LININS	30
C		DIMENSION SPLC(1), TF(1), ATN(1), BCF(1)	LININS	31
C		DIMENSION F12X(37), F12Y(37), F12XC(25), F12YC(25)	LININS	32
C		DATA F12X /-24.0, -21.0, -18.0, -15.0, -12.0, -11.0, -10.0, -9.0,	LININS	33
C	1	-8.0, -7.0, -6.0, -5.0, -4.0, -3.0, -2.0, -1.0,	LININS	34
C	2	-0.7, -0.35, 0.0, 0.35, 0.7, 1.0, 2.0, 3.0,	LININS	35
C	3	4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0,	LININS	36
C	4	12.0, 15.0, 18.0, 21.0, 24.0/	LININS	37
C		DATA F12Y /0.007776,0.01296,0.0216,0.036,0.06,0.07,0.084,0.105,	LININS	38
C	1	0.125, 0.16, 0.21, 0.28, 0.38,0.52,0.70, 0.89,	LININS	39
C	2	0.935, 0.97, 0.99, 0.97, 0.935,.89,0.70, 0.52,	LININS	40
C	3	0.38, 0.28, 0.21, 0.16, 0.125,.105,.084,0.07,	LININS	41
C	4	0.06, 0.036, 0.0216,0.01296, 0.007776/	LININS	42
C		DATA F12XC/-24.0, -21.0, -18.0, -15.0, -12.0, -10.0, -9.0,	LININS	43
C	1	-7.5, -6.0, -4.5, -3.0, -1.5, 0.0, 1.5,	LININS	44
C	2	3.0, 4.5, 6.0, 7.5, 9.0, 10.5, 12.0,	LININS	45
C	3	15.0, 18.0, 21.0, 24.0/	LININS	46
C		DATA F12YC/0.007776,0.01296,0.0216,0.036, 0.06, 0.075, 0.105,	LININS	47
C	1	0.165, 0.24, 0.37, 0.55, 0.74, 0.92, 0.74,	LININS	48
C	2	0.55, 0.37, 0.24, 0.165, 0.105,0.075, 0.06,	LININS	49
C	3	0.036, 0.0216, 0.01295,.007776/	LININS	50
C		DATA ZERO/0./	LININS	51
C		DATA IWL/C/	LININS	52
C			LININS	53
C	ZERO-OUT (ATN) ARRAY		LININS	54
C		IF(IWL.NE.0)GO TO 5	LININS	55
C		W=1.0	LININS	56
C		IF(NCF.NE.8)W=1./3.	LININS	57
C		IWL=1	LININS	58

5	CONTINUE	LININS	59
C		LININS	60
C	OUTER LOOP FOR EACH TARGET FREQUENCY	LININS	61
	DO 50 I = 1,NTF	LININS	62
C		LININS	63
C	DEFINE CHARACTERISTIC FREQUENCY FOR COPPLER FACTOR AND TARGET FREQ.	LININS	64
	FO = TF(I) / DSFC	LININS	65
C		LININS	66
C	INNER LOOP FOR EACH BAND OF ATTENUATION SPECTRUM	LININS	67
	DO 50 J = 1,NCF	LININS	68
C		LININS	69
C	CALCULATE THE NUMBER OF (1/3) OCTAVES BCF(J) IS FROM FO.	LININS	70
	CBAND = 4.328085123 * ALGG(BCF(J) / FO)	LININS	71
	CBAND=CBAND *FK	LININS	72
C		LININS	73
C	CHECK FOR FULL OR (1/3) OCTAVE BAND ATTENUATION SPECTRUM SHAPING	LININS	74
	IF (ABS(W - 1.0) - .002) 30, 30, 20	LININS	75
20	SHAPE = TBLU1(DBAND, F12X, F12Y, 2, 37)	LININS	76
	GO TO 40	LININS	77
30	SHAPE = TBLU1(DBAND, F12XC, F12YC, 2, 25)	LININS	78
40	IF (SHAPE .LT. ZERO) SHAPE = ZERC	LININS	79
C		LININS	80
C	SUM ATTENUATIONS FOR EACH TARGET FREQUENCY AT EACH PASS BAND.	LININS	81
	ATN(J) = ATN(J) + SHAPE * SPLC(I)	LININS	82
50	CONTINUE	LININS	83
	RETURN	LININS	84
	END	LININS	85

```

      FUNCTION MCHAR(XX)
C
C   AUTHOR          K.D. JOHNSON
C
C   PURPOSE         RETURN THE NUMBER OF DIGITS LEFT OF THE DECIMAL
C                   POINT IN A FLOATING POINT NUMBER
C
      X=XX+.1
      MCHAR=INT(ALOG10(X))+1
      RETURN
      END

```

```

MCHAR      2
MCHAR      3
MCHAR      4
MCHAR      5
MCHAR      6
MCHAR      7
MCHAR      8
MCHAR      9
MCHAR     10
MCHAR     11
MCHAR     12

```

C	SUBROUTINE MEASRD	MEASRD	2
C	COMMON /GCONST/ IN,I0,IT1,IT2,F0,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	MEASRD	3
	* I0,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,P001,	MEASRD	4
	* EPS,UNDEF,BL,ICD,OPR,RPD,ETA(17),M1,FM1,I17,A,P1	MEASRD	5
C		MEASRD	6
C	COMMON /MEASIN/ NEP,NPSI,NBETA,DELTA,EP(5),PSX(17),BETX(5),ICOR12	MEASRD	7
	COMMON /GCOMON/ NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),	MEASRD	8
	*BUF(25),RETA(17),SPL2(17),TGAGR(24),DUPSF(17)	MEASRD	9
C		MEASRD	10
C	FREQUENCY BANDS USED BY PROGRAM	MEASRD	11
C		MEASRD	12
	COMMON /GFREQ/ CFREQ(24),UFREQ(25),PFREQ(24)	MEASRD	13
	COMMON/SUMSPL/SSPL(24,10,17)	MEASRD	14
	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	MEASRD	15
	COMMON/ANGLE/PSI(17,10),PSIO(17,10),BETA(17,10)	MEASRD	16
C		MEASRD	17
C	GENERAL INPUT PARAMETERS	MEASRD	18
C		MEASRD	19
	COMMON /GRAM/ALTP,ALTR,SLOPE,AMACH,NOBS,SLODIST(10),NTENG,IUNIT	MEASRD	20
	* ,ISPTRM,IATMOS,IAIR,UAIRAB(24),NTEMP,TEMP(50),TALT(50)	MEASRD	21
	* ,NPRES,PRES(50),PALT(50),NHUMID,RALT(50),RHUMID(50),CTEMP	MEASRD	22
	* ,CPRES,CRHUMD,IEGA,IGDR,DTEMP,DPRES,DHUMID,XKN,ND,FLO(50),	MEASRD	23
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IPAGE,BCG,TCG,FLR,AALT,EPF	MEASRD	24
C		MEASRD	25
C	AIRCRAFT-OBSERVER GEOMETRY OUTPUTS	MEASRD	26
C		MEASRD	27
	COMMON /GEOMU/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	MEASRD	28
	* B1(10,17),B2(10,17),TDS(17,10),TPD(17,10),IRR(10,17)	MEASRD	29
	* ,APP,TSO,RHP,APU,TC,RHO,CA,CZ,TSP(17,10),COV	MEASRD	30
	COMMON/HEAD/HIN(20),HOUT(20),CHIN(20)	MEASRD	31
	COMMON/SWITCH/NTYPE,ITYPE,NEAG,IDCP,IPRT(7),ICN(13),NLOPT	MEASRD	32
	COMMON/GCONVC/C(2,10),SLOISX(10)	MEASRD	33
	COMMONJN/TMSPL/SPZ(24,17),IB(2,3,13)	MEASRD	34
	COMMON/CRSPLS/DUB(17),PSCR(17),DPB(408),NPSCR	MEASRD	35
	COMMON/ICPATH/NCAS,NCOF,NTYP,IC,NRN,ARRAY(2)	MEASRD	36
C	****	MEASRD	37
C	****	MEASRD	38
C	**** DIMENSION SPL(425,24)	MEASRD	39
C	**** DO 1 I=1,NEP	MEASRD	40
C	**** DO 1 J=1,NPSI	MEASRD	41
C	**** DO 1 K=1,NBETA	MEASRD	42
C	**** INDEX=I+5*(J-1+17*(K-1))	MEASRD	43
C	**** 1 READ(----) (SPL(INDEX,L),L=1,NCF)	MEASRD	44
C	****	MEASRD	45
C	****	MEASRD	46
	DIMENSION SPL(425,24)	MEASRD	47
	REWIND 11	MEASRD	48
	IT=IN	MEASRD	49
	ICN(12)=ICN(12)+1	MEASRD	50
	IF(NCAS.NE.1)IT=11	MEASRD	51
	DO 621 K=1,NBETA	MEASRD	52
	DO 621 I=1,NEP	MEASRD	53
	DO 621 J=1,NPSI	MEASRD	54
	INDEX=I+5*(J-1+17*(K-1))	MEASRD	55
	READ(IT,625)(SPL(INDEX,L),L=1,NCF)	MEASRD	56

IF(IT.EQ.11)GO TO 621	MEASRD	59
WRITE(11,625)(SPL(INDEX,L),L=1,NCF)	MEASRD	60
621 CONTINUE	MEASRD	61
625 FFORMAT(8F10.1)	MEASRD	62
50 CONTINUE	MEASRD	63
DELTA=DELTA*0.01745	MEASRD	64
CALL ANGLES(NOBS,DELTA)	MEASRD	65
C	MEASRD	66
C	MEASRD	67
DO 300 I=1,NOBS	MEASRD	68
CALL LINCOR(SPZ(1,1),0,X,X,X,X,X,X,X,X,X,PSI(1,1),NCF,BCF,	MEASRD	69
* X,X,X,X,X,X,X,X,ICOR12,IB(1,1,ITYPE),0,X)	MEASRD	70
DO 200 J=1,NCF	MEASRD	71
DO 100 K=1,17	MEASRD	72
C	MEASRD	73
C	MEASRD	74
SPLT(J,K)=TBLU3(EPF,PSI(K,1),BETA(K,1),EP,PSX,BETX,	MEASRD	75
* SPL(1,J),1,1,1,NEP,NPSI,NBETA,5,17,5) - SPZ(J,K)	MEASRD	76
100 SSPL(J,I,K)=PWRSUM(SSPL(J,I,K),SPLT(J,K))	MEASRD	77
C	MEASRD	78
200 CONTINUE	MEASRD	79
IF(IPRT(7).NE.7)GO TO 220	MEASRD	80
CALL NOISO(IPRT(7),I,NK,10,CHIN,IUNIT,SLOISX(I),PFREQ,	MEASRD	81
* SPLT(1,1),NCF,ITYPE)	MEASRD	82
220 CONTINUE	MEASRD	83
DO 240 NF=1,NCF	MEASRD	84
DO 240 J=1,17	MEASRD	85
240 SPLT(NF,J)=SPLT(NF,J)-TSPL(NF,I,J)	MEASRD	86
IF(IPRT(3).NE.3)GO TO 300	MEASRD	87
CALL PNLSUB(SPLT(1,1),PSPL(1,1),TPD(1,1),EPNL(1,1),SPL2,	MEASRD	88
* TEPNL(1,1),NK,BCG,TCG,FLR,I,NCBS,IRR(1,1))	MEASRD	89
CALL NOISO(IPRT(3),I,NK,12,CHIN,IUNIT,SLDISX(I),PFREQ,	MEASRD	90
* SPLT(1,1),NCF,ITYPE)	MEASRD	91
300 CONTINUE	MEASRD	92
RETURN	MEASRD	93
END	MEASRD	94

SUBROUTINE MENOZZ(IEJECT,IENTRY,A,TS,AMACHJ,CV,AN,AMACHS,AR,PS,
 * CO,PSD,THETA,FREQ,SPL,XFREQ)

DIMENSION FIG2(6,13),FIG2VR(6),FIG2AN(13)
 DIMENSION FIG2AV(2),FIG2A(2)
 DIMENSION FIG3(10,2),FIG3FO(10)
 DIMENSION FIG4(9,10),FIG4FO(9),FIG4AN(10)
 DIMENSION FIG5(6,11),FIG5VR(6),FIG5AN(11)
 DIMENSION FIG6(5),FIG6M(5)
 DIMENSION FIG10(4),FIG10VR(4)
 DIMENSION FIG8(3),FIG8AN(3)
 DIMENSION FIG9(5),FIG9AR(5)
 DIMENSION FIG7(8),FIG7AN(8)
 DIMENSION FTEMP(9),FGAMMA(9)
 DIMENSION SPL(24,17),FREQ(24),THETA(17)

DATA FIG2VR/2.778,2.903,3.0,3.176,3.301,3.398/
 DATA FIG2AN/20.,40.,60.,80.,90.,100.,110.,120.,130.,140.,
 * 150.,160.,170./

DATA FIG2 /106.C,108.8,111.8,118.C,123.1,127.7,
 * 106.3,109.3,112.2,119.C,125.0,129.9,
 * 106.4,109.5,112.8,120.5,127.1,132.9,
 * 106.5,110.C,113.8,122.8,130.C,135.5,
 * 106.6,111.0,115.3,125.1,133.2,139.1,
 * 107.5,112.3,117.C,128.C,136.7,143.0,
 * 110.5,115.2,120.C,131.C,140.0,146.3,
 * 113.3,118.2,123.C,134.5,143.9,150.0,
 * 116.7,121.7,126.8,138.5,148.2,154.6,
 * 118.7,124.0,129.4,142.4,153.C,159.5,
 * 120.4,126.C,131.9,145.7,156.2,163.0,
 * 119.5,125.C,130.7,144.1,154.7,161.0,
 * 117.8,123.0,128.3,140.5,151.0,157.7/

DATA FIG2AV/ 650.,1950./
 DATA FIG2A /1000.,1200./

DATA FIG3FO/-2.000,-1.699,-1.347,-1.097,-.6576,-.3010,0.000,
 * .4771, .9031, 1.301/
 DATA FIG3 / -37.3, -29.4, -20.3, -14.3, -9.5, -11.7, -15.9,
 * -23.6, -31.C, -37.8,
 * -37.3, -29.4, -20.3, -14.3, -8.8, -11.7, -18.7,
 * -30.9, -41.8, -52.3/

DATA FIG4FO/-2.0,-1.523,-1.155,-.699,-.222,.301,.845,1.398,2.0/
 DATA FIG4AN/0.,100.,110.,120.,130.,135.,140.,150.,160.,170./
 DATA FIG4 / 8.4, 5.1, 2.1,C.C, 1.2, 3.9, 5.8, 7.0, 8.0,
 * 8.4, 5.1, 2.1,0.C, 1.2, 3.9, 5.8, 7.0, 8.0,
 * 4.4, 3.3, 1.4,C.C, 1.0, 3.4, 5.2, 6.3, 7.0,
 * 3.0, 2.5, 1.0,C.C, C.7, 3.0, 4.6, 5.7, 6.4,
 * 0.0, C.0, 0.0,C.C, C.3, 1.3, 2.2, 2.7, 3.2,
 * 0.0, 0.0, 0.0,0.C, C.C, 0.0, 0.0, 0.0, 0.0,
 * -1.3,-1.0,-C.6,C.C,-C.5,-1.3, -1.9, -2.3, -2.7,
 * -4.0,-2.9,-1.6,C.C,-1.7,-4.0, -5.8, -7.0, -8.2,

MENOZZ 2
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*	-6.6,-4.2,-2.2,0.0,-2.5,-6.7,-10.3,-13.7,-17.0,	MENOZZ	59
*	-9.6,-6.0,-2.8,0.0,-3.9,-9.7,-14.6,-18.8,-23.0/	MENOZZ	60
C		MENOZZ	61
C		MENOZZ	62
	DATA FIG5VR/500.,800.,1000.,1250.,1500.,2000./	MENOZZ	63
	DATA FIG5AN/20.,40.,60.,80.,100.,110.,120.,130.,140.,150.,160./	MENOZZ	64
	DATA FIG5 /1.22,1.28,1.36,1.50,1.65,1.86,	MENOZZ	65
*	1.24,1.34,1.43,1.57,1.72,1.95,	MENOZZ	66
*	1.25,1.42,1.54,1.70,1.86,2.14,	MENOZZ	67
*	1.32,1.57,1.76,1.95,2.14,2.40,	MENOZZ	68
*	1.37,1.68,1.89,2.12,2.34,2.66,	MENOZZ	69
*	1.37,1.57,1.74,1.92,2.11,2.47,	MENOZZ	70
*	1.32,1.36,1.41,1.48,1.55,1.64,	MENOZZ	71
*	1.08,1.10,1.12,1.14,1.16,1.22,	MENOZZ	72
*	.84, .86, .86, .88, .90, .96,	MENOZZ	73
*	.68, .70, .70, .72, .74, .78,	MENOZZ	74
*	.58, .60, .61, .63, .64, .71/	MENOZZ	75
C		MENOZZ	76
C		MENOZZ	77
	DATA FIG6M/0.,.4,.8,1.2,1.5/	MENOZZ	78
	DATA FIG6 /1.31,1.24,1.07, .75, .45/	MENOZZ	79
C		MENOZZ	80
C		MENOZZ	81
	DATA FIG6VR /600.,1200.,1600.,2000./	MENOZZ	82
	DATA FIG10 / 6.4, 25.4, 36.0, 45.0/	MENOZZ	83
C		MENOZZ	84
C		MENOZZ	85
	DATA FIG8N/0.903,1.602,2.301/	MENOZZ	86
	DATA FIG8 / -5., -10., -15./	MENOZZ	87
C		MENOZZ	88
C		MENOZZ	89
	DATA FIG9AR/.079,.301,.362,.602,1.161/	MENOZZ	90
	DATA FIG9 /-7.6,-3.9,-3.2,-1.3, 3.0/	MENOZZ	91
C		MENOZZ	92
C		MENOZZ	93
	DATA FIG7AN/ 10., 35., 55., 80., 100., 125., 150., 170./	MENOZZ	94
	DATA FIG7 /-15.0,-12.3, -8.4, -1.9, 2.9, 6.0, 2.6, -4.0/	MENOZZ	95
C		MENOZZ	96
C		MENOZZ	97
	DATA FTEMP / 800., 900.,1000.,1200.,1400.,1600.,1800.,2000.,2500./	MENOZZ	98
	DATA FGAMMA/1.382,1.376,1.369,1.357,1.344,1.333,1.324,1.316,1.302/	MENOZZ	99
C		MENOZZ	100
C		MENOZZ	101
	DATA SPHDIV/33.2/,G/32.174/,R/53.345/	MENOZZ	102
C		MENOZZ	103
	IF(IENTRY.EQ.2) GO TO 200	MENOZZ	104
	GAMMA=TBLU1(TS,FTEMP,FGAMMA,1,9)	MENOZZ	105
	CJ=SQRT(GAMMA*G*R*TS)	MENOZZ	106
	XPS=PS*144.	MENOZZ	107
	IF(IEJECT.EQ.0) XPS=PSC*144.0	MENOZZ	108
	RHO=XPS/(R*TS)	MENOZZ	109
	VJET=CV*CJ*AMACHJ	MENOZZ	110
	VS=CO*AMACHS	MENOZZ	111
	UE=VJET-VS+0.*CO	MENOZZ	112
	TSO=TBLU1(VJET,FIG2AV,FIG2A,1,2)	MENOZZ	113
	V2=ALOG10(UE)	MENOZZ	114
	FUN1=TBLU1(AMACHJ,FIG6M,FIG6,2,5)	MENOZZ	115
	FUN2=10.0*ALOG1C(RHO*RHO*A*(TS/TSE)**1.5)		

V3 = VJET + (VS - 0.4 * CC)	MENOZZ	116
FUN5 = VJET*VJET / (V3 * 1.13 * SQRT(A / AN))	MENOZZ	117
FUN7=FUN2+TBLU1(ALOG10(AN),FIG8N,FIG8,1,3)	MENOZZ	118
* +TBLU1(ALOG10(AR),FIG9AR,FIG9,1,5)	MENOZZ	119
* +SPHDIV+TBLU2(V2,120.0,FIG2VR,FIG2AN,FIG2,1,1,6,13,6,13)	MENOZZ	120
XFREQ=FUN5*FUN1*TBLU2(UE,120.0,FIG5VR,FIG5AN,FIG5,1,1,	MENOZZ	121
* 6,11,6,11)*C.3	MENOZZ	122
	MENOZZ	123
	MENOZZ	124
DO 100 I=1,17	MENOZZ	125
	MENOZZ	126
	MENOZZ	127
FC2=FUN5*FUN1*TBLU2(UE,THETA(I),FIG5VR,FIG5AN,FIG5,1,1,6,	MENOZZ	128
* 11,6,11)	MENOZZ	129
	MENOZZ	130
	MENOZZ	131
OASPL2=FUN7+TBLU1(THETA(I),FIG7AN,FIG7,2,8)	MENOZZ	132
	MENOZZ	133
	MENOZZ	134
DO 100 J=1,24	MENOZZ	135
FREQ2=ALOG10(FREQ(J)/FC2)	MENOZZ	136
	MENOZZ	137
	MENOZZ	138
	MENOZZ	139
100 SPL(J,I)=OASPL2+TBLU1(FREQ2,FIG3F0,FIG3(1,2),2,10)	MENOZZ	140
* +TBLU2(FREQ2,THETA(I)+10.0,FIG4FC,FIG4AN,FIG4,2,1,9,10,9,10)	MENOZZ	141
RETURN	MENOZZ	142
	MENOZZ	143
	MENOZZ	144
200 VO=CU*AMACHS	MENOZZ	145
VE=SQRT(VJET*VJET-2.0*VJET*VC*CCS(AN)+VC*VC)	MENOZZ	146
FUN3=FUN2	MENOZZ	147
V3 = SQRT(VJET*VJET + 2.*VJET*VC*CCS(AN) + VC*VC)	MENOZZ	148
FUN6=-0.34*TBLU1(VE,FIG10VR,FIG10,1,4)*SQRT(AR-1.0)	MENOZZ	149
	MENOZZ	150
	MENOZZ	151
IF(IEJECT.EQ.0) GO TO 250	MENOZZ	152
PGAMMA=TBLU1(TS,FTEMP,FGAMMA,1,9)	MENOZZ	153
PCJ=SQRT(PGAMMA*G*R*TS)	MENOZZ	154
PRHO=PSI*144.0/(R*TS)	MENOZZ	155
PVJET=CV*PCJ*AMACHJ	MENOZZ	156
VE=SQRT(PVJET*PVJET-2.0*PVJET*VC*CCS(AN)+VC*VC)	MENOZZ	157
PTSO=TBLU1(PVJET,FIG2AV,FIG2A,1,2)	MENOZZ	158
FUN3=10.0*ALOG10(PRHO*PRHO*PS*(TS/PTSG)**1.5)	MENOZZ	159
V3 = SQRT(PVJET*PVJET + 2.*PVJET*VC*CCS(AN) + VC*VC)	MENOZZ	160
FUN4 = PVJET*PVJET / (V3 * 1.13 * SQRT(PS))	MENOZZ	161
FUN6=0.0	MENOZZ	162
	MENOZZ	163
	MENOZZ	164
	MENOZZ	165
250 V1=ALOG10(VE)	MENOZZ	166
	MENOZZ	167
	MENOZZ	168
	MENOZZ	169
DO 300 I=1,17	MENOZZ	170
	MENOZZ	171
	MENOZZ	172
F01=FUN4*TBLU2(VE,THETA(I),FIG5VR,FIG5AN,FIG5,1,1,6,11,6,11)		

C		MENOZZ	173
C		MENOZZ	174
	QASPL1=FUN3+FUN6	MENOZZ	175
	* +SPHDI V+TBLU2(V1,THETA(1),FIG2VR,FIG2AN,FIG2,1,1,6,13,6,13)	MENOZZ	176
C		MENOZZ	177
C		MENOZZ	178
	DO 300 J=1,24	MENOZZ	179
	FREQ1=ALOG10(FREQ(J)/FOL)	MENOZZ	180
C		MENOZZ	181
C		MENOZZ	182
	300 SPL(J,I)=QASPL1+TBLU1(FREQ1,FIG3FC,FIG3,2,10)	MENOZZ	183
	* +TBLU2(FREQ1,THETA(1),FIG4FC,FIG4AN,FIG4,2,1,9,10,9,10)	MENOZZ	184
C		MENOZZ	185
	RETURN	MENOZZ	186
	END	MENOZZ	187

C	SUBROUTINE NEXTCR	NEXTCR	2
C	CONSTANTS USED IN INTERNAL CALCULATIONS	NEXTCR	3
C		NEXTCR	4
C	COMMON/SWITCH/NTYPE, ITYPE, NENG, IDCF, IPRT(7), CN(13), ALGPT	NEXTCR	5
C	COMMON /GCONST/ IN, IO, IT1, IT2, FC, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10,	NEXTCR	6
*	IO, I1, I2, I3, I4, I5, I6, I7, I8, I9, I10, P1, P3, P5, POOL,	NEXTCR	7
*	EPS, UNDEF, BL, ICD, DPR, RPD, ETA(17), M1, FM1, I17, A, PI	NEXTCR	8
C		NEXTCR	9
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	NEXTCR	10
C		NEXTCR	11
C	COMMON /GCOMMON/ NCF, NK, BCF(24), TSFL(24, 10, 17), SPLT(24, 17),	NEXTCR	12
*	*BUF(25), RETA(17), SPL2(17), TGAGR(24), DOPSF(17)	NEXTCR	13
C		NEXTCR	14
C	FREQUENCY BANDS USED BY PROGRAM	NEXTCR	15
C		NEXTCR	16
C	COMMON /GFREQ/ CFREQ(24), UFREQ(25), PFREQ(24)	NEXTCR	17
C		NEXTCR	18
C	GENERAL INPUT PARAMETERS	NEXTCR	19
C		NEXTCR	20
C	COMMON /GRAM/ALTP, ALTR, SLOPE, AMACH, AOB, SLDIST(10), ITENG, IUNIT	NEXTCR	21
*	, ISPTM, IATMOS, IAIR, UAIRAB(24), NTEMP, TEMP(50), TALT(50)	NEXTCR	22
*	, NPRES, PRES(50), PALT(50), AHLMD, RALT(50), RHUMID(50), CTEMP	NEXTCR	23
*	, CPRES, CRHUMD, IECA, IGDR, DTEMP, DPRES, CHUMID, XKN, NC, FLD(50),	NEXTCR	24
*	ZNR(50), ZNI(50), LINECT, MAXLIN, IPAGE, BCG, TCG, FLR, AALT, EPF	NEXTCR	25
C		NEXTCR	26
C	AIRCRAFT-OBSERVER GEOMETRY CLTPLOTS	NEXTCR	27
C		NEXTCR	28
C	COMMON /GEOMO/ APY(10, 17), APZ(10, 17), PC(10, 17), DPND(10, 17),	NEXTCR	29
*	* B1(10, 17), B2(10, 17), TDS(17, 10), TPD(17, 10), IRR(10, 17)	NEXTCR	30
*	* APP, TP, RHP, APO, TD, RHC, CA, CZ, TSP(17, 10), CCV	NEXTCR	31
C		NEXTCR	32
C	CONVERSION CONSTANTS	NEXTCR	33
C		NEXTCR	34
C	COMMON/GCONVC/C(2, 10), SLDISX(10)	NEXTCR	35
	COMMON/CRSPLS/DOB(17), PSCR(17), CFB(408), NPSCR	NEXTCR	36
	DIMENSION XL(2)	NEXTCR	37
	DATA XL/2HM., 2HFT/	NEXTCR	38
C		NEXTCR	39
C	DETERMINE AVERAGE AIR ABSORPTION COEFFICIENTS	NEXTCR	40
40	IF(IAIR.EQ.M1) GO TO 150	NEXTCR	41
	IF(IAIR.EQ.I1) GO TO 150	NEXTCR	42
	ALTZ=ALTR+AALT	NEXTCR	43
	ALTW=ALTP+AALT	NEXTCR	44
	CALL AVGALF(ALTZ, ALTW, NK, NCF, BCF, UAIRAB, IATMOS)	NEXTCR	45
150	IF(IPRT(5).NE.5) GO TO 155	NEXTCR	46
	CALL PRINTH(IPRT(5), LCT, 5)	NEXTCR	47
	WRITE(9, 20)	NEXTCR	48
20	FORMAT(50X, 31HNOISE EXTRAPOLATION CORRECTIONS//)	NEXTCR	49
	WRITE(9, 22)	NEXTCR	50
22	FORMAT(2X, 46HSPHERICAL DIVERGENCE (APPLYS TO ALL PASSBANDS)//)	NEXTCR	51
	WRITE(9, 24) XL(IUNIT+1)	NEXTCR	52
24	FORMAT(6X, 1HX, 44X, 32HSCUND PRESSURE LEVEL ATTENUATION /5X, 1H(, A2,	NEXTCR	53
*	* 1H), 56X, 4H(DB) /)	NEXTCR	54
	LCT=13	NEXTCR	55
155	CONTINUE	NEXTCR	56
C	SPHERICAL DIVERGENCE CALCULATIONS	NEXTCR	57
		NEXTCR	58

DO 300 I=11,NOBS	NEXTCR	59
DO 200 J=11,117	NEXTCR	60
IF(PD(I,J).NE.F0)GO TO 160	NEXTCR	61
SPLT(I,J)=F0	NEXTCR	62
GO TO 170	NEXTCR	63
160 CONTINUE	NEXTCR	64
SPLT(I,J)=20.* ALOG10(ABS(PD(I,J)*C(I2,I1)))	NEXTCR	65
170 CONTINUE	NEXTCR	66
DO 180 K=11,NCF	NEXTCR	67
180 TSPL(K,I,J)=SPLT(I,J)	NEXTCR	68
200 CONTINUE	NEXTCR	69
IF(IPRT(5).NE.5)GO TO 300	NEXTCR	70
WRITE(9,250)SLDISX(I),(SPLT(I,J),J=11,117)	NEXTCR	71
250 FORMAT(2X,1PE10.3,QPF7.1,16F7.1)	NEXTCR	72
300 CONTINUE	NEXTCR	73
IF(IPRT(5).NE.5)GO TO 310	NEXTCR	74
WRITE(9,275)(ETA(J),J=11,117)	NEXTCR	75
275 FORMAT(1/3X,8HANGLE XI /4X,5H(DEG),2X,17F7.0//)	NEXTCR	76
LCT=LCT+NOBS+5	NEXTCR	77
310 CONTINUE	NEXTCR	78
C CALCULATION OF ATMOSPHERIC ABSORPTION	NEXTCR	79
DO 400 I=11,NOBS	NEXTCR	80
DO 400 K=11,NCF	NEXTCR	81
DO 350 J=11,117	NEXTCR	82
SPL2(J)=UAIRAB(K)*PD(I,J)*PGC1	NEXTCR	83
350 TSPL(K,I,J)=TSPL(K,I,J)+SPL2(J)	NEXTCR	84
IF(IPRT(5).NE.5) GO TO 400	NEXTCR	85
IF(LCT.GE.54) GO TO 360	NEXTCR	86
IF(K.EQ.1)GO TO 370	NEXTCR	87
GO TO 390	NEXTCR	88
360 CALL PRINTH(IPRT(5),LCT,9)	NEXTCR	89
WRITE(9,20)	NEXTCR	90
LCT=8	NEXTCR	91
370 WRITE(9,380)SLDISX(I),XL(IUNIT+1)	NEXTCR	92
LCT=LCT+1	NEXTCR	93
380 FORMAT(2X,32HATMOSPHERIC ABSORPTION FOR X =,1PE10.3,1X,A2)	NEXTCR	94
WRITE(9,382)	NEXTCR	95
382 FORMAT(1/3X,9H FREQUENCY,39X,32HSCALD PRESSURE LEVEL ATTENUATION/	NEXTCR	96
* 5X,5H(2,55X,4H(DB))	NEXTCR	97
LCT=LCT+4	NEXTCR	98
390 WRITE(9,250)PFR (K),(SPL2(J),J=11,117)	NEXTCR	99
LCT=LCT+1	NEXTCR	100
IF(K.NE.NCF)GO TO 400	NEXTCR	101
IF(LCT.C7.49)GO TO 395	NEXTCR	102
392 WRITE(9,275)(ETA(J),J=11,117)	NEXTCR	103
LCT=LCT+5	NEXTCR	104
GO TO 400	NEXTCR	105
395 CALL PRINTH(IPRT(5),LCT,9)	NEXTCR	106
WRITE(9,20)	NEXTCR	107
LCT=LCT+3	NEXTCR	108
WRITE(9,380)SLDISX(I),XL(IUNIT+1)	NEXTCR	109
LCT=LCT+1	NEXTCR	110
GO TO 392	NEXTCR	111
400 CONTINUE	NEXTCR	112
N1=11	NEXTCR	113
N2=12	NEXTCR	114
C CALCULATION OF EXTRA GROUND ATTENLATION AND GROUND REFLECTION	NEXTCR	115

IF(IEGA.EQ.I1) N1=I2	NEXTCR	116
SK=F1	NEXTCR	117
DO 500 N=N1,N2	NEXTCR	118
DO 500 I=I1,NOBS	NEXTCR	119
DO 475 J=I1,I17	NEXTCR	120
IF (N-1) 440, 440, 442	NEXTCR	121
440 CALL EGACAL(PD(I,J),B2(I,J),ACF,BCF,TGAGR)	NEXTCR	122
GO TO 448	NEXTCR	123
442 SK=FM1	NEXTCR	124
IF(IGDR.EQ.I0)GO TO 446	NEXTCR	125
DO 444 K1=1,NCF	NEXTCR	126
444 TGAGR(K1)=F3	NEXTCR	127
GO TO 448	NEXTCR	128
446 CALL GRDRFX(BCF, NCF,IO,PD(I,J),CPNC(I,J),B1(I,J),CA,XKN,ND,	NEXTCR	129
* FLD,ZNR,ZNI,TGAGR)	NEXTCR	130
448 CGNTINUE	NEXTCR	131
DO 450 K=1,NCF	NEXTCR	132
SPLT(K,J)=TGAGR(K)	NEXTCR	133
450 TSPL(K,I,J)=TSPL(K,I,J)+TGAGR(K)* SK	NEXTCR	134
475 CGNTINUE	NEXTCR	135
IF(IPRT(5).NE.5)GO TO 500	NEXTCR	136
DO 498 K=I1,NCF	NEXTCR	137
IK=1	NEXTCR	138
IF(LCT.GE.54) GO TO 460	NEXTCR	139
IF(K.EQ.1.AND.LCT.LE.48) GO TO 493	NEXTCR	140
IF(K.EQ.1) GO TO 460	NEXTCR	141
GO TO 490	NEXTCR	142
460 CALL PRINTH(IPRT(I),LCT,9)	NEXTCR	143
WRITE(9,20)	NEXTCR	144
LCT=I1	NEXTCR	145
IF (N-1) 470, 470, 474	NEXTCR	146
470 WRITE(9,480)SLDISX(I),XL(IUNIT+1)	NEXTCR	147
480 FORMAT(2X,32Hextra-GROUND-ATTENUATION FOR X =,1PE10.3,1X,A2)	NEXTCR	148
LCT=LCT+1	NEXTCR	149
482 WRITE(9,382)	NEXTCR	150
LCT=LCT+4	NEXTCR	151
490 WRITE(9,250) PFREQ(K),(SPLT(K,J),J=I1,I17)	NEXTCR	152
LCT=LCT+1	NEXTCR	153
491 IF(K.NE.NCF)GO TO 498	NEXTCR	154
IF(LCT.GT.49)GO TO 495	NEXTCR	155
IK=2	NEXTCR	156
492 WRITE(9,275)(ETA(J),J=I1,I17)	NEXTCR	157
IF (IK-1) 493, 493, 498	NEXTCR	158
493 CGNTINUE	NEXTCR	159
IF (N-1) 470, 470, 474	NEXTCR	160
474 WRITE(9,477)SLDISX(I),XL(IUNIT+1)	NEXTCR	161
477 FORMAT(2X,17HGROUND REFLECTION,8X, 7HFOR X =,1PE10.3,1X,A2)	NEXTCR	162
LCT=LCT+1	NEXTCR	163
IF(IGDR.EQ.I0)GO TO 482	NEXTCR	164
IF(K.NE.1)GO TO 491	NEXTCR	165
476 FORMAT(2X,47HGROUND REFLECTION = -3 DB ATTENUATION OR +3 DB ,	NEXTCR	166
* 29HCORRECTION FOR ALL PASSBANDS./)	NEXTCR	167
WRITE(9,476)	NEXTCR	168
LCT=LCT+3	NEXTCR	169
GO TO 500	NEXTCR	170
495 CALL PRINTH(IPRT(5),LCT,9)	NEXTCR	171
LCT=LCT+5	NEXTCR	172

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WRITE(9,20)
LCT=LCT+3
IK=2
IF (N-1) 496, 496, 497
496 WRITE(9,480)SLDISX(I),XL(IUNIT+1)
LCT=LCT+1
GO TO 492
497 WRITE(9,477)SLDISX(I),XL(IUNIT+1)
LCT=LCT+1
GO TO 492
498 CONTINUE
500 CONTINUE
ENDFILE 9
REWIND 9
RETURN
END

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NEXTCR 173
NEXTCR 174
NEXTCR 175
NEXTCR 176
NEXTCR 177
NEXTCR 178
NEXTCR 179
NEXTCR 180
NEXTCR 181
NEXTCR 182
NEXTCR 183
NEXTCR 184
NEXTCR 185
NEXTCR 186
NEXTCR 187
NEXTCR 188

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SLBROUTINE NINPUT	NINPUT	2
C	NINPUT	3
C INPUT DATA BLOCKS FOR NGISE COMPONENTS	NINPUT	4
C ITYPE DEFINES THE TYPE OF NGISE COMPONENT	NINPUT	5
C ITYPE=1 PRIMARY JET	NINPUT	6
C =2 PRIMARY AND SECONDARY JET	NINPUT	7
COMMON/JETDAT/NJET1,MCODE1,AP1,WF1,VF1,AS2,WS2,VS2,PR1,PA1,	NINPUT	8
1 TT1,VA1,DIAMT1,ANGJT1,ICCR1	NINPUT	9
C =3 CORE AND TURBINE	NINPUT	10
COMMON/COREIN/TT3,PP3,CMF3,EK3,DELT3,JB3,	NINPUT	11
* ICOR3,LIN3,NTF3,IMA3,LGM3,NWL3,ICP3,ILAY3,TF3(10),	NINPUT	12
* PCTA3(10),PLA3(10),ELOH3,EDH3,R1H3(10),TL3(10),CF3,FM3	NINPUT	13
C	NINPUT	14
COMMON/TURBIN/BN3,SS3,VTR3,CLS3,CT3,TU3,FMF3,CS3,IC3,ISW3	NINPUT	15
C =4 COMPRESSOR AND INLET FAN	NINPUT	16
C =5 EXIT FAN	NINPUT	17
COMMON/FANDAT/NSTG45,NLET45,NAFT45,ICP45,NB45(3),FPR45(3),	NINPUT	18
1 DIAM4(3),RSS45(3),AREA5(3),RN145,RTS45,CFPR4,DELT45,	NINPUT	19
* N15,BPR5,ICOR4,LIN4,NTF4,IMA4,LGM4,NWL4,IDF4,ILAY4,TF4(10),	NINPUT	20
* PCTA4(10),PLA4(10),ELCH4,EDH4,R1H4(10),TL4(10),CF4,FM4,	NINPUT	21
* ICOR5,LIN5,NTF5,IMA5,LGM5,NWL5,ICP5,ILAY5,TF5(10),	NINPUT	22
* PCTA5(10),PLA5(10),ELCH5,EDH5,R1H5(10),TL5(10),CF5,FM5	NINPUT	23
C =6 AUGMENTER-WING JET	NINPUT	24
COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCP,IPRT(7),ICN(13),ALCPT	NINPUT	25
* INSEOW(3),INSHLD	NINPUT	26
COMMON/AUGWNG/GAMA6,TT6,XNPR6,DELT6,AD6,CE6,	NINPUT	27
* ICOR6,LIN6,NTF6,IMA6,LGM6,NWL6,IDP6,ILAY6,TF6(10),	NINPUT	28
* PCTA6(10),PLA6(10),ELCH6,EDH6,R1H6(10),TL6(10),CF6,FM6	NINPUT	29
C =7 BLOWN-FLAP JET	NINPUT	30
COMMON/BLOWIN/PR7,TT7,AN7,DA7,FANG7,DELT7,CL7,HD7,ICCR7	NINPUT	31
DIMENSION PR7(1)	NINPUT	32
C =8 LIFT-FAN	NINPUT	33
COMMON/LFTFAN/NB8,FPR8,DIAP8,RSS8,AREA8,RN18,RTS8,CRFPR8,DELTA8,	NINPUT	34
* ICOR8,LIN8,NTF8,IMA8,LGM8,NWL8,ICP8,ILAY8,TF8(10),PCTA8(10),	NINPUT	35
* PLA8(10),ELOH8,EDH8,R1H8(10),TL8(10),CF8,FM8	NINPUT	36
C =9 EJECTOR - SUPPRESSOR JET	NINPUT	37
COMMON/EJECTO/IEJ9,NUP9,AREA9,AP9,ST9,EXNM9,SMACH9,CV9,	NINPUT	38
* PSS,PA9,PTS9,EMACH9,PCV9,DELT9,	NINPUT	39
* ICOR9,LIN9,NTF9,IMA9,LGM9,NWL9,ICP9,ILAY9,TF9(10),PCTA9(10),	NINPUT	40
* PLA9(10),ELOH9,EDH9,R1H9(10),TL9(10),CF9,FM9	NINPUT	41
C =10 PROPELLER	NINPUT	42
COMMON/PROPIN/T10,W10,RPM10,C10,CSLB10,ASUB10,B10,DELT10,	NINPUT	43
*ICOR10	NINPUT	44
C =11 HELICOPTER AND TILT ROTOR	NINPUT	45
COMMON/COPTER/T11,Q11,RPM11,B11,CT11,AB11,DE11,RN11,	NINPUT	46
1 S11,CEE11,DELT11,XLPC11,XPM11,ARTR11,LLF11,IRR11,	NINPUT	47
*ICOR11	NINPUT	48
C	NINPUT	49
C =12 MEASURED DATA INPUTS	NINPUT	50
COMMON/MEASIN/NEP12,NPSI12,NBTA12,DELT12,EP12(5),PSI12(17),	NINPUT	51
* BETA12(5),	NINPUT	52
*ICOR12	NINPUT	53
C	NINPUT	54
C ITYPE = 13 JET EDGE INTERACTION	NINPUT	55
COMMON/JETEDG/AJS13,DDA13,DDNE13,CHNL13,CJCL13,	NINPUT	56
*FLAP13,H013,EMJ13,TSR13,ICOR13	NINPUT	57
C	NINPUT	58

C	THIS ROUTINE HANDLES LINKAGE TO INPUT MODULES	NINPUT	55
C	OBSERVER GEOMETRY MODULE	NINPUT	60
C	VARIOUS NOISE ESTIMATION MODULES	NINPUT	61
C	EXTRAPOLATION MODULE	NINPUT	62
C	HUMAN RESPONSE MEASUREMENT MODULE	NINPUT	63
C	CONSTANTS USED IN INTERNAL CALCULATIONS	NINPUT	64
C	COMMON /GCONST/ IN,IO,IT1,IT2,FG,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	NINPUT	65
*	IO,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,POOL,	NINPUT	66
*	EPS,UNDEF,BL,ICD,DFR,RPC,ETA(17),M1,FM1,I17,A,PI	NINPUT	67
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING	NINPUT	68
C	COMMON /GCOMMON/ NCF,NK,BCF(24),ISFL(24,10,17),SPLT(24,17),	NINPUT	69
C	*BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)	NINPUT	70
C	FREQUENCY BANDS USED BY PROGRAM	NINPUT	71
C	COMMON /GFREQ/ CFREQ(24),UFREQ(25),PFREQ(24)	NINPUT	72
C	GENERAL INPUT PARAMETERS	NINPUT	73
C	COMMON /GPRAM/ALTP,ALTR,SLGPE,APACH,NCBS,SLDIST(10),ATENG,IUNIT	NINPUT	74
*	,ISPTRM,IATMOS,IAIR,UAIRAB(24),NTEMP,TEMP(50),TALT(50)	NINPUT	75
*	,NPRES,PRES(50),PALT(50),NHLMD,RAIT(50),RHUMID(50),CTEMP	NINPUT	76
*	,CPRES,CRHUMC,IEGA,IGDR,DTEPP,DPRES,CHUKIC,XKN,NC,FLO(50),	NINPUT	77
*	ZNR(50),ZNI(50),LINECT,MAXLIN,IFAGE,BCG,TCG,FLR,AALT,EFF	NINPUT	78
C	AIRCRAFT-OBSERVER GEOMETRY CLTFLTS	NINPUT	79
C	COMMON /GEMO/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	NINPUT	80
*	B1(10,17),B2(10,17),TDS(17,10),TFD(17,10),IRR(10,17)	NINPUT	81
*	,APP,TP,RHP,APO,TO,RHG,CA,CZ,TSF(17,10),CCV	NINPUT	82
C	CONVERSION CONSTANTS	NINPUT	83
C	COMMON/GCONVC/C(2,10),SLDISX(10)	NINPUT	84
C	COMMON/CRSPLS/DOB(17),PSCR(17),CFB(408),NPSCR	NINPUT	85
C	COMMON/ICPATH/NCAS,NCCF,NTYP,IC,ARR,IARRAY(2)	NINPUT	86
C	COMMON/HEAD/HIN(20),HEUT(20),CHIN(20)	NINPUT	87
C	THIS SECTION IS FOR SIZING DATA LOCALLY	NINPUT	88
C	DIMENSION INP5(3),XBP5(3),INLP(3),AREA9(1),IEJ(3)	NINPUT	89
C	DIMENSION ICOR3(1),IADC3(8,3),ACC3(54,3),ICGF4(1),IACC4(8,3),	NINPUT	90
1	ADD4(54,3),ICOR5(1),IADD5(8,3),ACD5(54,3),ICG5(1),IADC6(8,3),	NINPUT	91
2	ADD6(54,3),ICOR7(1),ICCR8(1),IACC8(8,3),	NINPUT	92
3	ADD8(54,3),ICOR9(1),IADD9(8,3),ACD9(54,3)	NINPUT	93
C	DIMENSION FPR8(1),INB8(3)	NINPUT	94
C	DIMENSION ICGN(20),EDGVAR(10)	NINPUT	95
C	DIMENSION S1(9,3),S2(3,3),S3(13,3),S45(14,3),S6(6,3),S7(8,3),	NINPUT	96
1	S8(8,3),S9(12,3),S1C(8,3),S11(13,3),S12(3)	NINPUT	97
2	S13(10,3),IADD13(3)	NINPUT	98
C	DIMENSION NC(4,3),IS45(7,3),JET1(2,3)	NINPUT	99
C	DIMENSION NDIC(4)	NINPUT	100
C	EQUIVALENCE (NTYPE,NDIC(1))	NINPUT	101
C		NINPUT	102
C		NINPUT	103
C		NINPUT	104
C		NINPUT	105
C		NINPUT	106
C		NINPUT	107
C		NINPUT	108
C		NINPUT	109
C		NINPUT	110
C		NINPUT	111
C		NINPUT	112
C		NINPUT	113
C		NINPUT	114
C		NINPUT	115

DIMENSION T3(5),J3(3,3)	NINPUT	116
EQUIVALENCE (T3(1),TT3)	NINPUT	117
DIMENSION B3(8)	NINPUT	118
EQUIVALENCE (B3(1),BN3)	NINPUT	119
DIMENSION T113(13),I113(3,3)	NINPUT	120
EQUIVALENCE (T113(1),T11)	NINPUT	121
DIMENSION AUGI(6)	NINPUT	122
EQUIVALENCE (GAMA6,AUGI(1))	NINPUT	123
DIMENSION PROPI(8)	NINPUT	124
EQUIVALENCE (T10,PROPI(1))	NINPUT	125
DIMENSION IJET(2),AJET(12)	NINPUT	126
EQUIVALENCE (IJET(1),NJET1),(AJET(1),AP1)	NINPUT	127
DIMENSION IFAN1(7),FAN2(3),FAN11(3),FAN3(3),FANA1(3),FAN5(20)	NINPUT	128
EQUIVALENCE (IFAN1(1),NSTG45),(FAN2(1),FPR45(1)),(FAN11(1),	NINPUT	129
1 DIAM4(1)),(FAN3(1),RSS45(1)),(AREA5(1),FANA1(1)),(FAN4,RN145),	NINPUT	130
2 (FAN12,RTS45)	NINPUT	131
EQUIVALENCE (ICOR1,ICCR2)	NINPUT	132
NAMLIST/NOISIN/T10,W10,RPM10,D10,OSLB10,ASUB10,B10,DELT10,NRTR11,	NINPUT	133
* NENG,NTYPE,ITYPE,GAMA6,TT6,XNPR6,DELT6,AC6,CE6,LLF11,IEJ9,NUM9,	NINPUT	134
* NSTG45,NLET45,NAFT45,FPR45,DIAM4,RSS45,AREA5,RN145,AREA9,AR9,	NINPUT	135
* RTS45,CFPR4,DELT45,AB45,NI5,BPR5,NJET1,PCODE1,AP1,hP1,VP1,ST9,	NINPUT	136
* AS2,WS2,VS2,PR1,PA1,TT1,DIAMT1,ANGJT1,BK3,SS3,VTR3,CLS3,EXNM9,	NINPUT	137
* DT3,TU3,PMF3,CS3,IC3,ISW3,TT3,FP3,CMF3,EK3,DELT3,JB3,T11,SMACH5,	NINPUT	138
* Q11,RPM11,B11,DT11,AB11,DE11,RN11,SI11,CE11,DELT11,XLMC11,CV9,	NINPUT	139
* NEP12,NPSI12,NBTA12,DELT12,EP12,PSI12,BETA12,DCB,PSCR,CDB,NPSCR,	NINPUT	140
* ICOR3,LIN3,NTF3,IMA3,LGM3,NWL3,ICP3,ILAY3,TF3,PCTA3,PLA3,EMACH5,	NINPUT	141
* ELOH3,EDH3,R1W3,TL3,CF3,FM3,ICCR4,LIN4,NTF4,IMA4,LGM4,NWL4,PS9,	NINPUT	142
* IDP4,ILAY4,TF4,PCTA4,PLA4,ELOH4,EDH4,R1W4,TL4,CF4,FM4,ICCR5,PA5,	NINPUT	143
* LIN5,NTF5,IMA5,LGM5,NWL5,ICP5,ILAY5,TF5,PCTA5,PLA5,ELOH5,EDH5,	NINPUT	144
* R1W5,TL5,CF5,FM5,ICOR6,LIN6,NTF6,IMA6,LGM6,NWL6,ICP6,ILAY6,TF6,	NINPUT	145
* PCTA6,PLA6,ELOH6,EDH6,R1W6,TL6,CF6,FM6,ICCR7,NB8,FPR8,CIAM8,	NINPUT	146
* RSS8,AREA8,RN18,RTS8,CRFPR3,DELTA8,PR7,TT7,AN7,DN7,FANG7,DELT7,	NINPUT	147
* ICOR8,LIN8,NTF8,IMA8,LGM8,NWL8,ICP8,ILAY8,TF8,PCTA8,PLA8,DELT9,	NINPUT	148
* FLOH8,EDH8,R1W8,TL8,CF8,FM8,ICCR9,LIN9,NTF9,IMA9,LGM9,NWL9,PTS9,	NINPUT	149
* IDP9,ILAY9,TF9,PCTA9,PLA9,ELOH9,EDH9,R1W9,TL9,CF9,FM9,PCV9,	NINPUT	150
*ICOR10,ICOR11,ICOR12,ICCR1,ICCR2,XMM11,DL7,HC7,IRR11,ECGVAR,INSHLD	NINPUT	151
*,ICOR13	NINPUT	152
C	NINPUT	153
IF(NTYP.NE.I0)GO TC 1015	NINPUT	154
1000 READ(IN,9000)FAN5	NINPUT	155
C	NINPUT	156
IF(NCAS.EQ.I1)GO TC 1011	NINPUT	157
IF(FAN5(1).EQ.BL.AND.FAN5(2).EQ.BL.AND.FAN5(3).EQ.BL.	NINPUT	158
1 AND.FAN5(4).EQ.BL.AND.FAN5(5).EQ.BL.AND.FAN5(6).EQ.BL.	NINPUT	159
2 AND.FAN5(7).EQ.BL.AND.FAN5(8).EQ.BL)GC TC 1015	NINPUT	160
1011 DO 1012 I=1,20	NINPUT	161
1012 C=IN(I)=FAN5(I)	NINPUT	162
C	NINPUT	163
IF(NCAS.NE.I1.OR.NTYP.NE.I0)GC TC 1015	NINPUT	164
C	NINPUT	165
STORE DEFAULT VALUES FOR ITYPE=12	NINPUT	166
EDGVAR(1)=DDNE13	NINPUT	167
EDGVAR(2)=EMJ13	NINPUT	168
EDGVAR(3)=HD13	NINPUT	169
EDGVAR(4)=TSR13	NINPUT	170
EDGVAR(5)=SHAM	NINPUT	171
EDGVAR(6)=AJS13	NINPUT	172
EDGVAR(7)=DUA13	NINPUT	172

EDGVAR(8)=DHNL13	NINPUT	173
EDGVAR(9)=DJCL13	NINPUT	174
EDGVAR(10)=FLAP13	NINPUT	175
1015 NTYP=NTYP+11	NINPUT	176
IF(NCAS.EQ.11) GO TO 1330	NINPUT	177
IGO=ICQN(IC)	NINPUT	178
GO TO(1017,1060,1080,1100,1120,1200,1220,1230,1240,1250,1270,1290	NINPUT	179
1,1293),IGO	NINPUT	180
1017 CCNTINUE	NINPUT	181
DC 1018 I=11,13	NINPUT	182
1018 AJET(I+3)=0.	NINPUT	183
1020 CCNTINUE	NINPUT	184
DO 1030 I=11,13	NINPUT	185
1030 AJET(I)=S1(I,NCOF)	NINPUT	186
DO 1040 I=14,19	NINPUT	187
1040 AJET(I+3)=S1(I,NCOF)	NINPUT	188
DO 1050 I=11,12	NINPUT	189
1050 IJET(I)=JET1(I,NCOF)	NINPUT	190
GO TO 1300	NINPUT	191
C	NINPUT	192
1060 CCNTINUE	NINPUT	193
DC 1070 I=11,13	NINPUT	194
1070 AJET(I+3)=S2(I,NCOF)	NINPUT	195
GO TO 1020	NINPUT	196
1080 CCNTINUE	NINPUT	197
CALL SN(ICOR3,IADD3(1,NCCF),2,8,1)	NINPUT	198
CALL SN(TF3,ADD3(1,NCCF),1,54,1)	NINPUT	199
DC 1090 I=11,15	NINPUT	200
1090 T3(I)=S3(I,NCOF)	NINPUT	201
JB3=J3(1,NCOF)	NINPUT	202
DC 1105 I=16,13	NINPUT	203
1105 B3(I-5)=S3(I,NCOF)	NINPUT	204
IC3=J3(2,NCOF)	NINPUT	205
ISW3=J3(3,NCOF)	NINPUT	206
GO TO 1300	NINPUT	207
1100 CCNTINUE	NINPUT	208
CALL SN(ICOR4,IADD4(1,NCCF),2,8,1)	NINPUT	209
CALL SN(TF4,ADD4(1,NCCF),1,54,1)	NINPUT	210
DO 1110 I=14,16	NINPUT	211
1110 FAN1(I-3)=S45(I,NCOF)	NINPUT	212
CFPR4=S45(15,NCOF)	NINPUT	213
GO TO 1140	NINPUT	214
1120 DC 1130 I=110,12	NINPUT	215
1130 FANA1(I-9)=S45(I,NCOF)	NINPUT	216
NI5=IN15(NCOF)	NINPUT	217
BPR5=XBP5(NCOF)	NINPUT	218
CALL SN(ICOR5,IADD5(1,NCCF),2,8,1)	NINPUT	219
CALL SN(TF5,ADD5(1,NCCF),1,54,1)	NINPUT	220
1140 DO 1150 I=11,12	NINPUT	221
1150 IFAN1(I)=IS45(I,NCOF)	NINPUT	222
DO 1160 I=15,17	NINPUT	223
1160 IFAN1(I)=IS45(I,NCOF)	NINPUT	224
DO 1170 I=11,13	NINPUT	225
1170 FAN2(I)=S45(I,NCOF)	NINPUT	226
DO 1180 I=17,19	NINPUT	227
1180 FAN3(I-6)=S45(I,NCCF)	NINPUT	228
FAN4=S45(13,NCOF)	NINPUT	229

FANI2=S45(14,NCOF)	NINPUT	230
DELT45=S45(16,NCOF)	NINPUT	231
GO TO 1300	NINPUT	232
1200 DO 1210 I=1,16	NINPUT	233
1210 AUGI(I)=S6(1,NCOF)	NINPUT	234
CALL SN(ICOR6,IADD6(1,NCOF),2,8,1)	NINPUT	235
CALL SN(TF6,ADD6(1,NCOF),1,54,1)	NINPUT	236
GO TO 1300	NINPUT	237
1220 CONTINUE	NINPUT	238
CALL N(PR7,S7(1,NCOF),1,8,1)	NINPUT	239
GO TO 1300	NINPUT	240
1230 CONTINUE	NINPUT	241
NB8=INB8(NCOF)	NINPUT	242
CALL SN(FPR8,S8(1,NCCF),1,8,1)	NINPUT	243
CALL SN(ICOR8,IADD8(1,NCOF),2,8,1)	NINPUT	244
CALL SN(TF8,ADD8(1,NCCF),1,54,1)	NINPUT	245
GO TO 1300	NINPUT	246
1240 CONTINUE	NINPUT	247
NUM9=INUM(NCOF)	NINPUT	248
IEJ9=IEJ(NCOF)	NINPUT	249
CALL SN(AREA9,S9(1,NCCF),1,12,1)	NINPUT	250
CALL SN(ICOR9,IADD9(1,NCCF),2,8,1)	NINPUT	251
CALL SN(TF9,ADD9(1,NCCF),1,54,1)	NINPUT	252
GO TO 1300	NINPUT	253
1250 CONTINUE	NINPUT	254
DO 1260 I=1,18	NINPUT	255
1260 PROPI(I)=S10(I,NCOF)	NINPUT	256
GO TO 1300	NINPUT	257
1270 CONTINUE	NINPUT	258
DO 1280 I=1,13	NINPUT	259
1280 T113(I)=S11(I,NCOF)	NINPUT	260
NRTR11=T113(1,NCOF)	NINPUT	261
LLF11=T113(2,NCCF)	NINPUT	262
IRR11=T113(3,NCOF)	NINPUT	263
GO TO 1300	NINPUT	264
1290 DELT12=S12(NCOF)	NINPUT	265
GO TO 1300	NINPUT	266
1293 CONTINUE	NINPUT	267
DO 1295 I=1,110	NINPUT	268
1295 EOGVAR(I)=S13(I,NCCF)	NINPUT	269
ICOR13=IADD13(NCOF)	NINPUT	270
1300 IF(NTYP.NE.11)GO TO 1320	NINPUT	271
DO 1310 I=1,13	NINPUT	272
1310 NCIC(I)=NC(I,NCOF)	NINPUT	273
INSHLC=NC(4,NCOF)	NINPUT	274
1320 ITYPE=IGO	NINPUT	275
1320 READ(IN,NOISIN)	NINPUT	276
C	NINPUT	277
IF(NCAS.EQ.11) ICON(IC)=ITYPE	NINPUT	278
GO TO(1335,1380,1400,1420,1440,1520,1540,1550,1560,1570,1590,1610	NINPUT	279
1,1650), ITYPE	NINPUT	280
1335 CONTINUE	NINPUT	281
DO 1336 I=1,13	NINPUT	282
1336 AJET(I+3)=C.	NINPUT	283
1340 CONTINUE	NINPUT	284
DO 1350 I=1,13	NINPUT	285
1350 S1(I,NCOF)=AJET(I)	NINPUT	286

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      DO 1360 I=14,19
1360 S1(I,NCOF)=AJET(I+3)
      DO 1370 I=11,12
1370 JET1(I,NCOF)=IJET(I)
      GO TO 1620
1380 CONTINUE
      DO 1390 I=11,13
1390 S2(I,NCOF)=AJET(I+3)
      GO TO 1340
1400 CONTINUE
      CALL SN(ICOR3,IADD3(1,NCCF),2,8,2)
      CALL SN(TF3,ADD3(1,NCOF),1,54,2)
      DO 1410 I=11,15
1410 S3(I,NCOF)=T3(I)
      J3(1,NCOF)=JB3
      DO 1415 I=16,13
1415 S3(I,NCOF)=B3(I-5)
      J3(2,NCOF)=IC3
      J3(3,NCOF)=ISW3
      GO TO 1620
1420 CONTINUE
      DO 1430 I=14,16
1430 S45(I,NCOF)=FAN1(I-3)
      S45(15,NCOF)=CFPR4
      CALL SN(ICOR4,IADD4(1,NCCF),2,8,2)
      CALL SN(TF4,ADD4(1,NCOF),1,54,2)
      GO TO 1460
1440 CONTINUE
      IN15(NCOF)=NI5
      XBP5(NCOF)=BPR5
      CALL SN(ICOR5,IADD5(1,NCCF),2,8,2)
      CALL SN(TF5,ADD5(1,NCOF),1,54,2)
      DO 1450 I=110,12
1450 S45(I,NCOF)=FANA1(I-9)
1460 DO 1470 I=11,12
1470 IS45(I,NCOF)=IFAN1(I)
      DO 1480 I=15,17
1480 IS45(I,NCOF)=IFAN1(I)
      DO 1490 I=11,13
1490 S45(I,NCOF)=FAN2(I)
      DO 1500 I=17,19
1500 S45(I,NCOF)=FAN3(I-6)
      S45(13,NCOF)=FAN4
      S45(14,NCOF)=FAN12
      S45(16,NCOF)=DELT45
      GO TO 1620
1520 CONTINUE
      CALL SN(ICOR6,IADD6(1,NCCF),2,8,2)
      CALL SN(TF6,ADD6(1,NCCF),1,54,2)
      DO 1530 I=11,16
1530 S6(I,NCOF)=ALG1(I)
      GO TO 1620
1540 CONTINUE
      CALL SN(PR7,S7(1,NCCF),1,8,2)
      GO TO 1620
1550 CONTINUE
      IN88(NCOF)=NB8

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CALL SN(FPR8, S8(1,NCCF), 1, 8, 2)	NINPUT	344
CALL SN(ICOR8, IADD8(1,NCCF), 2, 8, 2)	NINPUT	345
CALL SN(TF8, ADD8(1,NCCF), 1, 54, 2)	NINPUT	346
GO TO 1620	NINPUT	347
156C CONTINUE	NINPUT	348
INUM(NCOF)=NUM9	NINPUT	349
IEJ(NCOF)=IEJ9	NINPUT	350
CALL SN(AREA9, S9(1,NCGF), 1, 12, 2)	NINPUT	351
CALL SN(ICOR9, IADD9(1,NCGF), 2, 8, 2)	NINPUT	352
CALL SN(TF9, ADD9(1,NCGF), 1, 54, 2)	NINPUT	353
GO TO 1620	NINPUT	354
157C CONTINUE	NINPUT	355
DC 1580 I=11, 18	NINPUT	356
1580 S10(I,NCOF)=PROPI(I)	NINPUT	357
GO TO 1620	NINPUT	358
159C CONTINUE	NINPUT	359
DO 1600 I=11, 13	NINPUT	360
1600 S11(I,NCOF)=T113(I)	NINPUT	361
T113(1,NCOF)=NRTR11	NINPUT	362
T113(2,NCOF)=LLF11	NINPUT	363
T113(3,NCOF)=IRR11	NINPUT	364
GO TO 1620	NINPUT	365
161C S12(NCOF)=DELT12	NINPUT	366
162C IF(INTYP.NE.I1)GO TO 164C	NINPUT	367
DO 163C I=11, 13	NINPUT	368
163C NC(I,NCOF)=NDIC(I)	NINPUT	369
NC(4,NCOF)=INSHLD	NINPUT	370
164C CONTINUE	NINPUT	371
C	NINPUT	372
900C FORMAT(20A4)	NINPUT	373
IF(IUNIT.GT.0)GO TO 1700	NINPUT	374
CALL CONVR(ITYPE,I1,I1)	NINPUT	375
C	NINPUT	376
170C RETURN	NINPUT	377
165C CONTINUE	NINPUT	378
C	NINPUT	379
STORE JET EDGE INTERACTION CURRENT DATA	NINPUT	380
DO 1660 I=11, 110	NINPUT	381
166C S13(I,NCOF)=EDGVAR(I)	NINPUT	382
IADD13(NCOF)=ICOR13	NINPUT	383
CCNE13 = EDGVAR(1)	NINPUT	384
EMJ13 = EDGVAR(2)	NINPUT	385
HC13 = EDGVAR(3)	NINPUT	386
TSR13 = EDGVAR(4)	NINPUT	387
SHAM = EDGVAR(5)	NINPUT	388
AJS13 = EDGVAR(6)	NINPUT	389
DDA13 = EDGVAR(7)	NINPUT	390
DHNL13 = EDGVAR(8)	NINPUT	391
DJCL13 = EDGVAR(9)	NINPUT	392
FLAP13 = EDGVAR(10)	NINPUT	393
GO TO 1620	NINPUT	394
END		

SUBROUTINE NOISO(IPRT, 1, NK, ICLT, CHIN, IUNIT, X, CFREQ, SP, NCF	NOISO	2
*, ITYPE)	NOISO	3
COMMON/ISWK/ISWT(3,13)	NOISO	4
COMMON/SWITCH/NTYPE, IDUMT, AENG, IDCF, IDUM(7), ICN(13), NLGPT	NOISO	5
*, INSEQ(3), INSHLD	NOISO	6
COMMON/TLRBIN/XXXXXX(9), ISW3	NOISO	7
COMMON/ICPATH/NCAS, NCCF, NTYP, IC, AFA, IARRAY(2)	NOISO	8
COMMON/IMSPL/SPZ(24,17), IB(2,3,13)	NOISO	9
COMMON/CLABEL/CH(2,8)	NOISO	10
COMMON/ANGLE/PSI(17,10), PSIC(17,10), BETA(17,10)	NOISO	11
COMMON/SDELTD/DT	NOISO	12
COMMON /GCONST/ IN, IO, IT1, IT2, F0, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10,	NOISO	13
*, IO, I1, I2, I3, I4, I5, I6, I7, I8, I9, I10, P1, P33, P5, P001,	NOISO	14
*, EPS, UNDEF, BL, ICO, CPR, RPC, ETA(17), P1, FM1, I17, A, PI	NOISO	15
DIMENSION TIT(8,14), CHIN(20), CFREQ(24), SP(24,17)	NOISO	16
DIMENSION TNU(4,2)	NOISO	17
DATA TNU/4HCORE, 4H NOI, 4FSE, 4H	NOISO	18
*4HTURB, 4HINE, 4HNOIS, 4HE /	NOISO	19
DATA TIT/4HPRIM, 4HARY, 4HJET, 4HACIS, 1HE, 3*1F,	NOISO	20
2 4HPRIM, 4HARY, 4HAND, 4HSECC, 4HNDAR, 4HY JE, 4HT NO, 4HISE,	NOISO	21
3 4HCORE, 4H AND, 4H TLR, 4HBINE, 4F NCI, 2FSE, 2*1F,	NOISO	22
4 4FCOMP, 4HRESS, 4HOR A, 4HND I, 4HLET, 4H FAN, 4H NCI, 2FSE,	NOISO	23
5 4HEXIT, 4H FAN, 4H NOI, 2HSE, 4*1F,	NOISO	24
6 4HAUGM, 4HENTE, 4HRI, 4HNG J, 4FET N, 4HCISE, 2*1H,	NOISO	25
7 4HBLOW, 4HNF, 4HAP J, 4HET N, 4FCISE, 3*1F,	NOISO	26
9 4HLIFT, 4H-FAN, 4H NCI, 2HSE, 4*1F,	NOISO	27
8 4HEJEC, 4HTUR, 4HSUPP, 4HRESS, 4FCR J, 4HET N, 4HCISE, 1F,	NOISO	28
X 4HPROP, 4HELLE, 4HR NO, 3HISE, 4*1F,	NOISO	29
Y 4HHELI, 4HCOPT, 4HER N, 4HCISE, 4*1H,	NOISO	30
Z 4HMEAS, 4HURED, 4H DAT, 4HAC, 3FISE, 3*1H,	NOISO	31
U4HJET, 4HEDGE, 4H INT, 4HERAC, 4HICN, 3*1H,	NOISO	32
W4HTOTA, 4HL NO, 4HISE, 4H(ALL, 4H CCF, 4HPCNE, 4HNTS), 2H /	NOISO	33
DATA DT/2000./	NOISO	34
ISW=1	NOISO	35
IF(IPRT.EQ.0)RETURN	NOISO	36
C WRITE(IOUT,5)ISWT(NCOF, IDLMT)	NOISO	37
5 FCRMAT(1X, 5HISWT=, I10)	NOISO	38
ITTT=ISWT(NCOF, IDLMT)	NOISO	39
90 CONTINUE	NOISO	40
IF(IPRT.NE.8)GO TC 95	NOISO	41
92 CONTINUE	NOISO	42
IF(LCT.LT.44) GO TC 95	NOISO	43
GO TO 100	NOISO	44
95 IF(NK.EQ.3.AND.IPRT.NE.8)GO TC 100	NOISO	45
IF(ISW.EQ.2)GO TC 115	NOISO	46
IF(I/2*2.EQ.1) GO TC 115	NOISO	47
100 CALL PRINTH(IPRT, LCT, ICLT)	NOISO	48
104 IF(ITYPE.NE.3)WRITE(IOUT,105)(TIT(K, ITYPE), K=1,8)	NOISO	49
IF(ITYPE.EQ.3.AND.ISW3.EQ.0)WRITE(ICLT,105)(TIT(K, ITYPE), K=1,8)	NOISO	50
IF(ITYPE.EQ.3.AND.ISW3.EQ.2)WRITE(ICLT,106)(TNU(K,1), K=1,4)	NOISO	51
IF(ITYPE.EQ.3.AND.ISW3.EQ.3)WRITE(ICLT,106)(TNU(K,2), K=1,4)	NOISO	52
106 FORMAT(52X, 4A4)	NOISO	53
105 FORMAT(52X, 8A4)	NOISO	54
LCT=LCT+1	NOISO	55
IF(IPRT.EQ.8)GO TO 140	NOISO	56
115 GO TO(120,120,120,120,120,154,150,104), IPRT	NOISO	57
150 CONTINUE	NOISO	58

IF (ISW=1) 152, 152, 189	NOISU	59
152 IF(ITYT.NE.0.OR.INSHLD.NE.0)ISW=2	NOISU	60
IF(ITYPE.EQ.13)ISW=1	NOISU	61
C	NOISU	62
154 WRITE(IOUT,155)	NOISU	63
LCT=LCT+3	NOISU	64
155 FORMAT(49X,35HINDEX, FREE-FIELD SPECTRA (R = 1 M) //)	NOISU	65
CALL PRTSH1(IUNIT,X,LCT,IOUT,2)	NOISU	66
GO TO 125	NOISU	67
120 CALL PRTSH1(IUNIT,X,LCT,IOUT,1)	NOISU	68
125 WRITE(IOUT,130)(CFREQ(K1),(SP(K1,K2),K2=1,17),K1=1,NCF)	NOISU	69
130 FORMAT(1X,1PE10.3,1X,CPF7.1,16F7.1)	NOISU	70
LCT=LCT+1	NOISU	71
GO TO(140,140,140,140,140,140,180),IPRT	NOISU	72
160 WRITE(IOUT,170)(ETA(J),J=1,17),X,CH(IUNIT+1,1)	NOISU	73
170 FORMAT(/2X,8HANGLE X1/3X,5H(DEG),3X,17F7.0//50X,	NOISU	74
* 19HSIDELINE DISTANCE =,1PE10.3,A3 //)	NOISU	75
LCT=LCT+6	NOISU	76
RETURN	NOISU	77
140 CALL WRPNL(NK,I,IOUT,LCT,IPRT)	NOISU	78
135 RETURN	NOISU	79
180 WRITE(IOUT,185)	NOISU	80
185 FORMAT(/3X,6HANGLES/3X,5H(DEG) //)	NOISU	81
WRITE(IOUT,186)(PSI(J,I),J=1,17),(BETA(J,I),J=1,17),	NOISU	82
* (ETA(J),J=1,17)	NOISU	83
186 FORMAT(4X,3HPSI,5X,17F7.1/4X,4HP-A,4X,17F7.1/	NOISU	84
* 4X,2HXI,6X,17F7.1)	NOISU	85
200 CONTINUE	NOISU	86
DELT=DT*DPR	NOISU	87
WRITE(IOUT,187)DELT,X,CH(IUNIT+1,1)	NOISU	88
187 FORMAT(4X,5HDELTA,3X,F7.1,31X,20HSIDELINE DISTANCE = ,	NOISU	89
* 1PE10.3,A3//)	NOISU	90
LCT=LCT+9	NOISU	91
IF(ISW.EQ.2)GO TO 92	NOISU	92
RETURN	NOISU	93
189 ISW=1	NOISU	94
ISWT(NCOF,IDLMT)=0	NOISU	95
WRITE(IOUT,190)	NOISU	96
190 FORMAT(49X,25HPREDICTED CONFIGURATION CORRECTIONS //)	NOISU	97
LCT=LCT+3	NOISU	98
CALL PRTSH1(IUNIT,X,LCT,IOUT,3)	NOISU	99
WRITE(IOUT,130)(CFREQ(K1),(SPZ(K1,K2),K2=1,17),K1=1,NCF)	NOISU	100
LCT=LCT+1	NOISU	101
WRITE(IOUT,185)	NOISU	102
WRITE(IOUT,195)(PSI(J,I),J=1,17),(ETA(J),J=1,17)	NOISU	103
195 FORMAT(4X,3HPSI,5X,17F7.1/4X,2HXI,6X,17F7.1)	NOISU	104
GO TO 200	NOISU	105
END	NOISU	106

C	SUBROUTINE NSRIO	NSRIO	2
C	PURPOSE	NSRIO	3
C	TO READ NOISE SHIELDING REFRACTION	NSRIO	4
C	INPUT DATA AND SET UP CURVES FOR	NSRIO	5
C	DISCHARGE TURBOMACHINERY NOISE COMPONENTS	NSRIO	6
C	DATA IS STORED FOR ALL COMPONENTS OF ALL THREE	NSRIO	7
C	CONFIGURATIONS FOR THE FIRST CASE. THEN ONLY	NSRIO	8
C	CHANGES IN DATA FOR A COMPONENT IN A CONFIGURATION	NSRIO	9
C	REPLACE DATA IN THE FIRST CASE	NSRIO	10
C	INPUT	NSRIO	11
C	EMJ EXHAUST FLOW MACH NO	NSRIO	12
C	IWED AN ARRAY INDICATING THE TYPE OF WING EDGE	NSRIO	13
C	DIFFRACTION SOLUTIONS TO BE INCLUDED FOR	NSRIO	14
C	THE NOISE COMPONENT CONSIDERED	NSRIO	15
C	IWED(1)=1 TRAILING EDGE	NSRIO	16
C	IWED(2)=1 LEADING EDGE	NSRIO	17
C	IWED(3)=1 TIP EDGE	NSRIO	18
C	TSTSO EXHAUST FLOW STATIC TEMPERATURE RATIO WITH	NSRIO	19
C	TSO=TAMB IN ABSOLUTE UNITS (DEG R OR K)	NSRIO	20
C	ASF ANGLE OFFSET, GMA, FOR ANGULAR SHIFT OF SOURCE.	NSRIO	21
C	ONE-DIMENSIONAL ARRAYS FOR EMPIRICAL ADJUSTMENT	NSRIO	22
C	CPSIO CURVES TO THEORETICAL JET REFRACTION MODEL WITH	NSRIO	23
C	FASS CPSIO = COTANGENT(PASIC) INDEPENDENT VARIABLE	NSRIO	24
C	BETA FASS = ALFA IN FIGURE OF ENGR. DOC.	NSRIO	25
C	BETA = BETA IN FIGURE OF ENGR. DOC.	NSRIO	26
C	NASRO NUMBER OF POINTS IN THE EMPIRICAL CURVES-	NSRIO	27
C	FASS VS. CPSIO AND BETA VS. CPSIO	NSRIO	28
C	IF NO INPUT CURVES ARE TO BE INPUT, SET NASRO = 0	NSRIO	29
C	AND BUILT-IN CURVES WILL BE USED.	NSRIO	30
C	USPL EMPIRICAL DIRECTIVITY CURVE OF UNSHIELDED SPL	NSRIO	31
C	PSI AT STATIC CONDITIONS USED IN SHIELDING CALCULATIONS	NSRIO	32
C	IF PREDICTED AND BUILT-IN VALUES ARE NOT DESIRED	NSRIO	33
C	NLSPL NUMBER OF POINTS IN THE EMPIRICAL CURVE	NSRIO	34
C	USPL .VS. PSI	NSRIO	35
C	INUSP INDICATOR TO DECIDE WHICH EMPIRICAL CURVE OF	NSRIO	36
C	USPL .VS. PSI TO USE	NSRIO	37
C	INUSP=0 USE PREDICTED VALUES	NSRIO	38
C	INUSP=1 USE BUILT-IN VALUES	NSRIO	39
C	INUSP.GT.1 USE INPUT VALUES DEFINED ABOVE	NSRIO	40
C	DIAMT2 DIAMETER OF NOZZLE (M OR FT) SECONDARY JET	NSRIO	41
C	DSL1 DIMENSIONLESS SHIELD LENGTH TO NOZZLE EXIT PLANE	NSRIO	42
C	DSL2 PARALLEL TO EXHAUST AXIS (PRIMARY AND SECONDARY)	NSRIO	43
C	COMMON /SWITCH/NTYPE,ITYPE	NSRIO	44
C	COMMON/ICPATH/NCAS,NCCF,NTYP,IC	NSRIO	45
C	COMMON /TURBIN/HM1,HM2,HM3,HM4,HM5,HM6,HM7,HM8,HM9,(SW3	NSRIO	46
C	COMMON /GCONST/IN	NSRIO	47
C	JET NOISE SHIELDING DATA	NSRIO	48
C	COMMON/JNSHLD/DIAMT2,DSL1,DSL2	NSRIO	49
C	WING SHIELDING DATA	NSRIO	50
C	COMMON/REFRAC/EMJ,TSTSO,IWED(3),FASS(24),BETA(24),CPSIC(24),NASRO,	NSRIO	51
C	* ASF,INSE	NSRIO	52
C	COMMON/UNSHLD/USPL(19),PSI(19),NLSPL,INUSP	NSRIO	53
C	DIMENSION FPSI(24),FBETA(24),TPSI(24),TBETA(24),CPSI(24),CBETA(24)	NSRIO	54
C	*,USPIN(9),PSIIN(9),UGPAF(17),PSIAF(17),USPTE(17),PSITE(17),	NSRIO	55
C	* LSPCR(17),PSICR(17),FALF(24),TALF(24),CALF(24)	NSRIO	56
C		NSRIO	57
C		NSRIO	58

C	STORAGE REQUIRED FOR SAVING DATA FOR NEXT CASE	NSRIO	59
	DIMENSION ICON(20),ST01(3),ISTC1(3,3),STC2(3,3),IST12(3,3),	NSRIO	60
	* IS3C(3,3),IS3CC(3,3),ST3C(3,3),ST3CA(19,3),ST3CB(19,3),	NSRIO	61
	* ST3CC(10,3),ST3CD(10,3),IS3T(3,3),IS3TT(3,3),ST3T(3,3),	NSRIO	62
	* ST3TA(19,3),ST3TB(19,3),ST3TC(10,3),ST3TD(10,3),	NSRIO	63
	* IS4(3,3),IS44(3,3),ST4A(19,3),ST4B(19,3),IS5(3,3),IS55(3,3),	NSRIO	64
	* ST5(3,3),ST5A(19,3),ST5B(19,3),ST5C(10,3),ST5D(10,3),	NSRIO	65
	* ST3CE(24,3),ST3TE(24,3),ST5E(24,3)	NSRIO	66
	EQUIVALENCE (PSIAF(1),PSICR(1),PSITB(1)),(FPSI(1),IPSI(1),CPSI(1))	NSRIO	67
	NAMelist/SHLDAT/EMJ,STSO,IWED,FASS,BETA,CPSIO,INASRO,ASF,	NSRIO	68
	*USPL,PSI,NUSPL,INUSP,DIAMT2,DSL1,DSL2	NSRIO	69
C		NSRIO	70
C	DATA FOR EMPIRICAL ADJUSTMENT CURVES TO JET REFRACTOR MODEL	NSRIO	71
	DATA INASRO /0/	NSRIO	72
	DATA FPSI /-4.,-3.5,-3.,-2.75,-2.5,-2.25,-2.,-1.75,-1.5,-1.25,-1.,	NSRIO	73
	1 -1.75,-1.5,-1.25,-1.0,-.75,-.5,-.25,-.25,-.5,-.75,-1.,-1.25,-1.5,-1.75,-2.,-2.5,-3./	NSRIO	74
	DATA FALF /2*.45,.53,.64,.75,.87,1.02,1.22,1.42,1.55,1.47,1.3,1.16	NSRIO	75
	,1.04,.93,.93,1.01,1.1,1.17,1.02,.88,.79,2.75/	NSRIO	76
	DATA CALF /2*.45,.51,.57,.67,.77,.86,.96,1.03,1.07,1.01,.9,.82,	NSRIO	77
	* .77,2*.75,.8,.91,.95,.92,.85,.78,2*.75/	NSRIO	78
	DATA TALF /2*.45,.5,.53,.59,.67,.72,.78,.8,.72,.62,.55,.53,.54,	NSRIO	79
	* .56,.57,.61,.7,.79,.82,.8,.76,.75,.75/	NSRIO	80
	DATA FBETA /2*.95,.92,.82,.63,.41,.18,-.07,-.28,-.4,-.37,-.19,.07,	NSRIO	81
	* .37,.93,1.1,1.13,1.06,1.02,5*1./	NSRIO	82
	DATA CBETA /4*.95,.9,.8,.66,.48,.28,.07,-.07,.01,.27,.54,1.08,	NSRIO	83
	* 1.27,1.32,1.3,1.16,1.1,1.07,1.05,2*1./	NSRIO	84
	DATA TBETA /2*.95,1.,1.07,1.17,1.2,1.17,1.04,.87,.6,.32,.26,.46,	NSRIO	85
	* .73,1.27,1.47,1.55,1.47,1.35,1.24,1.16,1.09,2*1./	NSRIO	86
C		NSRIO	87
C	UNSHIELDED DIRECTIVITY FOR HIGH-BYPASS RATIO TURBOFANS	NSRIO	88
	DATA USPIN/0.,0.,-1.,-3.,-6.,-11.,-17.5,-30.,-43./	NSRIO	89
	DATA PSIN/0.,50.,60.,70.,80.,90.,100.,120.,140./	NSRIO	90
	DATA USPAF/-27.,-21.5,-17.5,-14.5,-12.5,-11.,-9.,-7.,-4.,-1.5,0.,	NSRIO	91
	*-1.5,-5.5,-10.,-13.5,-16.,-17./	NSRIO	92
	DATA USPTB/-19.,-18.,-17.,-16.,-15.,-14.,-12.,-10.5,-7.,-2.5,0.,	NSRIO	93
	*-5.5,-11.,-13.5,-14.3,-14.5,-14.7/	NSRIO	94
	DATA USPCR/-20.5,-17.5,-14.7,-13.3,-12.,-10.2,-8.5,-6.5,-4.,	NSRIO	95
	*-1.5,0.,-1.5,-4.,-7.5,-11.,-13.,-13.5/	NSRIO	96
	DATA PSIAF/0.,20.,40.,50.,60.,70.,80.,90.,100.,110.,120.,130.,	NSRIO	97
	*140.,150.,160.,170.,180./	NSRIO	98
C		NSRIO	99
C	CHECK NOISE COMPONENT TYPE AND EXIT IF NOT INCLUDED	NSRIO	100
C		NSRIO	101
C	IF(ITYPE.GT.5)GO TO 300	NSRIO	102
C		NSRIO	103
C	TEST IF FIRST CASE,IF IT IS READ DATA AND STORE FOR EACH	NSRIO	104
C	COMPONENT,IF NOT FIRST CASE RETRIEVE DATA FOR COMPONENT AND	NSRIO	105
C	CONFIGURATION AND THEN JC AND READ	NSRIO	106
C		NSRIO	107
	IF(NCAS.NE.1)GO TO 400	NSRIO	108
	INUSP=0	NSRIO	109
	INASRO=0	NSRIO	110
	ASF = 13.	NSRIO	111
	EMJ=0.0	NSRIO	112
	TSTSO=1.C	NSRIO	113
	GO TO 600	NSRIO	114
	400 IGO=ICON(IC)	NSRIO	115

IF(IGO.GT.5)GO TO 300	NSRIO	116
GO TO(410,420,430,440,450),IGC	NSRIO	117
C	NSRIO	118
C PRIMARY JET	NSRIO	119
410 DSL1=ST01(NCOF)	NSRIO	120
DO 415 I=1,3	NSRIO	121
415 IWED(I)=IST01(I,NCOF)	NSRIO	122
GO TO 600	NSRIO	123
C	NSRIO	124
C PRIMARY AND SECONDARY	NSRIO	125
420 DSL2=ST02(1,NCOF)	NSRIO	126
DIAMT2=ST02(2,NCCF)	NSRIO	127
DSL1=ST02(3,NCOF)	NSRIO	128
DO 425 I=1,3	NSRIO	129
425 IWED(I)=IST02(I,NCCF)	NSRIO	130
GO TO 600	NSRIO	131
C	NSRIO	132
C TURBINE OR CORE	NSRIO	133
430 IF(ISA3.NE.2)GO TO 435	NSRIO	134
C CORE	NSRIO	135
CALL WSDSTO(IGO ,INASRC,IS3C(1,NCCF),IS3CC(1,NCOF),ST3CE(1,NCOF),	NSRIO	136
*ST3C(1,NCOF),ST3CA(1,NCOF),ST3CB(1,NCCF),ST3CC(1,NCOF),	NSRIO	137
* ST3CD(1,NCCF),2)	NSRIO	138
GO TO 600	NSRIO	139
C	NSRIO	140
C TURBINE	NSRIO	141
435 CALL WSDSTO(IGO ,INASRC,IS3T(1,NCCF),IS3TT(1,NCOF),ST3TE(1,NCOF),	NSRIO	142
*ST3T(1,NCOF),ST3TA(1,NCCF),ST3TB(1,NCCF),ST3TC(1,NCOF),	NSRIO	143
* ST3TD(1,NCOF),2)	NSRIO	144
GO TO 600	NSRIO	145
C	NSRIO	146
C INLET FAN	NSRIO	147
440 CALL WSDSTO(IGO ,INASRC,IS4(1,NCCF),IS44(1,NCOF),ST5E(1,NCOF),	NSRIO	148
*ST5(1,NCOF),ST5A(1,NCCF),ST5B(1,NCCF),ST5C(1,NCOF),	NSRIO	149
* ST5D(1,NCOF),2)	NSRIO	150
GO TO 600	NSRIO	151
C	NSRIO	152
C EXIT OR AFT FAN	NSRIO	153
450 CALL WSDSTO(IGO ,INASRC,IS5(1,NCCF),IS55(1,NCCF),ST5E(1,NCOF),	NSRIO	154
*ST5(1,NCOF),ST5A(1,NCOF),ST5B(1,NCCF),ST5C(1,NCOF),	NSRIO	155
* ST5D(1,NCOF),2)	NSRIO	156
C READ NOISE COMPONENT SHIELDING DATA	NSRIO	157
C	NSRIO	158
600 READ(IN,SHLDAT)	NSRIO	159
C SAVE THE COMPONENT TYPE	NSRIO	160
IF(NCAS.EQ.1)ICUN(IC)=ITYPE	NSRIO	161
GO TO(710,720,730,740,750),ITYPE	NSRIO	162
C	NSRIO	163
C PRIMARY JET	NSRIO	164
710 ST01(NCOF)=DSL1	NSRIO	165
DO 715 I=1,3	NSRIO	166
715 IST01(I,NCOF)=IWED(I)	NSRIO	167
GO TO 300	NSRIO	168
C	NSRIO	169
C PRIMARY AND SECONDARY JET	NSRIO	170
720 ST02(1,NCOF)=DSL2	NSRIO	171
ST02(2,NCOF)=DIAMT2	NSRIO	172

STO2(3, NCOF)=DSL1	NSRIO	173
DO 725 I=1,3	NSRIO	174
725 ISTO2(I, NCOF)=I*ED(I)	NSRIO	175
GO TO 300	NSRIO	176
C	NSRIO	177
C TEST FOR CORE OR TURBINE	NSRIO	178
730 IF(ISH3.NE.2)GO TO 735	NSRIO	179
C CORE	NSRIO	180
CALL WSDSTO(ITYPE, INASRO, IS3C(1, NCOF), IS3CC(1, NCOF), ST3CE(1, NCOF),	NSRIO	181
*ST3C(1, NCOF), ST3CA(1, NCOF), ST3CB(1, NCOF), ST3CC(1, NCOF),	NSRIO	182
* ST3CD(1, NCOF), 1)	NSRIO	183
GO TO 15	NSRIO	184
C TURBINE	NSRIO	185
735 CALL WSDSTO(ITYPE, INASRO, IS3T(1, NCOF), IS3TT(1, NCOF), ST3TE(1, NCOF),	NSRIO	186
*ST3T(1, NCOF), ST3TA(1, NCOF), ST3TB(1, NCOF), ST3TC(1, NCOF),	NSRIO	187
* ST3TD(1, NCOF), 1)	NSRIO	188
GO TO 15	NSRIO	189
C	NSRIO	190
C INLET FAN	NSRIO	191
740 CALL WSDSTO(ITYPE, INASRO, IS4(1, NCOF), IS44(1, NCOF), ST5E(1, NCOF),	NSRIO	192
*ST5(1, NCOF), ST4A(1, NCOF), ST4B(1, NCOF), ST5C(1, NCOF),	NSRIO	193
* ST5D(1, NCOF), 1)	NSRIO	194
GO TO 15	NSRIO	195
C	NSRIO	196
C EXIT OR AFT FAN	NSRIO	197
750 CALL WSDSTO(ITYPE, INASRO, IS5(1, NCOF), IS55(1, NCOF), ST5E(1, NCOF),	NSRIO	198
*ST5(1, NCOF), ST5A(1, NCOF), ST5B(1, NCOF), ST5C(1, NCOF),	NSRIO	199
* ST5D(1, NCOF), 1)	NSRIO	200
C IF PRIMARY AND SECONDARY RETURN	NSRIO	201
15 CONTINUE	NSRIO	202
C	NSRIO	203
C TEST UNSHIELDED EMPIRICAL DIRECTIVITY CURVE USAGE	NSRIO	204
C BRANCH IF PREDICTED OR INPLT CURVE TO BE USED	NSRIO	205
C IF(INUSP.NE.1)GO TO 1CC	NSRIO	206
C	NSRIO	207
C STORE TEST DATA DIRECTIVITY CURVE FOR COMPONENT ITYPE	NSRIO	208
C FROM BUILT-IN CURVES	NSRIO	209
C IF(ITYPE.NE.5)GO TO 3C	NSRIO	210
NUSPL=17	NSRIO	211
DO 20 IS=1, NUSPL	NSRIO	212
USPL(IS)=USPAF(IS)	NSRIO	213
20 PSII(IS)=PSIAF(IS)	NSRIO	214
GO TO 100	NSRIO	215
3C IF(ITYPE.NE.4)GO TO 5C	NSRIO	216
NUSPL=9	NSRIO	217
DO 4C IS=1, NUSPL	NSRIO	218
USPL(IS)=USPIN(IS)	NSRIO	219
4C PSII(IS)=PSIIN(IS)	NSRIO	220
GO TO 100	NSRIO	221
50 IF(ISH3.EQ.0)GO TO 280	NSRIO	222
IF(ISH3.NE.3)GO TO 70	NSRIO	223
55 NUSPL=17	NSRIO	224
DO 6C IS=1, NUSPL	NSRIO	225
USPL(IS)=USPTB(IS)	NSRIO	226
60 PSII(IS)=PSITB(IS)	NSRIO	227
GO TO 100	NSRIO	228
7C NUSPL=17	NSRIO	229

DO 80 IS=1,NUSPL	NSRIO	230
USPL(IS)=USPCR(IS)	NSRIO	231
80 PSI(IS) =PSICR(IS)	NSRIO	232
C	NSRIO	233
C CHECK FOR INPUT OF EMPIRICAL ADJUSTMENT CURVES FOR JET REFRACTION	NSRIO	234
C MODEL, IF NOT INPUT, USE DEFAULT CURVES PER COMPONENT TYPE	NSRIO	235
100 NASRO=INASRO	NSRIO	236
IF (NASRO.NE. 0) GO TO 300	NSRIO	237
NASRO = 24	NSRIO	238
IF(ITYPE.EQ.4)GO TO 300	NSRIO	239
IF(ITYPE.NE.5)GO TO 130	NSRIO	240
DO 120 IS=1,NASRO	NSRIO	241
BETA(IS) =FBETA(IS)	NSRIO	242
FASS(IS) = FALF(IS)	NSRIO	243
120 CPSIO(IS)=FPSI(IS)	NSRIO	244
GO TO 300	NSRIO	245
130 IF(IS=3.NE.3) GO TO 150	NSRIO	246
DO 140 IS=1,NASRO	NSRIO	247
BETA(IS) =TBETA(IS)	NSRIO	248
FASS(IS) = TALF(IS)	NSRIO	249
140 CPSIO(IS)=TPSI(IS)	NSRIO	250
GO TO 300	NSRIO	251
150 DO 160 IS=1,NASRO	NSRIO	252
BETA(IS) =CBETA(IS)	NSRIO	253
FASS(IS) = CALF(IS)	NSRIO	254
160 CPSIO(IS)=CPSI(IS)	NSRIO	255
GO TO 300	NSRIO	256
280 WRITE(6,290)	NSRIO	257
290 FORMAT(1H0,1GX70H00 CORE SEPARATE FROM TURBINE WHEN SHIELDING INCL	NSRIO	258
\$USED TURBINE ASSUMED)	NSRIO	259
GO TO 55	NSRIO	260
300 RETURN	NSRIO	261
END	NSRIO	262

```

SUBROUTINE PLOTIT(X,Y,SNDL,FPATH,NCIM,M2,M5)
C
C
C PURPOSE          INITIALIZE PLOTTER AND READ IN DATA
C
C INPUTS           MAXIMUM DIMENSION OF ARRAYS STORING FLIGHT PATH
C                   DATA POINTS
C
C OUTPUTS          PRINTED CONTOUR DATA POINTS
C                   PLOT OF NOISE LEVEL CONTOURS
C                   PLOT OF SIDELINE NOISE LEVEL
C
C X,Y DIMENSIONS (NDIM) MUST BE AT LEAST 2 GREATER THAN THE NUMBER OF
C FLIGHT PATH POINTS TO BE READ
C
C   LOGICAL IWRITE
C   DIMENSION X(NDIM,M2,M5),Y(NDIM,M2,M5),FPATH(NCIM,3),VNOISE(5),
C * AREA(5)
C * ,SNDL(NDIM,3),TITLE( 8),NDIST(3)
C 360 * ,SNDL(NDIM,3),TITLE(18),NDIST(3)
C
C 360 COMMON /PLT/ SCALV,YLENM,XLENM,CMPIN,LABELX(10),LABELY(10),
C 1 AXUNIT,NLABEL(2),SCALU,IWRITE
C COMMON /PLT/ SCALV,YLENM,XLENM,CMPIN,LABELX( 4),LABELY( 4),
C 1 AXUNIT,NLABEL(1),SCALU,IWRITE
C
C PLOTTING BUFFER MAY NOT BE REQUIRED FOR HOUSTON INSTRUMENT PLOTTER
C
C   DIMENSION BUFFER(1024)
C   DATA IBUF/1024/
C
C   DATA CM,XIN /2HCM,2HIN/
C   CMPIN=2.54001
C   REWIND 2
C   IWRITE= .FALSE.
C
C INITIALIZE PLOTTER TO WRITE ON TAPE99
C   CALL PLOTS(BUFFER,IBUF,99)
C FACTOR REQUIRED ONLY FOR BCS 360 RUNS
C   CALL FACTOR(2.0)
C
C INPUT FROM CARDS GENERAL PLOTTING SPECS
C 360
C   READ(5,1000,END=905) SCALV,XLENM,YLENM,DURITS,AXUNIT,NLABEL
C   READ(5,1000)          SCALV,XLENM,YLENM,DURITS,AXUNIT,NLABEL
C   IF (EOF(5)) 905, 1905
C 1905 CONTINUE
C 360
C 1000 FORMAT(3F10.0,3X,A2,5X,A4,5X,2A4)
C 1000 FORMAT(3F10.0,3X,A2,5X,A4,5X,A8)
C 360
C   READ(5,1001,END=905) LABELX,LABELY
C   READ(5,1001)          LABELX,LABELY
C   IF (EOF(5)) 905, 2905

```

PLOTIT	2
PLOTIT	3
PLOTIT	4
PLOTIT	5
PLOTIT	6
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PLOTIT	8
PLOTIT	9
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PLOTIT	11
PLOTIT	12
PLOTIT	13
PLOTIT	14
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PLOTIT	48
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PLOTIT	53
PLOTIT	54
PLOTIT	55
PLOTIT	56
PLOTIT	57
PLOTIT	58

```

2905 CONTINUE
C 360
C1001 FORMAT(10A4)
1001 FORMAT(4A10)
C
C LENGTH MUST BE IN CM UNITS
IF(DUNITS.NE.XIN.AND.DUNITS.NE.CM)GO TO 901
IF(DUNITS.EQ.CM)GO TO 2C
XLENM=XLENM*CMPIIN
YLENM=YLENM*CMPIIN
C
20 CONTINUE
C READ INITIALIZING DATA FROM TAPE2
C 360
C50 READ(2,2003,END=900) TITLE
C 360
C2003 FORMAT(18A4)
2003 FORMAT(8A10)
50 READ(2,2003) TITLE
IF (EOF(2)) 900, 1903
1903 CONTINUE
C 360
C READ(2,2000,END=902) NP,NL,NSC,NCIST
READ(2,2000) NP,NL,NSC,NCIST
IF (EOF(2)) 902, 1902
1902 CONTINUE
2000 FORMAT(3I5,5X,A4,6X,A4,6X,A4)
READ(2,2002)(VNOISE(I),I=1,NL)
2002 FORMAT(5E15.6,15)
C
C READ DATA FOR 1 SET OF PLOTS - CONTOUR + SIDELINE
C
DO 100 I=1,NP
C 360
C READ(2,2022,END=902) FPATH(I,1),FPATH(I,2),FPATH(I,3),
READ(2,2022) FPATH(I,1),FPATH(I,2),FPATH(I,3):
X (SNDL(I,K),K=1,NSD)
2022 FORMAT(6E15.6)
IF (EOF(2)) 902, 1900
1900 CONTINUE
C
C READ DATA FOR EACH NOISE LEVEL AT POINT I
C
DO 100 J=1,NL
READ(2,2002) X(I,1,J),X(I,2,J), Y(I,1,J),Y(I,2,J),AREA(J),IERR
100 CONTINUE
C
C PLOT CONTOURS
C
CALL FOTCNT(X,Y,VNGISE,FPATH,AREA,NP,NL,NCIP,TITLE)
C
C PLOT SIDELINE
C
CALL SIDPLT(SNDL,FPATH(1,3),NP,NCIST,TITLE,NSC,NCIM)
C
C REPEAT PLCT LOOP UNTIL END OF DATA
C

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PLCTIT	59
PLOTIT	60
PLOTIT	61
PLOTIT	62
PLOTIT	63
PLOTIT	64
PLOTIT	65
PLOTIT	66
PLOTIT	67
PLOTIT	68
PLOTIT	69
PLOTIT	70
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PLOTIT	104
PLOTIT	105
PLOTIT	106
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PLOTIT	109
PLOTIT	110
PLOTIT	111
PLOTIT	112
PLOTIT	113
PLOTIT	114
PLOTIT	115

```

      GC TO 50
C
C NORMAL RETURN
C
C EMPTY PLOT BUFFER
C
900  CALL PLOT(0.,0.,999)
      RETURN
C
C ABNORMAL TERMINATION
C
901  WRITE(6,3000)
3000  FORMAT(1H0,2CH *** FATAL ERROR *** )
      WRITE(6,3001)
3001  FORMAT(1H ,5X,
X45HPLOT SIZE UNITS MUST BE SPECIFIED AS IN OR CM )
      GO TO 999
902  WRITE(6,3000)
      WRITE(6,3002)
3002  FORMAT(1H ,5X,
128HINSUFFICIENT DATA ON TAPE2 )
      GO TO 999
905  WRITE(6,3000)
      WRITE(6,3005)
3005  FORMAT(1H ,5X,
X45HINSUFFICIENT PLOT SPECIFICATION DATA ON CARDS )
999  STOP
      END

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PLOTIT 116
PLOTIT 117
PLOTIT 118
PLOTIT 119
PLOTIT 120
PLOTIT 121
PLOTIT 122
PLOTIT 123
PLOTIT 124
PLOTIT 125
PLOTIT 126
PLOTIT 127
PLOTIT 128
PLOTIT 129
PLOTIT 130
PLOTIT 131
PLOTIT 132
PLOTIT 133
PLOTIT 134
PLOTIT 135
PLOTIT 136
PLOTIT 137
PLOTIT 138
PLOTIT 139
PLOTIT 140
PLOTIT 141
PLOTIT 142
PLOTIT 143

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SUBROUTINE PNDB4(SPL,KIND,PNDB)		PNDB4	2
C PURPOSE	TO CALCULATE THE PERCEIVED NOISE LEVEL OF A SOUND	PNDB4	3
C	PRESSURE LEVEL SPECTRUM ACCORDING TO REFERENCE 2	PNDB4	4
C AUTHOR	J. N. THOMAS	PNDB4	5
C MODIFICATIONS	NONE	PNDB4	6
C		PNDB4	7
C METHOD	THIS SUBROUTINE USES THE METHODS AND TABLES IN	PNDB4	8
C	ARP-865 (REFERENCE 2). THE SPECTRUM CAN BE	PNDB4	9
C	PREFERRED 1/3 OCTAVE, PREFERRED OCTAVE, OR COMMON	PNDB4	10
C	OCTAVE BANDS.	PNDB4	11
C		PNDB4	12
C USAGE	CALL PNDB4(SPL,KIND,PNDB)	PNDB4	13
C	DIMENSION SPL(1)	PNDB4	14
C		PNDB4	15
C INPUTS	SPL - ARRAY OF 24 PREFERRED 1/3 OCTAVE, 8 PREFERRED	PNDB4	16
C	OCTAVE, OR 8 COMMON OCTAVE SPL VALUES IN DB	PNDB4	17
C	KIND - = 1 FOR PREFERRED 1/3 OCTAVE	PNDB4	18
C	= 2 FOR PREFERRED OCTAVE	PNDB4	19
C	= 3 FOR COMMON OCTAVE	PNDB4	20
C		PNDB4	21
C OUTPUTS	PNDB - THE PERCEIVED NOISE LEVEL IN PNDB	PNDB4	22
C		PNDB4	23
C ERROR RETURN	IF KIND DOES NOT EQUAL 1,2, OR 3, THE PNL WILL NOT	PNDB4	24
C	BE CALCULATED, AND THE FOLLOWING MESSAGE WILL BE	PNDB4	25
C	PRINTED: KIND EQUAL TO --- IS UNDEFINED. PNDB IS	PNDB4	26
C	SET EQUAL TO ZERO AND CONTROL IS RETURNED TO THE	PNDB4	27
C	CALLING PROGRAM.	PNDB4	28
C		PNDB4	29
C STORAGE	545 BASE EIGHT	PNDB4	30
C TIMING	0.015 CP SECONDS FOR A 24 VALUE SPL ARRAY	PNDB4	31
C REFERENCES	1. PEART, N.A., REVISED PNL CALCULATION PROCEDURE,	PNDB4	32
C	MEMO 6-8580-9-238, JUNE 19, 1969	PNDB4	33
C	2. SOCIETY OF AUTOMOTIVE ENGINEERS, AEROSPACE	PNDB4	34
C	RECOMMENDED PRACTICE 865A, SAE, AUGUST 15, 1969	PNDB4	35
C		PNDB4	36
C SUBROUTINES CALLED		PNDB4	37
C	APPLICATIONS - NONE	PNDB4	38
C	SYSTEMS - ALGOLIC	PNDB4	39
C		PNDB4	40
C DOCUMENTATION	AMEP-S-17C	PNDB4	41
C		PNDB4	42
C *** RESTRICTIONS ***		PNDB4	43
C	SPL VALUES SHOULD BE LESS THAN 150 DB. IF THEY ARE NOT,	PNDB4	44
C	NOY VALUES AND PNDB VALUES WILL BE INCORRECT.	PNDB4	45
C		PNDB4	46
C	REAL LL,MM	PNDB4	47
C	REAL L,M	PNDB4	48
C	DIMENSION L(24,5),M(24,4),SPL(24,17),PNDB(17)	PNDB4	49
C	DIMENSION LL(120),MM(56)	PNDB4	50
C	EQUIVALENCE(LL(1),L(1,1)),(M(1,1),MM(1))	PNDB4	51
C	DATA LL / 49., 44., 39., 34., 30., 27., 24., 21., 18.,	PNDB4	52
C	1 5*16., 15., 12., 9., 5., 4., 5., 6., 10., 17., 21.,	PNDB4	53
C	2 55., 51., 46., 42., 39., 36., 33., 30., 27.,	PNDB4	54
C	1 5*25., 23., 21., 18., 15., 14., 14., 15., 17., 23., 29.,	PNDB4	55
C	3 64., 60., 56., 53., 51., 48., 46., 44., 42.,	PNDB4	56
C	1 5*40., 38., 34., 32., 30., 29., 29., 30., 31., 37., 41.,	PNDB4	57
C	4 51.01, 45.88, 47.32, 49.85, 49.76,	PNDB4	58

1	75.86	,73.96	,74.91	,94.63	,13*100.,	44.29	,50.72	, PNCB4	59
5				52., 51., 49., 47., 46., 45., 43., 42., 41.,			PNCB4	60	
1	5*40.,38.,34.,32.,30.,29.,29.,30.,31.,34.,37.			/			PNCB4	61	
	DATA MM	/	.079520	, 2*.068160	, .059640		PNCB4	62	
1	10*.053013	,	.059640	, 2*.053013	, 2*.047712		PNCB4	63	
2	2*.053013	,	.068160	, .079520	, .0596401		PNCB4	64	
X			2*.058098	, .052288	, .047534		PNCB4	65	
1	2*.043573	,	.040221	, .037349	, 7*.034859		PNCB4	66	
2	.040221	,	.037349	, 4*.034859	, 2*.037349		PNCB4	67	
3	.043573						PNCB4	68	
X			.043478	, .040570	, 2*.036831		PNCB4	69	
1	.035336	,	2*.033333	, .032051	, .030675		PNCB4	70	
2	6*.030103	,	7*.029960	, 2*.042285			PNCB4	71	
X			15*.030103	, 9*.029960 /			PNCB4	72	
	DO 55 JJ=1,17						PNCB4	73	
	SUM=0.						PNCB4	74	
	XMAX=0.						PNCB4	75	
	PNCB(JJ)=0.						PNCB4	76	
	IF(KIND.LT.1.OR.KIND.GT.3) GC TC 60						PNCB4	77	
	IF (KIND-2) 1, 2, 3						PNCB4	78	
1	CONTINUE						PNCB4	79	
	NUM=24						PNCB4	80	
	C=.15						PNCB4	81	
	KK=0						PNCB4	82	
	INC=1						PNCB4	83	
	GC TO 10						PNCB4	84	
2	CONTINUE						PNCB4	85	
	KK=-1						PNCB4	86	
4	CONTINUE						PNCB4	87	
	NLM=8						PNCB4	88	
	C=.3						PNCB4	89	
	INC=3						PNCB4	90	
	GC TO 10						PNCB4	91	
3	CONTINUE						PNCB4	92	
	KK=-2						PNCB4	93	
	GO TO 4						PNCB4	94	
10	CONTINUE						PNCB4	95	
	DO 50 I=1,NUM						PNCB4	96	
	A=1.						PNCB4	97	
	KK=KK+INC						PNCB4	98	
	DO 20 J=1,4						PNCB4	99	
	IF(SPL(I,JJ).LT.L(KK,J)) GO TO 21						PNCB4	100	
20	CONTINUE						PNCB4	101	
	J=5						PNCB4	102	
	K=5						PNCB4	103	
	GC TO 22						PNCB4	104	
21	CONTINUE						PNCB4	105	
C	IGNORE SPL(I,JJ) IF IT FALLS OFF THE LOWER END OF THE TABLE, I.E., J=1						PNCB4	106	
	IF(J.LT.2) GO TO 50						PNCB4	107	
	IF(J.EQ.2) A=.1						PNCB4	108	
	K=J-1						PNCB4	109	
	IF(K.EQ.2) K=3						PNCB4	110	
22	CONTINUE						PNCB4	111	
	XNOY= A*10.** (M(KK,J-1) * (SPL(I,JJ)-L(KK,K)))						PNCB4	112	
	IF(XNOY.GT.XMAX) XMAX=XNOY						PNCB4	113	
	SUM=SUM+XNOY						PNCB4	114	
50	CONTINUE						PNCB4	115	

```

      BARN= XMAX + C* (SLM - XMAX)
C  PNDB CANNOT BE NEGATIVE
      IF(BARN.GT.0.048) PNDB(JJ)=(ALOG10(BARN))/0.030103 + 40.
55  CONTINUE
      RETURN
6C  CONTINUE
      WRITE (6,61) KIND
61  FORMAT(10X,14HKIND EQUAL TO ,I4,13H IS UNDEFINED )
      RETURN
      END

```

```

PNDB4 116
PNDB4 117
PNDB4 118
PNDB4 119
PNDB4 120
PNDB4 121
PNDB4 122
PNDB4 123
PNDB4 124
PNDB4 125

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SUBROUTINE PRINTH(N,LCT,L)
COMMON/ICPATH/NCAS,NCOF,NTYP,IC,ARN,IARRAY(2)
COMMON/HEAD/FIN(20),HCLT(20),CHIN(20)
DIMENSION HD1(4),HD2(7)
DATA HD1 /4HPRQG,4HRAH ,4HTEE3,4H30A /, ATE /4HDATE/
DATA HD2/4HAIRC,4HRAFT,4H NOI,4HSE P,4HREDI,4HCTIO,4HN /
DATA IENTRY/C/
IF(IENTRY.EQ.1)GO TO 1C
CALL DATE(DAY)
IENTRY=1
1C LCT=5
WRITE (L,1C0) HD1, ATE, HD2, DAY
100 FORMAT(1H1,57X,4A4,50X,A4/53X,7A4/120X,A10)
WRITE(L,110)NCAS,HCLT
110 FORMAT(10H CASE NO. ,13,27X,2CA4,1X,8HYR/MO/CA)
IF(N.EQ.3)GO TO 13C
IF(N.EQ.7)GO TO 13C
WRITE(L,120)
120 FORMAT(1H )
GO TO 1000
130 WRITE(L,140)CHIN
140 FORMAT(40X,2CA4)
1000 RETURN
END

```

```

PRINTH 2
PRINTH 3
PRINTH 4
PRINTH 5
PRINTH 6
PRINTH 7
PRINTH 8
PRINTH 9
PRINTH 10
PRINTH 11
PRINTH 12
PRINTH 13
PRINTH 14
PRINTH 15
PRINTH 16
PRINTH 17
PRINTH 18
PRINTH 19
PRINTH 20
PRINTH 21
PRINTH 22
PRINTH 23
PRINTH 24
PRINTH 25

```

C	SUBROUTINE PROP	PROP	2
C		PROP	3
C	PURPOSE	PRCP	4
C	THE FOLLOWING PROPELLER NOISE PREDICTION PROCEDURE	PROP	5
C	BASED ON THE BELOW LISTED REFERENCES. THE PROCEDURE	PROP	6
C	CONSIDERS TWO NOISE COMPONENTS. (1) THE VORTEX NOISE	PROP	7
C	BASED ON THE EQUATIONS IN REFERENCES 1 AND 2. PROP	PROP	8
C	(2) DISCRETE TONE NOISE BASED ON REFERENCE 3. THE	PROP	9
C	RESULTING NOISE ESTIMATES HAVE BEEN CORRECTED TO	PROP	10
C	FREE FIELD INDEX CONDITIONS (RADIUS = 1 METRE)	PROP	11
C	REFERENCES	PROP	12
C	1 F.H. SCHMITZ, W.Z. STEPNIOWSKI, J. GIBBS, E. HINTE	PROP	13
C	A COMPARISON OF OPTIMAL AND NOISE ABATEMENT	PROP	14
C	TRAJECTORIES OF A TILT ROTOR AIRCRAFT, NASA C	PROP	15
C	MAY 1972.	PROP	16
C	2 F.W. BARRY, E. MAGLIOZZI, NOISE DETECTABILITY P	PROP	17
C	N METHOD FOR LOW TIP SPEED PROPELLERS (HAMILTON	PROP	18
C	STANDARD), AFAPL-TR-71-37, JUNE 1971.	PROP	19
C	3 B. MAGLIOZZI, GENERALIZED PROPELLER NOISE EST	PROP	20
C	PROCEDURE (HAMILTON-STANDARD, REVISION C), 11	PROP	21
C		PROP	22
C	PROGRAMMER M.A. JAEGER NOISE AND PROPULSION GROUP G-	PROP	23
C	REQUIRED DATA VARIABLE DEFINITION UNITS	PROP	24
C	ISPRM-----SWITCH FOR 1/3 OR FULL O.B. (0 OR 1)	PROP	25
C	T-----THRUST DEVELOPED BY PROPELLER. LBF	PROP	26
C	W-----POWER GIVEN TO THE PROPELLER	PROP	27
C	SHAFT. HP	PROP	28
C	RPM-----ROTATIONAL SPEED OF PROPELLER	PROP	29
C	SHAFT. RPM	PROP	30
C	D-----PROPELLER DIAMETER FT	PROP	31
C	DSUBE-----CHARACTERISTIC DIMENSION FOR THE	PROP	32
C	BLADE GEOMETRY AT 0.7 SPAN. FT	PROP	33
C	DSUBE=BT*CCS(CL)+CL*ABS(SIN ATTANG)	PROP	34
C	BT= BLADE THICKNESS	PROP	35
C	CL= CHORD LENGTH	PROP	36
C	ATTANG= ANGLE OF ATTACK	PROP	37
C	ASLBB-----TOTAL BLADE AREA OF PROPELLER FT**2	PROP	38
C		PROP	39
C	ASLBB = B* INTEGRAL(HUB TO TIP)	PROP	40
C	CF CL DELTA-R	PROP	41
C	B-----NUMBER OF PROPELLER BLADES NONE	PROP	42
C	DELTA E-----ANGLE BETWEEN PROPELLER AND	PROP	43
C	HORIZON DEG.	PROP	44
C	SLOPE-----CLIMB GRADIENT IE TAN(THETA) NONE	PROP	45
C	DOPSF(JJ)-----COPIER SHIFT FACTOR (1-ACMN*	PROP	46
C	CCS(XI). IF NO COPIER SHIFT	PROP	47
C	AMACH-----AIRCRAFT MACH NUMBER NONE	PROP	48
C	THEN DOPSF=1. NONE	PROP	49
C	CAMB-----AMBIENT SPEED OF SOUND	PROP	50
C	CAMB= K * SQRT(TSO)	PROP	51
C	K=20.04647 M/SEC PER DEG. KELVIN	PROP	52
C	49.02142 FT/SEC PER DEG. RANKINE	PROP	53
C	TSC= STATIC TEMP (DEG. R OR K)	PROP	54
C	AT ALTITUDE ZC	PROP	55
C	P-----DISTANCE FOR SOUND PROPAGATION	PROP	56
C		PROP	57
C		PROP	58

C		BETWEEN SOURCE AND OBSERVER	FT	PROP	59
C		(X,Y,ZSUBN) AIRCRAFT COORDINATE RELATIVE		PROP	60
C		TO THE OBSERVER.	FT	PROP	61
C	BUF-----	ARRAY OF CUTOFF FREQUENCIES (HZ)		PROP	62
C		FOR THE SOUND PRESSURE LEVEL		PROP	63
C		SPECTRUM. LENGTH=25		PROP	64
C				PROP	65
C		FRCUT(I)=10**[0.1*(I+15.5)]	HZ	PROP	66
C	NENG-----	NUMBER OF PROPELLER ENGINES	NONE	PROP	67
C				PROP	68
C	VARIABLES SET DURING			PROP	69
C	INITIALIZATION			PROP	70
C				PROP	71
C	ALPHA-----	ANGLE BETWEEN THE THRUST AXIS AND		PROP	72
C		THE DIRECTION OF THE AIRPLANES		PROP	73
C		MOTION	DEG.	PROP	74
C		ALPHA=DELTA-ATAN(GRAD)		PROP	75
C	SCI-----	THE DIRECTIVITY ANGLE		PROP	76
C		ACCS=(-(YCS(DELTA)+ZNSIN(DELTA)		PROP	77
C		/F))	DEG.	PROP	78
C	VSLBT-----	TIP SPEED	FT/SEC	PROP	79
C		= PI*RPM*DSUBT / 60		PROP	80
C	XMSLBT-----	ROTATIONAL TIP MACH NUMBER		PROP	81
C	XMSBTR-----	RELATIVE ROTATIONAL TIP MACH		PROP	82
C		NUMBER		PROP	83
C		=SQRT XMSLBT**2+(ACMN*CCS(ALPHA))**2		PROP	84
C		(DIAGNOSTIC-IF XMSBTR GT .9 GR		PROP	85
C		.LE. 0)		PROP	86
C	VSLBTR-----	RELATIVE TIP SPEED	FT/SEC	PROP	87
C		= CAMB *X MSBTR		PROP	88
C	FSLBC-----	OBSERVED FUNDAMENTAL BLADE PASSAGE		PROP	89
C		FREQUENCY	HZ	PROP	90
C		= B * RPM / (60*CCPSF)		PROP	91
C	FSLBV-----	OBSERVED CHARACTERISTIC FREQUENCY		PROP	92
C		FOR BROADBAND VORTEX NOISE	HZ	PROP	93
C		=C.28*VSLBTR / (DSUBT*CCPSF)		PROP	94
C	PSLBI-----	ARRAY OF PRESSURE SPECTRA LEVELS		PROP	95
C	SPLI -----	ARRAY OF SOUND PRESSURE LEVELS I=1,24		PROP	96
C	BRING IN INPUT CARD VARIABLES FROM INPUT ROUTIN			PROP	97
C				PROP	98
C				PROP	99
C				PROP	100
C				PROP	101
C				PROP	102
C				PROP	103
C				PROP	104
C	COMMON/PROP(IN,T,W,RPM,D,DSUBT,ASLBB,B,DELTA,			PROP	105
C	*ICOR10,LIN10,NTF10,IMA10,LGM10,NW10,IOPI0,ILAY10,TF10(10),			PROP	106
C	*PCTA10(10),PLA10(10),ELCH10,ECH10,RLW10(10),TL10(10),CF10,FM10			PROP	107
C	COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCP,IPRT(7),ICN(13),NLCT			PROP	108
C	CONSTANTS USED IN INTERNAL CALCULATIONS			PROP	109
C				PROP	110
C	COMMON /GCONST/ IN,IC,IT1,IT2,FC,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,			PROP	111
C	* 10,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,P001,			PROP	112
C	* EPS,UNDEF,BL,ICD,OPR,RPD,ETA(17),M1,FM1,I17,A,PI			PROP	113
C				PROP	114
C	VARIABLE SET CALCULATED IN THE PROGRAM PROCESSING			PROP	115

C	COMMON /GCOMMON/ NCF,NK,BCF(24),TSPL(24,10,17),SPLT(24,17),	PROP	116
	*BUF(25),RETA(17),SPL2(17),TGAGR(24),CCPSF(17)	PROP	117
	COMMON/SUMSPL/SSPL(24,10,17)	PROP	118
	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	PROP	119
C		PROP	120
C	FREQUENCY BANDS USED BY PROGRAM	PROP	121
C		PROP	122
C	COMMON /GFREQ/ CFREQ(24),UFREQ(25),PFREQ(24)	PROP	123
C		PROP	124
C	GENERAL INPUT PARAMETERS	PROP	125
C	COMMON/ANGLE/PSI(17,10),PSIC(17,10),BETA(17,10)	PROP	126
C		PROP	127
	COMMON /GPRAM/ALTP,ALTR,SLOPE,AMACH,ACBS,SLDIST(10),ITENG,IUNIT	PROP	128
	* ,ISPTRM,IATMOS,IAIR,UAIRAB(24),NTEMP,TEMP(50),TALT(50)	PROP	129
	* ,NPRES,PRES(50),PALT(50),NHLUMID,RALT(50),RHUMID(50),CTEMP	PROP	130
	* ,CPRES,CRHUMD,IEGA,IGDR,CTEMP,CPRES,CHUMID,XKN,NC,FLD(50),	PROP	131
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IPAGE,BCG,TCG,FLR,AALT,EPF	PROP	132
C		PROP	133
C	AIRCRAFT-OBSERVER GEOMETRY CLTPLTS	PROP	134
C		PROP	135
C	COMMON /GEMO/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	PROP	136
	* B1(10,17),B2(10,17),TDS(17,10),TPC(17,10),IRR(10,17)	PROP	137
	* ,APP,TP,RHP,APU,TC,RHG,CA,CZ,TSP(17,10),CCV	PROP	138
C		PROP	139
C	CONVERSION CONSTANTS	PROP	140
C		PROP	141
	COMMON/GCONVC/C(2,10),SLDISX(10)	PROP	142
	COMMON/TMSPL/SPZ(24,17),IB(2,3,13)	PROP	143
	COMMON/CRSPLS/DOB(17),PSCR(17),CPB(408),APSCR	PROP	144
	COMMON/HEAD/HIN(20),HCUT(20),CHIN(20)	PROP	145
C		PROP	146
C		PROP	147
C		PROP	148
C		PROP	149
C		PROP	150
C		PROP	151
	DIMENSION SCIAN(15),DRINDX(15)	PROP	152
	DIMENSION S(25),DA(10)	PROP	153
	DIMENSION HAR(160)	PROP	154
	DIMENSION HARLEV(16,10),AMTE(16)	PROP	155
	EQUIVALENCE (HAR(1),HARLEV(1,1))	PROP	156
C		PROP	157
C		PROP	158
C		PROP	159
C		PROP	160
C	BUILD TABLE FOR F GF SCI CURVES FOR	PROP	161
C	DIRECTIVITY CORRECTION.(ANGLE AND CORRECTION)	PROP	162
	DATA DRINDX/-7.1,-4.2,-1.6,-1.0,-1.0,-1.0,-0.8,-0.5,-0.0,0.5,-0.2,	PROP	163
	*-1.5,-4.0,-11.5,-20.6/	PROP	164
	DATA SCIAN/0.0,0.349,0.698,0.872,1.047,1.221,1.396,1.571,1.745,	PROP	165
	*1.919,2.094,2.268,2.44,2.792,3.141/	PROP	166
C	BUILD TABLE OF ATMOSPHERIC ABSORPTION COEFF.	PROP	167
C	DELTA K AS A FUNCTION OF K THE BAND NUMBER	PROP	168
C	DATA BLOCKS DEFINING VARIABLES WITH CONSTANT VALUES	PROP	169
C		PROP	170
C		PROP	171
	DATA (HAR(I),I=1,80)/	PROP	172

C	CALCULATE THE VARIABLES TO BE USED BY BOTH	PROP	230
C	ROUTINES	PROP	231
	SCI=PSI(JJ,II)*RPD	PROP	232
	FSUBO = B*RPM/(60.*DCPSF(JJ))	PROP	233
	FSUBV= 0.28*VEEPT7/(DSUBE*DOPSF(JJ))	PROP	234
	CALCULATE VORTEX NOISE	PROP	235
C		PROP	236
C		PROP	237
C		PROP	238
C		PROP	239
C		PROP	240
C		PROP	241
	X22=(0.1+(COS(SCI)**2))/0.21658	PROP	242
	OA=10.*ALOG10(X11*X22*X33/DCPSF(JJ))+5.7	PROP	243
	DO 15 I=1,INCF	PROP	244
15	S(I)=BUF(I)/FSUBV	PROP	245
C	CALCULATE THE SPECTRUM SHAPE SS(I)	PROP	246
	DO 20 I=1,NCF	PROP	247
	GA=1.+(ONEPLS*S(I+1))**2	PROP	248
	GB=1.+(ONEMYN*S(I))**2	PROP	249
	GC=1.+(ONEMYN*S(I+1))**2	PROP	250
	GD=1.+(ONEPLS*S(I))**2	PROP	251
	SS=10.*ALOG10(1./CEE*ALCG((GA*GB)/(GC*GD)))	PROP	252
C	CALCULATE THE RESULTING SOUND PRESSURE LEVEL FO	PROP	253
C	R VORTEX NOISE AT 500 FT.	PROP	254
	SPLT(I,JJ)=OA+SS	PROP	255
C	CALCULATE THE RESULTANT PRESSURE SPECTRUM	PROP	256
	TGAGR(I)=10.**(C.1*SPLT(I,JJ))	PROP	257
20	CONTINUE	PROP	258
C		PROP	259
C		PROP	260
C		PROP	261
C		PROP	262
C		PROP	263
C		PROP	264
C		PROP	265
	F1SCI=TBLU1(SCI,SCIANG,DRINDX,1,15)	PROP	266
C	LO IS THE REFERENCE SOUND PRESSURE LEVEL	PROP	267
C	USED TO CALCULATE THE HARMONIC TONES	PROP	268
	XLO=15.5*ALOG10(Z1)-22.65*ALOG10(Z2)-40.*ALCG10(DOPSF(JJ))+38.00	PROP	269
	* *(XMSBTR)-2.2*8+F1SCI+137.7	PROP	270
	HC=0.1*XLO	PROP	271
	H1=0.1*(XLO+DA(10))	PROP	272
	H2=-2.185434*(DA(5)-DA(10))	PROP	273
C	FIND THE HARMONICS WITHIN THE BAND, IF ANY	PROP	274
	N1= 1.+ BUF(1)/FSUBO	PROP	275
	DO 60 I=1,NCF	PROP	276
	N2=BUF(I+1)/FSUBO	PROP	277
	IF(N2-N1 .LT. 0) GO TO 50	PROP	278
C		PROP	279
C	SUM THE HARMONIC TONE ENERGY WITHIN EACH BAND	PROP	280
	DO 45 K=N1,N2	PROP	281
	IF (K .GT. 10) GO TO 40	PROP	282
	DP=10.**(HC+C.1*DA(K))	PROP	283
	GO TO 45	PROP	284
40	XK=K	PROP	285
	DP=10.**(H1)*(C.1*XK)**H2	PROP	286

45	TGAGR(I)=TGAGR(I)+DP	PROP	287
50	SPLT(I,JJ) = TGAGR(I) * FLCAT(AENG)	PROP	288
	IF(SPLT(I,JJ) .LE. 0.)GO TO 61	PROP	289
	SPLT(I,JJ)=10.*ALOG10(SPLT(I,JJ))-SPZ(I,JJ)	PROP	290
	GO TO 62	PROP	291
61	SPLT(I,JJ)=SPZ(I,JJ)	PROP	292
62	CCNTINUE	PROP	293
	SSPL(I,II,JJ)=PWRSLP(SSPL(I,II,JJ),SPLT(I,JJ))	PROP	294
60	N1=N2+1	PROP	295
8888	CCNTINUE	PROP	296
	IF(IPRT(7).NE.7) GO TO 8900	PROP	297
	CALL NOISO(IPRT(7),II,NK,10,CHIN,ILNIT,SLEISX(II),PFREQ,	PROP	298
	* SPLT(1,1),NCF,ITYPE)	PROP	299
8900	CCNTINUE	PROP	300
	DO 65 NF=1,NCF	PROP	301
	DO 65 J=1,17	PROP	302
65	SPLT(NF,J)=SPLT(NF,J)-TSPL(NF,II,J)	PROP	303
	IF(IPRT(3).NE.3)GO TO 9999	PROP	304
	CALL PNLSUB(SPLT(1,1),PSPL(1,II),TFD(1,II),EPNL(1,II),SPL2,	PROP	305
	* TEPNL(1,II),NK,BCG,TCG,FLR,II,ACBS,IRR(II,1))	PROP	306
	CALL NOISO(IPRT(3),II,NK,12,CHIN,IUNIT,SLEISX(II),PFREQ,	PROP	307
	* SPLT(1,1),NCF,ITYPE)	PROP	308
9999	CCNTINUE	PROP	309
	RETURN	PROP	310
	END	PROP	311

SUBROUTINE PRTSH1(J,X,LCT,L,K)	PRTSH1	2
COMMON/CLABEL/CH(2,8)	PRTSH1	3
DATA CH/4H M. ,4H FT ,4H MIC,4HC PI,4HRC-N,4HCCBA,4H/SQ.,4HR) ,	PRTSH1	4
* 4HM.) ,1H ,1HK,1HR,4HATM.,4HPSIA,3HMPS,3HFPS/	PRTSH1	5
I=1	PRTSH1	6
IF(J.EQ.1)I=2	PRTSH1	7
IF (K-2) 1C, 20G, 30C	PRTSH1	8
10 CONTINUE	PRTSH1	9
WRITE(L,100)X ,CH(I,1)	PRTSH1	10
100 FORMAT(38X,3SHOBSERVED SPECTRA AT SIDELINE DISTANCE= ,1PE10.3,	PRTSH1	11
* A4//)	PRTSH1	12
LCT=LCT+3	PRTSH1	13
GO TO 200	PRTSH1	14
ENTRY PRTSH2	PRTSH1	15
200 WRITE(L,210)(CH(I,N),N=2,5)	PRTSH1	16
210 FORMAT(2X,9HFREQUENCY,43X,21HSCUND PRESSURE LEVELS/9H (KHZ),	PRTSH1	17
*46X,1CH(DB RE. 2C,4A4//)	PRTSH1	18
LCT=LCT+3	PRTSH1	19
RETURN	PRTSH1	20
300 WRITE(L,310)	PRTSH1	21
310 FORMAT(2X,9HFREQUENCY ,34X,	PRTSH1	22
*37HSCUND PRESSURE LEVEL ATTENLATION (DB) //9H (KHZ) /)	PRTSH1	23
LCT=LCT+1	PRTSH1	24
LCT=LCT+2	PRTSH1	25
RETURN	PRTSH1	26
END	PRTSH1	27

FUNCTION PWRSUM(SPL1,SPL2)	PWRSUM	2
C AUTHOR D. F. MELDRUM	PWRSUM	3
C	PWRSUM	4
C PURPOSE TO CALCULATE A POWER SUM	PWRSUM	5
C	PWRSUM	6
C INPUTS SPL1, SPL2 TWO SPL VALUES WHICH NEEDS TO BE	PWRSUM	7
C	PWRSUM	8
C	PWRSUM	9
C OUTPUTS PWRSUM POWER SUM OF SPL1 AND SPL2 - IF ONE	PWRSUM	10
C	PWRSUM	11
C	PWRSUM	12
C	PWRSUM	13
C	PWRSUM	14
C FUNCTION SUBPRGM ALGG10	PWRSUM	15
C	PWRSUM	16
C	PWRSUM	17
C	PWRSUM	18
C ANSWER=10.0*ALOG10(10.0**((SPL1*0.1)+10.0**((SPL2*0.1)))	PWRSUM	19
C	PWRSUM	20
300 PWRSLM=ANSWER	PWRSUM	21
RETURN	PWRSUM	22
END	PWRSUM	23

	SUBROUTINE REFRAC(AMACH,PSIC,ETA,DLT,RO,ROV,BV,U,V,W,E1,E2,E3,THO	REFRAC	2
1	,ROP,THOP)	REFRAC	3
C		REFRAC	4
C	TITLE	REFRAC	5
C	JET REFRACTION EFFECTS	REFRAC	6
C		REFRAC	7
C	PURPOSE	REFRAC	8
C	THIS SUBROUTINE COMPUTES THE JET FLOW REFRACTION EFFECTS BY	REFRAC	9
C	GIVING THE APPARENT SOURCE POLAR COORDINATE WITH JET FLOW REMOVED	REFRAC	10
C		REFRAC	11
C	INPUT - CALLING SEQUENCE	REFRAC	12
C	AMACH AIRCRAFT MACH NUMBER	REFRAC	13
C	PSIO DIRECTIVITY ANGLE GRAZING WING EDGES	REFRAC	14
C	ETA DIRECTION ANGLE RELATIVE TO EDGE	REFRAC	15
C	DLT NOT USED, FORMULA $\text{ASIN}(W(2))$ USED INSTEAD.	REFRAC	16
C	RO MAGNITUDE OF VECTOR OR INLET OR NOZZLE RELATIVE TO EDGE	REFRAC	17
C	ROV VECTOR OF INLET OR NOZZLE RELATIVE TO EDGE	REFRAC	18
C	BV VECTOR FOR A POINT ON THE EDGE RELATIVE TO NOZZLE	REFRAC	19
C	U,V,W UNIT VECTORS OF WING EDGE	REFRAC	20
C	E1,E2,E3 COORDINATE SYSTEM UNIT VECTORS FIXED TO ENGINE SUCH THAT	REFRAC	21
C	E1 IS PARALLEL TO HALF-PLANE	REFRAC	22
C		REFRAC	23
C	INPUT - COMMON	REFRAC	24
C	EWGED VARIABLE DIANI	REFRAC	25
C	REFRAC ALL VARIABLES EXCEPT IWED ARE USED	REFRAC	26
C		REFRAC	27
C	OUTPUT	REFRAC	28
C	ROP MAGNITUDE OF APPARENT SOURCE COORDINATE WITH JET FLOW	REFRAC	29
C	REMOVED	REFRAC	30
C	THOP PHASE ANGLE OF APPARENT SOURCE COORDINATE WITH JET FLOW	REFRAC	31
C	REMOVED	REFRAC	32
C		REFRAC	33
C	NOTE	REFRAC	34
C	ALL INPUT AND OUTPUT ANGLES ARE IN DEGREES	REFRAC	35
C		REFRAC	36
C	REFERENCE	REFRAC	37
C	THE WEGSTEIN ITERATION SCHEME IS USED. THE CODE IS EXTRACTED FROM	REFRAC	38
C	IBM SYS/360 SCIENTIFIC SUBROUTINE PACKAGE, VER. III, H20-0166-5,	REFRAC	39
C	1968, PP.215-216	REFRAC	40
C		REFRAC	41
C	DIMENSION ROV(3),L(3),V(3),W(3),E1(3),E2(3),E3(3),	REFRAC	42
C	* RV(3),RCAPV(3),X(5),RPL(3), ROPV(3),BV(3)	REFRAC	43
C	COMMON/EWGED/ SWPTE,SWPLE,DIFED,CCSD,CDX1D,CDX2D,CDXOC,CCY1D,	REFRAC	44
C	1 DDY2D,DDYOD,DDLD,DIANI	REFRAC	45
C	COMMON/REFRAC/EMJ,TSTSC,IWED(3),FASS(24),BETA(24),CPSIC(24),NASRG,	REFRAC	46
C	* ASF,IWSFE	REFRAC	47
C	DATA IC, IL, FO, FL, RPD, DPR /C,1,0.,1.,1.745329E-2,57.29578/	REFRAC	48
C	DATA OMEGA, EPS, MAXIT / 1.E75,1.2E-5,50/	REFRAC	49
C		REFRAC	50
C	INITIALIZATION	REFRAC	51
C		REFRAC	52
C	DEL=DLT	REFRAC	53
C	DEL = DPR * $\text{ASIN}(W(2))$	REFRAC	54
C	X(1) = AMACH	REFRAC	55
C	X(2) = EMJ	REFRAC	56
C	X(3) = TSTSC	REFRAC	57
C	X(5) = 180. - PSIC	REFRAC	58

SMJ = X(2) * X(2)	REFRAC	59
CR = SQRT(X(3))	REFRAC	60
RM = CR * X(2) - X(1)	REFRAC	61
CTO = COS(RPD * X(5))	REFRAC	62
STO = SQRT(F1 - CTO*CTO)	REFRAC	63
IF (ABS(STO) .LT. EPS) STO = EPS	REFRAC	64
COTPC = -CTO / STO	REFRAC	65
ACF = TBLU1(COTPC, CPSID, FASS, 1, NASRC)	REFRAC	66
CE=COS(ETA*RPD)	REFRAC	67
RCP=RC	REFRAC	68
TOP=THO	REFRAC	69
IF((EMJ.EQ.AMACH.AND.TSTSO.EQ.1.).CR.(ABS(CE).LT.EPS))RETURN	REFRAC	70
TEMP=RO*SIN(ETA*RPD)/CE	REFRAC	71
DO 1 J=1,3	REFRAC	72
RV(J) = RCV(J) + TEMP * L(J)	REFRAC	73
1 CCNTINUE	REFRAC	74
TEMP1=DOTP(E1,U)	REFRAC	75
TEMP=DOTP(BV,E1)	REFRAC	76
IF (ABS(TEMP1) .GT. EPS) GO TO 320	REFRAC	77
DO 310 J = 1,3	REFRAC	78
RCAPV(J) = BV(J) - TEMP * E1(J)	REFRAC	79
310 CCNTINUE	REFRAC	80
GO TO 340	REFRAC	81
320 TEMP = TEMP / TEMP1	REFRAC	82
DO 330 J = 1,3	REFRAC	83
RCAPV(J) = BV(J) - TEMP * L(J)	REFRAC	84
330 CCNTINUE	REFRAC	85
340 RCAPM = SQRT(DOTP(RCAPV, RCAPV))	REFRAC	86
GAMO = 180. - ACOS(RCAPV(2) / RCAPM) * DPR	REFRAC	87
R = SQRT(DOTP(RV,RV))	REFRAC	88
X(4) = R / DIANI	REFRAC	89
CTTP = CTO / (STC - C.5 / X(4))	REFRAC	90
DU = 2. * X(4) / STO	REFRAC	91
TM1 = DL * CTTP	REFRAC	92
TM2 = F1 - DU	REFRAC	93
C	REFRAC	94
C CRITICAL ANGLE CALC.	REFRAC	95
CP2 = F1 / (RM + CR)	REFRAC	96
IF(ABS(CP2).GT.1.) CP2 = SIGN(1.,CP2)	REFRAC	97
SP2 = SQRT(F1 - CP2*CP2)	REFRAC	98
DX = ATAN(SP2 / (X(1) + CP2)) * DPR	REFRAC	99
AC = X(5) + ACF * (DX - (ASF + X(5)))	REFRAC	100
IF (X(5) - AC) 220, 22C, 5	REFRAC	101
5 I = -11	REFRAC	102
K = 2	REFRAC	103
DX = FC	REFRAC	104
C	REFRAC	105
C FIRST FUNCTION EVALUATION	REFRAC	106
10 COTT1 = TM1 + TM2 * DX	REFRAC	107
CT1 = COTT1 / SQRT(F1 + COTT1*COTT1)	REFRAC	108
ST1S = F1 - CT1*CT1	REFRAC	109
RAC = F1 - SMJ * ST1S	REFRAC	110
IF (RAD) 20, 2C, 3C	REFRAC	111
20 CP1 = -F1 / X(2)	REFRAC	112
GO TO 4C	REFRAC	113
30 CP1 = -X(2) * ST1S + CT1 * SQRT(RAC)	REFRAC	114
40 CP2 = RM * CP1 + CR	REFRAC	115

IF (CP2) 50, 60, 50	REFRAC 116
50 CP2 = CP1 / CP2	REFRAC 117
SP2 = F1 - CP2*CP2	REFRAC 118
IF (SP2) 60, 60, 70	REFRAC 119
60 CP2 = -F1 / (RM + CR)	REFRAC 120
CP2 = .5 * (CP2 + CTC)	REFRAC 121
SP2 = F1 - CP2*CP2	REFRAC 122
IF (SP2) 65, 65, 70	REFRAC 123
65 COTT = -OMEGA	REFRAC 124
GC TO 180	REFRAC 125
70 SP2 = SQRT(SP2)	REFRAC 126
COTT = (X(1) + CP2) / SP2	REFRAC 127
80 IF (I) 90, 110, 160	REFRAC 128
C	REFRAC 129
C WEGSTEINS ITERATION	REFRAC 130
90 DU = COTT - DX	REFRAC 131
IF (ABS(DU) - EPS * ABS(COTT)) 180, 180, 100	REFRAC 132
100 DV = -DU	REFRAC 133
DX = COTT	REFRAC 134
I = I + 1	REFRAC 135
C	REFRAC 136
C SECOND FUNCTION EVALUATION	REFRAC 137
GO TO 10	REFRAC 138
110 DY = DX - COTT	REFRAC 139
I = I + 1	REFRAC 140
IF (ABS(DY) - EPS * ABS(COTT)) 180, 180, 120	REFRAC 141
120 K = K + 1	REFRAC 142
IF (K - MAXIT) 130, 130, 180	REFRAC 143
130 IF (DY) 140, 180, 140	REFRAC 144
140 DV = DV / DY - F1	REFRAC 145
IF (DV) 150, 180, 150	REFRAC 146
150 DL = DU / DV	REFRAC 147
DX = DX + DU	REFRAC 148
DV = DY	REFRAC 149
C	REFRAC 150
C THIRD TO MAXIT FUNCTION EVALUATIONS	REFRAC 151
GO TO 10	REFRAC 152
160 DY = DX - COTT	REFRAC 153
RAD = ABS(DX) * EPS	REFRAC 154
IF (ABS(DU) - RAD) 170, 170, 120	REFRAC 155
170 IF (ABS(DY) - 10.*RAD) 180, 180, 120	REFRAC 156
180 DX = COTT	REFRAC 157
IF (DX) 190, 200, 210	REFRAC 158
190 DX = 180. + DPR * ATAN(F1 / DX)	REFRAC 159
GO TO 220	REFRAC 160
200 DX = 90.	REFRAC 161
GC TO 220	REFRAC 162
210 DX = DPR * ATAN(F1 / DX)	REFRAC 163
220 DX = X(5) + ACF * (DX - (ASF + X(5)))	REFRAC 164
221 CT = COS(RPD * DX)	REFRAC 165
ST = SQRT(F1 - CT*CT)	REFRAC 166
RAD = X(1) * ST	REFRAC 167
RAD = F1 - RAD*RAD	REFRAC 168
IF (RAD) 223, 223, 225	REFRAC 169
223 CP2 = -F1 / X(1)	REFRAC 170
GO TO 227	REFRAC 171
225 CP2 = -X(1) * ST * ST + CT * SQRT(RAD)	REFRAC 172

227 IF(ABS(CP2).GT.1.) CP2 = SIGN(1.,CP2)	REFRAC	173
SP2 = SQRT(F1-CP2*CP2)	REFRAC	174
IF(ABS(SP2).LT.EPS) SP2=EPS	REFRAC	175
C	REFRAC	176
C NEW SOURCE AXIAL LOCATION VECTOR GRAZING WING EDGE.	REFRAC	177
RPV(1) = RV(1)	REFRAC	178
RPV(2) = -R * STG * CP2 / SP2	REFRAC	179
RPV(3) = RV(3)	REFRAC	180
C	REFRAC	181
C CALCULATE EFFECTS FOR PRESENCE OF THE WING, RELATIVE FLOW	REFRAC	182
C TURNING AND DUCTING AND COMPLETE OUTPLT COORDINATES	REFRAC	183
C	REFRAC	184
RCAPV(2) = RCAPV(2) + (RPV(2) - RV(2))	REFRAC	185
COSG1 = -RCAPV(2) / SQRT(DOTP(RCAPV, RCAPV))	REFRAC	186
GAM1 = ACOS(COSG1) * DPR	REFRAC	187
BETAX=TBLU1(COTPC,CPSIC,BETA,1,NASRO)	REFRAC	188
BETAX = AMIN1(BETAX, DDYOD+DDYCD - 0.088)	REFRAC	189
SING1 = SQRT(F1 - COSG1*CCSG1)	REFRAC	190
IF(ABS(SING1).LT.EPS) SING1=EPS	REFRAC	191
CCTG1=COSG1/SING1	REFRAC	192
DL=.5*DIANI*BETAX	REFRAC	193
SGPD=SIN((GAM1+DEL)*RPD)	REFRAC	194
IF (ABS(SGPD) .LT. EPS) GO TO E20	REFRAC	195
SDEL = W(2)	REFRAC	196
CDEL = SQRT(F1 - W(2)*W(2))	REFRAC	197
SGMGO=SIN((GAM1-GAM0)*RPC)	REFRAC	198
DL=(DL*SING1*CDEL-RCAPM*SDEL*SGMGO)/SGPD	REFRAC	199
CL=DL*COTG1	REFRAC	200
GO TO 83C	REFRAC	201
82C CL=0.0	REFRAC	202
83C CONTINUE	REFRAC	203
C	REFRAC	204
C MODIFY COMPONENTS OF RPV IN DIRECTION OF FLOW AND NORMAL TO	REFRAC	205
C HALF-PLANE FOR EFFECT OF WING PRESENCE, I.E. ADD TERMS (CL, CL)	REFRAC	206
C	REFRAC	207
P1 = DOTP(RPV,E1)	REFRAC	208
P2 = DOTP(RPV,E2)+CL	REFRAC	209
P3 = DOTP(RPV,E3)+DL	REFRAC	210
DO 85C J=1,3	REFRAC	211
RPV(J) = P1*E1(J) + P2*E2(J) + P3*E3(J)	REFRAC	212
85C CONTINUE	REFRAC	213
TEMP = DOTP(RPV, U)	REFRAC	214
DC 860 J=1,3	REFRAC	215
ROPV(J) = RPV(J) - TEMP * U(J)	REFRAC	216
86C CONTINUE	REFRAC	217
C	REFRAC	218
C COMPUTE APPARENT SOURCE POLAR COORDINATES RE. H.P.	REFRAC	219
ROP = SQRT(DOTP(ROPV, ROPV))	REFRAC	220
THOP = DPR * ACOS(DOTP(ROPV,V) / ROP)	REFRAC	221
C	REFRAC	222
RETURN	REFRAC	223
END	REFRAC	224

SUBROUTINE RESCAL(NUMBER,ARRAY)			RESCAL	2
C	AUTHOR	D. F. MELDRUM	RESCAL	3
C			RESCAL	4
C	PURPOSE	TO RESCALE THE INDEPEND VARIABLE FOR THE BASIC DATA	RESCAL	5
C		CURVES FOR DISCRETE TONES AND BROADBAND TO A LOG	RESCAL	6
C		SCALE.	RESCAL	7
C			RESCAL	8
C	INPUTS	NUMBER NUMBER OF POINTS TO RESCALE.	RESCAL	9
C		ARRAY ARRAY OF VARIABLES TO RESCALE.	RESCAL	10
C			RESCAL	11
C	OUTPUTS	ARRAY LOG OF THE INPUT ARRAY.	RESCAL	12
C			RESCAL	13
C	FUNCTION SUBPRGM	ALOG10	RESCAL	14
C			RESCAL	15
C			RESCAL	16
	DIMENSION ARRAY(NUMBER)		RESCAL	17
	DO 100 I=1,NUMBER		RESCAL	18
	100 ARRAY(I)=ALOG10(ARRAY(I))		RESCAL	19
	RETURN		RESCAL	20
	END		RESCAL	21

	SUBROUTINE SDSPLP(DISTX,NPSIX,PSIX,MAXPSI,NCF,USPL,NPSI,PSI,	SDSPLP	2
1	DLTSPL)	SDSPLP	3
C	TITLE	SDSPLP	4
C	SHIELDING ATTENUATION	SDSPLP	5
C		SDSPLP	6
C	PURPOSE	SDSPLP	7
C	THIS SUBROUTINE COMPUTES THE SHIELDING ATTENUATION GIVEN THE	SDSPLP	8
C	SHIELDED MEAN SQUARE PRESSURE PER FLIGHT POSITION AND	SDSPLP	9
C	FREQUENCY SUMMED OVER THE EDGES AND X-COORDINATE	SDSPLP	10
C		SDSPLP	11
C	INPUT	SDSPLP	12
C	DISTX AIRCRAFT COORDINATE DISTANCE X	SDSPLP	13
C	NPSIX NUMBER OF PSIX	SDSPLP	14
C	PSIX ARRAY OF DIRECTIVITY ANGLES AT WHICH USPL ARE GIVEN	SDSPLP	15
C	MAXPSI COLUMN DIMENSION OF USPL	SDSPLP	16
C	NCF NUMBER OF FREQUENCIES BCF	SDSPLP	17
C	USPL UNSHIELDED SPL VERSUS PSIX AND FREQUENCIES IN BCF	SDSPLP	18
C	NPSI NUMBER OF PSI	SDSPLP	19
C	PSI ARRAY OF DIRECTIVITY ANGLES AT WHICH DLTSPL ARE GIVEN	SDSPLP	20
C	DLTSPL UPON INPUT, THIS IS ARRAY OF PS2 VERSUS FREQUENCY AND PSI	SDSPLP	21
C		SDSPLP	22
C	OUTPUT	SDSPLP	23
C	DLTSPL UPON OUTPUT, THIS IS THE SHIELDING ATTENUATION VERSUS	SDSPLP	24
C	FREQUENCY AND PSI	SDSPLP	25
C		SDSPLP	26
C		SDSPLP	27
C	COMMON/ENWGE0/DMY(12),IES	SDSPLP	28
C		SDSPLP	29
C	DIMENSION PSIX(1),USPL(MAXPSI,1),PSI(1),DLTSPL(24,1)	SDSPLP	30
C		SDSPLP	31
C	C = 0.	SDSPLP	32
C	IF(DISTX.NE.0..AND.IES.EC.0)C=3.	SDSPLP	33
C		SDSPLP	34
C	LCOP ON FREQUENCY AND DIRECTIVITY ANGLE PSI	SDSPLP	35
C		SDSPLP	36
C	DO 100 IF=1,NCF	SDSPLP	37
C	DO 100 IPSI=1,NPSI	SDSPLP	38
C		SDSPLP	39
C	COMPUTE UNSHIELD SPL AT THIS FREQUENCY AND PSI BY INTERPOLATION	SDSPLP	40
C		SDSPLP	41
C	USPLI=TBLL1(PSI(IPSI),PSIX,USPL(1,IF),2,NPSIX)	SDSPLP	42
C		SDSPLP	43
C	COMPUTE TOTAL SHIELDED SOUND PRESSURE AND SUBTRACT FROM UNSHIELDED	SDSPLP	44
C	TO FORM THE SHIELDED ATTENUATION	SDSPLP	45
C		SDSPLP	46
C	SSPL = 0.	SDSPLP	47
C	PT2 = DLTSPL(IF,IPSI)	SDSPLP	48
C	IF(PT2.GT.0.) SSPL = 10.*ALOG10(PT2) - C	SDSPLP	49
C	DLTSPL(IF,IPSI) = USPLI - SSPL	SDSPLP	50
C	100 CONTINUE	SDSPLP	51
C		SDSPLP	52
C	RETURN	SDSPLP	53
C	END	SDSPLP	54

	SUBROUTINE SHATTN(IMACH,CZ,NCF,BCF,NPSIX,PSIX,MAXPSI,USPL,ISPTRM,	SHATTN	2
1	DISTX,APY,APZ,ALTR,NPSI,PSI,DELT3,ITYPE,DLTSPL)	SHATTN	3
C		SHATTN	4
C	TITLE	SHATTN	5
C	WING SHIELDING CALCULATION MODULE	SHATTN	6
C		SHATTN	7
C	PURPOSE	SHATTN	8
C	THIS SUBROUTINE CALCULATES WING SHIELDING DELTA-SPL WHICH CONSISTS	SHATTN	9
C	OF THE FOLLOWING SUB-TASKS OR MODULES	SHATTN	10
C	MULTIPLE EDGES	SHATTN	11
C	JET REFRACTION	SHATTN	12
C	UNIFORM FLOW	SHATTN	13
C	EDGE DIFFRACTION	SHATTN	14
C		SHATTN	15
C	INPUT - CALLING SEQUENCE	SHATTN	16
C	AMACH - AIRCRAFT MACH NUMBER FROM COMMON GPRAM	SHATTN	17
C	CZ - AMBIENT SPEED OF SOUND AT AIRCRAFT ALTITUDE	SHATTN	18
C	FROM COMMON GEOMG	SHATTN	19
C	NCF - NUMBER OF FREQUENCIES, 8 OR 24	SHATTN	20
C	BCF - 1/3 O. B. OR FULL O. B. GEOMETRIC MEAN CENTER FREQUENCIES	SHATTN	21
C	FROM COMMON GCOMN	SHATTN	22
C	NPSIX - NUMBER OF DIRECTIVITY ANGLES IN PSIX BELOW AT MOST MAXPSI	SHATTN	23
C	PSIX - DIRECTIVITY ANGLES IN DEGREES AT WHICH USPL ARE DEFINED	SHATTN	24
C	BELOW	SHATTN	25
C	MAXPSI - COLUMN OR VARIABLE DIMENSION OF USPL	SHATTN	26
C	USPL - UNSHIELDED SPL VERSUS PSIX AND BCF MATRIX IN THAT ORDER	SHATTN	27
C	AT STATIC CONDITIONS. THESE MAY BE OBTAINED FROM INPUT,	SHATTN	28
C	TABLE OR PREDICTED VALUES	SHATTN	29
C	ISPTRM - FILTER BAND WIDTH INDICATOR FROM COMMON GPRAM	SHATTN	30
C	= 0 USE .1 FOR 1/3 OCTAVE BANDS	SHATTN	31
C	1 USE .3 FOR FULL OCTAVE BANDS	SHATTN	32
C	DISTX - AIRCRAFT COORDINATE DISTANCE X FROM COMMON GPRAM FOR	SHATTN	33
C	THIS OBSERVER POSITION, I.E. A VALUE FROM SLDIST	SHATTN	34
C	APY - ARRAY OF 17 AIRCRAFT COORDINATES Y FROM COMMON GEOMG FOR	SHATTN	35
C	THIS OBSERVER, A ROW FROM APY	SHATTN	36
C	APZ - ARRAY OF 17 AIRCRAFT COORDINATES Z FROM COMMON GEOMG FOR	SHATTN	37
C	THIS OBSERVER, A ROW FROM APZ	SHATTN	38
C	ALTR - OBSERVER HEIGHT FROM COMMON GPRAM	SHATTN	39
C	NPSI - NUMBER OF DIRECTIVITY ANGLES PSI BELOW (SHOULD BE 17)	SHATTN	40
C	PSI - DIRECTIVITY ANGLES RELATIVE TO ENGINE INLET PHI FOR SOUND	SHATTN	41
C	PROPAGATING TO THE OBSERVER (DEG)	SHATTN	42
C	DELT3 - ENGINE INCLINATION ANGLE RELATIVE TO HORIZON (DEG)	SHATTN	43
C	ITYPE - = 4 FOR INLET FAN NOISE	SHATTN	44
C	NOT 4 FOR DISCHARGE TURBOMACHINERY NOISE	SHATTN	45
C		SHATTN	46
C	INPUT - COMMON	SHATTN	47
C	EWGEO - ENGINE/WING GEOMETRY VARIABLES	SHATTN	48
C	REFRAC - NOISE COMPONENT REFRACTION VARIABLES	SHATTN	49
C		SHATTN	50
C	OUTPUT	SHATTN	51
C	DLTSPL - ARRAY OF SHIELDING DELTA-SPL VERSUS BCF AND PSI, 24 BY 17	SHATTN	52
C		SHATTN	53
C	DIMENSION BCF(1),PSIX(1),USPL(MAXPSI,1),APY(1),APZ(1),PSI(1),	SHATTN	54
1	DLTSPL(24,1)	SHATTN	55
1	COMMON/EWGEO/ SWPTE,SWPLE,DIHED,CCSD,DCX1C,DCX2D,DCXOD,DDY1D,	SHATTN	56
1	DDY2D,DDYOD,DDLD,DIANI,IES	SHATTN	57
1	COMMON/REFRAC/EMJ,TSTSC,IWED(3),FASS(24),BETA(24),CPSIC(24),NASRO,	SHATTN	58

* ASF, IWSFE	SHATTN	59
C	SHATTN	60
DIMENSION U(3), V(3), E1(3), E2(3), E3(3), RGV(3), ZECN(17), PN(3), W(3)	SHATTN	61
* , AF(3), BV(3)	SHATTN	62
C	SHATTN	63
C TEST TO SEE IF FLIGHT EFFECTS FOR WING SHIELDING ARE NOT TO BE USED.	SHATTN	64
AMACH = TMACH	SHATTN	65
IF (IWSFE .NE. C) AMACH = C.	SHATTN	66
C	SHATTN	67
C INITIALIZE DLTSPL TO ZERO FOR ACCUMULATION OF PS2	SHATTN	68
C	SHATTN	69
DO 90 IP=1,17	SHATTN	70
DO 90 IF=1,24	SHATTN	71
DLTSPL(IF,IP) = C.	SHATTN	72
90 CONTINUE	SHATTN	73
C	SHATTN	74
C LOOP ON THE EDGES THAT ARE TURNED ON	SHATTN	75
C	SHATTN	76
DO 1000 IEDGE=1,3	SHATTN	77
IF(IWED(IEEDGE).EQ.0) GO TO 1000	SHATTN	78
C	SHATTN	79
C COMPUTE THE ENGINE/EDGE GEOMETRY	SHATTN	80
C	SHATTN	81
CALL EEDGEOM(IEDGE, ITYPE,	SHATTN	82
1 U, V, W, E1, E2, E3, RC, TH, RGV, BV, DLT, ALP, ALPO, AF)	SHATTN	83
C	SHATTN	84
C LOOP ON DISTX, ALWAYS EXECUTE THE LOOP CASE AND WHEN DISTX IS	SHATTN	85
C NOT ZERO, SET NEGATIVE AND RE-EXECUTE	SHATTN	86
C	SHATTN	87
X = DISTX	SHATTN	88
DO 900 IX=1,2	SHATTN	89
IF(IX.EQ.1) GO TO 210	SHATTN	90
IF(X.EQ.0.)GO TO 900	SHATTN	91
IF(IES.NE.0)GO TO 900	SHATTN	92
X = -X	SHATTN	93
210 CONTINUE	SHATTN	94
C	SHATTN	95
C LOOP ON THE FLIGHT PATH POSITION	SHATTN	96
C	SHATTN	97
DO 800 IPSI=1,NPSI	SHATTN	98
C	SHATTN	99
C CORRECT AIRCRAFT HEIGHT FOR OBSERVER HEIGHT	SHATTN	100
C	SHATTN	101
ZEDN(IPSI) = APZ(IPSI) - ALTR	SHATTN	102
C	SHATTN	103
C COMPUTE EDGE/OBSERVER GEOMETRY	SHATTN	104
C	SHATTN	105
CALL EEDGEOM(X , APY(IPSI), ZEDN(IPSI), DELT3, U, V, W, TH, DLT, ALP,	SHATTN	106
1 ETA, TH, PSIC, PN)	SHATTN	107
C	SHATTN	108
C TEST FOR INLET FAN (NO REFRACTION)	SHATTN	109
C	SHATTN	110
IF(ITYPE.NE.4)GO TO 300	SHATTN	111
RGP=RO	SHATTN	112
THOP=THO	SHATTN	113
GO TO 400	SHATTN	114
C	SHATTN	115

C	COMPUTE JET FLOW REFRACTION EFFECTS	SHATTN	116
C		SHATTN	117
	300 CALL REFRACT(AMACH,PSIO,ETA,DLT,RO,RCV,BV,U,V,W,E1,E2,E3,THO,	SHATTN	118
	1 ROP,THOP)	SHATTN	119
C		SHATTN	120
C	COMPUTE UNIFORM FLOW EFFECTS	SHATTN	121
C		SHATTN	122
	400 CALL UNIFLW(AF,U,V,W,AMACH,RCP,THCP,TH,ETA,PSI(IPS1),ALP,DLT,	SHATTN	123
	1 GAM,ROPP,THOPP,THP,ETAP,TLE,PSIO,PSIOP)	SHATTN	124
C		SHATTN	125
C	SET FILTER BANDWIDTH AND LOCF CN FREQUENCY	SHATTN	126
C		SHATTN	127
	BW = .1	SHATTN	128
	IF(1SPTRM.EQ.1)BW=.3	SHATTN	129
	DO 700 IF =1,NCF	SHATTN	130
C		SHATTN	131
C	COMPUTE EDGE DIFFRACTION	SHATTN	132
C		SHATTN	133
	CALL EDGED1(NPSIX,PSIX,BCF(IF), USPL(1,IF),CZ,THP,	SHATTN	134
	1 GAM,ROPP,THOPP,ETAP,PSIO,PSIOP,BW,TLE,	SHATTN	135
	2 PS2)	SHATTN	136
C		SHATTN	137
C	SUPERPOSITION OF EDGE SOLUTIONS AND X LOCF ALSO	SHATTN	138
C		SHATTN	139
	DLTSPL(IF,IPS1) = DLTSPL(IF,IPS1) + PS2	SHATTN	140
C		SHATTN	141
C	END ALL FOUR LOOPS	SHATTN	142
C		SHATTN	143
	700 CONTINUE	SHATTN	144
	800 CCNTINUE	SHATTN	145
	900 CCNTINUE	SHATTN	146
	1000 CONTINUE	SHATTN	147
C		SHATTN	148
C	COMPUTE TOTAL SOUND PRESSURE LEVEL AND THE ATTENUATION DUE TO	SHATTN	149
C	WING SHIELDING FOR EACH FREQUENCY AND FLIGHT PATH POSITION	SHATTN	150
C		SHATTN	151
	CALL SDSPLP(DISTX,NPSIX,PSIX,MAXPSI,NCF,USPL,NPSI,PSI,	SHATTN	152
	1 DLTSPL)	SHATTN	153
C		SHATTN	154
	RETURN	SHATTN	155
	END	SHATTN	156

C	SUBROUTINE SHELL(X,K,N)		SHELL	2
C	S01204 SHELL PS-481	STD SUB DEV GRP 670511 6600	SHELL	3
C			SHELL	4
C	AUTHOR	R.H.HAVIG	SHELL	5
C			SHELL	6
C	FORTAN IV SUBROUTINE SHELL ORDERS ARRAY X IN ASCENDING MANNER		SHELL	7
C	X IS THE ARRAY TO BE ORDERED		SHELL	8
C	N IS THE LENGTH OF X		SHELL	9
C	K WILL BE AN INDEX ARRAY FOR ORDERING DEPENDENT ARRAYS		SHELL	10
C****	TYPE X AND TEMP AS INTEGER IF X IS INTEGER ARRAY		SHELL	11
	DIMENSION X(1),K(1)		SHELL	12
	INTEGER K		SHELL	13
C	IBM SYS360 + 37C		SHELL	14
C	REAL*8 X, TEMP		SHELL	15
	IF(N.LE.0)RETURN		SHELL	16
C	ASSIGN INTEGERS 1 THRU N INTO ARRAY K		SHELL	17
	DO 1000 J=1,N		SHELL	18
	1000 K(J)=J		SHELL	19
	M=N		SHELL	20
	1010 M=M/2		SHELL	21
	IF (M) 1070,1070,1020		SHELL	22
	1020 NM=N-M		SHELL	23
	DO 1060 J=1,NM		SHELL	24
	1030 I=J		SHELL	25
	1040 L=I+M		SHELL	26
	IF (X(I)-X(L)) 1060,1060,1050		SHELL	27
C	EXCHANGE X(I) WITH X(L)		SHELL	28
	1050 TEMP=X(I)		SHELL	29
	X(I)=X(L)		SHELL	30
	X(L)=TEMP		SHELL	31
C	EXCHANGE K(I) WITH K(L)		SHELL	32
	NTEMP=K(I)		SHELL	33
	K(I)=K(L)		SHELL	34
	K(L)=NTEMP		SHELL	35
	I=I-M		SHELL	36
	IF (I-1) 1060,1040,1040		SHELL	37
	1060 CONTINUE		SHELL	38
	GO TO 1010		SHELL	39
	1070 CONTINUE		SHELL	40
C	WRITE (6,100)(K(I),I=1,N)		SHELL	41
	9000 FORMAT(5(3X,15))		SHELL	42
	RETURN		SHELL	43
	END		SHELL	44

SUBROUTINE SHELXH(Y,K,DUM,N)	SHELXH	2
C AUTHOR R.H. HAVIG	SHELXH	3
C PURPOSE TO ORDER ARRAY Y ACCORDING TO THE INDEX OF THE K ARRAY	SHELXH	4
C THIS SUBROUTINE IS A MODIFIED VERSION OF THE SHELX VERSION 1	SHELXH	5
C PS-481 THE WORKING ARRAY DUM IS PASSED THROUGH THE CALLING	SHELXH	6
C SEQUENCE	SHELXH	7
C	SHELXH	8
C INPUTS Y = THE ARRAY TO BE ORDERED	SHELXH	9
C K = INDEX ARRAY USED TO ORDER Y ARRAY	SHELXH	10
C DUM = WORKING ARRAY WITH LENGTH EQUAL TO Y ARRAY	SHELXH	11
C N = LENGTH OF ARRAY Y,K,DUM	SHELXH	12
C Y = ORDERED ARRAY	SHELXH	13
DIMENSION Y(1),K(1),DUM(1)	SHELXH	14
INTEGER K	SHELXH	15
DO 1000 J=1,N	SHELXH	16
L=K(J)	SHELXH	17
1000 DUM(J)=Y(L)	SHELXH	18
DO 1010 J=1,N	SHELXH	19
1010 Y(J)=DUM(J)	SHELXH	20
RETURN	SHELXH	21
END	SHELXH	22

	SUBROUTINE SHLDSP (AMACH,ALTR,ISPTRM,CZ,SLDIST,IOBS,APY,APZ,DOPSF,	SHLDSP	2
	* SPLT,NCF,BCF,SFZ,PSI,ITYPE,DELT3,ISW3)	SHLDSP	3
C	PURPOSE TO ADD TO THE SPL EVALUATED FOR EACH OF THE	SHLDSP	4
C	NOISE COMPONENTS AFT ,CORE,INLET,AND TURBINE	SHLDSP	5
C	THE ATTENUATION DUE TO WING SHIELDING (ECW ONLY)	SHLDSP	6
C	THE SHIELDING ATTENUATION SPECTRUM IS DETERMINED	SHLDSP	7
C	BY A CALL TO SUBROUTINE SHATTN.	SHLDSP	8
C	THE ATTENUATION IS DOPPLER SHIFTED,AND SUMMED	SHLDSP	9
C	WITH THE CONFIGURATION CORRECTION TO GIVE THE	SHLDSP	10
C	TOTAL CORRECTION WHICH IS THEN APPLIED TO THE	SHLDSP	11
C	BARE ENGINE SPL	SHLDSP	12
C		SHLDSP	13
C	INPUT APPLICABLE TO SHLDSP	SHLDSP	14
C		SHLDSP	15
C	DOPSF ARRAY OF DOPPLER SHIFT FACTORS	SHLDSP	16
C	ISPTRM =0 FOR 24 PREFERRED 1/3 OCTAVE BANDS	SHLDSP	17
C	=1 FOR 8 PREFERRED 1/1 OCTAVE BANDS	SHLDSP	18
C	ITYPE NOISE COMPONENT INDICATOR	SHLDSP	19
C	=4 INLET FAN	SHLDSP	20
C	=5 AFT FAN	SHLDSP	21
C	=3 CORE OR TURBINE	SHLDSP	22
C	ISW3 INDICATES WHETHER CORE OR TURBINE	SHLDSP	23
C	=2 CORE NOISE ONLY	SHLDSP	24
C	=3 TURBINE NOISE ONLY	SHLDSP	25
C	NCF NO. OF FREQUENCY BANDS 8 OR 24	SHLDSP	26
C	IOBS THE ITH OBSERVER REFERENCE	SHLDSP	27
C	SPLT A MATRIX OF UNSHIELDED SPL SPECTRA AT	SHLDSP	28
C	FLIGHT INDEX CONDITION	SHLDSP	29
C	SPZ CONFIGURATION CORRECTIONS AT FLIGHT CONDITIONS	SHLDSP	30
C		SHLDSP	31
C	INPUT APPLICABLE TO WING SHIELDING ATTENUATION	SHLDSP	32
C		SHLDSP	33
C	AMACH AIRCRAFT MACH NO	SHLDSP	34
C	CZ AMBIENT SPEED OF SOUND AT A/C ALTITUDE ZC	SHLDSP	35
C	DELT3 ENGINE ATTITUDE ANGLE RE TO HORIZON	SHLDSP	36
C	SLDIST SIDE LINE DIST. REL. TO THE OBSERVER	SHLDSP	37
C	APY A/C COORDINATES RELATIVE	SHLDSP	38
C	APZ TO EACH OBSERVER POSITION	SHLDSP	39
C	ALTR OBSERVER HEIGHT ABOVE GROUND	SHLDSP	40
C	NPSI NO OF DIRECTIVITY ANGLES	SHLDSP	41
C	PSI DIRECTIVITY ANGLES RE TO ENGINE INLET C.L.	SHLDSP	42
C	BCF 1/3 OR 1/1 OCTAVE BAND GEOMETRIC MEAN FREQUENCIES	SHLDSP	43
C		SHLDSP	44
C	INPUT FROM LABELED COMMON UNSHLD	SHLDSP	45
C		SHLDSP	46
C	USPLA EMPIRICAL DIRECTIVITY CURVE OF UNSHIELDED SPL	SHLDSP	47
C	FSI AT STATIC CONDITIONS (BUILT-IN VALUES)	SHLDSP	48
C	NUSPL NUMBER OF POINTS IN THE EMPIRICAL CURVE	SHLDSP	49
C	INUSP INDICATOR TO DECIDE THE DIRECTIVITY CURVE TO USE	SHLDSP	50
C	THAT IS IF	SHLDSP	51
C	INLSP=C USE PREDICTED VALUES	SHLDSP	52
C	INLSP=1 USE BUILT-IN VALUES	SHLDSP	53
C	INLSP.GT.1 USE INPUT VALUES	SHLDSP	54
C		SHLDSP	55
C	OUTPUT	SHLDSP	56
C		SHLDSP	57
C	SPZ CONFIGURATION CORRECTIONS AND SHIELDING ATTENUATION	SHLDSP	58

C	SPLT	A MATRIX OF SHIELDED SPECTRA	SHLDSP	59
C	NGTE		SHLDSP	60
C	USPL	A MATRIX OF UNSHIELDED SPECTRA WITH DOPPLER	SHLDSP	61
C		EFFECTS REMOVED GENERALLY PREDICTED BUT	SHLDSP	62
C		COULD BE INPUT OR MADE UP OF BUILT-IN VALUES	SHLDSP	63
C			SHLDSP	64
C			SHLDSP	65
C	UNSHIELDED DIRECTIVITY CURVE DATA		SHLDSP	66
C			SHLDSP	67
C	COMMON/UNSHLD/USPLA(19),FSI(19),ALSP,INLSP		SHLDSP	68
C	DIMENSION DUM(19),YCO(17),ZCO(17),PSIX(19),USPL(19,24),KIN(19),		SHLDSP	69
C	*DLTSPL(24,17),APY(10,17),APZ(10,17),SPLT(24,17),SPZ(24,17),FJ(24),		SHLDSP	70
C	*SLDIST(10),DOPSF(17),BCF(24),PSI(17,17)		SHLDSP	71
C			SHLDSP	72
C	DATA NPSI,MAXPSI/17,19/		SHLDSP	73
C	DATA FJ/1.,2.,3.,4.,5.,6.,7.,8.,9.,10.,11.,12.,13.,		SHLDSP	74
C	*14.,15.,16.,17.,18.,19.,20.,21.,22.,23.,24./		SHLDSP	75
C			SHLDSP	76
C	ZERO OUT MATRIX AND SET VARIABLES		SHLDSP	77
C			SHLDSP	78
C	CALL ZERO(LSPL,408)		SHLDSP	79
C	EN=4.		SHLDSP	80
C	IF(ITYPE.EQ.3.AND.ISW3.EQ.2)EN=2.		SHLDSP	81
C			SHLDSP	82
C	BANDWIDTH IN 1/3 OCTAVES		SHLDSP	83
C			SHLDSP	84
C	Bw=1.		SHLDSP	85
C	IF(ISPTRM.NE.C)Bw=3.		SHLDSP	86
C	DISTX=SLDIST(IOBS)		SHLDSP	87
C			SHLDSP	88
C	STORE COORDINATES FOR EACH OBSERVER TO TRANSFER TO SHATTN		SHLDSP	89
C	DO 50 K=1,NPSI		SHLDSP	90
C	YCO(K)=APY(IOBS,K)		SHLDSP	91
C	50 ZCO(K)=APZ(IOBS,K)		SHLDSP	92
C			SHLDSP	93
C	TEST FOR WHICH DIRECTIVITY CURVE TO USE		SHLDSP	94
C			SHLDSP	95
C	IF(INLSP.NE.C)GO TO 450		SHLDSP	96
C			SHLDSP	97
C	USE PREDICTED VALUES REMOVING DOPPLER EFFECT		SHLDSP	98
C			SHLDSP	99
C	NPSIX=NPSI		SHLDSP	100
C	DO 100 K=1,NPSIX		SHLDSP	101
C	DELTA=10.*ALOG10(DOPSF(K))		SHLDSP	102
C	DELTA8=DELTA/Bw		SHLDSP	103
C	PSIX(K)=PSI(K,IOBS)		SHLDSP	104
C	DO 100 J=1,NCF		SHLDSP	105
C	FJD8= FJ(J) -DELTA8		SHLDSP	106
C	SPLJ=TBUL1(FJD8,FJ,SPLT(1,K),1,NCF)		SHLDSP	107
C	USPL(K,J)=SPLJ+EN*DELTA		SHLDSP	108
C	100 CONTINUE		SHLDSP	109
C			SHLDSP	110
C	SORT THE DIRECTIVITY ANGLE IN PRACTICALLY ASCENDING		SHLDSP	111
C	ORDER AND CORRESPONDINGLY ADJUST THE PREDICTED UNSHIELDED SPL		SHLDSP	112
C			SHLDSP	113
C	CALL SHELL(PSIX,KIN,NPSIX)		SHLDSP	114
C	DO 200 J=1,NCF		SHLDSP	115

CALL SHELXHLUSPL(1,J), KIN, DCM, NPSIX)	SHLDSP	116
200 CCNTINUE	SHLDSP	117
C	SHLDSP	118
C ADJUST FOR EQUAL DIRECTIVITY ANGLES	SHLDSP	119
C	SHLDSP	120
MPSI=NPSIX-1	SHLDSP	121
DC 300 ISI=2,MPSI	SHLDSP	122
IF(PSIX(ISI-1).NE.PSIX(ISI))GC TC 300	SHLDSP	123
PSIX(ISI)=PSIX(ISI)+1.E-3*(PSIX(ISI+1)-PSIX(ISI))	SHLDSP	124
300 CCNTINUE	SHLDSP	125
IF(PSIX(MPSI).NE.PSIX(NPSI))GC TC 650	SHLDSP	126
PSIX(MPSI)=PSIX(MPSI)-1.E-3*(PSIX(MPSI)-PSIX(MPSI-1))	SHLDSP	127
GC TO 650	SHLDSP	128
C	SHLDSP	129
C BUILD MATRIX WITH EITHER BUILT-IN VALUES OR INPUT VALUES	SHLDSP	130
C	SHLDSP	131
450 NPSIX=NLSPL	SHLDSP	132
DC 500 K=1,NPSIX	SHLDSP	133
500 PSIX(K)=FSI(K)	SHLDSP	134
DC 600 J=1,NCF	SHLDSP	135
DC 600 K=1,NPSIX	SHLDSP	136
600 USPL(K,J)=USPLA(K)	SHLDSP	137
C	SHLDSP	138
C CALC.BARE ENGINE SPL USING PREDICTED SPL	SHLDSP	139
C	SHLDSP	140
650 DC 700 K=1,NPSI	SHLDSP	141
DC 700 J=1,NCF	SHLDSP	142
700 SPLT(J,K)=SPLT(J,K)+SPZ(J,K)	SHLDSP	143
C	SHLDSP	144
C ENTER PACKAGE TO CALCULATE ATTENUATION	SHLDSP	145
C DUE TO WING SHIELDING DLTSPL(MAX 24,17). THIS MATRIX	SHLDSP	146
C INCLUDES FOR EACH OBSERVER POSITION GREATER THAN 0. THE SUMMED	SHLDSP	147
C EFFECTS OF BOTH STARBOARD AND PORT NOISE SOURCE COMPONENT OVER	SHLDSP	148
C THE DESIRED WING EDGES	SHLDSP	149
C	SHLDSP	150
CALL SHATTN(AMACH,CZ,NCF,BCF,NPSIX,PSIX,MAXPSI,USPL,	SHLDSP	151
*[SPTRM,DISTX,YCG,ZCG,ALTR,NPSI,PSI,DELT3,ITYPE,DLTSPL)	SHLDSP	152
C	SHLDSP	153
C DOPPLER SHIFT THE SHIELDING ATTENUATION,AND ADD TO	SHLDSP	154
C CONFIGURATION CORRECTION. THE TOTAL ATTENUATION	SHLDSP	155
C IS THEN ADDED TO THE BARE ENGINE SPL TO GIVE THE	SHLDSP	156
C THE SHIELDED SPL	SHLDSP	157
C	SHLDSP	158
DO 1000 K=1,NPSI	SHLDSP	159
DELTAL=10.*ALOGIC(DOPSF(K))	SHLDSP	160
DELTAB=DELTAL/BW	SHLDSP	161
DC 1000 J=1,NCF	SHLDSP	162
FJDB= FJ(J) +DELTAB	SHLDSP	163
DSPLJ=TBLL1(FJDB,FJ,DLTSPL(1,K),1,NCF)	SHLDSP	164
SPZ(J,K)=DSPLJ+SPZ(J,K)	SHLDSP	165
SPLT(J,K)=SPLT(J,K)-SPZ(J,K)	SHLDSP	166
1000 CCNTINUE	SHLDSP	167
RETURN	SHLDSP	168
END	SHLDSP	169

SUBROUTINE SIDPLT(VN,DIST,AP,NOIST,TITLE,ASD,NDIM)			SIDPLT	2
C			SIDPLT	3
C			SIDPLT	4
C	AUTHOR	K.D. JOHNSON	SIDPLT	5
C	PURPOSE	TO GENERATE PLOT OF 500 FCCT SIDELINE NOISE LEVEL	SIDPLT	6
C		VS. DISTANCE ALONG RUNWAY	SIDPLT	7
C			SIDPLT	8
C	METHOD	SCALE TO UNITS/CM, DRAW AXIS AND PLOT CURVE OF	SIDPLT	9
C		CONNECTING POINTS	SIDPLT	10
C			SIDPLT	11
C	INPUTS	VN ARRAY OF NOISE LEVEL VALUES	SIDPLT	12
C		DIST ARRAY OF CORRESPONDING DISTANCE VALUES	SIDPLT	13
C		NP NUMBER OF POINTS TO BE PLOTTED	SIDPLT	14
C			SIDPLT	15
C	INPUTS VIA COMMON		SIDPLT	16
C		SCALV LSEK SELECTED SCALE, USED IF AGN-ZERO	SIDPLT	17
C		YLENM MAXIMUM LENGTH OF Y AXIS (GRAPH) (CM)	SIDPLT	18
C		XLENM MAXIMUM LENGTH OF Y AXIS (GRAPH) (CM)	SIDPLT	19
C		AXUNIT UNITS FOR DISTANCE	SIDPLT	20
C		NLABEL UNITS FOR NOISE LEVEL	SIDPLT	21
C			SIDPLT	22
C	DIMENSION FOR INPUT ARRAYS		SIDPLT	23
C			SIDPLT	24
C	LOGICAL IWRITE		SIDPLT	25
C	360		SIDPLT	26
C		DIMENSION VN(NDIM,3),DIST(NDIM),NOIST(3),TITLE(18)	SIDPLT	27
C		DIMENSION VN(NDIM,3),DIST(NDIM),NOIST(3),TITLE(8)	SIDPLT	28
C			SIDPLT	29
C	360		SIDPLT	30
C		COMMON /PLT/ SCALV,YLENM,XLENM,CMPIN,SPACE(20),NXUNIT,NLABEL(2)	SIDPLT	31
C			SIDPLT	32
C		COMMON /PLT/ SCALV,YLENM,XLENM,CMPIN,SPACE(8),NXUNIT,NLABEL	SIDPLT	33
C		1,SCALV,IWRITE	SIDPLT	34
C			SIDPLT	35
C	360		SIDPLT	36
C		DIMENSION LABELX(11), LABELY(9)	SIDPLT	37
C		DIMENSION LABELX(5),LABELY(4)	SIDPLT	38
C			SIDPLT	39
C	360		SIDPLT	40
C		DATA LABELX/44HNOISE LEVEL AT XXXXAAAA SIDELINE --AAAAAAA/	SIDPLT	41
C		DATA LABELX/50HNOISE LEVEL AT XXXX AAAA SIDELINE - AAAAAAA	SIDPLT	42
C		* /	SIDPLT	43
C		DATA LABELY /36HDISTANCE ALONG FLIGHT TRACK - /	SIDPLT	44
C		DATA LABELY /40HDISTANCE ALONG FLIGHT TRACK - /	SIDPLT	45
C		DATA BLANK/1H /	SIDPLT	46
C			SIDPLT	47
C	DEFINE BORDERS IN CENTIMETERS		SIDPLT	48
C		SIDE=2.	SIDPLT	49
C		TOP=2.	SIDPLT	50
C		BOTTM=3.	SIDPLT	51
C			SIDPLT	52
C	SET POINT SYMBOL		SIDPLT	53
C			SIDPLT	54
C		ISYM=2	SIDPLT	55
C			SIDPLT	56
C	FIND APPROPRIATE NOISE LEVEL SCALE AND LENGTH OF AXIS		SIDPLT	57
C			SIDPLT	58

IF(IWRITE) GO TO 10	SIDPLT	59
C 360	SIDPLT	60
C WRITE(6,1000) (NLABEL(I),I=1,2),NXUNIT,(NDIST(I),NXUNIT,I=1,NSD)	SIDPLT	61
WRITE(6,1000) NLABEL ,NXUNIT,(NDIST(I),NXUNIT,I=1,NSD)	SIDPLT	62
1000 FORMAT(1H1,54X,21HSIDELINE NCISE LEVELS,///31X,21HFLIGHT TRACK DIS	SIDPLT	63
*TANCE,21X,13HNOISE LEVEL (,A8,1H),/40X,A4,20X,3(A4,1X,A4,6X)///)	SIDPLT	64
DC 5 I=1,NP	SIDPLT	65
WRITE(6,1001) DIST(I),(VN(I,J),J=1,NSD)	SIDPLT	66
1001 FORMAT(30X,1PE15.3,9X,0PF15.1,2F15.1)	SIDPLT	67
5 CONTINUE	SIDPLT	68
10 XLEN=FLOAT(INT(XLENM-TCP-BCTTM))	SIDPLT	69
C	SIDPLT	70
C FIND LENGTH OF YAXIS, Y SCALE SAME AS CONTOUR PLOT	SIDPLT	71
C	SIDPLT	72
YLEN=FLOAT(INT(YLENM-2.*SIDE))	SIDPLT	73
CALL SCALE(DIST,YLEN,NP,1)	SIDPLT	74
DELTAY=DIST(NP+2)	SIDPLT	75
YMIN=DIST(NP+1)	SIDPLT	76
DELTAY=SCALU	SIDPLT	77
IF (YMIN .EQ. C.) GO TO 15	SIDPLT	78
YMIN = DELTAY * FLOAT(IFIX((YMIN - DELTAY) / DELTAY))	SIDPLT	79
15 CONTINUE	SIDPLT	80
DO 20C KK=1,NSD	SIDPLT	81
CALL SCALE(VN(1,KK),XLEN,NP,1)	SIDPLT	82
DELTAX=VN(NP+2,KK)	SIDPLT	83
XMIN=VN(NP+1,KK)	SIDPLT	84
XMIN=FLOAT(IFIX((XMIN-DELTAX)/DELTAX))*DELTAX	SIDPLT	85
C	SIDPLT	86
C POSITION PLOTTER ON PAGE	SIDPLT	87
C	SIDPLT	88
CALL PLOT(0.,-10.,-3)	SIDPLT	89
YP=1./CMPIN	SIDPLT	90
CALL PLOT(0.,YP,-3)	SIDPLT	91
XP=SIDE/CMPIN	SIDPLT	92
YP=BOTTM/CMPIN	SIDPLT	93
CALL PLOT(XP,YP,-3)	SIDPLT	94
C	SIDPLT	95
C DRAW Y AXIS	SIDPLT	96
NC = 36	SIDPLT	97
C LABELY(9) = NXUNIT	SIDPLT	98
CALL STRMOV(NXUNIT,1,4,LABELY,31)	SIDPLT	99
CALL CMAXIS(0.,0.,LABELY,NC,YLEN,0.0,YMIN,DELTAY)	SIDPLT	100
C	SIDPLT	101
C DRAW X AXIS	SIDPLT	102
NC=44	SIDPLT	103
C 360	SIDPLT	104
C LABELX(5)=NDIST(KK)	SIDPLT	105
C LABELX(6)=NXUNIT	SIDPLT	106
C DO 25 I=1,2	SIDPLT	107
C25 LABELX(9+I)=NLABEL(I)	SIDPLT	108
C	SIDPLT	109
CALL STRMOV(NXUNIT,1,4,LABELX,21)	SIDPLT	110
CALL STRMOV(NDIST(KK),1,4,LABELX,16)	SIDPLT	111
CALL STRMOV(NLABEL,1,8,LABELX,37)	SIDPLT	112
CALL CMAXIS(0.,0.,LABELX,NC,XLEN,0.0,XMIN,DELTAX)	SIDPLT	113
C	SIDPLT	114
C PLOT POINTS	SIDPLT	115

DELTA Δ =DELTA Δ *CMPIN	SIDPLT	116
DELCH=DELTA Δ *CMPIN	SIDPLT	117
DISTM=,YLEN*DELTA Δ +YMIN	SIDPLT	118
C	SIDPLT	119
C GOTO FIRST POINT WITH PEN UP	SIDPLT	120
C	SIDPLT	121
XP=(DIST(I)-YMIN)/DELCH	SIDPLT	122
YP=(VN(I,KK)-XMIN)/DELTA Δ	SIDPLT	123
CALL PLOT(XP,YP,3)	SIDPLT	124
C	SIDPLT	125
C PLOT CURVE AS SERIES OF CONNECTED SYMBOLS	SIDPLT	126
C	SIDPLT	127
DO 100 I=1,NP	SIDPLT	128
XP= DIST(I)	SIDPLT	129
IF(XP.GT.DISTM)GO TO 105	SIDPLT	130
XP=(XP-YMIN)/DELCH	SIDPLT	131
YP=(VN(I,KK)-XMIN)/DELTA Δ	SIDPLT	132
CALL SYMBOL(XP,YP,.06,ISYM,0.C,-2)	SIDPLT	133
100 CONTINUE	SIDPLT	134
C	SIDPLT	135
C DRAW TITLE AT TOP OF PAGE	SIDPLT	136
C	SIDPLT	137
105 XP=(XLEN+1.)/CMPIN	SIDPLT	138
C I=18	SIDPLT	139
I=8	SIDPLT	140
125 IF(TITLE(I).NE.BLANK) GO TO 130	SIDPLT	141
I=I-1	SIDPLT	142
IF(I.LT.0) GO TO 125	SIDPLT	143
130 IF(I.EQ.0) GO TO 135	SIDPLT	144
C I=I*4	SIDPLT	145
I=I*10	SIDPLT	146
YP = .5 * (YLEN / CMPIN - .16 * FLCAT(I))	SIDPLT	147
CALL SYMBOL(YP,XP,.16,TITLE,C.C,I)	SIDPLT	
135 CONTINUE	SIDPLT	149
C	SIDPLT	150
C MOVE TO NEW PAGE	SIDPLT	151
C	SIDPLT	152
XP=(YLEN+SIDE)/CMPIN+ 2.	SIDPLT	153
YP=-BOTTM/CMPIN	SIDPLT	154
CALL PLOT(XP,YP,-3)	SIDPLT	155
270 CONTINUE	SIDPLT	156
C	SIDPLT	157
RETURN	SIDPLT	158
END	SIDPLT	159

SUBROUTINE SORRTR(A,B,C,L,DEPNDT,CLM,K,ARG)	SORRTR	2
DIMENSION A(1),B(1),C(1),DEPNDT(1),K(1),CLM(1),ARG(1)	SORRTR	3
INTEGER K	SORRTR	4
C	SORRTR	5
C IBM SYS360 + 37C	SORRTR	6
C REAL*8 ARG, DT1, DT2, DT3	SORRTR	7
C EQUIVALENCE (T1,DT1), (T2,DT2), (T3,DT3)	SORRTR	8
C	SORRTR	9
C DETERMINE SCALE FACTORS FOR SINGLE PASS, THREE VARIABLE SORT USING	SORRTR	10
C FOUR SIGNIFICANT DIGITS	SORRTR	11
DT1 = 0.	SORRTR	12
DT2 = 0.	SORRTR	13
DT3 = 0.	SORRTR	14
FL = L	SORRTR	15
DO 10 I = 1,L	SORRTR	16
T1 = T1 + ABS(A(I))	SORRTR	17
T2 = T2 + ABS(B(I))	SORRTR	18
T3 = T3 + ABS(C(I))	SORRTR	19
10 CONTINUE	SORRTR	20
T1 = 10.** (INT(5.0 - ALOG10(T1/FL)))	SORRTR	21
T2 = 10.** (INT(-ALOG10(T2/FL)))	SORRTR	22
T3 = 10.** (INT(-5.0 - ALOG10(T3/FL)))	SORRTR	23
C	SORRTR	24
C DEFINE NEW INDEPENDENT VARIABLE, ARG, CONTAINING SCALED VALUES OF	SORRTR	25
C VARIABLES A, B, C.	SORRTR	26
DO 20 I = 1,L	SORRTR	27
ARG(I) = A(I)*DT1 + B(I)*DT2 + C(I)*DT3	SORRTR	28
20 CONTINUE	SORRTR	29
CALL SHELL(ARG,K,L)	SORRTR	30
CALL SPELXH(DEPNDT,K,CLM,L)	SORRTR	31
CALL SPELXH(A,K,DUM,L)	SORRTR	32
CALL SPELXH(B,K,DUM,L)	SORRTR	33
CALL SPELXH(C,K,CLM,L)	SORRTR	34
RETURN	SORRTR	35
END	SORRTR	36

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SUBROUTINE SN(X,Y,I1,I2,N)
DIMENSION X(1),Y(1)
NM1 = N - 1
DO 100 I=I1,I2
IF (NM1) 25, 25, 50
25 X(I)=Y(I)
GO TO 100
50 Y(I)=X(I)
100 CONTINUE
RETURN
END

```

SN	2
SN	3
SN	4
SN	5
SN	6
SN	7
SN	8
SN	9
SN	10
SN	11
SN	12

```

C      SUBROUTINE SORTX(X,Y,N)
C
C      AUTHOR  D.G.DUNN
C
C      THIS ROUTINE SORTS POINTS (X,Y) WITH RESPECT TO
C      INDEPENDENT VARIABLE (X).  AFTER SORTING THE
C      (X) ARRAY WILL BE MONOTONIC AND INCREASE IN ORDERING
C      VALUE.
C
C      DIMENSION X(1),Y(1)
C      KK=N-1
C      DO 2 K=1,KK
C      KL=K+1
C      DO 2 J=KL,N
C      IF(X(J)-X(K))1,2,2
1      T=X(J)
C      X(J)=X(K)
C      X(K)=T
C      T=Y(J)
C      Y(J)=Y(K)
C      Y(K)=T
2      CONTINUE
C      RETURN
C      END

```

```

SORTX      2
SORTX      3
SORTX      4
SORTX      5
SORTX      6
SORTX      7
SORTX      8
SORTX      9
SORTX     10
SORTX     11
SORTX     12
SORTX     13
SORTX     14
SORTX     15
SORTX     16
SORTX     17
SORTX     18
SORTX     19
SORTX     20
SORTX     21
SORTX     22
SORTX     23
SORTX     24
SORTX     25

```

SUBROUTINE SPECAN

PURPOSE EMPIRICAL PREDICTION OF THE SOUND PRESSURE LEVEL
FOR AN AUGMENTED SLCT NOZZLE WITH JET FLAP

SUBROUTINE SPECAN DETERMINES THE VARIABLES TO CALCULATE
THE CHARACTERISTIC FREQUENCY AND THEN DEVELOPS ARRAYS OF
SPL SPECTRA FOR EACH FLIGHT PATH OBSERVER COMBINATION.
THE INPUT DATA TO THE SUBROUTINE IS PROVIDED THROUGH
LABELLED COMMON STATEMENTS, AND DATA STATEMENTS

INPUT MO AIRCRAFT MACH NO
TSO STATIC TEMP. AT ALTITUDE ZO
GRAD CLIMB GRADIENT (TAN(THETA))
P PROPAGATION PATH DISTANCE (SOURCE TO OBSERVER)
X,Y,Z AIRCRAFT COORDINATES RELATIVE TO OBSERVER
GAMA RATIO OF SPECIFIC HEATS FOR EXHAUST
TT TOTAL TEMPERATURE AT NOZZLE EXIT
NPR NOZZLE PRESSURE RATIO
DELT FLAP ANGLE RELATIVE TO HORIZON
AD NOZZLE DISCHARGE AREA
DE EFFECTIVE DIAMETER - HYDRAULIC DIAMETER
FRQ ARRAY OF GEOMETRIC MEAN FREQUENCIES
FOR THE SOUND PRESSURE LEVEL SPECTRUM
NFB NO. OF FREQUENCY BANDS
NOBS NO. OF SIDELINE OBSERVER POSITIONS

OUTPUT SPL COLS. OF SOUND PRESSURE LEVEL SPECTRA
FOR EACH POINT ON THE FLIGHT PATH SEGMENT
FORMING AN ARRAY FOR EACH OBSERVER POSITION

COMMON/AUGWNG/GAMA,TT,NPR,DELT,AD,DE,
* ICOR6,LIN6,NTF6,IMA6,LGM6,NKL6,ICP6,ILAY6,TF6(10),
* PCTA6(10),PLA6(10),ELCH6,ECH6,RIK6(10),TL6(10),CF6,FM6
COMMON/GCOMMON/NCF,NK,FRQ(24),TSPL(24,10,17),SPLT(24,17),
1 BUF(25),RETA(17),SPL2(17),TGAGR(24),DCPSF(17)
COMMON/GEOMO/Y(10,17),Z(10,17),P(10,17),CPND(10,17),
* B1(10,17),B2(10,17),IDS(17,10),TFD(17,10),IRR(10,17)
*,APP,TSO,RHP,APD,TC,RHG,CA,CZ,TSF(17,10),CCV
COMMON/GPRAM/ALTP,ALTR,GRAC,PL,NCBS,SLDIST(10),NTENG,IUNIT,
* DUMXX(493),BCC,TCG,FLR,AAL1,EPF
COMMON/SUMSPL/SSPL(24,10,17)
COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)
COMMON/ANGLE/PSI(17,10),PSIG(17,10),BETA(17,10)
COMMON/HEAD/HIN(20),HGUT(20),CHIN(20)
COMMON/GFREQ/CFREQ(24),UFREQ(25),PFREQ(24)
COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCF,IPRT(17),ICN(13),NLCP
COMMON/GCONVC/C(2,10),SLDISX(10)
COMMON/TMSPL/SPZ(24,17),IB(2,3,13)
COMMON/CRSPLS/UCB(17),PSCR(17),DFB(408),APSCR

1
DIMENSION XPSI(7),YBETA(4),ZAL(7,4),ZA1(7),ZA2(7,4),
IXF(FO(20),SPLOA(20),GBSS(24)
REAL MO,NPR,MJE

DATA XPSI/100.,110.,120.,130.,140.,150.,160.,/
DATA YBETA/0.,30.,60.,90.,/
DATA ZAC/117.1,117.2,118.6,118.7,122.9,118.8,118.2,

SPECAN 2
SPECAN 3
SPECAN 4
SPECAN 5
SPECAN 6
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SPECAN 55
SPECAN 56
SPECAN 57
SPECAN 58

1	121.4,122.0,122.3,120.7,126.1,122.4,121.4,	SPECAN	59
2	120.4,122.3,124.1,123.8,127.6,123.4,119.8,	SPECAN	60
3	118.9,119.9,121.1,120.9,128.6,122.8,119.5/	SPECAN	61
	DATA ZA1/15.7,19.3,29.5,34.3,25.3,21.1,20.5/	SPECAN	62
	DATA ZA2/51.3,53.1,50.4,53.4,46.0,51.5,53.3,	SPECAN	63
1	52.2,52.5,50.7,52.3,46.2,46.3,45.4,	SPECAN	64
2	61.6,58.0,55.2,56.7,48.8,47.3,51.7,	SPECAN	65
3	63.8,64.8,64.9,61.7,48.3,49.5,51.8/	SPECAN	66
	DATA XFIFO/-2.,-1.695,-1.398,-1.222,-1.046,-.757,-.699,-.602,	SPECAN	67
*	-.523,-.456,-.398,-.301,-.222,-.097,0.,.114,.176,.301,.519,1.0/	SPECAN	68
	DATA SPLOA/-31.,-25.,-19.5,-16.5,-13.9,-10.,-9.25,-9.,-9.,	SPECAN	69
1	-9.25,-9.5,-10.35,-11.15,-12.85,-14.5,-17.,-18.75,-22.5,	SPECAN	70
2	-30.,-47.25/	SPECAN	71
	ICN(6)=ICN(6)+1	SPECAN	72
C		SPECAN	73
C		SPECAN	74
	DELTR=DELT*.01745	SPECAN	75
C	ANGLE BETWEEN FLIGHT PATH AND FLAP ANGLE	SPECAN	76
	ALFA=DELTR-ATAN(GRAD)	SPECAN	77
	CSAL=COS(ALFA)	SPECAN	78
C	TOTAL TEMP.OF FREE STREAM REL. TO EXHAUST	SPECAN	79
	TTO=TSO*(1+.2*(MC*CSAL)**2)	SPECAN	80
	TRAT=TT/TTO	SPECAN	81
	GAMM1=GAMA-1.	SPECAN	82
	Q= NPR**((GAMM1/GAMA)	SPECAN	83
C	STATIC TEMP.OF EXHAUST	SPECAN	84
	TS=TT/Q	SPECAN	85
C	MACH NO OF JET EXHAUST	SPECAN	86
	MJE= SQRT(2./GAMM1*(Q-1.))	SPECAN	87
C	VEL REL TO NOZZLE OF JET EXHAUST	SPECAN	88
	VJE= MJE*SQRT(1716.5*GAMA*TS)	SPECAN	89
C	VEL(AIR)REL. TO NOZZLE	SPECAN	90
	VO=MO*49.02*SQRT(TSC)	SPECAN	91
C	VEL OF JET REL TO AMBIENT AIR	SPECAN	92
	VJR=SQRT(VJE*VJE-2.*VJE*VC*CSAL+VC*VC)	SPECAN	93
C	CHARACTERISTIC FREQUENCY	SPECAN	94
	FO= VJR/DE/TRAT	SPECAN	95
C	EVALUATE CONSTANTS OF FUNCTIONAL VALUES	SPECAN	96
	C1=ALOG10(TRAT)	SPECAN	97
	C2=ALOG10(NPR)	SPECAN	98
	C3=10.*ALOG10(.188*AD)	SPECAN	99
C	TEST FOR 1/3 OCTAVE BAND FREQUENCY OF PREFERRED	SPECAN	100
	TENL3=C.C	SPECAN	101
	IF(NCF.EQ.8)TENL3=4.77	SPECAN	102
C	FIND OCTAVE BAND SPECTRUM SHAPE	SPECAN	103
20	DC 50 NF=1,NCF	SPECAN	104
	FIFO=FRQ(NF)/FO	SPECAN	105
	AFIFO=ALOG10(FIFO)	SPECAN	106
	OBSS(NF)=TBLL1(AFIFO,XFIFO,SPLCA,1,20)+TENL3	SPECAN	107
50	CONTINUE	SPECAN	108
C		SPECAN	109
	CALL ANGLES(NOBS,DELTR)	SPECAN	110
	F8PF=0.3*FO	SPECAN	111
	DO 300 I=1,NOBS	SPECAN	112
	CALL LINCOR(SPZ(1,1),IMA6,LGM6,ELCH6,EDH6,AWL6,R1W6,TL6,	SPECAN	113
*	ILAY6,FM6,IDP6,PSI(1,1),NCF,FRC,PLA6,CF6,PCTA6,NTF6,TF6,DOPSF,	SPECAN	114
*	SPL2,ICOR6,IB(1,1,1,ITYPE),LIN6,FEFF)	SPECAN	115

	DG 200 J=1,17	SPECAN	116
C	TABLE LOOK UP	SPECAN	117
	A0=TBLU2(PSI(J,I),BETA(J,I),XPSI,YBETA,ZA0,1,1,7,4,7,4)	SPECAN	118
	A1=TBLU1(PSI(J,I),XPSI,ZA1,1,7)	SPECAN	119
	A2=TBLU2(PSI(J,I),BETA(J,I),XPSI,YBETA,ZA2,1,1,7,4,7,4)	SPECAN	120
C	OVERALL SOUND PRESSURE LEVEL	SPECAN	121
	OA=A0+A1*C1+A2*C2+C3	SPECAN	122
C	OBTAIN SOUND PRESSURE LEVEL SPECTRUM	SPECAN	123
C	SPECTRA FOR AUGMENTOR SLCT NOZZLE WITH JET FLAP	SPECAN	124
	DO 100 NF=1,NCF	SPECAN	125
	SPLT(NF,J)=OA+OBSS(NF)-SPZ(NF,J)	SPECAN	126
	SSPL(NF,I,J)=PWRSUM(SSPL(NF,I,J),SPLT(NF,J))	SPECAN	127
C		SPECAN	128
100	CONTINUE	SPECAN	129
200	CONTINUE	SPECAN	130
	IF(IPRT(7).NE.7)GO TO 220	SPECAN	131
	CALL NOISO(IPRT(7),I,NK,10,CHIA,ILNIT,SLDISX(I),PFREQ,	SPECAN	132
	* SPLT(1,1),NCF,ITYPE)	SPECAN	133
220	CONTINUE	SPECAN	134
	DC 240 NF=1,NCF	SPECAN	135
	DC 240 J=1,17	SPECAN	136
240	SPLT(NF,J)=SPLT(NF,J)-TSPL(NF,I,J)	SPECAN	137
	IF(IPRT(3).NE.3)GO TO 300	SPECAN	138
	CALL PNLSUB(SPLT(1,1),PSPL(1,1),TPC(1,1),EPNL(1,1),SPL2,	SPECAN	139
	* TEPNL(1,1),NK,BCG,TCG,FLR,I,NCES,IRR(1,1))	SPECAN	140
	CALL NOISO(IPRT(3),I,NK,12,CHIA,ILNIT,SLDISX(I),PFREQ,	SPECAN	141
	* SPLT(1,1),NCF,ITYPE)	SPECAN	142
300	CONTINUE	SPECAN	143
	RETURN	SPECAN	144
	END	SPECAN	145

	SUBROUTINE SQUASH(A,M,B,L)	SQUASH	2
C	VALUES MUST BE MONOTONICALLY INCREASING IN THE A ARRAY	SQUASH	3
C	M MUST BE GREATER THAN ONE	SQUASH	4
C	A = INPUT ARRAY	SQUASH	5
C	M = LENGTH OF INPUT ARRAY	SQUASH	6
C	B = THE RESULTANT ARRAY OF DISTINCT VALUES WHICH CAN	SQUASH	7
C	BE PLACED IN THE A ARRAY IF CCRE SIZE IS OF CONCERN	SQUASH	8
C	L = THE NUMBER OF DISTINCT VALLES IN B	SQUASH	9
	DIMENSION A(1),B(1)	SQUASH	10
	J=1	SQUASH	11
	B(1)=A(1)	SQUASH	12
	DO 1000 I=2,M	SQUASH	13
	IF (A(I) .EQ. A(I-1)) GO TO 1000	SQUASH	14
	IF (A(I) .LT. B(J)) GO TO 1010	SQUASH	15
	J=J+1	SQUASH	16
	B(J)=A(I)	SQUASH	17
1000	CONTINUE	SQUASH	18
1010	CONTINUE	SQUASH	19
	L=J	SQUASH	20
	RETURN	SQUASH	21
	END	SQUASH	22

SUBROUTINE SWITCH(NEPR, NL, ALRO, ALFA, AARRAY, BARRAY)	SWITCH	2
C SWITCH CHANGES NL = F(LRO, ALPHA, EPR) INTO A SET OF FUNCTIONS...	SWITCH	3
C LOG10(RO) = F(EPR, ALPHA) FOR EACH DESIRED CONTOUR	SWITCH	4
C INDICATED BY THE ARRAY ANL(J).	SWITCH	5
C NEPR NUMBER OF EPR VALUES IN AEPR	SWITCH	6
C NLRO NUMBER OF LRO VALUES IN ALRO	SWITCH	7
C ALFA NUMBER OF ALPHA VALUES IN AALFA	SWITCH	8
C NL NUMBER OF VALUES OF NL IN ANL	SWITCH	9
C ANL ARRAY OF VALUES OF SPECIFIC NOISE CONTOURS	SWITCH	10
C AALFA ARRAY OF VALUES OF ALPHA	SWITCH	11
C ALRO ARRAY OF VALUES OF LCG RC	SWITCH	12
C AEPR ARRAY OF VALUES OF EPR	SWITCH	13
C AARRAY ... NOISE LEVELS FOR F(LRG, ALPHA, EPR)	SWITCH	14
C BARRAY ... LOG10(RO) FOR F(EPR, ALPHA) AT EACH ANL(J)	SWITCH	15
C DIMENSION AARRAY(NLRO,ALFA,NEPR)	SWITCH	16
C DIMENSION BARRAY(NEPR,ALFA,NL)	SWITCH	17
C COMMON/CONTNT/AEPR(6),ALRO(9),AALFA(6)	SWITCH	18
C COMMON/LEVELS/ANL(5)	SWITCH	19
C	SWITCH	20
C	SWITCH	21
DO 1010 L=1,NEPR	SWITCH	22
DO 1010 M=1,ALFA	SWITCH	23
DO 1010 J=1,NL	SWITCH	24
BARRAY(L,M,J) = TBLU1(ANL(J), AARRAY(1,M,L), ALRO, 1, NLRO)	SWITCH	25
1010 CONTINUE	SWITCH	26
C	SWITCH	27
C BARRAY REPRESENTS LOG10(RO) = F(EPR, ALPHA) FOR EACH ANL(J)	SWITCH	28
RETURN	SWITCH	29
END	SWITCH	30
	SWITCH	31

	FUNCTION TBLU1(XX,X,Y,MD,N)	TBLU1	2
C	SC0934 TBLU1 PS-473 LU, PAUL 661013 7094 6600	TBLU1	3
C	TABLE LOOKUP AND INTERPOLATION	TBLU1	4
	DIMENSION Y(1),X(1)	TBLU1	5
	INTEGER SEARCH	TBLU1	6
C		TBLU1	7
C	X ALWAYS INCREASING (OR DECREASING)	TBLU1	8
	NC = MD	TBLU1	9
	IF(SEARCH(XX,X,ND,N,I) .EQ. 0)GC TC 43	TBLU1	10
C	RETURN EXACT VALUE	TBLU1	11
	TBLU1 = Y(I)	TBLU1	12
	GO TO 51	TBLU1	13
C	INTERPOLATE	TBLU1	14
	43 TBLU1 = TERP1(XX,X,Y,ND,I)	TBLU1	15
	51 RETURN	TBLU1	16
	END	TBLU1	17

	FUNCTION TBLU2(XX,YY,X,Y,F2,MDX,MDY,NLX,NLY,NFX,NFY)	TBLU2	2
C	S00936 TBLU2 PS-473 LL, PAUL 661013 7094 6600	TBLU2	3
C	TABLE LOOKUP AND INTERPOLATE -- 2 INDEPENDENT VARIABLES	TBLU2	4
	DIMENSION F2(NFX,NFY),S(20),X(1),Y(1)	TBLU2	5
	INTEGER SEARCH	TBLU2	6
C	FIND POSITION IN X AND Y	TBLU2	7
	NCX = MDX	TBLU2	8
	NDY = MDY	TBLU2	9
	I1 = SEARCH(XX,X,NOX,NLX,I)	TBLU2	10
	I1 = I1 + I1 + 1 + SEARCH(YY,Y,NDY,NLY,J)	TBLU2	11
C	100--NEITHER EXACT, 50--Y EXACT, 60--X EXACT, 10--BOTH EXACT	TBLU2	12
	GO TO(100,50,60,10),I1	TBLU2	13
C	X IS EXACT MOVE THAT ROW TO S AND USE TERP1	TBLU2	14
C	A MAX OF 19 MAY BE USED IN SOME CASES FOR NDY	TBLU2	15
60	IX = MIN0(NDY,19)	TBLU2	16
	I2 = IX + J	TBLU2	17
	DO 1 I1 = J, I2	TBLU2	18
	IT = I1 - J	TBLU2	19
	1 S(IT+1) = F2(I,I1)	TBLU2	20
	TBLU2 = TERP1(YY,Y(J),S,IX,I)	TBLU2	21
	GO TO 1000	TBLU2	22
C	Y IS EXACT USE TERP1	TBLU2	23
50	TBLU2 = TERP1(XX,X,F2(I,J),NOX,I)	TBLU2	24
	GO TO 1000	TBLU2	25
100	TBLU2 = TERP2(XX,YY,X,Y,F2,NCX,NDY,NFX,NFY,I,J)	TBLU2	26
1000	RETURN	TBLU2	27
10	TBLU2 = F2(I,J)	TBLU2	28
	GO TO 1000	TBLU2	29
	END	TBLU2	30

```

FUNCTION TBLU3(X1,Y1,Z1,X,Y,Z,F3,MDX,MDY,MDZ,NLX,NLY,NLZ,
1      NFX,NFY,NFZ)
C      TABLE LOOKUP AND INTERPOLATION
C      SOG938 TBLU3 PS-473 LL, PAUL 661013 7094 6600
C      DIMENSION X(1), Y(1), Z(1), F3(NFX,NFY,NFZ), S(20,20)
C      INTEGER SEARCH
C      NDX = MDX
C      NDY = MDY
C      NDZ = MDZ
C      FIND POSITION OF X, Y, AND Z IN TABLES
C      IX = SEARCH(X1,X,NDX,NLX,I)
C      IY = SEARCH(Y1,Y,NDY,NLY,J)
C      IZ = SEARCH(Z1,Z,NDZ,NLZ,K)
C      CONSIDER IX BIT PATTERN
C      BIT 0 SET--X EXACT, BIT 1--Y EXACT, BIT 2--Z EXACT
C      IX = IX + IY + IY + IZ*4 + 1
C      GO TO (11,1,2,21,22,15,20,12),IX
C      NONE EXACT
11 TBLU3 = TERP3(X1,Y1,Z1,X,Y,Z,F3,NDX,NDY,NDZ,NFX,NFY,NFZ,I,J,K)
1000 RETURN
C      ALL EXACT--STRAIGHT TABLE LOOKUP
12 TBLU3 = F3(I,J,K)
C      GO TO 1000
C      Y AND Z ARE EXACT
20 TBLU3 = TERP1(X1,X,F3(I,J,K),NDX,I)
C      GO TO 1000
C      X AND Y ARE EXACT -- MOVE F3(I,J,*)
21 IX = MINO(19,NDZ)
C      IY = K + IX
C      DO 14 IZ = K, IY
C      IXA = IZ - K + 1
14 S(IXA,I) = F3(I,J,IZ)
C      TBLU3 = TERP1(Z1,Z(K),S,IX,I)
C      GO TO 1000
C      X AND Z ARE EXACT -- MOVE F3(I,*,K)
15 IX = MINO(NDY,19)
C      IY = J + IX
C      DO 16 IZ = J, IY
C      IXA = IZ - J + 1
16 S(IXA,I) = F3(I,IZ,K)
C      TBLU3 = TERP1(Y1,Y(J),S,IX,I)
C      GO TO 1000
C      Z IS EXACT
22 TBLU3 = TERP2(X1,Y1,X,Y,F3(1,1,K),NDX,NDY,NFX,NFY,I,J)
C      GO TO 1000
C      X IS EXACT -- MOVE F3(I,*,*)
1 IX = MINO(NDY,19)
C      IY = MINO(NDZ,19)
C      IJ = J + IX
C      IK = K + IY
C      DO 3 IZ = J, IJ
C      DO 3 II = K, IK
C      IXA = IZ - J + 1
C      IXB = II - K + 1
3 S(IXA,IXB) = F3(I,IZ,II)
C      TBLU3 = TERP2(Y1,Z1,Y(J),Z(K),S,IX,IY,20,20,1,1)
C      GO TO 1000

```

TBLU3	2
TBLU3	3
TBLU3	4
TBLU3	5
TBLU3	6
TBLU3	7
TBLU3	8
TBLU3	9
TBLU3	10
TBLU3	11
TBLU3	12
TBLU3	13
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TBLU3	31
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TBLU3	37
TBLU3	38
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TBLU3	40
TBLU3	41
TBLU3	42
TBLU3	43
TBLU3	44
TBLU3	45
TBLU3	46
TBLU3	47
TBLU3	48
TBLU3	49
TBLU3	50
TBLU3	51
TBLU3	52
TBLU3	53
TBLU3	54
TBLU3	55
TBLU3	56
TBLU3	57
TBLU3	58

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C      Y IS EXACT -- MOVE F3(*,J,*)
2 IX = MING(19,NDX)
  IZ = MINO(19,NDZ)
  II = I + IX
  IK = K + IZ
  DO 4 JI = I, II
    DO 4 JK = K, IK
      IXA = JI - I + 1
      IXB = JK - K + 1
4  S(IXA,IXB) = F3(JI,J,JK)
  TBLU3 = TERP2(X1,Z1,X(II),Z(K),S,NDX,NDZ,20,20,1,1)
  GO TO 1000
  END

```

TBLU3	59
TBLU3	60
TBLU3	61
TBLU3	62
TBLU3	63
TBLU3	64
TBLU3	65
TBLU3	66
TBLU3	67
TBLU3	68
TBLU3	69
TBLU3	70
TBLU3	71

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SUBROUTINE TEE227(IMODE,NLN)
C PROGRAM TEE227A(INPUT,OUTPUT,TAPE5 INPUT,TAPE6 OUTPUT)
C THIS PROGRAM HAS BEEN GENERATED AS A MEANS OF
C CIRCUMVENTING THE NEED FOR INPUT TO TEE227 WHICH IS TO
C BE RUN UNDER CONTROL OF A REAL TIME SIMULATOR ON
C THE SIGMA 7.
C THE 4 NUMBERS REPRESENTED ON EACH LINE OF THE DATA
C STATEMENT ARE THE OUTPUT OF NOISE LEVEL, ENGINE PRESSURE
C RATIO, ELEVATION ANGLE, LOGIC CF RANGE, GENERATED BY
C THE NOISE PREDICTION PROGRAM, TEE187 PER INPUT CASE
C AND PLACED ON FILE TAPE20, WHICH HAVE BEEN PROCESSED
C BY THE TEE187C POST-PROCESSOR. THE POST-PROCESSOR
C INCORPORATES THIS DATA DURING THE GENERATION OF THE
C MAIN PROGRAM OF TEE227, THE NOISE CALCUL PROGRAM
C WHICH THE POST-PROCESSOR HAS OUTPUT IN SOURCE CODING ON
C FILE TAPE22
COMMON/CCUNT/NEPR, NL
COMMON/CONTINT/AEPR(6),ALRG(9),AALFA(6)
DIMENSION A10(72)
EQUIVALENCE (DATN( 1),A10(1))
DIMENSION A11(72)
EQUIVALENCE (DATN( 73),A11(1))
DIMENSION A12(72)
EQUIVALENCE (DATN( 145),A12(1))
DIMENSION A13(72)
EQUIVALENCE (DATN( 217),A13(1))
DIMENSION A14(72)
EQUIVALENCE (DATN( 289),A14(1))
DIMENSION A15(72)
EQUIVALENCE (DATN( 361),A15(1))
DIMENSION A16(72)
EQUIVALENCE (DATN( 433),A16(1))
DIMENSION A17(72)
EQUIVALENCE (DATN( 505),A17(1))
DIMENSION A18(72)
EQUIVALENCE (DATN( 577),A18(1))
DIMENSION A19(72)
EQUIVALENCE (DATN( 649),A19(1))
DIMENSION A20(72)
EQUIVALENCE (DATN( 721),A20(1))
DIMENSION A21(72)
EQUIVALENCE (DATN( 793),A21(1))
DIMENSION A22(72)
EQUIVALENCE (DATN( 865),A22(1))
DIMENSION A23(72)
EQUIVALENCE (DATN( 937),A23(1))
DIMENSION A24(72)
EQUIVALENCE (DATN(1009),A24(1))
DIMENSION A25(72)
EQUIVALENCE (DATN(1081),A25(1))
DIMENSION A26(72)
EQUIVALENCE (DATN(1153),A26(1))
DIMENSION A27(72)
EQUIVALENCE (DATN(1225),A27(1))
DIMENSION DATN(1296)
DIMENSION D1(324),D2(324),D3(324),D4(324)
DATA A10 /

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TEE227 2
TEE227 3
TEE227 4
TEE227 5
TEE227 6
TEE227 7
TEE227 8
TEE227 9
TEE227 10
TEE227 11
TEE227 12
TEE227 13
TEE227 14
TEE227 15
TEE227 16
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TEE227 47
TEE227 48
TEE227 49
TEE227 50
TEE227 51
TEE227 52
TEE227 53
TEE227 54
TEE227 55
TEE227 56
TEE227 57
TEE227 58

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1	1.125E 02,	2.000E 00,	7.181E 00,	2.301E 00,	TEE227	59
2	9.530E 01,	1.800E 00,	1.448E 01,	3.204E 00,	TEE227	60
3	1.101E 02,	1.600E 00,	7.181E 00,	2.000E 00,	TEE227	61
4	1.116E 02,	1.600E 00,	1.448E 01,	2.000E 00,	TEE227	62
5	9.341E 01,	1.200E 00,	9.000E 01,	2.301E 00,	TEE227	63
6	8.268E 01,	1.200E 00,	4.500E 01,	3.806E 00,	TEE227	64
7	3.386E 01,	1.000E 00,	C.0	4.107E 00,	TEE227	65
8	1.137E 02,	1.600E 00,	3.000E 01,	2.000E 00,	TEE227	66
9	7.348E 01,	1.600E 00,	C.0	3.806E 00,	TEE227	67
*	1.110E 02,	1.600E 00,	4.500E 01,	2.301E 00,	TEE227	68
*	7.934E 01,	1.200E 00,	3.000E 01,	2.903E 00,	TEE227	69
*	4.695E 01,	1.000E 00,	3.000E 01,	3.806E 00,	TEE227	70
*	8.988E 01,	2.000E 00,	9.000E 01,	3.806E 00,	TEE227	71
*	8.140E 01,	1.000E 00,	4.500E 01,	2.000E 00,	TEE227	72
*	1.021E 02,	1.800E 00,	C.0	2.602E 00,	TEE227	73
*	8.449E 01,	1.600E 00,	1.448E 01,	3.505E 00,	TEE227	74
*	1.186E 02,	2.000E 00,	7.181E 00,	1.699E 00,	TEE227	75
*	3.988E 01,	1.000E 00,	0.0	3.806E 00,	TEE227	76
DATA A11 /					TEE227	77
1	9.136E 01,	1.800E 00,	3.000E 01,	3.505E 00,	TEE227	78
2	9.270E 01,	1.800E 00,	4.500E 01,	3.505E 00,	TEE227	79
3	1.033E 02,	1.800E 00,	3.000E 01,	2.903E 00,	TEE227	80
4	9.737E 01,	1.800E 00,	3.000E 01,	3.204E 00,	TEE227	81
5	1.047E 02,	1.800E 00,	4.500E 01,	2.903E 00,	TEE227	82
6	9.943E 01,	1.200E 00,	9.000E 01,	1.699E 00,	TEE227	83
7	9.871E 01,	1.800E 00,	4.500E 01,	3.204E 00,	TEE227	84
8	1.077E 02,	1.400E 00,	3.000E 01,	1.699E 00,	TEE227	85
9	1.003E 02,	1.800E 00,	9.000E 01,	3.204E 00,	TEE227	86
*	1.140E 02,	2.000E 00,	1.448E 01,	2.301E 00,	TEE227	87
*	9.859E 01,	1.400E 00,	C.0	2.000E 00,	TEE227	88
*	8.006E 01,	1.000E 00,	3.000E 01,	2.000E 00,	TEE227	89
*	9.897E 01,	2.000E 00,	3.000E 01,	3.204E 00,	TEE227	90
*	1.003E 02,	2.000E 00,	4.500E 01,	3.204E 00,	TEE227	91
*	1.019E 02,	2.000E 00,	9.000E 01,	3.204E 00,	TEE227	92
*	1.056E 02,	1.800E 00,	7.181E 00,	2.602E 00,	TEE227	93
*	8.003E 01,	1.000E 00,	1.448E 01,	1.699E 00,	TEE227	94
*	8.790E 01,	1.600E 00,	4.500E 01,	3.505E 00,	TEE227	95
DATA A12 /					TEE227	96
1	1.200E 02,	2.000E 00,	1.448E 01,	1.699E 00,	TEE227	97
2	7.503E 01,	1.000E 00,	C.0	1.699E 00,	TEE227	98
3	8.181E 01,	1.800E 00,	7.181E 00,	3.806E 00,	TEE227	99
4	7.857E 01,	1.000E 00,	7.181E 00,	1.699E 00,	TEE227	100
5	8.695E 01,	1.200E 00,	7.181E 00,	2.301E 00,	TEE227	101
6	7.990E 01,	1.400E 00,	4.500E 01,	3.505E 00,	TEE227	102
7	9.190E 01,	2.000E 00,	C.0	3.204E 00,	TEE227	103
8	8.328E 01,	1.800E 00,	1.448E 01,	3.806E 00,	TEE227	104
9	8.068E 01,	1.200E 00,	4.500E 01,	2.903E 00,	TEE227	105
*	9.430E 01,	1.400E 00,	1.448E 01,	2.602E 00,	TEE227	106
*	8.299E 01,	1.000E 00,	9.000E 01,	2.000E 00,	TEE227	107
*	8.930E 01,	1.400E 00,	C.0	2.602E 00,	TEE227	108
*	9.147E 01,	1.600E 00,	C.0	2.903E 00,	TEE227	109
*	9.501E 01,	1.600E 00,	7.181E 00,	2.903E 00,	TEE227	110
*	8.810E 01,	1.200E 00,	9.000E 01,	2.602E 00,	TEE227	111
*	1.017E 02,	1.400E 00,	3.000E 01,	2.301E 00,	TEE227	112
*	1.030E 02,	1.400E 00,	4.500E 01,	2.301E 00,	TEE227	113
*	5.179E 01,	1.200E 00,	7.181E 00,	4.107E 00,	TEE227	114
DATA A13 /					TEE227	115

1	1.150E 02,	2.00CE 00,	C.0	1.699E 00,	TEE227	116
2	1.170E 02,	1.80CE 00,	7.181E 00,	1.699E 00,	TEE227	117
3	5.533E 01,	1.20CE 00,	3.000E 01,	4.107E 00,	TEE227	118
4	6.529E 01,	1.20CE 00,	1.448E 01,	3.505E 00,	TEE227	119
5	9.048E 01,	1.20CE 00,	3.000E 01,	2.301E 00,	TEE227	120
6	9.182E 01,	1.200E 00,	4.500E 01,	2.301E 00,	TEE227	121
7	1.063E 02,	1.80CE 00,	9.000E 01,	2.903E 00,	TEE227	122
8	9.030E 01,	1.80CE 00,	C.0	3.204E 00,	TEE227	123
9	9.384E 01,	1.80CE 00,	7.181E 00,	3.204E 00,	TEE227	124
*	1.008E 02,	1.60CE 00,	7.181E 00,	2.602E 00,	TEE227	125
*	9.961E 01,	1.40CE 00,	1.448E 01,	2.301E 00,	TEE227	126
*	7.746E 01,	1.60CE 00,	9.000E 01,	4.107E 00,	TEE227	127
*	8.535E 01,	1.80CE 00,	3.000E 01,	3.806E 00,	TEE227	128
*	5.781E 01,	1.20CE 00,	7.181E 00,	3.806E 00,	TEE227	129
*	1.046E 02,	1.40CE 00,	9.000E 01,	2.301E 00,	TEE227	130
*	7.701E 01,	1.60CE 00,	7.181E 00,	3.806E 00,	TEE227	131
*	6.787E 01,	1.00CE 00,	9.000E 01,	2.903E 00,	TEE227	132
*	1.149E 02,	1.80CE 00,	7.181E 00,	2.000E 00/	TEE227	133
DATA A14 /					TEE227	134
1	7.848E 01,	1.60CE 00,	1.448E 01,	3.806E 00,	TEE227	135
2	5.544E 01,	1.00CE 00,	7.181E 00,	3.204E 00,	TEE227	136
3	1.023E 02,	1.60CE 00,	1.448E 01,	2.602E 00,	TEE227	137
4	1.044E 02,	1.60CE 00,	3.000E 01,	2.602E 00,	TEE227	138
5	6.723E 01,	1.00CE 00,	7.181E 00,	2.602E 00,	TEE227	139
6	1.061E 02,	1.60CE 00,	7.181E 00,	2.301E 00,	TEE227	140
7	1.134E 02,	1.80CE 00,	C.0	1.699E 00,	TEE227	141
8	7.255E 01,	1.40CE 00,	3.000E 01,	3.806E 00,	TEE227	142
9	1.042E 02,	1.40CE 00,	7.181E 00,	1.699E 00,	TEE227	143
*	9.730E 01,	1.60CE 00,	C.0	2.602E 00,	TEE227	144
*	9.429E 01,	1.80CE 00,	9.000E 01,	3.505E 00,	TEE227	145
*	7.828E 01,	1.80CE 00,	C.0	3.806E 00,	TEE227	146
*	6.287E 01,	1.00CE 00,	1.448E 01,	2.903E 00,	TEE227	147
*	6.494E 01,	1.00CE 00,	3.000E 01,	2.903E 00,	TEE227	148
*	6.446E 01,	1.40CE 00,	1.448E 01,	4.107E 00,	TEE227	149
*	1.106E 02,	1.40CE 00,	9.000E 01,	1.699E 00,	TEE227	150
*	9.283E 01,	1.40CE 00,	7.181E 00,	2.602E 00,	TEE227	151
*	1.057E 02,	1.60CE 00,	4.500E 01,	2.602E 00/	TEE227	152
DATA A15 /					TEE227	153
1	1.073E 02,	1.60CE 00,	9.000E 01,	2.602E 00,	TEE227	154
2	5.666E 01,	1.20CE 00,	4.500E 01,	4.107E 00,	TEE227	155
3	5.946E 01,	1.40CE 00,	C.0	4.107E 00,	TEE227	156
4	7.726E 01,	1.80CE 00,	1.448E 01,	4.107E 00,	TEE227	157
5	8.341E 01,	1.20CE 00,	C.0	2.301E 00,	TEE227	158
6	4.488E 01,	1.00CE 00,	1.448E 01,	3.806E 00,	TEE227	159
7	9.544E 01,	2.00CE 00,	7.181E 00,	3.204E 00,	TEE227	160
8	9.690E 01,	2.00CE 00,	1.448E 01,	3.204E 00,	TEE227	161
9	9.841E 01,	1.20CE 00,	1.448E 01,	2.301E 00,	TEE227	162
*	1.230E 02,	2.00CE 00,	9.000E 01,	2.000E 00,	TEE227	163
*	1.090E 02,	2.00CE 00,	C.0	2.301E 00,	TEE227	164
*	1.076E 02,	1.60CE 00,	1.448E 01,	2.301E 00,	TEE227	165
*	1.164E 02,	1.80CE 00,	1.448E 01,	2.000E 00,	TEE227	166
*	7.923E 01,	1.80CE 00,	3.000E 01,	4.107E 00,	TEE227	167
*	6.786E 01,	1.40CE 00,	4.500E 01,	4.107E 00,	TEE227	168
*	6.628E 01,	1.00CE 00,	4.500E 01,	2.903E 00,	TEE227	169
*	1.126E 02,	1.60CE 00,	9.000E 01,	2.301E 00,	TEE227	170
*	8.429E 01,	1.80CE 00,	C.0	3.505E 00/	TEE227	171
DATA A16 /					TEE227	172

1	1.124E 02,	1.800E 00,	1.448E 01,	2.301E 00,	TEE227	173
2	7.886E 01,	2.000E 00,	1.448E 01,	4.107E 00,	TEE227	174
3	8.093E 01,	2.000E 00,	3.000E 01,	4.107E 00,	TEE227	175
4	1.056E 02,	1.400E 00,	1.448E 01,	1.699E 00,	TEE227	176
5	9.443E 01,	1.200E 00,	1.448E 01,	1.699E 00,	TEE227	177
6	1.097E 02,	1.600E 00,	3.000E 01,	2.301E 00,	TEE227	178
7	1.006E 02,	1.400E 00,	C.0	1.699E 00,	TEE227	179
8	1.185E 02,	1.800E 00,	3.000E 01,	2.000E 00,	TEE227	180
9	6.299E 01,	1.400E 00,	7.181E 00,	4.107E 00,	TEE227	181
*	8.066E 01,	1.800E 00,	4.500E 01,	4.107E 00,	TEE227	182
*	9.650E 01,	1.200E 00,	3.000E 01,	1.699E 00,	TEE227	183
*	9.784E 01,	1.200E 00,	4.500E 01,	1.699E 00,	TEE227	184
*	8.783E 01,	1.800E 00,	7.181E 00,	3.505E 00,	TEE227	185
*	8.929E 01,	1.800E 00,	1.448E 01,	3.505E 00,	TEE227	186
*	1.066E 02,	1.600E 00,	C.0	2.000E 00,	TEE227	187
*	9.787E 01,	2.000E 00,	C.0	2.903E 00,	TEE227	188
*	8.386E 01,	2.000E 00,	9.000E 01,	4.107E 00,	TEE227	189
*	5.690E 01,	1.000E 00,	1.448E 01,	3.204E 00,	TEE227	190
DATA A17 /					TEE227	191
1	6.946E 01,	1.400E 00,	9.000E 01,	4.107E 00,	TEE227	192
2	6.383E 01,	1.200E 00,	7.181E 00,	3.505E 00,	TEE227	193
3	6.901E 01,	1.400E 00,	7.181E 00,	3.806E 00,	TEE227	194
4	7.048E 01,	1.400E 00,	1.448E 01,	3.806E 00,	TEE227	195
5	5.897E 01,	1.000E 00,	3.000E 01,	3.204E 00,	TEE227	196
6	1.165E 02,	2.000E 00,	7.181E 00,	2.000E 00,	TEE227	197
7	4.589E 01,	1.000E 00,	0.0	3.505E 00,	TEE227	198
8	7.810E 01,	1.200E 00,	C.0	2.602E 00,	TEE227	199
9	8.163E 01,	1.200E 00,	7.181E 00,	2.602E 00,	TEE227	200
*	8.695E 01,	2.000E 00,	3.000E 01,	3.806E 00,	TEE227	201
*	7.548E 01,	1.400E 00,	9.000E 01,	3.806E 00,	TEE227	202
*	8.828E 01,	2.000E 00,	4.500E 01,	3.806E 00,	TEE227	203
*	6.901E 01,	1.000E 00,	C.0	2.301E 00,	TEE227	204
*	1.221E 02,	2.000E 00,	3.000E 01,	1.699E 00,	TEE227	205
*	8.656E 01,	1.600E 00,	3.000E 01,	3.505E 00,	TEE227	206
*	1.150E 02,	1.600E 00,	4.500E 01,	2.000E 00,	TEE227	207
*	6.029E 01,	1.200E 00,	C.0	3.505E 00,	TEE227	208
*	1.234E 02,	2.000E 00,	4.500E 01,	1.699E 00,	TEE227	209
DATA A18 /					TEE227	21
1	1.250E 02,	2.000E 00,	9.000E 01,	1.699E 00,	TEE227	211
2	1.214E 02,	1.800E 00,	9.000E 01,	2.000E 00,	TEE227	212
3	1.087E 02,	2.000E 00,	1.448E 01,	2.602E 00,	TEE227	213
4	8.226E 01,	1.800E 00,	9.000E 01,	4.107E 00,	TEE227	214
5	1.108E 02,	2.000E 00,	3.000E 01,	2.602E 00,	TEE227	215
6	6.630E 01,	1.200E 00,	C.0	3.204E 00,	TEE227	216
7	6.984E 01,	1.200E 00,	7.181E 00,	3.204E 00,	TEE227	217
8	8.668E 01,	1.800E 00,	4.500E 01,	3.806E 00,	TEE227	218
9	8.828E 01,	1.800E 00,	9.000E 01,	3.806E 00,	TEE227	219
*	7.226E 01,	1.800E 00,	C.0	4.107E 00,	TEE227	220
*	7.579E 01,	1.800E 00,	7.181E 00,	4.107E 00,	TEE227	221
*	1.218E 02,	1.800E 00,	4.500E 01,	1.699E 00,	TEE227	222
*	1.234E 02,	1.800E 00,	9.000E 01,	1.699E 00,	TEE227	223
*	1.184E 02,	1.800E 00,	1.448E 01,	1.699E 00,	TEE227	224
*	1.121E 02,	2.000E 00,	4.500E 01,	2.602E 00,	TEE227	225
*	1.137E 02,	2.000E 00,	9.000E 01,	2.602E 00,	TEE227	226
*	5.928E 01,	1.200E 00,	1.448E 01,	3.806E 00,	TEE227	227
*	9.770E 01,	1.400E 00,	4.500E 01,	2.602E 00,	TEE227	228
DATA A19 /					TEE227	229

1	8.701E 01,	1.400E 00,	7.181E 00,	2.903E 00,	TEE227	230
2	9.930E 01,	1.400E 00,	9.000E 01,	2.602E 00,	TEE227	231
3	1.079E 02,	2.000E 00,	9.000E 01,	2.903E 00,	TEE227	232
4	1.180E 02,	2.000E 00,	1.448E 01,	2.000E 00,	TEE227	233
5	1.114E 02,	1.800E 00,	0.0	2.000E 00,	TEE227	234
6	7.581E 01,	1.200E 00,	7.181E 00,	2.903E 00,	TEE227	235
7	1.021E 02,	1.400E 00,	7.181E 00,	2.000E 00,	TEE227	236
8	7.386E 01,	2.000E 00,	C.0	4.107E 00,	TEE227	237
9	7.739E 01,	2.000E 00,	7.181E 00,	4.107E 00,	TEE227	238
*	1.036E 02,	1.400E 00,	1.448E 01,	2.000E 00,	TEE227	239
*	1.166E 02,	1.600E 00,	9.000E 01,	2.000E 00,	TEE227	240
*	5.190E 01,	1.000E 00,	C.0	3.204E 00,	TEE227	241
*	4.341E 01,	1.000E 00,	7.181E 00,	3.806E 00,	TEE227	242
*	1.086E 02,	1.400E 00,	9.000E 01,	2.000E 00,	TEE227	243
*	1.015E 02,	1.600E 00,	9.000E 01,	2.903E 00,	TEE227	244
*	8.550E 01,	1.600E 00,	C.0	3.204E 00,	TEE227	245
*	1.205E 02,	1.800E 00,	3.000E 01,	1.699E 00,	TEE227	246
*	8.210E 01,	1.000E 00,	3.000E 01,	1.699E 00,	TEE227	247
DATA A20 /					TEE227	248
1	8.188E 01,	1.600E 00,	4.500E 01,	3.806E 00,	TEE227	249
2	8.348E 01,	1.600E 00,	9.000E 01,	3.806E 00,	TEE227	250
3	7.227E 01,	1.200E 00,	C.0	2.903E 00,	TEE227	251
4	1.174E 02,	1.800E 00,	9.000E 01,	2.301E 00,	TEE227	252
5	7.337E 01,	1.200E 00,	3.000E 01,	3.204E 00,	TEE227	253
6	7.471E 01,	1.200E 00,	4.500E 01,	3.204E 00,	TEE227	254
7	7.630E 01,	1.200E 00,	9.000E 01,	3.204E 00,	TEE227	255
8	5.326E 01,	1.200E 00,	1.448E 01,	4.107E 00,	TEE227	256
9	4.826E 01,	1.200E 00,	C.0	4.107E 00,	TEE227	257
*	8.344E 01,	1.000E 00,	4.500E 01,	1.699E 00,	TEE227	258
*	8.503E 01,	1.000E 00,	9.000E 01,	1.699E 00,	TEE227	259
*	8.847E 01,	1.400E 00,	1.448E 01,	2.903E 00,	TEE227	260
*	1.057E 02,	1.400E 00,	2.000E 01,	2.000E 00,	TEE227	261
*	7.255E 01,	1.000E 00,	7.181E 00,	2.301E 00,	TEE227	262
*	1.070E 02,	1.400E 00,	4.500E 01,	2.000E 00,	TEE227	263
*	8.943E 01,	2.000E 00,	7.181E 00,	3.505E 00,	TEE227	264
*	4.226E 01,	1.000E 00,	4.500E 01,	4.107E 00,	TEE227	265
*	4.386E 01,	1.000E 00,	9.000E 01,	4.107E 00,	TEE227	266
DATA A21 /					TEE227	267
1	7.988E 01,	2.000E 00,	C.0	3.806E 00,	TEE227	268
2	1.145E 02,	1.800E 00,	3.000E 01,	2.301E 00,	TEE227	269
3	7.401E 01,	1.000E 00,	1.448E 01,	2.301E 00,	TEE227	270
4	7.750E 01,	1.400E 00,	C.0	3.204E 00,	TEE227	271
5	9.089E 01,	2.000E 00,	1.448E 01,	3.505E 00,	TEE227	272
6	9.296E 01,	2.000E 00,	3.000E 01,	3.505E 00,	TEE227	273
7	8.341E 01,	2.000E 00,	7.181E 00,	3.806E 00,	TEE227	274
8	1.201E 02,	2.000E 00,	3.000E 01,	2.000E 00,	TEE227	275
9	1.214E 02,	2.000E 00,	4.500E 01,	2.000E 00,	TEE227	276
*	6.746E 01,	1.600E 00,	C.0	4.107E 00,	TEE227	277
*	9.430E 01,	2.000E 00,	4.500E 01,	3.505E 00,	TEE227	278
*	9.589E 01,	2.000E 00,	9.000E 01,	3.505E 00,	TEE227	279
*	1.157E 02,	1.600E 00,	3.000E 01,	1.699E 00,	TEE227	280
*	1.174E 02,	2.000E 00,	4.500E 01,	2.301E 00,	TEE227	281
*	8.055E 01,	1.600E 00,	3.000E 01,	3.806E 00,	TEE227	282
*	6.736E 01,	1.200E 00,	3.000E 01,	3.505E 00,	TEE227	283
*	9.391E 01,	1.600E 00,	4.500E 01,	3.204E 00,	TEE227	284
*	9.550E 01,	1.600E 00,	9.000E 01,	3.204E 00,	TEE227	285
DATA A22 /					TEE227	286

1	9.054E 01,	1.40CE 00,	3.000E 01,	2.903E 00,	TEE227	287
2	8.75CE 01,	1.40CE 00,	9.000E 01,	3.204E 00,	TEE227	288
3	9.647E 01,	1.60CE 00,	1.448E 01,	2.903E 00,	TEE227	289
4	7.149E 01,	1.40CE 00,	C.0	3.505E 00,	TEE227	290
5	8.310E 01,	1.20CE 00,	1.448E 01,	2.602E 00,	TEE227	291
6	7.949E 01,	1.600E 00,	C.0	3.505E 00,	TEE227	292
7	7.13CE 01,	1.20CE 00,	1.448E 01,	3.204E 00,	TEE227	293
8	1.092E 02,	1.800E 00,	3.000E 01,	2.602E 00,	TEE227	294
9	8.104E 01,	1.40CE 00,	7.181E 00,	3.204E 00,	TEE227	295
*	6.870E 01,	1.00CE 00,	1.448E 01,	2.602E 00,	TEE227	296
*	7.210E 01,	1.00CE 00,	4.500E 01,	2.602E 00,	TEE227	297
*	7.370E 01,	1.00CE 00,	9.000E 01,	2.602E 00,	TEE227	298
*	5.787E 01,	1.00CE 00,	C.0	2.903E 00,	TEE227	299
*	6.141E 01,	1.00CE 00,	7.181E 00,	2.903E 00,	TEE227	300
*	1.390E 02,	1.40CE 00,	4.500E 01,	1.699E 00,	TEE227	301
*	1.158E 02,	1.80CE 00,	4.500E 01,	2.301E 00,	TEE227	302
*	6.135E 01,	1.20CE 00,	3.000E 01,	3.806E 00,	TEE227	303
*	8.517E 01,	1.20CE 00,	3.000E 01,	2.602E 00/	TEE227	304
DATA A23 /					TEE227	305
1	1.105E 02,	1.800E 00,	4.500E 01,	2.602E 00,	TEE227	306
2	1.121E 02,	1.80CE 00,	9.000E 01,	2.602E 00,	TEE227	307
3	9.854E 01,	1.60CE 00,	3.000E 01,	2.903E 00,	TEE227	308
4	7.503E 01,	1.40CE 00,	7.181E 00,	3.505E 00,	TEE227	309
5	1.190E 02,	2.00CE 00,	9.000E 01,	2.301E 00,	TEE227	310
6	5.296E 01,	1.000E 00,	3.000E 01,	3.505E 00,	TEE227	311
7	3.739E 01,	1.00CE 00,	7.181E 00,	4.107E 00,	TEE227	312
8	9.188E 01,	1.40CE 00,	4.500E 01,	2.903E 00,	TEE227	313
9	5.430E 01,	1.00CE 00,	4.500E 01,	3.505E 00,	TEE227	314
*	7.077E 01,	1.00CE 00,	3.000E 01,	2.602E 00,	TEE227	315
*	9.461E 01,	1.40CE 00,	C.0	2.301E 00,	TEE227	316
*	9.815E 01,	1.40CE 00,	7.181E 00,	2.301E 00,	TEE227	317
*	8.25CE 01,	1.40CE 00,	1.448E 01,	3.204E 00,	TEE227	318
*	9.347E 01,	1.40CE 00,	9.000E 01,	2.903E 00,	TEE227	319
*	8.739E 01,	1.20CE 00,	C.0	2.000E 00,	TEE227	320
*	9.093E 01,	1.20CE 00,	7.181E 00,	2.000E 00,	TEE227	321
*	7.299E 01,	1.00CE 00,	C.0	2.000E 00,	TEE227	322
*	1.074E 02,	1.80CE 00,	C.0	2.301E 00/	TEE227	323
DATA A24 /					TEE227	324
1	8.65CE 01,	1.20CE 00,	4.500E 01,	2.602E 00,	TEE227	325
2	7.653E 01,	1.00CE 00,	7.181E 00,	2.000E 00,	TEE227	326
3	8.904E 01,	1.60CE 00,	7.181E 00,	3.204E 00,	TEE227	327
4	6.870E 01,	1.20CE 00,	4.500E 01,	3.505E 00,	TEE227	328
5	9.050E 01,	1.60CE 00,	1.448E 01,	3.204E 00,	TEE227	329
6	6.548E 01,	1.40CE 00,	C.0	3.806E 00,	TEE227	330
7	1.014E 02,	2.000E 00,	7.181E 00,	2.903E 00,	TEE227	331
8	1.086E 02,	1.60CE 00,	C.0	1.699E 00,	TEE227	332
9	4.943E 01,	1.00CE 00,	7.181E 00,	3.505E 00,	TEE227	333
*	7.586E 01,	1.60CE 00,	4.500E 01,	4.107E 00,	TEE227	334
*	6.653E 01,	1.40CE 00,	3.000E 01,	4.107E 00,	TEE227	335
*	1.049E 02,	2.000E 00,	3.000E 01,	2.903E 00,	TEE227	336
*	1.122E 02,	1.60CE 00,	7.181E 00,	1.699E 00,	TEE227	337
*	8.457E 01,	1.40CE 00,	3.000E 01,	3.204E 00,	TEE227	338
*	1.063E 02,	2.00CE 00,	4.500E 01,	2.903E 00,	TEE227	339
*	1.130E 02,	2.00CE 00,	C.0	2.000E 00,	TEE227	340
*	4.828E 01,	1.00CE 00,	4.500E 01,	3.806E 00,	TEE227	341
*	4.988E 01,	1.000E 00,	9.000E 01,	3.806E 00/	TEE227	342
DATA A25 /					TEE227	343

1	1.029E 02,	2.000E 00,	1.448E 01,	2.903E 00,	TEE227	344
2	1.170E 02,	1.600E 00,	4.500E 01,	1.699E 00,	TEE227	345
3	9.988E 01,	1.600E 00,	4.500E 01,	2.903E 00,	TEE227	346
4	9.637E 01,	1.400E 00,	3.000E 01,	2.602E 00,	TEE227	347
5	7.029E 01,	1.200E 00,	9.000E 01,	3.505E 00,	TEE227	348
6	8.949E 01,	1.600E 00,	9.000E 01,	3.505E 00,	TEE227	349
7	1.186E 02,	1.600E 00,	9.000E 01,	1.699E 00,	TEE227	350
8	5.428E 01,	1.200E 00,	0.0	3.806E 00,	TEE227	351
9	1.037E 02,	2.000E 00,	0.0	2.602E 00,	TEE227	352
*	1.072E 02,	2.000E 00,	7.181E 00,	2.602E 00,	TEE227	353
*	3.886E 01,	1.000E 00,	1.448E 01,	4.107E 00,	TEE227	354
*	1.136E 02,	1.600E 00,	1.448E 01,	1.699E 00,	TEE227	355
*	7.649E 01,	1.400E 00,	1.448E 01,	3.505E 00,	TEE227	356
*	1.198E 02,	1.800E 00,	4.500E 01,	2.000E 00,	TEE227	357
*	6.428E 01,	1.200E 00,	9.000E 01,	3.806E 00,	TEE227	358
*	5.826E 01,	1.200E 00,	9.000E 01,	4.107E 00,	TEE227	359
*	4.093E 01,	1.000E 00,	3.000E 01,	4.107E 00,	TEE227	360
*	9.257E 01,	1.600E 00,	3.000E 01,	3.204E 00,	TEE227	361
DATA A26 /					TEE227	362
1	7.856E 01,	1.400E 00,	3.000E 01,	3.505E 00,	TEE227	363
2	8.149E 01,	1.400E 00,	9.000E 01,	3.505E 00,	TEE227	364
3	8.943E 01,	1.200E 00,	0.0	1.699E 00,	TEE227	365
4	9.297E 01,	1.200E 00,	7.181E 00,	1.699E 00,	TEE227	366
5	7.727E 01,	1.200E 00,	1.448E 01,	2.903E 00,	TEE227	367
6	7.608E 01,	1.000E 00,	3.000E 01,	2.301E 00,	TEE227	368
7	7.742E 01,	1.000E 00,	4.500E 01,	2.301E 00,	TEE227	369
8	9.627E 01,	1.800E 00,	0.0	2.903E 00,	TEE227	370
9	9.981E 01,	1.800E 00,	7.181E 00,	2.903E 00,	TEE227	371
*	1.071E 02,	1.800E 00,	1.448E 01,	2.602E 00,	TEE227	372
*	1.013E 02,	1.800E 00,	1.448E 01,	2.903E 00,	TEE227	373
*	5.589E 01,	1.000E 00,	9.000E 01,	3.505E 00,	TEE227	374
*	7.901E 01,	1.000E 00,	9.000E 01,	2.301E 00,	TEE227	375
*	6.370E 01,	1.000E 00,	0.0	2.602E 00,	TEE227	376
*	8.488E 01,	2.000E 00,	1.448E 01,	3.806E 00,	TEE227	377
*	5.089E 01,	1.000E 00,	1.448E 01,	3.505E 00,	TEE227	378
*	1.109E 02,	1.800E 00,	7.181E 00,	2.301E 00,	TEE227	379
*	8.347E 01,	1.400E 00,	0.0	2.903E 00,	TEE227	380
DATA A27 /					TEE227	381
1	8.591E 01,	1.400E 00,	4.500E 01,	3.204E 00,	TEE227	382
2	8.226E 01,	2.000E 00,	4.500E 01,	4.107E 00,	TEE227	383
3	1.161E 02,	2.000E 00,	3.000E 01,	2.301E 00,	TEE227	384
4	8.227E 01,	1.200E 00,	9.000E 01,	2.903E 00,	TEE227	385
5	7.388E 01,	1.400E 00,	4.500E 01,	3.806E 00,	TEE227	386
6	9.235E 01,	1.200E 00,	1.448E 01,	2.000E 00,	TEE227	387
7	7.099E 01,	1.600E 00,	7.181E 00,	4.107E 00,	TEE227	388
8	9.446E 01,	1.200E 00,	3.000E 01,	2.000E 00,	TEE227	389
9	9.580E 01,	1.200E 00,	4.500E 01,	2.000E 00,	TEE227	390
*	7.246E 01,	1.600E 00,	1.448E 01,	4.107E 00,	TEE227	391
*	8.303E 01,	1.600E 00,	7.181E 00,	3.505E 00,	TEE227	392
*	7.453E 01,	1.600E 00,	3.000E 01,	4.107E 00,	TEE227	393
*	7.799E 01,	1.000E 00,	1.448E 01,	2.000E 00,	TEE227	394
*	6.031E 01,	1.000E 00,	4.500E 01,	3.204E 00,	TEE227	395
*	9.739E 01,	1.200E 00,	9.000E 01,	2.000E 00,	TEE227	396
*	1.026E 02,	1.600E 00,	0.0	2.301E 00,	TEE227	397
*	6.190E 01,	1.000E 00,	9.000E 01,	3.204E 00,	TEE227	398
*	8.589E 01,	2.000E 00,	0.0	3.505E 00,	TEE227	399
					TEE227	400

N=1296

N4=324
CALL FTPRT(N,DATN,N4,D1,D2,D3,D4,IMODE,ALN)
RETURN
END

TEE227	4C1
TEE227	402
TEE227	403
TEE227	4C4

	FUNCTION TERP1(Z,X,Y,ND,I)		TERP1	2
C	SC0940 TERP1 PS-472 LL, PAUL 661013 7094 6600		TERP1	3
C	LAGRANGIAN INTERPOLATION		TERP1	4
	DIMENSION X(1), Y(1)		TERP1	5
	N = I + ND		TERP1	6
C	INTERPOLATE FOR Y(Z)		TERP1	7
	TERP1 = 0.		TERP1	8
	DO 50 J = 1, N		TERP1	9
	PX = 1.		TERP1	10
	DO 42 K = 1, N		TERP1	11
	IF(K .EQ. J) GO TO 42		TERP1	12
	PX = (PX/(X(J) - X(K)))*(Z - X(K))		TERP1	13
42	CONTINUE		TERP1	14
50	TERP1 = TERP1 + PX*Y(J)		TERP1	15
51	RETURN		TERP1	16
	END		TERP1	17

```

FUNCTION TERP2(ZX,ZY,X,Y,F2,NX,NY,IX,IY,II,JJ)
C S00941 TERP2 PS-472 LL, PAUL 661013 7094 6600
C LAGRANGIAN INTERPOLATION — 2 INDEPENDENT VARIABLES
DIMENSION X(1), Y(1), F2(MX,MY)
N = II + NX
M = JJ + NY
TERP2 = C.
DO 3 I = II, N
PX = 1.
DO 1 K = II, N
IF(K .EQ. I)GO TO 1
PX = (PX/(X(I) - X(K)))*(ZX - X(K))
1 CONTINUE
DO 3 J = JJ, M
PY = 1.
DO 2 K = JJ, M
IF(K .EQ. J)GO TO 2
PY = (PY/(Y(J) - Y(K)))*(ZY - Y(K))
2 CONTINUE
3 TERP2 = TERP2 + PY*PX*F2(I,J)
RETURN
END

```

```

TERP2      2
TERP2      3
TERP2      4
TERP2      5
TERP2      6
TERP2      7
TERP2      8
TERP2      9
TERP2     10
TERP2     11
TERP2     12
TERP2     13
TERP2     14
TERP2     15
TERP2     16
TERP2     17
TERP2     18
TERP2     19
TERP2     20
TERP2     21
TERP2     22
TERP2     23

```

	FUNCTION TERP3(X1,Y1,Z1,X,Y,Z,F3,AX,AY,AZ,MX,MY,MZ,I,J,K)	TERP3	2
C	S00942 TERP3 PS-472 LL, PAUL 661013 7094 6600	TERP3	3
C	LAGRANGIAN INTERPOLATION -- 3 INDEPENDENT VARIABLES	TERP3	4
	DIMENSION X(1), Y(1), Z(1), F3(MX,MY,MZ)	TERP3	5
C	CALCULATE LOOP ENDS	TERP3	6
	NI = I + NX	TERP3	7
	NJ = J + NY	TERP3	8
	NK = K + NZ	TERP3	9
C	TRIPLE SUMMATION	TERP3	10
	TERP3 = 0.	TERP3	11
	DO 4 LI = I, NI	TERP3	12
	PX = 1.	TERP3	13
C	X PRODUCT	TERP3	14
	DO 1 L = I, NI	TERP3	15
	IF(L .EQ. LI)GO TO 1	TERP3	16
	PX = (PX/(X(LI) - X(L)))*(X1 - X(L))	TERP3	17
1	CONTINUE	TERP3	18
	DO 4 LJ = J, NJ	TERP3	19
	PY = 1.	TERP3	20
C	Y PRODUCT	TERP3	21
	DO 2 L = J, NJ	TERP3	22
	IF(L .EQ. LJ)GO TO 2	TERP3	23
	PY = (PY/(Y(LJ) - Y(L)))*(Y1 - Y(L))	TERP3	24
2	CONTINUE	TERP3	25
	DO 4 LK = K, NK	TERP3	26
	PZ = 1.	TERP3	27
C	Z PRODUCT	TERP3	28
	DO 3 L = K, NK	TERP3	29
	IF(L .EQ. LK)GO TO 3	TERP3	30
	PZ = (PZ/(Z(LK) - Z(L)))*(Z1 - Z(L))	TERP3	31
3	CONTINUE	TERP3	32
C	SUM	TERP3	33
4	TERP3 = TERP3 + PX*PY*PZ*F3(LI,LJ,LK)	TERP3	34
	RETURN	TERP3	35
	END	TERP3	36

SUBROUTINE TONCOR(SPL,CCRR,FREQ,IRR)		TONCOR	2
C-----		TONCOR	3
C-----	TONCOR GRABLE,E.L. OCTOBER 1969	TONCOR	4
C-----	ABSTRACT T O N C O R IS A DRIVER FOR ACOUSTICS SUBROUTINES	TONCOR	5
C-----	THAT CALCULATE A TONE CORRECTION FROM A SOUND LEVEL	TONCOR	6
C-----	SPECTRUM. THE SLOPE METHOD (DEFINED IN REF. 1) IS USED	TONCOR	7
C-----	TO FIND TONAL IRREGULARITIES, THEN THESE ARE APPLIED TO	TONCOR	8
C-----	THE ISO/FAA CURVES (ALSO IN REF. 1) TO FIND TONE COR-	TONCOR	9
C-----	RECTIONS. THE MAXIMUM OF THESE IS RETURNED AS THE TONE	TONCOR	10
C-----	CORRECTION SOUGHT.	TONCOR	11
C-----	REFERENCE 1. DEPARTMENT OF TRANSPORTATION, FEDERAL AVIATION	TONCOR	12
C-----	REGULATIONS, TITLE 14, CHAPTER 1, PART 36 **	TONCOR	13
C-----	NOISE STANDARDS- AIRCRAFT TYPE CERTIFICATION **	TONCOR	14
C-----	FEDERAL AVIATION ADMINISTRATION, NOV. 3, 1969.	TONCOR	15
C-----		TONCOR	16
C-----	INPUT SPL = AN ARRAY OF SOUND PRESSURE LEVELS CORRESPONDING	TONCOR	17
C-----	TO 24 1/3-OCTAVE BANDS WITH CENTER FREQUENCY OF	TONCOR	18
C-----	FIRST BAND AT 50 CPS.	TONCOR	19
C-----		TONCOR	20
C-----	OUTPUT CORR= THE TONE CORRECTION FOR THE SPECTRUM.	TONCOR	21
C-----	FREQ= CENTER FREQUENCY OF THE BAND CORRESPONDING TO	TONCOR	22
C-----	THE TONE CORRECTION.	TONCOR	23
C-----	IRR = THE BAND NUMBER CORRESPONDING TO THE TONE	TONCOR	24
C-----	CORRECTION.	TONCOR	25
C-----		TONCOR	26
C-----	LOCAL VARIABLES	TONCOR	27
C-----	F = AN ARRAY OF TONAL IRREGULARITIES	TONCOR	28
C-----	FA = AN ARRAY OF CENTER FREQUENCIES	TONCOR	29
C-----	FC = AN ARRAY OF TONAL CORRECTIONS	TONCOR	30
C-----	N = NUMBER OF FREQUENCY BANDS (24)	TONCOR	31
C-----		TONCOR	32
	DIMENSION SPL(24,17),FA(24),F(24),FC(24),CCRR(17)	TONCOR	33
	DATA FA / 50.,63.,80.,100.,125.,160.,200.,250.,315.,	TONCOR	34
	1400.,500.,630.,800.,1000.,1250.,1600.,2000.,2500.,3150.,4000.,	TONCOR	35
	25000.,6300.,8000.,10000./,N/24/	TONCOR	36
	DO 30 JJ=1,17	TONCOR	37
	CALL TONES2(SPL(1,JJ),F)	TONCOR	38
	CALL FAAISO(F,FA,N,FC)	TONCOR	39
	IRR = 1	TONCOR	40
	CCRR(JJ)=0.	TONCOR	41
	DO 20 I=2,24	TONCOR	42
	IF (FC(I).LE.CCRR(JJ)) GO TO 20	TONCOR	43
	IRR = I	TONCOR	44
	CORR(JJ) = FC(I)	TONCOR	45
20	CONTINUE	TONCOR	46
	FREQ = FA(IRR)	TONCOR	47
30	CONTINUE	TONCOR	48
	RETURN	TONCOR	49
	END	TONCOR	50

<pre> SUBROUTINE TONES3(SPL,F) C----- GRABLE, E. L. TONES3 700108 C----- ABSTRACT THE SLOPE METHOD OF TONE IDENTIFICATION AS PRESENTED C----- IN REFERENCE 1 IS USED TO FIND TONAL IRREGULARITIES C----- IN 24 ONE-THIRD OCTAVE BANDS. C----- REFERENCE 1. DEPARTMENT OF TRANSPORTATION, FEDERAL AVIATION C----- REGULATIONS, TITLE 14, CHAPTER 1, PART 36 ** C----- NOISE STANDARDS- AIRCRAFT TYPE CERTIFICATION ** C----- FEDERAL AVIATION ADMINISTRATION, NOV. 3, 1969. C----- C----- INPUT* SPL ARRAY IS 24 ELEMENT ARRAY OF SOUND PRESSURE LEVELS C----- IN 24 ONE-THIRD OCTAVE BANDS (PREFERRED OCTAVES) C----- OUTPUT* F ARRAY IS 24 ELEMENT ARRAY OF TONAL IRREGULARITIES. C----- C----- LOCAL VARIABLES MEANING C----- S FIRST ORDER SLOPES C----- SPLP AVERAGED SOUND PRESSURE LEVELS C----- C C REVISED ON MARCH 10, 1971 BY J. L. CRAIG C C THE STEP 4 CALCULATIONS HAVE BEEN MODIFIED TO ALTER CALCULATION C OF SPLPRIME(23). HERE-TO-FORE IF SPL(23) HAD BEEN CIRCLED AS C PER CONDITION B OF STEP 3, SPLPRIME(23) WAS NOT CALCULATED AS C THE AVERAGE OF SPL(22) AND SPL(24) AS PER PARAGRAPH B OF STEP C 4. THIS PARAGRAPH IS NOW SATISFIED. C C DIMENSION SPL(24),S(24),SPLP(24),F(24) C----- STEP ONE C DO 20 I=4,24 C S(I) = SPL(I) - SPL(I-1) C 20 CONTINUE C----- STEPS TWO AND FOUR C SPLP(3) = SPL(3) C SPLP(4) = SPL(4) C DO 50 I=5,24 C SPLP(I) = SPL(I) C IF (ABS(S(I)-S(I-1)).LE.5.) GO TO 50 C----- STEPS THREE AND FOUR C IF (S(I).LE.0.) GO TO 40 C IF (I.LT.23.AND. C * (S(I).GT.S(I-1))) SPLP(I) = (SPL(I-1)+SPL(I+1))*0.5 C GO TO 50 C 40 IF (S(I-1).GT.0.) SPLP(I-1) = (SPL(I-2)+SPL(I))*0.5 C 50 CONTINUE C SPLP(24) = SPL(24) C IF (ABS(S(24)-S(23)).GT.5..AND.S(24).GT.AMAX1(0.,S(23))) C * SPLP(24) = SPL(23) + S(23) C----- STEPS FIVE, SIX, SEVEN, AND EIGHT. C F(1) = 0. C F(2) = 0. C F(3) = 0. C DO 60 I=4,23 C F(I) = SPL(I) - (SPLP(I-1) + SPLP(I) + SPLP(I+1))/3. C 60 CONTINUE C F(24) = SPL(24) - SPLP(24) </pre>	<pre> TONES3 2 TONES3 3 TONES3 4 TONES3 5 TONES3 6 TONES3 7 TONES3 8 TONES3 9 TONES3 10 TONES3 11 TONES3 12 TONES3 13 TONES3 14 TONES3 15 TONES3 16 TONES3 17 TONES3 18 TONES3 19 TONES3 20 TONES3 21 TONES3 22 TONES3 23 TONES3 24 TONES3 25 TONES3 26 TONES3 27 TONES3 28 TONES3 29 TONES3 30 TONES3 31 TONES3 32 TONES3 33 TONES3 34 TONES3 35 TONES3 36 TONES3 37 TONES3 38 TONES3 39 TONES3 40 TONES3 41 TONES3 42 TONES3 43 TONES3 44 TONES3 45 TONES3 46 TONES3 47 TONES3 48 TONES3 49 TONES3 50 TONES3 51 TONES3 52 TONES3 53 TONES3 54 TONES3 55 TONES3 56 TONES3 57 TONES3 58 </pre>
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DC 80 I=4,24
IF (F(I).LT.0.) F(I) = 0.
80 CONTINUE
RETURN
END

TONES3	59
TONES3	60
TONES3	61
TONES3	62
TONES3	63

1	SLBROUTINE UNIFLW(AF,U,V,W,AMACH,ROPP,THOP,TH,ETA,PSI,ALP,DLT, GAM,ROPP,THOPP,THP,ETAP,TLE,PSIO,PSIOP)	UNIFLW	2
C		UNIFLW	3
C	TITLE	UNIFLW	4
C	UNIFORM FLOW EFFECTS	UNIFLW	5
C		UNIFLW	6
C	PURPOSE	UNIFLW	7
C	THIS SUBROUTINE COMPUTES UNIFORM FLOW EFFECTS BY THE FOLLOWING	UNIFLW	8
C	COORDINATE TRANSFORM FOR SOURCE POSITION	UNIFLW	9
C	COORDINATE TRANSFORM FOR OBSERVER DIRECTION ANGLES	UNIFLW	10
C	SPECIAL LEADING EDGE TERM	UNIFLW	11
C	WAVE NUMBER TRANSFORM	UNIFLW	12
C	DIRECTIVITY ANGLE FOR REFERENCE PRESSURE OF DIFFRACTED	UNIFLW	13
C	INCIDENT AND IMAGE FIELDS	UNIFLW	14
C		UNIFLW	15
C	INPUT - CALL SEQUENCE	UNIFLW	16
C	AF UNIT VECTOR IN DIRECTION OF AMBIENT FLOW	UNIFLW	17
C	U,V,W UNIT VECTORS FOR COORDINATE SYSTEM FIXED TO EDGE	UNIFLW	18
C	AMACH AIRCRAFT MACH NUMBER	UNIFLW	19
C	ROPP,THOP POLAR COORDINATES OF APPARENT SOURCE WITH JET FLOW	UNIFLW	20
C	REMOVED	UNIFLW	21
C	TH,ETA DIRECTION ANGLES RELATIVE TO EDGE	UNIFLW	22
C	PSI OBSERVER DIRECTIVITY ANGLE	UNIFLW	23
C	ALP,DLT ENGINE CENTERLINE ANGLES RELATIVE TO HALF PLANE	UNIFLW	24
C		UNIFLW	25
C	OUTPUT	UNIFLW	26
C	GAM TRANSFORMED WAVE NUMBER	UNIFLW	27
C	ROPP MAGNITUDE OF TRANSFORMED SOURCE POSITION	UNIFLW	28
C	THOPP PHASE OF TRANSFORMED SOURCE POSITION	UNIFLW	29
C	THP,ETAP TRANSFORMED OBSERVER POSITION ANGLES	UNIFLW	30
C	TLE LEADING EDGE TERM	UNIFLW	31
C	PSIO DIRECTIVITY ANGLES FOR DIFFRACTED INCIDENT FIELD	UNIFLW	32
C	PSIOP DIRECTIVITY ANGLES FOR DIFFRACTED IMAGE FIELD	UNIFLW	33
C		UNIFLW	34
C	NOTE	UNIFLW	35
C	ALL INPUT AND OUTPUT ANGLES ARE IN DEGREES	UNIFLW	36
C		UNIFLW	37
C	DIMENSION AF(3),U(3),V(3),W(3),R(3),EL(3)	UNIFLW	38
C		UNIFLW	39
C	DATA DEGRAD,RADDEG,EPS /1.745329251943E-2,57.295779513082,1.2E-4/	UNIFLW	40
C		UNIFLW	41
C	INITIALIZATION COMPUTATIONS	UNIFLW	42
C		UNIFLW	43
C	TLE = 0.	UNIFLW	44
C	THOPP = THCP	UNIFLW	45
C	THP = TH	UNIFLW	46
C	ETAP = ETA	UNIFLW	47
C	ALP = ALP	UNIFLW	48
C	ROPP = RCP	UNIFLW	49
C	GAM = 1.	UNIFLW	50
C	SINETA = SIN(ETA * DEGRAD)	UNIFLW	51
C	COSETA = SQRT(1. - SINETA*SINETA)	UNIFLW	52
C	IF (ABS(AMACH) .LE. EPS) GO TO 90	UNIFLW	53
C	WAVE NUMBER TRANSFORM	UNIFLW	54
C		UNIFLW	55
C	EMV=AMACH*DOTP(AF,V)	UNIFLW	56
C	GMA2=1./(1.-EMV*EMV)	UNIFLW	57
		UNIFLW	58

	GAM=SQRT(GMA2)	UNIFLW	59
	GAM1=GAM-1.	UNIFLW	60
C		UNIFLW	61
C	SOURCE COORDINATE TRANSFORM(ORIGINAL SCURCE VECTOR)	UNIFLW	62
C		UNIFLW	63
	CTHOP=COS(THOP*DEGRAD)	UNIFLW	64
	STHOP=SIN(THOP*DEGRAD)	UNIFLW	65
	R(1)= ROP*(STHOP*W(1)-CTHOP*V(1))	UNIFLW	66
	R(2)= ROP*(STHOP*W(2)-CTHOP*V(2))	UNIFLW	67
	R(3)= ROP*(STHOP*W(3)-CTHOP*V(3))	UNIFLW	68
	DCT=DOTP(R,AF)	UNIFLW	69
	EL(1)= R(1)-DOT*AF(1)	UNIFLW	70
	EL(2)= R(2)-DOT*AF(2)	UNIFLW	71
	EL(3)= R(3)-DOT*AF(3)	UNIFLW	72
	ELMAG= SQRT(EL(1)*EL(1)+EL(2)*EL(2)+EL(3)*EL(3))	UNIFLW	73
	IF(ELMAG.GT.0.)GO TO 20	UNIFLW	74
	EL(1)= W(1)	UNIFLW	75
	EL(2)= W(2)	UNIFLW	76
	EL(3)= W(3)	UNIFLW	77
	GO TO 40	UNIFLW	78
20	CALL VECN(EL)	UNIFLW	79
40	R(1)= R(1)+GAM1*DCT*AF(1)	UNIFLW	80
	R(2)= R(2)+GAM1*DCT*AF(2)	UNIFLW	81
	R(3)= R(3)+GAM1*DCT*AF(3)	UNIFLW	82
	TMAG=SQRT(R(1)*R(1)+R(2)*R(2)+R(3)*R(3))	UNIFLW	83
	COSXI = -DOT / ROP	UNIFLW	84
	CCSXIP=(COSXI+AMACH)/(1.+AMACH*CCSXIP)	UNIFLW	85
	SINXIP=SQRT(1.-COSXIP*CCSXIP)	UNIFLW	86
		UNIFLW	87
	NEW SOURCE VECTOR	UNIFLW	88
C		UNIFLW	89
	R(1)= TMAG*(SINXIP*EL(1)-CCSXIP*AF(1))	UNIFLW	90
	R(2)= TMAG*(SINXIP*EL(2)-CCSXIP*AF(2))	UNIFLW	91
	R(3)= TMAG*(SINXIP*EL(3)-CCSXIP*AF(3))	UNIFLW	92
	DCT= DOTP(R,U)	UNIFLW	93
	R(1)= R(1)-DOT*L(1)	UNIFLW	94
	R(2)= R(2)-DOT*L(2)	UNIFLW	95
	R(3)= R(3)-DOT*U(3)	UNIFLW	96
	ROPP=SQRT(R(1)*R(1)+R(2)*R(2)+R(3)*R(3))	UNIFLW	97
	DCT=-DOTP(R,V)	UNIFLW	98
	TRCPP=ACOS(DCT/ROPP)*RADDEG	UNIFLW	99
C		UNIFLW	100
C	OBSERVER TRANSFORM (ORIGINAL OBSERVER VECTOR)	UNIFLW	101
C		UNIFLW	102
	CCSTH = COS(TH*DEGRAD)	UNIFLW	103
	SINTH = SIN(TH*DEGRAD)	UNIFLW	104
	R(1)= SINETA*U(1)+COSETA*CCSTH*V(1)-CCSETA*SINTH*W(1)	UNIFLW	105
	R(2)= SINETA*U(2)+COSETA*CCSTH*V(2)-CCSETA*SINTH*W(2)	UNIFLW	106
	R(3)= SINETA*U(3)+COSETA*CCSTH*V(3)-CCSETA*SINTH*W(3)	UNIFLW	107
	DCT=DOTP(R,AF)	UNIFLW	108
	EL(1)= R(1)-DOT*AF(1)	UNIFLW	109
	EL(2)= R(2)-DOT*AF(2)	UNIFLW	110
	EL(3)= R(3)-DOT*AF(3)	UNIFLW	111
	ELMAG=SQRT(EL(1)*EL(1)+EL(2)*EL(2)+EL(3)*EL(3))	UNIFLW	112
	IF(ELMAG.GT.0.)GO TO 60	UNIFLW	113
	EL(1)=-W(1)	UNIFLW	114
	EL(2)=-W(2)	UNIFLW	115

EL(3)=-W(3)	UNIFLW	116
GO TO 80	UNIFLW	117
60 CALL VECN(EL)	UNIFLW	118
80 COSXI=DOT	UNIFLW	119
CCSXIP=(COSXI-AMACH)/(1.-CCSXIP*AMACH)	UNIFLW	120
SINXIP=SQRT(1.-COSXIP*CCSXIP)	UNIFLW	121
C	UNIFLW	122
C NEW VECTOR TO OBSERVER	UNIFLW	123
C	UNIFLW	124
R(1) =SINXIP*EL(1)+COSXIP*AF(1)	UNIFLW	125
R(2) =SINXIP*EL(2)+CCSXIP*AF(2)	UNIFLW	126
R(3) =SINXIP*EL(3)+COSXIP*AF(3)	UNIFLW	127
DOT= DOTP(R,U)	UNIFLW	128
ETAP=ASIN(DOT)*RADDEG	UNIFLW	129
THP=C.O	UNIFLW	130
ARG1= -DOTP(R,W)	UNIFLW	131
ARG2= DOTP(R,V)	UNIFLW	132
IF((ARG1.NE.O.).OR.(ARG2.NE.C.)) THP=ATAN2(ARG1,ARG2)*RADDEG	UNIFLW	133
C	UNIFLW	134
C CALC. SPECIAL LEADING EDGE TERM FACTOR AND REFERENCE DIRECTIVITY	UNIFLW	135
C ANGLES GRAZING BARRIER EDGE FOR INCIDENT AND IMAGE SIGNALS	UNIFLW	136
C	UNIFLW	137
IF(EMV.LT.O.))TLE=EMV/(1.+AMACH*CCSXIP)	UNIFLW	138
90 SINALP = U(2)	UNIFLW	139
CCSALP = SQRT(1. - SINALP*SINALP)	UNIFLW	140
ARG1 = COSALP*COSETA*COS((THOP-CLT)*DEGRAD) - SINALP*SINETA	UNIFLW	141
IF(ABS(ARG1).GT.1.)ARG1=SIGN(1.,ARG1)	UNIFLW	142
PSIO=180.-ACOS(ARG1)*RADDEG	UNIFLW	143
IF (TH .LE.-THOP) GO TO 100	UNIFLW	144
PSIOP=PSIO	UNIFLW	145
GO TO 200	UNIFLW	146
100 ARG1 = COSALP*COSETA*CGS((TH+CLT)*DEGRAD) - SINALP*SINETA	UNIFLW	147
IF(ABS(ARG1).GT.1.)ARG1=SIGN(1.,ARG1)	UNIFLW	148
PSICP=180.-ACOS(ARG1)*RADDEG	UNIFLW	149
200 IF (TH .LT. THOP) PSIO = PSI	UNIFLW	150
C	UNIFLW	151
RETURN	UNIFLW	152
END	UNIFLW	153

SUBROUTINE UNIT(DISTAT,NUMBER,SPL)		UNIT	2
C	AUTHOR D. F. MELDRUM	UNIT	3
C		UNIT	4
C	PURPOSE TO CONVERT DATA AT ANY GIVEN REFERENCED DISTANCE	UNIT	5
C	TO AN INDEXED SPECTRA AT 3.281 FEET (1 METER)	UNIT	6
C		UNIT	7
C	METHOD ACCOUNT FOR SPHERICAL DIVERGENCE AND ATMOSPHERIC	UNIT	8
C	ABSORPTIONS A STANDARD DAY CONDITIONS OF	UNIT	9
C	70 PERCENT RELATIVE HUMIDITY AND 59 DEGREES F.	UNIT	10
C		UNIT	11
C	INPUTS DISTAT DISTANCE GIVEN FOR THE REFERENCED	UNIT	12
C	DATA (DISTANCE PREDICTED AT).	UNIT	13
C	NUMBER NUMBER OF ANGLES OR SET OF SPECTRA	UNIT	14
C	TO BE CONVERTED.	UNIT	15
C	SPL SPECTRA TO BE CONVERTED	UNIT	16
C		UNIT	17
C	VIA LABELED COMMON GFREQ	UNIT	18
C		UNIT	19
C	FREQ 1/3 OCTAVE CENTER BAND FREQUENCIES	UNIT	20
C		UNIT	21
C	OUTPUTS SPL CONVERTED TO INDEXED SPECTRA	UNIT	22
C		UNIT	23
C	FUNCTION SUBPRGM ALCG1C	UNIT	24
C		UNIT	25
C	DIMENSION COEF(24),SPL(24,NUMBER)	UNIT	26
C		UNIT	27
C		UNIT	28
C	COMMON /GFREQ/ FREQ(24)	UNIT	29
C		UNIT	30
C		UNIT	31
C	DATA DISTGO/3.281/,ISWTC/0/	UNIT	32
C		UNIT	33
C	IF(ISWTC.NE.0) GO TO 100	UNIT	34
C	ISWTC=1	UNIT	35
C	CALL ABSORP(70.0,59.0,3,24,FREQ,COEF)	UNIT	36
C		UNIT	37
C		UNIT	38
C	100 SPHER=20.0*ALOGIC(DISTAT/DISTGO)	UNIT	39
C		UNIT	40
C	DO 200 I=1,24	UNIT	41
C	ATMOS=COEF(I)*(DISTAT-DISTGO)/1000.0	UNIT	42
C		UNIT	43
C	DO 200 J=1,NUMBER	UNIT	44
C		UNIT	45
C	IF(SPL(I,J).NE.C.C) SPL(I,J)=SPL(I,J)	UNIT	46
C	* +SPHER+ATMOS	UNIT	47
C		UNIT	48
C	200 CONTINUE	UNIT	49
C	RETURN	UNIT	50
C	END	UNIT	51

	SUBROUTINE VALUES(IMODE,NLS,NLF,XF,YF,Z,SCI,CE,EPR,DS,	VALUES	2
	* X1,X2,Y1,Y2,SUM,SLNL ,IEC)	VALUES	3
	COMMON/VALNL/NLST,NLFT	VALUES	4
	COMMON/ASD/SD(3),NSL	VALUES	5
	DIMENSION SUM(1),IEC(1),X1(1),X2(1),Y1(1),Y2(1)	VALUES	6
	DIMENSION DS(1),SLNL(3)	VALUES	7
	DIMENSION X1Q(5),X2Q(5),Y1Q(5),Y2Q(5),SUMQ(5),SLNLQ(3),IECQ(5)	VALUES	8
	COMMON/FLIGHT/IMODEQ,XFQ,YFQ,ZQ,SCIQ,DEQ,EPRQ	VALUES	9
	COMMON/RESLTT/X1Q,X2Q,Y1Q,Y2Q,SLAQ,SLALC,IECQ	VALUES	10
C		VALUES	11
C		VALUES	12
C	IF IMODE= -1 INITIALIZATION OF CONTCUR PROGRAM	VALUES	13
C	IMODE= 0 HOLD NO ACTION RETURN	VALUES	14
C	IMODE= 1 REAL TIME CR 360/67 SIMULATION	VALUES	15
	IF(IMODE) 1000,1030,1030	VALUES	16
1000	CONTINUE	VALUES	17
	JJK=0	VALUES	18
	DO 1001 I=1,3	VALUES	19
	IF(DS(I).LT. 1.0)GO TO 1001	VALUES	20
	SD(I)=DS(I)	VALUES	21
	JJK=JJK+1	VALUES	22
1001	CONTINUE	VALUES	23
	NSL=JJK	VALUES	24
1020	CONTINUE	VALUES	25
	NLST=NLS	VALUES	26
	NLFT=NLF	VALUES	27
	CALL TEE227(IMODE,N,N)	VALUES	28
	RETURN	VALUES	29
1030	CONTINUE	VALUES	30
	IMODEQ=IMODE	VALUES	31
	XFQ=XF	VALUES	32
	YFQ=YF	VALUES	33
	ZQ=Z	VALUES	34
	SCIQ=SCI	VALUES	35
	DEQ=DE	VALUES	36
	EPRQ=EPR	VALUES	37
	CALL VALUE2	VALUES	38
	DO 1028 I=NLS,NLF	VALUES	39
	X1(I)=X1Q(I)	VALUES	40
	X2(I)=X2Q(I)	VALUES	41
	Y1(I)=Y1Q(I)	VALUES	42
	Y2(I)=Y2Q(I)	VALUES	43
	SUM(I)=SUMQ(I)	VALUES	44
	IEC(I)=IECQ(I)	VALUES	45
1028	CONTINUE	VALUES	46
	DO 1029 I=1,NSL	VALUES	47
1029	SLNL(I)=SLNLQ(I)	VALUES	48
	RETURN	VALUES	49
	END	VALUES	50

C	SUBROUTINE VOIM(AARRAY,BARRAY,NEPR,NL,NLRC,NALFA,NLS,NLF)	VDIM	2
C		VDIM	3
C	THIS ROUTINE ASSUMES THAT THE AIRCRAFT IS FLYING IN THE (X,Y,Z	VDIM	4
C	COORDINATE SYSTEM. THE POSITIONS (ONE TO THE RIGHT AND ONE TO	VDIM	5
C	THE LEFT OF THE AIRCRAFT IN THE U,V SYSTEM) OF THE INTERSECTION	VDIM	6
C	OF THE CONTOUR ARE CALCULATED. THE COORDINATES OF THESE TWO PO	VDIM	7
C	RELATIVE TO THE AIRCRAFT ARE TRANSFORMED INTO THE (X,Y,Z) SYST	VDIM	8
C		VDIM	9
C		VDIM	10
C	REVISED BY D.G. DUNN (17 JUN 1974)	VDIM	11
C		VDIM	12
C	IEC ERROR CODE FOR EACH PARTICULAR CONTOUR	VDIM	13
C	IEC LT 0 INDICATES NO ERROR	VDIM	14
C	IEC EQ 0 INDICATES CONTOUR HAS CLOSED	VDIM	15
C	IEC GT 0 INDICATES SINGULARITY CONDITION EXISTS	VDIM	16
C		VDIM	17
C	ASSUMPTIONS	VDIM	18
C	-90 LT DE LT 90 I.E. CCS(DE) GT ZERO	VDIM	19
C	0 LT SCI LT 180 AND CCS(DE) DOES NOT EQUAL SCI	VDIM	20
C	RPD ... RADIANS PER DEGREE (1.745329252E-2)	VDIM	21
C	DPR ... DEGREES PER RADIAN (57.2957795)	VDIM	22
C	DIMENSION SUM(5),IEC(5),U(5),V(5),X1(5),X2(5),Y1(5),Y2(5)	VDIM	23
C	DIMENSION U2(5), V2(5), SAX(5)	VDIM	24
C	COMMON/ASC/SD(3),NSL	VDIM	25
C	COMMON/CONINT/AEPR(6),ALRO(9),AALFA(6)	VDIM	26
C	COMMON/FLIGHT/IMODE,XF,YF,Z,SCI,DE,EPR	VDIM	27
C	COMMON/RESLT/X1,X2,Y1,Y2,SLN,SLNL,IEC	VDIM	28
C	DIMENSION AARRAY(NLRO,NALFA,NEPR),BARRAY(NEPR,NALFA,NL)	VDIM	29
C	DIMENSION SLNL(3),SUMX(5)	VDIM	30
C	DOUBLE PRECISION SUMX	VDIM	31
C		VDIM	32
C	DATA CONSTANTS	VDIM	33
C	DATA IO, I1, I2 /C,1,2/	VDIM	34
C	DATA INDX, MAXIT, EPS2, U, V, SAX /1,10,1.2E-5,10*0.,5*45.0/	VDIM	35
C	DATA DPR,RPD,ONE,ZERO,P5,EPS,H1,H2,H3/57.2957795,0.01745329252,	VDIM	36
C	11.0,C.0,0.5,1.E-4,90.0,180.0,360.C/	VDIM	37
C	GC TO 1360	VDIM	38
C	ENTRY RESTRT	VDIM	39
C	101C INDX = I1	VDIM	40
C	DC 1020 I=1,NL	VDIM	41
C	SLM(I) = ZERO	VDIM	42
C	SLMX(I) = ZERO	VDIM	43
C	IEC(I) = -I1	VDIM	44
C	102C CONTINUE	VDIM	45
C	GC TO 1360	VDIM	46
C	ENTRY VALUE2	VDIM	47
C	103C CONTINUE	VDIM	48
C	DC 1040 I=NLS,NLF	VDIM	49
C	104C IEC(I) = -I1	VDIM	50
C	IF (INDX .GT. I1) GO TO 106C	VDIM	51
C	DC 1050 I=NLS,NLF	VDIM	52
C	SLM(I) = ZERO	VDIM	53
C	SLMX(I) = ZERO	VDIM	54
C	U2(I) = ZERO	VDIM	55
C	V2(I) = ZERO	VDIM	56
C	105C CONTINUE	VDIM	57
C	XS=XF	VDIM	58

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YS=YF
ZO=Z
ST = ZERO
CT = ONE
C REDUCE ANGLES (DE,SCI) TO APPROPRIATE QUADRANTS
1060 SCI=AMOD(SCI,H3)
C
SCI=ABS(SCI-H3*FLGAT(IFIX(SCI/H2)))
DE=AMOD(DE,H3)
DE=DE+H3*FLOAT(IFIX(DE/H2))
IF (ABS(DE)-H1) 1080,1080,1070
C RESTRICTION OF RANGE TEST ON DE
1070 CE=DE-SIGN(H2,DE)
SCI=H2-SCI
C
1080 A1=SCI*RPD
A2=DE*RPD
A3=A1-A2
C A3 REPRESENTS
A3T=ABS(ABS(A3)-1.570796)-EPS
C 1.5707963267949 A REPRESENTATION OF PI/2
IF (A3T) 1100,1100,1090
C RESTRICTION OF RANGE
1090 TA3=TAN(A3)
C TANGENT OF SCI-DE
1100 SA2=SIN(A2)
C SINE OF DE
SA2S=SA2*SA2
C SINE SQUARED DE
CA2S=ONE-SA2S
C COSINE SQUARED DE
CA2=SQRT(CA2S)
CA1=COS(A1)
CA1S=CA1*CA1
C
C
ZS=Z*Z
DX = XF - XS
DY = YF - YS
DZ = Z - ZO
DL = DX*DX + DY*DY
DV = DL + DZ*DZ
IF (DV .LE. ZERO) GO TO 1101
CA4 = SQRT(DL / DV)
GO TO 1102
1101 CA4 = ONE
1102 ZE = Z * CA4
ZES=ZE*ZE
C
C OBTAIN THE NOISE LEVEL AT DISTANCE SD AND AT ALTITUDE Z
DC 1120 I=1,NSL
ALPHA1=ATAN(ZE/SD(I))*DPR
SLLRO = P5 * ALOG10(ZES + SD(I)*SD(I))
SLNL(I) = TBLU3(SLLRO, ALPHA1, EPR, ALRG, AALFA, AEPR, AARRAY,
* I1, I1, I1, NLRO, NALFA, NEPR, ALRG, NALFA, NEPR)
1120 CONTINUE
C

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VDIM 59
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C		VDIM	116
C		VDIM	117
C	OBTAIN QUADRATIC EQUATION COEFFICIENTS (A,B) WHICH DO NOT VARY FOR EACH NOISE CONTOUR(J)	VDIM	118
C	A=CA2S-CA1S	VDIM	119
	B=2.*(Z*SA2*CA2)	VDIM	120
	CC=ZS*(SA2S-CA1S)	VDIM	121
	IF (A) 1140,1130,1140	VDIM	122
1130	IF (B) 1150,1160,1150	VDIM	123
1140	P1=B/(A+A)	VDIM	124
	P1S=P1*P1	VDIM	125
	IP = -I1	VDIM	126
	GO TO 1170	VDIM	127
1150	IP = I0	VDIM	128
	GO TO 1170	VDIM	129
1160	IP = I1	VDIM	130
C		VDIM	131
C	OBTAIN SINE AND COSINE OF FLIGHT VECTOR FOR TRANSFORMATION	VDIM	132
C	OF COORDINATE (U,V) TO (X,Y,Z)	VDIM	133
1170	DS = SQRT(DU)	VDIM	134
	IF (DS) 1190,1190,1180	VDIM	135
1180	ST=-(DX/DS)	VDIM	136
	CT=DY/DS	VDIM	137
C		VDIM	138
C	ITERATION FOR EACH CONTOUR(J)	VDIM	139
C		VDIM	140
1190	DO 1340 J = NLS,NLF	VDIM	141
C		VDIM	142
C	ITERATION INVOLVING THE ELEVATION ANGLE (SA = ALPHA) WHICH IS A	VDIM	143
C	FUNCTION OF THE AIRPLANE ALTITUDE AND RANGE FOR A SPECIFIED NOISE	VDIM	144
C	CONTOUR.	VDIM	145
C	CCODE USES WEGSTEINS SECANT ITERATION SCHEME EXTRACTED FROM SUBR. RTWI	VDIM	146
C	REF... IBM SYS/360 SCIENTIFIC SUBROUTINE PACKAGE, VER.III,	VDIM	147
C	H20-0166-5, 1968, PP. 215-216	VDIM	148
	DX = SAX(J)	VDIM	149
	I = -I1	VDIM	150
	K = I2	VDIM	151
C		VDIM	152
C	FIRST FUNCTION EVALUATION	VDIM	153
10	RO = 10.**TBLU2(EPR, DX, AEPR, AALFA, BARRAY(1,1,J),I1,I1, NEPR,	VDIM	154
	* NALFA, NEPR, NALFA)	VDIM	155
	IF (RO - ZE) 20, 20, 30	VDIM	156
20	SA = (DX + H1) * P5	VDIM	157
	GO TO 40	VDIM	158
30	SA = DPR * ASIN(ZE / RC)	VDIM	159
40	IF (I) 50, 60, 120	VDIM	160
50	DU = SA - DX	VDIM	161
	IF (ABS(DU) - EPS2 * ABS(SA)) 140, 140, 55	VDIM	162
55	DV = -DU	VDIM	163
	DX = SA	VDIM	164
	I = I0	VDIM	165
C		VDIM	166
C	SECOND FUNCTION EVALUATION	VDIM	167
	GO TO 10	VDIM	168
60	DY = DX - SA	VDIM	169
	I = I1	VDIM	170
	IF (ABS(DY) - P52 * ABS(SA)) 140, 140, 80	VDIM	171
		VDIM	172

80 K = K + 11	VDIM	173
IF (K - MAXIT) 90, 90, 140	VDIM	174
90 IF (DY) 100, 140, 100	VDIM	175
100 DV = DV / DY - GNE	VDIM	176
IF (DV) 110, 140, 110	VDIM	177
110 DL = DU / DV	VDIM	178
DX = DX + DU	VDIM	179
DV = DY	VDIM	180
C	VDIM	181
C THIRD TO MAXIT FUNCTION EVALUATIONS	VDIM	182
GO TO 10	VDIM	183
120 DY = DX - SA	VDIM	184
GA = EPS2 * ABS(DX)	VDIM	185
IF (ABS(DU) - DA) 130, 130, 80	VDIM	186
130 IF (ABS(DY) - 10.*DA) 140, 140, 80	VDIM	187
140 SAX(J) = SA	VDIM	188
1220 ROS = RC * RO	VDIM	189
US = ROS - ZES	VDIM	190
C TEST FOR PROPER RANGE OF U SQUARED. (IF CONTOUR HAS CLOSED)	VDIM	191
IF (US) 1230, 1230, 1260	VDIM	192
1230 U(J)=ZERO	VDIM	193
V(J)=ZERO	VDIM	194
IEC(J) = 10	VDIM	195
IF (ABS(CA4*DZ) .LE. EPS*RC) GO TO 1320	VDIM	196
DV = -DS * (2 - (RC/CA4)) / DZ	VDIM	197
IF (ABS(DV) .LT. DS) V(J) = DV	VDIM	198
IF(A3T) 1320,1320,1240	VDIM	199
C TEST TO SEE IF RADIATION DIRECTION IS STRAIGHT DOWN	VDIM	200
1240 V(J) = V(J) + RC / (CA4 * TA3)	VDIM	201
GO TO 1320	VDIM	202
1260 U(J)=SQRT(US)	VDIM	203
C=-US*CA CC	VDIM	204
IF (IP) 270, 1300, 1310	VDIM	205
1270 P2S=P1S-C/A	VDIM	206
IF (P2S) 1280,1290,1290	VDIM	207
C TEST FOR NOISE CCNE FORMING AN ELLIPSE NOT	VDIM	208
C INTERSECTING THE SIDELINE	VDIM	209
1280 P2S=-P2S	VDIM	210
IF(P2S-EPS*P1S)1290,1290,1285	VDIM	211
1285 IEC(J) = 11	VDIM	212
GO TO 1330	VDIM	213
1290 P2=SIGN(SQRT(P2S),CA1)	VDIM	214
V(J)=P1+P2	VDIM	215
GO TO 1320	VDIM	216
1300 V(J)=C/B	VDIM	217
GO TO 1320	VDIM	218
1310 V(J)=ZERO	VDIM	219
1320 LST=U(J)*ST	VDIM	220
UCT=U(J)*CT	VDIM	221
DL=XF-V(J)*ST	VDIM	222
DV=YF+V(J)*CT	VDIM	223
C	VDIM	224
C TRANSFORMATION OF COORDINATES(L,V) TO (X,Y)	VDIM	225
X1(J)=DU+UCT	VDIM	226
X2(J)=DU-UCT	VDIM	227
Y1(J)=DV+LST	VDIM	228
Y2(J)=DV-LST	VDIM	229

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DA = (L(J) + U2(J)) * (V(J) - V2(J) + CS)
SUMX(J)=SUMX(J)+DA
IF (INDX .LE. 11) SUMX(J) = ZERC
SLM(J)=SUMX(J)
1330 L2(J) = U(J)
V2(J) = V(J)
1340 CONTINUE
INDX = INDX + 11
XS=XF
YS=YF
ZO=Z
1360 RETURN
END

```

```

VDIM      230
VDIM      231
VDIM      232
VDIM      233
VDIM      234
VDIM      235
VDIM      236
VDIM      237
VDIM      238
VDIM      239
VDIM      240
VDIM      241
VDIM      242

```

```

SUBROUTINE VECN(A)
C
C ROUTINE TO NORMALIZE A VECTOR
C
  DIMENSION A(3)
  AX = SQRT(A(1)*A(1) + A(2)*A(2) + A(3)*A(3))
  IF(AX.EQ.0.)RETURN
  A(1) = A(1)/AX
  A(2) = A(2)/AX
  A(3) = A(3)/AX
  RETURN
  END

```

```

VECTOR 2
VECTOR 3
VECTOR 4
VECTOR 5
VECTOR 6
VECTOR 7
VECTOR 8
VECTOR 9
VECTOR 10
VECTOR 11
VECTOR 12
VECTOR 13

```

```

FUNCTION DOTP(A,B)
C
C COMPUTES DOT PRODUCT OF TWO VECTORS, (A,B)
C
  DIMENSION A(3), B(3)
  DOTP = A(1)*B(1) + A(2)*B(2) + A(3)*B(3)
  RETURN
END

```

```

VECTOR 14
VECTOR 15
VECTOR 16
VECTOR 17
VECTOR 18
VECTOR 19
VECTOR 20
VECTOR 21

```

```

SUBROUTINE CROSP(A,B,C)
C
C ROUTINE TO COMPUTE THE CROSS PRODUCT, A=B * C
C
  DIMENSION A(3), B(3), C(3)
  A(1) = B(2)*C(3) - C(2)*B(3)
  A(2) = C(1)*B(3) - B(1)*C(3)
  A(3) = B(1)*C(2) - C(1)*B(2)
  RETURN
  END

```

```

VECTOR 22
VECTOR 23
VECTOR 24
VECTOR 25
VECTOR 26
VECTOR 27
VECTOR 28
VECTOR 29
VECTOR 30
VECTOR 31

```

	SUBROUTINE WRPNL(NK,I,L,LCT,IPT)	WRPNL	2
	COMMON /GCONST/ IN,I0,IT1,IT2,F0,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,	WRPNL	3
	* I0,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,P1,P33,P5,P001,	WRPNL	4
	* EPS,UNDEF,B1,ICG,CPR,RPD,ETA(17),M1,FM1,I17,A,PI	WRPNL	5
C	AIRCRAFT-OBSERVER GEOMETRY CLTPLTS	WRPNL	6
C		WRPNL	7
	COMMON/SWITCH/NTYPE,ITYPE,NENG,ICCP,IPRT(7),ICN(13),NLOPT	WRPNL	8
	COMMON /GEOMO/ APY(10,17),APZ(10,17),PD(10,17),DPND(10,17),	WRPNL	9
	* B1(10,17),B2(10,17),TDS(17,10),TFC(17,10),IRR(10,17)	WRPNL	10
	* ,APP,TP,RHP,APD,TO,RHO,CA,CZ,TSP(17,10),CGV	WRPNL	11
C		WRPNL	12
	COMMON/CLABEL/CH(2,8)	WRPNL	13
	COMMON /GPRAM/ALTP,ALTR,SLCPE,AMACH,NOBS,SLDIST(10),NTENG,IUNIT	WRPNL	14
	* ,ISPTRM,IAIMOS,IAIR,LAIRAB(24),NTEMP,TEMP(50),TALT(50)	WRPNL	15
	* ,NPRES,PRES(50),PALT(50),NHLFID,RALT(50),RHUMID(50),CTEMP	WRPNL	16
	* ,CPRES,CRHUMD,IEGA,IGDR,DTEHP,DPRES,CHUMID,XKN,ND,FLO(50),	WRPNL	17
	* ZNR(50),ZNI(50),LINECT,MAXLIN,IFACE,BCG,TCG,FLR,AALT,EPF	WRPNL	18
	COMMON/PNLD/PSPL(17,20),EPNL(5,10),TEPNL(5,10)	WRPNL	19
	COMMON/GCONVC/C(2,10),SLDISX(10)	WRPNL	20
	COMMON/CRSPLS/DOB(17),PSCR(17),DFB(408),NPSCR	WRPNL	21
	DIMENSION PNL(3),TCPNL(3),T(3)	WRPNL	22
	DATA PNL/4H PNL,4H (P,4HND8)/,TCPNL/4H TCP,4HNL(P,4HND8)/,	WRPNL	23
	* T/4H T ,4H (S,4HEC) /	WRPNL	24
	WRITE(L,100)	WRPNL	25
	LCT=LCT+1	WRPNL	26
100	FORMAT(1H)	WRPNL	27
	WRITE(L,90)(ETA(J),J=1,17)	WRPNL	28
90	FORMAT(2X,10HXI (DEG),17F7.1)	WRPNL	29
	DO 95 J=1,17	WRPNL	30
	IF(PSPL(J,I).EQ.C.)PSPL(J,I+10)=C.	WRPNL	31
95	CONTINUE	WRPNL	32
	WRITE(L,110)PNL,(PSPL(J,I),J=1,17)	WRPNL	33
	LCT=LCT+2	WRPNL	34
	IF(NK.NE.3) GO TO 105	WRPNL	35
	WRITE(L,110)TCPNL,(PSPL(J,I+10),J=1,17)	WRPNL	36
	LCT=LCT+1	WRPNL	37
105	WRITE(L,110)T,(TPD(J,I),J=1,17)	WRPNL	38
	LCT=LCT+1	WRPNL	39
	WRITE(L,100)	WRPNL	40
	LCT=LCT+1	WRPNL	41
110	FORMAT(1H ,3A4,F6.1,16F7.1)	WRPNL	42
	WRITE(L,120)(EPNL(J,I),J=1,5)	WRPNL	43
	LCT=LCT+1	WRPNL	44
120	FORMAT(20H EPNL*(EPNDB) = ,F6.1,1X,28HBASED ON MIN/MAX PNL	WRPNL	45
	* = ,F6.1,1H,,F6.1,24H PND8 AND TIME LIMITS =,5X,F6.1,1H,,F6.1,	WRPNL	46
	*1X,3HSEC)	WRPNL	47
	IF(IPT.EQ.1)GO TO 121	WRPNL	48
	IF(IPRT(1).NE.8)GO TO 128	WRPNL	49
121	CONTINUE	WRPNL	50
	IF(NLOPT .EQ. 0)GO TO 128	WRPNL	51
	IF (NLOPT-1) 122, 122, 124	WRPNL	52
122	XNL=EPNL(1,1)	WRPNL	53
	GO TO 125	WRPNL	54
124	XNL=EPNL(3,1)	WRPNL	55
125	ELANG=B2(I,9)	WRPNL	56
	CPAR9=PD(I,9)	WRPNL	57
	IF (IUNIT .EQ. C)CPAR9=PD(I,9)*0.3048	WRPNL	58

CPAR9=ALOG10(CPAR9)	WRPNL	59
WRITE(20,170)XNL,EPF,ELANG,CPAR9	WRPNL	60
170 FGMAT(1PE12.3,3E12.3)	WRPNL	61
128 CONTINUE	WRPNL	62
IF(INK.NE.3)GO TO 140	WRPNL	63
WRITE(L,130)(TEPNL(J,1),J=1,5)	WRPNL	64
LCT=LCT+1	WRPNL	65
130 FORMAT(20H EPNL (EPNDB) = ,F6.1,1X,	WRPNL	66
* 28HBASED ON MIN/MAX TCPNL = ,F6.1,1H,	WRPNL	67
* ,F6.1,1X,23HPNDB AND TIME LIMITS =,5X,F6.1,1H,,F6.1,1X,3HSEC)	WRPNL	68
140 WRITE(L,100)	WRPNL	69
LCT=LCT+1	WRPNL	70
PX=PD(I,9)	WRPNL	71
BX=B2(I,9)	WRPNL	72
IF(IUNIT.NE.0)GO TO 145	WRPNL	73
IF(IPT.EQ.1)GO TO 145	WRPNL	74
IF(IPT.EQ.8)GO TO 145	WRPNL	75
PX=PX*C(2,1)	WRPNL	76
145 CONTINUE	WRPNL	77
WRITE(L,150)EPF,PX,CH(IUNIT+1,1),BX	WRPNL	78
LCT=LCT+1	WRPNL	79
150 FORMAT(20H ENG.PERF.PARM.= ,1FE10.3,18H, RANGE AT CPA = ,	WRPNL	80
* E10.3,A3,15H, ELEV.ANGLE = ,E10.3,5H DEG./ !	WRPNL	81
RETURN	WRPNL	82
END	WRPNL	83

C	SUBROUTINE WSHOUT(IPRNT,ICLT,ITYPE,USPL,NUSPL,PSI,INUSP)	WSHOUT	2
C	PURPOSE	WSHOUT	3
C	PRINTOUT THE WING SHIELDING VARIABLES	WSHOUT	4
C		WSHOUT	5
C	INPUT - CALLING SEQUENCE	WSHOUT	6
C	IPRNT - REPORT INDICATOR FOR SUBROUTINE PRINTH	WSHOUT	7
C	IOUT - OUTPUT UNIT	WSHOUT	8
C	ITYPE - COMPONENT NOISE TYPE	WSHOUT	9
C	USPL - ARRAY OF INPUT GR BLIT IN UNSHIELDED SPL TO BE USED	WSHOUT	10
C	NUSPL - NUMBER OF USPL	WSHOUT	11
C	PSI - DIRECTIVITY ANGLES AT WHICH PSI ARE INPUT	WSHOUT	12
C	INUSP - NON-ZERO WHEN USPL ARE TO BE PRINTED, I.E. NOT PREDICTED	WSHOUT	13
C		WSHOUT	14
C	INPUT - COMMON	WSHOUT	15
C	REFRAC - ALL VARIABLES ARE PRINTED	WSHOUT	16
C		WSHOUT	17
C		WSHOUT	18
C	DIMENSION USPL(1),PSI(1),CCMTI(8,4)	WSHOUT	19
C	COMMON/TURBIN/ROT(9),ISW3	WSHOUT	20
C		WSHOUT	21
C	COMMON/REFRAC/EMJ,TSTSC,IWED(3),FASS(24),BETA(24),CPSIC(24),NASRO,	WSHOUT	22
C	* ASF,IWSFE	WSHOUT	23
C		WSHOUT	24
C	DATA COMTI/4HCORE,4H NCI,4HSE ,5*1H ,	WSHOUT	25
C	* 4HTURB,4HINE ,4HNCS,4HE ,4*1H ,	WSHOUT	26
C	* 4HCOMP,4HRESS,4HCR A,4HND I,4HLET,4H FAN,4H NOI,4HSE	WSHOUT	27
C	2 ,4HEXIT,4H FAN,4H NCI,4HSE ,4H ,4H ,4H ,4H /	WSHOUT	28
C		WSHOUT	29
C	PRINT STANDARD TITLE	WSHOUT	30
C		WSHOUT	31
C	CALL PRINTH(IPRNT,ICLT,IOUT)	WSHOUT	32
C		WSHOUT	33
C	PRINT COMPONENT NOISE TYPE TITLE	WSHOUT	34
C		WSHOUT	35
C	IF(ITYPE.NE.3)ITIT=ITYPE-1	WSHOUT	36
C	IF(ITYPE.EQ.3)ITIT=ISW3-1	WSHOUT	37
C	WRITE(IOUT,100) (CCMTI(I,ITIT),I=1,8)	WSHOUT	38
C	100 FORMAT(1H0,43X,8A4)	WSHOUT	39
C		WSHOUT	40
C	PRINT INPUT TYPE	WSHOUT	41
C		WSHOUT	42
C	WRITE(IOUT,200)	WSHOUT	43
C	200 FORMAT(1H0,30X,39H W I N G S H I E L D I N G I N P U T S)	WSHOUT	44
C		WSHOUT	45
C	PRINT INPUT FOR FAN, TURBINE AND CORE NOISE CASES	WSHOUT	46
C		WSHOUT	47
C	WRITE(IOUT,300) (IWED(I),I=1,3)	WSHOUT	48
C	300 FORMAT(///17X,46H1) EDGE S'LLTICS CONSIDERED (1 = YES, 0 = NO)/	WSHOUT	49
C	1 22X,13HTRAILING E. =,13,1H,,10X,12HLEADING E. =,13,1H,,	WSHOUT	50
C	2 15X,8HTIP E. =,13)	WSHOUT	51
C	IF(INUSP.EQ.0) GO TO 600	WSHOUT	52
C	WRITE(IOUT,400) (USPL(I),I=1,NUSPL)	WSHOUT	53
C	400 FORMAT(1H0,16X,31H2) UNSHIELDED DIRECTIVITY CURVE/1H0,19X,	WSHOUT	54
C	1 11HSPL (DB) =,10F7.1/(31X,10F7.1))	WSHOUT	55
C	WRITE(IOUT,500) (PSI(I),I=1,NUSPL)	WSHOUT	56
C	500 FORMAT(1H0,19X,11HPSI (DEG) =,10F7.1/(31X,10F7.1))	WSHOUT	57
C		WSHOUT	58

C		WSHOUT	59
C	PRINT FOR DISCHARGE FAN, CCRE AND TURBINE CASES BUT NOT INLET FAN	WSHOUT	60
C		WSHOUT	61
	600 IF(ITYPE.EQ.4) GO TO 1000	WSHOUT	62
	WRITE (IOUT,700) EMJ, TSTSC, (FASS(I), I = 1,NASRC)	WSHOUT	63
	700 FORMAT(///17X,27H3) EXHALST FLCH PACH NO. = ,F7.3,1H,,	WSHOUT	64
	1 27HSTATIC TEMPERATURE RATIO = ,F7.3//	WSHOUT	65
	2 17X,48H4) CORRECTION FACTOR FOR ANGULAR SHIFT OF SOURCE /	WSHOUT	66
	3 1H0,19X,11HALFA =,8F8.3/(31X,8F8.3))	WSHOUT	67
	WRITE (IOUT,900) (CPSIO(I), I = 1,NASRC)	WSHOUT	68
	WRITE (IOUT,750) ASF	WSHOUT	69
	750 FORMAT(1H0,16X,36H5) ANGLE CFFSET FOR ANGULAR SHIFT OF,	WSHOUT	70
	1 16H SOURCE, GAMA = ,F8.3)	WSHOUT	71
	WRITE(IOUT,800) (BETA(I),I=1,NASRC)	WSHOUT	72
	800 FORMAT(1H0,16X,35H6) RADIAL CFFSET OF APPARENT SOURCE /	WSHOUT	73
	1 1H0,19X,11HBETA =,8F8.3/(31X,8F8.3))	WSHOUT	74
	WRITE(IOUT,900) (CPSIO(I),I=1,NASRC)	WSHOUT	75
	900 FORMAT(1H0,19X,11HCOT(PSIO) =,8F8.3/(31X,8F8.3))	WSHOUT	76
C		WSHOUT	77
	1000 RETURN	WSHOUT	78
	END	WSHOUT	79

	SUBROUTINE WSDSTO(ITYPE, INASRC, IS1, IS2, ST6,	WSDSTC	2
	ST1, ST2, ST3, ST4, ST5, ISOR)	WSDSTO	3
C	PURPOSE TO STORE WING SHIELDING DATA FOR COMPONENT	WSDSTO	4
	DIMENSION IS1(3), IS2(3), ST1(3), ST2(1), ST3(1), ST4(1), ST5(1), ST6(1)	WSDSTO	5
	COMMON/REFRAC/EMJ, TSTSO, INED(3), FASS(24), BETA(24), CPSIC(24), NASRC,	WSDSTC	6
	* ASF, INUSFE	WSDSTO	7
	COMMON/UNSHLD/LSPL(19), PSI(19), NUSPL, INUSP	WSDSTC	8
	IF(ISCR.GT.1)GO TO 100	WSDSTO	9
C	STORE	WSDSTU	10
	IS1(1)=NUSPL	WSDSTO	11
	IS1(2)=INUSP	WSDSTO	12
	DO 20 I=1,3	WSDSTC	13
20	IS2(I)=INED(I)	WSDSTO	14
C		WSDSTO	15
C	TEST WHETHER DIRECTIVITY CURVES TO BE READ IN.	WSDSTO	16
C	IF NOT ASSUME DEFAULT OR PREDICTED VALUES	WSDSTO	17
C		WSDSTC	18
	IF(INUSP.LT.2)GO TO 40	WSDSTO	19
C		WSDSTC	20
C	STORE DIRECTIVITY CURVES INPLT AS DATA	WSDSTC	21
C		WSDSTU	22
	CALL SN(LSPL,ST2,1,NUSPL,2)	WSDSTO	23
	CALL SN(PSI,ST3,1,NUSPL,2)	WSDSTC	24
C		WSDSTO	25
C	IF INLET FAN EXIT	WSDSTC	26
C		WSDSTO	27
40	IF(ITYPE.EQ.4)GO TO 80	WSDSTO	28
C		WSDSTO	29
C	STORE SHIELDING DATA FOR AFT FAN, TURBINE AND CORE	WSDSTO	30
C		WSDSTC	31
	ST1(1)=EMJ	WSDSTO	32
	ST1(2)=TSTSO	WSDSTO	33
	ST1(3) = ASF	WSDSTO	34
	IS1(3)=INASRC	WSDSTO	35
	IF(INASRC.EQ.0)GO TO 80	WSDSTO	36
C		WSDSTO	37
C	STORE EMPIRICAL CURVES FOR JET REFRACTION MODEL	WSDSTO	38
C		WSDSTC	39
	CALL SN(BETA,ST4,1,INASRC,2)	WSDSTO	40
	CALL SN(CPSIC,ST5,1,INASRC,2)	WSDSTO	41
	CALL SN(FASS,ST6,1,INASRC,2)	WSDSTO	42
80	RETURN	WSDSTO	43
C		WSDSTC	44
C	RESTORE WING SHIELDING DATA	WSDSTO	45
C		WSDSTO	46
100	NUSPL=IS1(1)	WSDSTC	47
	INUSP=IS1(2)	WSDSTO	48
	DO 120 I=1,3	WSDSTO	49
120	INED(I)=IS2(I)	WSDSTO	50
C		WSDSTO	51
C	TEST IF DIRECTIVITY CURVE INPUT AS DATA	WSDSTO	52
C	IF NOT ASSUME DEFAULT OR PREDICTED VALUES	WSDSTO	53
C		WSDSTO	54
	IF(INUSP.LT.2)GO TO 140	WSDSTO	55
C		WSDSTC	56
C	RESTORE DIRECTIVITY CURVES	WSDSTO	57
C		WSDSTC	58

CALL SN(USPL,ST2,1,NUSPL,1)	WSDSTO	59
CALL SN(PSI,ST3,1,NUSPL,1)	WSDSTO	60
C	WSDSTO	61
C EXIT IF INLET FAN	WSDSTC	62
C	WSDSTO	63
140 IF (ITYPE.EQ. 4) GO TO 80	WSDSTO	64
C	WSDSTC	65
C RESTORE SHIELDING DATA FOR AFT FAN, TURBINE AND CORE	WSDSTO	66
C	WSDSTO	67
EMJ=ST1(1)	WSDSTO	68
ISTSD=ST1(2)	WSDSTC	69
ASF = ST1(3)	WSDSTO	70
INASRO=IS1(3)	WSDSTO	71
IF(INASRO.EQ.0)GO TO 9C	WSDSTO	72
C	WSDSTO	73
C RESTORE EMPIRICAL CURVES FOR JET REFRACTION MODEL	WSDSTO	74
C	WSDSTO	75
CALL SN(BETA,ST4,1,INASRC,1)	WSDSTO	76
CALL SN(CPSIO,ST5,1,INASRC,1)	WSDSTO	77
CALL SN(FASS,ST6,1,INASRC,1)	WSDSTO	78
GO TO 80	WSDSTO	79
END	WSDSTC	80

FUNCTION XINTEG(X,Y,NPTS)	XINTEG	2
C PURPOSE TO INTEGRATE A TABULATED FUNCTION OF ONE INDEPENDENT	XINTEG	3
C VARIABLE BY TRAPEZOIDAL RULE	XINTEG	4
C AUTHOR R. M. PASTERS	XINTEG	5
C MODIFICATIONS NONE	XINTEG	6
C METHOD THIS SUBROUTINE USES THE TRAPEZOIDAL RULE TO	XINTEG	7
C INTEGRATE A TABULATED FUNCTION WHICH HAS EQUAL OR	XINTEG	8
C UNEQUAL STEP SIZES.	XINTEG	9
C USAGE A = XINTEG(X,Y,NPTS)	XINTEG	10
C DIMENSION X(1),Y(1)	XINTEG	11
C INPUTS X - ARRAY OF NPTS INDEPENDENT VARIABLE VALUES FOR	XINTEG	12
C UNEQUAL SPACING OR DELTA X VALUE FOR EQUAL	XINTEG	13
C SPACING	XINTEG	14
C Y - ARRAY OF NPTS TABULATED FUNCTION VALUES	XINTEG	15
C NPTS - NUMBER OF POINTS TO BE INTEGRATED (POSITIVE	XINTEG	16
C FOR UNEQUAL SPACING, NEGATIVE FOR EQUAL	XINTEG	17
C SPACING)	XINTEG	18
C OUTPUTS A - THE INTEGRAL OF THE TABULATED FUNCTION	XINTEG	19
C ERROR RETURN NONE	XINTEG	20
C STORAGE 112 BASE EIGHT	XINTEG	21
C TIMING NO TIMING RUNS WERE MADE	XINTEG	22
C REFERENCES NONE	XINTEG	23
C SUBROUTINES CALLED	XINTEG	24
C NONE	XINTEG	25
C DOCUMENTATION AMEP-S-162	XINTEG	26
C NPTS .GE. 2 = POINTS UNEQUALLY SPACED,	XINTEG	27
C NPTS .LE.-2 = POINTS EQUALLY SPACED,	XINTEG	28
C OTHERWISE THE INTEGRAL IS SET TO ZERO.	XINTEG	29
C 1) FOR UNEQUAL SPACING THE X ARRAY CONTAINS THE	XINTEG	30
C INDEPENDENT VARIABLE VALUES CORRESPONDING TO	XINTEG	31
C THE Y ARRAY (DEPENDENT VALUES).	XINTEG	32
C 2) FOR EQUAL SPACING X(1) CONTAINS THE INCREMENT	XINTEG	33
C BETWEEN INDEPENDENT VARIABLE VALUES.	XINTEG	34
C 3) NPTS IS THE NUMBER OF DEPENDENT VARIABLE POINTS	XINTEG	35
C TO BE INTEGRATED (+ FOR UNEQUAL SPACING, - FOR	XINTEG	36
C EQUAL SPACING).	XINTEG	37
C 4) ANYTIME THERE ARE LESS THAN 2 DATA POINTS	XINTEG	38
C THE INTEGRAL IS SET TO ZERO.	XINTEG	39
C DIMENSION X(2), Y(2)	XINTEG	40
C IF(NPTS.LE.-2) GO TO 200	XINTEG	41
C IF(NPTS.LE.2) GO TO 400	XINTEG	42
C *****UNEQUAL SPACING*****	XINTEG	43
C NPTS1=NPTS-1	XINTEG	44
C SUM=Y(1)*(X(2)-X(1))+Y(NPTS)*(X(NPTS)-X(NPTS1))	XINTEG	45
C IF(NPTS.EQ.2) GO TO 150	XINTEG	46
C DO 100 I=2,NPTS1	XINTEG	47
C SUM=SUM+Y(I)*(X(I+1)-X(I-1))	XINTEG	48
C 100 CONTINUE	XINTEG	49
C 150 XINTEG=.5*SUM	XINTEG	50
C RETURN	XINTEG	51
C 200 CONTINUE	XINTEG	52
	XINTEG	53
	XINTEG	54
	XINTEG	55
	XINTEG	56
	XINTEG	57
	XINTEG	58

```

C      *****EQUAL SPACING*****
      NPTSA=IABS(NPTS)
      NPTS1=NPTSA-1
      SUM=.5*(Y(1)+Y(NPTS1))
      IF(NPTSA.EQ.2) GO TO 350
      DO 300 I=2,NPTS1
        SUM=SUM+Y(I)
300  CONTINUE
350  XINTEG=X(1)*SUM
      RETURN
400  CONTINUE
C      *****LESS THAN 2 DATA POINTS*****
      XINTEG=0.
      RETURN
      END

```

```

XINTEG  59
XINTEG  60
XINTEG  61
XINTEG  62
XINTEG  63
XINTEG  64
XINTEG  65
XINTEG  66
XINTEG  67
XINTEG  68
XINTEG  69
XINTEG  70
XINTEG  71
XINTEG  72
XINTEG  73

```

```

      FUNCTION XPM1DX(Y)
C  FUNCTION XPM1DX(Y) SUB-SECTION FOR COMPUTING  $(\exp(Y) - 1) / Y$  TO
C  MAXIMUM MACHINE ACCURACY AND TO AVOID OVERFLOWS.
      DOUBLE PRECISION S, P
      EQUIVALENCE (S,SK), (P,PK)
      DATA YL, ONE, EP / .3465736, 1.0, 1.2E-7/
12  IF (ABS(Y) - YL) 14, 13, 13
13  XPM1DX = (EXP(Y) - ONE) / Y
      GO TO 18
14  S = ONE
      P = ONE
      F = ONE
15  F = F + ONE
      P = P * Y / F
16  S = S + P
      IF (ABS(PK) - EP * ABS(SK)) 17, 17, 15
17  XPM1DX = S
18  RETURN
      END

```

XPM1DX	2
XPM1DX	3
XPM1DX	4
XPM1DX	5
XPM1DX	6
XPM1DX	7
XPM1DX	8
XPM1DX	9
XPM1DX	10
XPM1DX	11
XPM1DX	12
XPM1DX	13
XPM1DX	14
XPM1DX	15
XPM1DX	16
XPM1DX	17
XPM1DX	18
XPM1DX	19
XPM1DX	20

```

SUBROUTINE ZERO(DATA,NUMBER)
C  AUTHOR          D. F. MELDRUM
C
C  PURPOSE          TO ZERO OUT AN ARRAY
C
C  INPUTS           DATA      ARRAY TO BE ZEROED OUT
C                   NUMBER     NUMBER OF ELEMENTS TO BE ZEROED OUT
C
C  OUTPUTS          DATA      ARRAY WHICH IS ZEROED OUT FOR
C                               (NUMBER) OF ELEMENTS.
C
C                   DIMENSION DATA(NUMBER)
C                   DO 100 I=1,NUMBER
C 100 DATA(I)=0.
C
C                   RETURN
C                   END

```

```

ZERO      2
ZERO      3
ZERO      4
ZERO      5
ZERO      6
ZERO      7
ZERO      8
ZERO      9
ZERO     10
ZERO     11
ZERO     12
ZERO     13
ZERO     14
ZERO     15
ZERO     16
ZERO     17
ZERO     18
ZERO     19

```