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INSERT PAGE 44 OF 53 FACING PAGE 6-100.

Reason: To add a new failure code, 0B, to Table 6-19 between failure codes 0A and 0D.

Failure code 0B is added as follows:

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No.

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes	ATA Number
0B	HDM	232832

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes		ATA Number
1A	ANTENNA1(116RV1)	[IGA]	232813
	HI GAIN ANTENNA–TOP(16RV1)	[Top Mount]	232813
	HI GAIN ANTENNA–L(17RV)	[Conformal]	232812
1C	HI GAIN ANTENNA–R(18RV)	[Conformal]	232812
1F	LO GAIN ANTENNA(13RV)		232811
21	MCDU1(2CA1)	[A330/A340]	228212
	MCDU1(3CA1)	[A320]	228212
22	MCDU2(2CA2)	[A330/A340]	228212
	MCDU2(3CA2)	[A320]	228212
23	MCDU3(2CA3)	[A330/A340]	228212
	MCDU3(3CA3)	[A320]	228212
33	ATSU1(1TX1)	[ATSU]	462134
	ACARS MU(1RB)	[A320 ACARS]	232434
	ACARS MU1(1RB1)	[A330/A340 ACARS]	232434
34	ATSU2 (1TX2)	[ATSU]	462134
	ACARS MU2	[A320 ACARS]	232434
	ACARS MU2(1RB2)	[A330/A340 ACARS]	232434
35	ADIRU1(1FP1)		341234
36	ADIRU2(1FP2)		341234
37	RESERVED		N/A
38	RESERVED		N/A
39	RESERVED		N/A
3D	FMGC1(1CA1)	[A320]	228334
	FMGEC1(1CA1)	[A330/A340]	228334
3E	FMGC2(1CA2)	[A320]	228334
	FMGEC2(1CA2)	[A330/A340]	228334
40	ARINC 429 ICAO		N/A

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes		ATA Number
42	CTU–CU CEPT–E1 BUS/SDU1 (105RV1)	[IGA A320]	233500
	CTU–CU CEPT–E1 BUS/SDU1 (105RV1)	[IGA A330/A340]	239200
	CTU–CU CEPT–E1 BUS/SDU1 (5RV1)	[HGA A320]	233500
	CTU–CU CEPT–E1 BUS/SDU1 (5RV1)	[HGA A330/A340]	239200
43	IFE 429 BUS/SDU1 (5RV1)	[A330/A340 HGA]	233000
	IFE 429 BUS/SDU1 (105RV1)	[A330/A340 HGA]	
	IFE 429 BUS/SDU1 (105RV1)	[A320 IGA]	233000
	IFE 429 BUS/SDU1 (5RV1)	[A320 HGA]	
50	HSDU1 (63RV1)/SDU1 (5RV1)		232839
52	IFE 429 BUS/SDU1 (5RV1)	[A330/A340 HGA]	233000
	IFE 429 BUS/SDU1 (105RV1)	[A330/A340 HGA]	
	IFE 429 BUS/SDU1 (105RV1)	[A320 IGA]	233000
	IFE 429 BUS/SDU1 (5RV1)	[A320 HGA]	
53	ATSU1 (1TX1)/SDU1(105RV1)	[IGA ATSU]	462134
	ATSU1 (1TX1)/SDU1(5RV1)	[HGA ATSU]	462134
	ACARS MU (1RB)/SDU1(105RV1)	[IGA A320 ACARS]	232434
	ACARS MU1 (1RB1)/SDU1(105RV1)	[IGA A330/A340 ACARS]	232434
	ACARS MU (1RB)/SDU1(5RV1)	[HGA A320 ACARS]	232434
	ACARS MU1 (1RB1)/SDU1(5RV1)	[HGA A330/A340 ACARS]	232434
54	CTU–CU CEPT–E1 BUS/SDU1(105RV1)	[IGA A320]	233500
	CTU–CU CEPT–E1 BUS/SDU1(105RV1)	[IGA A330/A340]	239200
	CTU–CU CEPT–E1 BUS/SDU1(5RV1)	[HGA A320]	233500
	CTU–CU CEPT–E1 BUS/SDU1(5RV1)	[HGA A330/A340]	239200
55	MCDU1(2CA1)/SDU1(105RV1)	[IGA A330/A340]	228212
	MCDU1(2CA1)/SDU1(5RV1)	[HGA A330/A340]	228212
	MCDU1(3CA1)/SDU1(105RV1)	[IGA A320]	228212
	MCDU(3CA1)/SDU1(5RV1)	[HGA A320]	228212
56	MCDU2(2CA2)/SDU1(105RV1)	[IGA A330/A340]	228212
	MCDU2(2CA2)/SDU1(5RV1)	[HGA A330/A340]	228212
	MCDU2(3CA2)/SDU1(105RV1)	IGA A320	228212
	MCDU2(3CA2)/SDU1(5RV1)	HGA A320	228212

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes		ATA Number
57	ATSU2 (1TX2)/SDU1(105RV1)	[IGA ATSU]	462134
	ATSU2 (1TX2)/SDU1(5RV1)	[HGA ATSU]	462134
	ACARS MU2/SDU1(105RV1)	[IGA A320 ACARS]	232434
	ACARS MU2 (1RB2)/SDU1(105RV1)	[IGA A330/A340 ACARS]	232434
	ACARS MU2/SDU1(5RV1)	[HGA A320 ACARS]	232434
	ACARS MU2 (1RB2)/SDU1(5RV1)	[HGA A330/A340 ACARS]	232434
59	CFDIU(1TW)/SDU1(105RV1)	[IGA A320]	313234
	CMC1(1TM1)/SDU1(105RV1)	[IGA A330/A340]	451334
	CFDIU(1TW)/SDU1(5RV1)	[HGA A320]	313234
	CMC1(1TM1)/SDU1(5RV1)	[HGA A330/A340]	451334
5A	ADIRU1(1FP1)/SDU1(105RV1)	[IGA]	341234
	ADIRU1(1FP1)/SDU1(5RV1)	[HGA]	341234
5B	ADIRU2(1FP2)/SDU1(105RV1)	[IGA]	341234
	ADIRU2(1FP2)/SDU1(5RV1)	[HGA]	341234
5C	HPA1 (110RV1)/SDU1(105RV1)	[IGA]	232831
	HPA–HI GAIN(7RV1)/SDU1(5RV1)	[HGA]	232831
5F	HPA–LO GAIN(9RV)/SDU1(5RV1)	[HGA + LGA]	232835
	HPA–LO GAIN(9RV)/SDU1(105RV1)	[IGA + LGA]	232835
62	BSU(8RV1)/SDU1(5RV1)	[Top Mount]	232846
	BSU–L(15RV1)/SDU1(5RV1)	[Conformal]	232844
64	BSU–R(15RV2)/SDU1(5RV1)	[Conformal]	232844
66	MCDU3(2CA3)/SDU1(105RV1)	[IGA A330/A340]	228212
	MCDU3(2CA3)/SDU1(5RV1)	[HGA A330/A340]	228212
	MCDU3(3CA3)/SDU1(105RV1)	[IGA A320]	228212
	MCDU3(CA3)/SDU1(5RV1)	[HGA A320]	228212
67	RESERVED		
68	RESERVED		
6A	RESERVED		
6C	RESERVED		
6D	RESERVED		

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes		ATA Number
6E	RESERVED		
6F	RESERVED		
71	SDU2(105RV2)CROSSTALK BUS/SDU1 (105RV1)	[IGA]	232834
		[HGA]	232834
	SDU2(5RV2)CROSSTALK BUS/SDU1 5RV1)		
73	FMGC1(1CA1)/SDU1(105RV1)	[IGA A320]	228334
	FMGEC1(1CA1)/SDU1(105RV1)	[IGA A330/A340]	228334
	FMGC1(1CA1)/SDU1(5RV1)	[HGA A320]	228334
	FMGEC1(1CA1)/SDU1(5RV1)	[HGA A330/A340]	228334
74	FMGC2(1CA2)/SDU1(105RV1)	[IGA A320]	228334
	FMGEC2(1CA2)/SDU1(105RV1)	[IGA A330/A340]	228334
	FMGC2(1CA2)/SDU1(5RV1)	[HGA A320]	228334
	FMGEC2(1CA2)/SDU1(5RV1)	[HGA A330/A340]	228334
80	RESERVED		
82	RESERVED		
88	RESERVED		
90	SDU1(105RV1) BUS M–CTRL/HPA1(110RV1)	[IGA]	232834
	SDU1(5RV1) BUS M–CTRL/HPA–HI GAIN(7RV1)	[HGA]	232834
96	SDU1(5RV1) BUS M–CTRL/HPA–LO GAIN(9RV)	[HGA+LGA]	232834
	SDU1(105RV1) BUS M–CTRL/HPA–LO GAIN(9RV)	[IGA+LGA]	232834
98	SDU1(5RV1) BUS M–CTRL/BSU(8RV1)	[Top Mount]	232834
	SDU1(5RV1) BUS M–CTRL/BSU–L(15RV1)	[Conformal]	232834
9A	BSU–R (15RV2) XTALK BUS/BSU–L(15RV1)	[Conformal]	232844
9C	SDU1(5RV1) BUS M–CTRL/BSU–R(15RV2)	[Conformal]	232834
9D	BSU–L (15RV1) XTALK BUS/BSU–R(15RV2)	[Conformal]	232844
9E	SDU1 (5RV1) /HSDU1 (63RV1)		232834
9F	Not applicable for package 6.0 and beyond		N/A

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes		ATA Number
A1	SDU1(105RV1)/MCDU1(2CA1)	[IGA]	228212
	SDU1(5RV1)/MCDU1(2CA1)	[HGA]	228212
A2	SDU1(105RV1).MCDU2(2CA2)	[IGA]	228212
	SDU1(5RV1)/MCDU2(2CA2)	[HGA]	228212
A3	SDU1(105RV1)/MCDU3(2CA3)	[IGA]	228212
	SDU1(5RV1)/MCDU3(2CA3)	[HGA]	228212
A6	ESU(101RF) ETHERNET 1/HSDU1(63RV1)		464131
A7	ESU(101RF) ETHERNET 2/HSDU1(63RV1)		464131
A8	ESU(101RF) ISDN 1/HSDU1(63RV1)		464131
A9	ESU(101RF) ISDN 2/HSDU1(63RV1)		464131
C0	WRG:CONFIG PIN PROG/SDU1(105RV1)	[IGA]	232800
	WRG:CONFIG PIN PROG/SDU1(5RV1)	[HGA]	232800
C1	LGCIU1(5GA1)/LGCIU2(5GA2)/SDU1(105RV1)	[IGA]	323171
	LGCIU1(5GA1)/LGCIU2(5GA2)/SDU1(5RV1)	[HGA]	323171
C2	SDU1(105RV1) SEL–DISABLE DISCRETE/SDU2(105RV2)	[IGA]	232834
	SDU1(5RV1) SEL–DISABLE DISCRETE/SDU2(5RV2)	[HGA]	232834
C3	WRG:ICAO ADDRESS PIN PROG/SDU1(105RV1)	[IGA]	232800
	WRG:ICAO ADDRESS PIN PROG/SDU1(5RV1)	[HGA]	232800
C4	HPA1 (110RV1)/VSWR	[IGA]	232831
	HPA–HI GAIN(7RV1)/VSWR	[HGA]	232831
C5	WRG:CONFIG PIN PROG/SDU1(105RV1) OWNER REQS DB	[IGA]	232800
	WRG:CONFIG PIN PROG/SDU1(5RV1) OWNER REQS DB	[HGA]	232800
C6	HPA–LO GAIN(9RV)/VSWR		232835
C7	HPA(110RV1)/OVER TEMPERATURE	[IGA]	232831
	HPA–HI GAIN(7RV1)/OVER TEMPERATURE	[HGA]	232831

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes		ATA Number
C8	SDU1(105RV1)/BAD DATA FROM GROUND STATION	[IGA]	232834
	SDU1(5RV1)/BAD DATA FROM GROUND EARTH STATION	[HGA]	232834
C9	HPA–LO GAIN(9RV)/OVER TEMPERATURE		232835
CA	SDU1(5RV1)CTRL DISCRETE/DLNA–LO GAIN(14RV)	[HGA+LGA]	232834
	SDU1(105RV1)CTRL DISCRETE/DLNA–LO GAIN(14RV)	[IGA+LGA]	232834
CB	WRG:SDI PIN PROG/HPA1(110RV1)	[IGA]	232800
	WRG:SDI PIN PROG/HPA–HI GAIN(7RV1)	[HGA]	232800
CC	WRG:SDI PIN PROG/HPA–LO GAIN(9RV)		232800
CD	N/A		N/A
CE	RESERVED		
CF	N/A		N/A
D0	N/A		N/A
D1	WRG:SDI PIN PROG/HPA1(110RV1)		232800
	WRG:SDI PIN PROG/HPA–HI GAIN(7RV1)		232800
D2	WRG:SDI PIN PROG/HPA–LO GAIN(9RV)		232800
D3	WRG:SDI PIN PROG/BSU(8RV1)	[Top Mount]	232800
	WRG:SDI PIN PROG/BSU–L(15RV1)	[Conformal]	232800
D4	WRG:SDI PIN PROG/BSU–R(15RV2)	[Conformal]	232800
D5	SDU1(105RV1)/TXCOAX	[IGA]	232834
	SDU1(5RV1)/TXCOAX	[HGA]	232834
D6	SDU1 (105RV1)/TXCOAX	[IGA+LGA]	232834
	SDU1(5RV1)/TXCOAX	[HGA+LGA]	232834
D7	RESERVED		
D8	SDU1(105RV1)/RXCOAX	[IGA]	232834
	SDU1(5RV1)/RXCOAX	[HGA]	232834
D9	SDU2(5RV1)/RXCOAX		232834
DA	SDU1(105RV1)/RXCOAX	[IGA+LGA]	232834

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes	ATA Number
	SDU1(5RV1)/RXCOAX [HGA+LGA]	232834
DB	LO GAIN ANTENNA(13RV) LOG ON FAILURE	232811
DC	N/A	N/A to Airbus
DD	SDU1(105RV1) OWNER REQS DB SECURED PARTITION [IGA]	232834
	SDU1(5RV1) OWNER REQS DB SECURED PARTITION [HGA]	232834
DE	SDU1(105RV1) OWNER REQS DB USER PARTITION [IGA]	232834
	SDU1(5RV1) OWNER REQS DB USER PARTITION [HGA]	232834
DF	SDU1(105RV1) [IGA] LOG ON FAILURE	232834
	SDU1(5RV1) [HGA] LOG ON FAILURE	232834
E0	RESERVED	
E1	SDU1(5RV1) DISCRETE/HSDU1(63RV1)	232834
E2	N/A	N/A
E3	N/A	N/A to Airbus
E4	SDU1(5RV1)/HSDU1(63RV1)	232834
E5	N/A	N/A to Airbus
E6	HSDU1(63RV1)/TXCOAX	232839
E7	N/A	N/A
E8	HSDU1(63RV1)/RXCOAX	232839
E9	N/A	N/A
EA	N/A	N/A to Airbus
EB	MCDU1(2CA1)+MCDU2(2CA2)+MCDU3(2CA3) [RMP only] INACTIVE	228212
EC	WRG:CONFIG PIN PROG/HSDU1(63RV1)	232800
ED	WRG:CONFIG PIN PROG/HSDU1(63RV1) SDU ORT	232800

Table 6-19. Airbus Level I (SDU No. 1) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 1 – CFDS Normal and Interactive Modes	ATA Number
EE	WRG:FWD ID1 ADDRESS PIN PROG/HSDU1(63RV1)	232800
FE	POWER SUPPLY INTERRUPT	240000

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No.

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes		ATA Number
01	SDU2(105RV2)	[IGA]	232834
	SDU2(5RV2)	[HGA]	232834
02	SDU1(105RV1) INCOMPATIBILITY	[IGA]	232834
	SDU1(5RV1) INCOMPATIBILITY	[HGA]	232834
03	HSDU2(63RV2)		232839
04	HPA2(110RV2)	[IGA]	232831
	HPA–HI GAIN(7RV2)	[HGA]	232831
07	HPA–LO GAIN(9RV)		232835
0A	HI POWER RELAY(21RV)		232842
0D	DLNA2 (119RV2)	[IGA]	232838
	DLNA–TOP(19RV2)	[Top Mount]	232838
	DLNA–L(20RV3)	[Conformal]	232837
0F	DLNA–R(20RV4)	[Conformal]	232837
10	DLNA–LO GAIN(14RV)		232836
13	BSU(8RV2)	[Top Mount]	232846
	BSU–L(15RV3)	[Conformal]	232844
15	BSU–R(15RV4)	[Conformal]	232844
1A	ANTENNA2(116RV2)	[IGA]	232813
	HI GAIN ANTENNA–TOP(16RV1)	[Top Mount]	232813
	HI GAIN ANTENNA–L(17RV)	[Conformal]	232812
1C	HI GAIN ANTENNA–R(18RV)	[Conformal]	232812
1F	LO GAIN ANTENNA(13RV)		232811
21	MCDU1(2CA1)	[A330/A340]	228212
	MCDU1(3CA1)	[A320]	228212

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INSERT PAGE 45 OF 53 FACING PAGE 6-108.

Reason: To add a new failure code, 0B, to Table 6-20 between failure codes 0A and 0D.

Failure code 0B is added as follows:

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No.

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes	ATA Number
0B	HDM	232832

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes		ATA Number
22	MCDU2(2CA2)	[A330/A340]	228212
	MCDU2(3CA2)	[A320]	228212
23	MCDU3(2CA3)	[A330/A340]	228212
	MCDU3(3CA3)	[A320]	228212
33	ATSU1(1TX1)	[ATSU]	462134
	ACARS MU(1RB)	[A320 ACARS]	232434
	ACARS MU1(1RB1)	[A330/A340 ACARS]	232434
34	ATSU2 (1TX2)	[ATSU]	462134
	ACARS MU(1RB)	[A320 ACARS]	232434
	ACARS MU2(1RB2)	[A320/A340 ACARS]	232434
35	ADIRU1(1FP1)		341234
36	ADIRU2(1FP2)		341234
37	RESERVED		N/A
38	RESERVED		N/A
39	RESERVED		N/A
3D	FMGC1(1CA1)	[A320]	228334
	FMGEC1(1CA1)	[A330/A340]	228334
3E	FMGC2(1CA2)	[A320]	228334
	FMGEC2(1CA2)	[A330/A340]	228334
40	ARINC 429 ICAO		232800
42	CTU – CU CEPT–E1 BUS/SDU2(105RV2)	[IGA A320]	233500
	CTU – CU CEPT–E1 BUS/SDU2(105RV2)	[IGA A330/A340]	239200
	CTU – CU CEPT–E1 BUS/SDU2(5RV2)	[HGA A320]	233500
	CTU – CU CEPT–E1 BUS/SDU2(5RV2)	[HGA A330/A340]	239200
43	IFE 429 BUS/SDU2(5RV2)	[A330/A340 HGA]	233000
	IFE 429 BUS/SDU2(105RV2)	[A330/A340 IGA]	
	IFE 429 BUS/SDU2(105RV2)	[A320 IGA]	233000
	IFE 429 BUS/SDU2(5RV2)	[A320 HGA]	
50	HSDU2(63RV2)/SDU2(5RV2)		232839
51	RESERVED		

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes		ATA Number
52	IFE 429 BUS/SDU2(5RV2)	[A330/A340 HGA]	233000
	IFE 429 BUS/SDU2(105RV2)	[A330/A340 IGA]	
	IFE 429 BUS/SDU2(105RV2)	[A320 IGA]	233000
	IFE 429 BUS/SDU2(5RV2)	[A320 HGA]	
53	ATSU1 (1TX1)/SDU2(105RV2)	[IGA ATSU]	462134
	ATSU1 (1TX1)/SDU2(5RV2)	[HGA ATSU]	462134
	ACARS MU(1RB1)/SDU2(105RV2)	[IGA ACARS A330/A340]	232434
	ACARS MU1(1RB1)/SDU2(5RV2)	[HGA ACARS A330/A340]	232434
	ACARS MU(1RB)/SDU2(105RV2)	[IGA ACARS A320]	232434
	ACARS MU1(1RB)/SDU2(5RV2)	[HGA ACARS A320]	232434
54	CTU – CU CEPT–E1 BUS/SDU2(105RV2)	[IGA A320]	233500
	CTU – CU CEPT–E1 BUS/SDU2(105RV2)	[IGA A330/A340]	239200
	CTU – CU CEPT–E1 BUS/SDU2(5RV2)	[HGA A320]	233500
	CTU – CU CEPT–E1 BUS/SDU2(5RV2)	[HGA A330/A340]	239200
55	MCDU1(2CA1)/SDU2(105RV2)	[IGA A330/A340]	228212
	MCDU1(2CA1)/SDU2(5RV2)	[HGA A330/A340]	228212
	MCDU1(3CA1)/SDU2(105RV2)	[IGA A320]	228212
	MCDU1(3CA1)/SDU2(5RV2)	[HGA A320]	228212
56	MCDU2(2CA2)/SDU2(105RV2)	[IGA]	228212
	MCDU2(2CA2)/SDU2(5RV2)	[HGA]	228212
	MCDU2(3CA2)/SDU2(105RV2)	[IGA A320]	228212
	MCDU2(3CA2)/SDU2(5RV2)	[HGA A320]	228212
57	ATSU2 (1TX2)/SDU2(105RV2)	[IGA ATSU]	462134
	ATSU2 (1TX2)/SDU2(5RV2)	[HGA ATSU]	462134
	ACARS MU2/SDU2(105RV2)	[IGA A320 ACARS]	232434
	ACARS MU2 (1RB2)/SDU2(105RV2)	[IGA A330/A340 ACARS]	232434
	ACARS MU2/SDU2(5RV2)	[HGA A320 ACARS]	232434
	ACARS MU2(1RB2)/SDU2(5RV2)	[HGA A330/A340 ACARS]	232434

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes		ATA Number
59	CFDIU(1TW)/SDU2(105RV2)	[IGA A320]	313234
	CMC1(1TM1)/SDU2(105RV2)	[IGA A330/A340]	451334
	CFDIU(1TW)/SDU2(5RV2)	[HGA A320]	313234
	CMC1(1TM1)/SDU2(5RV2)	[HGA A330/A340]	451334
5A	ADIRU1(1FP1)/SDU2(105RV2)	[IGA]	341234
	ADIRU1(1FP1)/SDU2(5RV2)	[HGA]	341234
5B	ADIRU2(1FP2)/SDU2(105RV2)	[IGA]	341234
	ADIRU2(1FP2)/SDU2(5RV2)	[HGA]	341234
5C	HPA2(110RV2)/SDU2(105RV2)	[IGA]	232831
	HPA–HI GAIN(7RV2)/SDU2(5RV2)	[HGA]	232831
5F	HPA–LO GAIN(9RV)/SDU2(5RV2)	HGA+LGA	232835
	HPA–LO GAIN(9RV)/SDU2(105RV2)	IGA+LGA	232835
62	BSU(8RV2)/SDU2(5RV2)	[Top Mount]	232846
	BSU–L(15RV3)/SDU2(5RV2)	[Conformal]	232844
64	BSU–R(15RV4)/SDU2(5RV2)	[Conformal]	232844
66	MCDU3(2CA3)/SDU2(105RV2)	[IGA A330/A340]	228212
	MCDU3(2CA3)/SDU2(5RV2)	[HGA A330/A340]	228212
	MCDU3(3CA3)/SDU2(105RV2)	[IGA A320]	228212
	MCDU3(3CA3)/SDU2(5RV2)	[HGA A320]	228212
67	RESERVED		
68	RESERVED		
6A	RESERVED		
6C	RESERVED		
6D	RESERVED		
6E	RESERVED		
6F	RESERVED		
71	SDU1(105RV1)CROSSTALK BUS/SDU2(105RV2)	[IGA]	232834
	SDU1(5RV1)CROSSTALK BUS/SDU2(5RV2)	[HGA]	232834

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes		ATA Number
73	FMGC1(1CA1)/SDU2(105RV2)	[IGA A320]	228334
	FMGEC1(1CA1)/SDU2(105RV2)	[IGA A330/A340]	228334
	FMGC1(1CA1)/SDU2(5RV2)	[HGA A320]	228334
	FMGEC1(1CA1)/SDU2(5RV2)	[HGA A330/A340]	228334
74	FMGC2(1CA2)/SDU2(105RV2)	[IGA A320]	228334
	FMGEC2(1CA2)/SDU2(105RV2)	[IGA A330/A340]	228334
	FMGC2(1CA2)/SDU2(5RV2)	[HGA A320]	228334
	FMGEC2(1CA2)/SDU2(5RV2)	[HGA A330/A340]	228334
80	RESERVED		
82	RESERVED		
88	RESERVED		
90	SDU2(105RV2) BUS M–CTRL/HPA2(110RV2)	[IGA]	232834
	SDU2(5RV2) BUS M–CTRL/HPA–HI GAIN(7RV2)	[HGA]	232834
96	SDU2(5RV2) BUS M–CTRL/HPA–LO GAIN(9RV)	HGA+LGA	232834
	SDU2(105RV2) BUS M–CTRL/HPA–LO GAIN(9RV)	IGA+LGA	232834
98	SDU2(5RV2) BUS M–CTRL/BSU(8RV2)	[Top Mount]	232834
	SDU2(5RV2) BUS M–CTRL/BSU–L(15RV3)	[Conformal]	232834
9A	BSU–R(15RV4) XTALK/BSU–L(15RV3)	[Conformal]	232844
9C	SDU2(5RV2) BUS M–CTRL/BSU–R(15RV4)	[Conformal]	232834
9D	BSU–L(15RV3) XTALK BUS/BSU–R(15RV4)	[Conformal]	232844
9E	SDU2(5RV2)/HSDU2(63RV2)		232834
9F	Not applicable for package 6.0 and beyond		N/A
A1	SDU2(105RV2)/MCDU1(2CA1)	[IGA]	228212
	SDU2(5RV2)/MCDU1(2CA1)	[HGA]	228212
A2	SDU2(105RV2)/MCDU2(2CA2)	[IGA]	228212
	SDU2(RV2)/MCDU2(2CA2)	[HGA]	228212

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes		ATA Number
A3	SDU2(105RV2)/MCDU3(2CA3)	[IGA]	228212
	SDU2(5RV2)/MCDU3(2CA3)	[HGA]	228212
A6	ESU(101RF) ETHERNET 1/HSDU2(63RV2)		464131
A7	ESU(101RF) ETHERNET 2/HSDU2(63RV2)		464131
A8	ESU(101RF) ISDN 1/HSDU2(63RV2)		464131
A9	ESU(101RF) ISDN 2/HSDU2(63RV2)		464131
C0	WRG:CONFIG PIN PROG/SDU2(105RV2)	[IGA]	232800
	WRG:CONFIG PIN PROG/SDU2(5RV2)	[HGA]	232800
C1	LGCIU1(5GA1)/LGCIU2(5GA2)/SDU2(105RV2)	[IGA]	323171
	LGCIU1(5GA1)/LGCIU2(5GA2)/SDU2(5RV2)	[HGA]	323171
C2	SDU2(105RV2) SEL–DISABLE DISCRETE/SDU1(105RV1)	[IGA]	232834
	SDU2(5RV2) SELECT–DISABLE DISCRETE/SDU1(5RV1)	[HGA]	232834
C3	WRG:ICAO ADDRESS PIN PROG/ SDU2(105RV2)	[IGA]	232800
	WRG:ICAO ADDRESS PIN PROG/ SDU2(5RV2)	[HGA]	232800
C4	HPA2(110RV2)/COAX	[IGA]	232831
	HPA–HI GAIN(7RV1)/COAX	[HGA]	232831
C5	WRG:CONFIG PIN PROG/SDU2(105RV2) OWNER REQS DB	[IGA]	232800
	WRG:CONFIG PIN PROG/SDU2(5RV2) OWNER REQS DB	[HGA]	232800
C6	LPA–LO GAIN(9RV)/COAX		232835
C7	HPA2(110RV2)/OVER TEMPERATURE	[IGA]	232831
	HPA–HI GAIN(7RV2)/OVER TEMPERATURE	[HGA]	232831
C8	SDU2(105RV2)/BAD DATA FROM GROUND STATION	[IGA]	232834
	SDU2(5RV2)/BAD DATA FROM GROUND EARTH STATION	[HGA]	232834
C9	HPA–LO GAIN(9RV)/OVER TEMPERATURE		232835

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes		ATA Number
CA	SDU2(5RV2)CTRL DISCRETE/DLNA–LO GAIN(14RV)	[HGA+LGA]	232834
	SDU2(105RV2)CTRL DISCRETE/DLNA–LO GAIN(14RV)	[IGA+LGA]	232834
CB	WRG:SDI PIN PROG/HPA2(110RV1)	[IGA]	232800
	WRG:SDI PIN PROG/HPA–HI GAIN(7RV2)	[HGA]	232800
CC	WRG:SDI PIN PROG/HPA–LO GAIN(9RV)		232800
CD	N/A		N/A
CE	RESERVED		
CF	N/A		N/A
D0	N/A		N/A
D1	WRG:SDI PIN PROG/HPA2(110RV1)	[IGA]	232800
	WRG:SDI PIN PROG/HPA–HI GAIN(7RV2)	[HGA]	232800
D2	WRG:SDI PIN PROG/HPA–LO GAIN(9RV)		232800
D3	WRG:SDI PIN PROG/BSU(8RV2)	[Top Mount]	232800
	WRG:SDI PIN PROG/BSU–L(15RV3)	[Conformal]	232800
D4	WRG:SDI PIN PROG/BSU–R(15RV4)	[Conformal]	232800
D5	SDU2(105RV2)/TXCOAX	[IGA]	232834
	SDU2(5RV2)/TXCOAX	[HGA]	232834
D6	SDU2(105RV2)/TXCOAX	[LGA]	232834
	SDU2(5RV2)/TXCOAX	[HGA or IGA]	232834
D7	RESERVED		
D8	SDU2(105RV2)/RXCOAX	[IGA]	232834
	SDU2(5RV2)/RXCOAX	[HGA]	232834
D9	SDU2(5RV2)/RXCOAX	[HGA]	232834
DA	SDU2(105RV2)/RXCOAX	LGA+(HGA or IGA)	232834
	SDU2(5RV2)/RXCOAX	LGA+(HGA or IGA)	232834
DB	LO GAIN ANTENNA(13RV) LOG ON FAILURE		232811
DC	N/A		N/A

Table 6-20. Airbus Level I (SDU No. 2) Failure Messages and ATA No. (cont)

Failure Code	SDU/SDU No. 2 – CFDS Normal and Interactive Modes	ATA Number
DD	SDU2 (105RV2) OWNER REQS DB SECURED PARTITION [IGA]	232834
	SDU2 (5RV2) OWNER REQS DB SECURED PARTITION [HGA]	232834
DE	SDU2 (105RV2) OWNER REQS DB USER PARTITION [IGA]	232834
	SDU2 (5RV2) OWNER REQS DB USER PARTITION [HGA]	232834
DF	SDU2 (105RV2) LOG ON FAILURE [IGA]	232834
	SDU2 (5RV2) LOG ON FAILURE [HGA]	232834
E0	RESERVED	
E1	SDU2(5RV2) DISCRETE/HSDU2(63RV2)	232834
E2	N/A	N/A
E3	N/A	N/A
E4	SDU2(5RV2)/HSDU2(63RV2)	232834
E5	N/A	N/A
E6	HSDU2(63RV2)/TXCOAX	232839
E7	N/A	N/A
E8	HSDU2(63RV2)/RXCOAX	232839
E9	N/A	N/A
EA	N/A	N/A
EB	MCDU1(2CA1)+MCDU2(2CA2)+MCDU3(2CA3) INACTIVE [RMP only]	228212
EC	WRG:CONFIG PIN PROG/HSDU2(63RV2)	232800
ED	WRG:CONFIG PIN PROG/HSDU2(63RV2) SDU ORT	232800
EE	WRG:FWD ID1 ADDRESS PIN PROG/HSDU2(63RV2)	232800
FE	POWER SUPPLY INTERRUPT	240000

Table 6-21. McDonnell Douglas Level I Failures Messages and ATA Reference Numbers

Failure Code	CFDS Normal and Interactive Modes		ATA Number
01	SDU		232610
02	OTHER SDU INCOMPATIBILITY		232611
03	HSU		232664
04	HPA–IN GAIN	[IGA]	232600
	HPA–HI GAIN	[HGA]	232613
07	HPA–LO GAIN		232614
0A	HI POWER RELAY		232615
0D	DLNA–(TOP/L)		232616
0F	DLNA–R		232618
10	DLNA–LO GAIN		232619
13	BSU–(TOP/L)		23261B
15	BSU–R		23261C
1A	IN GAIN ANTENNA–TOP	[IGA]	232600
	HI GAIN ANTENNA–(TOP/L)	[HGA]	23261D
1C	HI GAIN ANTENNA–R		23261F
1F	LO GAIN ANTENNA		232620
21	MCDU1		232635
22	MCDU2		232636
23	MCDU3		232637
33	(ACARS MU/CMU)		23243C
34	(ACARS MU/CMU)2		N/A
35	(IRS/ADIRU)–PRI		23263E
36	(IRS/ADIRU)–SEC		23263F
37	RESERVED		
38	RESERVED		
39	RESERVED		
3D	(FMC/VIA)1		232642
3E	(FMC/VIA)2		232643

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Reason: To add a new failure code, 0B, to Table 6-21 between failure codes 0A and 0D.

Failure code 0B is added as follows:

Table 6-21. McDonnell Douglas Level I Failure Messages and ATA Reference Numbers

Failure Code	CFDS Normal and Interactive Modes	ATA Number
0B	HDM	232664

Table 6-21. McDonnell Douglas Level I Failures Messages and ATA Reference Numbers (cont)

Failure Code	CFDS Normal and Interactive Modes	ATA Number
40	ARINC 429 ICAO ADDRESS	N/A
42	CTU	232644
43	(CFS/CPDF)	TBD
50	HSU/SDU	232664
52	(CFS/CPDF)/SDU	TBD
53	(ACARS MU/CMU)/SDU	23263C
54	CTU/SDU	232644
55	MCDU1/SDU	232635
56	MCDU2/SDU	232636
57	(ACARS MU/CMU)2/SDU	N/A
59	CFDIU/SDU	232641
5A	(IRS/ADIRU)-PRI/SDU	23263E
5B	(IRS/ADIRU)-SEC/SDU	23263F
5C	HPA-IN GAIN/SDU [IGA]	232600
	HPA-HI GAIN/SDU [HGA]	232600
5F	HPA-LO GAIN/SDU	232623
62	BSU-(TOP/L)/SDU	232626
64	BSU-R/SDU	232627
66	MCDU3/SDU	232637
67	RESERVED	
68	RESERVED	
6A	RESERVED	
6C	RESERVED	
6D	RESERVED	
6E	RESERVED	
6F	RESERVED	
71	OTHER SDU/THIS SDU	232600
73	(FMC/VIA)1/SDU	232642

Table 6-21. McDonnell Douglas Level I Failures Messages and ATA Reference Numbers (cont)

Failure Code	CFDS Normal and Interactive Modes		ATA Number
74	(FMC/VIA)2/SDU		232643
80	RESERVED		
82	RESERVED		
88	RESERVED		
90	SDU M–CTRL/HPA–IN GAIN	[IGA]	232600
	SDU M–CTRL/HPA–HI GAIN	[HGA]	232600
96	SDU M–CTRL/HPA–LO GAIN		23262D
98	SDU M–CTRL/BSU–(TOP/L)		232600
9A	BSU–R XTALK/BSU–L		232600
9C	SDU M–CTRL/BSU–R		232630
9D	BSU–L XTALK/BSU–R		232600
9E	SDU/HSU		232664
9F	RESERVED		232664
A6	HSU ETHERNET PORT 1		232664
A7	HSU ETHERNET PORT 2		232664
A8	HSU ISDN PORT 1		232664
A9	HSU ISDN PORT 2		232664
C0	WRG:CONFIG PIN PROG/SDU		232600
C1	SDU WOW MISCOMPARE		N/A
C2	SDU/OTHER SDU SELECT–DISABLE DISCRETE		232600
C3	WRG:ICAO ADDRESS PIN PROG/SDU		232631
C4	TX PATH VSWR–IN GAIN	[IGA]	232600
	TX PATH VSWR–HI GAIN	[HGA]	232600
C5	WRG:CONFIG PIN PROG/SDU OWNER REQS		232600
C6	TX PATH VSWR–LO GAIN		232600
C7	HPA–IN GAIN/OVER TEMPERATURE	[IGA]	232600
	HPA–HI GAIN/OVER TEMPERATURE	[HGA]	23262C
C8	BAD DATA FROM GROUND EARTH STATION		None
C9	HPA–LO GAIN/OVER TEMPERATURE		232634

Table 6-21. McDonnell Douglas Level I Failures Messages and ATA Reference Numbers (cont)

Failure Code	CFDS Normal and Interactive Modes		ATA Number
CA	SDU/DLNA–LO GAIN		232619
CB	WRG:SDI PIN PROG/HPA–IN GAIN	[IGA]	232600
	WRG:SDI PIN PROG/HPA–HI GAIN	[HGA]	232600
CC	WRG:SDI PIN PROG/HPA–LO GAIN		232600
CD	SDU (POC/TOTC) DATA RESET		None
CE	RESERVED		
CF	HPA–IN GAIN (POC/TOTC) DATA RESET	[IGA]	None
	HPA–HI GAIN (POC/TOTC) DATA RESET	[HGA]	None
D0	HPA–LO GAIN (POC/TOTC)		None
D1	WRG:SDI PIN PROG/HPA–IN GAIN	[IGA]	232600
	WRG:SDI PIN PROG/HPA–HI GAIN	[HGA]	232600
D2	WRG:SDI PIN PROG/HPA–LO GAIN		232600
D3	WRG:SDI PIN PROG/BSU–(TOP/L)		232600
D4	WRG:SDI PIN PROG/BSU–R		232600
D5	SDU COAX/HPA–IN GAIN	[IGA]	232600
	SDU COAX/HPA–HI GAIN	[HGA]	232600
D6	SDU COAX/HPA–LO GAIN		232600
D7	RESERVED		
D8	DLNA/(SDU)–(TOP/L)		232600
D9	DLNA/(SDU)–R		232600
DA	DLNA/(SDU)–LO GAIN		232600
DB	LO GAIN SUBSYSTEM		232600
DC	NO ACTIVE ACARS MU/CMU		232400
DD	SDU OWNER REQS – SECURED		None
DE	SDU OWNER REQS – USER		None
DF	IN GAIN SUBSYSTEM	[IGA]	232600
	HI GAIN SUBSYSTEM	[HGA]	232600
E0	RESERVED		
E1	BAD HSU DISABLE DISCRETE		232664

Table 6-21. McDonnell Douglas Level I Failures Messages and ATA Reference Numbers (cont)

Failure Code	CFDS Normal and Interactive Modes	ATA Number
E2	RESERVED	
E3	RESERVED	
E4	HSU/SDU INTERFACE VER INCOMPATIBILITY	232664
E5	RESERVED	
E6	HSU/HPA TX RF PATH	232664
E7	RESERVED	
E8	DLNA/HSU RX RF PATH	232664
E9	RESERVED	
EA	RESERVED	
EC	WRG:CONFIG PIN PROG/HSU	232664
ED	WRG:CONFIG PIN PROG/HSU SDU OWNER REQS	232664
EE	WRG:FWD ID PIN PROG/HSU	232664
FE	POWER SUPPLY INTERRUPT	None

4. SCDU for Dual SATCOM

A. General

(1) The SDU supports SCDU page displays for dual systems. All pages are as specified in paragraph 2.D. (SCDU pages) with the following exceptions.

B. SATCOM Logical Channels

(1) The SATCOM channels for HEADSET calls in a dual system can be supplied by several combinations of physical channels within both SDUs. These combinations are determined by the configuration strap settings for cockpit wiring and ORT items regarding the use of SDU channel resources (items vi, vii, and xlviii). The display of channel status and selections as reported on menus MAIN, DIRECTORY, and CATEGORY-n reflect the logical channel status.

C. SATCOM (Cross-Talk Bus Failed)

(1) The SDU designated as the slave unit in a dual system must receive most of the system status information from the master over the SDU cross-talk bus. If full communication is not established, the slave unit cannot receive the necessary data for the display pages. The default SATCOM MAIN MENU display page **THIS UNIT UNAVAILABLE** is displayed in this case.

D. SATCOM

(1) The channel status page reflects the physical channels within the SDU that is providing the display page.

E. SATCOM Menus

(1) The maintenance menus reflect the maintenance data for the SATCOM system that is providing the display page.

5. Maintenance Panel Assembly

A. General

(1) The maintenance panel assembly interface diagram (Figure 5-17) supplies remote monitoring of MCS system operation. The maintenance panel assembly is made up of two parts: the cabin telecommunications (CTM) panel and the Commissioning and Maintenance Terminal (CMT) panel. The CTM panel is used for monitoring the cabin telecommunications equipment. The panel contains six lamps to indicate the availability of the telephone handsets. A keyed on/off switch arms the system when the key is turned to the ON position.

(2) The CMT panel is used primarily to debug, detect, isolate software and/or hardware integration, LRU and system integration, formal testing, and system access approval, as well as general performance analysis. The CMT data connector supplies an access port for a commissioning and maintenance terminal that can be a personal computer, a dumb terminal, or a modem. The SDU interface connector on the panel supplies a remote access port for testing the SDU. The panel also contains lamps to indicate the status of the MCS system. These lamps are defined in Table 6-22.

Table 6-22. Commissioning and Maintenance Terminal Panel Lamps

Lamp	Definition
IN USE CH–1	(SDU pin TPH1) This lamp lights to show channel 1 is in use.
IN USE CH–2	(SDU pin TPK1) This lamp lights to show channel 2 is in use.
PILOT VCE NOT AVAIL	(SDU pin TP3A) This lamp lights to show no additional voice channels can be established. This can be because no resources are available, or all available resources being allocated to existing calls.
LOG OFF	(SDU pin TPC3) This lamp lights to show no packet mode data service capability exists at any data rate; system not logged on.
CABIN VCE NOT AVAIL	(SDU pin TPB3) This lamp lights to show no additional channels can be established for analog or digital cabin voice, or circuit–mode data. This can be because no resources are available, or all available resources being allocated to existing calls.
MCS FAIL	(SDU pin TPG1) This lamp lights to show a total loss of all SATCOM voice and data services, and at least one cause can be attributable to the MCS system LRUs themselves. Replacement of the appropriate LRU (SDU, HPA) is necessary to restore partial or complete service. It is possible for this indicator and the MCS inoperable indicator (NON-MCS FAIL) to be active simultaneously, indicating failure in both the MCS system LRUs and nonsystem LRUs.
NON-MCS FAIL	(SDU pin TPE3) This lamp lights to show total loss of all SATCOM voice and data services, and at least one cause is attributable to the non-MCS system LRUs, or interfaces to those LRUs. Replacement of the appropriate non MCS LRU(s), or correction of the interface failure is necessary to restore partial or complete service. It is possible for this indicator and the SATCOM fail indicator (MCS FAIL) to be active simultaneously, indicating failure in both the MCS system LRUs and the nonsystem LRUs or interfaces.
NO SAT LINK	(SDU pin TPJ1) This lamp lights to show no SATCOM voice or data services are available because of the AES not being successfully logged-on, and the cause is definitely not due to reported failures (MCS or non-MCS). If there is a MCS or non-MCS failure, the NO SAT LINK lamp will not light.
HGA FAIL	(SDU pin TPD3) This lamp lights to show packet-mode data service capability exists, but only at the lowest channel rates (600 and 1200 bps). This indicator is assumed to only be present in high gain antennas installations that have a low gain antenna backup system. The lamp indicates an HGA failure due to the reduction from normal high speed capability.

SECTION 7
MAINTENANCE PRACTICES

1. Overview

A. General

(1) This section supplies instructions for removing, reinstalling, and adjusting each LRU of the MCS that has been installed by the aircraft manufacturer or completion center. Where applicable, instructions for replacing lamps, knobs, and set screws are included. Adjustment information is called out as required.

CAUTION: SHOULD ANY INSTALLATION CRITICAL CASES ARISE WITH THE REINSTALLATION OF ANY UNIT, YOU MUST COMPLY 100 PERCENT WITH THE INSTRUCTION.

CAUTION: TO PREVENT DAMAGE TO EQUIPMENT, TURN AIRCRAFT POWER OFF WHEN REMOVING OR INSTALLING LRUS.

2. Equipment and Materials

A. General

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO MATERIALS SPECIFIED BY HONEYWELL. MATERIALS NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(1) Maintenance materials identified with a Honeywell Material Number (HMN) are given in Table 7-1.

(2) No additional special equipment or materials other than those commonly used in the shop are required to install the units in existing trays and clamps, and to adjust the system. Do not over tighten mounting screws. Where torque values are not given, it is acceptable to finger tighten the mounting screws.

Table 7-1. Materials

Item	Description	Source
HMN 97P5778	RTV silicone, No. 3145, translucent, per MIL–A–46146, Group II, Type I military designation M4614621XTN.	Dow Corning Corp, Midland, MI (05AJ8)
HMN 98C0978	Sealant, corrosion inhibitive (MIL–S–81733, Type II–1/2 – for extrusion application in the time of 1/2 hour) — Pro–Seal 870B–1/2	Courtaulds Aerospace, Glendale, CA (83574)
NOTES: NOTES: 1. Equivalent alternatives are permitted for materials in this list. 2. The HMN codes in the list of materials identify the Honeywell Material Number (HMN) given to each material.		

3. Procedure for Antennas

A. General

(1) The following paragraphs describe general information when removing or installing antennas.

NOTE: For all antennas not supplied by Honeywell, removal and installation should be done according to installation instructions from the manufacturer.

B. Antenna Weather Protection

(1) Some antennas require gaskets and others have O–rings. When reinstalling antennas, new gaskets or O–rings should be used.

(2) A weather sealant should be applied around the periphery of the antenna base to prevent seepage of water and condensation and preclude corrosion. If a sealant or aerodynamic smoother is used around the periphery of the antenna base, it should be applied after the antenna has been bolted down. The sealant used should be nonadhering so the antenna can be removed at a later time, if necessary. Chromatic tape is recommended.

NOTE: When mounting antennas on a pressurized fuselage, a leveling and sealing compound like Pro-Seal 870B–1/2 should be used between the entire mounting surface of the antenna and the fuselage. Use of this compound, in addition to the installation gasket, compensates for surface irregularities and voids between the antenna and the fuselage. A mold releasing agent can be used on the fuselage prior to installation to prevent the leveling compound from adhering to the fuselage.

(3) To prevent water seepage on top mounted antennas, it can be necessary to apply Silastic sealant (RTV–3145 or equivalent) to the mounting screw heads.

C. Antenna Hardware

(1) Clean the airframe at the antenna mounting area to remove any foreign material.

(2) Because of the insulation qualities of gaskets and leveling compounds, the mounting screws are required to supply the electrical bonding between the antennas and the aircraft (typically 15 milliohms or less is required). The technician doing the reinstallation must be sure any hardware being reused is clean and free of corrosion. If in doubt, use new hardware.

(3) Gaskets and O–rings deform during initial installation. While it is possible to reuse gaskets and O–rings, it is highly recommended new gaskets or O–rings be used.

D. General Antenna Removal Instructions

NOTE: These procedures apply to all antennas. To prevent damage to the antennas, do not apply pressure to the plastic housings or pry on plastic housings.

(1) Pull the appropriate circuit breakers.

(2) After removing and saving the hardware, cut the bond line of any installer–applied sealant between the antenna and the aircraft skin.

(3) Pull the antenna away from the aircraft skin far enough to disconnect the cable connector(s).

4. Procedure for the LRUs

CAUTION: BEFORE AN LRU IS INSTALLED OR REMOVED, PULL THE CIRCUIT BREAKERS THAT SUPPLY POWER TO THE LRU TO REMOVE POWER.

CAUTION: MOISTURE AND DIRT CAUSE DAMAGE TO LRUs.

CAUTION: LRU FAILURE RATES INCREASE WITH A RISE IN TEMPERATURE. INSTALL THE LRUs WITH CLEARANCE; LET THE AIR FLOW ON TOP AND BOTTOM OF LRUS TO PREVENT OVERHEATING.

A. LRU Removal

(1) Remove an LRU as follows:

(a) Disconnect the circuit breakers that supply power to the LRU.

(b) Tag the circuit breakers with DO-NOT-OPERATE identifiers.

(c) Loosen the clamp knobs and let them drop out of the way.

(d) Pull the LRU forward a minimum of 1/2 inch to clear the rear connector pins.

(e) Lift the LRU free of the cooling air-duct gasket on the mounting rack.

B. LRU Installation

(1) Install an LRU as follows:

(a) Determine the location of each LRU in the aircraft.

(b) Check the LRU to be installed and make sure all connector pins are straight and ready for connection.

(c) Make sure the index pin coding on the rear connector is correct for the mating connector.

(d) Place the LRU in the appropriate mounting rack and align the connectors. Push the LRU back to make contact with the connector pins. Push the LRU into place and rock the LRU sideways slightly.

CAUTION: DO NOT OVER TIGHTEN THE CLAMP. EXCESSIVE TORQUE CAN CAUSE BRACKETS AND CONNECTORS TO WARP AND BEND.

(e) Put the hold-down clamps in place and tighten the knobs finger-tight.

5. Owner Requirements Table Uploading

A. General

(1) When the SDU is replaced, the ORT needs to be uploaded before normal operation can begin. Refer to SYSTEM OPERATION, for the ORT uploading procedure.

6. Instructions for Continued Airworthiness, FAR 25.1529

A. General

(1) Maintenance requirements and instructions for continued airworthiness of the MCS components are contained in the paragraphs that follow.

(2) Installation of the MCS on an aircraft by supplemental type certificate or Form 337 obligates the aircraft operator to include the maintenance information supplied by this manual in the operator's Aircraft Maintenance Manual and the operator's Aircraft Scheduled Maintenance Program.

(a) Maintenance information for the MCS (system description, removal, installation, testing, etc.) is contained in this manual.

(b) LRU part numbers and other necessary part numbers contained in this manual should be placed into the aircraft operator's appropriate aircraft illustrated parts catalog (IPC).

(c) Wiring diagram information contained in this manual should be placed into the aircraft operator's appropriate aircraft Wiring Diagram Manuals.

(d) The MCS system components are considered on–condition units and no additional maintenance is required other than a check for security and operation at normal inspection intervals.

(e) If a system component is inoperative, remove unit, secure cables and wiring, collar applicable switches and circuit breakers, and placard them inoperative. Revise equipment list and weight and balance as applicable prior to flight and make a log book entry that unit was removed (refer to section 91.213 of the FAR or the aircraft's minimum equipment list (MEL).

(f) The MCS components can be repaired at a factory authorized repair center or an appropriately rated FAA Part 145 repair station.

(g) Once repaired, reinstall the LRU in the aircraft in accordance with the original Form 337 approved data or instructions in this manual. Do a Return to Service test of the system and approve it for return to service with a log book entry required by section 43.9.

(h) Scheduled maintenance program tasks to be added to the aircraft operator's appropriate aircraft maintenance program are as follows:

1 Recommended periodic scheduled servicing tasks: None required.

2 Recommended periodic inspections: None required.

NOTE: The (applicable LRUs) used with this system have test and inspections that are required by FAR 91.413 to be completed every 24 calender months.

3 Recommended periodic scheduled preventative maintenance tests (Tests to determine system condition and/or latent failures): None required.

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APPENDIX A
VENDOR EQUIPMENT

1. Overview

A. General

(1) Appendix A contains information on vendor-manufactured equipment that can be installed on an aircraft configured for MCS system. Installation of this equipment depends on the specific requirements of the operator. Therefore, information in this section is supplied as a courtesy to the MCS equipment operators.

2. Electronic Cable Specialists

A. General

(1) This paragraph contains information on how to select installation provisions offered by ECS for the Honeywell MCS–4200/7200 system. ECS designs and manufactures the installation provisions described here and can supply either individual components or complete installation kits. The address for Electronic Cable Specialists is as follows:

Electronic Cable Specialists
5300 W. Franklin Drive
Franklin, WI 53132
U.S.A.

Telephone: (414) 421–5300
FAX: (414) 421–5301

B. Radio Frequency Components

(1) All RF components (cable, connectors, and attenuators) supplied to interface the SATCOM Avionics and Antenna Subsystems have been designed to meet the strict usage and attenuation requirements of the Honeywell MCS–4200/7200 system and ARINC 741/761. A selected list of RF components offered by ECS for SATCOM installations is shown in Table A–1 and Table A–2.

C. Cable Assembly Fabrication

(1) ECS fabricates cable assemblies guaranteed to meet SATCOM system requirements and ARINC 741 specifications.

- Each cable assembly is fabricated with an individual part number, which is permanently affixed to each end of the assembly.
- Each set of cable assemblies is assigned a serial number, which is printed on the part number label. Serialization makes sure each cable assembly is traceable and repeatable.

Table A–1. ECS Cables and Connectors

ECS Cable Part No.	310801	310201	311501	311601	311901	3C142B*
Nominal Attenuation @ 1.6 GHz (dB/100 ft)	4.7	6.9	8.7	10.7	15.5	18.4
Overall Diameter	0.45 in.	0.32 in.	0.245 in.	0.23 in.	0.195 in.	0.195 in.
Pounds/100 ft	15.0	8.6	5.2	5.0	4.3	5.0
Male TNC 180°	CTS022	CTS122	CTS922	CTS922	CTS722	CTS722
Male TNC 90°	CTR022	CTR122	CTR922	CTR922	CTR722	CTR722
Male N 180°	CNS022	CNS122	CNS922	CNS922	CNS722	CNS722
Male N 90°	CNR022	CNR122	CNR922	CNR922	CNR722	CNR722
Female N 180°	FNS022	FNS122	FNS922	FNS922	FNS722	FNS722
ARINC 600 Size 1	L0122	L1122	L9122	L9122	L7122	L7122
ARINC 600 Size 5	N/A	N/A	A650922	A650922	225791–2	225791–2

Table A–2. ECS Attenuators

Attenuator (Transmit Path)	Attenuator (Receive Path)
Fixed or Variable	Fixed or Variable

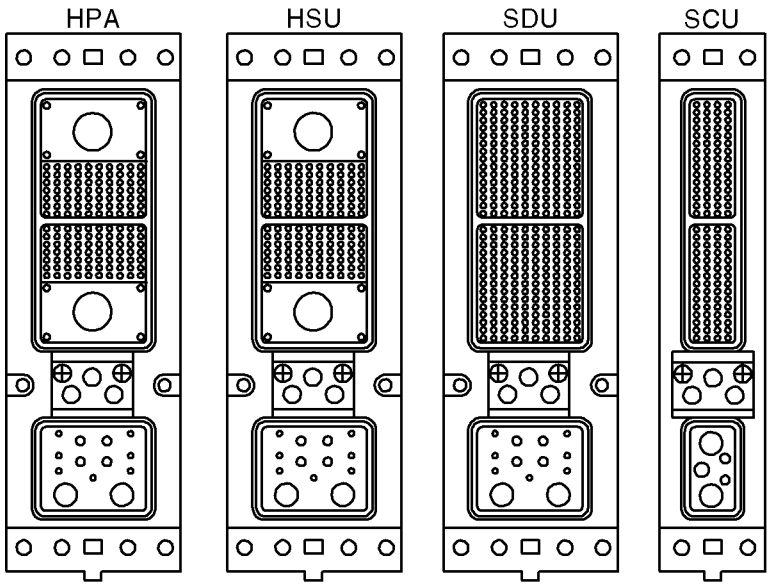
D. Cable Assembly Testing

(1) Testing is done on Hewlett-Packard 8753 network analyzers to verify insertion loss and VSWR. The results become part of a test database and are shipped with each cable assembly. Each cable assembly is tested across the SATCOM system frequency bandwidth (1530 MHz to 1660.5 MHz). Received path cable assemblies are test swept from 1530 MHz to 1559 MHz. Customers have the option of having cable assemblies tested with or without attenuators.

E. ARINC 600 Connectors

(1) ECS supplies ARINC 600 connectors for ARINC 741 style avionic electrical interfaces. The SATCOM rack-side connectors (Figure A–1) are described in this paragraph. Connector part numbers are:

(2) ECS supplies ARINC 600 Size 1 coaxial connectors with the requisite termination kit and assembly instructions (Figure A–2).



CONTACTS

HPA AND HSU

70 22AWG PINS, 1 SIZE NO. 1 (TP)
70 22AWG PINS, 1 SIZE NO. 1(MP)
2 SIZE NO. 5, 4 SIZE NO. 20
3 SIZE NO.16, 4 SIZE NO.12 (BP)

SDU

150 22AWG PINS (TP)
150 22AWG PINS (MP)
2 SIZE NO. 5, 4 SIZE NO. 20
3 SIZE NO. 16, 4 SIZE NO. 12 (BP)

SCU (2MCU STYLE AVIONICS)

60 22AWG PINS (TP)
60 22AWG PINS (MP)
2 SIZE NO. 5, 2 SIZE NO. 16,
1 SIZE NO. 12 (BP)

ID-176452

Figure A–1. ARINC Connectors

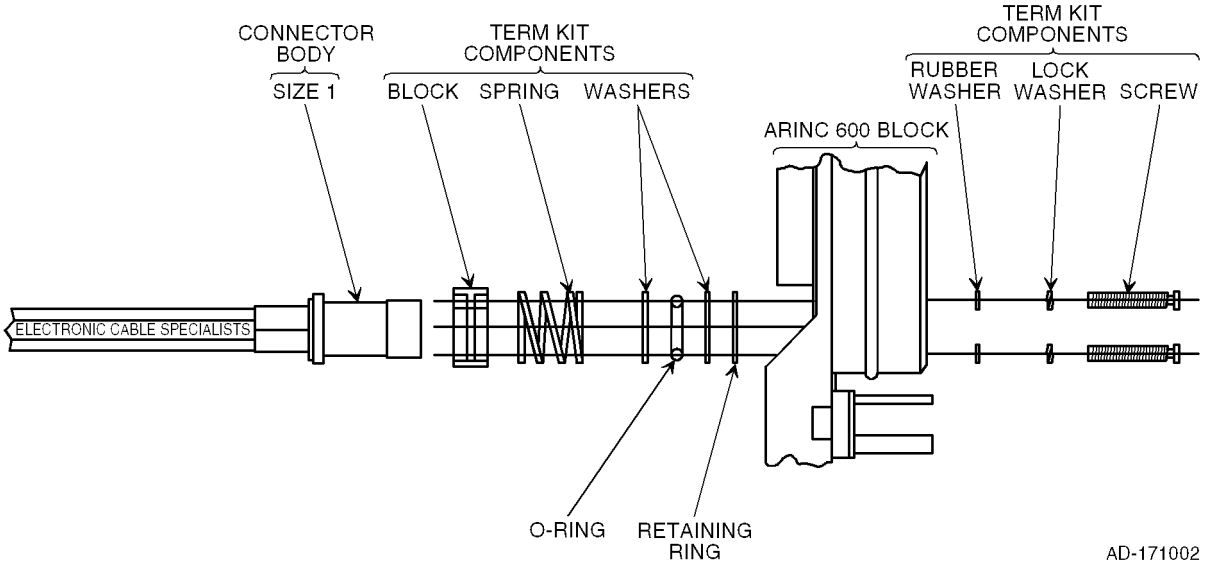


Figure A–2. ARINC Assembly

F. SATCOM Avionics Unit Mounting Hardware

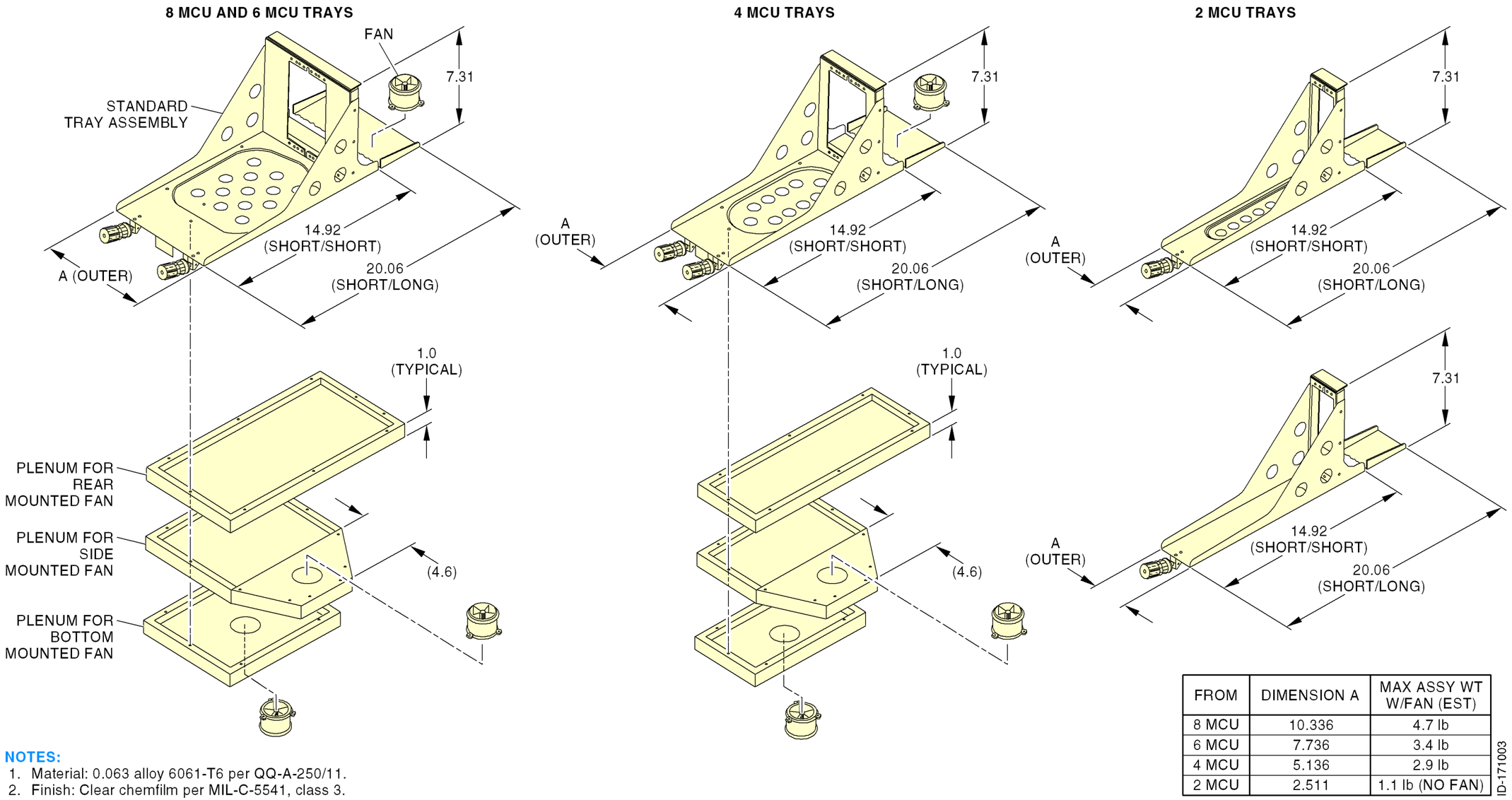
(1) SATCOM avionics mounting hardware is made up of the HPA, SDU, and SCU and will be mounted in ARINC 600 style tray assemblies. The HPA and SDU each require forced air cooling during normal operation, whereas the SCU can function properly with convection cooling alone. Refer to MECHANICAL INSTALLATION, for LRU cooling requirements.

G. SATCOM Hardware Component Kits

(1) This paragraph contains information on how to select SATCOM hardware component kits offered by ECS for the Honeywell MCS–4200/7200 avionic units in Table A–3 thru Table A–8. ECS supplies several options for each kit to accommodate the variety of mounting requirements specific to each aircraft installation. ECS tray assemblies come with and without independent cooling systems to ensure installation flexibility.

(2) The tray assemblies have been specially designed to meet Honeywell and ARINC 600 LRU cooling requirements. Tray assemblies are supplied with insertion/extraction front hold-downs as standard, but are available with other front hold-down options. For tray assembly dimensions refer to Figure A–3.

(3) The hardware component kits for the HPA, HSU, and SDU are listed in Table A–3 thru Table A–8, respectively.



FROM	DIMENSION A	MAX ASSY WT W/FAN (EST)
8 MCU	10.336	4.7 lb
6 MCU	7.736	3.4 lb
4 MCU	5.136	2.9 lb
2 MCU	2.511	1.1 lb (NO FAN)

ID-171003

NOTES:
1. Material: 0.063 alloy 6061-T6 per QQ-A-250/11.
2. Finish: Clear chemfilm per MIL-C-5541, class 3.

Figure A-3. Dimensions for ECS Tray Assemblies

Table A-3. SD-720 (120-10141-1XX) Pressurized Hardware Kit

4	4	4	4	4	4	4	4	4	4	4	MS51957-29	6-32 X 7/16 IN. PAN HEAD
4	4	4	4	4	4	4	4	4	4	4	NAS1149DN616J	WASHER, FLAT
1	1	1	1	1	1	1	1	1	1	1	NSXN2P201S01	SD-720 ARINC CONNECTOR W/PINS AND SOCKETS (NOTE 1 AND 2)
1	-	-	-	-	-	-	-	-	-	-	6028-101	6 MCU TRAY SHORT, RIGHT SIDE DC FAN
-	1	-	-	-	-	-	-	-	-	-	6068-101	6 MCU TRAY, SHORT, LEFT SIDE DC FAN
-	-	1	-	-	-	-	-	-	-	-	6413-101	6 MCU TRAY, LONG, REAR DC FAN
-	-	-	1	-	-	-	-	-	-	-	6013-102	6 MCU TRAY, SHORT, BOTTOM DC FAN
-	-	-	-	1	-	-	-	-	-	-	6218-101	6 MCU TRAY, LONG, RIGHT REAR AC FAN
-	-	-	-	-	1	-	-	-	-	-	6217-101	6 MCU TRAY, LONG, LEFT REAR AC FAN
-	-	-	-	-	-	1	-	-	-	-	6080-101	6 MCU TRAY, LONG, NO FAN
-	-	-	-	-	-	-	1	-	-	-	6110-101	6 MCU TRAY, SHORT, RIGHT SIDE AC FAN
-	-	-	-	-	-	-	-	1	-	-	6216-101	6 MCU TRAY, SHORT, LEFT SIDE AC FAN
-	-	-	-	-	-	-	-	-	1		6013-106	6 MCU TRAY, SHORT, BOTTOM AC FAN
-	-	-	-	-	-	-	-	-	-	1	6035-101	6 MCU TRAY, SHORT, NO FAN
QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	COMPONENTS PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
-111	-110	-109	-108	-107	-106	-105	-104	-103	-102	-101		
ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N		

NOTES:

1. ALTERNATE P/N: AD2-313-3AA00, NIC66H21A00AA0.
2. CONTACTS ARE: 22 AWG PINS, QTY OF 300; 20 AWG SOCKETS, QTY OF 4; 16 AWG SOCKETS. QTY OF 3; 12 AWG SOCKETS, QTY OF 4.

Table A-4. SD-720 (120-10142-1XX) Unpressurized Hardware Kit

4	4	4	4	4	4	4	4	4	4	4	MS51957-29	6-32 X 7/16 IN. PAN HEAD
4	4	4	4	4	4	4	4	4	4	4	NAS1149DN616J	WASHER, FLAT
1	1	1	1	1	1	1	1	1	1	1	NSXN2P201S01	SD-720 ARINC CONNECTOR W/PINS AND SOCKETS (NOTE 1 AND 2)
1	-	-	-	-	-	-	-	-	-	-	200-10276-101	6 MCU TRAY SHORT, RIGHT SIDE DC FAN (NOTE 3)
-	1	-	-	-	-	-	-	-	-	-	200-85743-101	6 MCU TRAY, SHORT, LEFT SIDE DC FAN
-	-	1	-	-	-	-	-	-	-	-	200-93955-101	6 MCU TRAY, LONG, REAR DC FAN
-	-	-	1	-	-	-	-	-	-	-	200-93112-101	6 MCU TRAY, SHORT, BOTTOM DC FAN
-	-	-	-	1	-	-	-	-	-	-	6281-101	6 MCU TRAY, LONG, RIGHT REAR AC FAN
-	-	-	-	-	1	-	-	-	-	-	6045-109	6 MCU TRAY, LONG, LEFT REAR AC FAN
-	-	-	-	-	-	1	-	-	-	-	6080-101	6 MCU TRAY, LONG, NO FAN
-	-	-	-	-	-	-	1	-	-	-	6282-101	6 MCU TRAY, SHORT, RIGHT SIDE AC FAN
-	-	-	-	-	-	-	-	1	-	-	6232-101	6 MCU TRAY, SHORT, LEFT SIDE AC FAN
-	-	-	-	-	-	-	-	-	1	-	6283-101	6 MCU TRAY, SHORT, BOTTOM AC FAN
-	-	-	-	-	-	-	-	-	-	1	6035-101	6 MCU TRAY, SHORT, NO FAN
QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	COMPONENTS PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
-111	-110	-109	-108	-107	-106	-105	-104	-103	-102	-101		
ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N		

NOTES:

1. ALTERNATE P/N: AD2-313-3AA00, NIC66H21A00AA0.
2. CONTACTS ARE: 22 AWG PINS, QTY OF 300; 20 AWG SOCKETS, QTY OF 4; 16 AWG SOCKETS, QTY OF 3; 12 AWG SOCKETS, QTY OF 4.
3. 200-10276-101 TRAY NOT CURRENTLY DESIGNED. APPROVED FAN ASSEMBLIES ARE: S0085-125, -134, -135, -138, AND -142.

Table A-5. HS-720 (120-10267-1XX) Pressurized Hardware Kit

4	4	4	4	4	4	4	4	4	4	4	MS51957-29	6-32 X 7/16 IN. PAN HEAD
4	4	4	4	4	4	4	4	4	4	4	NAS1149DN616J	WASHER, FLAT
1	1	1	1	1	1	1	1	1	1	1	NSXN2P221S01	HS-720 ARINC CONNECTOR W/PINS AND SOCKETS (NOTE 1 AND 2)
1	-	-	-	-	-	-	-	-	-	-	200-10510-101	4 MCU TRAY SHORT, RIGHT SIDE DC FAN
-	1	-	-	-	-	-	-	-	-	-	200-92609-101	4 MCU TRAY, SHORT, LEFT SIDE DC FAN
-	-	1	-	-	-	-	-	-	-	-	200-92893-101	4 MCU TRAY, LONG, REAR DC FAN
-	-	-	1	-	-	-	-	-	-	-	200-84977-101	4 MCU TRAY, SHORT, BOTTOM DC FAN
-	-	-	-	1	1	-	-	-	-	-	6083-102	4 MCU TRAY, LONG, REAR AC FAN
-	-	-	-	-	-	1	-	-	-	-	6026-101	4 MCU TRAY, LONG, NO FAN
-	-	-	-	-	-	-	1	-	-	-	6049-102	4 MCU TRAY, SHORT, RIGHT SIDE AC FAN
-	-	-	-	-	-	-	-	1	-	-	6049-101	4 MCU TRAY, SHORT, LEFT SIDE AC FAN
-	-	-	-	-	-	-	-	-	1	-	6050-101	4 MCU TRAY, SHORT, BOTTOM AC FAN
-	-	-	-	-	-	-	-	-	-	1	6034-101	4 MCU TRAY, SHORT, NO FAN
QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	COMPONENTS PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
-111	-110	-109	-108	-107	-106	-105	-104	-103	-102	-101		
ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N		

NOTES:

1. ALTERNATE P/N: AD2-155C-3AA00, AD2-155C-30000, NIC66H20A00A00.
2. CONTACTS ARE: 22 AWG PINS, QTY OF 140; 20 AWG SOCKETS, QTY OF 4; 16 AWG SOCKETS, QTY OF 3; 12 AWG SOCKETS, QTY OF 4.

Table A-6. HS-720 (120-10268-1XX) Unpressurized Hardware Kit

4	4	4	4	4	4	4	4	4	4	4	MS51957-29	6-32 X 7/16 IN. PAN HEAD
4	4	4	4	4	4	4	4	4	4	4	NAS1149DN616J	WASHER, FLAT
1	1	1	1	1	1	1	1	1	1	1	NSXN2P221S01	HS-720 ARINC CONNECTOR W/PINS AND SOCKETS (NOTE 1 AND 2)
1	-	-	-	-	-	-	-	-	-	-	200-10684-101	4 MCU TRAY SHORT, RIGHT SIDE DC FAN
-	1	-	-	-	-	-	-	-	-	-	200-10683-101	4 MCU TRAY, SHORT, LEFT SIDE DC FAN
-	-	1	-	-	-	-	-	-	-	-	200-85588-101	4 MCU TRAY, LONG, REAR DC FAN
-	-	-	1	-	-	-	-	-	-	-	200-10682-101	4 MCU TRAY, SHORT, BOTTOM DC FAN
-	-	-	-	1	1	-	-	-	-	-	6137-101	4 MCU TRAY, LONG, REAR AC FAN
-	-	-	-	-	-	1	-	-	-	-	6026-101	4 MCU TRAY, LONG, NO FAN
-	-	-	-	-	-	-	1	-	-	-	200-87190-101	4 MCU TRAY, SHORT, RIGHT SIDE AC FAN
-	-	-	-	-	-	-	-	1	-	-	200-84496-101	4 MCU TRAY, SHORT, LEFT SIDE AC FAN
-	-	-	-	-	-	-	-	-	1	-	6376-101	4 MCU TRAY, SHORT, BOTTOM AC FAN
-	-	-	-	-	-	-	-	-	-	1	6034-101	4 MCU TRAY, SHORT, NO FAN
QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	COMPONENTS PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
-111	-110	-109	-108	-107	-106	-105	-104	-103	-102	-101		
ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N		

NOTES:

1. ALTERNATE P/N: AD2-155C-3AA00, AD2-155C-30000, NIC66H20A00A00.
2. CONTACTS ARE: 22 AWG PINS, QTY OF 140; 20 AWG SOCKETS, QTY OF 4; 16 AWG SOCKETS, QTY OF 3; 12 AWG SOCKETS, QTY OF 4.

Table A-7. HP-720 (120-99510-1XX) Pressurized Hardware Kit

4	4	4	4	4	4	4	4	4	4	4	MS51957-29	6-32 X 7/16 IN. PAN HEAD
4	4	4	4	4	4	4	4	4	4	4	NAS1149DN616J	WASHER, FLAT
1	1	1	1	1	1	1	1	1	1	1	NSXN2P221S01	HSD-128 ARINC CONNECTOR W/CONTACTS (NOTE 1 AND 2)
1	1	1	1	1	1	1	1	1	1	1	MS25083-2BB8	6 INCH GROUNDING STRAP
1	-	-	-	-	-	-	-	-	-	-	200-96981-101	8 MCU S/S W/RIGHT MOUNTED DC FAN
-	1	-	-	-	-	-	-	-	-	-	200-91171-101	8 MCU S/S TRAY W/LEFT MOUNTED DC FAN
-	-	1	-	-	-	-	-	-	-	-	200-90568-101	8 MCU S/L W/REAR MOUNTED DC FAN
-	-	-	1	-	-	-	-	-	-	-	200-88654-101	8 MCU S/S TRAY W/BOTTOM MOUNTED DC FAN
-	-	-	-	1	-	-	-	-	-	-	6117-103	8 MCU S/L TRAY W/RIGHT REAR AC FAN
-	-	-	-	-	1	-	-	-	-	-	6117-101	8 MCU S/L TRAY W/LEFT REAR AC FAN
-	-	-	-	-	-	1	-	-	-	-	6096-101	8 MCU S/L STANDARD TRAY
-	-	-	-	-	-	-	1	-	-	-	6101-101	8 MCU S/S TRAY W/RIGHT SIDE AC FAN
-	-	-	-	-	-	-	-	1	-	-	6100-101	8 MCU S/S TRAY W/LEFT SIDE AC FAN
-	-	-	-	-	-	-	-	-	1		6093-103	8 MCU S/S TRAY W/BOTTOM AC FAN
-	-	-	-	-	-	-	-	-	-	1	6072-102	8 MCU S/S STANDARD TRAY
QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	COMPONENTS PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
-111	-110	-109	-108	-107	-106	-105	-104	-103	-102	-101		
ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N		

NOTES:

1. ALTERNATE P/N: 4D2-155C-3AA00, AD2-155C-30000, 4D2-155C-38900, BKAD2-V155M-301, NIC66H20A00AA0.
2. CONTACTS ARE: 22 AWG PINS, QTY OF 140; 20 AWG SOCKETS, QTY OF 4; 16 AWG SOCKETS, QTY OF 3; 12 AWG SOCKETS, QTY OF 4.

Table A-8. HP-720 (120-99509-1XX) Unpressurized Hardware Kit

4	4	4	4	4	4	4	4	4	4	4	4	MS51957-29	6-32 X 7/16 IN. PAN HEAD
4	4	4	4	4	4	4	4	4	4	4	4	NAS1149DN616J	WASHER
1	1	1	1	1	1	1	1	1	1	1	1	NSXN2P221S01	HSD-128 ARINC CONNECTOR W/CONTACTS (NOTE 1 AND 2)
1	1	1	1	1	1	1	1	1	1	1	1	MS25083-2BB8	6 INCH GROUNDING STRAP
1	-	-	-	-	-	-	-	-	-	-	-	200-90568-101	8 MCU S/L W REAR DC FAN
-	1	-	-	-	-	-	-	-	-	-	-	200-91171-102	8 MCU S/S W LEFT DC FAN & FINGER GUARD
-	-	1	-	-	-	-	-	-	-	-	-	200-91171-101	8 MCU S/S TRAY W/LEFT SIDE DC FAN
-	-	-	1	-	-	-	-	-	-	-	-	6-08S1C1C0	8 MCU S/S TRAY W/O COOLING AND #10 MOUNTING HOLES
-	-	-	-	1	-	-	-	-	-	-	-	200-91165-101	8 MCU S/S TRAY W/BOTTOM DC FAN
-	-	-	-	-	1	-	-	-	-	-	-	6288-101	8 MCU S/S TRAY W/LEFT SIDE AC FAN
-	-	-	-	-	-	1	-	-	-	-	-	6269-101	8 MCU S/S TRAY W/BOTTOM AC MOUNTED
-	-	-	-	-	-	-	1	-	-	-	-	6286-101	8 MCU S/L TRAY W/RIGHT AC REAR FAN
-	-	-	-	-	-	-	-	1	-	-	-	6284-101	8 MCU S/L TRAY W/LEFT AC REAR FAN
-	-	-	-	-	-	-	-	-	1	-	-	6290-101	8 MCU S/S TRAY W/RIGHT AC SIDE FAN
-	-	-	-	-	-	-	-	-	-	1		200-90202-101	8 MCU S/S TRAY W/LEFT SIDE AC FAN/FILTER
-	-	-	-	-	-	-	-	-	-	-	1	6292-101	8 MCU S/S TRAY W/BOTTOM FAN
QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	QTY REQ'D	COMPONENTS PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
-112	-111	-110	-109	-108	-107	-106	-105	-104	-103	-102	-101		
ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N	ASSEMBLY P/N		

NOTES:

1. ALTERNATE P/N: 4D2-155C-3AA00, AD2-155C-30000, 4D2-155C-38900, BKAD2-V155M-301, NIC66H20A00AA0.
2. CONTACTS ARE: 22 AWG PINS, QTY OF 140; 20 AWG SOCKETS, QTY OF 4; 16 AWG SOCKETS, QTY OF 3; 12 AWG SOCKETS, QTY OF 4.

H. Air Filtration Assemblies

(1) ECS can supply air filtration assemblies for the HPA, SDU, and BSU tray assemblies described in Table A–9. These filter assemblies offer protection against airborne contaminants, such as dust and cigarette smoke. System mean–time–between–failures (MTBF) can be significantly increased. Appendix B supplies installation procedures for air filtration hardware.

I. SATCOM Shelf Assemblies

(1) ECS supplies customized and standard turnkey plenum shelf assemblies to accommodate either single or dual SATCOM installations. A shelf assembly can incorporate equipment trays, racking, and additional support structures, such as disconnect panels, cover plates, and mounting brackets. ECS can supply components that are compatible with all types of air transport aircraft.

NOTE: Some SATCOM system installation locations render the aircraft cooling system inadequate. ECS has designed a self-contained cooling system for the SATCOM shelf assembly that can be used in this type of installation.

J. Additional Avionics Installation Components

(1) ECS supplies a variety of additional components to support a SATCOM installation. These include RF splitters, combiners, high power relays, maintenance panels, placards, circuit breakers, and control annunciator panels.

K. Antenna System Provisions

(1) SATCOM antenna systems are available in numerous configurations. ECS supplies installation provisions for each of these configurations.

- Some high-gain top-mounted antenna systems require a 2-MCU tray assembly and an ARINC 600 connector for the BSU. Others require mounting bracketry for the BSU. ECS supplies both BSU 2-MCU tray assembly, and connector and mounting bracketry as required.
- ECS supplies trays and ARINC connectors for various SCUs in the market place.
- ECS supplies other antenna mounting hardware, such as mounting brackets for the diplexer/low noise amplifier (D/LNA) and high- and low-gain antenna doublers.

L. Cabin Communications System Provisions

(1) ECS supplies ARINC 746 compliant air-to-ground communication systems installation provisions. These provisions include mounting hardware and connectors, shelves, racks, brackets, placards, cover plates, RF cable, connectors, cable assemblies, and wire harness assemblies.

M. Wire Harnesses

(1) ECS can supply wire harness provisions that interface the SATCOM avionics with the cabin communication units, the cabin communications units with the cabin phones, and both the SATCOM avionics and cabin communication units with other aircraft systems.

(2) ECS wire harness assemblies can be custom designed and fabricated to meet system installation requirements.

N. Complete Integrated SATCOM Installation Kits

(1) Complete system integration packages are available for ECS for virtually any given installation requirements. These integration packages can include any of the installation provisions discussed in this section, along with other customer-specified components. ECS can also support Honeywell's customers with systems installation design engineering and certification design data packaging.

3. Hollingsead International

A. General

(1) This information aids you in selecting the engineering services and installation provisions offered by Hollingsead International for the various MCS systems. Hollingsead International is rapidly transforming into a world-class avionics and aircraft systems integration leader, providing the capability to perform any or all of the following:

- Design and manufacturing of the structural mounting for the MCS and all associated avionics.
- Design and manufacturing of all wire and cable harness assembly interface connections between the MCS and all associated avionics.
- Development of all engineering design substantiation, documentation, and testing in support of FAA approval.
- Complete on-site support of a full installation team for the entire MCS installation kit.

(2) You can contact them at the following address regarding your specific MCS program requirements:

Hollingsead International
13701 Excelsior Drive
Santa Fe Springs, CA 90670
U.S.A.

Telephone: (310) 921-3438
FAX: (310) 921-6313
Telex: 691-462

B. Engineering Services

(1) As addressed in the previous paragraph, Hollingsead International supplies any level of engineering support from minimal consultation to full turn-key. Full turn-key support is defined as Hollingsead International undertaking the entire systems integration from initial design through procurement and manufacture of parts to final installation and certification on behalf on the customer.

C. LRU Mounting Requirements

(1) MCS avionics are made up of the HPA, SDU, and BSU, which are mounted in ARINC 600 style tray assemblies. The HPA and SDU each require forced air cooling during normal operation. The BSU and CMU, which are mounted in an ARINC 404 tray, function properly with convection cooling alone.

D. Installation Kit Components

(1) General

(a) Complete system installation kits are available from Hollingsead International for virtually any given installation requirement. These installation kits can include any of the installation provisions discussed herein along with other customer-specified components.

(2) Coaxial Cables

(a) All coaxial cables, connectors, and attenuators have been designed to fulfill the MCS system and the ARINC 741 usage and attenuation requirements. Hollingsead International supplies immediate access to several types and manufacturers of coaxial cable, appropriate N or TNC connectors, and attenuators to make sure the specific attenuation profiles for each aircraft installation is achieved. These cables range in nominal attenuation from 1.27 to 16.3 dB per 100 feet at 1.6 GHz. The cable outer diameter range is from 0.206 inch to 1.55 inches. Each cable assembly is fabricated with an individual part number and, where necessary, is assigned a serial number, which is permanently affixed to each end. Serialization insures traceability and reproducibility.

(b) Testing of each cable assembly is performed to verify insertion loss and VSWR. The results become part of a test database and are shipped with each cable assembly. Each cable assembly is tested across the MCS system frequency bandwidth. Transmit path cable assemblies are test swept from 1626.5 MHz to 1660.5 MHz and receive path cable assemblies are test swept from 1530 MHz to 1559 MHz. Customers have the option of having cable assemblies tested with or without attenuators.

(3) Connectors

(a) Hollingsead International supplies the appropriate ARINC connectors for ARINC Characteristic 741 style avionics electrical interfaces. The SATCOM rack-side connector blocks are appropriately mounted on each tray assembly. Hollingsead International supplies ARINC 600 Size 1 coaxial connectors with the necessary termination kit assembly instructions.

(b) The connector part numbers are as follows:

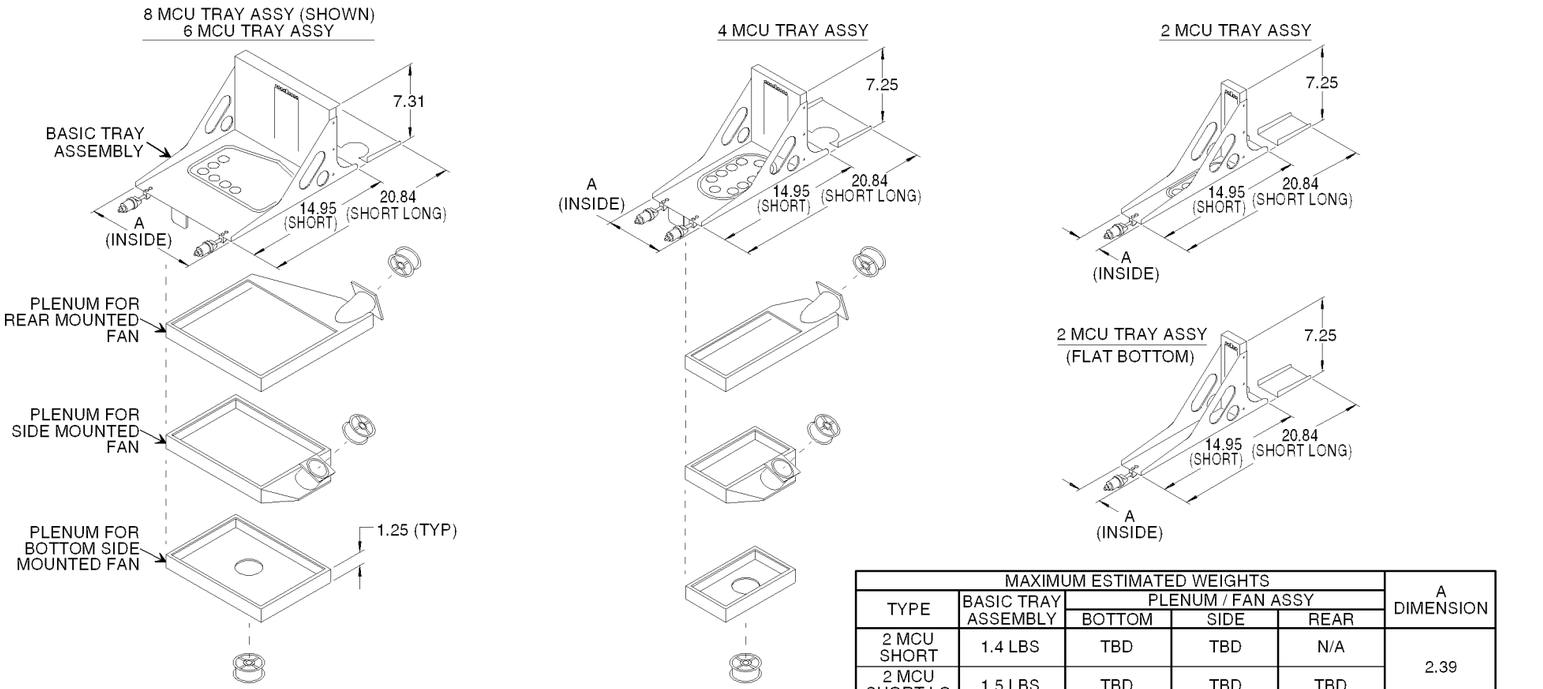
- SDU – C–06B3–0204–0100
- HPA – C–06B3–0708–0100
- HSU – C–06B3–0708–0100
- BSU – C–06B1–0101–0100
- CMU – DPX2MA–A106PA106P–33B–0001.

(4) Tray Assemblies

(a) Hollingsead International manufactures several tray assemblies for the MCS avionics. These tray assemblies come with or without independent cooling systems to ensure installation flexibility. Where forced air cooling is required, these tray assemblies have been specially designed to meet the cooling requirements of each LRU using a single fan. Tray assemblies are supplied with insertion/extraction front hold-downs as standard, but are available with other front hold-down options. Table A–9 identifies the various tray options and Figure A–3 identifies the dimensions for each tray assembly.

Table A–9. Tray Assembly Part Numbers

Type	Standard Tray Assembly	Assembly Fan Location				
		Bottom	Left Side	Right Side	Left Rear	Right Rear
8 MCU S/S	1708006–101	1708007–101	1708008–101	1708008–102	N/A	N/A
8 MCU S/L	1708006–201	1708007–201	1708008–201	1708008–202	1708009–101	1708009–102
6 MCU S/S	1706007–101	1706008–101	1706009–101	1706009–102	N/A	N/A
6 MCU S/L	1706007–201	1706008–201	1706009–201	1706009–202	1706010–101	1706010–102
4 MCU S/S	1704008–101	1704009–101	1704010–101	1704010–102	N/A	N/A
4 MCU S/L	1704008–201	1704009–201	1704010–201	1704010–202	1704011–101	1704011–102
2 MCU S/S	1702002–101	1702003–101				
2 MCU S/L	1702002–201	1702003–201				



TYPE	MAXIMUM ESTIMATED WEIGHTS				A DIMENSION
	BASIC TRAY ASSEMBLY	PLENUM / FAN ASSY			
		BOTTOM	SIDE	REAR	
2 MCU SHORT	1.4 LBS	TBD	TBD	N/A	2.39
2 MCU SHORT LG	1.5 LBS	TBD	TBD	TBD	
4 MCU SHORT	1.7 LBS	2.1 LBS	2.3 LBS	N/A	5.01
4 MCU SHORT LG	1.9 LBS	2.3 LBS	2.4 LBS	2.6 LBS	
6 MCU SHORT	2.3 LBS	2.6 LBS	3.2 LBS	N/A	7.61
6 MCU SHORT LG	2.6 LBS	2.9 LBS	3.5 LBS	3.6 LBS	
8 MCU SHORT	2.6 LBS	3.7 LBS	4.0 LBS	N/A	10.21
8 MCU SHORT LG	3.0 LBS	4.1 LBS	4.2 LBS	4.3 LBS	

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Figure A-4. Dimensions for Hollingsead Tray Assemblies

(5) Plenum Shelf Assemblies

(a) Hollingsead International supplies customized and standard turnkey plenum shelf assemblies to accommodate either single or dual MCS system installations. A shelf assembly can incorporate equipment trays, racking, and additional support structures such as disconnect panels, cover plates, and mounting brackets. Hollingsead International can supply components that are compatible with all types of air transport aircraft.

(6) Additional Components

(a) Hollingsead International supplies a variety of additional components to support an MCS installation, including RF splitters, combiners, high power relays, maintenance panels, placards, circuit breakers, and control enunciator panels.

(7) Antenna System Provisions

(a) The antenna subsystems for the MCS system are available in numerous configurations. Hollingsead International supplies installation provisions for each of these configurations. Some high-gain, top-mounted antenna systems use a 2-MCU tray assembly and ARINC 600 connector for the BSU. Others use mounting bracket hardware for the BSU. Hollingsead International supplies both BSU 2-MCU tray assemblies and mounting bracket hardware as necessary. Hollingsead International supplies other antenna mounting hardware such as mounting brackets for the diplexer/LNA and high-gain and low-gain antenna doublers.

(8) Cabin Communications System Provisions

(a) Hollingsead International supplies ARINC 746 compliant air-to-ground communications system installation provisions. These provisions include mounting hardware and connectors, shelves, racks, brackets, placards, cover plates, RF cable, connectors, cable assemblies, and wire harness assemblies.

(9) Wire Harness Assemblies

(a) Hollingsead International wire harness assemblies are custom designed and fabricated to meet each customer’s specific system installation requirements. Hollingsead International supplies wire harness assemblies for the following interfaces:

- MCS avionics and cabin communication units
- MCS avionics and flight deck data and voice communication sources
- Cabin communications units and cabin telephones
- Both the SATCOM avionics and cabin communication units with other aircraft systems.

4. Signal Conditioning Unit

A. General

(1) The SCU (Part No. 56047–010XX) is manufactured by ATS USA Inc. in the U.S.A. Contact the project manager at the following address for additional information not supplied in this section:

ATS USA Inc.
11410 Isaac Newton Square
Suite 210
Reston, VA 20190
U.S.A.

Telephone: (800) 709–0172
FAX: (888) 325–5808

(2) The MCS system requires ARINC 429 data for antenna pointing, antenna stabilization, and Doppler frequency correction. These requirements are defined in Table A–10. If the aircraft does not have an IRS that supplies this ARINC data, the SCU can be used to supply the data.

(3) The SCU is packaged as an ARINC 600 2 MCU and weighs a maximum of 5.95 pounds (2.70 kilograms). The outer case of the SCU is constructed from two half-shells identical in dimensions, which are made of an aluminum alloy 1.6 millimeters thick. The front and rear panels are made of the same alloy 3.3 millimeters thick. Both panels attach to the outer half-shells with corner brackets. Two divider plates mount between the half-shells of the outer case to supply additional rigidity and electrical shielding.

(4) The SCU translates and consolidates various input data formats into a two-wire differential ARINC 429 high speed output for latitude and longitude position, true heading, track angle, ground speed, and pitch and roll attitude. Program pins define the particular type of data being received. These pins are interrogated at power on by the software to determine the required configuration.

(5) The SCU operates from a nominal 115 V ac, 400 Hz single phase supply and/or from 28 V dc primary power. Input pins are supplied for both power sources in the ARINC 600 connector, and both power inputs can be connected to the aircraft power. Current consumption depends on the input voltage and temperature, but is typically 0.25 amperes at 115 V ac or 0.40 amperes at 28 V dc.

Table A–10. ARINC 429 Data Requirements

Label	Definition	Minimum Rate (MS)	Maximum Rate (ms)
310	Latitude of present position	334	67
311	Longitude of present position	334	67
312	Ground speed	125	22
313	Track angle	55	22
314	True heading	55	22
324	Pitch	40	8
325	Roll	40	8

B. Operator Functions

(1) The front panel contains six LED indicators to allow monitoring of the SCU status. However, these indicators are intended for use during repair by maintenance personnel rather than by the operator during normal flight operation. Discrete outputs representing the state of each LED indicator are also supplied for remote monitoring. The functions of these discretes are defined in Table A–11.

Table A–11. SCU Discrete Functions

Color	Nomenclature	Function
Green	Power	Indicates SCU is on and all voltages are correct when lit.
Green	SCU Valid	Indicates correct operation of the SCU logic and processing circuits when lit.
Red	BIT Fail	• Indicates normal operation when off. • Indicates BIT is running repetitively when flashing slowly. Indicates the SCU has failed BIT when steadily lit. • Indicates the SCU has failed BIT when steadily lit.
Amber	Signal 1	Indicates selection of input channel 1 when lit.
Amber	Signal 2	Indicates selection of input channel 2 when lit.
Amber	Signal 3	Indicates selection of input channel 3 when lit.

(2) Three amber LED indicators supply an error code that is displayed when the SCU fails in the BIT mode. The red indicator lights and a three-bit code is continuously displayed on the amber LEDs as indicated in Table A–12. BIT is interruptive and all normal operation ceases during the time when the SCU is in the BIT mode.

Table A–12. SCU Error Code

Failure	Code	LED 1	LED 2	LED 3
ARINC 429 translator not programmed	1	ON	OFF	OFF
RAM read/write failed	2	OFF	ON	OFF
ARINC 561 translator failed	3	ON	ON	OFF
PROM checksum failed	4	OFF	OFF	ON
ARINC 561 translator not programmed	5	ON	OFF	ON
Discrete input failed	6	OFF	ON	ON
ARINC 429 translator failed	7	ON	ON	ON

C. Control Functions

(1) Normal operation of the SCU is fully automatic and does not require operator intervention. Some control functions are supplied through the main ARINC 600 connector. These functions include:

- Remote SCU on/off control
- BIT initiate control
- Signal select A
- Signal select B
- Program pin A
- Program pin B
- Program pin C.

(2) The remote SCU on/off control line enables the operation of the SCU power supply. The control line is active low and must be connected to ground to enable operation of the SCU. An open circuit or 28 V dc on this line shuts down operation of the SCU.

(3) The BIT initiate control line is an active low input used to enable BIT in the SCU. The BIT mode is an optional function that supplies a pre/post-flight confidence check and is intended for use by maintenance personnel as a diagnostic tool. The SCU remains in the BIT mode as long as the BIT initiate control line is grounded. An open circuit or 28 V dc on this control causes the SCU to return to normal operation.

(4) Signal selection is normally an automatic function under control of the internal SCU program and is based on the validity of the received data. The signal select control lines supply an override of this automatic function to allow manual selection of one input from three available sources. The signal select control lines are active low and are internally pulled high. Manual selection is accomplished by applying a ground to the control lines as given in Table A–13.

Table A–13. SCU Manual Signal Selection

Function	Signal Select Control Lines	
	A	B
Automatic Selection	High	High
Select Input No. 1	Low	High
Select Input No. 2	High	Low
Select Input No. 3	Low	Low

D. System Functions

(1) Initialization

(a) Operation begins with BIT when the SCU is activated by applying aircraft power and grounding the on/off control line. Testing normally takes approximately 0.5 second and when BIT passes normal operation begins. If the SCU fails the initial BIT check, the unit latches in the BIT mode and displays an error code with the amber LED indicators.

(2) Automatic Input Selection Mode

(a) There are three available data input channels. Unless a channel is manually selected, the input to be used by the SCU is selected automatically. After initially selecting Channel 1, the SCU checks for the presence of the required valid words in the input data stream and the status of the attitude warning discrete from the selected synchro channel. If all validity conditions are met within 1.6 seconds from the initial channel selection, the SCU locks on to the current channel and continues to operate from that data source. The appropriate amber LED indicator lights to indicate the selected channel to operator. If any of the required data is invalid, the SCU cycles to the next input channel until a channel providing a complete frame of valid data is received.

(3) Valid Channel Condition

(a) Conditions that must exist to let the SCU accept the current input channel include:

- At least one new data word for each of the required labels is received within the specified time period.
- The sign/status matrix (SSM) of all words for all required labels must be valid.
- The primary attitude warning input discrete must be in a valid state to indicate the synchro inputs for attitude are usable.

(4) Channel Switching Timing

(a) The SCU allows 1.6 seconds for the selected input channel to receive a valid data frame. However, if 1.6 seconds has passed and the valid channel conditions have not been satisfied, the input channel cycles to the next sequential channel. If all three input channels have been checked and none are valid, the SCU prevents further cycling of the input channel selection for 1 minute. This prevents the SCU from continuously cycling when the inertial navigation units or other sources of navigation data have not been initialized. After the 1-minute delay, the SCU again initiates the checking cycle.

(5) Data Input

(a) A data subset made up of present latitude and longitude, true heading, track angle, and ground speed is received through either the ARINC 561–6 wire inputs or the ARINC 571–2 wire inputs as defined by the program pin selections. When used as a selector of ARINC 404 data inputs, pitch and roll labels are also included. The words are selected from the data stream by their octal labels while other words are ignored. Program pin selections and associated data formats and labels are defined in Table A–14 thru Table A–18.

Table A–14. ARINC 561 Binary Data

Octal Label	Coded	Program Pin			Definition
		A	B	C	
310	Binary	0	0	0	Latitude of present position
311	Binary	0	0	0	Longitude of present position
212	Binary	0	0	0	Ground speed
213	Binary	0	0	0	Track angle
214	Binary	0	0	0	True heading

Table A–15. ARINC 561 BCD Data

Octal Label	Coded	Program Pin			Definition
		A	B	C	
010	BCD	1	0	0	Latitude of present position
011	BCD	1	0	0	Longitude of present position
012	BCD	1	0	0	Ground speed
013	BCD	1	0	0	Track angle
014	BCD	1	0	0	True heading

Table A–16. ARINC 571 Data, ARINC 429 Format

Octal Label	Program Pin			Definition
	A	B	C	
310	0	1	0	Latitude of present position
311	0	1	0	Longitude of present position
212	0	1	0	Ground speed
213	0	1	0	Track angle
214	0	1	0	True heading

Table A–17. ARINC 571 Data, ARINC 419 Format

Octal Label	Program Pin			Definition
	A	B	C	
210	1	1	0	Latitude of present position
211	1	1	0	Longitude of present position
212	1	1	0	Ground speed
213	1	1	0	Track angle
214	1	1	0	True heading

Table A–18. ARINC 404 Data, ARINC 429 Format

Octal Label	Program Pin			Definition
	A	B	C	
310	0	0	1	Latitude of present position
311	0	0	1	Longitude of present position
312	0	0	1	Ground speed
313	0	0	1	Track angle
314	0	0	1	True heading
324	0	0	1	Pitch
325	0	0	1	Roll

(b) The SSM of each received data word is checked. Valid words are converted to ARINC 429 data. Invalid words are discarded.

(c) With exception of the ARINC 404 input, the SCU also receives attitude data from an associated attitude source. The attitude data is in the form of ARINC 407 pitch and roll synchro channels and an attitude warning flag. Attitude data is selected from a source associated with the source selected for digital data. The attitude inputs used are given in Table A–19.

Table A–19. SCU Attitude Data Inputs

Data	Line Function
Roll	Synchro X
Roll	Synchro Y
Roll	Synchro Z
Pitch	Synchro X
Pitch	Synchro Y
Pitch	Synchro Z
Roll/Pitch	Reference HI
Roll/Pitch	Reference LO
Warning Flag	HI Flag (HI = Good)

(d) The pitch and roll synchro inputs are read every 20 milliseconds. The attitude warning flag is sampled before each computation to check the validity of the input data before the data is accepted.

(6) Data Output

(a) The SCU transmits ARINC 429 serial words at a rate of one complete seven-word message every 20 milliseconds. The SSMs in the navigation data words are based on those supplied by the digital input words. The SSM data for the attitude words is derived from computations and from the primary warning flag.

(b) The data output is in accordance with ARINC 429 high speed data (100 kHz clock speed). The SCU outputs ARINC 429 data on two separate ports operating in parallel. Data from both ports is identical, but independent output buffers are used to supply redundancy.

E. ARINC 600 Connector Pin Assignments

(1) The rear connector (ARINC Part No. NIC66F11A00AA0) of the SCU complies with ARINC Characteristic 600 as specified in the following:

- ARINC 600 – Size MCU 2 no. 2 shell
- Type 0X top insert
- Type 0X middle insert
- Type 0X bottom insert
- Index pin code 0X.

(2) The contact arrangements for the connector are specified in Table A–20. An example pin designation of BC12 for the table is given below.

Pin Designation Example: Pin BC12

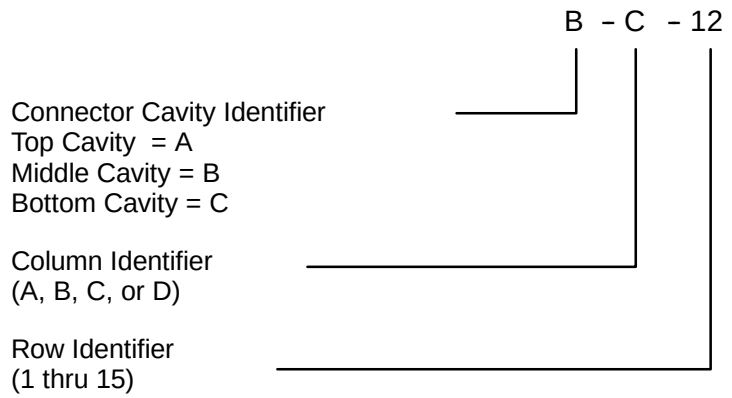

Table A–20. Contact Arrangements for SCU ARINC 600 Connector

Pin	Function	Remarks
AC1	ARINC 561 Data No. 1 (HI)	Note 1.
AD1	ARINC 561 Data No. 1 (LO)	Note 1.
AC2	ARINC 561 Clock No. 1 (HI)	Note 1.
AD2	ARINC 561 Clock No. 1 (LO)	Note 1.
AC3	ARINC 561 Strobe No. 1 (HI) or ARINC 429/419 Data No. 1 (HI)	Note 1.
AD3	ARINC 561 Strobe No. 1 (LO) or ARINC 429/419 Data No. 1 (LO)	Note 1.
AC4	Spare	
AD4	Spare	
AC5	Spare	
AD5	Spare	
AC6	Spare	
AD6	Spare	
AC7	Spare	
AD7	Spare	
AC8	Spare	
AD8	Spare	
AC9	ARINC 561 Data No. 3 (HI)	Note 1.
AD9	ARINC 561 Data No. 3 (LO)	Note 1.
AC10	ARINC 561 Clock No. 3 (HI)	Note 1.
AD10	ARINC 561 Clock No. 3 (LO)	Note 1.
AC11	ARINC 561 Strobe No. 3 (HI) or ARINC 429/419 Data No. 3 (HI)	Note 1.
AD11	ARINC 561 Strobe No. 3 (LO) or ARINC 429/419 Data No. 3 (LO)	Note 1.
AC12	Spare	
AD12	Spare	
AC13	ARINC 407 Pitch No. 1 X	Note 2.
AD13	ARINC 407 Pitch No. 1 Y	Note 2.
AC14	ARINC 407 Pitch No. 1 Z	Note 2.
AD14	ARINC 407 Heading X	Reserved
AC15	ARINC 407 Heading Y	Reserved
AD15	ARINC 407 Heading Z	Reserved

Table A-20. Contact Arrangements for SCU ARINC 600 Connector (cont)

Pin	Function	Remarks
AA1	ARINC 407 Pitch No. 3 X	Note 2.
AB1	ARINC 407 Pitch No. 3 Y	Note 2.
AA2	ARINC 407 Pitch No. 3 Z	Note 2.
AB2	Attitude Warning No. 1 (From Attitude Source)	Note 2.
AA3	ARINC 407 Reference No. 1 (HI)	
AB3	ARINC 407 Reference No. 1 (LO)	
AA4	ARINC 407 Heading Reference (HI)	Reserved
AB4	ARINC 407 Heading Reference (LO)	Reserved
AA5	ARINC 407 Reference No. 3 (HI)	
AB5	ARINC 407 Reference No. 3 (LO)	
AA6	Attitude Warning No. 3 (From Attitude Source)	Note 2.
AB6	Spare	
AA7	ARINC 407 Roll No. 1 X	Note 2.
AB7	ARINC 407 Roll No. 1 Y	Note 2.
AA8	ARINC 407 Roll No. 1 Z	Note 2.
AB8	Spare	
AA9	Spare	
AB9	Spare	
AA10	Spare	
AB10	Spare	
AA11	ARINC 407 Roll No. 3 X	Note 2.
AB11	ARINC 407 Roll No. 3 Y	Note 2.
AA12	ARINC 407 Roll No. 3 Z	Note 2.
AB12	Spare	
AA13	ARINC 404 Echo (HI)	Note 3.
AB13	ARINC 404 Echo (LO)	Note 3.
AA14	Spare	
AB14	Spare	
AA15	Spare	
AB15	Spare	

Table A–20. Contact Arrangements for SCU ARINC 600 Connector (cont)

Pin	Function	Remarks
BC1	ARINC 407 Pitch No. 2 X	Note 2.
BD1	ARINC 407 Pitch No. 2 Y	Note 2.
BC2	ARINC 407 Pitch No. 2 Z	Note 2.
BD2	Spare	
BC3	ARINC 407 Roll No. 2 X	Note 2.
BD3	ARINC 407 Roll No. 2 Y	Note 2.
BC4	Spare	
BD4	ARINC 407 Roll No. 2 Z	Note 2.
BC5	Spare	
BD5	Attitude Warning No. 2 (From Attitude Source)	Note 2.
BC6	ARINC 407 Reference No. 2 (HI)	
BD6	ARINC 407 Reference No. 2 (LO)	
BC7	Signal Source Select A (Input No. 1)	Note 4.
BD7	Signal Source Select (Input No. 2)	Note 4.
BC8	BIT initiate (Input No. 3)	Note 5.
BD8	Spare	
BC9	BIT Failed (Output No. 2)	Reserved
BD9	SCU Valid	Reserved
BC10	Superflag (+28 V dc = Output Valid)	Note 6.
BD10	/Superflag (<1 V dc = Output Valid)	Note 6.
BC11	Program Pin A (Input No. 5)	Note 7.
BD11	Program Pin B (Input No. 6)	Note 7.
BC12	Program Pin C (Input No. 7)	Note 7.
BD12	Spare	
BC13	Spare	
BD13	Spare	
BC14	Spare	
BD14	Spare	
BC15	ARINC 429 Out No. 1 (HI)	
BD15	ARINC 429 Out No. 1 (LO)	

Table A-20. Contact Arrangements for SCU ARINC 600 Connector (cont)

Pin	Function	Remarks
BA1	Spare	
BB1	Spare	
BA2	ARINC 429 Out No. 2 (HI)	
BB2	ARINC 429 Out No. 2 (LO)	
BA3	Spare	
BB3	Spare	
BA4	Discrete Out No. 3 (Select No. 2 LED)	Reserved
BB4	Discrete Out No. 4 (Select No. 3 LED)	Reserved
BA5	Discrete Out No. 5 (Select No. 1 LED)	Reserved
BB5	Discrete Out No. 6	Reserved
BA6	Discrete Out No. 7	Reserved
BB6	Discrete Out No. 8	Reserved
BA7	ARINC 561 Data No. 2 (HI)	Note 1.
BB7	ARINC 561 Data No. 2 (LO)	Note 1.
BA8	ARINC 561 Clock No. 2 (HI)	Note 1.
BB8	ARINC 561 Clock No. 2 (LO)	Note 1.
BA9	ARINC 561 Strobe No. 2 (HI) or ARINC 429/419 Data No. 2 (HI)	Note 1.
BB9	ARINC 561 Strobe No. 2 (LO) or ARINC 429/419 Data No. 2 (LO)	Note 1.
BA10	+28 V dc Power	Aircraft Power (Note 8.)
BB10	+28 V dc Power	Aircraft Power (Note 8.)
BA11	0 V dc Power Return	Aircraft Power (Note 8.)
BB11	0 V dc Power Return	Aircraft Power (Note 8.)
BA12	Chassis Ground	
BB12	Remote SCU On/Off Control	Note 9.
BA13	Shield return	Connected to Chassis
BB13	Shield Return	Connected to Chassis
BA14	115 V ac Power 400 Hz (HI)	Aircraft Power (Note 8.)
BB14	Chassis Ground	
BA15	115 V ac Power 400 Hz (LO)	Aircraft Power (Note 8.)

Table A–20. Contact Arrangements for SCU ARINC 600 Connector (cont)

Pin	Function	Remarks
BB15	Chassis Ground	

NOTES:

1. The 6-wire ARINC 561 or 2-wire ARINC 429/419 (ARINC 571/404) data can be routed from up to three sources. However, if a single input is supplied, it should be connected to the No. 1 inputs as indicated. Inputs No. 2 and 3 should be left open. The type of data being used, either ARINC 561 or ARINC 571/404, must be indicated by selecting the proper program pins as specified in NOTE 7. Also, refer to NOTE 4. for more information on selecting a specific input as the data source.
2. The synchro pitch and roll data can be routed from up to three sources. However, sources of attitude data must be paired with sources of ARINC 561 or ARINC 571 data. Thus, if only one source of ARINC 561 or ARINC 571 data is available, then only one source of attitude data can be used. An attitude warning flag for each source of attitude that is active must be supplied. +28 V dc = valid. Ground or open = invalid.
3. When the SCU is used as a selector/controller of multiple ARINC 404 compatible data sources, the receiving equipment should be connected to the ARINC 404 echo outputs. In this configuration, the input as valid by the SCU is routed back out of the unit on these pins. Since attitude data is embedded in the ARINC 404 data stream, no attitude inputs are used.
4. When multiple sources of data are available and routed to the SCU, it automatically searches for an input with valid attitude data and ARINC 561/571 data. If only one source of ARINC 561/571 data and attitude data is available, the SCU should be connected to only one input and the signal source select lines should be linked as applicable for the selected input as given in Table A–21.
5. Grounding the BIT initiate input forces the SCU to enter the interruptive BIT mode and repetitively do its BIT routines until ground is removed. BIT is automatically done at each power-up cycle. This input should be an open, if not used.
6. The superflag output is +28 V dc whenever the SCU is operating normally and the output data is valid. If a portion of the input data is invalid or the SCU detects an internal fault, then the superflag output is 0 V dc. The /superflag output is the inverse of the superflag output.
7. The data format and characteristics accepted by the SCU are programmable through pins A, B, and C. The combinations supported by the SCU are specified in Table A–22.
8. The SCU operates from either +28 V dc or 115 V ac, 400 Hz power. The power source not used should remain unconnected.
9. The remote SCU on/off control can be used to power down the SCU from a remote location. A ground activates the unit and an open switches the unit off. If remote control is not required, this pin should be permanently grounded at the connector.

Table A–21. Signal Source Select Lines

Signal Source Select	A	B
Auto	Open	Open
Input No.1	Ground	Open
Input No. 2	Open	Ground
Input No. 3	Ground	Ground

Table A-22. SCU Program Pin Combinations

Program Pins			Input Description
A	B	C	
0	0	0	ARINC 561 data, binary labels, synchro attitude
1	0	0	ARINC 561 data, BCD labels, synchro attitude
0	1	0	ARINC 571 data with ARINC 429 format, synchro attitude
1	1	0	ARINC 571 data with ARINC 419 format, synchro attitude
NOTE: Ground = 1; open = 0.			

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APPENDIX B
INSTALLATION PROCEDURES FOR SATCOM AIR FILTRATION SYSTEMS

1. Introduction

A. General

(1) Appendix B contains information on the different air filtration systems available for the SATCOM installations. Procedures for installing these air filtration systems are also supplied. After you have determined the proper air filtration system for your needs, follow the appropriate procedures in paragraph 4.

(2) The SATCOM system (SDU and HPA) is designed to ARINC 600 standards including ARINC 600 cooling requirements. ARINC 600 calls for the cooling air to contain no contamination particles in excess of 400 microns. Several installation designs do not supply cooling air in accordance with ARINC 600. The OEM installation design for the B747, B767, and B777 supply unfiltered cooling air (cabin air) to the SATCOM LRUs. As a result, contaminants in the air tend to accumulate on and inside the LRUs sometimes blocking off the cooling air passages. This leads to units operating at a higher temperature, which can result in decreasing the MTBF of the units.

(3) Filter assemblies have been designed that attach to the SATCOM LRUs or to the LRU trays. These filter assemblies contain filter media that filter out contaminants before entering the LRUs. This design is for installations where the cooling air is drawn through the LRU top to bottom, and where there is at least 1 inch of clearance above the LRUs to allow for the assembly itself. Thus, the air filtration units included in this appendix are acceptable for installation on the B747 and B777 aircraft, but because of clearance problems, are not acceptable for installation on the OEM-provisioned B767 aircraft.

2. Continued Airworthiness

A. General

CAUTION: THE FILTER MEDIA MUST BE REPLACED (OR CLEANED) APPROXIMATELY EVERY 4000 FLIGHT HOURS OR EVERY C CHECK, WHICHEVER COMES FIRST, OR THE EFFECTIVENESS OF THE AIR FILTRATION ASSEMBLY CAN BE DEGRADED.

(1) The selection of the type of filter media cartridge is based on the following:

- Effectiveness of the filter media in removing contaminants from the cooling air before entering the SATCOM LRUs.
- Impact of the filter media on the cooling air mass flow rate through the units.
- Time between removals.

3. Equipment and Materials

A. General

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO MATERIALS SPECIFIED BY HONEYWELL. MATERIALS NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(1) Refer to Table B–1 for a list of materials.

Table B–1. Materials

Item	Description	Source
HMN 9730178	Retaining compound (MIL–S–22473, grade A) — Grade A	Loctite Corp, Rocky Hill, CT (05972)
HMN 9731178	Primer for retaining compound, ready–to–use, quick (MIL–S–22473, grade T, form R) — Locquic Grade T	
NOTES: NOTES: 1. Equivalent alternatives are permitted for equipment and materials in this list. 2. The HMN codes in the list of materials identify the Honeywell Material Number (HMN) given to each material.		

(2) The equipment listed in Table B–2, Table B–3, and Table B–4 supplies the necessary hardware to install air filtration systems on the aircraft. Find the air filtration system and filter that best fits your needs and contact the company that manufacturers that particular equipment.

Table B–2. Air Filtration Systems from ECS for a Top Mount Assembly

Equipment	Quantity	LRU	Part No.	SATCOM System
SATCOM Filter Assembly	1	SDU	10919–101	6–MCU assembly
SATCOM Filter Assembly	1	HPA (20W)	10968–101	4–MCU assembly
SATCOM Filter Assembly	1	HPA (40W)	10923–101	8–MCU assembly
Filter Cartridge Assembly	1	SDU	10907–105	6–MCU assembly
Filter Cartridge Assembly	1	HPA (20W)	10907–104	4–MCU assembly
Filter Cartridge Assembly	1	HPA (40W)	10907–106	8–MCU assembly

Table B-3. Air Filtration Systems from ECS for a Body-Mounted Design

Equipment	Quantity	LRU	Part No.	SATCOM System
SATCOM Filter Assembly	1	SDU	P0329-106	6-MCU assembly
SATCOM Filter Assembly	1	HPA (20W)	P0329-104	4-MCU assembly
SATCOM Filter Assembly	1	HPA (40W)	P0329-108	8-MCU assembly
Filter Cartridge Assembly	1	SDU	20008-05	6-MCU assembly
Filter Cartridge Assembly	1	HPA (20W)	20008-04	4-MCU assembly
Filter Cartridge Assembly	1	HPA (40W)	20008-06	8-MCU assembly

Table B-4. Air Filtration Systems from ECS for a Tray-Mounted Design

Equipment	Quantity	LRU	Part No.	SATCOM System
SATCOM Filter Assembly	1	SDU	20005-103	6-MCU assembly
SATCOM Filter Assembly	1	HPA (20W)	20005-102	4-MCU assembly
SATCOM Filter Assembly	1	HPA (40W)	20005-104	8-MCU assembly
Filter Cartridge Assembly	1	SDU	20008-05	6-MCU assembly
Filter Cartridge Assembly	1	HPA (20W)	20008-04	4-MCU assembly
Filter Cartridge Assembly	1	HPA (40W)	20008-06	8-MCU assembly

4. Installation Instructions

A. Top Mount Assembly

(1) The ECS top mount air filtration assembly is designed to clamp to the top of the SATCOM LRUs so it does not come off the LRU. Once attached to the top of the LRU, it forms a seal letting only filtered air enter the LRU. The assembly is held to the top of the LRU by friction from the sides of the assembly and by the clamps that supply friction to the front and rear panels of the unit. Figure B–1 shows the location of the components for the following procedures.

(2) Install the filter assembly to an SDU or HPA using the following steps.

(a) Make sure the correct size assembly is selected for the given LRU (refer to Table B–2).

(b) OPTIONAL — Remove the SATCOM LRU from its tray and set it on a secure surface. (The assembly can be installed while the unit is in the rack.)

(c) Install the air filtration media inside the air filtration assembly in the rectangular filter frame.

(d) Place the filter assembly over the top of the LRU with the clamps in the up (thumb lever over the top of the filter assembly) position and pointing toward you.

(e) Push down on the air filtration unit until it fits over the top of the SATCOM LRU. The sides of the air filtration assembly may need to be spread open slightly prior to sliding over the sides of the LRU.

(f) Once the air filtration unit is firmly seated to the top of the LRU, clamp the assembly to the unit by pushing down on the two thumb levers until they lock into position. The thumb levers pass through approximately 180 degrees of rotation for the clamping process.

(g) Make sure the air filtration assembly remains seated firmly against the top of the LRU to maintain the air seal.

(h) Make sure the air filtration assembly is held tightly to the unit by gently lifting up on the assembly; making sure the assembly does not pull off of the LRU.

(i) OPTIONAL – Install the SATCOM LRU back into its tray if removed in step 4.A.(2)(b).

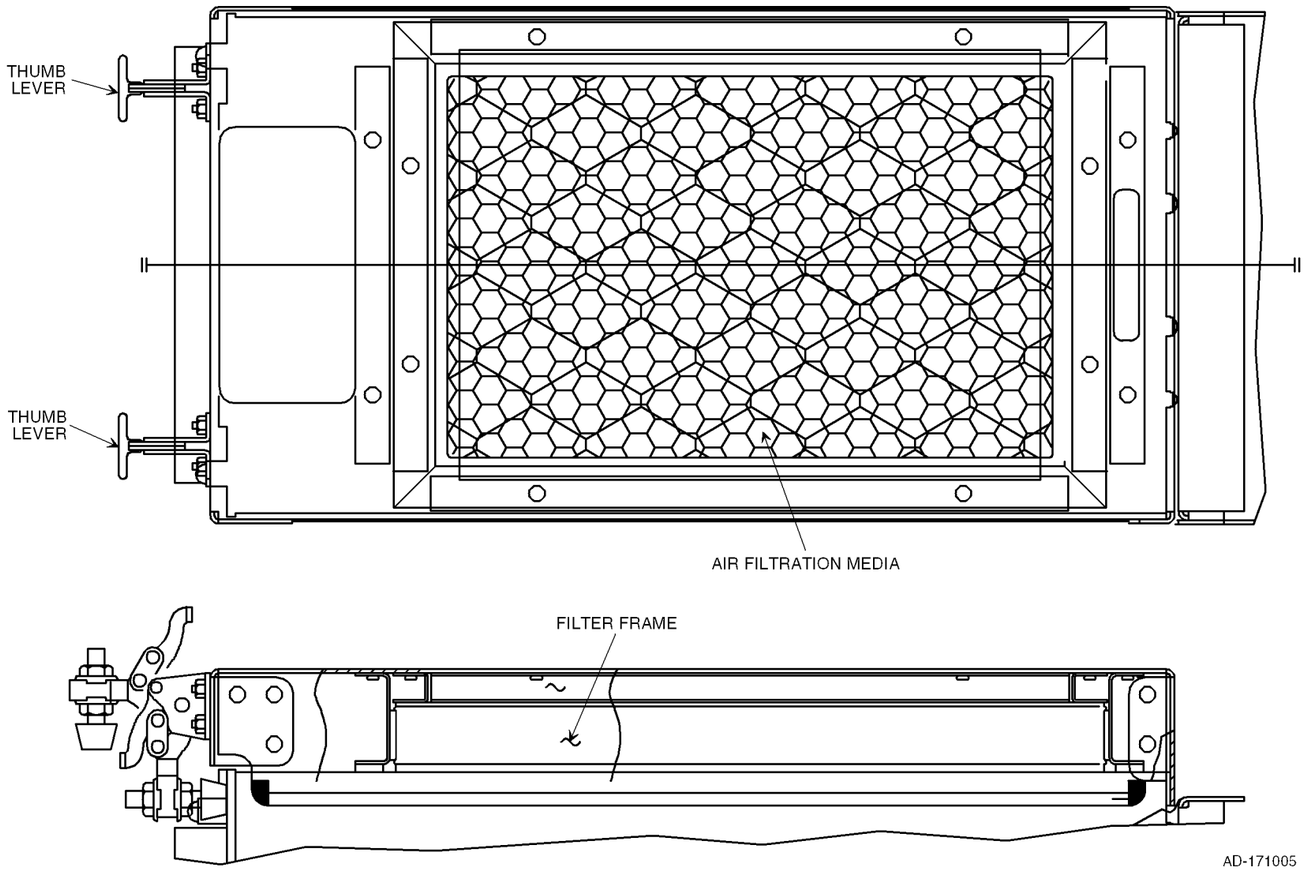

Figure B-1. ECS Top Mount Air Filtration Assembly

(3) Replace the filter media according to the following steps.

(a) Gain access to the SATCOM LRUs.

(b) Lift up on the two thumb levers (approximately 180 degrees).

(c) Pull up on the air filtration unit until it lifts off the top of the SATCOM LRU. The sides of the air filtration assembly may need to be spread open slightly prior to sliding up the sides of the LRU.

(d) Remove the air filtration media from the air filtration assembly in the rectangular filter frame.

(e) Once the assembly is removed, pull the filter assembly out of its retaining fixture and discard the filter appropriately.

(f) Obtain a new filter.

(g) Make sure the correct size filter assembly is selected for the given LRU (refer to Table B–2).

(h) Install the new filter media into the filter assembly retaining fixture.

(i) OPTIONAL — Remove the SATCOM LRU from its tray and set on a secure surface. (The assembly can be installed while the unit is in the rack.)

(j) Install the air filtration media inside the air filtration assembly in the rectangular filter frame.

(k) Place the filter assembly over the top of the LRU with the clamps in the up (thumb lever over the top of the filter assembly) position and pointing toward you.

(l) Push down on the air filtration unit until it fits over the top of the SATCOM LRU. The sides of the air filtration assembly may need to be spread open slightly prior to sliding over the sides of the LRU.

(m) Once the air filtration unit is firmly seated to the top of the LRU, clamp the assembly to the unit by pushing down on the two thumb levers until they lock into position. The thumb levers will pass through approximately 180 degrees of rotation for the clamping process.

(n) Make sure the air filtration assembly remains seated firmly against the top of the LRU to maintain the air seal.

(o) Make sure the air filtration assembly is held tightly to the unit by gently lifting up on the assembly to verify the assembly does not pull off the LRU.

(p) OPTIONAL – Install the SATCOM LRU back into its tray if removed in step 4.A.(3)(i).

B. Body–Mounted Assembly

(1) The ECS body-mounted air filtration assembly is designed to strap around the body of the SATCOM LRUs in a way that it will not come off the LRU. Once attached to the LRU, it forms a seal allowing only filtered air to enter the LRU. The assembly is held to the top of the LRU with a strap that fits securely around the body of the unit. The filtration unit sits on top of the SATCOM LRU. The strap runs down the side, underneath, and up the other side of the LRU. By way of a clamping system on top of the LRU, the strap is pulled tight, which firmly secures the filter assembly to the top of the unit.

(2) Install the filter assembly to an SDU or HPA according to the following steps.

(a) Make sure the correct size assembly is selected for the given LRU (refer to Table B–3).

(b) Remove the SATCOM LRU from its tray and set it on a secure surface.

(c) Slide the filter strap around the front of the LRU so the strap is underneath and coming up each side of the LRU.

(d) Place the filter assembly on top of the LRU so the back lip of the assembly unit fits over the back of the LRU.

(e) Pull the strap around the top of the filter assembly unit so the two ends of the strap overlap. The strap should come over the top of the filter assembly on the front end of the assembly (dog-house end of the LRU). A channel is built into the filter assembly for the strap.

(f) With the strap in place, latch the strap together by inserting the lips of the strap ends together so they latch together. With the LRU facing you, the strap on the left-hand side should latch over the top of the strap on the right-hand side.

(g) Once the strap is latched, make sure the lip on the rear of the filter assembly is seated firmly just over the rear of the LRU.

(h) Make sure the filter retainer mechanism is latched closed.

(3) Replace the filter media according to the following steps. Figure B–2 shows the location of the components used.

(a) Gain access to the SATCOM LRUs.

(b) Locate the filter retaining clips located on the forward end of the filter assembly mechanism.

(c) Slide the retainer clips (one on the left and one on the right) out to disengage the clips from the latching pins.

(d) Lift the filter retaining tray up, (hinged on the rear side) remove the filter media cartridge and discard the filter appropriately.

(e) Install the new filter media by placing a new filter media cartridge in the filter retaining tray chamber.

(f) Lower the filter retaining tray down until the locating pins protrude through the clearance holes on the filter retaining tray.

(g) Slide the retaining clips (left and right) in until they latch around the latching pins.

C. Tray-Mounted Assembly

(1) The ECS tray-mounted air filtration assembly is designed as an integral part of the equipment tray and does not attach to the LRU itself. The SATCOM LRU slides into the tray, sandwiched between the tray and plenum below, and the air filtration assembly above. Since the air filtration assembly is an integral part of the equipment tray, in order to install this type of assembly, a modified equipment tray must be purchased for each LRU.

(2) Replace the filter media according to the following steps. Figure B-2 shows the location of the components used.

(a) Gain access to the SATCOM LRUs.

(b) Locate the filter retaining clips located on the forward end of the filter assembly mechanism.

(c) Slide the retainer clips (one on the left and one on the right) out to disengage the clips from the latching pins.

(d) Lift the filter retaining tray up (hinged on the rear side) and remove the filter media cartridge. Discard the filter media cartridge appropriately.

(e) Install the new filter media by placing a new filter media cartridge in the filter retaining tray chamber.

(f) Make sure the filter cartridge is supported on the air plenum seals. The direction of airflow through the filter is not important.

(g) Lower the filter retaining tray until the locating pins protrude through the clearance holes on the filter retaining tray.

(h) Slide the retaining clips (left and right) in until they latch around the latching pins.

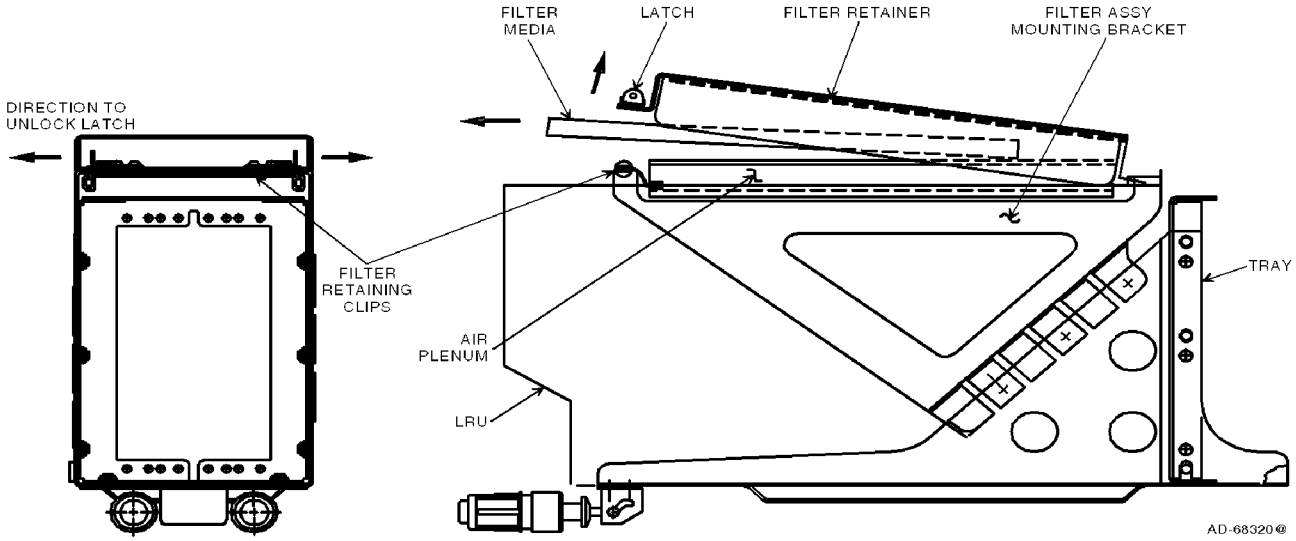

Figure B–2. Front and Side Views Showing Filter Removal

APPENDIX C
OWNER REQUIREMENTS TABLE

1. Overview

A. General

(1) Appendix C contains information on the ORT and is stored in non–volatile memory in the SDU. The ORT contains information relating to different areas of functionality, such as log-on and telephony. The ORT does not lose its contents because of the loss of SDU primary power or as a result of PAST. All ORT contents are set to default values by a factory settings restart. The ORT contains all pilot and aircraft operator entered information preserved when the SDU is powered-down. The characteristics of the ORT are specified in Table C–1.

NOTE: Honeywell supplies Windows–based software (ORT editor) that is used to generate the ORT files for upload. Contact your Honeywell representative for a copy of this software.

Table C–1. ORT Characteristics

ORT Item	Characteristic	Attributes	Description
i	Log-On Policy	Secured, common	This item defines the log-on procedure. When the SDU has power applied, the SDU either starts the automatic log-on procedure at the earliest opportunity (automatic), or the SDU goes to an inert standby state, even if the SDU is entirely failure free, where the SDU then waits for user stimulus to start logging-on (commanded).
ii	Satellite/GES Names	User, common	This item defines associated names for the satellites and GESs. Satellite names are up to five characters long. GES names are up to 14 characters long. Names made up of upper case letters, decimal digits, hyphens, and spaces are allowed. A GES name can include satellite and service identifying strings; e.g., GOON A–E SKY takes 12 characters and identifies Goonhilly, the United Kingdom GES servicing the Skyphone consortium and using the Atlantic ocean region east satellite.
iii	GES Preference Values	User, common	This item defines the automatic log-on preference values for GESs from 0 to 9, where 9 corresponds to the most preferred GES. The interpretation of preference value 0 is determined by item lvi, 0 is either the least preferred GES or it is not used for automatic log-on. GESs with preference level 0 can still be used for a constrained log-on. When all GESs on a particular satellite have a preference level of 0 and this satellite becomes the candidate for logon, the logon processing considers all of these GESs to have a preference level of 1 to facilitate continued SATCOM operation.
iv	Maintenance Page Access	User, common	This item defines whether the SCDU maintenance pages are accessible as: a) never; b) always; or c) only when the aircraft is on the ground.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
v	Cockpit Telephone Numbers	User, common	This item defines up to 100 telephone numbers as follows: • Each made up of up to 18 numeric characters (including optional spaces and/or trailing network ID preceded by a slash) • Each number having an associated priority value (i.e., 1 thru 4), protection (i.e., protected or unprotected), and a mnemonic of up to 14 characters • All are located in four user-definable categories of no more than 25 telephone numbers each. If configuration pin TP13A is set to the zero state, every entry with a priority 4 is modified to a priority 3 following an ORT upload or following a POST/PAST where priority 4 numbers existed prior to TP13A being set to the zero state. In a dual system, this modification takes place only if strap TP13A is in the zero state on both SDU systems. This item includes manually entered telephones from the SCDU CATEGORY NUMBERS pages.
vi	Deleted		
vii	Resources Reserved for Headset	User, common	When enabled, this item reserves the following resources for cockpit headset use at all times: one codec, one modem, and sufficient HPA power to support an extra C–channel in all prevailing circumstances. These resources are capable of being reserved for either of the cockpit audio channels. In a dual system, **channel** refers to logical channel.
viii	Response Capability to Log-On Interrogation	N/A	This item is not considered part of the MCS ORT, since the AES always supports log-on interrogation. There is always one SDU modem dedicated to P–channel reception and capable of R–channel and T–channel transmission.
ix	Use and Value of Flight Identification	N/A	This item is not considered part of the MCS ORT since the value is dynamic and is obtained from the CFDS/CMC/OMS or SCDU (along with item xxxiv).
x	Ground-to-Air Circuit-Mode Data	User, common	This item defines the allowing/disallowing of analog interconnect circuit-mode data on ground-to-air calls. It lets the AES identify itself to the GES as being data capable and the owner/operator anticipates receiving ground-to-air calls that need circuit-mode data service, thereby directing the GES to assign data capable channels to all ground-to-air calls.
xi	Deleted		
xii	Deleted		

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xiii	Ground-to-Air Calls	User, common	This item defines the allowing/disallowing and routing of ground-to-air priority 4 calls. If calls are allowed and if two or more of the AES voice user interfaces (i.e., digital phones, analog handset, or headset) are fitted, this item specifies which destination (digital phone, analog handset, or headset) incoming priority 4 calls are routed. However, routing to the headset is only possible if configuration pin TP13A is set to the one state. If TP13A is set to the zero state, the ORT setting is modified to Disallowed following a factory setting restart, an ORT upload with headset selected, or a POST/PAST if headset was selected prior to TP13A being set to the zero state. In a dual system, ground-to-air priority 4 calls can be routed to an interface that is installed on at least one of the SDU systems. Routing to HEADSET is only possible if at least one SDU system has a codec wired to AMS with TP13A strap in the one state (on this same SDU system).
xiv	Call Camp-On Duration	User, common	This item defines the camp-on duration be either indefinite, or a specified time-out period in the range of 1 to 15 minutes, or a time–out period of zero minutes (immediate time–out).
xv	Camp-On Time-out Action	User, common	This item defines whether the camp-on time-out action is to (a) preempt (if a candidate call exists) or to cancel camp-on (if no candidate call exists), or (b) to cancel camp-on.
xvi	Stored APHONE (WH–10) Telephone Numbers	User, duplicated	This item defines up to 10 stored telephone numbers (9 numbers plus last number redial), with each telephone number made up of up to 18 digits, for each of the two analog (APHONE) WH–10 channels. All such telephone numbers are priority 4 and the priority is not modifiable. These two sets of stored telephone numbers can be separate (distinct) or shared as specified in ORT item xxvi.
xvii	Deleted		
xviii	Noise Insertion Level	Secured, common	This item defines whether to enable or disable noise insertion on ground-to-air circuit-mode telephone calls. When noise insertion is enabled, this item also defines the level, as selected. Noise insertion minimizes annoying noise modulation when the GES drops the carrier in the forward (to–aircraft) direction during speech pauses.
xix	Ground-to-Air Preemption	User, common	This item defines whether or not incoming calls of priority 2 and/or 3 automatically preempt (as necessary) a candidate call as specified in SYSTEM DESCRIPTION. Priority 1 ground-to-air calls unconditionally preempt other calls of lower priority as necessary.
xx	Preferred Cockpit Call Routing	User, common	This item defines the routing of ground-initiated cockpit voice calls to a particular channel when two channels are available. This item does not affect which channel should be preempted if both channels are not available. In a dual system, channel refers to logical channel.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xxi	Preferred APHONE Call Routing	User, duplicated	When allowed by item xiii, this item defines the routing of ground-to-air priority 4 calls, when allowed in accordance with item xiii, to a particular channel when two APHONE channels are available. In a dual system, this item specifies the preferred physical channel on each SDU system, or None when there is no channel wired to APHONE on that system.
xxii	HGA Tx Gain Threshold	Secured, common	This item specifies the threshold on the reported HGA Tx gain for stimulating log-on renewal at Class 1 or automatic handover.
xxiii	Analog telephone (APHONE) System Management Commands	Secured, duplicated	This item defines the allowing/disallowing of system management commands from the analog phone (APHONE) interface (WH–10 or APBX).
xxiv	Analog telephone (APHONE) Outgoing Call Barring Level	User, duplicated	This item defines one of three levels for analog phone call barring. Level 0 allows all outgoing calls and the Store Phone Number Memory command specified in SYSTEM DESCRIPTION, but disallows six-digit numbers between 42XXXX and 47XXXX if accompanied by credit card data. Level 1 allows only stored phone numbers, directly dialed short-code phone numbers, and long dialed numbers from the APBX accompanied with credit card data to initiate outgoing calls. Level 1 disallows manually dialed full-length phone numbers not accompanied with credit card data, six-digit numbers between 42XXXX and 47XXXX if accompanied by credit card data, and the Store Phone Number Memory command. Level 2 disallows all outgoing calls, both manual and stored numbers, and the Store Phone Number Memory command. **NOTE:** The six-digit numbers between 42XXXX and 47XXXX have been designated air traffic control (ATC) destinations. These numbers may be dialed at any priority and are assigned a network ID of 1. In order to prevent unauthorized use of these numbers once they become publicly available, the AES filters these numbers appropriately. The filtering specified prohibits these numbers from being dialed with credit card data present based on the assumption anyone making a call to one of these numbers using a credit card is not an authorized user (i.e., a passenger).
xxv	Call Barring Security Code	User, duplicated	This item defines a four-digit password that, if entered through the analog phone (APHONE), allows call barring commands (SYSTEM DESCRIPTION) to be accepted.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xxvi	Shared Analog Telephone (WH–10) (APHONE) Number Storage	User, duplicated	This item defines whether the 10 stored numbers (9 numbers plus the last number redial) maintained for each of the analog phone (APHONE) channels are separate or shared (i.e., whether a phone number stored on a channel is accessible by the dial stored phone number command on the other channel).
xxvii	Deleted		
xxviii	Default HPA Backoff Limits	Secured, duplicated	This item defines the maximum backoff values for the linear and class C HPAs. The working (volatile) values are automatically updated by non zero values (i.e., other than 16 dB) received in the HPA backoff range fields of valid HPA status words. The nonvolatile entries are not modified with the received values.
xxix	HPA Minimum Reportable Actual Power Output	Secured, duplicated	This item defines the minimum values of actual power output capable of being reported through the HPA status words by the linear and class C HPAs. When this value or a lower value is reported in the HPA status word, calibration is inhibited.
xxx	Default Assumed Global Beam Initial C–Channel EIRP	Secured, common	This item defines the default assumed global beam initial C–channel EIRP. This value is used to assess the power availability for a C–channel call in the absence of any existing C–channels.
xxxi	SCDU Telephone Number Preselect	Secured, common	This item defines whether selection of a phone number on one of the CATEGORY NUMBERS pages preselects the phone number or initiates a call using the phone number. If this item is enabled, the selection of a phone number on one of the CATEGORY NUMBERS pages or manual entry of a phone number on the DIRECTORY page retrieves the selected number to the SATCOM MAIN MENU page (TESTING/FAULT ISOLATION), where the number can then be dialed by selecting the MAKE CALL prompt or by any of the call initiation methods triggered by activation of an input discrete.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xxxii	ACP Call Initiation	Secured, common	This item enables/disables ACP call initiation. This item can only be enabled when item xxxi is enabled. If enabled, one of the following two pairs of SDU discretes are capable of being used for call initiation (when the associated cockpit voice call light outputs are open), based on the state of program pin TP13K: • Cockpit voice mic on inputs — if the latched ACP hookswitch signaling method is strapped. • Place/End call discrete inputs — if the switched PTT hookswitch signaling method is strapped. In either case, this item specifies whether the number dialed should come from the ATC phone number register rather than the SCDU MAIN menu. If the MAIN menu is selected, the phone number displayed on the SATCOM MAIN MENU (3L label line for channel 1, or 5L label line for channel 2) is used for call initiation. If the ATC menu is selected, the phone number displayed on the ATC menu is used for call initiation on either cockpit channel. In a dual system, this item is enabled if the straps of both SDU systems are identical.
xxxiii	User (or Composite) Partition ORT Description	User, common	This item defines the 24-character field to describe the ORT. The ORT description is a 24-character field that annotates a particular set of options, in order to distinguish one set from another (e.g., NORTH PACIFIC ROUTE, SOUTH ATLANTIC ROUTE, 747–400 ASIAN ROUTE, 777 ASIAN ROUTE). Alternatively, this item could contain a software identification (e.g., a software part number for the ORT as a released entity). If the ORT version is for a composite file, the description field is for the entire ORT and item liii is not used. See item liii also.
xxxiv	Airline Code	User, common	This item defines an airline code made up of up to four ISO–5 characters to be used with a four-digit BCD flight number received from a McDonnell Douglas CFDIU (SYSTEM DESCRIPTION) in constructing a flight identifier for log-on. This is only used if the CFDS/CMC/OMS does not supply the airline code.
xxxv	Headset Outgoing Call Barring Level	User, common	This item defines one of two levels for headset call barring. Level 0 allows all outgoing calls. Level 1 allows only stored phone numbers, manually dialed short-code numbers, and manually dialed numbers with a network ID other than 1. For Level 1 call barring, all cockpit stored numbers are treated as protected (i.e., they cannot be modified from the SCDU).
xxxvi	Headset Transit Call	User, common	This item either enables or disables transit calls from the headset for line select key 4L.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xxxvii	User ORT Partition Modified Flag	User, common	This item indicates whether any item in the nonvolatile copy of the user partition of the ORT partition has been modified since the ORT was created in a configured state by the PC-based off-line ORT editing tool. When any user-partition ORT item is modified in nonvolatile memory by the SDU software, either directly or indirectly, this flag is set to modified. This value is never set to unmodified by the SDU software. Its value is displayed on the SCDU, on the CFDS, on the front panel display of the SDU, and on the CMT.
xxxviii	Failure Masking Data	Secured, common	This item is made up of a list of up to 50 failures (Level I code, SRU code, and failure code) whose operation is masked or suppressed. A switch is stored with each specified failure to indicate whether that failure should never be raised (i.e., the failure annunciation and reversion should be suppressed completely), or whether the failure should be annunciated normally (i.e., recorded and reported as specified in TESTING/FAULT ISOLATION) when declared, but not indict the appropriate functional resource specified for the failure (i.e., not take any other action in response to the failure, such as reconfiguring redundant resources). Unused entries in this table are represented by the Level I code, SRU code, and failure code all set to zero.
xxxix	Elevation Handover Threshold	Secured, common	This item, ranging in integer degrees between 0° and 90°, is used in combination with calculated elevation of the highest satellite to determine at what elevation to initiate a handover from the current satellite. This item is also used to determine when a satellite is not high enough in elevation to be considered in view for acquisition purposes by the automatic log-on process.
xl	High Rate Data Transmit Support	User, common	This item made up of two flags that specify (by being set to enabled or disabled) whether the SDU indicates support for 10,500 bps R– and T–channels in its log-on request of class 2, 3, and 4 (i.e., when using a high gain antenna), for the global beam and spot beam log-on requests, respectively.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xli	Automatic Transit Call GES Table	Secured, common	This item indicates the transit GES ID to be specified in an air-to-ground call setup request (SYSTEM DESCRIPTION) if no transit GES ID has been explicitly specified through the initiating user interface (APHONE, Headset, DPHONE). If the GES ID in the table is 377 octal (indicating null), then the log-on GES is used in the call setup request. For each satellite ID of 0, 1, 2, and 3, the table stores a GES ID to be used with the following types of calls: • Any PSTN long number call (i.e., with network ID 1, with between 7 and 18 digits, beginning with 00) with country code beginning with 1 (i.e., North America) • Any PSTN long number call with a country code beginning with 2 (i.e., Africa) • Any PSTN long number call with a country code beginning with 3 (i.e., South and West Europe) • Any PSTN long number call with a country code beginning with a 4 (i.e., North and East Europe) • Any PSTN long number call with a country code beginning with a 5 (i.e., South America) • Any PSTN long number call with a country code beginning with a 6 (i.e., South East Asia and Australia) • Any PSTN long number call with a country code beginning with a 7 (i.e., Soviet Union) • Any PSTN long number call with a country code beginning with an 8 (i.e., Far East) • Any PSTN long number call with a country code beginning with a 9 (i.e., India and Middle East) • Any PSTN short number call (i.e., network ID of 1, with between 2 and 6 digits not beginning with 00) • Any non-PSTN call (i.e., with network ID other than 1). The geographical region associated with each zone is approximate; refer to Figure 1–3 for details of individual country codes.
xlii	Air-to-Ground Chime	Secured, common	This item defines one of three chime options. These options only affect air-to-ground chime activation for call annunciation and the setting of SDU-to-ACARS MU/CMU status word bits. The first option is to always chime and always set the appropriate bits. The second option is to chime and set the appropriate bits only if the call was camped-on. The third option is to never chime and never set the bits.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xliii	SCDU Call Prompts	Secured, common	This item defines one of three levels of SCDU call prompt display. Level 0 causes all SCDU call prompts to be displayed. Level 1 causes the ANSWER CALL, REJECT, and END CALL prompts to not be displayed. Level 2 causes the MAKE CALL prompt and the Level 1 prompts to not be displayed. Level 2 is selectable only if ORT item xxxii is enabled.
xliv	EIRP Overdraft Checking Priority	Secured, common	This item defines the call priority level where at least one call must be in progress when considering if an EIRP overdraft is allowed.
xlv	Analog Telephone (APHONE) Called Terminal ID Assignment	User, duplicated	This item provides for the assignment of a three-digit called terminal identification (CTid) code to each APHONE channel routing ground-to-air priority 4 calls to the APHONE interface, based on the called terminal field in the call announcement signal unit. The CTid assigned can be any decimal value between –1 and 999. A CTid value of –1 represents no specific routing. This item also specifies a CTid assignment type of exclusive or nonexclusive for each channel. The assignment type defaults to nonexclusive if no CTid is assigned. An assignment type of exclusive with no CTid assigned is undefined and is not selectable. With a CTid assigned, an assignment type of exclusive inhibits all incoming calls from being routed to the associated channel unless the call announcement contains a CTid that matches the assigned value. An assignment type of nonexclusive allows all incoming calls to be routed to the associated channel unless the call announcement contains a CTid that matches the assigned value of the other channel. Regardless of the assignment type, an incoming call with a matching CTid is rejected if the associated channel is unavailable. Modifications of this item through the APHONE or CMT are checked for duplication with the other APHONE channel in the SDU and, in a dual system, with the APHONE channels in the other SDU. The primary use of this ORT item is to let incoming facsimile calls be routed to the channel connected to the facsimile machine.
xlvi	Cockpit Audio Level Settings	Secured, common	This item defines the level settings for the cockpit microphone, sidetone, and receive audio.
xlvii	HGA Retry Period (ground and air)	Secured, common	This item defines the time interval for ground and airborne cases after which SATCOM (when logged on through the LGA) is to make attempts to logon through the HGA. A value of 0 disables the periodic retry for each case. The time interval is in integer minutes ranging from 0 to 255.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xlviii	Cockpit Channel Interface Type for Dual	Secured, common	This item defines the functional mapping of the one to four potentially available physical SDU cockpit voice channels in a dual system to the one or two logical cockpit voice channels (as viewed from the perspective of the ACP and SCDU). It is used in combination with ORT item vi and system configuration pins TP13F and TP13J to determine the number of logical channels and which physical channel(s) is/are potentially available for each logical channel. This item is capable of taking on the states of fixed and shared. Fixed interfacing is interfacing each ACP/SCDU (logical) channel to one physical channel on one SDU only. Shared interfacing is interfacing each ACP/SCDU logical channel to one physical channel on each of the two SDUs. The fixed or shared interfacing declaration refers to the functional channel mapping, and not necessarily to the physical interwiring, e.g., the interwiring can be independent but the interface can be effectively shared by virtue of splitting/combining/paralleling within the AMS (as in the Boeing 777), or the interwiring can be literally paralleled, forcing the interface type to shared. In the case of two logical channels, it is assumed the single value for this item applies to both channels (i.e., both fixed or both shared). For the case of shared (for one or two logical channels), it is assumed each logical channel shares the same numbered physical channel on each SDU. The state of this item is checked for compatibility with the state of pins TP13F and TP13J of both SDUs and the state of ORT item vi of both SDUs.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
il	Mastery Handover Algorithm Weighting	User, common	This item stores the relative weighting factors for each of the six functional capability items that form the criteria for determining which system should automatically become the master in a dual system. Each of the six weighting factors is a non-negative integer ranging from 0 to 99. Higher factors indicate more important criteria; however, only the relative values of the factors is significant. Zero is used to indicate a capability factor not installed, not used, or is a don't care. The functional capability items are as follows: • CoV – Cockpit voice (for any number of channels). • CaV – Cabin circuit-mode voice/fax/data (any number of channels, any cabin interface). • CoL – Cockpit packet-mode data (through [C]MU) at low-rate only. • CoH – Cockpit packet-mode data (through [C]MU) at (potentially) high-rate. • CaL – Cabin packet-mode data (through CPDF or CTU) at low rate only. • CaH – Cabin packet-mode data (through CPDF or CTU) at (potentially) high-rate. CoL and CoH are mutually exclusive, as are CaL and CaH — i.e., regardless of the weighting factors assigned, no more than one of the cockpit data (or cabin data) capabilities can be true at a time. The primary practical use of this ORT item is for determining which SDU in a dual system should be the master when the choice is down to one system which only has voice capability vs one which only has data capability, or one with only cockpit services capabilities vs one with only cabin services capabilities.
l	Disable/Reenable Other SATCOM SCDU Prompts	Secured, common	This item determines if the disable other SATCOM and re–enable other SATCOM toggling SCDU prompts are presented or suppressed. The SCDU prompts are usually suppressed if the optional external manual switch (that controls the dual system select and disable discretes) is supplied so there is only one means of performing any function at a time and the possibility of inadvertently disabling both systems is avoided.
li	SCDU SATCOM Subsystem Prompts	Secured, duplicated	This item defines up to six ISO–5 characters used for the SCDU main menu SATCOM subsystem selection LSK prompts. The owner/operator is able to select any ISO–5 characters and any length up to six characters. Example character strings would be SAT L and SAT R, or <SDU–1 and <SDU–2.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
lii	SCDU Channel Label Suffixes	Secured, common	This item defines the one-character suffix for each cockpit voice channel label on the SCDU displays. The choices are 1 and 2, or L and R for channels 1 and 2, respectively. These suffixes are used for the channel identifiers on the SATCOM Main Menu, Directory, and Category Numbers pages.
liii	Secured ORT Description	Secured, common	This items defines a 24-character (ISO–5) field to describe the secured ORT partition. The description field is used to write a particular set of secured ORT items to distinguish one from another (e.g., B777 DUAL 950901, B747–400 DUAL 951001, B747–300 STC 951225). Alternatively, this item can contain a software identification (e.g., a software part number for the ORT as a released entity). If the ORT version is for a composite file, description field xxxiii is for the entire ORT, so item liii is not used in that case.
liv	Composite ORT File Upload Capability	Secured, common	This item defines whether or not the uploading of a composite ORT file version is to be allowed. This option is required to prevent the unintentional overwriting of the secured partition with a composite ORT file that contains both user and secured ORT items.
lv	Secured ORT Modified Flag	Secured, common	This item indicates whether any item in the nonvolatile copy of the secured ORT partition has been modified since the ORT was created in a configured state by the PC-based off-line ORT editing tool. When any secured ORT item is modified in nonvolatile memory by the SDU software, directly or indirectly, this flag is set to Modified. This value is never set to Unmodified by SDU software. Its value is displayed on the SCDU, the CFDS, the front panel display, and the CMT.
lvi	Access to Zero-Preference GESs	Secured, common	This item defines whether automatic log-on is allowed or disallowed to GESs with preference values set to zero by ORT item iii. This is intended to be set to allowed in Essential certified systems so at least two GESs are selectable for automatic log-on on each satellite. It can be set to disallowed in nonessential certified systems to intentionally preclude automatic log-on to particular GESs, e.g., those with the AES owner/operator have no contractual arrangements. See ORT item iii for additional information.
lvii	L–Band Reference Offset Calibration Thresholds	Secured, common	This item defines (in Hz) the thresholds of the L–Band reference offset calibration for both the **with IRS** and **without IRS** cases. These thresholds are used to determine whether to adjust the L–Band reference offsets. These values are displayed on the CMT.
lviii	Suppress AES Position Reporting	User, common	This item enables or disables the AES position reporting sent across each active C–channel.
lix	APHONE Audio Level Setting	Secured, common	This item defines the output level setting for the receive audio.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
lx	AERO H Only Operation	Secured, common	This item defines the service mode when an HGA is installed.
lxi	HSD Preemption Preferences	user, common	This ORT item defines the preferences to be used in determining which channel(s)/call(s) will be preempted when one or more HSD channels are among the preemption candidates. The following preference sets are selectable: Level Retention Preferences 0 C–P4 > MPDS/BGAN > ISDN 1 C–P4 > ISDN > MPDS/BGAN 2 MPDS/BGAN > C–P4 > ISDN 3 MPDS/BGAN > ISDN > C–P4 4 ISDN > C–P4 > MPDS/BGAN 5 ISDN > MPDS/BGAN > C–P4
lxii	Ongoing HSD Call EIRP	user, common	This item defines the minimum level of power that the SDU reserves for an ongoing Swift64 M–ISDN HSD call. If the HSU requested EIRP falls below this reserved EIRP level, then power reserved for the HSU will freeze at this level even though the actual power will track the EIRP requested by the HSU. The defined range of this item is 0.0 to 25.0 dBW.
lxiii	WSC Manual Dialing	user, common	This item defines parameter options to be passed to any connected and active Williamsburg SDU controller(s) (WSCs), for the WSC's own optional usage. It has no other direct functionality within the SDU. It shall be capable of taking on the values "Disabled" and "Enabled", and for the latter case, it specifies the priority level (1 through 4, [for Manual Dial Enable and Priority for Manual Dial]) to be used for such calls.
lxiv	Minimum HSD Call EIRP	user, common	This item defines the minimum permissible level of power that the SDU deems adequate for an ongoing Swift64 M–ISDN HSD call. If the HSU requested EIRP falls below this level, then the SDU terminates the call. The defined range of this item is 0.0 to 30.0 dBW.
lxv	HSD Registration Preference	user, common	This item specifies the type of HSD service (Swift64 or BGAN) which the HSU shall provide by way of the chosen satellite when in a region of both Swift64 and BGAN service coverage. The item defines the registration preference to be either a) automatic (i.e. BGAN when in BGAN coverage, otherwise Swift64 if in Swift64 coverage) b) Swift64 only c) BGAN only.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
lxvi	Swift64 M–ISDN LES Preference Values	user, common	This item defines automatic log–on preference values for Swift64 M–ISDN LESs in the range of 0 to 9 for use by the HSU, where 0 disallows use for automatic log on and 9 corresponds to most preferred.
lxvii	Swift64 MPDS LES Preference Values	user, common	This item defines automatic log–on preference values for Swift64 MPDS LESs in the range of 0 to 9 for use by the HSU, where 0 disallows use for automatic log–on and 9 corresponds to most preferred.
lxviii	Ethernet MAC Address Assignment	user, common	This item defines the MAC addresses that will be used to overwrite the globally unique, IEEE–allocated addresses associated with the Ethernet chipsets for HSU port 1 and 2. The defined range for each of the two addresses is 00–00–00– 00–00–00 (i.e., retain chipset value) to FF–FF–FF–FF–FF–FF. If an ORT upload attempts to set the MAC addresses for both HSU ports to the same non–zero value, then both addresses are set to their default values (as specified in Section 3.3.3.1.4.3.2), the User ORT Modified Flag is set and the associated range check failure is declared.
lxix	PPPoE Access–Concentrator Name	user, duplicated	This item defines the Access Concentrator (AC) name, for use in the HSU's PADO response to a PADI received during PPPoE communications. The AC name is up to 15 characters long. Names consisting of upper case letters, decimal digits, hyphens and spaces shall be allowed. In a dual system, this item specifies the AC name for each SDU system. If an ORT upload attempts to set identical AC names for both SDU #1 and SDU #2, then both names are set to their default values, the User ORT Modified Flag is set and the associated range check failure is declared.
lxx	Telnet Server Access	user, common	This item defines whether access to the HSU Telnet client, by way of the HSU's Ethernet port 1, is Disallowed or Allowed.
lxxi	DHCP Server Access	user, common	This item defines whether access to the HSU Dynamic Host Configuration Protocol (DHCP) server, by way of the HSU's ethernet port 1, is Disallowed or Allowed.
lxxii	Telnet IP Address Assignment	user, duplicated	This item defines the base IP address to be used for the HSU Telnet server on Ethernet port 1. The defined range for this item is 0.0.0.0 to 255.255.255.255.

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INSERT PAGE 47 OF 53 THRU N OF N FACING PAGE C-15.

Reason: To change the capitalization of INMARSAT to Inmarsat in the description of ORT Item lxxviii.

The description for Item lxxviii is changed as follows:

Table C-1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
lxxviii			This item defines Psid frequencies that may be used when attempting to acquire a satellite. The item specifies two frequencies and associated system table revision number for a maximum of 10 satellites. The frequencies are specified as Inmarsat channel numbers, with 0000x indicating no frequency stored.

Table C–1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
lxxiii	Telnet Subnet Mask Assignment	user, duplicated	This item defines the subnet mask address to be used for the HSU Telnet server on Ethernet port 1. The defined range for this item is 0.0.0.0 to 255.255.255.255. In a dual system, this item specifies the subnet mask address for each SDU system.
lxxiv	Telnet Default Gateway Assignment	user, duplicated	This item defines the default gateway address to be used for the HSU Telnet server on Ethernet port 1. The defined range for this item must be 0.0.0.0 to 255.255.255.255. In a dual system, this item specifies the default gateway address for each SDU system.
lxxv	DHCP IP Address Assignment	user, common	This item defines the base IP address to be used for the HSU DHCP server on Ethernet port 1. The defined range for this item is 0.0.0.0 to 255.255.255.255.
lxxvi	DHCP IP Address Pool Allocation	user, common	This item defines the number of IP addresses allocated for use by the HSU DHCP server on Ethernet port 1. The defined range for this item is 3 to 250.
lxxvii	BGAN PDP Session Parameters	user, common	This item defines the default values to be used in establishing a BGAN PDP session when no control parameter information is passed from the user terminal. The item specifies defaults for the following parameters: Traffic Class, Maximum Downlink and Uplink Bit Rates, Guaranteed Downlink and Uplink Bit Rates. The item defines the traffic class to be either a) Conversational b) Streaming c) Interactive d) Background The defined range of all bit rate parameters is 0 to FFFFx kbit/s.
lxxviii	Psid Supplementary Frequencies	user, common	This item defines Psid frequencies that may be used when attempting to acquire a satellite. The item specifies two frequencies and associated system table revision number for a maximum of 10 satellites. The frequencies are specified as INMARSAT channel numbers, with 0000x indicating no frequency stored.

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INSERT PAGE 48 OF 53 THRU 51 OF 53 FACING PAGE C-16.

Reason: To add Items lxxix thru cviii to Table C-1, ORT Characteristics.

Table C-1 is changed to add new data as follows:

Table C-1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
lxxix	DHCP Client Activated	User, duplicated	This item defines whether the DHCP client within the HSDU should be enabled or disabled on the two HSDU Ethernet ports.
lxxx	Access Point Name	User, common	This item defines the Access Point Name (APN) of an external network that can be accessed by the HSDU. The APN can be up to 40 characters long and can consist of upper case letters, decimal digits and hyphens.
lxxxi	Telnet User Name and Password	User, duplicated	This item defines the user name and password to be used when accessing Telnet sessions on the HSDU. The user name and password can each be up to 15 characters long and consist of upper case letters, decimal digits, hyphens and spaces. If the user name is defined as a null string, the HSDU will impose no access restrictions on a Telnet session.
lxxxii	Port Host Name	User, duplicated	This item defines the host names for Ethernet ports 1 and 2 for use by the DHCP client in the HSDU for TCP/IP addressing. Each host name can be up to 15 characters long and consist of upper case letters, decimal digits, hyphens, underscores and spaces.
lxxxiii	Reserved	-	-
lxxxiv	TFTP Software Upload Enabled	User, common	This item defines whether the TFTP server within the HSDU should be enabled or disabled. If enabled, the upload of an HSDU software image through Ethernet port 1 will be allowed.
lxxxv	CHAP/PAP User Name and Password	User, duplicated	This item defines the user name and password to be used when the IP router function is enabled within the HSDU and CHAP/PAP authentication is required. The user name and password can each be up to 15 characters long and consist of upper case letters, decimal digits, hyphens and spaces. If the user name is defined as a null string, the HSDU will impose no access restrictions.
lxxxvi	User ORT Part Number	User, common	This item defines the 15-character (ISO-5) ARINC-665 User ORT part number.
lxxxvii	Secured ORT Part Number	Secured, common	This item defines the 15-character (ISO-5) ARINC-665 Secured ORT part number.
lxxxviii	MIB Self-Test	User, common	This item defines whether the HSDU can be reset via the SNMP interface and can be set to either allowed or disallowed.
lxxxix	Primary Context Loading	User, duplicated	This item defines the philosophy used by the HSDU for assigning new Primary contexts to available channel cards. The options available are: a) Share new Primary contexts between channel cards b) Fill channel card 1 before moving onto channel card 2 or c) Fill channel card 2 before moving onto channel card 1.

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Table C-1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xcvii	Ciphering Enabled	User, common	This item defines whether the data passed over the air should be encrypted as per the 3G specifications. The value can be Enabled or Disabled.
xcviii	Ethernet Duplex Mode	User, duplicated	This item shall control the half/full duplex mode applicable to both HSU Ethernet ports. The available options are: a) Both Ethernet ports operate at half duplex, b) Ethernet Port 1 operates at full duplex, Ethernet Port 2 operates at half duplex, c) Ethernet Port 1 operates at half duplex, Ethernet Port operates at full duplex or d) Both Ethernet ports operate at full duplex.
ic	SwiftBroadband Attachment Mode	User, common	This item shall control the mode of attachment the HSU will use when in SwiftBroadband mode. The available options are: a) No automatic attachment, b) Automatic attachment for SwiftBroadband Circuit Switched service, c) Automatic attachment for SwiftBroadband Packet Switched service or d) Automatic attachment for SwiftBroadband Circuit Switched and Packet Switched services.
c	HSD Channel Preemption Preference	User, common	This item defines the preferred HSD Channel to preempt when more than one HSD channel is among the preemption candidates and the HSU is in SwiftBroadband mode. The available options are: a) Any Channel, b) HSD Channel Card 1, c) HSD Channel Card 2.
ci	LCP Authentication Enabled	User, common	This item defines whether LCP Authentication (using the PAP protocol) should be Enabled or Disabled. The HSU shall only utilize the CHAP/PAP Username and Password if the LCP Authentication Enabled flag indicates 'Enabled'. If LCP Authentication is enabled, the CHAP/PAP Username and Password shall be compared against the Username and Password provided by the PPPoE client, if they both match, then no authentication parameters are sent in the PDP context activation request to the network. If they do not match, the HSU shall pass the Username and Password parameters provided by the PPPoE client in the PDP context activation request for authentication with the network.

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Table C-1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
xc	BGAN Packet Data Threshold	User, common	This item defines the values to be used as a data threshold value in determining if any active PDP context has sufficient data throughput to deem SwiftBroadband service as being “in use”. This item contains two values, the number of data packets that defines the threshold, and a period value in milliseconds in which the designated number of packets are to be transmitted / received.
xci	Satellite Preferences	User, common	This item defines the satellites to be used in the automatic satellite selection algorithm. A satellite can be marked as either 0 (not considered for selection) or 1 (considered for selection).
xcii	Service Preferences	User, common	This item defines a preference level associated with a service or combination of services that the system can provide. The preference value ranges from 0 to 3, with 3 being the most preferred service(s) for which to attempt registration and 0 indicating that registration should not be attempted for the service(s).
xciii	Satellite Handover based on Service Preferences	User, common	This item defines whether a satellite handover can be initiated due to a higher preference service being available for selection.
xciv	HSD Service Recovery Timeout	User, common	This item defines the number of minutes to wait before allowing HSDU services to be available for selection again on a particular satellite after being temporarily marked as unavailable (e.g. as a result of registration rejection). The defined range for the timeout is 1 to 30 minutes.
xcv	Satellite Constellation	User, common	This item contains satellite constellation information which includes the satellite identity, satellite longitude and satellite service information. This item can be used to provide data for use in automatic satellite and service selection.
xcvi	IP Header Compression	User, common	This item defines whether IP Header Compression of TCP and UDP headers as per RFC 2507 should be disabled or enabled and the amount of memory to reserve for use. The range of values are: 0: IP header compression is disabled 1: IP header compression is enabled, with 512 bytes 2: 1024 bytes 3: 2048 bytes 4: 4096 bytes 5: 8192 bytes 6: 16384 bytes 7: 32768 bytes 8: 65536 bytes 9: 131072 bytes

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Table C-1. ORT Characteristics (cont)

ORT Item	Characteristic	Attributes	Description
cii	Maximum SwiftBroadband Streaming Bandwidth	User, common	This item defines the maximum streaming bandwidth permitted within the HSU when using SwiftBroadband service. The Maximum SwiftBroadband Streaming Bandwidth ORT Item will not be used by the HSU to deny SwiftBroadband service at the interface level. It will instead be used as a basis of populating the ARINC 781 MIB Service Availability Related Sub Branch for information purposes.
ciii	PIMBIT Fault Threshold	User, common	Reserved.
civ	PIMBIT Fault Threshold for Antenna Beams	User, common	Reserved.
cv	PIMBIT Data Invalid Thresholds	User, common	Reserved.
cvi	PIMBIT Antenna Beam Angles	User, common	Reserved.
cvii	PIMBIT Sample Discard Ratio	User, common	Reserved.
cviii	Aero Satellite Recovery Timer	User, common	This item defines the number of minutes to wait before allowing a Aero service to be available for selection again on a particular satellite after being temporarily marked as unavailable (e.g. as a result of P-Channel degradation or failure to acquire a P-Channel or HGA transmit gain below threshold). The defined range for the timeout is 1 to 30 minutes.

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APPENDIX D
CALL EVENTS LOG (CEL)

1. Call Events Log

A. General

(1) A CEL is maintained in non–volatile storage for post–flight analysis of circuit–mode call statistics. The CEL can store at least 300 events. In a dual system, each SDU maintains its own CEL for the calls it provides through its own antenna subsystem. The slave logs its own calls, and the master does not log calls provided by the slave, even though the master is involved with the establishment of the slave's calls. Events and the associated parameters to be stored are listed in Table D–1.

Table D–1. Call Events Log

Event	Parameters
Air to Ground Call Setup Request	Current Time/Date Interface (Headset 1 or 2, WH–10 1 or 2, APBX 1 or 2, DPHONE) Application Reference Number Call Precedence (Q) Initial 6 digits of B–Party Address Credit Card Data Present Flag Calling Terminal Number GES Id Modem Number Satellite Relative Azimuth and Elevation Voice Channel Characteristics RFM Channel Id Transcoder Number
Call Setup Failure	Current Time/Date Application Reference Number Call Precedence (Q) SLCV and detailed code GES Id
Ground to Air Call Announcement	Current Time/Date Application Reference Number Call Precedence (Q) GES Id Called Terminal Number Modem Number Transcoder Number Satellite Relative Azimuth and Elevation SLCV and detailed code (NULL if not rejected) Voice Channel Characteristics RFM Channel Id

Table D–1. Call Events Log (cont)

Event	Parameters
Ground to Air Call Answer	Current Time/Date Application Reference Number Call Precedence (Q) Interface (Headset 1 or 2, WH–10 1 or 2, APBX 1 or 2, DPHONE) GES Id
Call Termination	Current Time/Date Application Reference Number Call Precedence (Q) Satellite Relative Azimuth and Elevation Return EIRP at end of call Clearing SLCV and detailed code GES Id Highest audio level reported during call
CTU Call Setup Failure	Current Time/Date Call Reference Number CTU Event Type SLCV and Detailed Code
HSD Air to Ground Call Setup Request	HSD channel number Current Time/Date Call Reference Number Service Address (dialed phone number) Service Variant Originating Terminal Id LES Id Spot Beam Id (package 6.0 and subsequent) Satellite Relative Azimuth and Elevation Latitude Longitude HSU Interface (package 6.0 and subsequent)
HSD Ground to Air Call Announcement	HSD channel number Current Time/Date Call Reference Number Service Variant Destination Terminal Id LES Id Spot Beam Id (package 6.0 and subsequent) Satellite Relative Azimuth and Elevation Latitude Longitude
HSD Channel Assignment	HSD channel number Current Time/Date Call Reference Number LES Id Spot Beam Id (package 6.0 and subsequent) Initial call EIRP Forward and return channel Id

Table D–1. Call Events Log (cont)

Event	Parameters
HSD Call Termination	HSD channel number Current Time/Date Call Reference Number LES Id Spot Beam Id (package 6.0 and subsequent) Satellite Relative Azimuth and Elevation Latitude Longitude EIRP at end of call SLCV and Detailed Termination Code Carrier to Noise Density at end of call Unique Word Error Count
BGAN Air to Ground Circuit	HSD channel number Switched Setup Request Current Time/Date Call Reference Number Radio Network Controller Spot Beam Id Service Address (dialed phone number) Calling Terminal Id Service Type HSU Interface Satellite Relative Azimuth and Elevation Latitude Longitude
BGAN Call Termination	HSD channel number Current Time/Date Call Reference Number Radio Network Controller Spot Beam Id Clearing SLCV and detailed termination code Satellite Relative Azimuth and Elevation Latitude Longitude
BGAN Ground to Air Circuit	HSD channel number Switched Setup Request Current Time/Date Call Reference Number Radio Network Controller Spot Beam Id Calling Terminal Id Service Type HSU Interface Satellite Relative Azimuth and Elevation Latitude Longitude

2. Commentary

A. Most Significant Digit

(1) The DSLCV may be used to determine the type of circuit–mode service in–use when a call terminates. The coding for this digit is as follows:

- 0 Not Answered
- 1 Answered, Voice Call
- 2 2400 bps TIF Fax
- 3 4800 bps TIF Fax
- 4 9600 bps TIF Fax (reserved)
- 5 V.21 only TIF Fax
- 6 1200/2400 bps TIF V.22bis “PC” Data
- 7 4800 (reserved)
- 8 9600 (reserved)
- 9 (reserved)
- A (reserved)
- B 9600 bps CN11 Circuit Mode Data
- C Answered ISDN Call

B. SLCV And Detailed Code Definitions

(1) Table D–2 lists the SLCV and detailed code combinations and associated descriptions.

Table D–2. SCLV and Detailed Code Descriptions

Code	Description
0006 xBx	CTU, Chan Unacceptable <state>
0010 x00	Gnd User, Normal Clear
0010 x01	Normal Clear from Handset
0010 x02	Normal Clear from MCDU
0010 x03	Normal Clear from ACP Mic
0010 x04	Normal Clear from Cockpit Disc
0010 xBx	CTU, Normal Clear <state>
0012 x81	Incoming Call Not Answered
0012 xBx	CTU, No User Responding <state>
0015 x00	Call Rejected from SCDU

Table D-2. SCLV and Detailed Code Descriptions (cont)

Code	Description
0015 xBx	CTU, Call Rejected <state>
001d xBx	CTU, Req Facility Reject <state>
001e xBx	CTU, Respnse to Enquiry <state>
001f xBx	CTU, Unspecified Failure <state>
0029 xBx	CTU, Temporary Failure <state>
002c xBx	CTU, Chan Unavailable <state>
0043 xBx	CTU, Incoming APC Barred <state>
0051 xBx	CTU, Invalid Call Ref <state>
0060 xBx	CTU, Info Elemts Missing <state>
0061 xBx	CTU, Invalid Msg Type <state>
0064 xBx	CTU, Invalid Info Ctnts <state>
0065 xBx	CTU, Inappropriate Msg <state>
0066 xBx	CTU, Protocl Timer Expry <state>
006f xBx	CTU, Unspec Protocol Err <state>
0106 xBx	931, Chan Unacceptable <state>
0110 xBx	931, Normal Clear <state>
0112 xBx	931, No User Responding <state>
0115 xBx	931, Call Rejected <state>
011d xBx	931, Req Facility Reject <state>
011e xBx	931, Respnse to Enquiry <state>
011f xBx	931, Unspecified Failure <state>
0129 xBx	931, Temporary Failure <state>
012c xBx	931, Chan Unavailable <state>
0143 xBx	931, Incoming APC Barred <state>
0151 xBx	931, Invalid Call Ref <state>
0160 xBx	931, Info Elemts Missing <state>
0161 xBx	931, Invalid Msg Type <state>
0164 xBx	931, Invalid Info Ctnts <state>
0165 xBx	931, Inappropriate Msg <state>
0166 xBx	931, Protocl Timer Expry <state>

Table D–2. SCLV and Detailed Code Descriptions (cont)

Code	Description
016f xBx	931, Unspec Protocol Err <state>
0206 xBx	CTU, Chan Unacceptable <state>
0210 xBx	CTU, Normal Clear <state>
0212 xBx	CTU, No User Responding <state>
0212 xC0	Timer 301, No User Responding
0215 xBx	CTU, Call Rejected <state>
021C x40	Invalid B–Party Address
021d xBx	CTU, Req Facility Reject <state>
021e xBx	CTU, Respnse to Enquiry <state>
021f xBx	CTU, Unspecified Failure <state>
0229 xBx	CTU, Temporary Failure <state>
022c xBx	CTU, Chan Unavailable <state>
0243 xBx	CTU, Incoming APC Barred <state>
0251 xBx	CTU, Invalid Call Ref <state>
0260 xBx	CTU, Info Elemts Missing <state>
0261 xBx	CTU, Invalid Msg Type <state>
0264 xBx	CTU, Invalid Info Ctnts <state>
0265 xBx	CTU, Inappropriate Msg <state>
0266 xBx	CTU, Protocl Timer Expry <state>
026f xBx	CTU, Unspec Protocol Err <state>
0401 x00	Pub Net, Unassigned Number
0403 x00	Pub Net, No Route to Dest
0411 x00	Pub Net, User Busy
0412 x00	Pub Net, No User Responding
0412 xC0	G–>A Call Not Answered by User
041B x00	Pub Net, Dest Out of Service
041C x00	Pub Net, Invalid Number Format
0422 x00	Pub Net, No Circuit Avail
0426 x00	Pub Net, Network Out of Order
042A x00	Pub Net, Equip Congestion

Table D–2. SCLV and Detailed Code Descriptions (cont)

Code	Description
0442 x00	Pub Net, Chan Type not Implnt'd
046f xC0	Pub Net – Q.931 Error State I1
046f xC1	Pub Net – Q.931 Error State I3
046f xC2	Pub Net – Q.931 Error State I4
046f xC3	Pub Net – Q.931 Error State I6
046f xC4	Pub Net – Q.931 Error State I7
046f xC5	Pub Net – Q.931 Error State I9
046f xC6	Pub Net – Q.931 Error State I10
0501 x00	Priv Net, Unassigned Number
071F x00	Intn'l, Busy Flash (Unspec'd)
1111 x11	Preempt by Higher Priority
1121 xC0	B–Channel Not Available
1131 xC0	Invalid CCD, No Track 2 Data
1132 xC0	Invalid Address/Call'Party Num
1132 xC1	Number not preselected for cockpit
1141 xC0	Dest Out of Service, Chan Abort
1141 xC1	Dest Out of Service, I/F Abort
1141 xC2	Call Rejected, in Released St
1161 xB0	Credit Card Not Supported
1164 x92	Outgoing call – GES cannot provide requested voice service
1165 xC0	Invalid Bearer Capability
1165 xC1	Invalid Net Specific Facilities
1221 x20	GES Selective Release
1221 x21	No Power to Sustain Call
1221 x22	Satellite Handover
1221 x23	System Logged–Off
1221 x24	Equipment Failure (loss of min–op)
1221 x25	HGA Failed
1221 x26	HGA Deselected
1221 x27	Modem Revoked

Table D–2. SCLV and Detailed Code Descriptions (cont)

Code	Description
1221 x28	Transcoder Revoked
1221 x29	This SDU Disabled
1221 x2A	Cross–Talk Bus Failure
1221 x41	Analog Audio Interface revoked from call
1222 x32	Outgoing call – Insufficient Power for Setup
1222 x33	Outgoing call – No Modem for Setup
1222 x34	Outgoing call – No Transcoder for Setup
1222 x35	Not Logged On
1222 x36	Outgoing call – Cockpit Camp–On Cancel
1222 x37	Outgoing call – Call Failed to Preempt
1222 x38	Missing Resource for Setup
1222 x39	Incoming call – Destination I/F Not Wired
1222 x3A	Incoming call – Internal Equipment Failure
1222 x3B	Incoming call – External Equipment Failure
1222 x3C	Incoming call – Invalid DDI Called Term Id
1222 x3D	Incoming call – No Channel Available
1222 x3E	Incoming call – Master [other_satcom] Not OK
1222 x3F	Incoming call – Cannot Reach CTId on Other SATCOM (e.g., XTB failure)
1222 x40	Outgoing call – No available analog interface
1242 x90	Outgoing Calls Disallowed (ORT item xxvi)
1243 x50	Incoming Public Calls Barred (ORT item xiii)
1251 x61	C'ty Fail (C–Chan not Received)
1251 x63	C'ty Fail (No C–Chan Assignmnt)
1251 x64	C'ty Fail (No Test SU Received)
1251 x65	C'ty Fail (No S4 or S7 SU Rxed)
1251 x66	C'ty Fail (No Ack to Connect)
1251 x67	C–channel Bit Error Rate Degradation (CN59)
1251 x68	C–channel Inhibited, AES ID or ARN mismatch (CN59)
1264 x91	Incoming call – Voice Channel Type Not Supported
1265 x70	Not Logged On for Voice

Table D–2. SCLV and Detailed Code Descriptions (cont)

Code	Description
1271 x80	User Busy, Handset Off–Hook
1321 x00	GES, No Channel Avail
1322 x00	GES, No Channel Unit
1323 x00	GES, Analog Equip Unavail
1324 x00	GES, Digital Equip Unavail
1331 x00	GES, Credit Card Number Rejected
1332 x00	GES, Invalid Address
1341 x00	GES, Dest Out Of Service
1342 x00	GES, AES not Authorized
1351 x00	GES, Continuity Failure
1361 x00	GES, Credit Card Type not supported
1362 x00	GES, Analog Rate not Supp
1363 x00	GES, Digital Rate not Supp
1364 x00	GES, Voice Type not Supp
1365 x00	GES, Service not Supported
1374 x00	Spot Beam Handover
NOTE: <STATE> indicates the Q.931 Call STATE, for example, “Active” or “Incoming”. “X” indicates any value.	

C. HSD ISDN Call SLCV And Detailed Codes

(1) Table D–3 lists the SLCV and associated descriptions for HSD ISDN call terminations. Table D–4 lists the detailed combinations.

Table D–3. SLCV Description for HSD ISDN Call Terminations

S	L	V	C	Description
1	0	0	1	MES is clearing the call as instructed by the relevant MES terminal equipment (that is, normal clearing due to MES terminal “on–hook,” etc.).
1	0	1	1	MES is rejecting the call because the specified MES terminal number is currently busy, and MES has not been authorized to divert calls which are addressed to that number.
1	0	1	2	MES is clearing the fixed–originated call because subsequent to the acceptance of the call and the signaling of the identity of the mobile terminal to which the call will actually be routed, that terminal has become busy and hence cannot be rung.

Table D–3. SLCV Description for HSD ISDN Call Terminations (cont)

S	L	V	C	Description
1	0	2	1	MES is clearing the call because appropriate “off-hook” signaling has not been received from the addressed MES terminal (including any authorized diversions) within the allowed time limit.
1	0	8	1	MES is rejecting the call because the specified MES terminal number has not been installed, and MES has not been authorized to divert calls which are addressed to that number.
1	0	9	1	MES is rejecting the call because the specified MES terminal number is currently out–of–service, and MES has not been authorized to divert calls which are addressed to that number.
1	0	9	2	MES is clearing the fixed–originated call because subsequent to the acceptance of the call and the signalling of the identity of the mobile terminal to which the call will actually be routed, that terminal has become out–of–service and hence cannot be rung.
1	1	4	5	MES is prematurely clearing the mobile–originated call which is in the process of being established because the MES user has initiated a call from a terminal which is authorized to automatically preempt an existing mobile–originated call.
1	1	4	6	MES is prematurely clearing the mobile–originated call which is in the process of being established because the MES user has abandoned the call (by placing the originating terminal “on–hook”).
1	1	D	1	LES is rejecting the call because the “Service Nature” and/or “Service Type” and/or “Channel parameter” information received from the MES is invalid (eg, not currently defined in the SDM, mutually contradictory, or not applicable to a MES–originated call).
1	1	D	2	LES is clearing the call because the “service address” information received from the MES is invalid (ie, less than 2 digits).
1	1	D	3	LES is clearing the call because the “service address” information received from the MES is a 2–digit address which is either undefined or which is currently unavailable at this LES.
1	1	D	5	LES is clearing the call because the “service address” information received from the MES contains a country code which is regarded (by this LES) as invalid.
1	1	D	6	LES is clearing the call because the “PID” information received from the MES in the “scrambling vector” message (type 8DH) is not consistent with the PID information in the Fixed/MES–Originated (PID) and PID/MES Registration Tables at the LES as it relates to this call.
1	2	0	2	(Spot Beam Handover): MES is ready to make the transition from the current beam to the next beam.
1	2	8	1	MES is rejecting the call because the MES is not equipped to provide the specified service.

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INSERT PAGE 52 OF 53 FACING PAGE D-11.

Reason: To change the capitalization of INMARSAT to Inmarsat in the Description column of Table D-3.

The description for SLVC 1-3-6-2 is changed as follows:

Table D-3. ORT Characteristics (cont)

S	L	V	C	Description
1	3	6	2	MES is clearing the call because a long-term interruption in reception has occurred (the definition of a “long-term interruption” depends upon the service type, See Inmarsat SDM).

Table D–3. SLCV Description for HSD ISDN Call Terminations (cont)

S	L	V	C	Description
1	2	9	1	MES is rejecting the call because although it is equipped to provide the specified service, it is not currently able to do so.
1	2	B	1	MES is rejecting or clearing the call for a reason which is not covered by any of the currently defined “Cause” events.
1	2	C	0	Internal HSDU Termination (pertains to HS–720 only, for packages 6.0 and subsequent). DSLCV codes are “THA” codes that are only available from EMS.
1	2	C	3	MES is clearing the call because a “LES Connect” message (type 8CH) has not been received by the MES within the allowed time limit.
1	2	C	4	MES is clearing the call because the “authentication query” ISU message (type B4H) and/or the “authentication query” SSU message (type B5H) have not been received by the MES within the allowed time limit.
1	2	C	5	MES is clearing the call because an expected supplementary services SU(s) has (have) not been received by the MES within the allowed time limit.
1	2	C	6	MES is clearing the call because the “supplementary services interrogation” ISU (type B2H), and/or “subscriber digits” SSU (type AD H) messages have not been received by the MES within the allowed time limit.
1	2	C	7	MES is clearing the call because a “SCPC channel release” SU (type 8A H) has not been received by the MES, in response to the transmission of a “notification acknowledge” message (type BAH) during the supplementary services call diversion information retrieval process, within the allowed time limit.
1	2	C	8	(Spot Beam Handover): MES is clearing the call session in the next beam because the MES did not detect the LESH carrier on the new frequency.
1	2	D	1	LES is rejecting the call because the “spot–beam ID” information received from the MES is invalid (ie, ID is not allocated on satellite in use).
1	2	D	2	LES is clearing the call because the “Scrambling Vector” information received from the MES is invalid (ie, 0000 H , 6959 H or 7FFF H).
1	3	6	1	MES is clearing the call because the Above–decks equipment is about to “cable unwrap”.
1	3	6	2	MES is clearing the call because a long–term interruption in reception has occurred (the definition of a “long–term interruption” depends upon the service type, See INMARSAT SDM).
1	3	9	1	MES is clearing the call because the call has lasted more than 700 km in linear traveled distance (used for Aero Class MES only). Not used by HSU.
1	3	9	2	MES is clearing the call because it has moved out of spot beam coverage.
1	3	9	3	Aeronautical Class MES only: MES in “cooperative mode” is clearing the call because of a preemption request from the master entity. This code is used by the HSU for any channel release commanded from the SDU when an HSD call is in progress.

Table D–3. SLCV Description for HSD ISDN Call Terminations (cont)

S	L	V	C	Description
1	4	5	1	LES is rejecting the call because an appropriate terrestrial circuit is not currently available at this specific LES.
1	4	5	2	LES is rejecting the call because an appropriate channel unit and associated terrestrial circuit are not currently available at this LES. [This “cause” is only utilized when there is a permanent “one–to–one” connection between appropriate channel units and their terrestrial circuits].
1	5	0	2	(Spot Beam Handover): LES is ready to make the transition from the current beam to the next beam and is clearing the call session in the current beam (normal clear).
1	5	5	1	LES is rejecting the call because an appropriate satellite channel is not currently available at this specific LES.
1	5	8	1	LES is rejecting the call because the requested service is not provided by this specific LES.
1	5	9	1	LES is rejecting the call because the requested service is temporarily not available at this specific LES.
1	5	A	1	LES is rejecting the call because the specified MES is not authorized for any service at this specific LES.
1	5	A	2	LES is rejecting the call because the specified MES is not authorized to use specific requested service via this specific LES.
1	5	A	4	LES is clearing the call because the data received from the MES in the “authentication reply” message (type B6H) has been declared “invalid” by the LES authentication process.
1	5	A	5	LES is rejecting the call because the specified PID is not authorized for any service at this specific LES.
1	5	A	6	LES is rejecting the call because the specified PID is not authorized to use specific requested service via this specific LES.
1	5	A	7	LES is clearing the call because the service address received from the MES is not authorized for the requested priority.
1	5	B	1	LES is rejecting or clearing the call for a reason which is not covered by any of the currently defined “Cause” events.
1	5	C	1	LES is rejecting the call because an appropriate “Channel Assignment” message has not been received by the LES within the allowed time limit.
1	5	C	2	LES is clearing the call because the “service address” information has not been received by the LES within the allowed time limit.
1	5	C	3	LES is clearing the call because a “Scrambling Vector” message (type 8DH) has not been received by the LES within the allowed time limit.
1	5	C	4	LES is clearing the call because neither the “service address” information nor a “Scrambling Vector” message (type 8DH) has been received by the LES within the allowed time limit.

Table D–3. SLCV Description for HSD ISDN Call Terminations (cont)

S	L	V	C	Description
1	5	C	7	LES is clearing the call because a “MES Connect” message (type 99H) has not been received by the LES within the allowed time limit.
1	5	C	9	LES is clearing the call because a “authentication reply” message (type B6H) has not been received by the LES within the allowed time limit.
1	5	C	A	LES is clearing the call because a “notification acknowledge” message (type BAH) has not been received by the LES within the allowed time limit.
1	5	C	B	LES is clearing the call because the request sequence number contained in the received “notification acknowledge” message (type BA) is not valid (i.e. either not ‘0’ or not the next value in the sequence).
1	5	C	C	(Spot Beam Handover): LES is terminating the procedure because it did not receive a response to the Handover Request from the NCS.
1	5	C	D	(Spot Beam Handover): LES is clearing the call session in the next beam because the MES did not indicate that it was ready to make the transition (possibly because the MES did not receive the Channel Assignment).
1	5	D	1	LES is rejecting the call because the “Channel Assignment” message received from the NCS contains inappropriate or conflicting information.
1	5	D	2	LES is clearing this MES ID and channel number in the busy lists at LES and NCS because a new call to/from this MES is being set–up (and thus any previous call to/from this MES must have cleared).
1	5	E	1	LES is attempting to clear an MES which has sent an SCPC channel release message but is found still to be transmitting 5.12 seconds later.
1	6	5	1	LES is rejecting the call because an appropriate channel unit is not currently available at this specific LES.
1	6	6	1	LES is clearing the call because of an interruption in reception of the MES carrier exceeding the allowed time limit.
1	6	C	2	LES is clearing the call because an appropriate SCPC MES carrier has not been received by the LES (at the commencement of the call) within the allowed time limit.
1	6	C	3	(Spot Beam Handover): LES is clearing the call session in the next beam because the LES did not detect the MESH carrier on the new frequency.
1	7	9	1	LES is clearing the call because of a malfunction in the authentication checking database or in the communications links thereto.
1	8	1	1	NCS is rejecting the call because the specified MES ID is in the “MES busy” list at the NCS.
1	8	1	2	NCS is rejecting the call because the specified MES is busy with an IPDS call at the NCS.
1	8	5	1	NCS is rejecting the call because an appropriate SCPC channel is not currently available.

Table D–3. SLCV Description for HSD ISDN Call Terminations (cont)

S	L	V	C	Description
1	8	5	2	NCS is rejecting the call because no SCPC channel exists at the NCS which matches the contents of the Channel Parameters, Service Nature, Service Type, MES Category, Spot Beam ID and Priority fields contained in the Request for Channel Assignment.
1	8	5	3	NCS is rejecting the call because no SCPC channel is currently available for the specified leasemarked MES.
1	8	5	4	NCS is rejecting the call because the MES is outside the spot beam coverage area.
1	8	5	5	NCS is rejecting the call because an appropriate SCPC channel is not currently available and channel pre–emption failed.
1	8	5	6	NCS is rejecting the call because the requested spot beam indicates failed spot beam selection (“FF”) and an appropriate global SCPC channel is not currently available.
1	8	5	7	(Spot Beam Handover) NCS is rejecting the Handover Request because an appropriate SCPC channel is not available in the next beam.
1	8	A	1	NCS is rejecting the call because the specified MES ID was not found in the “Forward and Return MES ID” cross–reference table.
1	8	A	2	NCS is rejecting the call because the specified MES is not authorized for any service (except for Distress calls) at the NCS.
1	8	A	3	NCS is rejecting the call because the specified LES is not authorized for the requested service at the NCS.
1	8	B	1	NCS is rejecting or clearing the call for a reason which is not covered by any of the currently defined “Cause” events.
1	8	B	2	NCS is rejecting the call because the requested service variant is invalid.
1	8	C	1	NCS is rejecting the call because no message was received from the specified MES (in reaction to a Call Announcement message) within the allowed time limit.
1	8	C	3	NCS is rejecting the call because the specified MES was busy and the MES pre–emption failed (i.e. no response within the allowed time limit).
1	8	D	1	NCS is rejecting the call because the Request for Call Announcement or Request for Channel Assignment contains invalid or inappropriate information.
1	8	E	1	NCS is rejecting the call because the specified MES ID is in the “MES busy” list at the NCS, and is listed as being busy with a call through the same LES as that now requesting a “call announcement” addressed to that MES.
1	8	E	2	NCS is rejecting the call because the specified MES is busy with an IPDS call through the same LES which is requesting the call announcement.
1	F	0	1	LES is clearing the call because of the receipt of “on–hook” signalling from the relevant terrestrial circuit (i.e., normal clearing).

Table D–3. SLCV Description for HSD ISDN Call Terminations (cont)

S	L	V	C	Description
1	F	1	1	LES is clearing the call because the terrestrial called party is engaged (busy).
1	F	2	1	LES is clearing the call because appropriate “off–hook” signalling from the terrestrial called party has not been received by the LES within the allowed time limit.
1	F	6	1	LES is clearing the call because of the detection of a failure in the relevant terrestrial circuit.
1	F	6	2	The LES is clearing the call because the terrestrial calling party or the terrestrial network has cleared the call before the “MES connect” message has been received by the LES.

Table D–4. Detailed Codes

ID	Description
0x00	Default value
0x01	Channel out of range
0x04	MES time–out
0x05	Incoming call in progress
0x09	Call spacing restriction not fulfilled
0x0B	Timeout on phone number dialing
0x0E	Invalid Ocean Region
0x10	Invalid Telephone Interface type
0x11	The terminal id already in use
0x22	Min–op not achieved
0x24	HSU equipment failure
0x30	Cooperative Preempt: High Priority Call
0x31	Cooperative Preempt: Ocean Region Handover
0x32	Cooperative Preempt: System Failure
0x33	Cooperative Preempt: No Power Available
0x34	Cooperative Preempt: Not Logged On
0x35	Cooperative Preempt: GNSS Frequency Check Error
0x36	Cooperative Preempt: Spare
0x37	Cooperative Preempt: Invalid Parameter

Table D–4. Detailed Codes (cont)

ID	Description
0x40	Ruthless Preempt: High Priority Call
0x41	Ruthless Preempt: Ocean Region Handover
0x42	Ruthless Preempt: System Failure
0x43	Ruthless Preempt: No Power Available
0x44	Ruthless Preempt: Not Logged On
0x45	Ruthless Preempt: GNSS Frequency Check Error
0x46	Ruthless Preempt: Spare
0x47	Ruthless Preempt: Invalid Parameter
0x50	EIRP Request Reject: High Priority Call
0x51	EIRP Request Reject: Ocean Region Handover
0x52	EIRP Request Reject: System Failure
0x53	EIRP Request Reject: No Power Available
0x54	EIRP Request Reject: Not Logged On
0x55	Power Not Available (prior to Package 6.0)
0x55	EIRP Request Reject: GNSS Frequency Check Error (Package 6.0 and subsequent)
0x56	EIRP Request Reject: Spare
0x57	EIRP Request Reject: Invalid Parameter

APPENDIX E
MESSAGING

1. PPPoE Messaging

A. General

(1) The following subsections define the format and services for the PPPoE discovery packets as defined in RFC 2516.

B. PPPoE Active Discovery Offer (PADO)

(1) The HSU will respond to PPPoE Active Discovery Initiation (PADI) packets in accordance with RFC 2516. If the requested service in not available, the HSU will not provide a PADO response.

(2) The HSU will support service names of length less than or equal to 64 characters. The conditions for the PADO response and the PADO content are as specified in Table E–1.

Table E–1. PADO Services

PADI Service Name	PADO Response	Controlling Condition
No service name tag	Null terminated, or PacketData, or Swift64	If all services are available or if SwiftBroadband PS services are available or if MPDS services are available. This PADI may be used as a status poll from a server.
PacketData	PacketData	SwiftBroadband PS services or MPDS services are available on at least one channel.
BGAN	BGAN	SwiftBroadband PS services available on at least one channel.
BGAN–1	BGAN–1	SwiftBroadband PS services available on Channel Card 1.
BGAN–2	BGAN–2	SwiftBroadband CS and PS services available on Channel Card 2.
MPDS	MPDS	MPDS service available on at least one channel.
MPDS–1	MPDS–1	MPDS service available on at least on channel of Channel Card 1 (HSU channel 1 or 2).
MPDS–2	MPDS–2	MPDS service available on at least on channel of Channel Card 2 (HSU channel 3 or 4).

Table E–1. PADO Services (cont)

PADI Service Name	PADO Response	Controlling Condition
MPDS–1A	MPDS–1A	MPDS service available on HSU Channel 1.
MPDS–1B	MPDS–1B	MPDS service available on HSU Channel 2.
MPDS–2A	MPDS–2A	MPDS service available on HSU Channel 3.
MPDS–2B	MPDS–2B	MPDS service available on HSU Channel 4.
MPDS–C1	MPDS–C1	MPDS service is available on HSU Channel 1.
MPDS–C2	MPDS–C2	MPDS service is available on HSU Channel 2.
MPDS–C3	MPDS–C3	MPDS service is available on HSU Channel 3.
MPDS–C4	MPDS–C4	MPDS service is available on HSU Channel 4.
123	123	MPDS service available on at least one channel.
28#	28#	M–ISDN service is available on at least one channel.
Numeric digits (See below)	Numeric digits (See below)	SwiftBroadband CS or M–ISDN service available on at least one channel.

(3) The PADI response to a series of numeric digits is detailed in the following:

(a) Definitions:

- “Dialed” digits are defined as the set { 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, *}
- “Dial Termination” characters are defined as the set { # (octothorp, ASCII 23_x), : (colon, ASCII $3A_x$) }
- “Unrecognized” characters are defined as the rest of the ASCII character set.
- “Filtered Service Name” is the service–name with unrecognized characters removed, stopping at (but not including) the first dial termination character, if any.

(b) If the PADI service name contains up to the first dial termination character, no unrecognized characters, and consists of two (2) or more dialed digits, and if SwiftBroadband CS or Swift64 M–ISDN service is available on a channel, the HSU will respond with a PADO echoing the service name.

(c) If the PADI filtered service name consists of seven (7) or more dialed digits, and if SwiftBroadband CS or Swift64 M–ISDN service is available on a channel, the HSU will respond with a PADO echoing the service name.

(d) If the PADI service name consists of the specific string “123”, and if MPDS service is available on any available channel, the HSU will respond with a PADO echoing the service name.

C. PPPoE Active Discovery Request (PADR)

(1) The HSU will respond to PPPoE Active Discovery Request (PADR) packets in accordance with RFC 2516. If the requested service in not available, the HSU will not initiate a PPP session and will send a PPPoE active discovery session confirmation (PADS) packet with a service–name error tag.

(2) The HSU will support service names of length less than or equal to 64 characters.

(3) The HSU response to the PADR packet is as specified in Table E–2.

Table E–2. PADR Services

PADR Service Name	HSU response
No service name tag	If SwiftBroadband services are available, a PS session is initiated using the PDP parameters provided by the SDU. If SwiftBroadband services are not available and MPDS services are available, an MPDS session will be initiated.
PacketData	If SwiftBroadband services are available, a PS session is initiated using the PDP parameters provided by the SDU. If SwiftBroadband services are not available and MPDS services are available, an MPDS session will be initiated.
BGAN	A SwiftBroadband PS session is initiated on an available channel card.
BGAN–1	A SwiftBroadband PS session is initiated on Channel Card 1.
BGAN–2	A SwiftBroadband PS session is initiated on Channel Card 2.
MPDS	An MPDS session is initiated on an available channel.
MPDS –1	An MPDS session is initiated on Channel Card 1 (HSU channel 1 or 2).
MPDS –2	An MPDS session is initiated on Channel Card 2 (HSU channel 3 or 4).
MPDS–1A	MPDS session is initiated on HSU Channel 1.
MPDS–1B	MPDS session is initiated on HSU Channel 2.
MPDS–2A	MPDS session is initiated on HSU Channel 3.
MPDS–2B	MPDS session is initiated on HSU Channel 4.
MPDS–C1	MPDS session is initiated on HSU Channel 1.
MPDS–C2	MPDS session is initiated on HSU Channel 2.
MPDS–C3	MPDS session is initiated on HSU Channel 3.

Table E–2. PADR Services (cont)

PADR Service Name	HSU response
MPDS–C4	MPDS session is initiated on HSU Channel 4.
123	MPDS session is initiated on any available channel.
28#	M–ISDN 64k UDI session initiated to called party number “28” on any available channel.
Numeric digits (See below)	If SwiftBroadband services are available, a CS session is initiated on any available channel to the called party number defined below. If SwiftBroadband services are not available and M–ISDN service is available, a 64k UDI session is initiated on any available channel to the called party number defined below.

(4) The HSU will determine the called party number from the PADR service name as detailed in the following:

(a) Definitions:

- “Dialed” digits are defined as the set { 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, *}
- “Dial Termination” characters are defined as the set { # (octothorp, ASCII 23_x), : (colon, ASCII $3A_x$) }
- “Unrecognized” characters are defined as the rest of the ASCII character set.
- “Filtered Service Name” is the service–name with unrecognized characters removed, stopping at (but not including) the first dial termination character, if any.

(b) If the PADR service name contains up to the first dial termination character, no unrecognized characters, and consists of two (2) or more “dialed” digits, and if SwiftBroadband CS service is available, the HSU will initiate a SwiftBroadband CS session on an available channel using the service name as the called party number.

(c) If the PADR service name contains up to the first dial termination character, no unrecognized characters, and consists of two (2) or more “dialed” digits, and SwiftBroadband CS service is not available, and Swift64 M–ISDN is available, the HSU will initiate a M–ISDN 64k UDI session on an available channel using the service name as the called party number.

(d) If the PADR filtered service name contains up to seven (7) or more “dialed” digits, and if SwiftBroadband CS service is available, the HSU will initiate a SwiftBroadband CS session on an available channel using the filtered service name as the called party number.

(e) If the PADR filtered service name contains up to seven (7) or more “dialed” digits, and SwiftBroadband CS service is not available, and Swift64 M–ISDN is available, the HSU will initiate an M–ISDN 64k UDI session on an available channel using the filtered service name as the called party number.

(f) If the PADR service name consists of the specific string “123”, and if MPDS service is available on any channel, the HSU will initiate an MPDS session on an available channel.

D. PPPoE Active Discovery Session–Confirmation (PADS)

(1) The HSU will provide PPPoE Active Discovery Session–Confirmation (PADS) packets in response to PADR packets in accordance with RFC 2516.

(2) If the requested service in not available, the HSU will not initiate a PPP session and will send a PPPoE active discovery session confirmation (PADS) packet with a service–name error tag as specified in Table E–3.

(3) The HSU may provide a PADS response prior to the establishment of the over–the–satellite call connection.

Table E–3. Service Name Error

PADR Service Name	Service–Name Error Tag
No Service–Name tag	Missing Service–Name
No Service–Name tag (and default service is disabled by a HSU configuration item)	Default service disabled
Service–Name not recognized (not from set of Table E–2)	Unrecognized service
Requested Service–Name is disabled or not available	Service disabled or unavailable
Requested Service–Name became unavailable after PADR received, but before PPP session established	Unable to reserve the channel

E. PPPoE Active Discovery Termination (PADT)

(1) The HSU will provide a PPPoE Active Discovery Termination (PADT) packet in response to termination of the PPPoE session.

(2) The PPPoE session may be terminated by the HSU or by a PADT from the host.

(3) The HSU will send periodic Echo–Request packets to the host to assess continued connectivity.

(4) The HSU will generate a Generic Error tag upon termination of every session, including those that terminate normally. The Generic–Error tag is of the following format:

(a) SLCV – nnnn/dddd: SLCV_cause_string [detailed_cause_string] Where:

- nnnn is the Inmarsat SLCV termination code as defined in Table E–4.
- dddd is the detailed cause code defined in Table E–4.
- SLCV_cause_string is the (modified) Inmarsat standard cause code wording defined in Table E–4.
- detailed_cause_string is extended cause description as defined in Table E–4.

(5) The HSU will generate an AC–System–Error tag upon termination of every session, including those that terminate normally. The AC–System–Error tag is as defined below.

(a) If the PPPoE session was a Swift64 64k UDI session, the AC–System–Error tag will be of the following format:

1 Q850 – qqq: Q.850_string Where:

- qqq is the ISDN Q.850 cause code defined in Table E–5.
- Q.850_string is the Q.850 cause string defined in Table E–5.

(b) If the PPPoE session was a Swift64 MPDS session, the AC–System–Error tag will be of the following format:

1 MPDS – mmm: +WQ_cause_string defined in Table E–6. Where:

- qqq is the MPDS AT +WQ cause number defined in Table E–6.
- +WQ_cause_string is the MPDS AT +WQ cause string defined in Table E–6.

(c) If the PPPoE session was a SwiftBroadband PS session, the AC–System–Error tag will be of the following format:

1 BGAN – bbb: TBD Where:

- bbb and TBD are not specified.

Table E–4. SLCV Cause Codes and Strings

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
1001	0000	call cleared by MES terminal		
1011	0000	call failed, MES terminal busy		
1012	0000	call cleared, MES terminal busy		
1021	0000	call failed, MES time–out (no answer)		
1081	0000	call failed, MES terminal not installed		

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
1091	0000	call failed, MES terminal out–of–service		
1092	0000	call cleared, MES terminal out–of–service		
1141	0000	MES preempted clear by higher priority call		
1142	0000	MES preempted fixed call by higher priority call		
1143	0000	offered call cleared, pre–empted at MES		
1144	0000	call cleared, MES initiated preemption		
1145	0000	attempted call cleared, pre–empted at MES		
1146	0000	attempted call abandoned by MES terminal		
1191	0000	MES outside spot beam		
11A0	0000	call cleared, credit card not accepted		
11D1	0000	call failed, LES service call type Incorrect		
11D2	0000	call failed, insufficient digits in service address		
11D3	0000	call failed, invalid service address		
11D4	0000	call cleared, credit card data information invalid		
11D5	0000	call cleared, invalid country code		
11D6	0000	call cleared, PID information is not consistent		
11D7	0000	call rejected, invalid service for pri. 1 or 2 call		
11D8	0000	call cleared, dialed number not 2 or 3 digits for pri. 1 or 2 call		
11E0	0000	call cleared, invalid credit card PIN at this LES		

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
11E1	0000	call cleared, too many invalid credit card call attempts		
1202	0000	handover, MES ready		
1262	0000	MES distress timeout		
1281	0000	call failed, MES cannot accept		
1291	0000	call failed, MES cannot accept at present		
1291	0034	call failed, MES cannot accept at present	Call cleared, SDU not logged On	Cooperative Preempt: Not Logged On
1291	0035	call failed, MES cannot accept at present	Call cleared, GNSS frequency check error	Cooperative Preempt: GNSS Frequency Check Error
1291	0044	call failed, MES cannot accept at present	Call cleared, SDU not logged On	Ruthless Preempt: Not Logged On
1291	0045	call failed, MES cannot accept at present	Ruthless Preempt: GNSS Frequency Check Error	Call cleared, GNSS frequency check error
1291	0054	call failed, MES cannot accept at present	EIRP Request rejected due to: Not Logged On	Call rejected, SDU not logged On
1291	0055	call failed, MES cannot accept at present	Call rejected, GNSS frequency check error	EIRP Request rejected due to: GNSS Frequency Check Error
12B1	0000	call cleared by MES for unspecified reason		
12B1	0024	call cleared by MES for unspecified reason	HSU Equipment Failure	
12B1	0032	call cleared by MES for unspecified reason	Call cleared, SDU reporting system failure	Cooperative Preempt: System Failure
12B1	0036	call cleared by MES for unspecified reason	Call cleared, pre–empted by SDU for undeclared reason	Cooperative Preempt: Spare
12B1	0037	call cleared by MES for unspecified reason	Call cleared, pre–empted by SDU for invalid parameter	Cooperative Preempt: Invalid Parameter
12B1	0042	call cleared by MES for unspecified reason	Call cleared, SDU reporting system failure	Ruthless Preempt: System Failure
12B1	0046	call cleared by MES for unspecified reason	Call cleared, pre–empted by SDU for undeclared reason	Ruthless Preempt: Spare
12B1	0047	call cleared by MES for unspecified reason	Call cleared, pre–empted by SDU for invalid parameter	Ruthless Preempt: Invalid Parameter

Table E-4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
12B1	0052	call cleared by MES for unspecified reason	Call rejected, SDU reporting system failure	EIRP Request rejected due to: System Failure
12B1	0056	call cleared by MES for unspecified reason	Call rejected, pre-empted by SDU for undeclared reason	EIRP Request rejected due to: Spare
12B1	0057	call cleared by MES for unspecified reason	Call rejected, pre-empted by SDU for invalid parameter	EIRP Request rejected due to: Invalid Parameter
12C2	0000	call cleared, no credit card valid message received		
12C3	0000	call failed, MES time-out (no terrestrial answer)		
12C4	0000	call cleared, authentication query not received		
12C5	0000	call cleared, MES missing sup service SU		
12C6	0000	call cleared, MES missing sup service 2 SU		
12C7	0000	call cleared, MES missing SCPC channel release SU sup service		
12C8	0000	handover failed, LES not detected		
12D1	0000	call failed, spot beam data invalid		
12D2	0000	call failed, invalid scrambling vector		
1351	0000	call cleared, insufficient free memory		
1361	0000	call cleared by MES cable unwrap		
1362	0000	call cleared, long interruption in reception at MES		
1363	0000	MES secondary clear due to repoint OR		
1363	0031	MES secondary clear due to repoint OR	Call cleared, SDU re-pointing antenna to different Ocean Region	Cooperative Preempt: Ocean Region Handover

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
1363	0041	MES secondary clear due to repoint OR	Call cleared, SDU re–pointing antenna to different Ocean Region	Ruthless Preempt: Ocean Region Handover
1363	0051	MES secondary clear due to repoint OR	Call rejected, SDU re–pointing antenna to different Ocean Region	EIRP Request rejected due to: Ocean Region Handover
1391	0000	call cleared, traveled distance exceeds 700km		
1392	0000	call cleared, spot beam transition		
1393	0000	call cleared, cooperative mode		
1393	0030	call cleared, cooperative mode	Call cleared, pre–empted by higher priority call	Cooperative Preempt: High Priority Call
1393	0033	call cleared, cooperative mode	Call cleared, no power available from SDU	Cooperative Preempt: No Power Available
1393	0040	call cleared, cooperative mode	Call cleared, pre–empted by higher priority call	Ruthless Preempt: High Priority Call
1393	0043	call cleared, cooperative mode	Call cleared, no power available from SDU	Ruthless Preempt: No Power Available
1393	0044	call cleared, cooperative mode	Channel cleared, SDU not logged on	Ruthless Preempt: Not Logged On
1393	0050	call cleared, cooperative mode	Call rejected, pre–empted by higher priority call	EIRP Request rejected due to: High Priority Call
1393	0053	call cleared, cooperative mode	Call rejected, no power available from SDU	EIRP Request rejected due to: No Power Available
1451	0000	call failed, terrestrial circuits congested		
1452	0000	call failed, LES congested (no channel and no circuit)		
1502	0000	spotbeam handover, LES ready, normal clear		
1551	0000	call failed, LES congested (no channel)		
1581	0000	call failed, service not provided at this LES		

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
1591	0000	call failed, service temporarily not available at this LES		
1592	0000	call cleared, credit card type not supported		
15A1	0000	call failed, MES not authorised at this LES		
15A2	0000	call failed, service not authorised at this LES		
15A3	0000	call cleared, credit card not authorised		
15A4	0000	call cleared, authentication reply invalid		
15A5	0000	call failed, PID not authorised for any service		
15A6	0000	call failed, PID not authorised for requested service		
15B1	0000	call cleared by LES for unspecified reason		
15C1	0000	call failed, no channel assignment from LES		
15C2	0000	call failed, LES time–out (no service address)		
15C3	0000	call failed, LES time–out (no scrambling vector)		
15C4	0000	call failed, no service address and no scrambling vector		
15C5	0000	call cleared, incomplete credit card data information		
15C7	0000	call failed, LES time–out (no MES connect)		
15C9	0000	call cleared, no authentication reply		
15CA	0000	call cleared, notification ack not received		
15CB	0000	call cleared, invalid sequence number in notification ack		
15CC	0000	handover failed, no response to request		

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
15CD	0000	handover failed, MES not ready		
15D1	0000	call failed, LES time–out (invalid assignment)		
15D2	0000	LES MES already busy		
15E1	0000	call cleared but MES still transmitting (FAULT)		
1651	0000	call failed, LES congested (no channel unit)		
1661	0000	call failed, long interruption in reception at LES		
1662	0000	LES long term blockage of SCPC MES		
16C2	0000	LES missing MES SCPC		
16C3	0000	handover failed, MES not detected		
1790	0000	call cleared, failure credit card validation process		
1791	0000	call cleared, failure authentication process		
1811	0000	NCS MES ID busy		
1812	0000	NCS MES ID busy MPDS		
1813	0000	Call waiting request rejected, MES not accepted call		
1814	0000	Call waiting request rejected, RLES shows MES busy		
1841	0000	call cleared, NCS initiated preemption for incoming pri.1 call		
1842	0000	call cleared, NCS initiated preemption for incoming pri.2 call		
1843	0000	call cleared, NCS initiated preemption for incoming pri.3 call		
1844	0000	call cleared, NCS initiated preemption		

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
1851	0000	call failed, satellite congestion NCS reject no SCPC available		
1852	0000	call failed, satellite congestion NCS reject SCPC does not match request		
1853	0000	call failed, lease channel congestion		
1854	0000	call failed, MES outside spot beam coverage area		
1855	0000	call rejected, preemption failed, no channel available		
1856	0000	call rejected, spot beam selection failed		
1857	0000	handover failed, channel not available		
185A	0000	NCS Reject Lease–marked MES –– No Matching SCPC channel		
18A1	0000	NCS MES ID not found		
18A2	0000	call failed, MES not authorised		
18A3	0000	call failed, LES not authorised		
18B1	0000	call failed by NCS for unspecified reason		
18B2	0000	call rejected, invalid service requested		
18C1	0000	NCS MES burst missing		
18C3	0000	NCS MES busy preemption failed		
18D1	0000	call failed, invalid call request		
18E1	0000	NCS MES busy already		
18E2	0000	NCS MES busy already MPDS		
1D61	0000	Call wait failed, fixed line hung up		
1F01	0000	call cleared by terrestrial circuit		

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
1F11	0000	call failed, terrestrial party busy		
1F21	0000	call failed, LES time–out (no answer)		
1F61	0000	call failed, terrestrial circuit failure		
1F62	0000	call failed, early clear by terrestrial circuit		
0000	0000	MPDS channel cleared		No Inmarsat SLCV for termination of MPDS session
0000	0064	MPDS channel cleared	MPDS Port error code 100 401	
0000	01F4	MPDS channel cleared	Unknown Error 500	
0000	01F5	MPDS channel cleared	LES Access Code does not support MPDS	
0000	01F6	MPDS channel cleared	Network does not recognise Mobile ID	
0000	01F7	MPDS channel cleared	Network does not recognise Sim Card	
0000	01F8	MPDS channel cleared	Authentication Failed to Complete	
0000	01F9	MPDS channel cleared	Authentication Failure	
0000	01FA	MPDS channel cleared	Authorisation Failure	
0000	01FB	MPDS channel cleared	Authorisation Failure – Mobile Barred	
0000	01FC	MPDS channel cleared	Authorisation Failure – Mobile Barred on this LES Access Code	
0000	01FD	MPDS channel cleared	Authorisation Failure – SIM Card Barred on this LES Access Code	
0000	01FE	MPDS channel cleared	Authorisation Failure – Temporarily Unable to Accept Credit Cards	
0000	01FF	MPDS channel cleared	Authorisation Failure – Unable to Accept Credit Cards	

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
0000	0200	MPDS channel cleared	Authorisation Failure – Credit Card Refused	
0000	0201	MPDS channel cleared	Authorisation Failure – This Service not Allowed	
0000	0202	MPDS channel cleared	Authorisation Failure – Service Option(s) not Allowed	
0000	0203	MPDS channel cleared	Authorisation Failure – QoS not Allowed	
0000	0204	MPDS channel cleared	Authorisation Failure – Unsupported Service Option(s)	
0000	0205	MPDS channel cleared	QoS Option(s) Unsupported By Mobile	
0000	0206	MPDS channel cleared	QoS Option(s) Unsupported By Network	
0000	0207	MPDS channel cleared	Satellite Network Congestion	
0000	0208	MPDS channel cleared	Satellite Network Unavailable	
0000	0209	MPDS channel cleared	Service Congestion	
0000	020A	MPDS channel cleared	Service Unavailable	
0000	020B	MPDS channel cleared	Terrestrial Network Congestion	
0000	020C	MPDS channel cleared	Terrestrial Network Unavailable	
0000	020D	MPDS channel cleared	Terrestrial Network Destination – Busy	
0000	020E	MPDS channel cleared	Terrestrial Network Destination – No Answer	
0000	020F	MPDS channel cleared	Terrestrial Network Destination – Unavailable	
0000	0210	MPDS channel cleared	Terrestrial Network Destination – No Carrier	
0000	0211	MPDS channel cleared	Service Timed Out	
0000	0212	MPDS channel cleared	Terminated by Network Operator	
0000	0213	MPDS channel cleared	Insufficient Resources at Mobile	
0000	0214	MPDS channel cleared	Mobile Failure	

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
0000	0215	MPDS channel cleared	Mobile – Connection to DTE Lost	
0000	0216	MPDS channel cleared	Mobile – Unrecoverable DTE Protocol Error	
0000	0217	MPDS channel cleared	Mobile Reset	
0000	0218	MPDS channel cleared	User Cancellation of Connection Establishment	
0000	0258	MPDS channel cleared	Unable to Find Satellite Access Node	
0000	0259	MPDS channel cleared	Unable to Establish Communication with Satellite Access Node	
0000	025A	MPDS channel cleared	Link with Satellite Access Node Lost	
0000	02BC	MPDS channel cleared	Reason Unspecified	
0000	02BD	MPDS channel cleared	L3 Release	
0000	02BE	MPDS channel cleared	L3 Deregister	
0000	02BF	MPDS channel cleared	L3 Reject	
0000	02CC	MPDS channel cleared	SAN Idle Timer Expiry	
0000	02CD	MPDS channel cleared	MAN Idle Timer Expiry	
0000	02CE	MPDS channel cleared	SAN Connect Timer	
0000	02CF	MPDS channel cleared	SAN Modify Timer	
0000	02D0	MPDS channel cleared	SAN Handover Timer	
0000	02D1	MPDS channel cleared	SAN Connection Timer	
0000	02D2	MPDS channel cleared	MAN Connection Timer	
0000	02DC	MPDS channel cleared	Insufficient operating system resources at MAN	
0000	02DD	MPDS channel cleared	Insufficient memory at MAN	
0000	02EC	MPDS channel cleared	Invalid L3 Call Ref in Establish SDU	
0000	02ED	MPDS channel cleared	Invalid L3 Call Ref in Modify SDU	
0000	02FC	MPDS channel cleared	Unsupported MPDS MAC version	

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
0000	02FD	MPDS channel cleared	Invalid Bearer Connection type in Establish SDU	
0000	02FE	MPDS channel cleared	Invalid Bearer Control type in Establish SDU	
0000	02FF	MPDS channel cleared	Invalid Bearer Connection ID in Establish SDU	
0000	0300	MPDS channel cleared	Invalid Bearer Connection type in Modify SDU	
0000	0301	MPDS channel cleared	Invalid Bearer Control type in Modify SDU	
0000	0302	MPDS channel cleared	Invalid Bearer Connection ID in Modify SDU	
0000	0303	MPDS channel cleared	Invalid Handover SDU	
0000	0304	MPDS channel cleared	Invalid SDU type	
0000	0305	MPDS channel cleared	SDU Incorrectly Formatted	
0000	030C	MPDS channel cleared	Connection sub–layer protocol failure (MAN specific signaling)	
0000	030D	MPDS channel cleared	Connection sub–layer protocol failure (HDLC signaling)	
0000	031C	MPDS channel cleared	Control sub–layer protocol failure	
0000	032C	MPDS channel cleared	Channel Unit failure	
0000	032D	MPDS channel cleared	Hardware failure	
0000	032E	MPDS channel cleared	MAN not responding to frequency corrections	
0000	032F	MPDS channel cleared	MAN not responding to power corrections	
0000	0330	MPDS channel cleared	MAN not responding to timing corrections	
0000	033C	MPDS channel cleared	Internal SAN failure	
0000	033D	MPDS channel cleared	SAN Shutting Down	
0000	034C	MPDS channel cleared	Bearer Control – No satellite link	
0000	034D	MPDS channel cleared	Bearer Control – No suitable contention slot	

Table E–4. SLCV Cause Codes and Strings (cont)

SLCV	dddd	SLCV cause string	Detailed cause string	Comments
0000	034E	MPDS channel cleared	Bearer Control – Status Acknowledgement failure	
0000	034F	MPDS channel cleared	Bearer Control – Incorrect SAN ID	
0000	035C	MPDS channel cleared	No such MAN	
0000	035D	MPDS channel cleared	Invalid L3 Call Reference	

Table E–5. Q.850 Cause Codes and Strings

Q.850 Value (qqq)	Q8.50 string
1	Unallocated number
2	No route to specified transit network
3	No route to destination
4	Send special information tone
5	Misdialed trunk prefix
6	Channel unacceptable
7	Call awarded and being delivered in an established channel
8	Preemption
9	Preemption – circuit reserved for reuse
10	Normal call clearing
16	Normal call clearing
17	User busy
18	No user responding
19	No answer from user
20	Subscriber absent
21	Call rejected
22	Number changed
26	Non–selected user clearing
27	Destination out of order
28	Invalid number format – address incomplete
29	Facility rejected

Table E–5. Q.850 Cause Codes and Strings (cont)

Q.850 Value (qqq)	Q8.50 string
30	Response to a status enquiry
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
39	Permanent frame mode connection out–of–service
40	Permanent frame mode connection operational
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Request channel not available
46	Precedence call blocked
47	Resource not available
49	Quality of service unavailable
50	Requested facility not subscribed
52	Outgoing calls barred
53	Outgoing calls barred within CUG
54	Incoming calls barred
55	Incoming calls barred within CUG
57	Bearer capability not authorized
58	Bearer capability not presently available
62	Inconsistency in designated outgoing access information and subscriber class
63	Service or option not available
65	Bearer capability not implemented
66	Channel type not implemented
69	Request facility not implemented
70	Only restricted digital information bearer capability is available
79	Service or option not implemented, unspecified
81	Invalid call reference value
82	Identified channel does not exist

Table E–5. Q.850 Cause Codes and Strings (cont)

Q.850 Value (qqq)	Q8.50 string
83	Suspended call exists, but call identity does not
84	Call identity in use
85	No call suspended
86	Call with the specified call identity is cleared
87	User not a member of CUG
88	Incompatible destination
90	Non–existent CUG
91	Invalid transit network selection
95	Invalid message, unspecified
96	Mandatory information element is missing
97	Message type non–existent or not implemented
98	Message not compatible with call state or message type non–existent
99	Information element non–existent or not implemented
100	Invalid information element contents
101	Message not compatible with call state
102	Recovery on timer expiry
103	Parameter non–existent or not implemented – passed on
110	Message with unrecognized parameter, discarded
111	Protocol error, unspecified
127	Internetworking, unspecified

Table E–6. MPDS +WQ Cause Codes and Strings

mmm	+WQ cause code string
100	MPDS Port error code 100 401
500	Unknown Error 500
501	LES Access Code does not support MPDS
502	Network does not recognize Mobile ID
503	Network does not recognize Sim Card
504	Authentication Failed to Complete

Table E–6. MPDS +WQ Cause Codes and Strings (cont)

mmm	+WQ cause code string
505	Authentication Failure
506	Authorization Failure
507	Authorization Failure – Mobile Barred
508	Authorization Failure – Mobile Barred on this LES Access Code
509	Authorization Failure – SIM Card Barred on this LES Access Code
510	Authorization Failure – Temporarily Unable to Accept Credit Cards
511	Authorization Failure – Unable to Accept Credit Cards
512	Authorization Failure – Credit Card Refused
513	Authorization Failure – This Service not Allowed
514	Authorization Failure – Service Option(s) not Allowed
515	Authorization Failure – QoS not Allowed
516	Authorization Failure – Unsupported Service Option(s)
517	QoS Option(s) Unsupported By Mobile
518	QoS Option(s) Unsupported By Network
519	Satellite Network Congestion
520	Satellite Network Unavailable
521	Service Congestion
522	Service Unavailable
523	Terrestrial Network Congestion
524	Terrestrial Network Unavailable
525	Terrestrial Network Destination – Busy
526	Terrestrial Network Destination – No Answer
527	Terrestrial Network Destination – Unavailable
528	Terrestrial Network Destination – No Carrier
529	Service Timed Out
530	Terminated by Network Operator
531	Insufficient Resources at Mobile
532	Mobile Failure
533	Mobile – Connection to DTE Lost
534	Mobile – Unrecoverable DTE Protocol Error

Table E–6. MPDS +WQ Cause Codes and Strings (cont)

mmm	+WQ cause code string
535	Mobile Reset
536	User Cancellation of Connection Establishment
600	Unable to Find Satellite Access Node
601	Unable to Establish Communication with Satellite Access Node
602	Link with Satellite Access Node Lost
700	Reason Unspecified
701	L3 Release
702	L3 Deregister
703	L3 Reject
716	SAN Idle Timer Expiry
717	MAN Idle Timer Expiry
718	SAN Connect Timer
719	SAN Modify Timer
720	SAN Handover Timer
721	SAN Connection Timer
722	MAN Connection Timer
732	Insufficient operating system resources at MAN
733	Insufficient memory at MAN
748	Invalid L3 Call Ref in Establish SDU
749	Invalid L3 Call Ref in Modify SDU
764	Unsupported MPDS MAC version
765	Invalid Bearer Connection type in Establish SDU
766	Invalid Bearer Control type in Establish SDU
767	Invalid Bearer Connection ID in Establish SDU
768	Invalid Bearer Connection type in Modify SDU
769	Invalid Bearer Control type in Modify SDU
770	Invalid Bearer Connection ID in Modify SDU
771	Invalid Handover SDU
772	Invalid SDU type
773	SDU Incorrectly Formatted

Table E-6. MPDS +WQ Cause Codes and Strings (cont)

mmm	+WQ cause code string
780	Connection sub-layer protocol failure (MAN specific signaling)
781	Connection sub-layer protocol failure (HDLC signaling)
796	Control sub-layer protocol failure
812	Channel Unit failure
813	Hardware failure
814	MAN not responding to frequency corrections
815	MAN not responding to power corrections
816	MAN not responding to timing corrections
828	Internal SAN failure
829	SAN Shutting Down
844	Bearer Control – No satellite link
845	Bearer Control – No suitable contention slot
846	Bearer Control – Status Acknowledgement failure
847	Bearer Control – Incorrect SAN ID
860	No such MAN
861	Invalid L3 Call Reference

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APPENDIX F
FAILURE OVERVIEW

1. Fault Codes

CODE	FAILURE DESCRIPTION
UNKNOWN LEVEL 1 UNKNOWN SRU	
00 0 01	RESERVED
00 0 02	SPARE
00 0 03	RESERVED
00 0 04	RESERVED
00 0 05	RESERVED
00 0 06	RESERVED
00 0 07	RESERVED
00 0 08	RESERVED
SDU	
UNKNOWN SDU SRU	
01 0 01	SPARE
01 0 02	HMPM HPA CMD WORD (143) UPDATE RATE FAIL
01 0 03	HMPM HPA CMD WORD (143) DATA FAIL
01 0 04	RESERVED
01 0 05	RESERVED
01 0 06	RESERVED
01 0 07	HSU1–SDU W'BURG DATA TX FAIL
01 0 08	HSU1–SDU W'BURG SOLO WORD ACK FAIL
01 0 09	SPARE
01 0 0A	SPARE
01 0 0B	HSU2–SDU W'BURG DATA TX FAIL
01 0 0C	HSU2–SDU W'BURG SOLO WORD ACK FAIL
01 0 0D	SPARE
01 0 0E	SPARE
01 0 0F	SPARE
01 0 10	HGA HPA COMMAND WORD (NCD)
01 0 11	SPARE
01 0 12	LGA HPA COMMAND WORD (NCD)
01 0 13	RESERVED
01 0 14	RESERVED
01 0 15	RESERVED
01 0 96	INCOMPLETE ID PROM RESPONSES

CODE	FAILURE DESCRIPTION
SMPM: SDU MAIN PROCESSOR MODULE	
01 1 81	SDU H/W–S/W COMPATIBILITY FAIL
01 1 82	BATTERY VOLTAGE LOW
01 1 83	WATCHDOG TIMEOUT FAIL
01 1 84	MICRO BOOT ROM FAIL
01 1 85/05	EEPROM FAIL
01 1 86/06	FLASH FAIL
01 1 87/07	SRAM FAIL
01 1 88/08	REAL TIME CLOCK FAIL
01 1 89	QUART FAIL
01 1 0A	SOFTWARE ERROR (SYSFAIL)
01 1 0B	FLASH–PSRAM MISCOMPARE
01 1 0C	FLASH–PSRAM MISCOMPARE EXTENSION
01 1 0D	FLASH–PSRAM MISCOMPARE EXTENSION
CODA: SDU VOICE CODEC MODULE A	
01 2 81/01	<CODEC–A> PROGRAM MEMORY CRC FAIL
01 2 82	<CODEC–A> RESERVED
01 2 83	<CODEC–A> RESERVED
01 2 84	<CODEC–A> RESERVED
01 2 05	<CODEC–A> RESERVED
01 2 86	<CODEC–A> RESERVED
01 2 87/07	<CODEC–A> TIMING GENERATOR FAIL
01 2 88	<CODEC–A> DUAL PORT RAM FAIL CODEC SIDE
01 2 89	<CODEC–A> RESERVED
01 2 8A/0A	<CODEC–A> PROGRAM MEMORY W/R FAIL
01 2 8B PP	<CODEC–A> DSP INTERNAL MEMORY W/R FAIL
01 2 8C/0C	<CODEC–A> DSP COMPREHENSIVE FAIL
01 2 0D	<CODEC–A> HEALTH COUNT UPDATE
01 2 8E	<CODEC–A> DUAL PORT RAM FAIL SMPM SIDE
01 2 0F	<CODEC–A> SPARE
01 2 90	<CODEC–A> BUS ERROR
01 2 91	<CODEC–A> SELF TEST MISOPERATION
01 2 12	<CODEC–A> COMMUNICATION PROBLEM
01 2 93/13	<CODEC–A> RESERVED
01 2 94	<CODEC–A> ST BUS AUDIO LOOPBACK FAIL
01 2 95	<CODEC–A> SW DOWNLOAD FAIL

CODE	FAILURE DESCRIPTION
CODB: SDU VOICE CODEC MODULE B	
01 3	Same entries as for CODA above except substitute CODB for CODA, SRU code 3 for code 2, [CODEC_B] for [CODEC_A] and <CODEC-B> for <CODEC-A>.

Fault codes for codecs C-F have Level 2 (SRU) codes E-H. They are listed in the appropriate section of this table for those SRU codes.

SIOM: SDU INPUT/OUTPUT MODULE (EXCLUSIVE TO SIOM)	
01 4 81	A429 XMTR LOOP-BACK TO OTHER SDU FAIL
01 4 82	A429 XMTR LOOP-BACK TO CFDS FAIL
01 4 83	A429 XMTR LOOP-BACK TO ADL FAIL
01 4 84	A429 XMTR LOOP-BACK TO PDL FAIL
01 4 85	A429 XMTR LOOP-BACK TO (C)MUs FAIL
01 4 86	A429 XMTR LOOP-BACK TO SCDUs FAIL
01 4 87	A429 XMTR LOOP-BACK TO MULTI-CNTRL FAIL
01 4 88	RESERVED
01 4 89	A429 XMTR LOOP-BACK TO RMP/CAP FAIL
01 4 8A	A429 XMTR LOOP-BACK TO SNU/CPDF FAIL
01 4 8B	A429 XMTR LOOP-BACK TO HSU1 FAIL
01 4 8C	A429 XMTR LOOP-BACK TO HSU2 FAIL
01 4 8D	A429 XMTR LOOP-BACK SPARE
01 4 8E	A429 XMTR LOOP-BACK SPARE
01 4 8F	A429 XMTR LOOP-BACK SPARE
01 4 90	A429 XMTR LOOP-BACK SPARE
01 4 91	RESERVED
01 4 AB	SIOM BUS ERROR
01 4 2C	A429 TX TO OTHER SDU BUFFER FULL
01 4 2D	A429 TX TO CFDS BUFFER FULL
01 4 2E	A429 TX TO ADL BUFFER FULL
01 4 2F	A429 TX TO PDL BUFFER FULL
01 4 30	A429 TX TO (C)MUs BUFFER FULL
01 4 31	A429 TX TO SCDUs BUFFER FULL
01 4 32	A429 TX TO MULTI-CTRL BUFFER FULL
01 4 33	RESERVED
01 4 34	A429 TX TO RMP/CAP BUFFER FULL
01 4 35	A429 TX TO SNU/CPDF BUFFER FULL
01 4 36	A429 TX TO HSU1 BUFFER FULL
01 4 37	A429 TX TO HSU2 BUFFER FULL
01 4 38	A429 TX BUFFER FULL SPARE
01 4 39	A429 TX BUFFER FULL SPARE

CODE	FAILURE DESCRIPTION
01 4 3A	A429 TX BUFFER FULL SPARE
01 4 3B	A429 TX BUFFER FULL SPARE
01 4 BC	SIOM INTERRUPT FAIL
01 4 3D	IRS ASIC MATCHING PROBLEM

SMDM1: SDU MODEM MODULE #1

01 5 81	<MODEM–1> PROCESSOR FAIL
01 5 82/02	RESERVED
01 5 83/03	RESERVED
01 5 84/04	<MODEM–1> PROGRAM CRC FAIL
01 5 85/05	RESERVED
01 5 86/06	RESERVED
01 5 87	RESERVED
01 5 88/08	RESERVED
01 5 89/09	RESERVED
01 5 0A	<MODEM–1>MODEM TO RFM INTERFACE FAIL
01 5 8B	<MODEM–1> TIMER/INTERRUPT FAIL
01 5 8C	RESERVED
01 5 8D	RESERVED
01 5 8E	<MODEM–1> EXTERNAL MEMORY FAIL
01 5 8F/0F	RESERVED
01 5 90/10	RESERVED
01 5 91	<MODEM–1> MODEM DPR FAIL
01 5 92	RESERVED
01 5 93/13	RESERVED
01 5 94/14	RESERVED
01 5 95	<MODEM–1> SMPM SIDE DPR FAIL
01 5 16	<MODEM–1> SW DOWNLOAD FAIL
01 5 17	<MODEM–1> HEALTH COUNT UPDATE FAIL
01 5 18	RESERVED
01 5 99	<MODEM–1> BUS ERROR
01 5 9A	<MODEM–1> SELF TEST MISOPERATION
01 5 1B	<MODEM–1> SOFTWARE FAIL
01 5 1C	<MODEM–1> COMMUNICATIONS PROBLEM
01 5 1D	RESERVED
01 5 9E	<MODEM–1> RFM SSI LOOPBACK FAIL
01 5 9F	RESERVED

CODE	FAILURE DESCRIPTION
SMDM2: SDU MODEM MODULE #2	
01 6	Same entries as for SMDM1 above except substitute SMDM2 for SMDM1, SRU code 6 for code 5, [MODEM_2] for [MODEM_1] and <MODEM– 2> for <MODEM–1>.
SMDM3: SDU MODEM MODULE #3	
01 7	Same entries as for SMDM1 above except substitute SMDM3 for SMDM1, SRU code 7 for code 5, [MODEM_3] for [MODEM_1] and <MODEM– 3> for <MODEM–1>.

Fault codes for modems 4–7 have Level 2 (SRU) codes J, L, M and N. They are listed in this table in the appropriate section for those SRU codes.

SRFM: SDU RADIO FREQUENCY MODULE

01 8 81	RESERVED
01 8 82	RESERVED
01 8 83	RESERVED
01 8 84	RESERVED
01 8 85	RESERVED
01 8 86	RESERVED
01 8 87	RESERVED
01 8 88	RESERVED
01 8 89	RESERVED
01 8 0A	SPARE
01 8 0B	SPARE
01 8 0C	SPARE
01 8 0D	SPARE
01 8 8E/0E	RF SYNTH CHAN1 LOCK DETECT FAIL
01 8 8F/0F	RESERVED
01 8 90/10	RF SYNTH CHAN2 LOCK DETECT FAIL
01 8 91/11	RESERVED
01 8 92/12	RF SYNTH CHAN3 LOCK DETECT FAIL
01 8 93/13	RESERVED
01 8 94/14	RESERVED
01 8 95/15	RESERVED
01 8 96/16	RF SYNTH CHAN4 LOCK DETECT FAIL
01 8 97/17	RF SYNTH CHAN5 LOCK DETECT FAIL
01 8 98/18	RF SYNTH CHAN6 LOCK DETECT FAIL
01 8 99/19	RF SYNTH CHAN7 LOCK DETECT FAIL
01 8 9A/1A	RF SYNTH CHAN8 LOCK DETECT FAIL
01 8 9B/1B	RF SYNTH TX BLOCK PLO LOCK DETECT FAIL
01 8 9C/1C	RF SYNTH RX BLOCK PLO LOCK DETECT FAIL

CODE	FAILURE DESCRIPTION
01 8 9D/1D	RF SYNTH RX CHAN PLO LOCK DETECT FAIL
01 8 9E/1E	RF SYNTH TX DOPPLER PLO LOCK DETECT FAIL
01 8 A0	RFM CHAN 1 L–BAND LOOP–BACK (TX) FAIL
01 8 A1	RFM CHAN 1 L–BAND LOOP–BACK (RX) FAIL
01 8 A2	RFM CHAN 2 L–BAND LOOP–BACK (TX) FAIL
01 8 A3	RFM CHAN 2 L–BAND LOOP–BACK (RX) FAIL
01 8 A4	RFM CHAN 3 L–BAND LOOP–BACK (TX) FAIL
01 8 A5	RFM CHAN 3 L–BAND LOOP–BACK (RX) FAIL
01 8 A6	RFM CHAN 4 L–BAND LOOP–BACK (TX) FAIL
01 8 A7	RFM CHAN 4 L–BAND LOOP–BACK (RX) FAIL
01 8 A8	RFM CHAN 5 L–BAND LOOP–BACK (TX) FAIL
01 8 A9	RFM CHAN 5 L–BAND LOOP–BACK (RX) FAIL
01 8 AA	RFM CHAN 6 L–BAND LOOP–BACK (TX) FAIL
01 8 AB	RFM CHAN 6 L–BAND LOOP–BACK (RX) FAIL
01 8 AC	RFM CHAN 7 L–BAND LOOP–BACK (TX) FAIL
01 8 AD	RFM CHAN 7 L–BAND LOOP–BACK (RX) FAIL
01 8 AE	RFM CHAN 8 L–BAND LOOP–BACK (TX) FAIL
01 8 AF	RFM CHAN 8 L–BAND LOOP–BACK (RX) FAIL
01 8 30	RFM CHAN 1 TX CALIBRATION ERROR
01 8 31	RFM CHAN 2 TX CALIBRATION ERROR
01 8 32	RFM CHAN 3 TX CALIBRATION ERROR
01 8 33	RFM CHAN 4 TX CALIBRATION ERROR
01 8 34	RFM CHAN 5 TX CALIBRATION ERROR
01 8 35	RFM CHAN 6 TX CALIBRATION ERROR
01 8 36	RFM CHAN 7 TX CALIBRATION ERROR
01 8 37	RFM CHAN 8 TX CALIBRATION ERROR
01 8 38	RFM CHAN 1 RX CALIBRATION ERROR
01 8 39	RFM CHAN 2 RX CALIBRATION ERROR
01 8 3A	RFM CHAN 3 RX CALIBRATION ERROR
01 8 3B	RFM CHAN 4 RX CALIBRATION ERROR
01 8 3C	RFM CHAN 5 RX CALIBRATION ERROR
01 8 3D	RFM CHAN 6 RX CALIBRATION ERROR
01 8 3E	RFM CHAN 7 RX CALIBRATION ERROR
01 8 3F	RFM CHAN 8 RX CALIBRATION ERROR
01 8 C0/40	RFM CHAN 1 AGC TELLBACK FAIL
01 8 C1/41	RFM CHAN 2 AGC TELLBACK FAIL
01 8 C2/42	RFM CHAN 3 AGC TELLBACK FAIL
01 8 C3/43	RFM CHAN 4 AGC TELLBACK FAIL
01 8 C4/44	RFM CHAN 5 AGC TELLBACK FAIL

CODE	FAILURE DESCRIPTION
01 8 C5/45	RFM CHAN 6 AGC TELLBACK FAIL
01 8 C6/46	RFM CHAN 7 AGC TELLBACK FAIL
01 8 C7/47	RFM CHAN 8 AGC TELLBACK FAIL
01 8 C8/48	RFM BLOCK AGC TELLBACK FAIL
01 8 C9	I/Q CALIBRATION FAIL
01 8 D0	RFM CHAN 1 AGC CALIBRATION ERROR
01 8 D1	RFM CHAN 2 AGC CALIBRATION ERROR
01 8 D2	RFM CHAN 3 AGC CALIBRATION ERROR
01 8 D3	RFM CHAN 4 AGC CALIBRATION ERROR
01 8 D4	RFM CHAN 5 AGC CALIBRATION ERROR
01 8 D5	RFM CHAN 6 AGC CALIBRATION ERROR
01 8 D6	RFM CHAN 7 AGC CALIBRATION ERROR
01 8 D7	RFM CHAN 8 AGC CALIBRATION ERROR
01 8 D8	RFM BLOCK AGC CALIBRATION ERROR

SCFM: SDU CHANNEL FILTER MODULE

01 9 81/01	RESERVED
01 9 82/02	RESERVED
01 9 83/03	RESERVED
01 9 04	RESERVED
01 9 05	RESERVED
01 9 06	RESERVED
01 9 07	RESERVED
01 9 08	RESERVED
01 9 09	RESERVED
01 9 0A	RESERVED

OCXO: SDU OVEN CONTROLLED CRYSTAL OSCILLATOR

01 A 01	OVEN READY FAIL

SMB: SDU MOTHER BOARD

01 B NONE

SPSU: SDU AC OR DC POWER SUPPLY UNIT

01 C 01	PSU TEMP LIMITS FAIL
01 C 02	SPARE
01 C 03	PSU SECONDARY VOLTAGE FAIL

CODE	FAILURE DESCRIPTION
SFPDM: SDU FRONT PANEL DISPLAY MODULE	
01 D 01	TEST (PAST) SWITCH STUCK
01 D 02	MANUAL SCROLL SWITCH STUCK

CODC: SDU VOICE CODEC MODULE C

01 E Same entries as for CODA (01 2 xx) above except substitute CODC for CODA, SRU code E for code 2, [CODEC_C] for [CODEC_A] and <CODEC–C> for <CODEC–A>.

CODD: SDU VOICE CODEC MODULE D

01 F Same entries as for CODA (01 2 xx) above except substitute CODD for CODA, SRU code F for code 2, [CODEC_D] for [CODEC_A] and <CODEC–D> for <CODEC–A>.

CODE: SDU VOICE CODEC MODULE E

01 G Same entries as for CODA (01 2 xx) above except substitute CODE for CODA, SRU code G for code 2, [CODEC_E] for [CODEC_A] and <CODEC–E> for <CODEC–A>.

CODF: SDU VOICE CODEC MODULE F

01 H Same entries as for CODA (01 2 xx) above except substitute CODF for CODA, SRU code H for code 2, [CODEC_F] for [CODEC_A] and <CODEC–F> for <CODEC–A>.

01 I Not used.

SMDM4: SDU MODEM MODULE #4

01 J Same entries as for SMDM1 (01 5 xx) above except substitute SMDM4 for SMDM1, SRU code J for code 5, [MODEM_4] for [MODEM_1] and <MODEM–4> for <MODEM–1>.

01 K Not used.

SMDM5: SDU MODEM MODULE #5

01 L Same entries as for SMDM1 (01 5 xx) above except substitute SMDM5 for SMDM1, SRU code L for code 5, [MODEM_5] for [MODEM_1] and <MODEM–5> for <MODEM–1>.

SMDM6: SDU MODEM MODULE #6

01 M Same entries as for SMDM1 (01 5 xx) above except substitute SMDM6 for SMDM1, SRU code M for code 5, [MODEM_6] for [MODEM_1] and <MODEM–6> for <MODEM–1>.

SMDM7: SDU MODEM MODULE #7

01 N Same entries as for SMDM1 (01 5 xx) above except substitute SMDM7 for SMDM1, SRU code N for code 5, [MODEM_7] for [MODEM_1] and <MODEM–7> for <MODEM–1>.

CODE	FAILURE DESCRIPTION
VIM: VOICE INTERFACE MODULE	
01 P 81	CABIN INTERFACE 1 AUDIO LOOPBACK FAIL
01 P 82	CABIN INTERFACE 2 AUDIO LOOPBACK FAIL
01 P 83	COCKPIT INTERFACE 1 AUDIO LOOPBACK FAIL
01 P 84	COCKPIT INTERFACE 2 AUDIO LOOPBACK FAIL
01 P 85	CTU CEPT-E1 AUDIO LOOPBACK FAIL
01 P 06	SPARE
01 P 07	CABIN AUDIO DISCRETE OUTPUTS LOOPBACK FAIL
01 P 08	COCKPIT AUDIO DISCRETE OUTPUTS LOOPBACK FAIL
01 P 89	CTU CEPT-E1 HDLC LOOPBACK FAIL
01 P 8A	CABIN INTERFACE 1 BUS ERROR
01 P 8B	CABIN INTERFACE 2 BUS ERROR
01 P 8C	COCKPIT INTERFACE 1 BUS ERROR
01 P 8D	COCKPIT INTERFACE 2 BUS ERROR
01 P 8E	CTU CEPT-E1 BUS ERROR
"OTHER" SATCOM SYSTEM	
02 0 01	PROTOCOL VERSION NUMBER INCOMPATIBLE
02 0 02	SDU/SDU MESSAGE PROTOCOL ERROR

HSU

Only applicable to Package 6.0 and subsequent.

UNKNOWN HSU SRU	
03 0 01	HSU SELF-DECLARED FAILURE
03 0 02	HSU WILLIAMSBURG PROTOCOL ALO/ALR FAIL
03 0 03	HSU WILLIAMSBURG PROTOCOL DATA XFER FAIL
03 0 84	HSU SELF-TEST MISOPERATION
03 0 05	HSU SERIAL PORT MIS-WIRING
03 0 86/06	HSU TOTC RESET
03 0 87/07	HSU POC RESET
03 0 08	SPARE
03 0 09-0B	RESERVED
03 0 0C	HSU CHANNEL 1 FAILURE
03 0 0D	HSU CHANNEL RELEASE ACKNOWLEDGE FAILURE
03 0 8E/0E	HSU RF LOOPBACK INHIBIT FAILURE
03 0 0F	HSU CHANNEL 2 FAILURE
03 0 10	HSU CHANNEL 3 FAILURE
03 0 11	HSU CHANNEL 4 FAILURE

CODE	FAILURE DESCRIPTION
HSCC1: HSU CHANNEL CARD 1	
03 1 01	HSU CC1 MODEM FAULT
03 1 02	HSU CC1 MODEM FAILURE
03 1 03	HSU CC1 PERIPHERAL ERROR
03 1 04	HSU CC1 PERIPHERAL FAILURE
03 1 05	HSU CC1 CP SW INCOMPATIBILITY
03 1 06	RESERVED
03 1 07	HSU CC1 RF FAULT
03 1 08	HSU CC1 RF FAILURE
03 1 09	HSU CC1 TAL ERROR
03 1 0A	HSU CC1 MODEM CALIBRATION MISSING
03 1 0B	HSU CC1 TEMPERATURE UNREADABLE
03 1 0C	HSU CC1 OVER TEMPERATURE
03 1 0D	RESERVED
03 1 0E	HSU CC1 TURBO FAULT
03 1 0F	HSU CC1 TURBO FAILURE
03 1 10	RESERVED
03 1 11	HSU CC1 VCODEC FAULT|
03 1 12	HSU CC1 VCODEC FAILURE
03 1 93	HSU CC1 APPLICATION CODE ERROR
HSCC2: HSU CHANNEL CARD 2	
03 2 01	HSU CC2 MODEM FAULT
03 2 02	HSU CC2 MODEM FAILURE
03 2 03	HSU CC2 PERIPHERAL ERROR
03 2 04	HSU CC2 PERIPHERAL FAILURE
03 2 05	HSU CC2 CP SW INCOMPATIBILITY
03 2 06	RESERVED
03 2 07	HSU CC2 RF FAULT
03 2 08	HSU CC2 RF FAILURE
03 2 09	HSU CC2 TAL ERROR
03 2 0A	HSU CC2 MODEM CALIBRATION MISSING
03 2 0B	HSU CC2 TEMPERATURE UNREADABLE
03 2 0C	HSU CC2 OVER TEMPERATURE
03 2 0D	RESERVED
03 2 0E	HSU CC2 TURBO FAULT
03 2 0F	HSU CC2 TURBO FAILURE
03 2 10	RESERVED

CODE	FAILURE DESCRIPTION
03 2 11	HSU CC2 VCODEC FAULT
03 2 12	HSU CC2 VCODEC FAILURE
03 2 93	HSU CC2 APPLICATION CODE ERROR

HSDIO: HSU DATA I/O CARD

03 3 01	RESERVED
03 3 02	HSU UNRECOVERABLE SW / PROTOCOL ERROR
03 3 03	HSU I/O CHANNEL CARD 1 UNSERVICEABLE
03 3 04	HSU I/O CHANNEL CARD 2 UNSERVICEABLE
03 3 85	HSU CONFIGURATION ERROR
03 3 86	HSU I/O PERIPHERAL FAILURE
03 3 07	HSU I/O BOTH CHANNEL CARDS UNSERVICEABLE
03 3 08	HSU I/O RAM FAULT
03 3 09	HSU I/O ROM FAULT
03 3 0A	HSU SW CONFIGURATION ERROR
03 3 0B	HSU PPPoE SESSION FAILURE

HSCP: HSU CONTROL PROCESSOR

03 4 01	RESERVED
03 4 02	RESERVED
03 4 03	RESERVED
03 4 04	RESERVED
03 4 05	RESERVED
03 4 06	RESERVED
03 4 87/07	HSU CP CHANNEL CARD 1 UNRESPONSIVE
03 4 88/08	HSU CP CHANNEL CARD 2 UNRESPONSIVE
03 4 89/09	HSU CP BOTH CHANNEL CARDS UNRESPONSIVE
03 4 8A/0A	HSU DATA I/O CARD UNRESPONSIVE
03 4 0B CM	HSU CP RAM FAULT
03 4 0C CM	HSU CP ROM FAULT
03 4 0D CM	HSU OVER TEMPERATURE
03 4 0E CM	HSU CHANNEL CARD 1 OVER TEMPERATURE
03 4 0F CM	HSU CHANNEL CARD 2 OVER TEMPERATURE
03 4 10 CM	HSU BOTH CHANNEL CARDS OVER TEMPERATURE
03 4 91 PP	HSU ADL BUS INTERFACE FAILURE
03 4 92 PP	HSU PDL BUS INTERFACE FAILURE
03 4 93 PP	HSU DATA I/O DUART FAILURE
03 4 94 PP	HSU CHANNEL CARD 1 DUART FAILURE

CODE	FAILURE DESCRIPTION
03 4 95 PP	HSU CHANNEL CARD 2 DUART FAILURE
03 4 96 PP	HSU BOTH CHANNEL CARDS DUART FAILURE
03 4 97 PP	HSU MAINTENANCE INTERFACE DUART FAILURE
03 4 98 PP	HSU DISCRETE OUTPUT FAILURE
03 4 99 PP	HSU BOARD CONFIGURATION/REVISION FAILURE

HOCXO: HSU OVEN–CONTROLLED 10 MHZ OSCILLATOR

03 5 01	HSU OCXO TIMEOUT
03 5 02	HSU OCXO TEMPERATURE UNSTABLE

HSPSU: HSU POWER SUPPLY UNIT 1

03 6 01	HSU POWER SUPPLY FAIL
03 6 02	HSU PSU OVER TEMPERATURE

HSCDM: HSU CONFIGURATION DATA MODULE

03 7 NONE

HSFP: HSU FRONT PANEL

03 8 81	HSU SELF–TEST BUTTON STUCK

HSBP: HSU BACKPLANE

03 9 NONE

HGA/IGA HPA

This section lists failure codes inclusive of all HPA designs. Each HPA uses the SRU codes appropriate to its design.

UNKNOWN HGA/IGA HPA SRU

04 0 01	<HGA HPA> STATUS WORD (143) UPDATE RATE FAIL
04 0 02	<HGA HPA> STATUS WORD (143) DATA FAIL
04 0 03	<HGA HPA> MNTNC WORD (350) UPDATE RATE FAIL
04 0 04	<HGA HPA> MNTNC WORD (350) DATA FAIL
04 0 05	<HGA HPA> SPARE
04 0 06	<HGA HPA> SPARE
04 0 87	<HGA HPA> SELF–TEST MISOPERATION
04 0 08	<HGA HPA> RF OVERDRIVE ERROR
04 0 09	<HGA HPA> RF SUPPLY CURRENT FAIL
04 0 0A	<HGA HPA> OVER TEMP (COMB/DET) SHUTDOWN
04 0 0B	<HGA HPA> NO RESPONSE TO CARRIER COMMAND
04 0 0C	<HGA HPA> FAILURE WARNING W/NO DISC'S SET

CODE	FAILURE DESCRIPTION
04 0 0D	<HGA HPA> 429 MNTNC WORD PSU FAIL (350)
04 0 0E	<HGA HPA> 429 MNTNC WORD INTERNAL RAM FAIL
04 0 0F	<HGA HPA> 429 MNTNC WORD INTERNAL ROM FAIL
04 0 10	<HGA HPA> CLASS C HPA MAX AVAIL PWR FAIL
04 0 40	<HGA HPA> SELF-TEST BUTTON STUCK
04 0 41	<HGA HPA> RESERVED (HP-720 “RF Power Input Low”)

HPSU: HPA AC OR DC POWER SUPPLY UNIT

04 1 01	<HGA HPA> PSU OVER TEMP SHUTDOWN
04 1 02	<HGA HPA> PSU TEMP SENSOR FAIL
04 1 03	<HGA HPA> PSU BIAS +5VDC FAIL
04 1 04	<HGA HPA> PSU +28/+25.5 VDC FAIL
04 1 05	<HGA HPA> PSU +5 VDC FAIL
04 1 06	<HGA HPA> PSU +15 VDC FAIL
04 1 07	<HGA HPA> PSU -15 VDC FAIL
04 1 08	<HGA HPA> PSU -85 VDC FAIL
04 1 09	<HGA HPA> PSU +8 VDC FAIL
04 1 0A	<HGA HPA> PSU +16 VDC FAIL
04 1 40	<HGA HPA> INTERNAL POWER SUPPLY FAIL
04 1 41	<HGA HPA> PSU OVER TEMP

HMPM: HPA MAIN PROCESSOR MODULE

04 2 81	<HGA HPA> H/W-S/W COMPATIBILITY FAIL
04 2 02	<HGA HPA> SPARE
04 2 83/03	<HGA HPA> BOOT FLASH MEMORY FAIL
04 2 04	<HGA HPA> A429 SDU XMTR LOOP-BACK FAIL
04 2 05	<HGA HPA> SPARE
04 2 06	<HGA HPA> SPARE
04 2 87	<HGA HPA> A429 MULTICNT RCVR FAIL
04 2 88	<HGA HPA> A429 ADL RCVR FAIL
04 2 89	<HGA HPA> A429 PDL-TO-HPA RCVR FAIL
04 2 0A	<HGA HPA> MAINTENANCE MEMORY CRC FAIL
04 2 0B	<HGA HPA> MAINTENANCE MEMORY WRITE FAIL
04 2 8C/0C	<HGA HPA> CALIBRATION MEMORY CRC FAIL
04 2 0D	<HGA HPA> CALIBRATION MEMORY WRITE FAIL
04 2 8E/0E	<HGA HPA> PROGRAM FLASH MEMORY FAIL
04 2 0F	<HGA HPA> SPARE
04 2 90	<HGA HPA> RAM FAIL
04 2 11	<HGA HPA> CPU OVER TEMP SHUTDOWN

CODE	FAILURE DESCRIPTION
04 2 12	<HGA HPA> CPU TEMP SENSOR FAIL
04 2 93/13	<HGA HPA> CPU GND REF FAIL
04 2 94/14	<HGA HPA> FAN RELAY DRIVER FAIL
04 2 95/15	<HGA HPA> BIAS ENABLE LOOPBACK FAIL
04 2 96/16	<HGA HPA> VAR ATTN DRIVER FAIL
04 2 17	<HGA HPA> FRONT PANEL TEST SWITCH STUCK
04 2 98	<HGA HPA> WATCHDOG TIMEOUT FAIL
04 2 19	<HGA HPA> DRIVER GND FAIL
04 2 1A	<HGA HPA> SPARE
04 2 1B	<HGA HPA> SPARE
04 2 9C/1C	<HGA HPA> DRIVER TEST – MUX
04 2 9D	<HGA HPA> DRIVER TEST – GREEN LED
04 2 9E	<HGA HPA> DRIVER TEST – RED LED
04 2 1F	<HGA HPA> SPARE
04 2 A0	<HGA HPA> DRIVER TEST–MUTE ATTENUATOR
04 2 21	<HGA HPA> SPARE – – – – –
04 2 A2	<HGA HPA> DRIVER TEST – SER DATA CONCATENATE
04 2 23	<HGA HPA> SPARE
04 2 24	<HGA HPA> SPARE
04 2 A5	<HGA HPA> MUTE INPUT TEST
04 2 A6	<HGA HPA> CPU DEVICE TEST
04 2 A7	<HGA HPA> ACTUAL POWER CALIBRATION
04 2 A8	<HGA HPA> VALIDATION OF UPLOAD
04 2 29	<HGA HPA> MUTE ATTEN P OUT OF LIMITS
04 2 2A	<HGA HPA> CODE VPP OUT OF LIMITS
04 2 2B	<HGA HPA> MAINT LOG VPP OUT OF LIMITS
04 2 2C	<HGA HPA> CAL MEM VPP OUT OF LIMITS
04 2 AD/2D	<HGA HPA> ADC REF OUT OF LIMITS
04 2 2E	<HGA HPA> PWR LO OUT OF LIMITS
04 2 2F	<HGA HPA> PSU TEMP LO OUT OF LIMITS
04 2 30	<HGA HPA> AMPS LO OUT OF LIMITS
04 2 31	<HGA HPA> SOFTWARE FAULT
04 2 32	<HGA HPA> SPARE
04 2 B3/33	<HGA HPA> DISC OUTPUT TEST – FAN
04 2 B4	<HGA HPA> RS–422 INTERNAL LOOPBACK FAIL
04 2 35	<HGA HPA> IGA LNA/DIP ON/OFF DISC LOOP FAIL
04 2 C0	<HGA HPA> I2C INTERFACE FAILURE
04 2 C1/41	<HGA HPA> RAM FAILURE
04 2 C2	<HGA HPA> KERNAL CODE ERROR

CODE	FAILURE DESCRIPTION
04 2 C3	<HGA HPA> APPLICATION CODE ERROR
04 2 C4	<HGA HPA> CONFIGURATION ERROR
04 2 C5	<HGA HPA> SDU BUS I/F FAILURE
04 2 C6	<HGA HPA> ADL BUS I/F FAILURE
04 2 C7	<HGA HPA> PDL BUS I/F FAILURE
04 2 C8	<HGA HPA> MAINTENANCE DUART FAILURE
04 2 C9/49	<HGA HPA> DISCRETE OUTPUTS FAILURE
04 2 CA/4A	<HGA HPA> CP TEMP SENSOR FAILURE
04 2 CB	<HGA HPA> BOARD CONFIG/REV FAILURE
04 2 4C	<HGA HPA> I^2C INTERFACE FAILURE
04 2 4D	<HGA HPA> ROM FAILURE

DRIV: HPA RF DRIVER

04 3 01	<HGA HPA> DRIVER RF OUTPUT FAIL
04 3 02	<HGA HPA> DRIVER TEMP SENSOR FAIL
04 3 03	<HGA HPA> DRIVER OVER TEMP SHUTDOWN
04 3 04	<HGA HPA> DRIVER VCC FAIL
04 3 05	<HGA HPA> SPARE

SPLT: HPA RF SPLITTER

04 4 01	<HGA HPA> SPARE

PWR1: HPA RF POWER AMPLIFIER (1)

04 5 01	<HGA HPA> <AMP 1> RF BALANCE FAIL
04 5 02	<HGA HPA> <AMP 1> VCC FAIL
04 5 03	<HGA HPA> SPARE

PWR2: HPA RF POWER AMPLIFIER (2)

04 6 Same as for PWR1 except sub. SRU code 6 for 5 and <AMP-2> for <AMP-1>.

PWR3: HPA RF POWER AMPLIFIER (3)

04 7 Same as for PWR1 except sub. SRU code 7 for 5 and <AMP-3> for <AMP-1>.

C/DET: HPA RF POWER COMBINER/DETECTOR

04 8 01	<HGA HPA> FORWARD OUTPUT POWER DET 1 FAIL
04 8 02	<HGA HPA> FORWARD OUTPUT POWER DET 2 FAIL
04 8 03	<HGA HPA> FORWARD OUTPUT PWR COMPARE FAIL
04 8 04	<HGA HPA> REFLECTED OUTPUT PWR DET FAIL
04 8 05	<HGA HPA> COMBINER TEMP SENSOR FAIL
04 8 06	<HGA HPA> SPARE

CODE	FAILURE DESCRIPTION
FPAMP: HPA RF FINAL POWER AMPLIFIER	
04 9 01	<HGA HPA> FINAL AMP 1 RF BALANCE FAIL
04 9 02	<HGA HPA> FINAL AMP 1 VCC FAIL
04 9 03	<HGA HPA> SPARE
04 9 04	<HGA HPA> FINAL AMP 2 RF BALANCE FAIL
04 9 05	<HGA HPA> FINAL AMP 2 VCC FAIL
04 9 06	<HGA HPA> SPARE
04 9 C0/40	<HGA HPA> PA UNRESPONSIVE
04 9 41	<HGA HPA> SPARE
04 9 42	<HGA HPA> OVER CURRENT FAILURE
04 9 43	<HGA HPA> DRIVER AMPLIFIER DC VOLTAGE FAILURE
04 9 44	<HGA HPA> DRIVER AMPLIFIER CURRENT FAILURE
04 9 45	<HGA HPA> 12 VDC FAILURE
04 9 46	<HGA HPA> PA MUTE FAILURE
04 9 47	<HGA HPA> PA OVER TEMP
04 9 48	<HGA HPA> PA STATUS FAILURE
04 9 49	<HGA HPA> PA TEMP SENSOR FAILURE
HMB: HPA MOTHER BOARD	
04 A 40	<HGA HPA> BP TEMP SENSOR FAILURE
RFAM: 20W HPA RF AMPLIFIER MODULE	
04 B 01	<HGA HPA> OVER TEMP SHUTDOWN
04 B 02	<HGA HPA> RFAM VCC FAIL
04 B 03	<HGA HPA> AMP 1 VCC FAIL
04 B 04	<HGA HPA> FORWARD OUTPUT POWER DET 1 FAIL
04 B 05	<HGA HPA> FORWARD OUTPUT POWER DET 2 FAIL
04 B 06	<HGA HPA> REFLECTED OUTPUT PWR DET FAIL
04 B 07	<HGA HPA> TEMP SENSOR FAIL
04 B 08	<HGA HPA> FORWARD OUTPUT POWER FAIL
04 B 09	<HGA HPA> AMP 2 RF BALANCE FAIL
04 B 0A	<HGA HPA> AMP 2 VCC FAIL

SPARE Level 1 Codes

05

06

LGA HPA

07 Same entries as for HGA/IGA HPA above except substitute LRU code 7 for code 4, <LGA HPA> for <HGA HPA>, and [LGA_SUBSYS] for [HGA_SUBSYS]. For the cases of conditional HGA subsystem indictments ([cond_HGA_SUBSYS]), the equivalent LGA HPA failures shall UNconditionally indict [LGA_SUBSYS].

CODE	FAILURE DESCRIPTION
HSU #1	
Only applicable prior to Package 6.0.	
UNKNOWN <HSU1> SRU	
08 0 01	<HSU1> SELF-DECLARED FAILURE
08 0 02	<HSU1> WILLIAMSBURG PROTOCOL ALO/ALR FAIL
08 0 03	<HSU1> WILLIAMSBURG PROTOCOL DATA XFER FAIL
08 0 84	<HSU1> SELF-TEST MISOPERATION
08 0 05	<HSU1> CHANNEL RELEASE ACKNOWLEDGE FAILURE
08 0 86/06	<HSU1> RF LOOPBACK INHIBIT FAILURE
HSCPU: <HSU1> CPU	
08 1 01-79	SPARE
08 1 FA	<HSU1> ACCESS LEVEL DEVELOPMENT
08 1 FB	<HSU1> ACCESS LEVEL PRODUCTION
08 1 FC	<HSU1> ACCESS LEVEL PRODUCTION FAST STARTUP
08 1 FD	<HSU1> SW VERSIONS INCONSISTENCY
08 1 7E	SPARE - - - - -
08 1 7F	<HSU1> ENVIRONMENT TEMP AT POWER-UP FAIL
08 1 80-90	SPARE - - - - -
08 1 91	<HSU1> TEMP SENSOR FAILURE
FDSMP: <HSU1> FRAME DSP (AND INTERFACES)	
08 2 01-14	SPARE
08 2 95	<HSU1> FRAME DSP/CPU INTERFACE FAILURE
VSDPM: <HSU1> VFC DSP (AND INTERFACES)	
08 3 01-17	SPARE
08 3 98	<HSU1> VFC DSP/CPU INTERFACE FAILURE
TFPGA: <HSU1> TURBO FPGA	
08 4 01-05	SPARE
08 4 86	<HSU1> TURBO FPGA FAIL
ISDNT: <HSU1> ISDN TRANSCEIVER	
08 5 01-06	SPARE
08 5 87	<HSU1> ISDN TRANSCEIVER FAILURE
AFPGA: <HSU1> ARINC 429 FPGA	
08 6 NONE	

CODE	FAILURE DESCRIPTION
CPURM: <HSU1> CPU RAM	
08 7 01–03	SPARE
08 7 84	<HSU1> CPU RAM FAILURE
CEM: <HSU1> CONVERTER EEPROM	
08 8 81	<HSU1> EEPROM FAILURE
FLASH: <HSU1> FLASH	
08 9 81	SPARE
08 9 82	<HSU1> PARAMETER BLOCK CHECKSUM FAILURE
08 9 83	<HSU1> CPU BIOS/APPLICATION CRC FAILURE
08 9 04–06	SPARE
08 9 87	<HSU1> MISSING FILE IN FLASH
08 9 88	<HSU1> CORRUPTED FILE IN FLASH/INCORRECT CRC
QUART: <HSU1> QUAD UART	
08 A 01–10	SPARE
08 A 91	<HSU1> EXTERNAL UART FAILURE
ETHER: <HSU1> ETHERNET	
08 B NONE	
PSPCB: <HSU1> POWER SUPPLY PCB	
08 C 01–0A	SPARE
08 C 0B	<HSU1> POWER FAILURE
ETIME: <HSU1> EXTERNAL TIMER	
08 D NONE	
SPARE	
08 E NONE	
SPARE	
08 F NONE	
HCDMI: <HSU1>/CDM INTERFACE	
08 G 01–71	SPARE
08 G F2	<HSU1> CDM INTERFACE FAILURE
08 G 73–7D	SPARE
08 G FE	<HSU1> CDM NOT FITTED

CODE	FAILURE DESCRIPTION
SPARE	
08 H NONE	
SPARE	
08 I NONE	
TDRAM: <HSU1> TURBO DECODER RAM	
08 J 81–89	SPARE
08 J 8A	<HSU1> TURBO DECODER RAM FAILURE
BATTM: <HSU1> BATTERY	
08 K 01–04	SPARE
08 K 85	<HSU1> BATTERY CHECK FAILURE
IUART: <HSU1> INTERNAL UART	
08 L NONE	
STAM: <HSU1> STEP ATTENUATOR	
08 M 01–04	SPARE
08 M B5	<HSU1> STEP ATTENUATOR FAILURE
HRFM: <HSU1> RF	
08 N 81	<HSU1> 1.LO LOCK DETECTOR FAILURE
08 N 82	<HSU1> 2.LO LOCK DETECTOR FAILURE
08 N 83	<HSU1> 3.LO LOCK DETECTOR FAILURE
08 N 04–10	SPARE
08 N 91	<HSU1> 1.LO MIN FREQUENCY TEST FAILURE
08 N 92	<HSU1> 2.LO MIN FREQUENCY TEST FAILURE
08 N 93	<HSU1> 3.LO MIN FREQUENCY TEST FAILURE
08 N 14–20	SPARE
08 N A1	<HSU1> 1.LO MAX FREQUENCY TEST FAILURE
08 N A2	<HSU1> 2.LO MAX FREQUENCY TEST FAILURE
08 N A3	<HSU1> 3.LO MAX FREQUENCY TEST FAILURE
08 N 24–2F	SPARE
08 N B0	<HSU1> ALC – CARRIER OFF FAILURE
08 N B1	<HSU1> ALC – CARRIER ON FAILURE
08 N B2	<HSU1> RF LOOPBACK FAILURE
08 N B3	<HSU1> AVERAGE AMPLITUDE FAILURE
08 N B4	<HSU1> 16QAM SCPC FRAME SYNC FAILURE
08 N 35–39	SPARE

CODE	FAILURE DESCRIPTION
08 N BA	<HSU1> INTERNAL RX COAX CABLE FAILURE
08 N BB	<HSU1> TX/RX CHANNEL FREQUENCY ERROR
08 N BC	<HSU1> CARRIER_ON OFF CONTROL FAILURE
08 N BD	<HSU1> RF LOOP_BACK OFF CONTROL FAILURE
08 N BE	<HSU1> TX_ON/OFF CONTROL FAILURE
08 N BF–40	SPARE
08 N 41	<HSU1> AGC LEVEL OUTSIDE LIMITS WARNING
08 N 42	SPARE
08 N C3	<HSU1> LINEARITY OUTSIDE LIMITS WARNING
08 N 44–50	SPARE
08 N 51	<HSU1> 1.LO LOCK FAILURE
08 N 52	<HSU1> 2.LO LOCK FAILURE
08 N 53	<HSU1> 3.LO LOCK FAILURE

REOSM: <HSU1> REFERENCE OSCILLATOR

08 O 01–41	SPARE
08 O 42	<HSU1> REF OSC WARNING: SEND HSU TO CAL
08 O 43–62	SPARE
08 O 63	<HSU1> REF OSC FAILURE/VOLTAGE TOO LOW
08 O 64	<HSU1> REF OSC FAILURE/VOLTAGE TOO HIGH

BMONM: <HSU1> BURST DURATION MONITOR

08 P 81	<HSU1> BURST DURATION MONITOR CIRCUIT
08 P 02–03	SPARE
08 P 04	<HSU1> TDM BURST DURATION FAILURE
08 P 85	<HSU1> CARRIER ON SIGNALS

DCOMM: <HSU1> DOPPLER COMPENSATION

08 Q 01–38	SPARE
08 Q 39	<HSU1> REF OSC COMPENSATION ERROR

FVFCI: <HSU1> FRAME DSP/VFC DSP INTERFACE

08 R 01–16	SPARE
08 R 17	<HSU1> FRAME DSP/VFC DSP FAILURE

FDTFI: <HSU1> FRAME DSP/TURBO FPGA INTERFACE

08 S 01–15	SPARE
08 S 96	<HSU1> FRAME TURBO FPGA INTERFACE FAILURE

TEMPORARY REVISION NO. 23-1

INSERT PAGE 53 OF 53 FACING PAGE F-21.

Reason: To move 0B from the SPARE code at the bottom of the page and to add 0B to a new code category HDM and applicable failure descriptions.

The SPARE code is changed and the new HDM code and subheading UNKNOWN HDM SRU are added before the SPARE code as follows:

HDM

UNKNOWN HDM SRU

0B 0 81/01	HSU DATA MODULE ABSENT/REMOVED
0B 0 82	HDM USIM 1 ABSENT
0B 0 83/03	RESERVED
0B 0 84	HDM USIM 3 ABSENT
0B 0 85/05	RESERVED
0B 0 86	HDM USIMS 1 & 3 ABSENT
0B 0 07	HDM ORT FAILURE
0B 0 08	HDM TEMPERATURE UNSTABLE
0B 0 09	HDM TEMPERATURE TIMEOUT
0B 0 8A	HDM USIM 1 INVALID
0B 0 8B/0B	RESERVED
0B 0 8C	HDM USIM 3 INVALID
0B 0 8D/0D	RESERVED
0B 0 8E	HDM USIM 1 & 3 INVALID
0B 0 8F/0F	HDM USIM 1 FAILED
0B 0 90/10	RESERVED
0B 0 91/11	HDM USIM 3 FAILED
0B 0 92/12	RESERVED
0B 0 93/13	HDM USIM 1 & 3 FAILED

SPARE

0C

CODE	FAILURE DESCRIPTION
VDTFI: <HSU1> VFC DSP/TURBO FPGA INTERFACE	
08 T NONE	
VDITI: <HSU1> VFC DSP/ISDN TRANSCEIVER INTERFACE	
08 U NONE	
TFTDR: <HSU1> TURBO FPGA/TURBO DECODER RAM INTERFACE	
08 V NONE	
PSIPI: <HSU1> POWER SUPPLY PCB/ISDN PHONE INTERFACE	
08 W 01–07	SPARE
08 W 88	<HSU1> ISDN SUPPLY VOLTAGE FAILURE
CDM: <HSU1> CONFIGURATION DATA MODULE	
08 X 01–70	SPARE
08 X F1	<HSU1> INVALID SERIAL NUMBER
08 X 72	SPARE
08 X F3	<HSU1> CDM ESSENTIAL DATA FAILURE
08 X F4	<HSU1> CDM DATA ACCESS ERROR
08 X F5	<HSU1> CDM MISSING WRITE PROTECTION
08 X F6	<HSU1> CDM INCORRECT VERSION
SPARE	
08 Y NONE	
ITPSI: <HSU1> ISDN TRANSCEIVER/POWER SUPPLY PCB INTERFACE	
08 Z 01–08	SPARE
08 Z 89	<HSU1> ISDN RX VOLTAGE

HSU #2

09 Same entries as for HSU #1 above except substitute LRU code 09 for code 08, <HSU2> for <HSU1>, and [HSU2] for [HSU1]. Only applicable prior to Package 6.0.

HIGH POWER RELAY	
UNKNOWN HPR SRU	
0A 0 01	(PORT) MNTNC WORD HPR FAIL
0A 0 02	(STBD) MNTNC WORD HPR FAIL
SPARE	
0B	
0C	

CODE	FAILURE DESCRIPTION
TOP/PORT LNA/DIPLEXER	
UNKNOWN TOP/PORT LNA/DIPLEXER SRU	
0D 0 01	<T/P LNA/DIP> MNTNC WORD FAIL
SPARE	
0E	
STARBOARD LNA/DIPLEXER	
0F	Same entries as for TOP/PORT LNA/Diplexer above except substitute STBD BSU for T/P BSU, LRU code 0F for code 0D and <STBD LNA/DIP> for <T/P LNA/DIP>.
LGA LNA/DIPLEXER	
UNKNOWN LGA LNA/DIPLEXER SRU	
10 0 01	LGA LNA/DIP FAIL
SPARE	
11	
12	
TOP/PORT BSU OR ACU	
UNKNOWN TOP/PORT BSU OR ACU SRU	
13 0 01	<T/P B/A> MNTNC WORD (350) UPDATE RATE FAIL
13 0 02	<T/P B/A> MNTNC WORD (350) DATA FAIL
13 0 03	<T/P B/A> STATUS WORD (144) UPDATE RATE FAIL
13 0 04	<T/P B/A> STATUS WORD (144) DATA FAIL
13 0 05	<T/P B/A> MNTNC WORD RAM FAIL
13 0 06	<T/P B/A> MNTNC WORD ROM FAIL
13 0 07	<T/P B/A> MNTNC WORD PSU FAIL
13 0 08	<T/P B/A> MNTNC WORD PARAMETER FAIL
13 0 09	<T/P B/A> MNTNC WORD TEMP FAIL
13 0 8A	<T/P B/A> SELF–TEST MISOPERATION
SPARE	
14	
STARBOARD BSU	
15	Same entries as for TOP/PORT BSU or ACU above except substitute LRU code 15 for code 13 and <STBD BSU> for <T/P B/A>.

CODE	FAILURE DESCRIPTION
SPARE	
16	
17	
18	
19	
TOP/PORT HGA/IGA	
UNKNOWN TOP/PORT HGA/IGA SRU	
1A 0 01	CM SMPM <T/P HGA/IGA> MNTNC WORD FAIL
1A 0 02	CM HMPM IGA FAILURE
1A 0 03	CM HMPM IGA RS-422 INPUT BUS LINK FAULT
1A 0 04	CM HMPM IGA HPA RS-422 INPUT BUS ERROR/INACTIVE
SPARE	
1B	
STARBOARD HGA	
1C	Same entries as for TOP/PORT HGA above except substitute LRU code 1C for code 1A, <STBD BSU> for <T/P B/A>, and <STBD HGA> for <T/P HGA>.
SPARE	
1D	
1E	
LGA	
UNKNOWN LGA SRU	
1F RESERVED	
SPARE	
20	
SCDU/WSC #1	
UNKNOWN SCDU/WSC #1 SRU	
21 0 01	<SCDU-1> PROTOCOL ERROR
21 0 02	<WSC-1> STATUS (270) BAD SSM
21 0 03	<WSC-1> MASTER PROTOCOL ERROR
21 0 04	<WSC-1> DATA TRANSMISSION FAILURE
21 0 05	SPARE
21 0 06	SPARE
21 0 07	<WSC-1> MASTER TEST LOOP FAILURE

CODE	FAILURE DESCRIPTION
21 0 08	SPARE

SCDU/WSC #2

22 Same entries as for SCDU/WSC #1 above except substitute LRU code 22 for code 21, <WSC–2> for <WSC–1>, and <SCDU–2> for <SCDU–1>.

SCDU/WSC #3

23 Same entries as for SCDU/WSC #1 above except substitute LRU code 23 for code 21, <WSC–3> for <WSC–1>, and <SCDU–3> for <SCDU–1>.

SPARE

24–2F

RMP

UNKNOWN RMP SRU

30 RESERVED

SPARE

31

32

(C)MU #1

UNKNOWN (C)MU #1 SRU

33 0 01	<(C)MU–1> SPARE – – – – –
33 0 02	<(C)MU–1> STATUS (270) BAD SSM
33 0 03	<(C)MU–1> MASTER PROTOCOL ERROR
33 0 04	<(C)MU–1> DATA TRANSMISSION FAILURE
33 0 05	<(C)MU–1> SLAVE PROTOCOL ERROR
33 0 06	<(C)MU–1> SELF–DECLARED FAILURE
33 0 07	<(C)MU–1> MASTER TEST LOOP FAILURE
33 0 08	<(C)MU–1> SLAVE TEST LOOP FAILURE

(C)MU #2

34 Same entries as for CMU #1 above except substitute LRU code 34 for code 33 and <(C)MU–2> for <(C)MU–1>.

IRS–PRI

UNKNOWN IRS–PRI SRU

35 0 01	SPARE
35 0 02	<IRS–PRI> LAT DATA (310) FAIL
35 0 03	SPARE

CODE	FAILURE DESCRIPTION
35 0 04	<IRS-PRI> LON DATA (311) FAIL
35 0 05	SPARE
35 0 06	<IRS-PRI> GND SPD DATA (312) FAIL
35 0 07	SPARE
35 0 08	<IRS-PRI> TRK DATA (313) FAIL
35 0 09	SPARE
35 0 0A	<IRS-PRI> TRUE HDG DATA (314) FAIL
35 0 0B	SPARE
35 0 0C	<IRS-PRI> PITCH DATA (324) FAIL
35 0 0D	SPARE
35 0 0E	<IRS-PRI> ROLL DATA (325) FAIL

IRS-SEC

36 Same entries as for IRS-PRI above except substitute LRU code 36 for code 35 and <IRS-SEC> for <IRS-PRI>.

RESERVED

37

38

CFDS/CMC

UNKNOWN CFDS/CMC SRU

39 0 01	INVALID OMS PARAMETER(S) 3 3 E 29,34 NONE

SPARE

3A-3C

FMC #1

UNKNOWN FMC #1 SRU

3D RESERVED

FMC #2

3E Same entries as for FMC #1 above except substitute LRU code 3E for code 3D and <FMC-2> for <FMC-1>.

SPARE

3F

CODE	FAILURE DESCRIPTION
429 ICAO ADDRESS SOURCE	
UNKNOWN 429 ICAO ADDRESS SOURCE SRU	
40 0 01	429 ICAO ADDRESS FAIL
40 0 02	DUAL SYSTEM DIFFERENT 429 AES ID

SPARE

41

CABIN TELECOMMUNICATIONS UNIT

UNKNOWN CABIN TELECOMMUNICATIONS UNIT SRU	
42 0 01	CCS ECL NOT ESTABLISHED
42 0 02	CCS CCL NOT ESTABLISHED
42 0 03	CCS CTU NOT AVAILABLE
42 0 04	CCS PDL NOT ESTABLISHED

CPDF

43 Same entries as for CMU #1 above except substitute LRU code 43 for code 33, <CPDF> for <(C)MU–1> and make the class of all CPDF failure 2.

SPARE

44 – 4F

SDU INPUT BUSES AND RELATED

50 0 01	SDU HSU1 BUS INACTIVE
50 0 02	HSU1 SELF–TEST MISOPERATION
50 0 03	HSU1 PERIODIC DATA RATE FAIL
50 0 04	HSU1 SOLO WORD DATA RATE FAIL
50 0 05	HSU1 W’BURG DATA RATE FAIL
51 0 01	SDU HSU2 BUS INACTIVE
51 0 02	HSU2 SELF–TEST MISOPERATION
51 0 03	HSU2 PERIODIC DATA RATE FAIL
51 0 04	HSU2 SOLO WORD DATA RATE FAIL
51 0 05	HSU2 W’BURG DATA RATE FAIL
52 0 01	SDU CPDF BUS INACTIVE
53 0 01	SDU CMU–1 BUS INACTIVE
54 0 01	SDU CTU CEPT–E1 BUS INACTIVE
55 0 01	SDU SCDU/WSC–1 BUS INACTIVE
56 0 01	SDU SCDU/WSC–2 BUS INACTIVE
57 0 01	SDU CMU–2 BUS INACTIVE

CODE	FAILURE DESCRIPTION
58 0 01	SPARE MP4A/B
59 0 01	SDU CFDS BUS INACTIVE
59 0 02	INVALID OMS PARAMETER(S)
5A 0 01	SDU PRI IRS BUS INACTIVE
5B 0 01	SDU SEC IRS BUS INACTIVE
5C 0 01	SDU HGA/IGA HPA BITE BUS INACTIVE
5C 0 02	HGA/IGA HPA SELF–TEST MISOPERATION
5D	SPARE
5E	SPARE MP6G/H
5F 0 01	SDU LGA HPA BITE BUS INACTIVE
5F 0 02	LGA HPA SELF–TEST MISOPERATION
60	SPARE MP7A/B
61	SPARE
62 0 01	SDU TOP/PORT BSU/ACU BITE BUS INACTIVE
62 0 02	TOP/PORT BSU/ACU SELF–TEST MISOPERATION
63	SPARE
64 0 01	SDU STBD BSU BITE BUS INACTIVE
64 0 02	STBD BSU/ACU SELF–TEST MISOPERATION
65 0 01	SDU RMP BUS INACTIVE
66 0 01	SDU SCDU/WSC–3 BUS INACTIVE
67 0 01	RESERVED
68 0 01	RESERVED
69	SPARE
6A 0 81	RESERVED
6B 0 01	SPARE
6C 0 81	RESERVED
6D 0 81	RESERVED
6E 0 81	RESERVED
6F 0 81	RESERVED
70	SPARE
71 0 01	SDU CROSS–TALK BUS INACTIVE 3 2 I – [OTHER_SATCOM]
72	SPARE MP12E/F
73 0 01	SDU FMC–1 BUS INACTIVE
74 0 01	SDU FMC–2 BUS INACTIVE
75	SPARE
76	SPARE
77	SPARE
78	SPARE

CODE	FAILURE DESCRIPTION
79	SPARE
7A	SPARE
7B	SPARE
7C	SPARE
7D	SPARE
7E	SPARE
7F	SPARE

RESERVED

80-8F

HGA/IGA HPA INPUT BUSES

90 0 01	HGA/IGA HPA 429 MNTNC WORD CTL BUS INACTIVE
90 0 02	HGA/IGA HPA MULTICONTROL BUS INACTIVE
91	SPARE TP2A/B
92	SPARE
93	SPARE
94	SPARE
95	SPARE

LGA HPA INPUT BUSES

96 0 01	LGA HPA 429 MNTNC WORD CONTROL BUS INACTIVE
96 0 02	LGA HPA MULTICONTROL BUS INACTIVE
97	SPARE TP2A/B

TOP/PORT BSU/ACU INPUT BUSES

98 0 01	MNTNC WORD T/P BSU/ACU MULTICTL BUS INACTIVE
99	SPARE

PORT BSU INPUT BUSES

9A 0 01	MNTNC WORD PORT BSU CROSSTALK BUS INACTIVE
9B	SPARE

STARBOARD BSU INPUT BUSES

9C 0 01	MNTNC WORD STBD BSU MULTICTL BUS INACTIVE
9D 0 01	MNTNC WORD STBD BSU CROSSTALK BUS INACTIVE

CODE	FAILURE DESCRIPTION
HSU #1 INPUT BUS	
9E 0 01	<HSU1> 429 CONTROL BUS INACTIVE
9E 0 02	<HSU1> ICAO ADDRESS INVALID
9E 0 03	<HSU1> POSITION UNAVAILABLE
9E 0 04	<HSU1> VELOCITY UNAVAILABLE
HSU #2 INPUT BUS	
9F	Same as entries for HSU #1 above except substitute Level 1 code 9F for code 9E and <HSU2> for <HSU1>. Only applicable prior to Package 6.0.
SPARE	
A0	SPARE – – – – –
WSC INPUT BUSES	
A1 0 01	WSC1 429 CNTRL BUS FROM THIS SDU INACTIVE
A2 0 01	WSC2 429 CNTRL BUS FROM THIS SDU INACTIVE
A3 0 01	WSC3 429 CNTRL BUS FROM THIS SDU INACTIVE
SPARE	
A4–A5	
HSU USER INTERFACES	
A6 0 01	HSU ETHERNET PORT 1 BUS INACTIVE
A7 0 01	HSU ETHERNET PORT 2 BUS INACTIVE
A8 0 01	HSU ISDN PORT 1 BUS INACTIVE
A9 0 01	HSU ISDN PORT 2 BUS INACTIVE
SPARE	
AA–BF	
MISCELLANEOUS ERRORS, FAILURES AND WARNINGS	
SDU SYSTEM CONFIGURATION STRAP ERRORS	
C0 0 81	SDU STRAPS PARITY ERROR
C0 0 82	SDU ANT CONFIG STRAPS ERROR
C0 0 83	SDU CFDS CONFIG STRAPS ERROR
C0 0 84	SDU STRAPS INCONSISTENCY
C0 0 05	DUAL SYSTEM CONFIG STRAPS ERROR
C0 0 06	DUAL REMOTE COCKPIT STRAPS INCOMPATIBLE
C0 0 87	MANUFACTURER–SPECIFIC STRAPS PARITY ERROR

CODE	FAILURE DESCRIPTION
MISC	
C1 0 81/01	SDU WOW MISCOMPARE ERROR
C2 0 81	SDU DUAL SYSTEM SELECT/DISABLE TEST ERROR
C2 0 82	SDU DUAL SYSTEM SEL/DIS TEST NOT INITIATED
C3 0 81	SDU (ICAO) ADDRESS BITS (STRAPS) ERROR
C3 0 02	DUAL SYSTEM DIFFERENT STRAPS AES ID
C4 0 01	HGA/IGA HPA 429 MNTNC WORD OUTPUT VSWR BAD
C4 0 02	HGA/IGA HPA REFLECTED OUTPUT POWER ERROR
C5 0 81/01	ORT/LOCAL CONFIG STRAPS INCOMPATIBILITY
C5 0 02	DUAL ORT/COMBINED CONFIG STRAPS INCOMP
C6 0 01	LGA HPA 429 MNTNC WORD OUTPUT VSWR BAD
C6 0 02	LGA HPA REFLECTED OUTPUT POWER ERROR
HGA/IGA HPA OVER TEMP WARNINGS	
C7 0 01	HGA HPA MNTNC WORD LRU OVER TEMP
C7 1 01	HGA HPA PSU OVER TEMP WARNING
C7 2 01	HGA HPA CPU OVER TEMP WARNING
C7 2 02	HGA HPA OVER TEMP WARNING
C7 3 01	HGA HPA DRIVER OVER TEMP WARNING
C7 8 01	HGA HPA OVER TEMP (COMBINER) WARNING
C7 B 01	HGA HPA RFAM OVER TEMP WARNING
MISC	
C8 0 01	INVALID FREQ CMD FROM GES
C8 0 02	GNSS INTERFERENCE RISK FROM GES
LGA HPA OVER TEMP WARNINGS	
C9 0 01	LGA HPA MNTNC WORD LRU OVER TEMP
C9 1 01	LGA HPA PSU OVER TEMP WARNING
C9 2 01	LGA HPA CPU OVER TEMP WARNING
C9 2 02	LGA HPA OVER TEMP WARNING
C9 3 01	LGA HPA DRIVER OVER TEMP WARNING
C9 8 01	LGA HPA OVER TEMP (COMBINER) WARNING
C9 B 01	LGA HPA RFAM OVER TEMP WARNING
MISC	
CA 0 01	LGA LNA CONTROL DRIVER FAIL
CB 0 01	HGA/IGA HPA INVALID SDI STRAPPING
CC 0 01	LGA HPA INVALID SDI STRAPPING

CODE	FAILURE DESCRIPTION
TOTC/POC RESETS	
CD 0 81/01	SDU TOTC AUTO/MANUAL RESET
CD 0 82/02	SDU POC AUTO/MANUAL RESET
CE 0 81/01	RESERVED
CE 0 82/02	RESERVED
CF 0 81/01	HGA/IGA HPA TOTC AUTO/MANUAL RESET
CF 0 82/02	HGA/IGA HPA POC AUTO/MANUAL RESET
D0 0 81/01	LGA HPA TOTC AUTO/MANUAL RESET
D0 0 82/02	LGA HPA POC AUTO/MANUAL RESET
WRONG SDI CODES	
D1 0 01	HGA/IGA HPA WRONG A429 SDI CODE
D2 0 01	LGA HPA WRONG A429 SDI CODE
D3 0 01	TOP/PORT BSU/ACU WRONG A429 SDI CODE
D4 0 01	STARBOARD BSU WRONG A429 SDI CODE
RF INTER–LRU FAILURES	
D5 0 01	SDU TO HGA/IGA HPA CALIBRATION ERROR
D5 0 02	SDU TO LINEAR HGA/IGA HPA RF CONTIN. FAIL
D5 0 03	SDU TO CLASS C HGA/IGA HPA RF CONTIN. FAIL
D5 0 04	SDU TO HGA/IGA HPA ATTEN. CALIBRATION ERROR
D5 0 05	SDU TO LINEAR HGA/IGA HPA ATTEN. RF CONTIN. FAIL
D6 0 01	SDU TO LGA HPA CALIBRATION ERROR
D6 0 02	SDU TO LINEAR LGA HPA RF CONTINUITY FAIL
D6 0 03	SDU TO CLASS C LGA HPA RF CONTINUITY FAIL
D6 0 04	SDU TO LGA HPA ATTEN. CALIBRATION ERROR
D6 0 05	SDU TO LINEAR LGA HPA ATTEN. RF CONTIN. FAIL
D7 0 01	RESERVED
D7 0 82	RESERVED
D8 0 81	T/P HGA LNA TO SDU RF CONTINUITY FAIL
D9 0 81	STBD HGA LNA TO SDU RF CONTINUITY FAIL
DA 0 81	LGA LNA TO SDU RF CONTINUITY FAIL
MISC	
DB 0 01	LGA LOG–ON TEST FAILURE
DB 0 02	SLAVE LGA LOG–ON TEST NOT INITIATED
DC 0 01	NO DECLARED ACTIVE (C)MU – 1

CODE	FAILURE DESCRIPTION
SDU ORT ERRORS	
SDU SECURED ORT ERRORS	
DD 0 01	(I) STARTUP LOG–ON POLICY
DD 0 02	RESERVED
DD 0 03	(VIII) RESPONSE CAPABILITY TO LOG–ON INTRRGTN
DD 0 04	(XVIII) NOISE INSERTION LEVEL
DD 0 05	(XXII) TX GAIN THRESHOLD
DD 0 06	(XXIII) APHONE SYSTEM MANAGEMENT COMMANDS
DD 0 07	RESERVED
DD 0 08	(XXVIII) HPA BACKOFF LIMITS
DD 0 09	(XXIX) HPA MIN REPORTABLE ACTUAL PWR OUT
DD 0 0A	(XXX) DEFAULT ASSUMED GLOBAL INITIAL C–CH EIRP
DD 0 0B	(XXXI) SCDU TELEPHONE NUMBER PRESELECT
DD 0 0C	(XXXII) ACP CALL INITIATION
DD 0 0D	(XXXVIII) FAILURE MASKING DATA
DD 0 0E	(XXXIX) ELEVATION HANDOVER THRESHOLD
DD 0 0F	(XLI) AUTOMATIC TRANSIT CALL GES TABLE
DD 0 10	(XLII) AIR–TO–GROUND CHIME
DD 0 11	(XLIII) SCDU CALL PROMPTS
DD 0 12	(XLIV) EIRP OVERDRAFT CHECKING PRIORITY
DD 0 13	(XLVI) COCKPIT AUDIO LEVEL SETTINGS
DD 0 14	(XLVII) HGA RETRY PERIOD
DD 0 15	(XLVIII) COCKPIT CHAN INTERFACE TYPE FOR DUAL
DD 0 16	(L) ”DIS/REENABLE OTHER SATCOM” SCDU PROMPTS
DD 0 17	(LI) SCDU SATCOM SUBSYSTEM PROMPTS
DD 0 18	(LII) SCDU CHANNEL LABEL SUFFIXES
DD 0 19	(LIII) SECURED ORT DESCRIPTION
DD 0 1A	(LIV) COMPOSITE ORT FILE UPLOAD ALLOWED
DD 0 1B	SECURED ORT MISMATCH WITH OTHER SDU
DD 0 1C	(LVI) ACCESS TO ZERO–PREFERENCE GESS
DD 0 1D	(LV) SECURED ORT MODIFIED FLAG
DD 0 1E	(LVII) L–BAND REFERENCE OFFSET CAL THRESHOLDS
DD 0 1F	(LIX) APHONE AUDIO LEVEL SETTING
DD 0 20	(LX) AERO–H ONLY OPERATION

CODE	FAILURE DESCRIPTION
SDU USER ORT ERRORS	
DE 0 01	(II) SATELLITE/GES NAMES
DE 0 02	(III) GES PREFERENCE VALUES
DE 0 03	(IV) MAINTENANCE PAGE ACCESS
DE 0 04	(V) COCKPIT TELEPHONE NUMBERS
DE 0 05	(VII) RESOURCES RESERVED FOR HEADSET
DE 0 06	SPARE
DE 0 07	(X) GROUND-TO-AIR CIRCUIT-MODE DATA
DE 0 08	(XIII) GROUND-TO-AIR CALLS
DE 0 09	(XIV) CALL CAMP-ON DURATION
DE 0 0A	(XV) CAMP-ON TIMEOUT ACTION
DE 0 0B	(XVI) STORE APHONE TELEPHONE NUMBERS
DE 0 0C	(XIX) GROUND-TO-AIR CALL PREEMPTION
DE 0 0D	(XX) PREFERRED COCKPIT CALL ROUTING
DE 0 0E	(XXI) PREFERRED APHONE CALL ROUTING
DE 0 0F	(XXIV) APHONE OUTGOING CALL BARRING LEVEL
DE 0 10	(XXV) CALL BARRING SECURITY CODE
DE 0 11	(XXVI) SHARED APHONE PHONE NUMBER STORAGE
DE 0 12	(XXXIII) ORT DESCRIPTION
DE 0 13	(XXXIV) AIRLINE CODE
DE 0 14	(XXXV) HEADSET OUTGOING CALL BARRING LEVEL
DE 0 15	(XXXVI) HEADSET TRANSIT CALL
DE 0 16	(XL) HIGH RATE DATA TRANSMIT SUPPORT
DE 0 17	(XLV) APHONE CALLED TERMINAL ID ASSIGNMENT
DE 0 18	(IL) MASTERY HANDOVER ALGORITHM WEIGHTING
DE 0 19	(LVIII) AES POSITION REPORTING
DE 0 1A	(LXI) HSD PREEMPTION FOR PRIORITY 4 CALLS
DE 0 1B	(LXII) ONGOING HSD CALL EIRP
DE 0 1C	(XXXVII) ORT MODIFIED FLAG
DE 0 1D	(LXIII) WSC MANUAL DIALING
DE 0 1E	(LXIV) MINIMUM HSD CALL EIRP
DE 0 1F	(LXV) HSD REGISTRATION PREFERENCE
DE 0 20	(LXVI) SWIFT64 M-ISDN LES PREFERENCE VALUES
DE 0 21	(LXVII) SWIFT64 MPDS LES PREFERENCE VALUES
DE 0 22	(LXVIII) ETHERNET MAC ADDRESS ASSIGNMENT
DE 0 23	(LXIX) PPPoE ACCESS-CONCENTRATOR NAME
DE 0 24	(LXX) TELNET SERVER ACCESS
DE 0 25	(LXXI) DHCP SERVER ACCESS
DE 0 26	(LXXII) TELNET IP ADDRESS ASSIGNMENT

CODE	FAILURE DESCRIPTION
DE 0 27	(LXXIII) TELNET SUBNET MASK ASSIGNMENT
DE 0 28	(LXXIV) TELNET DEFAULT GATEWAY ASSIGNMENT
DE 0 29	(LXXV) DHCP IP ADDRESS ASSIGNMENT
DE 0 2A	(LXXVI) DHCP IP ADDRESS POOL ALLOCATION
DE 0 2B	(LXXVII) BGAN PDP SESSION PARAMETERS
DE 0 2C	(LXXVIII) PSID SUPPLEMENTARY FREQUENCIES
MISC	
DF 0 01	SLAVE HGA/IGA LOG–ON TEST FAILURE
DF 0 02	SLAVE HGA/IGA LOG–ON TEST NOT INITIATED
E0 0 81	RESERVED
E1 0 01	HSU1 SYSTEM DISABLE DISCRETE FAILURE
E1 0 01	HSU SYSTEM DISABLE DISCRETE FAILURE
E2 0 01	HSU2 SYSTEM DISABLE DISCRETE FAILURE
E3 0 01	UNSUPPORTED HSU1 CONFIGURATION
E3 0 02	UNSUPPORTED HSU2 CONFIGURATION
E4 0 81	HSU1/SDU INTERFACE VERSION INCOMPATIBILITY
E5 0 81	HSU2/SDU INTERFACE VERSION INCOMPATIBILITY
E6 0 81/01	HSU1/HPA TX RF SIGNAL PATH FAILURE
E6 0 02	HSU1 to HGA/IGA HPA CALIBRATION ERROR
E6 0 03	HSU2 to HGA/IGA HPA CALIBRATION ERROR
E6 0 04	HSU3 to HGA/IGA HPA CALIBRATION ERROR
E6 0 05	HSU4 to HGA/IGA HPA CALIBRATION ERROR
E7 0 01	HSU2/HPA TX RF SIGNAL PATH FAILURE
E8 0 81	DLNA/HSU1 RX RF SIGNAL PATH FAILURE
E9 0 81	DLNA/HSU2 RX RF SIGNAL PATH FAILURE
EA 0 01	DUAL HSU–700 CONFIG WARNING
EB 0 01	NO DECLARED ACTIVE WSC
EC 0 81	HSU CONFIGURATION STRAPS PARITY ERROR
EC 0 82	HSU CONFIGURATION STRAPS ERROR
ED 0 01	SDU ORT/HSU CONFIG STRAPS INCOMPATIBILITY
EE 0 81	HSU FORWARD ID ADDRESS BITS (STRAPS) ERROR
EE 0 82	ILLEGAL HSU FORWARD ID ADDRESS

CODE	FAILURE DESCRIPTION
SPARE	
EF – FC	
FD 0 01–16	EXTERNAL PILOT EVENT MARKER TO SDU
FE 0 01	EXTERNAL POWER SUPPLY INTERRUPT TO SDU
RESERVED	
FF	

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