ARINC CHARACTERISTIC 757-5 (Change 1)

ARINC CHARACTERISTIC 757A (Change 1)

COCKPIT VOICE RECORDER (CVR)

Draft 2 – March 20, 2013

Purpose of this Document: This Summary Change Notice 1 identifies changes that will be made in the next Supplement to the documents affected: ARINC Characteristic 757 and ARINC Characteristic 757A. Though these documents have similarities, the reader is cautioned that the changes to each document are different. This Summary Change Notice should be read completely.

Rationale: Following the release of ARINC Characteristic 757-5 on June 8, 2011 and ARINC Characteristic 757A on February 21, 2011 several parties from within industry identified topics for discussion and clarification. These are generally in the category of providing clarity by removing specific ambiguities in the standards. In some cases changes need to be made to correct errors in publication. In the end, these changes are viewed to be more than editorial comments. These changes are technical in nature and they have been coordinated with industry. They represent the consensus of industry and will be included in a future Supplement to ARINC 757 and ARINC 757A.

Organization and Process: The ARINC staff called a series of web conferences to coordinate the changes and to build the necessary consensus with specialists from within industry. The specialists include those who normally participate in DFDR Subcommittee activities. Concerned parties prepared white papers for discussion. The consensus of those white papers is reflected here in the form of "spec language" intended to read exactly as it will appear in the respective standards. This Summary Change Notice reflects the consensus of industry, and as such, it is posted on the AEEC website (www.aviation-ia.com/aeec) for all interested parties to use.

Questions and Comments may be directed to:

AEEC Executive Secretary & Program Director
Paul J. Prisaznuk
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SUMMARY CHANGE NOTICE – ARINC 757-5 and ARINC 757A

PART 1: Changes to ARINC Characteristic 757-5

This section identifies the sections to be changed in ARINC Characteristic 757 and the associated rationale.

ATTACHMENT 3 – CVR INTERWIRING DIAGRAM WITH REMOTE MICROPHONE (DC POWER SHOWN)

Drawing showing the "AREA MIC" connection calls out Note 12 in error. This is corrected to read Note 11.

ATTACHMENT 6 - NOTES TO STANDARD INTERWIRING

Note 8 GROUND CONNECTION is viewed to be incomplete. New language is provided.

ATTACHMENT 10 MICROPHONE AND CABLE

The drawing is viewed to be complete for ARINC 757 CVR installations. This drawing is re-drawn for artistic purposes only. (Note a similar drawing is included in ARINC 757A with changes.)

ATTACHMENT 12 NOTES TO CONTROL UNIT STANDARD INTERWIRING

Note 5 is updated to correct a typographical error in the pin call-outs. "Pins p, s, or t" is corrected to read "pins p, r, or t."

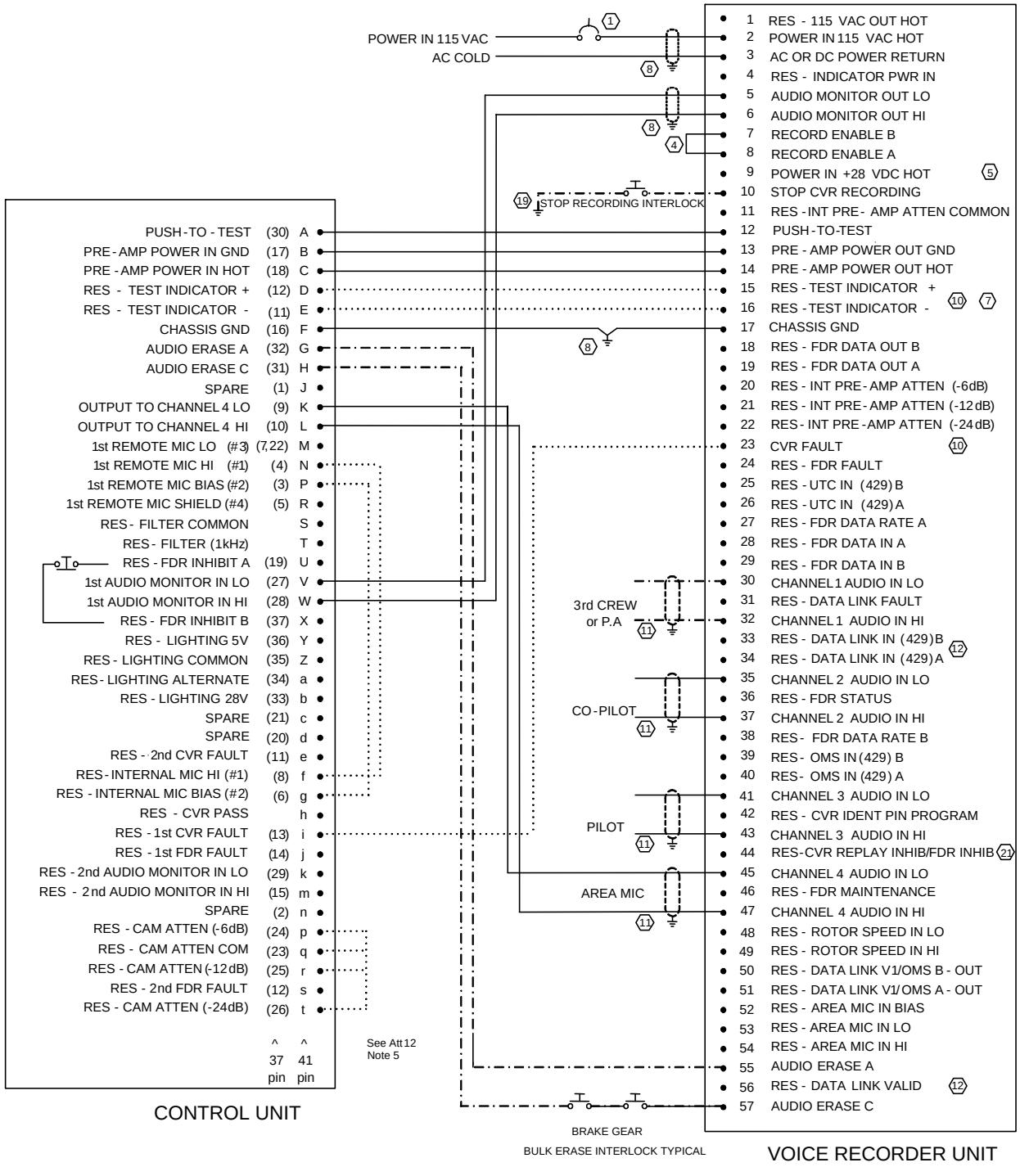
ATTACHMENT 19 RECORDER STATUS/OMS COMMAND WORD FORMAT

This attachment contains the definition of the Recorder Status Word, per ARINC 429 label 350. Bit 23 will be defined as the "FDR/CVR Inhibit" discrete. The Sign Status Matrix (SSM) bits 30 and 31 are re-defined per ARINC Specification 429.

ATTACHMENT 20 FAULT AND STATUS OUTPUT CONDITIONS

The table will be revised to reflect changes in the Recorder Status Word defined by Attachment 19.

ATTACHMENT 3
CVR INTERWIRING DIAGRAM WITH REMOTE MICROPHONE
(DC POWER SHOWN)



Denotes Minimum Wiring
Denotes Optional Wiring
Denotes Alternate Wiring

AIRCRAFT WIRING ALTERNATES	
POWER SUPPLY	115 VAC or 28 VDC or BOTH
COCKPIT AREA MICROPHONE	REMOTE or INTERNAL
FAULT INDICATION	TEST INDICATOR or CVR FAULT or BOTH
CAM ATTEN	AS REQUIRED FOR OPTIMUM PERFORMANCE

See Attachment 6 for notes indicated by ⬡

ATTACHMENT 6 – NOTES TO STANDARD INTERWIRING

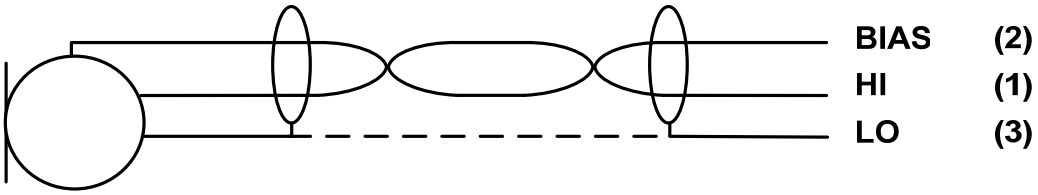
Replace Note 8, GROUND CONNECTION, with the following:

[8] CHASSIS GROUND CONNECTION

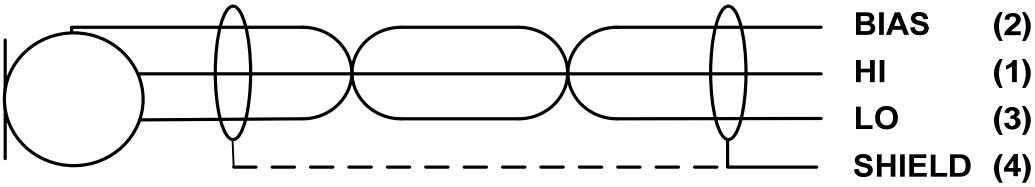
To be grounded to the airframe within 1 ft. of Pin 17 (CVR), and Pin F (Control Unit), heavy gauge wire. For backward compatibility, the CVR and Control Unit Chassis Ground pins may be connected to each other by a wire. Shields are to be grounded at the recorder using only short wires.

ATTACHMENT 10
MICROPHONE AND CABLE

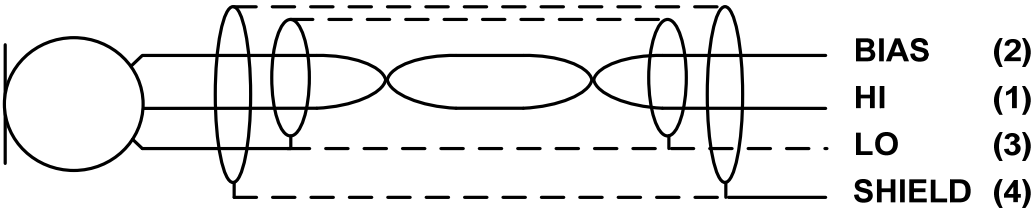
Earlier Systems According to ARINC 557
2-Conductor Twisted and Shielded Cable
(Shield is the Audio Return)



3-Conductor Twisted and Shielded



2-Conductor Twisted With Dual Shield



Microphone Sound Pressure Level (SPL) versus Record Level

(100 dB SPL = 20 DYNES/CM^2) = (Relative)
120 dB SPL = max (48 dB S/N)
90 dB SPL = (≈ 35 dB S/N)
60 dB SPL = min (0 dB S/N)

ATTACHMENT 12 NOTES TO CONTROL UNIT STANDARD INTERWIRING

Replace Note 5 with the following:

Note 5. The control unit may permit selection of attenuation levels for the CAM preamplifier to accommodate the differing sound levels in various aircraft types. If used, the gain selection is from common jumper pin q (23) to pins p, r, or t, (24, 25, 26), individually or in combination. Attenuation values are additive.

ATTACHMENT 19
RECORDER STATUS/OMS COMMAND WORD FORMAT

Recorder Status Word

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
P	SSM		SSM Ack	Test Inhibit	RSVD			SPARE	FDR / CVR Inhibit	FDR Interface	Stop CVR Recording	RIPS Maint. Status	CVR Record Disabled	D/L Interface	Clock Status	Data Link Recording	RIPS Status	FDR Status	Control Unit Status	OMS Bus Status	CVR Status	SDI		Label (350) LSB							MSB
Odd	see below				Pad 0			Pad 0	1= FDR / CVR Replay Inhibit	1= Loss of Sync	1= Pin 10 GND	1 = Maint Regd	1 = Disabled	Status 0 = OK, 1 = Failure									see below		0	0	0	1	0	1	1	1

SSM Bits		
31	30	Status
0	0	Normal
0	1	NCD
1	0	Test
1	1	Failed

SDI Bits			
10	9	Device Ident	CVR Ident Pin
0	0	First Recorder	Open
0	1	Second Recorder	Gnd
1	0	Not Used	N/A
1	1	Not Used	N/A

NOTE: This definition of SSM bits is aligned with ARINC Specification 429 and shall be used with all new recorder designs.

Equipment built to previous versions of ARINC 757 (ARINC 757 to ARINC 757-5) may have used the older form of SSM encoding. This encoding may be found on legacy systems. It is provided below for information.

SSM Bits		
31	30	Status
1	1	Normal
1	0	Test
0	1	Not Used
0	0	Not Used

OMS Command Word

BIT	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	P	Command							Equipment ID Code (057H) MSB											LSB	PAD		SDI		Label (227) LSB							MSB
		(See Below)							MSD				LSD+1				LSD				0	0	0	0	1	1	1	0	1	0	0	1

Command:

0	0	0	0	0	0	0	Not Used
0	0	0	0	0	1	0	Ground Test Command
0	0	1	0	0	1	0	New Flight Leg – 000 Equipment Code
1	1	1	1	1	1	1	Log Off – 000 Equipment Code or CVR Specific Code

	CVR							RIPS		FDR							Data Link			OMS	CU	Clock
State	CVR Replay Inhibit	CVR Fault <1>	Test Ind <2>	Audio Echo <3>	Stop CVR Recording	CVR Status <4>	CVR Record Disable <16>	Internal RIPS Maint	Internal RIPS Status <17>	FDR Inhibit	FDR Fault <5>	FDR Interface	FDR Status <6>	FDR Maint <18>	Data Echo <7>	Status(OMS) <8>	Data Link Fault <9>	Data Link Status <10>	Data Link Interface Status	CMC Bus Status <11>	Control Unit Status	Clock Status
Pin Number	44	23	15/16	5/6		na		na	na	44	24	na	36	46	18/19	na	31	na		na		
Recorder Status Word Bit Number	23				21	11	19	20	15	23		22				14		16	18	12	13	17
Recorder not installed		x	x	x		na			na		x		na	x	x	na	x	na		na		
Recorder not powered		x	x	x		na			na		x		x	ox	x	na	x	na		na		
Recorder not functional <14>		x	x	x		na			na		x		x	ox	x	na	x	na		na		
Audio circuit failure		x	x	x		x																
Recording medium or mechanism failure		x	x	x		x					x		x	x	x	x	x	x				
Failure to store in recording medium		x	x	x		x					x		x	x	x	x	x	x				
nsufficient audio, UTC or Rotor Speed recording duration		x	x	x		x																
Insufficient power holdup capacity (Internal RIPS)		x	x	x					x													
RIPS Needs Maintenance								x														
Pin 10 Grounded					x																	
Pin 10 Grounded > 10 mins		x		x	x	x	x										x	x				
Pins 7-8 not connected		x	x	x			x				*		*	*	*	*	x					
Pin 44 Grounded	x									x												
FDR self-test fault detected											x		x	x	x	x						
Missing or garbled FDR data stream											x	x	x	ox	x	x						
ata Rate does not match config pins											x		x	ox	x	x						
Insufficient FDR recording duration											x		x	x	x	x						
FDR Inhibited <13>										x	x	x	x	ox	x	x						
FDR Function not present <15>											x		na	x	x	ox						
Missing Datalink heartbeat and Datalink Valid is asserted																	x		x			
Datalink heartbeat and Datalink Valid not asserted																			x			
Insufficient Datalink recording duration																	x	x				
No Data Link Function present																	x	ox				
Missing OMS heartbeat (see Section 4.2.1)																				x		
Missing Clock Information																						x
Control Unit Failure																					x	

PART 2: Changes to ARINC Characteristic 757A

This section identifies the sections to be changed in ARINC Characteristic 757A and the associated rationale.

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ATTACHMENT 6 – NOTES TO STANDARD INTERWIRING

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ATTACHMENT 10 MICROPHONE AND CABLE

The drawing is updated for ARINC 757A CVR installations using a 3-wire microphone.

ATTACHMENT 12 NOTES TO CONTROL UNIT STANDARD INTERWIRING

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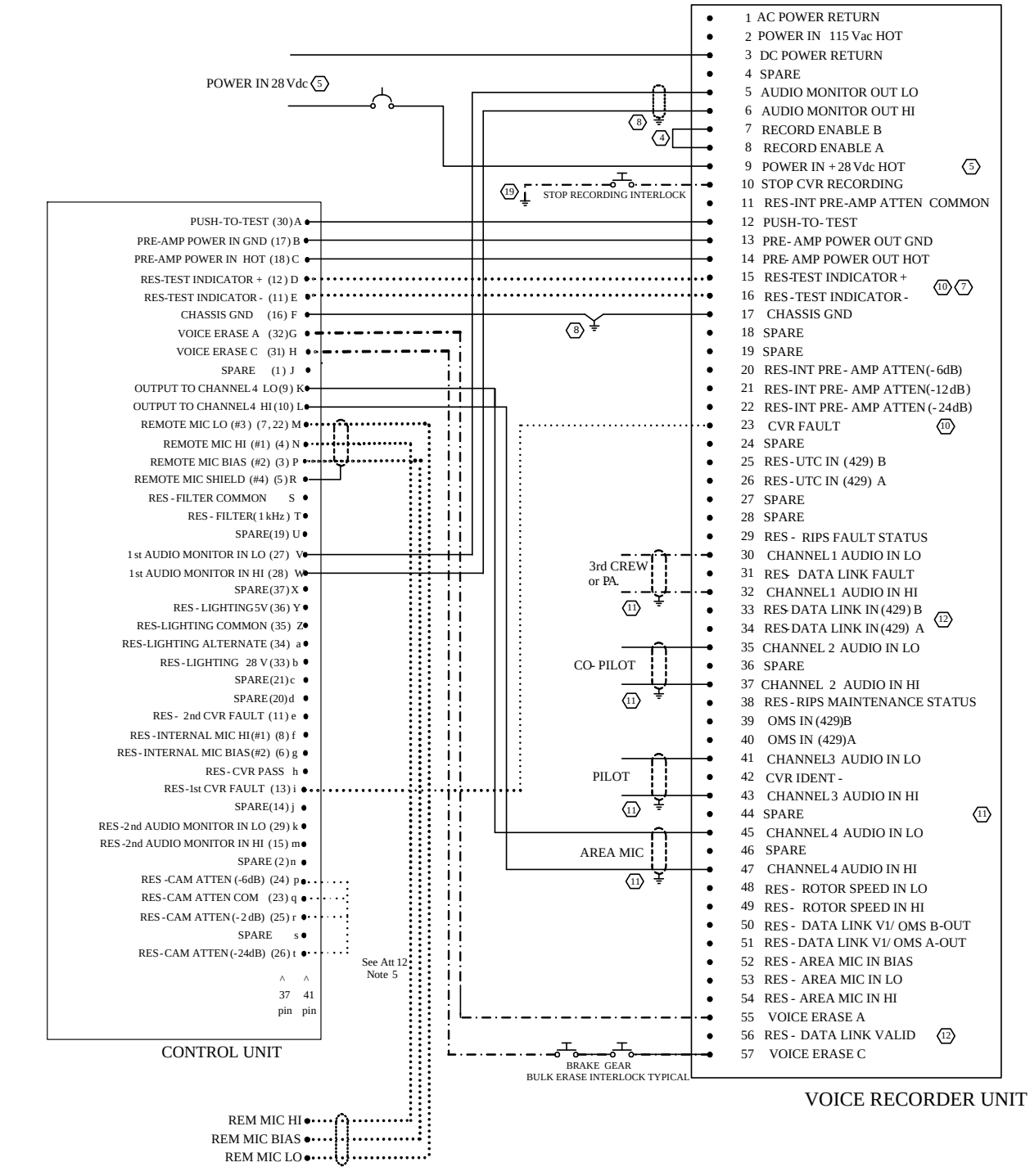

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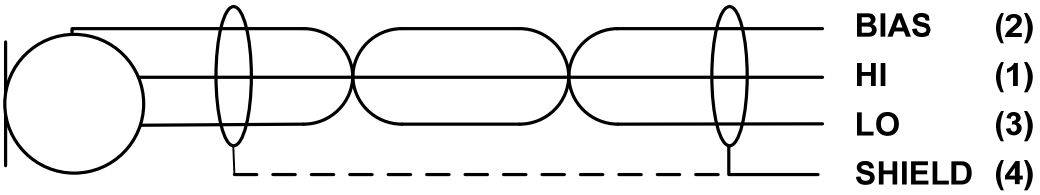
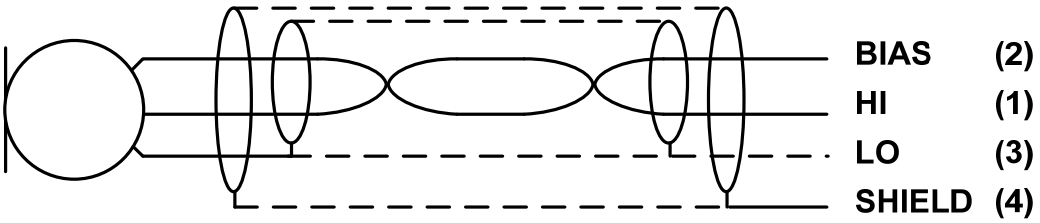
MICROPHONE AND CABLE

MICROPHONE AND CABLE

3-CONDUCTOR TWISTED AND SHIELD



2-CONDUCTOR TWISTED WITH DUAL SHIELD



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CVR STATUS/OMS COMMAND WORD FORMAT

CVR Status Word

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P	SSM		SSM Ack	Test Inhibit	RSVD			SPARE			Stop CVR Recording	RIPS Maint. Status	CVR Record Disabled	D/L Interface	Clock Status	Data Link Recording	RIPS Status	RSVD		Control Unit Status	OMS Bus Status	CVR Status	SDI		Label (350) LSB							MSB
Odd	see below				Pad 0			Pad 0			1= Active	1 = Maint Regd	1 = Disabled	Status 0 = OK, 1 = Failure								see below		0	0	0	1	0	1	1	1

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	P	Command							Equipment ID Code (057H) MSB											LSB	PAD		SDI		Label (227) LSB							MSB
		(See Below)							MSD				LSD+1				LSD				0	0	0	0	1	1	1	0	1	0	0	1

Command:

0	0	0	0	0	0	0	Not Used
0	0	0	0	0	1	0	Ground Test Command
0	0	1	0	0	1	0	New Flight Leg – 000 Equipment Code
1	1	1	1	1	1	1	Log Off – 000 Equipment Code or CVR Specific Code

END OF CHANGES