

ENGINEERING SPECIFICATION		SECURITY NOTATION		SPEC NO. IT7026201	H REV LTR
				CAGE CODE 55939	
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TITLE INTEGRATED TEST SPECIFICATION FOR THE VHF DATA RADIO TR-86X, PART NO. 7026201					
PREPARED BY: M. Howk		DATE 2/26/02	APPROVED BY TECHNICAL MANAGER J. Schneider	DATE 2/26/02	APPROVED BY ENGINEERING DEPARTMENT MANAGER
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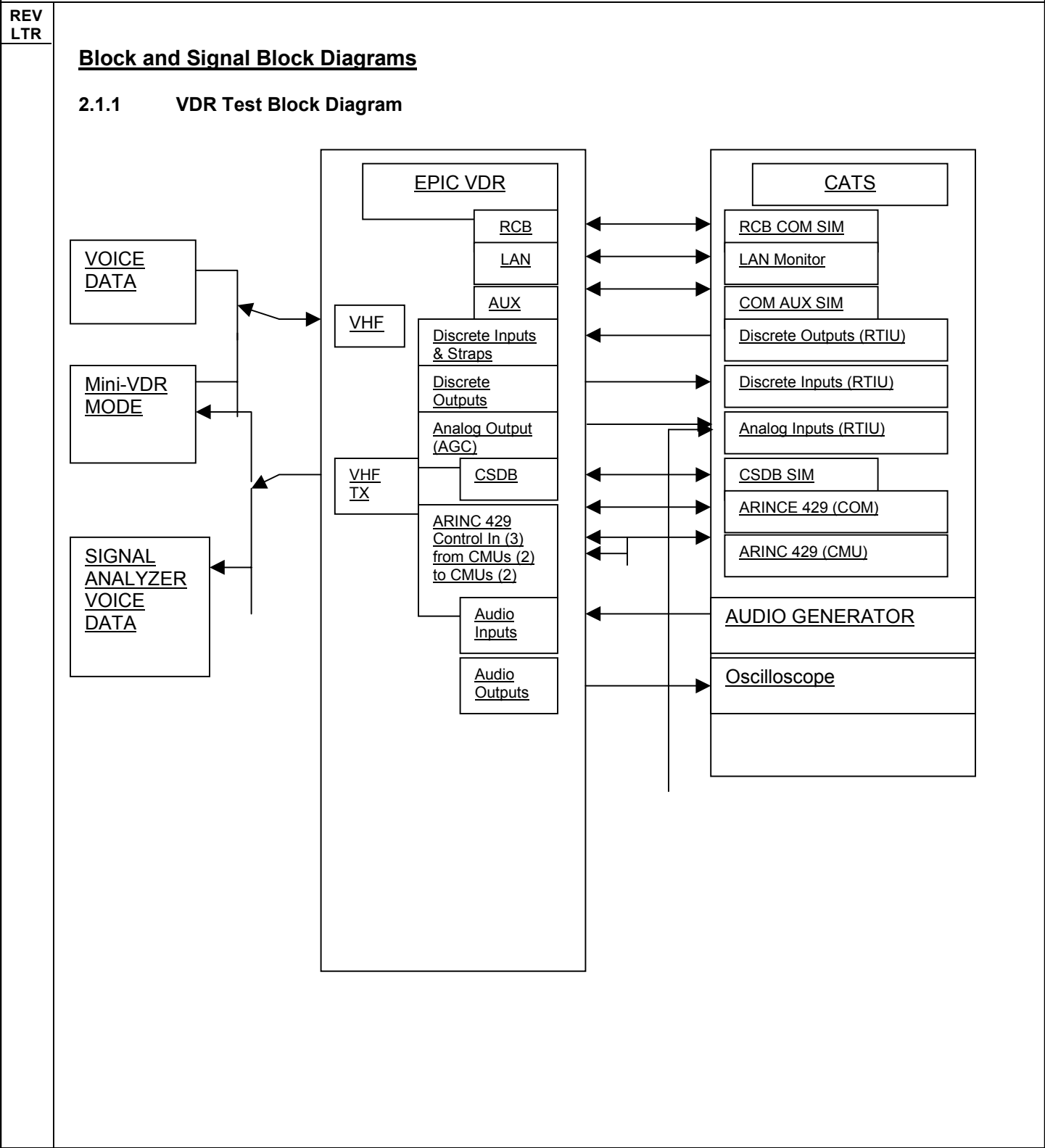
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REV LTR	<u>TITLE:</u> INTEGRATED TEST SPECIFICATION FOR THE TR-86X VHF DATA RADIO, PART NO. 7026201 1. SCOPE This Integrated Test Specification establishes the manufacturing and operational requirements that the VDR, TR-86X must meet to ensure that the units are in proper operating condition. This specification also contains detailed test procedures, which apply to the test equipment listed in paragraph 5. 2. REFERENCE DOCUMENTS These reference documents are not required for performance of the test procedure. However, these documents provide an aid for troubleshooting should any discrepancies occur during performance of the test procedure. They are also useful for the development of test equipment and test procedures. <u>Assembly Prints</u> <table><tr><td>Final Assembly</td><td>7026201</td></tr><tr><td>CPU/PS</td><td>7026230-90X</td></tr><tr><td>I/O</td><td>7026232-90X</td></tr><tr><td>VHF RECEIVER</td><td>7026234-90X</td></tr><tr><td>VHF TRANSMITTER</td><td>7026236-90X</td></tr></table>					Final Assembly	7026201	CPU/PS	7026230-90X	I/O	7026232-90X	VHF RECEIVER	7026234-90X	VHF TRANSMITTER	7026236-90X
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2.1.2 EPIC VDR Signal & Pin Assignment

The external interfaces for the EPIC VDR LRM will be pinned as specified in the following table. This connector is a 78 pin D subminiature connector that mates inside the EPIC MRC.

Table 1-2: External Interface Pin Definitions for the EPIC VDR LRM

SIGNAL NAME	SIGNAL DESCRIPTION	I/O TYPE	VDR LRM PIN #
FAN CONTROL	CONTROL FOR BOTH FANS	DISCRETE INPUT	01
MICROPHONE HI	MICROPHONE AUDIO INPUT HI	AUDIO INPUT	02
GND	GROUNDING INTERNALLY	GND	03
SPARE 11 DISCRETE INPUT	WAS LAN ENABLE	DISCRETE INPUT	04
NAV/COM PHONE AUDIO LO	NAV or COM HEADPHONE-AUDIO-LO	AUDIO OUTPUT	05
NAV/COM AUX-DATA+	RS-422 AUX DATA BUS FROM CD	BUS INPUT	06
SIDE-TONE-PHONE AUDIO	TX SIDETONE HEADPHONE AUDIO	AUDIO OUTPUT	07
TUNE/TEST INHIBIT	TUNE/TEST INHIBITED WHEN GROUNDING	DISCRETE INPUT	08
RCB-RTN	GROUNDING INTERNALLY	GND	09
RCB-RX DATA	RCB DATA INPUT	BUS INPUT	10
RCB TX DATA	RCB DATA BUS OUTPUT	BUS OUTPUT	11
RS-422 OUT PORT 1B	CSDB DATA OUT 1B (LO)	BUS OUTPUT	12
RS-422 OUT PORT 1A	CSDB DATA OUT 1A (HI)	BUS OUTPUT	13
VOICE/DATA SEL	DISCRETE (ACTIVE), DATA = GND	DISCRETE INPUT	14
DATA-KEY	DISCRETE (ACTIVE), KEY = GND	DISCRETE INPUT	15
A429 FREQ/FUNC SEL IN PORT 2B	ARINC 429 LS BUS (CONTROL)	BUS INPUT	16
A429 FREQ/FUNC SEL IN PORT 1A	ARINC 429 LS BUS (CONTROL)	BUS INPUT	17
POWER GND	GROUNDING INTERNALLY	GND	18
SPARE 1 DISCRETE INPUT	Resvd for PS SYNC	DISCRETE INPUT	19
+28V POWER IN	+28 VDC POWER	POWER INPUT	20
FAN #1 MONITOR	Fan #1 Monitor Pulsed Input	DISCRETE INPUT	21
MICROPHONE LO	MICROPHONE AUDIO INPUT LO	AUDIO INPUT	22
POWER ON/OFF	DISCRETE (ACTIVE)	DISCRETE INPUT	23
MIC PTT	DISCRETE (ACTIVE)	DISCRETE INPUT	24
NAV/COM PHONE AUDIO HI	NAV or COM HEADPHONE-AUDIO-HI	AUDIO OUTPUT	25
NAV/COM AUX-DATA-	RS-422 AUX DATA BUS FROM CD	BUS INPUT	26
REC-PHONE AUDIO	RECEIVER HEADPHONE AUDIO	AUDIO OUTPUT	27
VDR-EMERG SEL	DISCRETE (ACTIVE)	DISCRETE INPUT	28
SPARE 2	SPARE was COM EXTENDED-FREQ-EN	OPEN	29
MKR AUDIO LO	MARKER AUDIO Output Low	AUDIO OUTPUT	30
MKR AUDIO HI	MARKER AUDIO Output High	AUDIO OUTPUT	31
SYS-POSITION-MS-BIT	DISCRETE (STRAP)	STRAP INPUT	32
SYS-POSITION-LS-BIT	DISCRETE (STRAP)	STRAP INPUT	33
VOICE/DATA STATUS (or BURN IN TEST FAIL)	DISCRETE (OPEN=V, GND=D)	DISCRETE OUTPUT	34
A429 FREQ/FUNC SEL IN PORT 2A	ARINC 429 LS BUS (CONTROL)	BUS INPUT	35
A429 FREQ/FUNC SEL IN PORT 1B	ARINC 429 HS BUS (CONTROL)	BUS INPUT	36
POWER GND	GROUNDING INTERNALLY	GND	37
SPARE 3 DISCRETE INPUT	SPARE DISCRETE INPUT	DISCRETE INPUT	38
+28V POWER IN	+28 VDC POWER	POWER INPUT	39
FAN #2 MONITOR	Fan #2 Monitor Pulsed Input	DISCRETE INPUT	40

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SLOT</td><td>OPEN</td><td>49</td></tr> <tr><td>SPARE 6</td><td>RESERVED in MRC COM SLOT</td><td>OPEN</td><td>50</td></tr> <tr><td>ACARS-DATA-IN-LO</td><td>AUDIO DATA (MSK)</td><td>AUDIO INPUT</td><td>51</td></tr> <tr><td>LAN RX+</td><td>10 BASE T LAN RECEIVER</td><td>BUS INPUT</td><td>52</td></tr> <tr><td>LAN TX+</td><td>10 BASE T LAN TRANSMITTER</td><td>BUS OUTPUT</td><td>53</td></tr> <tr><td>LAN TX-</td><td>10 BASE T LAN TRANSMITTER</td><td>BUS OUTPUT</td><td>54</td></tr> <tr><td>A429 FREQ/FUNC SEL IN PORT 3B or RS-422 CSDB IN PORT B</td><td>ARINC 429 LS BUS (CONTROL) or CSDB NAV or COM CDU bus</td><td>BUS INPUT</td><td>55</td></tr> <tr><td>A429 FREQ/FUNC SEL IN PORT 3A or RS-422 CSDB IN PORT A</td><td>ARINC 429 LS BUS (CONTROL) or CSDB NAV or COM CDU bus</td><td>BUS INPUT</td><td>56</td></tr> <tr><td>POWER GND</td><td>GROUNDING INTERNALLY</td><td>GND</td><td>57</td></tr> <tr><td>SPARE 7</td><td>SPARE</td><td>OPEN</td><td>58</td></tr> <tr><td>+28V POWER IN</td><td>+28 VDC POWER</td><td>POWER INPUT</td><td>59</td></tr> <tr><td>FAN SUPPLY</td><td>28VDC Fan supply</td><td></td><td>60</td></tr> <tr><td>SPARE 8 DISCRETE INPUT</td><td>DISCRETE INPUT was AUDIO RTN</td><td>DISCRETE INPUT</td><td>61</td></tr> <tr><td>NAV/COM-AUDIO</td><td>Low level audio to the NIM</td><td>AUDIO OUTPUT</td><td>62</td></tr> <tr><td>COM AUDIO-EN</td><td>COM audio enabled</td><td>DISCRETE OUTPUT</td><td>63</td></tr> <tr><td>VDR TRANSMIT</td><td>DISCRETE</td><td>DISCRETE OUTPUT</td><td>64</td></tr> <tr><td>VHF AGC</td><td>VHF AGC ANALOG VOLTAGE (RSSI)</td><td>ANALOG OUTPUT</td><td>65</td></tr> <tr><td>SELCAL/ACARS-RTN</td><td>GROUNDING INTERNALLY</td><td>GND</td><td>66</td></tr> <tr><td>SELCAL/ACARS DATA OUT</td><td>SELCAL AUDIO OR ACARS DATA</td><td>AUDIO OUTPUT</td><td>67</td></tr> <tr><td>FREQ-TONE-TRANSFER-DIS</td><td>DISCRETE (STRAP)</td><td>STRAP INPUT</td><td>68</td></tr> <tr><td>SPARE 10 DISCRETE INPUT</td><td>SPARE DISCRETE INPUT was ARINC-429-COMPATIBLE-EN</td><td>DISCRETE 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FROM CMU #2</td><td>BUS INPUT</td><td>78</td></tr> </tbody> </table>						SIGNAL NAME	SIGNAL DESCRIPTION	I/O TYPE	VDR LRM PIN #	LAN RX-	10 BASE T LAN RECEIVER	BUS INPUT	41	SIMULCOM	DISCRETE (ACTIVE)	DISCRETE O & I	42	A429 IN PORT 1/2 SEL	DISCRETE (ACTIVE)	DISCRETE INPUT	43	A429 BURST-TUNE-ENABLE	DISCRETE (STRAP)	STRAP INPUT	44	RNAV VIDEO	CODEC TEST OUTPUT (was CHAN-ANTI-BLOCKING-EN)	AUDIO OUTPUT	45	RX-AUDIO-COMP-DIS	DISCRETE (STRAP)	STRAP INPUT	46	GND	GROUNDING INTERNALLY (was TX-TIME-OUT-PERIOD-SEL)	GROUNDING INTERNALLY	47	SPARE 4 DISCRETE INPUT	RESERVED in MRC COM SLOT	DISCRETE INPUT	48	SPARE 5	RESERVED in MRC COM SLOT	OPEN	49	SPARE 6	RESERVED in MRC COM SLOT	OPEN	50	ACARS-DATA-IN-LO	AUDIO DATA (MSK)	AUDIO INPUT	51	LAN RX+	10 BASE T LAN RECEIVER	BUS INPUT	52	LAN TX+	10 BASE T LAN TRANSMITTER	BUS OUTPUT	53	LAN TX-	10 BASE T LAN TRANSMITTER	BUS OUTPUT	54	A429 FREQ/FUNC SEL IN PORT 3B or RS-422 CSDB IN PORT B	ARINC 429 LS BUS (CONTROL) or CSDB NAV or COM CDU bus	BUS INPUT	55	A429 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	LAN RX-	10 BASE T LAN RECEIVER	BUS INPUT	41																																																																																																																																																														
	SIMULCOM	DISCRETE (ACTIVE)	DISCRETE O & I	42																																																																																																																																																														
	A429 IN PORT 1/2 SEL	DISCRETE (ACTIVE)	DISCRETE INPUT	43																																																																																																																																																														
	A429 BURST-TUNE-ENABLE	DISCRETE (STRAP)	STRAP INPUT	44																																																																																																																																																														
	RNAV VIDEO	CODEC TEST OUTPUT (was CHAN-ANTI-BLOCKING-EN)	AUDIO OUTPUT	45																																																																																																																																																														
	RX-AUDIO-COMP-DIS	DISCRETE (STRAP)	STRAP INPUT	46																																																																																																																																																														
	GND	GROUNDING INTERNALLY (was TX-TIME-OUT-PERIOD-SEL)	GROUNDING INTERNALLY	47																																																																																																																																																														
	SPARE 4 DISCRETE INPUT	RESERVED in MRC COM SLOT	DISCRETE INPUT	48																																																																																																																																																														
	SPARE 5	RESERVED in MRC COM SLOT	OPEN	49																																																																																																																																																														
	SPARE 6	RESERVED in MRC COM SLOT	OPEN	50																																																																																																																																																														
	ACARS-DATA-IN-LO	AUDIO DATA (MSK)	AUDIO INPUT	51																																																																																																																																																														
	LAN RX+	10 BASE T LAN RECEIVER	BUS INPUT	52																																																																																																																																																														
	LAN TX+	10 BASE T LAN TRANSMITTER	BUS OUTPUT	53																																																																																																																																																														
	LAN TX-	10 BASE T LAN TRANSMITTER	BUS OUTPUT	54																																																																																																																																																														
	A429 FREQ/FUNC SEL IN PORT 3B or RS-422 CSDB IN PORT B	ARINC 429 LS BUS (CONTROL) or CSDB NAV or COM CDU bus	BUS INPUT	55																																																																																																																																																														
	A429 FREQ/FUNC SEL IN PORT 3A or RS-422 CSDB IN PORT A	ARINC 429 LS BUS (CONTROL) or CSDB NAV or COM CDU bus	BUS INPUT	56																																																																																																																																																														
	POWER GND	GROUNDING INTERNALLY	GND	57																																																																																																																																																														
	SPARE 7	SPARE	OPEN	58																																																																																																																																																														
	+28V POWER IN	+28 VDC POWER	POWER INPUT	59																																																																																																																																																														
	FAN SUPPLY	28VDC Fan supply		60																																																																																																																																																														
	SPARE 8 DISCRETE INPUT	DISCRETE INPUT was AUDIO RTN	DISCRETE INPUT	61																																																																																																																																																														
	NAV/COM-AUDIO	Low level audio to the NIM	AUDIO OUTPUT	62																																																																																																																																																														
	COM AUDIO-EN	COM audio enabled	DISCRETE OUTPUT	63																																																																																																																																																														
	VDR TRANSMIT	DISCRETE	DISCRETE OUTPUT	64																																																																																																																																																														
	VHF AGC	VHF AGC ANALOG VOLTAGE (RSSI)	ANALOG OUTPUT	65																																																																																																																																																														
	SELCAL/ACARS-RTN	GROUNDING INTERNALLY	GND	66																																																																																																																																																														
	SELCAL/ACARS DATA OUT	SELCAL AUDIO OR ACARS DATA	AUDIO OUTPUT	67																																																																																																																																																														
	FREQ-TONE-TRANSFER-DIS	DISCRETE (STRAP)	STRAP INPUT	68																																																																																																																																																														
	SPARE 10 DISCRETE INPUT	SPARE DISCRETE INPUT was ARINC-429-COMPATIBLE-EN	DISCRETE INPUT	69																																																																																																																																																														
	ACARS-DATA-IN-HI	AUDIO DATA (MSK)	AUDIO INPUT	70																																																																																																																																																														
	A429 CMU #1 TO VDR IN PORT B	ARINC 429 HS BUS FROM CMU #1 was (AUX-CDH-BUS-MONITOR-EN)	BUS INPUT	71																																																																																																																																																														
	A429 CMU #1 TO VDR IN PORT A	ARINC 429 HS BUS FROM CMU #1 was (DATA-DISABLE)	BUS INPUT	72																																																																																																																																																														
	A429 NAVCOM OUT PORT B	ARINC 429 LS BUS (VDR STATUS)	BUS OUTPUT	73																																																																																																																																																														
	A429 NAVCOM OUT PORT A	ARINC 429 LS BUS (VDR STATUS)	BUS OUTPUT	74																																																																																																																																																														
	A429 VDR TO CMU OUT PORT B	ARINC 429 HS BUS TO CMUS	BUS OUTPUT	75																																																																																																																																																														
	A429 VDR TO CMU OUT PORT A	ARINC 429 HS BUS TO CMUS	BUS OUTPUT	76																																																																																																																																																														
A429 CMU #2 TO VDR IN PORT B	ARINC 429 HS BUS FROM CMU #2	BUS INPUT	77																																																																																																																																																															
A429 CMU #2 TO VDR IN PORT A	ARINC 429 HS BUS FROM CMU #2	BUS INPUT	78																																																																																																																																																															
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2.1.3 RTIU Cable Signal & Pin Assignment

RTIU Pin #	VRD Pin #	VDR Description
P2B2	1	Fan Control
P2V3	2	Microphone Hi
P2Z4	3	Gnd
P2G4	4	Spare 11
P2S5	5	NC Phone Lo
P1A3	6	RS422 IN HI
P2P2	7	SIDETONE PHONE AUDIO
P1T1	8	TUNE/TEST INHIBIT
P1G6	9	RCB REURN
P2E1	10	RCB RX DATA
P2F1	11	RCB TX DATA
P1A2	12	RS422 OUT 1LO
P1B2	13	RS422 OUT 1HI
P2F4	14	VOICE/DATA SELECT
P2H4	15	DATA KEY
P2C6	16	RX429 FREQ2 B
P1H6	17	RX429 FREQ1 B
p1Z6	18	GND
P2S1	19	SPARE 1
P1b5	20	+28V IN
P2D5	21	FAN #1 MONITOR
P2M6	22	MICROPHONE LO
P2H6	23	POWER ON/OFF
P2D6	24	MIC PTT
P2T5	25	NC PHONE HI
P1B3	26	RS422 IN LO
P2S2	27	REC PHONE AUDIO
p2C5	28	VDR EMERG SEL
P2C2	29	SPARE 2
P2V2	30	MKR AUDIO LO
P2L5	31	MKR AUDIO HI
P1T2	32	SYS POS MS BIT
P1V2	33	SYS POS LS BIR
P2J3	34	VOICE/DATA STATUS
P2C3	35	RX429 FREQ2 A
P1G6	36	RX429 FREQ1 A
P2a4	37	GND
P2G6	38	SPARE 3

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P1b6	39	+28V IN
P2E4	40	FAN#2 MONITOR
P1X5	41	LAN RX-
P2A5	42	SIMULCOM
P2B5	43	A429 1/2 SELECT
P2J4	44	A429 BURS TUNE ENABLE
P1M6	45	RNAV VIDEO
P1R1	46	RX AUDIO COMP DIS
P2a6	47	GND
P2D2	48	SPARE 4
P2D4	49	SPARE 5
P2E2	50	SPARE 6
P2R6	51	ACARS DATA IN LO
P1Y5	52	LAN RX+
P1Y6	53	LAN TX+
P1X6	54	LAN TX-
P1X4	55	RX429 FREQ3 B
P1Y4	56	RX429 FREQ3 A
P2a5	57	GND
P2K6	58	SPARE 7
P2b6	59	+28V IN
P2J6	60	FAN SUPPLY
P2E6	61	SPARE 8
P2V5	62	NAV/COM AUDIO+
P2E3	63	COM AUDIO EN
P2D3	64	VDR TRANSMIT
P1M3	65	VHF AGC
P2T2	66	SELCAL/ACARS DATA RET
P2U2	67	SELCAL/ACARS DATA OUT
P1N1	68	FREQ TONE TRANSFER DIS
P2F6	69	SPARE 10
P2S6	70	ACARS DATA IN HI
P2B6	71	RX429 CMU1 B
P2B3	72	RX429 CMU1 A
P1X2	73	TX429 STATUS B
P1Y2	74	TX429 STSTUS A
P1X3	75	TX429 CMU/GPS B
P1Y3	76	TX429 CMU/GPS A
P2A6	77	RX429 CMU2 B
P2A3	78	RX429 CMU2 A

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REV LTR	<u>Product Specification</u> 7500300 Radio System Operation Specification 7500301-001 Radio Communications Bus Specification – General Specifications 7500301-002 RCB – VHF COM Data Specification <u>Governing Documents</u> EUROCAE ED-XX Minimum Operational Performance Standards for Airborne Radio Communications Equipment Operating Within the Radio Frequency Range 118.000- 136.975 MHz. RTCA DO-186a Minimum Operational Performance Standards for Airborne Radio Communications Equipment Operating Within the Radio Frequency Range 118.000- 136.975 MHz EUROCAE ED-92 Minimum Operational Performance Standards for an Airborne VDL Mode-2 Transceiver Operating in the frequency range 118-136.975 MHz. RTCA DO-160D Environmental Conditions and Test Procedures for Airborne Equipment RTCA DO-178B Software Considerations in Airborne Systems and Equipment Certification				
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REV LTR	3. GENERAL INFORMATION All tests shall be performed under conditions of 25 ± 10 °C and less than 90 percent relative humidity, unless otherwise specified. All input signals shall be applied between the designated terminal and ground, unless otherwise stated. All output voltages shall be measured with respect to ground, unless otherwise stated. No warm-up period is required. All RF input voltages are expressed in HARD micro-volts. The term "hard" microvolts refers to the sensitivity of the receiver as measured with a signal generator calibrated in terms of open circuit E.M.F. If a signal generator calibrated in terms of output voltage across a matched load is employed, hard microvolts are observed when a 6-dB pad is connected between it and the receiver. The signal generator output impedance shall comprise a resistance of 50 ± 5 ohms and a reactance of not more than 5 ohms. Unless otherwise specified, all tests shall be performed with the equipment antenna jack connected to a 50-ohm load. The Standard on channel RF signal is an RF input signal generated at the selected radio frequency. Unless otherwise stated, the Receiver Audio Compressor shall be OFF. (RTIU - Audio Compressor - Open) <u>NOTE:</u> R.T.I.U. has all loads internal. No external loads are required.			
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	COMM AUDIO 3.1.1 A 600 ohm $\pm$ 10% resistive load must be applied between PHONE AUDIO HI (P5-25) and PHONE AUDIO LO (P5-5). 3.1.2 SELCAL/ACARS (P5-67) must be terminated with a 600 ohm resistive load. 3.1.3 A 150 ohm $\pm$ 10% resistive load shall be applied between MIC HI (P5-2) and MIC LO (P5-22). MIC LO (P5-22) shall be grounded. The audio signal generator shall be capacitively coupled to MIC HI (P5-2). 3.1.4 3VOICE audio input levels specified for the transmitter are those appearing at MIC HI (P5-2) when the transmitter is keyed and transmitting. 3.1.5 DATA input levels specified for the transmitter are those appearing at ACARS_DATA_IN_HI (P5-70) when the transmitter is keyed and transmitting. The transmitter is keyed by grounding the PTT Line (P5-24). The transmitter is un-keyed by releasing the ground on the PTT Line (P5-24). The transmitter is keyed by grounding the DATA-KEY Line (P5-15). The transmitter is un-keyed by releasing the ground on the PTT Line (P5-15). All alphanumeric symbols bracketed by greater-than/less-than "< >" symbols will require the characters be typed and "ENTER" or "Return" typed. Bus Errors The test equipment may continuously monitor the RCB port of the COMM module. If such monitoring is provided, the VDR shall generate no bus errors except when the power is off or being cycled off or on. Transmitter power measurements shall be taken at 10 seconds after the transmitter is keyed unless otherwise specified. Each test parameter reading will have a test number assigned. Test setup instructions will occur before the reading is taken. Taking the reading is the end of that test section and subsequent instructions belong to the next test parameter Tests are normally done in sequence and the test steps are written for this purpose. If tests are performed out of sequence the tester is responsible for insuring the correct mechanical and software setups are performed. In cases where timing is required be sure to read the entire instruction before performing the test. A Record test results in the Functional Test Report (Appendix C) for all manual tests. G Deleted.				
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REV LTR																																															
B	4. POWER REQUIREMENTS Unless otherwise specified, all tests shall be conducted with the power-input voltage adjusted to 27.5 ± 0.1 V dc. This voltage shall be measured between the power-input terminals of the U.U.T. VDR: P5-20,39,59 (H) and P5-18,37, 57 (L)] 5. TEST EQUIPMENT OR EQUIVALENT <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Gain Phase Meter</td> <td>HP3575A or equivalent</td> </tr> <tr> <td>R.F. Signal Generator</td> <td>HP8656B with OPT 001 or equivalent</td> </tr> <tr> <td>Modulation Analyzer</td> <td>HP8901A or equivalent</td> </tr> <tr> <td>Audio Analyzer</td> <td>HP8903B or equivalent</td> </tr> <tr> <td>Digital Voltmeter</td> <td>Keithley 178 or equivalent</td> </tr> <tr> <td>Spectrum Analyzer</td> <td>HP141T with 8554B and 8552B or equivalent</td> </tr> <tr> <td>Oscilloscope</td> <td>Tektronix 2465 or equivalent</td> </tr> <tr> <td>Function Generator</td> <td>HP3312A or equivalent</td> </tr> <tr> <td>Frequency Counter</td> <td>Phillips PM6614 or equivalent</td> </tr> <tr> <td>Radio Test Interface Unit (RTIU)</td> <td>Honeywell 7511400-902</td> </tr> <tr> <td>RTIU Software</td> <td>7512001-XYX</td> </tr> <tr> <td></td> <td>Where X = media code as specified on drawing</td> </tr> <tr> <td></td> <td>7512001 and YY = 17 or greater (software version)</td> </tr> </table> NOTE: RTIU P/N 7511400-901 is equipped with software version 7512001-108. RTIU P/N 7511400-902 is equipped with software version 7512001-109. <table style="width: 100%; border: none; margin-top: 20px;"> <tr> <td style="width: 50%;">Harness Assembly RTIU-TR-855</td> <td>T337297-9001</td> </tr> <tr> <td>Trap Filter</td> <td>T360055 (required only for original manufacturing tests)</td> </tr> <tr> <td>ARINC 429 Test Set</td> <td>JcAir 429 or equivalent</td> </tr> </table> <u>Alternate Test Equipment</u> <table style="width: 100%; border: none; margin-top: 10px;"> <tr> <td style="width: 60%;">Honeywell EPIC Computer Aided Test System</td> <td>T336384</td> </tr> <tr> <td>VDR Adapter</td> <td>T336400</td> </tr> </table> <u>Test Software</u> The following table indicates the software part numbers and revision status for the various automated test stations and test software. <table style="width: 100%; border: none; margin-top: 10px;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Test Station Part No.</th> <th style="text-align: left; border-bottom: 1px solid black;">Name</th> <th style="text-align: left; border-bottom: 1px solid black;">Software Part No.</th> </tr> </thead> <tbody> <tr> <td>T336384</td> <td>Epic CATS</td> <td>MT7026201</td> </tr> </tbody> </table>					Gain Phase Meter	HP3575A or equivalent	R.F. Signal Generator	HP8656B with OPT 001 or equivalent	Modulation Analyzer	HP8901A or equivalent	Audio Analyzer	HP8903B or equivalent	Digital Voltmeter	Keithley 178 or equivalent	Spectrum Analyzer	HP141T with 8554B and 8552B or equivalent	Oscilloscope	Tektronix 2465 or equivalent	Function Generator	HP3312A or equivalent	Frequency Counter	Phillips PM6614 or equivalent	Radio Test Interface Unit (RTIU)	Honeywell 7511400-902	RTIU Software	7512001-XYX		Where X = media code as specified on drawing		7512001 and YY = 17 or greater (software version)	Harness Assembly RTIU-TR-855	T337297-9001	Trap Filter	T360055 (required only for original manufacturing tests)	ARINC 429 Test Set	JcAir 429 or equivalent	Honeywell EPIC Computer Aided Test System	T336384	VDR Adapter	T336400	Test Station Part No.	Name	Software Part No.	T336384	Epic CATS	MT7026201
Gain Phase Meter	HP3575A or equivalent																																														
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REV LTR	6. TEST SETUP Initial Setup Turn the RTIU main power on. Turn P.C. power on. When main menu appears on screen: Select (TR-850/833/853).<12> Select TR-833/853<2> The Page Menu should appear: Select CONFIGURATION PAGE<C> CONFIGURATION SOURCE DISPLAY should appear: EXTENDED STATUSYES(1 VALID) TRANSFER TONEGND(0 ENABLE) AUDIO COMPRESSOROPEN(1 DISABLE) COM ACH MONITORGND(0 ENABLE) SYS POSITIONSYS 1(00) ARINC 716 DATA MODEOPEN(0 DISABLE) TX TIMEOUTOPEN(0 2 MINUTES) CHANNEL ANTIBLOCKINGOPEN(0 DISABLE) ARINC 429 COMPATIBLEGND(1 COMPATIBLE) DATA ENABLEOPEN(1 ENABLE) COM ON/OFFOFF ERROR DATA BLOCK TIME-OUT If the source display does not match the settings above, enter the appropriate letter as indicated by the menu at the bottom of the page. Go to PAGE MENU<P> Select AUDIO/ANALOG PAGE<A> Select AUDIO SOURCE<S> BNC<1> Select AUDIO INPUT<I> MICROPHONE<A> Return to PAGE MENU<P> Go to RCB PAGE<R> Turn the 28-V dc power supply ON (Adjust supply for 27.5 V dc ± 0.1 V)				
G					
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REV LTR	<u>Test Setup #1</u> After initial setup has been performed: Connect VDR per Figure 2. Turn ON the 28 V dc on R.T.I.U <F>: CHANGE FREQUENCY <127.500> FREQUENCY IN MHz If necessary: <Q> Change squelch status to TEST and OPEN <V> Voice Select <V> VOICE mode. <u>SIGNAL GENERATOR:</u> Apply a 127.500 MHz, 3 uV RF LEVEL, with standard modulation of 1000 Hz at 30% AM to the VHF COM antenna connector. <u>Test Setup #2</u> After initial setup has been performed: Connect VDR per Figure 3. Turn 28 V dc on, on the RTIU. <F>: CHANGE FREQUENCY <127.100> FREQUENCY IN MHz If necessary: <Q> Change squelch status to TEST and OPEN <V> Voice Select <V> VOICE mode. <u>MODULATION ANALYZER:</u> Connect two 20-dB attenuators in series, between the VHF COM antenna connector and the modulation analyzer. <u>Test Setup # 3</u> After initial setup has been performed: Connect VDR per Figure 4. Turn ON 28 V dc power on R.T.I.U <F>: SELECT FREQUENCY			
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<118.100> FREQUENCY IN MHz

If necessary:

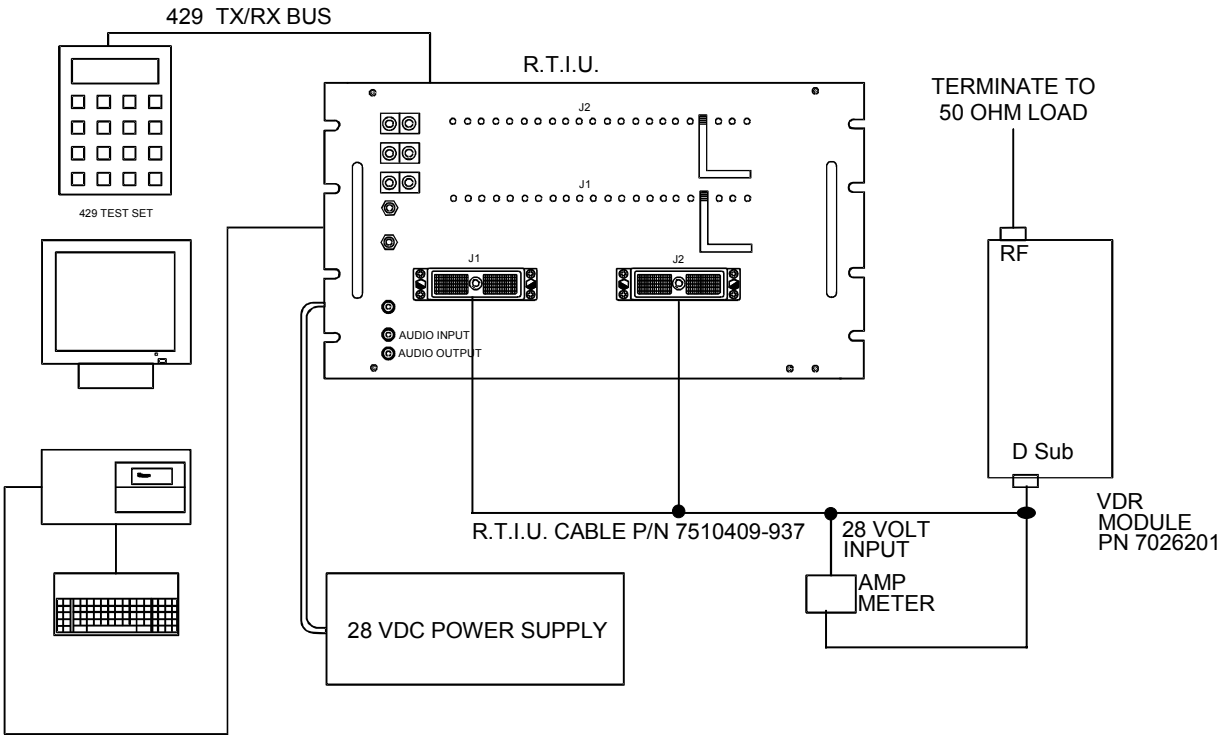
<Q> Change squelch status to TEST and OPEN

<V> Voice Select

<V> VOICE mode.

SPECTRUM ANALYZER:

Connect two 20-dB attenuators in series, between the VHF COM antenna connector and the spectrum analyzer.



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Figure 1

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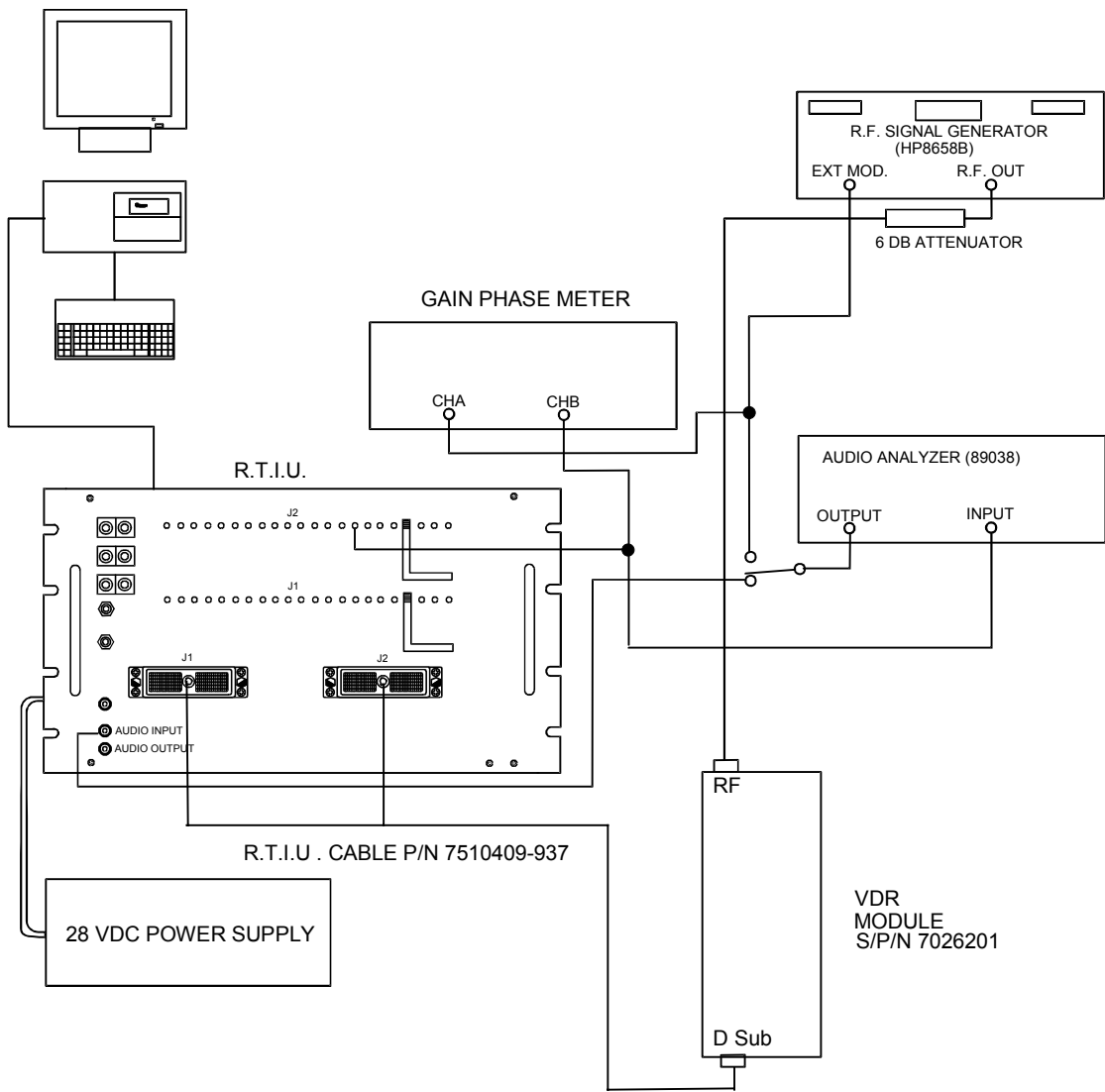


Figure 2

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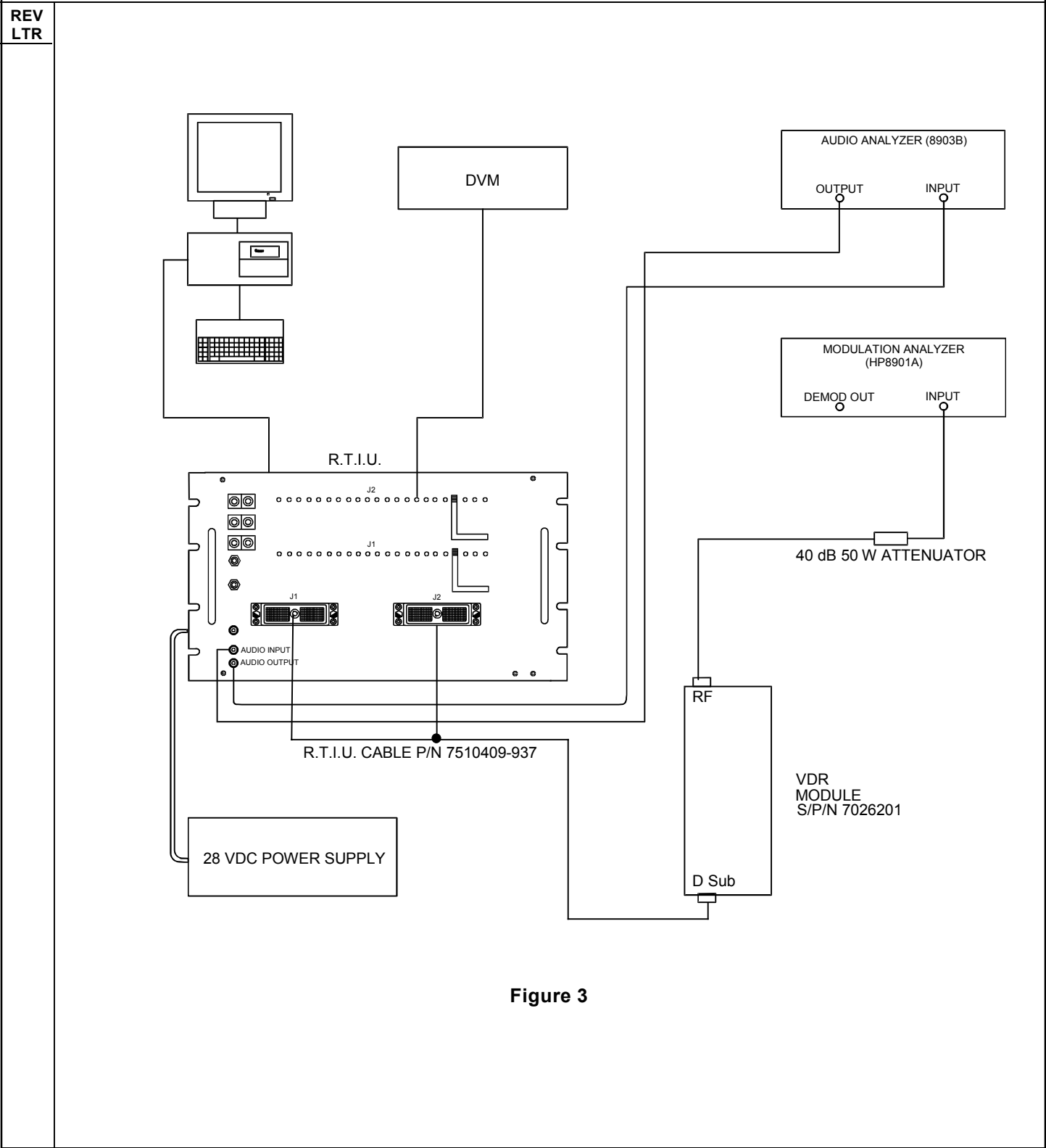


Figure 3

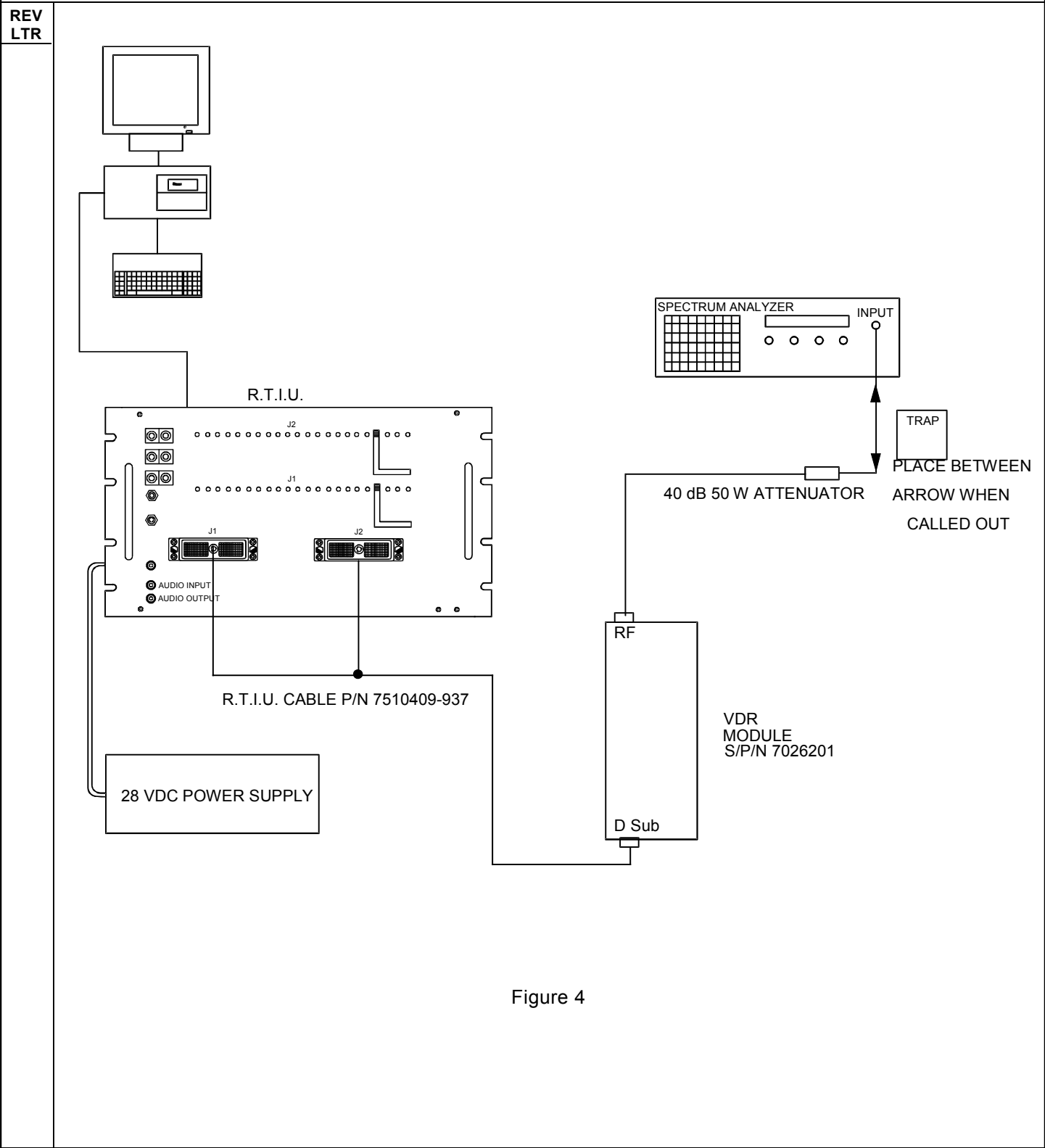
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7. TEST REQUIREMENTS					
	<u>Column</u>	<u>Description</u>			
	Rev Ltr	This column is used to identify revised material.			
	Test No.	Tests are numbered in sequence in steps of 10. If new tests are added adding 1-9 to the end of the appropriate section will number them e.g. add new test to 1.010 results in 1.011.			
	Opr Limits	Unit under test (UUT) shall meet these limits whenever tested at other than the manufacturing facility. When an item is marked OPTIONAL in this column, the corresponding test is not required except as an aid in troubleshooting.			
	Test Description	These items are the parameters to which the unit under test was designed. In addition, these items aid in troubleshooting by specifying the input and output signal terminals. For brevity, all conditions required are not repeated for each test. Conditions established in previous tests will also apply.			
	Switch Pos	Perform switch settings in order specified. When an item is entered in Work Steps Column opposite a switch setting other than the first or when there is additional space between switches, perform this item before setting any other switches.			
	Work Steps	When work step items are entered opposite first Switch Pos, perform all switch settings first. When items are entered opposite switch setting other than first setting or when there is additional space between switches, perform work step item before setting any other switches.			
	Mfg Limits	Unit under test shall meet these limits prior to customer delivery.			
	Code	A "1" in the column indicates that the material in the next column applies only to manual test procedures. A "2" in the column indicates that the material in the next column applies only to Automatic Test Equipment procedures. A blank column indicates that the material in the next column applies equally to manual and automated test procedures.			
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	1.000			<u>RECEIVE INPUT CURRENT</u>	Test Setup #1		<u>RECEIVE INPUT CURRENT</u> Connect per Figure #1 R.T.I.U.: 28 VOLT POWER OFF R.T.I.U.:28 VOLT POWER ON COM ON/OFF: OFF.	
	1.010	One or more errors (Not blank)		Apply logic '0' to on/off (P5-23) [open collector on]. The radio shall generate errors.	<O>		Observe the RTIU screen. The row indicate by ERRORS shall indicate as specified. COM ON/OFF: ON.	One or more errors (Not blank)
	1.020	less than or equal to 1.0 A		Apply logic '1' to on/off (P5-23) [open collector off]. Measure the current on P5-20, 39,59 (H) and P5-18, 37, 47, 57(L) Reading shall be as specified.	<Q> <Q>		Squelch Normal (Closed) The current on the milliamp meter shall read as specified. R.T.I.U.: 28 VOLT POWER OFF R.T.I.U.:28 VOLT POWER ON Squelch Test (Open)	less than or equal to 1.0 A
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	2.000			<u>SELF TEST</u> Place holder for future self test	Test setup #1		<u>SELF TEST</u>	
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
B	3.000			<u>RECEIVER TEST: SENSITIVITY</u> All measurements are taken at NAV/COM-AUDIO+ (P5-62) with a load of 8200 ohms. All tests are done with standard modulation of 1000 Hz at 30%.	Test Setup #1		<u>RECEIVER TEST: SENSITIVITY</u> Connect per Figure # 2 <u>SIGNAL GENERATOR:</u> Connect the signal generator to the VHF COM antenna connector. The signal amplitude is measured at the antenna port and is specified in HARD uV. Change the signal strength accordingly for all cable losses. <u>AUDIO ANALYZER:</u> Connect the audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5) (NAV/COM-AUDIO+). Set the audio analyzer to measure SINAD.	
				Channel the radio to 118.025. Inject a 118.025 MHz 3.0 uV signal into the antenna port.	<F> <118.025>		Frequency 118.025 <u>SIGNAL GENERATOR:</u> Set frequency for 118.025 MHz, modulate at 1 kHz 30% AM. R.F. output for 3.0 uV.	
	3.010	greater than or equal to 6 dB		Verify the SINAD at NAV/COM-AUDIO+ (P5-62) is as specified. Select radio frequency 123.025.	<F> <123.025>		<u>AUDIO ANALYZER:</u> The SINAD at the audio output shall be as specified. Frequency 123.025	greater than or equal to 7 dB
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
B				Inject a 123.025 MHz 3.0 uV signal into the VHF COM antenna connector.			<u>SIGNAL GENERATOR:</u> Set the signal generator frequency for 123.025, R.F. output for 3.0 uV.	
	3.020	greater than or equal to 6 dB		Verify the SINAD at NAV/COM-AUDIO+ (P5-62) is as specified.			<u>AUDIO ANALYZER:</u> The SINAD at the audio output shall be as specified.	greater than or equal to 7 dB
A				Select radio channel 123.030 (narrow band mode). Inject a 123.030 MHz 3.0 uV signal into the VHF COM antenna connector.	<F> <123.030>		Frequency 123.030	
	3.030	greater than or equal to 6 dB		Verify the SINAD at NAV/COM-AUDIO+ (P5-62) is as specified.			<u>AUDIO ANALYZER:</u> The SINAD at the audio output shall be as specified.	greater than or equal to 7 dB
				Select radio channel 136.975.	<F> <136.975>		Frequency 136.975	
				Inject a 136.975 MHz 3.0 uV signal into the VHF COM antenna connector.			<u>SIGNAL GENERATOR:</u> Set signal generator for 136.975 MHz, R.F. output for 3.0 uV.	
	3.040	greater than or equal to 6 dB		Verify the SINAD at NAV/COM-AUDIO+ (P5-62) is as specified.			<u>AUDIO ANALYZER:</u> The SINAD at the audio output shall be as specified.	greater than or equal to 7 dB
F				This test (3.050) applies to -81x only.				
A				Inject a 151.975 MHz 3.0 uV signal into the VHF COM antenna connector.			<u>SIGNAL GENERATOR:</u> Set signal generator for 151.975 MHz, R.F. output for 3.0 uV.	
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	4.000			<u>RECEIVER SELECTIVITY</u> Channel the radio to 127.500. Apply a 127.500 MHz, 10 mV, 8 kHz, 30% modulation signal to the VHF COM antenna connector. (This is the highest modulation frequency that will fit in a 25 kHz channel without introducing distortion)	Test Setup #1		<u>RECEIVER SELECTIVITY</u> Connect per Figure 2. <u>SIGNAL GENERATOR</u> Set the Signal Generator to 127.500 MHz. Set the R.F. level for 10 mV, 8 kHz, 30% modulation. <u>AUDIO ANALYZER</u> Connect the Audio Analyzer to the RTIU front panel (J2U2/J2T2). Set the Audio Analyzer to measure distortion.	
	4.010	less than or equal to 5%		Measure the distortion level at SELCAL/ACARS-DATA-OUT (P5-67). The distortion shall be as specified. Channel the radio to 127.505. Apply a 127.500 MHz, 10 mV, 3 kHz, 30% modulation signal to the VHF COM antenna connector. (This is the highest modulation frequency that will fit in a 8.33 kHz channel without introducing distortion)	<F> <127.505>		Measure the distortion at SELCAL/ACARS-DATA-OUT (RTIU J2U2/J2T2). The distortion level shall be as specified. FREQUENCY 127.505 <u>SIGNAL GENERATOR</u> Set the Signal Generator to 127.500 MHz. Set the R.F. level for 10 mV, 3 kHz, 30% modulation.	less than or equal to 5%
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	4.020	less than or equal to 5%		Measure the distortion level at SELCAL/ACARS-DATA-OUT (P5-67). The distortion shall be as specified. Apply a 127.500 MHz, 10 mV, 8 kHz, 30% modulation signal to the antenna port. (This modulation frequency will be outside what can be received in a 8.33 kHz channel)			Measure the distortion at SELCAL/ACARS-DATA-OUT (RTIU J2U2/J2T2). The distortion level shall be as specified. <u>SIGNAL GENERATOR</u> Set the Signal Generator to 127.500 MHz. Set the R.F. level for 10 mV, 8 kHz, 30% modulation. <u>AUDIO ANALYZER:</u> Set the audio analyzer to measure Vrms.	less than or equal to 5%
	4.030	less than or equal to 25 mVrms		Measure the audio level at SELCAL/ACARS-DATA-OUT (P5-67). The distortion shall be as specified.	<F> <127.500>		Measure the audio at SELCAL/ACARS-DATA-OUT (RTIU J2U2/J2T2). The distortion level shall be as specified. Frequency 127.500	less than or equal to 25 mVrms
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	5.000			<u>CARRIER SQUELCH</u> On units with MOD B cycle the power OFF the ON	Test Setup # 1 <0> Wait 10 Sec. <0>		<u>CARRIER SQUELCH</u> Connect per Figure # 2. <u>SIGNAL GENERATOR:</u> Remove the R.F. output from the VHF COM antenna connector. <u>SIGNAL GENERATOR:</u> Set signal generator to 123.500 MHz. R.F. level to 1 uV, 1000 Hz 50% modulation. Change SQUELCH TEST to SQUELCH NORMAL (SQUELCH CLOSE). Verify radio squelch is normal and closed. <u>AUDIO ANALYZER:</u> Connect the input of the audio analyzer to the R.T.I.U. front panel (J2V5/J2U5). Set the audio analyzer to measure VAC.	
A	5.010	Less than or equal to 10 mVrms		With no R.F. signal applied, the voltage at NAV/COM-AUDIO+ (P5-62) shall be as specified. Open the squelch using the squelch test function.	<Q>		Measure the NAV/COM-AUDIO+ level (J2V5/J2U5), it shall be as specified. Change SQUELCH NORMAL to SQUELCH TEST (SQUELCH OPEN). Verify radio squelch is test and open	Less than or equal to 10 mVrms
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	5.020	Greater than or equal to 100 mVrms		With no R.F. signal applied, the voltage at NAV/COM-AUDIO (P5-62) shall be as specified.			<u>SIGNAL GENERATOR:</u> Connect the R.F. output to the VHF COM antenna connector. Set R.F. output to 0.1 uV.	Greater than or equal to 100 mVrms.
A	5.030	10 to 20 μV		Close the squelch using the squelch test function. Apply an on channel R.F. signal with standard modulation.	<Q>		<u>AUDIO ANALYZER:</u> The NAV/COM-AUDIO+ (J2V5/J2U5) shall be as specified. Change SQUELCH TEST to SQUELCH NORMAL. Verify radio squelch is normal and closed.	Greater than or equal to 100 mVrms.
A	5.040			Gradually increase the R.F. signal level until RTIU indicates squelch OPEN The R.F. signal level shall be as specified.			<u>SIGNAL GENERATOR:</u> Set R.F. frequency to 123.500 MHz. Set R.F. level for 5 uV, 5000 Hz 30% modulation. Gradually increase the R.F. signal level until RTIU indicates squelch OPEN. The R.F. signal level shall be as specified.	12 to 18 μV
A	5.040			Place holder for future test.			<u>AUDIO ANALYZER:</u> Set audio analyzer to measure VAC. Connect input to R.T.I.U. audio output (J2V5/J2U5).	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	5.050	4 to 8 dB		Gradually decrease the R.F. signal level RTIU indicates squelch CLOSED. The R.F. signal level shall be smaller than that obtained in (5.03) by the amount shown.	<Q>		<u>SIGNAL GENERATOR:</u> Slowly decrease the R.F. level until the RTIU indicates squelch CLOSED The difference in signal levels between 5.03 and 5.05 shall be as specified. Squelch Test to Squelch Normal	4 to 8 dB
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
B	6.000			<u>NOISE SQUELCH</u>	Test Setup # 1		<u>NOISE SQUELCH</u> Connect per Figure 2	
					<Q>		Change SQUELCH TEST to SQUELCH NORMAL	
				Channel the radio to 123.5. Apply a standard on channel R.F. signal at 1 uV, 50% modulation to the VHF COM antenna connector.	<F>		<u>SIGNAL GENERATOR:</u> Set signal generator to 123.500 MHz. R.F. level to 1 uV, 1000 Hz 50% modulation. <u>DVM:</u> Connect the DVM (H) to the R.T.I.U. (J2H3) and power ground. Set DVM to measure DC volts. Monitor while adjusting signal generator.	
	6.010	2.0 to 3.0 µV		Gradually increase the R.F. signal level until the RTIU indicates squelch OPEN	<123.5>		<u>SIGNAL GENERATOR:</u> Slowly increase the R.F. signal level until the RTIU indicates squelch OPEN <u>AUDIO ANALYZER:</u> Connect audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5). Set the analyzer to measure VAC.	2.2 to 3.0 µV
	6.020	Greater than or equal to 100 mVrms		The voltage at NAV/COM-AUDIO+ (P5-62) shall be as specified.			The NAV/COM-AUDIO+ (J2V5/J2U5) level shall be as specified.	Greater than or equal to 100 mVrms
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REV	TEST	SPECIFICATION			PROCEDURE		SPECIFICATION	
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	
A A A	6.030	4 to 8 dB		Gradually decrease the R.F. signal level until the RTIU indicates squelch CLOSED. The R.F. signal level shall be less than that measured in (6.01) by the amount shown.			Slowly decrease R.F. signal level until the RTIU indicates squelch CLOSED The difference in R.F. signal levels between 6.01 and 6.03 shall be as specified.	4 to 8 dB
				Channel the radio to 123.505.	<F> <123.505>		Frequency 123.505	
				On units with MOD B cycle the power OFF the ON	<0> Wait 10 sec			
				Apply a standard, on channel R.F. signal at 1 μV, 50% modulation to the VHF COM antenna connector.			<u>SIGNAL GENERATOR:</u> Set signal generator to 123.500 MHz, R.F. level to 1 μV, 1000 Hz, and 50% modulation. <u>DVM</u> Connect the DVM (H) to the R.T.I.U. (J2H3) and power ground. Set DVM to measure DC volts. Monitor while adjusting signal generator.	
	6.040	2.0 to 3.0 μV		Gradually increase the RF signal level until the RTIU indicates squelch OPEN. The RF level shall be as specified.			<u>SIGNAL GENERATOR</u> Slowly increase R.F. signal level until the RTIU indicates squelch OPEN. <u>SIGNAL GENERATOR</u> Slowly decrease R.F. signal level until the RTIU indicates squelch CLOSED.	2.2 to 3.0 μV
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LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	6.050	4 to 8 dB		Gradually decrease the RF signal level until the RTIU indicates squelch CLOSED. The RF signal level shall be less than that measured in 6.040 by the amount shown.			The difference in RF signal levels between 6.040 and 6.050 shall be as specified.	4 to 8 dB
					<Q>		Change SQUELCH TEST to SQUELCH NORMAL	
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	7.000			<u>AUDIO OUTPUT LEVEL</u> On all units except MOD B Switch the Receive Audio COMPRESSOR <u>ON</u> . Apply a 1 mV on channel RF signal with 1 kHz, 80% modulation to the VHF COM antenna connector.	Test Setup #1 <P> <C> <C> <O> WAIT 10 SEC <O>		Connect per Figure # 2 RCB Page Configuration Page Audio Compressor: GND COM OFF WAIT 10 SEC COM ON <u>SIGNAL GENERATOR:</u> Set the R.F. frequency for 127.500 MHz. Set the R.F. level for 1 mV, 1000 Hz 80% modulation. <u>AUDIO ANALYZER:</u> Connect the audio analyzer to the R.T.I.U. front panel (J2S2/J2S5). Set the audio analyzer to measure Vrms.	
B	7.010	2.9 ± 0.4 Vrms		Measure the audio level between REC-PHONE-AUDIO HI (P5-27) and PHONE AUDIO LO (P5-5). Apply a 600-ohm resistive load. The voltage shall be as specified.			The REC-PHONE-AUDIO voltage (J2S2/J2S5) shall be as specified. <u>AUDIO ANALYZER:</u> Connect the audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5) Set the audio analyzer to measure Vrms.	2.9 ± 0.3 Vrms

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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
E	7.020	0.71 ± 0.2 Vrms		Measure the audio level at NAV/COM-AUDIO+ (P5-62) [terminated with a 8.2k ohm resistor]. The voltage shall be as specified. Reduce the modulation level of the RF signal to 40%.			The voltage at NAV/COM-AUDIO+ (R.T.I.U. J2V5/J2U5) shall be as specified. <u>SIGNAL GENERATOR:</u> Set the modulation to 1000 Hz 40%.	0.71 ± 0.03 Vrms
	7.030	REFERENCE		Measure the audio level at NAV/COM-AUDIO+ (P5-62).			Measure and record the NAV/COM-AUDIO+ (R.T.I.U. J2V5/J2U5).	REFERENCE
	7.040	Less than or equal to 2 dB		Measure the level change at NAV/COM-AUDIO+ (P5-62). The level change from 7.020 to 7.030 shall be as specified. Switch the Receive Audio COMPRESSOR <u>OFF</u>.	<C> <O> WAIT 10 SEC <O>		The change in level from 7.020 to 7.030 shall be as specified. Audio Compressor: OPEN COM OFF WAIT 10 SEC COM ON	less than or equal to 1 dB
	7.050	REFERENCE		Measure the audio level at NAV/COM-AUDIO+ (P5-62).			<u>AUDIO ANALYZER:</u> Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). Record for reference.	REFERENCE
	7.060	8 ± 4 dB		The level change from 7.030 to 7.050 shall be as specified. <P> <R>			Calculate the difference between (7.030) and (7.050). The difference shall be as specified. Return to the RCB/ACH PAGE. Page Menu RCB/ACH Page	8 ± 4 dB
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	8.000			<u>AUDIO OUTPUT DISTORTION</u> On all units except MOD B. Switch the Receive Audio COMPRESSOR <u>ON</u> . Apply a 127.500 MHz, 10,000 uV 300 Hz 30% modulation signal to the VHF COM antenna connector.	Test Setup #1 <P> <C> <C> <O> WAIT 10 SEC <O>		<u>AUDIO OUTPUT DISTORTION</u> Connect per Figure # 2 Page Menu Configuration Page COMPRESSOR: GND COM/OFF: OFF WAIT 10 SEC COM/OFF: ON <u>SIGNAL GENERATOR:</u> Set the signal generator to 127.500 MHz. Set the R.F. level for 10 mV, 300 Hz 30% modulation. <u>AUDIO ANALYZER:</u> Connect audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5). Set the audio analyzer to measure distortion.	
	8.010	Less than or equal to 5%		Measure the distortion level at the NAV/COM-AUDIO+ (P5-62). The distortion shall be as specified. Apply an on channel R.F. signal of 10,000 uV with a modulation of 1000 Hz 30%.			Measure the distortion at the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). The distortion level shall be as specified. <u>SIGNAL GENERATOR:</u> Set signal generator for 127.500 MHz. Set R.F. level for 10 mV 1000 Hz 30% modulation.	Less than or equal to 5%
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	8.020	Less than or equal to 5%		Measure the distortion level at the NAV/COM-AUDIO+ (P5-62). The distortion shall be as specified. Apply an on channel R.F. signal of 10,000 uV with a modulation of 3000 Hz 30%.			Measure the distortion at the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). The distortion level shall be as specified. <u>SIGNAL GENERATOR:</u> Set signal generator to 127.500 MHz. Set the R.F. level for 10 mV, 3000 Hz 30% modulation.	Less than or equal to 5%
	8.030	Less than or equal to 5%		Measure the distortion level at the NAV/COM-AUDIO+ (P5-62). The distortion shall be as specified.	<C> <O> WAIT 10 SEC <O> <P> <R>		Measure the distortion at the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). The distortion level shall be as specified. Return to RCB/ACH PAGE. Audio Compressor: Open Com ON/OFF: OFF WAIT 10 SEC Com ON/OFF: ON Page Menu RCB/ACH Page	Less than or equal to 5%
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	9.000			<u>AUDIO FREQUENCY RESPONSE</u> Select Radio Channel 127.50. Apply an on channel R.F. signal of 1000 uV at 1000 Hz 30% modulation.	Test Setup #1		<u>AUDIO FREQUENCY RESPONSE</u> Connect per Figure # 2 <u>AUDIO ANALYZER:</u> Connect Audio Analyzer 600-ohm audio output to the signal generator external modulation input. <u>SIGNAL GENERATOR:</u> Set the signal generator for 127.500 MHz. Set the R.F. level for 1000 uV, AM EXT MOD: 30% modulation. <u>AUDIO ANALYZER:</u> Set analyzer frequency for 1000 Hz. Adjust output voltage until signal generator HI/LO light goes out. <u>AUDIO ANALYZER:</u> Connect the audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5). Set the audio analyzer to measure Vrms.	
	9.010	REFERENCE		Measure the audio level at NAV/COM-AUDIO+ (P5-62).			Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). Record for reference. <u>AUDIO ANALYZER:</u> Set analyzer frequency for 300 Hz. Adjust output voltage until signal generator HI/LO light goes out.	REFERENCE
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	9.020	REFERENCE		Change the modulation frequency to 300 Hz. Measure the audio level at NAV/COM-AUDIO+ (P5-62). Change the modulation frequency to 3 kHz.			<u>SIGNAL GENERATOR:</u> Set the signal generator for 127.500 MHz. Set the R.F. level for 1 mV, AM EXT MOD: 30% modulation. <u>AUDIO ANALYZER:</u> Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). Record for reference. <u>AUDIO ANALYZER:</u> Set analyzer frequency for 3000 Hz. Adjust output voltage until signal generator HI/LO light goes out. <u>SIGNAL GENERATOR:</u> Set the signal generator for 127.500 MHz. Set the R.F. level for 1 mV, AM EXT MOD: 30% modulation.	REFERENCE
	9.030	REFERENCE		Measure the audio level at NAV/COM-AUDIO+ (P5-62). Change the modulation frequency to 4 kHz.			<u>AUDIO ANALYZER:</u> Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). Record for reference. <u>AUDIO ANALYZER:</u> Set analyzer frequency for 4000 Hz. Adjust output voltage until signal generator HI/LO light goes out.	REFERENCE
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	9.040	REFERENCE		Measure the audio level at NAV/COM-AUDIO+ (P5-62).			<u>SIGNAL GENERATOR:</u> Set the signal generator for 127.500 MHz. Set the R.F. level for 1 mV, AM EXT MOD: 30% modulation. <u>AUDIO ANALYZER:</u> Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). Record for reference.	REFERENCE
	9.050	Less than or equal to 6 dB		The variation in output level between 1 kHz, 300 Hz, and 3 kHz modulation (9.010, 9.020, 9.030) shall be as specified.			Calculate the Maximum dB difference between (9.010, 9.020, and 9.030). The difference shall be as specified.	Less than or equal to 4 dB.
	9.060	Greater than or equal to 18 dB		The decrease in output level between 1 kHz (9.010) and 4 kHz (9.040) shall be as specified.			Calculate the dB difference between (9.010) and (9.040). The decrease in output level between (9.010 and 9.040) shall be as specified.	Greater than or equal to 18 dB.
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	10.000			<u>SELCAL/ACARS OUTPUT LEVEL</u> Select radio channel 127.500. Apply an on channel R.F. signal of 1 mV with 70% 1 kHz modulation.	Test Setup # 1		<u>SELCAL/ACARS OUTPUT LEVEL</u> Connect per Figure # 2 <u>SIGNAL GENERATOR:</u> Set the signal generator to 127.500 MHz. Set the R.F. level to 1 mV, 1000 Hz INT AM, 70% modulation. <u>AUDIO ANALYZER:</u> Connect the audio analyzer input to the R.T.I.U. front panel (J2U2/J2T2). Set the analyzer to measure Vrms.	
	10.010	0.63 Vrms ±0.1		Measure the audio level at SELCAL/ACARS-DATA-OUT (P5-67) with a 600 ohm load applied. The voltage shall be as specified.			Measure the audio level SELCAL/ACARS-DATA-OUT (R.T.I.U. J2U2/J2T2). The voltage shall be as specified.	0.63 Vrms ±0.1
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	11.000			<u>SELCAL/ACARS OUTPUT DISTORTION</u> Apply a 127.500 MHz, 10,000 μ V, 1000 Hz, and 30% modulation signal to the VHF COM antenna connector.	Test Setup # 1		<u>SELCAL/ACARS OUTPUT DISTORTION</u> Connect per Figure # 2 <u>SIGNAL GENERATOR:</u> Set the signal generator to 127.500 MHz. Set the R.F. level for 10 mV, 1000 Hz INT AM, 30% modulation. <u>AUDIO ANALYZER:</u> Connect audio analyzer input to the R.T.I.U. Front Panel (J2U2/J2T2) Set the audio analyzer to measure distortion.	
	11.010	Less than or equal to 5%		Measure the distortion level at the SELCAL/ACARS-DATA-OUT (P5-67) The distortion shall be as specified.			Measure the distortion at the SELCAL/ACARS-DATA-OUT (P5-67) (R.T.I.U. J2U2/J2T2). The distortion level shall be as specified.	Less than or equal to 5%
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	12.000			<u>SELCAL/ACARS FREQUENCY AND PHASE RESPONSE</u> Select Radio Channel 127.50. Apply an on channel R.F. signal of 1000 uV at 600 Hz 30% modulation.	Test Setup # 1		<u>SELCAL/ACARS FREQUENCY AND PHASE RESPONSE</u> Connect per Figure # 2 <u>AUDIO ANALYZER:</u> Connect Audio Analyzer 600-ohm audio output to the signal generator external modulation input. <u>SIGNAL GENERATOR:</u> Set the signal generator for 127.500 MHz. Set the R.F. level for 1000 uV, AM EXT MOD: 30% modulation. <u>AUDIO ANALYZER:</u> Set analyzer frequency for 600 Hz. Adjust output voltage until signal generator HI/LO light goes out. <u>AUDIO ANALYZER:</u> Connect the audio analyzer input to the R.T.I.U. front panel (J2U2/J2T2) Set the audio analyzer to measure Vrms.	
	12.010	REFERENCE		<u>FREQUENCY RESPONSE</u> Measure the audio level at SELCAL/ACARS-DATA-OUT (P5-67).			<u>FREQUENCY RESPONSE</u> Measure the SELCAL/ACARS-DATA-OUT (P5-67) (R.T.I.U. J2U2/J2T2). Record for reference.	REFERENCE
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	12.020	REFERENCE		Change the modulation frequency to 1200 Hz. Measure the audio level at SELCAL/ACARS-DATA-OUT (P5-67).			<u>AUDIO ANALYZER:</u> Set analyzer frequency for 1200 Hz. Adjust output voltage until signal generator HI/LO light goes out. <u>AUDIO ANALYZER:</u> Measure the SELCAL/ACARS-DATA-OUT (P5-67) (R.T.I.U. J2U2/J2T2). Record for reference.	REFERENCE
	12.030	REFERENCE		Change the modulation frequency to 2.4 kHz. Measure the audio level at SELCAL/ACARS-DATA-OUT (P5-67).			<u>AUDIO ANALYZER:</u> Set analyzer frequency for 2400 Hz. Adjust output voltage until signal generator HI/LO light goes out. <u>AUDIO ANALYZER:</u> Measure the SELCAL/ACARS-DATA-OUT (P5-67) (R.T.I.U. J2U2/J2T2). Record for reference.	REFERENCE
	12.040	REFERENCE		Change the modulation frequency to 4 kHz. Measure the audio level at SELCAL/ACARS-DATA-OUT (P5-67).			<u>AUDIO ANALYZER:</u> Set analyzer frequency for 4000 Hz. Adjust output voltage until signal generator HI/LO light goes out. <u>AUDIO ANALYZER:</u> Measure the SELCAL/ACARS-DATA-OUT (P5-67) (R.T.I.U. J2U2/J2T2). Record for reference.	REFERENCE
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	12.050	REFERENCE		Change the modulation frequency to 6.6 kHz. Measure the audio level at SELCAL/ACARS-DATA-OUT (P5-67).			<u>AUDIO ANALYZER:</u> Set analyzer frequency for 6600 Hz. Adjust output voltage until signal generator HI/LO light goes out. <u>AUDIO ANALYZER:</u> Measure the SELCAL/ACARS-DATA-OUT (P5-67) (R.T.I.U. J2U2/J2T2). Record for reference.	REFERENCE
	12.060	Less than or equal to 6 dB		The variation in output level between 600 Hz, 1.2 kHz, 2.4 kHz, 4 kHz, and 6.6 kHz modulation (12.010,12.020, 12.030, 12.040,12.050) shall be as specified.			Calculate the Maximum dB difference between (12.010, 12.020, 12.030, 12.040 and 12.050). The difference shall be as specified.	Less than or equal to 6 dB.
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	13.000			<u>A.G.C. RISE</u> Select Radio channel 127.500. Apply an on channel R.F. signal (standard modulation) at 5 uV.	Test Setup #1		<u>A.G.C. RISE</u> Connect per Figure # 2 <u>SIGNAL GENERATOR:</u> Set the signal generator to 127.500 MHz. Set the R.F. level for 5 uV, 1000 Hz INT MOD, and 30% modulation. <u>AUDIO ANALYZER:</u> Connect the audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5). Set the audio analyzer to measure Vrms.	
	13.010	REFERENCE		Measure the audio level at NAV/COM-AUDIO+ (P5-62). Change the R.F. level to 1000 uV.			Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5) level. Record for reference. <u>SIGNAL GENERATOR:</u> Set the R.F. level for 1 mV.	REFERENCE
	13.020	REFERENCE		Measure the audio level at NAV/COM-AUDIO+ (P5-62). Change the R.F. level to 0.3 V.			<u>AUDIO ANALYZER:</u> Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V52/J2U5) Audio Output level. Record for reference. <u>SIGNAL GENERATOR:</u> Set the R.F. level to 0.3 V.	REFERENCE
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	13.030	REFERENCE		Measure the audio level at the NAV/COM-AUDIO+ (P5-62).			<u>AUDIO ANALYZER:</u> Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U J2V5/J2U5). Record for reference.	REFERENCE
	13.040	Less than or equal to 3 dB		The audio level variation from 5 uV (13.010) through 1000 uV (13.020) to 0.3 V (13.030) shall be as specified.			Calculate the audio level variation from (13.010 to 13.030). At no signal level shall the variation exceed as specified.	Less than or equal to 2 dB
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	14.000			<u>NOISE LEVEL</u> Select Radio channel 127.500. Apply an on channel R.F. signal of 100 uV with standard modulation to the VHF COM antenna connector.	Test Setup #1		<u>NOISE LEVEL</u> Connect per Figure # 2 <u>SIGNAL GENERATOR:</u> Set the signal generator to 127.500 MHz. Set the R.F. level to 100 uV, 1000 Hz, 30% INT AM MOD. <u>AUDIO ANALYZER:</u> Connect the audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5). Set the audio analyzer to measure Vrms.	
	14.010	REFERENCE		Measure and record the audio level at NAV/COM-AUDIO+ (P5-62).			Measure the NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). Record for reference. <u>SIGNAL GENERATOR:</u> Turn the modulation off. AM MOD: OFF	REFERENCE
	14.020	REFERENCE		Remove the modulation from the R.F. input signal. Measure and record the audio level at NAV/COM-AUDIO+ (P5-62).			<u>AUDIO ANALYZER:</u> Measure and record the NAV/COM-AUDIO+ (R.T.I.U. J2V5/J2U5).	REFERENCE
	14.030	greater than or equal to 30 dB		The ratio between the readings obtained in 14.010 and 14.020 shall be as specified.			Calculate the difference between (14.010) and (14.020). Shall be as specified.	greater than or equal to 33 dB
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	14.040	REFERENCE		Apply an on channel R.F. signal of 3000 uV with standard modulation to the VHF COM antenna connector. Measure and record the audio level at NAV/COM-AUDIO+ (P5-62).			<u>SIGNAL GENERATOR:</u> Set 30% INT MOD, R.F. level for 3000 uV. <u>AUDIO ANALYZER:</u> Measure and record the audio level at NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5) <u>SIGNAL GENERATOR:</u> Turn the modulation off. <u>AUDIO ANALYZER:</u> Measure and record the audio level at NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5)	REFERENCE
	14.050	REFERENCE		Remove the modulation from the R.F. input signal. Measure and record the audio level at NAV/COM-AUDIO+ (P5-62).			<u>SIGNAL GENERATOR:</u> Turn the modulation off. <u>AUDIO ANALYZER:</u> Measure and record the audio level at NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5)	REFERENCE
	14.060	greater than or equal to 40 dB		The ratio between the readings obtained in 14.040 and 14.050 shall be as specified. Apply an on channel R.F. signal of 0.1 V with standard modulation to the VHF COM antenna connector.			Calculate the difference between (14.040) and (14.050). The difference shall be as specified. <u>SIGNAL GENERATOR:</u> Set the signal generator to 127.500 MHz. Set the R.F. level to 0.1V, 1000 Hz 30% INT AM MOD.	greater than or equal to 40 dB
	14.070	REFERENCE		Measure and record the audio level at NAV/COM-AUDIO+ (P5-62). Remove the modulation from the R.F. input signal.			<u>AUDIO ANALYZER:</u> Measure and record the audio output at NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5). <u>SIGNAL GENERATOR:</u> Turn off the modulation.	REFERENCE
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LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	14.080	REFERENCE		Measure and record the audio level at NAV/COM-AUDIO+ (P5-62).			<u>AUDIO ANALYZER:</u> Measure and record the audio output at NAV/COM-AUDIO+ (P5-62) (R.T.I.U. J2V5/J2U5).	REFERENCE
	14.090	greater than or equal to 40 dB		The ratio between the readings obtained in 14.070 and 14.080 shall be as specified.			Calculate the difference between (14.070) and (14.080). The difference shall be as specified.	greater than or equal to 40 dB
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	15.000			<u>IMAGE REJECTION</u> This test (15.xxx) applies to -813 only. Select Radio channel 127.5. Apply a 5 uV on channel un-modulated R.F. signal to the VHF COM antenna connector.	Test Setup #1		<u>IMAGE REJECTION</u> Connect per Figure # 2 <u>SIGNAL GENERATOR:</u> Set the signal generator to 127.500 MHz. Set the R.F. level to 5 uV, no modulation. <u>DVM:</u> Connect the DVM to R.T.I.U. (J1M3) and D.C. ground. Set the DVM to measure D.C. volts.	
	15.010	REFERENCE		Measure and record the AGC level (P5-65) in dB.			Measure and record the AGC voltage at (J1M3).	REFERENCE
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	15.020	greater than or equal to 90 dB above 5 uV (158 mV)		Change the frequency of the R.F. input signal to the image frequency (171.150 MHz). Increase the R.F. level of the input signal until the AGC level of step 15.01 is obtained. The amplitude of the R.F. signal shall be as specified.			<u>SIGNAL GENERATOR:</u> Set the signal generator to 171.150 MHz. Increase the R.F. level of the input signal until the AGC voltage is equal to the value obtained in (15.010). <u>NOTE:</u> The AGC voltage should increase from (15.01) when the frequency is changed. When the R.F. level is increased the AGC voltage will decrease to the level of (15.010). If the AGC level has not dropped below the reference level then a larger R.F. input is necessary and the image rejection is greater than 90 dB. The Amplitude shall be as specified.	greater than or equal to 90 dB above 5 uV (158 mV)
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LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	16.000			<u>SIMULCOM</u> Place holder for a feature to be added in the future	Test Setup #1		<u>SIMULCOM</u>	
	17.000			Place holder for a feature to be added in the future. <u>TRANSMITTER TESTS:</u> CAUTION: DO NOT TRANSMIT UNTIL COM ANTENNA CABLE IS CONNECTED TO A SAFE LOAD CAPABLE OF DISSIPATING AT LEAST 50 WATTS	Test Setup # 2			
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	18.020	16 W min 30 W max		Channel the radio to 127.100. Ground the VHF COM PTT line (P5-24). The R.F. output power at the VHF COM antenna connector shall be as specified. The transmitter must be keyed for at least 3 seconds for test 18.050 to be valid.	<F> <127.100> <T> <T>		Frequency 127.100 Key Transmitter Wait 10 seconds <u>MODULATION ANALYZER:</u> Note the power level for calculations. Un-key transmitter Calculate the output power using the meter reading and the attenuation losses. The results shall be as specified.	20.2 W min 28.5 W max
	18.030	16 W min 30 W max		Channel the radio to 136.000. Ground the VHF COM PTT line (P5-24) The R.F. output power at the VHF COM antenna connector shall be as specified. The transmitter must be keyed for at least 3 seconds for test 18.050 to be valid.	<F> <136.000> <T> <T>		Frequency 136.000 Key Transmitter Wait 10 seconds <u>MODULATION ANALYZER:</u> Note the power level for calculations. Un-key transmitter Calculate the output power using the meter reading and the attenuation losses. The results shall be as specified.	20.2 W min 28.5 W max
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
F				This test (18.040) applies to -81x only. Channel the radio to 151.800. Ground the VHF COM PTT line (P5-24)	<F> <151.800> <T>		Frequency 151.800 Key Transmitter Wait 10 seconds <u>MODULATION ANALYZER:</u> Note the power level for calculations. Un-key Transmitter	
A	18.040	16 W min 30 W max		The R.F. output power at the VHF COM antenna connector shall be as specified. The transmitter must be keyed for at least 3 seconds for test 18.050 to be valid	<T>		Calculate the output power using the meter reading and the attenuation losses. The results shall be as specified. Page Menu Maintenance Menu	16.0 W min 28.5 W max
	18.050	None		Maintenance Log. Place holder.	<P> <M>		Error codes for current power on count. Page Menu RCB/ACH Page Frequency 127.100	
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	19.000			<u>EXTENDED TRANSMISSIONS</u> THE FOLLOWING TESTS ARE TIMED. IT IS INTENDED THESE THREE TESTS 19.010, 19.020 AND 19.030 ALL BE DONE IN ONE CONTINUOUS TRANSMISSION.	Test Setup # 2		<u>EXTENDED TRANSMISSIONS</u> Connect per Figure # 3 THE FOLLOWING TESTS ARE TIMED. IT IS INTENDED THESE THREE TESTS 19.010, 19.020 AND 19.030 ALL BE DONE IN ONE CONTINUOUS TRANSMISSION. READ THROUGH THE TEST AND UNDERSTAND IT BEFORE CONTINUING! <u>NOTE:</u> After keying the transmitter note the power readings at the times specified. Calculate the power for each reading after the 2-minute time limit is finished. <u>NOTE:</u> If the radio has been in transmit mode for 1 minute or longer the radio must be left in a non-transmit mode for 4 minutes before taking new power readings.	
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
				Channel the radio to 136.000. Key the transmitter by grounding the VHF COM PTT line (P5-2).	<F> <136.000> <T>		<u>MODULATION ANALYZER:</u> (POWER METER) Measures the output power at the VHF COM antenna connector. Calculate the output power using the meter reading and the attenuation losses <u>NOTE:</u> All attenuation losses are to be calculated out of the power measurements for an accurate reading. The actual losses of the power attenuator and cable must be known and used when taking power readings. Correction factors for the power meter must be used. START TIMER UPON KEYING TRANSMITTER Frequency 136.000 Key Transmitter	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	19.010	16 W min 30 W max		Within 15 seconds of keying the transmitter, the R.F. power at the antenna jack shall be as specified. After 90 ± 10 seconds of continuous transmitter operation measure the power output.			Within 15 seconds of keying the transmitter measure the output power. The power shall be as specified. At 90 ± 10 seconds of continuous transmitter operation take a power measurement from the MOD ANALYZER.	18 W min 28.5 W max
	19.020	13 W min 30 W max		The R.F. output power at the antenna jack shall be as specified. Monitor the RCB page, (RCB DATA) column "ACT CHANNEL" row, and "From COM" column; monitor values 'T' transmit, 'R' receive			The power shall be as specified. Monitor the RCB page, (RCB DATA) column "ACT CHANNEL" row, and "From COM" column; monitor values 'T' transmit, 'R' receive	14 W min 28.5 W max
	19.030	110 sec min 130 sec max		The radio shall automatically un-key the transmitter: Stop the timer when the RTIU value changes from 'T' to 'R'. The timer should read as specified	<T> <F> <127.100>		Stop the timer when the RTIU value changes from 'T' to 'R'. The timer should read as specified Un-key Transmitter Frequency 127.100	110 sec min 130 sec max
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	20.000			<u>TRANSMIT INPUT CURRENT</u>	Test Setup #2		<u>TRANSMIT INPUT CURRENT</u> Connect per Figure # 3 COM ON/OFF: OFF Remove 28-volt power plug and insert current meter in series with the high input line. Reconnect 28-volt power plug to VDR.	
	20.010	less than or equal to 7.0 A		Channel the radio to 127.100 and key the transmitter. With no audio applied to the COM-MIC-HI (P5-2), measure the total input current on the +27.5 V dc line (J3-39, 59). The current shall be as specified.	<O>		COM ON/OFF: ON Key Transmitter	
				Un-key the transmitter	<T> <O>		Measure the total input current on the + 27.5 V dc line (A1A1P1-5 for -90X; J3-39, 59). The current shall be as specified.	less than or equal to 7.0 A
					<O>		Un-key Transmitter COM ON/OFF: OFF Remove the current meter from the 28 volt input line and reconnect 28-volt line to the VDR.	
					<O>		COM ON/OFF: ON	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	21.000			<u>FREQUENCY TOLERANCE</u>	Test Setup #2		<u>FREQUENCY TOLERANCE</u> Connect per Figure # 3 <u>MODULATION ANALYZER:</u> Set to measure frequency. Frequency 120.000 Key Transmitter	
	21.010	120.00 ± 0.0006 MHz		Channel the radio to 120.00 MHz and key the transmitter. With no audio applied to the COM-MIC-HI (P5-2), measure the output frequency. The frequency shall be as specified.	<F> <120.000> <T> <T> <F> <127.100>		<u>MODULATION ANALYZER:</u> Measure the transmitter output frequency. The frequency shall be as specified. Un-key Transmitter Frequency 127.100	120.00 ± 0.0006 MHz
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	23.000			<u>VOICE AND DATA MODULATION LEVEL</u> <u>VOICE MODULATION LEVEL</u> Channel the radio to 127.100. Apply a 400 mVrms, 1 kHz to the COM-MIC-HI (P5-2) and key the transmitter.	Test Setup #2 <T> <T> <T>		<u>VOICE AND DATA MODULATION LEVEL</u> Connect per Figure # 3 <u>VOICE MODULATION LEVEL</u> <u>DVM:</u> Connect DVM to COM-MIC-HI (R.T.I.U. J2V3/J2M6). Set DVM to measure Vrms. <u>AUDIO ANALYZER:</u> Connect the audio analyzer output to the R.T.I.U. audio input jack. <u>NOTE:</u> The MIC level input must be set prior to taking the modulation reading. The level is set with the unit transmitting Key Transmitter. <u>AUDIO ANALYZER:</u> Set the audio analyzer for 1000 Hz output. While monitoring the DVM adjust the audio analyzer output voltage until the DVM reads 400 mVrms. Un-Key transmitter Key Transmitter	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	23.010	75% to 95%		The modulation level shall be as specified.			<u>MODULATION ANALYZER:</u> Measure the (pos.) and (neg.) peak values. The average of these two readings will be as specified.	80% to 90%
				Un-key the transmitter.	<T>		Un-key Transmitter	
				Channel radio to 118.100. Apply a 400 mVrms, 1 kHz tone to COM-MIC-HI (P5-2) and key the transmitter.	<F> <118.100>		Frequency 118.100	
	23.020	75% to 95%		The modulation level shall be as specified.			<u>MODULATION ANALYZER:</u> Measure the (pos.) and (neg.) peak values. The average of these two readings will be as specified.	75% to 95%
					<T>		Key Transmitter.	
					<F> <136.000>		Frequency 136.000	
				Channel the radio to 136.000. Apply a 400 mVrms, 1 kHz tone to COM-MIC-HI (P5-2) and key the transmitter.	<T>		Un-key Transmitter	
	23.030	75% to 95%		The modulation level shall be as specified.			<u>MODULATION ANALYZER:</u> Measure the (POS.) and (NEG) peak values. The average of these two readings will be as specified.	75% to 95%
					<T>		Un-Key Transmitter	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	25.000			<u>SIDETONE DISTORTION</u>	Test Setup #2		<u>SIDETONE DISTORTION</u> Connect per Figure # 3 <u>DVM:</u> Connect DVM to R.T.I.U. (J2V3/J2M6) set for Vrms. <u>AUDIO ANALYZER:</u> Connect Audio analyzer output to R.T.I.U. audio input jack. <u>AUDIO ANALYZER:</u> Set frequency output for 1000 Hz. Connect the audio analyzer input to the R.T.I.U. front panel (J2V5/J2U5). Set the audio analyzer to measure distortion. Key Transmitter <u>AUDIO ANALYZER:</u> Monitor the DVM and adjust the voltage output for 250 mVrms. Un-key Transmitter Key Transmitter <u>AUDIO ANALYZER:</u> Measure the NAV/COM-AUDIO + (R.T.I.U. J2V5/J2U5). The distortion shall be as specified. Un-key Transmitter	
	25.010	Less than or equal to 10%		Channel the radio to 127.100. Key the transmitter. Apply a 250 mVrms, 1 kHz tone to COM-MIC-HI (P5-2). Measure the audio distortion at NAV/COM-AUDIO + (P5-62). The distortion shall be as specified.	<T> <T> <T> <T>			Less than or equal to 10%
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	26.010	Less than or equal to 10%		The combined noise and distortion in the demodulated output of the transmitter shall be as specified. <T> Apply a 300 Hz tone. <T> Key the transmitter. Apply a 250 mVrms, 300 Hz tone to COM-MIC-HI (P5-2). <T> <T>			<u>AUDIO ANALYZER:</u> Measure the combined noise and distortion in the demodulated output of the transmitter. Shall be as specified. Un-key Transmitter <u>AUDIO ANALYZER:</u> Change audio analyzer frequency output to 300 Hz. Key Transmitter <u>AUDIO ANALYZER:</u> Monitor the DVM and adjust the voltage output for 250 mVrms. Un-key Transmitter Key Transmitter	Less than or equal to 10%
	26.020	Less than or equal to 10%		Measure the combined distortion and noise in the demodulated output of the transmitter at modulation frequency 300 Hz. <T> Apply a 3000 Hz tone. <T> Key the transmitter. Apply a 250 mVrms, 3 kHz tone to COM-MIC-HI (P5-2).			<u>AUDIO ANALYZER:</u> Measure the combined noise and distortion in the demodulated output of the transmitter. Shall be as specified. Un-key Transmitter <u>AUDIO ANALYZER:</u> Change audio analyzer frequency output to 3000 Hz. Key Transmitter <u>AUDIO ANALYZER:</u> Monitor the DVM and adjust the voltage output for 250 mVrms.	Less than or equal to 10%
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	27.030	REFERENCE		Change the modulation frequency to 3 kHz and measure the modulation level.			<u>MODULATION ANALYZER:</u> Measure the modulation level and record for reference.	REFERENCE
	27.040	Less than or equal to 6 dB		The variation in modulation level from the highest to the lowest level measured in (27.010, 27.020, 27.030) shall be as specified.	<T>		Un-key Transmitter Calculate the variation in dB from the highest to lowest level in tests (27.010, 27.020, and 27.030). The variation from highest to lowest level shall be as specified.	Less than or equal to 6 dB
				Channel the radio to 127.105.	<F> <127.105>		Frequency 127.105 <u>AUDIO ANALYZER:</u> Set the frequency output to 300 Hz.	
				Key the transmitter and apply a 50 mVrms, 300 Hz tone to COM-MIC-HI (P5-2).	<T>		Key Transmitter <u>AUDIO ANALYZER:</u> While monitoring the DVM, adjust the voltage output of the audio analyzer for 50 mVrms on the DVM.	
					<T>		Un-key Transmitter	
					<T>		Key Transmitter	
	27.050	REFERENCE		Measure and record the modulation level.			<u>MODULATION ANALYZER:</u> Measure the modulation level. Record for reference.	REFERENCE
					<T>		Un-key Transmitter.	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	27.060	REFERENCE		Key the transmitter and apply a 50 mVrms, 1000 Hz tone to COM-MIC-HI (P5-2).	<T>		<u>AUDIO ANALYZER:</u> Set frequency output to 1000 Hz. <u>AUDIO ANALYZER:</u> While monitoring the DVM adjust the voltage output of the audio analyzer for 50 mVrms on the DVM. Un-key Transmitter Key Transmitter	REFERENCE
	27.070	REFERENCE		Change the modulation frequency to 1 kHz and measure the modulation level.	<T>		<u>MODULATION ANALYZER:</u> Measure the modulation level and record for reference. Un-key Transmitter <u>AUDIO ANALYZER:</u> Set the frequency output to 2500 Hz. <u>AUDIO ANALYZER:</u> While monitoring the DVM adjust the voltage output of the audio analyzer for 50 mVrms on the DVM. Un-key Transmitter Key Transmitter	REFERENCE
				Key the transmitter and apply a 50 mVrms, 2500 Hz tone to COM-MIC-HI (P5-2).	<T>		<u>MODULATION ANALYZER:</u> Measure the modulation level and record for reference. Un-key Transmitter	REFERENCE
				Change the modulation frequency to 2.5 kHz and measure the modulation level.	<T>		Un-key Transmitter	

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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION	
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS	
A	27.080	Less than or equal to 6 dB		The variation in modulation level from the highest to the lowest level measured in (27.050, 25.060, 25.070) shall be as specified.			Calculate the variation in dB from the highest to lowest level in tests (27.050, 27.060, and 27.070). The variation from highest to lowest level shall be as specified.	Less than or equal to 6 dB	
				Key the transmitter and apply a 50 mVrms, 3000 Hz tone to COM-MIC-HI (P5-2).	<T>		AUDIO ANALYZER: Set the frequency output to 3000 Hz.		
					<T>		AUDIO ANALYZER: While monitoring the DVM adjust the voltage output of the audio analyzer for 50 mVrms on the DVM.		
	27.090	REFERENCE		Change the modulation frequency to 3.0 kHz and measure the modulation level.	<T>		Un-key Transmitter	REFERENCE	
							Key Transmitter		
							MODULATION ANALYZER: Measure the modulation level and record for reference.		
					<T>		Un-key Transmitter		
	27.100	Greater than or equal to 18 dB		The variation in the modulation level of 27.090 compared to the level in 25.060 shall be as specified.			Calculate the variation in dB between the level in test 27.090 compared to the level in 27.060. The variation shall be as specified.	Greater than or equal to 18 dB	
					<F>		Frequency		
					<127.100>		127.100		
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	28.000			<u>ACARS-DATA-IN FREQUENCY AND PHASE RESPONSE</u> Place holder for future test			<u>ACARS-DATA-IN FREQUENCY AND PHASE RESPONSE</u>	
	29.000			<u>CARRIER NOISE LEVEL</u> Key transmitter and apply a 250 mVrms, 1000 Hz tone to COM-MIC-HI (P5-2).	Test Setup #2 <T> <T>		<u>CARRIER NOISE LEVEL</u> Connect per Figure # 4 <u>DVM:</u> Connect the DVM to the R.T.I.U. J2V3/J2M6. Set the DVM to measure Vrms. <u>AUDIO ANALYZER:</u> Set the audio analyzer for 1000 Hz frequency output. Set analyzer to measure ((S+N)/N). Connect to the R.T.I.U. audio input jack. Key Transmitter <u>AUDIO ANALYZER:</u> While monitoring the DVM adjust the audio output voltage for 250 mVrms on the DVM. Set the audio analyzer to measure dB. Un-key Transmitter	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	29.010	Greater than or equal to 50 dB		Measure the demodulated audio level with the audio signal applied and removed ((S+N)/N). The ((S+N)/N) shall be as specified.	<T>		<u>MODULATION ANALYZER:</u> (HP8901A) Apply a 15 kHz, LP Filter. Set the modulation analyzer to measure (AM). (ENTER 2.2 SPCL) Non-autoranging. Connect the Modulation Analyzer demodulated output to the audio analyzer input. Key Transmitter <u>AUDIO ANALYZER:</u> Measure the demodulated audio level. The transmitter output ((S+N)/N) ratio shall be as specified. Un-key Transmitter <u>MODULATION ANALYZER:</u> (HP8901A) ENTER AUTOMATIC OPERATION.	Greater than or equal to 50 dB
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	30.010	less than or equal to 1000 Hz		The peak frequency deviation shall be as specified.			<u>MODULATION ANALYZER:</u> Measure the (FM) frequency. The frequency shall be as specified.	Less than or equal to 1000 Hz.
					<T>		Un-key Transmitter	
				Change the radio channel to 128.000.	<F>		Frequency 128.000	
				Key the transmitter.	<T>		Key Transmitter	
	30.020	Less than or equal to 1000 Hz		The peak frequency deviation shall be as specified.			<u>MODULATION ANALYZER:</u> Measure the (FM) frequency. The frequency shall be as specified.	Less than or equal to 1000 Hz
					<T>		Un-key Transmitter	
				Change the radio channel to 136.000.	<F>		Frequency 136.000	
				Key the transmitter.	<T>		Key Transmitter	
	30.030	Less than or equal to 1000 Hz		The peak frequency deviation shall be as specified.			<u>MODULATION ANALYZER:</u> Measure the (FM) frequency. The frequency shall be as specified.	Less than or equal to 1000 Hz
					<T>		Un-key Transmitter	
					<F>		Frequency 118.100	
					<T>		Un-key Transmitter	
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	31.000			<u>SPURIOUS R.F. EMISSIONS</u> THIS TEST MANDATORY ONLY FOR ORIGINAL MANUFACTURING TEST.	Test Setup #3		<u>SPURIOUS R.F. EMISSIONS</u> Connect per Figure # 5 Disconnect the antenna port from the modulation analyzer. <u>AUDIO ANALYZER:</u> Output voltage to zero (0) V ac. <u>SPECTRUM ANALYZER:</u> Connect the spectrum analyzer to the VHF COM antenna connector through two (2) 20 dB power attenuators. Adjust the analyzer attenuation to 20 dB. Key Transmitter <u>SPECTRUM ANALYZER:</u> Adjust spectrum analyzer for the R.F. level of the carrier to the top of the screen. Un-key Transmitter <u>SPECTRUM ANALYZER:</u> Insert the trap after the pads. Adjust analyzer attenuation to 0 dB.- DO NOT REMOVE POWER PADS	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	31.010	Less than -70 dBc for harmonics not between 1015 and 1045 MHz		Channel the radio to 118.100. Key the transmitter with a 145 mVrms 1 kHz audio signal applied to COM-MIC-HI (P5-2). Verify that the levels of harmonic and spurious signals coming from the VHF COM antenna connector are as specified.	<T> <T> <T>		<u>DVM</u> Connect DVM to the R.T.I.U. (J2V3/J2M6) COM-MIC-HI. Set DVM to read V ac. Key Transmitter <u>AUDIO ANALYZER:</u> While monitoring the DVM adjust the audio analyzer output for 145 mVrms on the DVM. Un-Key Transmitter Key Transmitter <u>SPECTRUM ANALYZER:</u> Adjust the trap until the analyzer shows minimum carrier level. Verify the spurious and harmonics outside the 1015 and 1045 MHz frequency range. Shall be as specified.	Less than-70 dBc for harmonics not between 1015 and 1045 MHz
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	31.020	Less than -90 dBc for harmonics between 1015 and 1045 MHz and all non-harmonic spurious signals					Verify the spurious and harmonics between the 1015 and 1045 MHz frequency range. Shall be as specified.	Less than -90 dBc for harmonics between 1015 and 1045 MHz and all non-harmonic spurious signals.
					<T>		Un-key Transmitter	
							Remove trap. Set input attenuation for 20-dB input.	
							<u>AUDIO ANALYZER:</u>	
							Set output for 0 Vrms.	
				Channel radio to 128.000.	<F> <128.000>		Frequency 128.000	
					<T>		Key Transmitter. Adjust the R.F. level for the carrier to the top of the screen.	
					<T>		Un-key Transmitter.	
							<u>SPECTRUM ANALYZER:</u>	
							Insert trap.	
					<T>		Key Transmitter.	
							<u>AUDIO ANALYZER:</u>	
							While monitoring the DVM adjust the audio analyzer output for 145 mVrms on the DVM.	
					<T>		Un-Key Transmitter	
					<T>		Key Transmitter	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	31.030	Less than -70 dBc for harmonics not between 1015 and 1045 MHz		With the radio tuned to 128.000. Verify that the levels of harmonic and spurious signals coming from the VHF COM antenna connector are as specified.			<u>SPECTRUM ANALYZER:</u> Set analyzer attenuation to zero (0). Tune trap for min carrier level. <u>SPECTRUM ANALYZER:</u> Read and record the level of harmonics and spurious shall be as specified.	Less than -70 dBc for harmonics not between 1015 and 1045 MHz
	31.040	Less than -90 dBc for harmonics between 1015 and 1045 MHz and all non-harmonic spurious signals		Channel radio to 136.000.	<T>		<u>SPECTRUM ANALYZER:</u> Read and record the level of harmonics and spurious shall be as specified. Un-key Transmitter Remove trap. Set input attenuation for 20-dB input. <u>AUDIO ANALYZER:</u> Set output for 0 Vrms. Frequency 136.000 Key Transmitter Adjust the R.F. level for the carrier to the top of the screen. Un-key Transmitter <u>SPECTRUM ANALYZER:</u> Insert trap.	Less than -90 dBc for harmonics between 1015 and 1045 MHz and all non-harmonic spurious signals
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	31.050	Less than -70 dBc for harmonics not between 1015 and 1045 MHz		With the radio tuned to 136.000. Verify that the levels of harmonic and spurious signals coming from the VHF COM antenna connector are as specified.	<T>		Key Transmitter. <u>AUDIO ANALYZER:</u> While monitoring the DVM adjust the audio analyzer output for 145 mVrms on the DVM. <u>SPECTRUM ANALYZER:</u> Set analyzer attenuation to zero (0). Tune trap for min carrier level. <u>SPECTRUM ANALYZER:</u> Read and record the level of harmonics and spurious shall be as specified.	Less than -70 dBc for harmonics not between 1015 and 1045 MHz
	31.060	Less than -90 dBc for harmonics between 1015 and 1045 MHz and all non-harmonic spurious signals					<u>SPECTRUM ANALYZER:</u> Read and record the level of harmonics and spurious shall be as specified.	
					<T>		Un-key Transmitter <u>SPECTRUM ANALYZER:</u> Set analyzer attenuator to 20 dB and remove trap.	
					<F> <127.500>		Frequency 127.500	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	32.000			<u>PHONE AUDIO OUTPUT</u>	Test Setup #1		<u>PHONE AUDIO OUTPUT</u> Connect per Figure # 2 <u>SIGNAL GENERATOR:</u> Set signal generator for 127.500 MHz, 1000 uV R.F. output, 1 kHz, 30% A.M. modulation. <u>AUDIO ANALYZER:</u> (DVM or Oscilloscope) Set Audio analyzer to measure Vrms. Connect analyzer to R.T.I.U. audio output jack. Page Menu Audio/Analog Page Audio Output Phone	
	32.010	Greater than or equal to 800 mVrms		Verify that the Receiver and Side tone audio is properly steered to the three phone audio outputs. With the radio receiving a standard modulated signal, the NAV/COM-PHONE-AUDIO-HI (P5-25) with respect to COM PH AUD LO (P5-5) shall be as specified.	<P> <A> <A> 		<u>AUDIO ANALYZER:</u> Measure the output of the R.T.I.U. audio jack NAV/COM-PHONE-AUDIO-HI [R.T.I.U. J2T5/J2S5]. The output shall be as specified.	Greater than or equal to 800 mVrms
	32.020	Less than or equal to 80 mVrms		With the radio receiving a standard modulated signal, the SIDE TONE PH AUD (P5-7) with respect to COM PH AUD LO (P5-5) shall be as specified.	<A> <C>		<u>AUDIO ANALYZER:</u> Measure the output of the R.T.I.U. audio jack SIDE TONE PH AUD. [R.T.I.U. J2P2/J2N2]. The output shall be as specified.	Less than or equal to 80 mVrms
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
H	32.030	Greater than or equal to 800 mVrms		With the radio receiving a standard modulated signal, the REC-PHONE-AUDIO (P5-27) with respect to COM PH AUD LO (P5-5) shall be as specified.	<P> <R>		<u>AUDIO ANALYZER:</u> Measure the output of the R.T.I.U. audio jack REC-PHONE AUDIO [R.T.I.U. J2S2/J2R2]. The output shall be as specified. Page Menu RCB/ACH Page <u>CONNECT UUT PER FIGURE # 3</u> <u>AUDIO ANALYZER:</u> Connect the audio analyzer output to the R.T.I.U. audio input jack. Set audio output frequency to 1000 Hz. Connect audio analyzer input to the R.T.I.U. audio output jack. Set the analyzer to measure Vrms. Frequency 127.100 <u>DVM</u> Connect the DVM to R.T.I.U. J2V3/J2M6 (COM-MIC-HI). Key Transmitter Monitor the DVM while adjusting the audio analyzer output. Adjust the analyzer output for the DVM to read 400 mVrms. Un-key Transmitter	Greater than or equal to 800 mVrms
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	32.040	Greater than or equal to 800 mVrms		With the radio transmitting a standard modulated signal, the NAV/COM-PHONE-AUDIO-HI (P5-25) with respect to the COM PH AUD LO (P5-5) shall be as specified.	<P> <A> <A> <T>		Page Menu Audio/Analog Page Audio Output Phone Key Transmitter <u>AUDIO ANALYZER:</u> Measure the output of the R.T.I.U. audio jack NAV/COM-PHONE-AUDIO-HI [R.T.I.U. J2T5/J2S5]. Shall be as specified.	Greater than or equal to 800 mVrms
	32.050	Greater than or equal to 800 mVrms		With the radio transmitting a standard modulated signal the SIDE TONE PH AUD (P5-7) with respect to the COM PH AUD LO (P5-5) shall be as specified.	<T> <A> <C> <T> <T> <A> <D> <T>		Un-key Transmitter Audio Output Sidetone Key Transmitter <u>AUDIO ANALYZER:</u> Measure the output of the R.T.I.U. audio jack SIDE TONE PH AUD [R.T.I.U. J2P2/J2N2]. Shall be as specified. Un-Key Transmitter Audio Output Rec-Phone Key Transmitter	Greater than or equal to 800 mVrms
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	32.060	Less than or equal to 80 mVrms		With the radio transmitting a standard modulated signal the REC-PHONE-AUD (P5-27) with respect to COM PH AUD LO (P5-5) shall be as specified.	<T> <A> <F> <P> <R>		<u>AUDIO ANALYZER:</u> Measure the output of the R.T.I.U. audio jack REC-PHONE-AUDIO [R.T.I.U. J2S2/J2R2]. Shall be as specified. Un-Key Transmitter Audio Output None Page Menu RCB/ACH Page <u>AUDIO ANALYZER:</u> REMOVE SIGNAL FROM R.T.I.U. AUDIO INPUT JACK.	Less than or equal to 80 mVrms
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	33.000			<u>MICROPHONE BIAS</u>	Test Setup #2		<u>MICROPHONE BIAS</u> Connect per Figure # 3 <u>AUDIO ANALYZER:</u> (DVM) Set audio analyzer to measure V dc. Connect to the R.T.I.U. J2V3 (H) and 28 RTN T.P. (L). Key Transmitter <u>AUDIO ANALYZER:</u> (DVM) The voltage measured shall be as specified.	
	33.010	3.4 ± 1.1 V dc		Set the radio to channel 127.100. Key the transmitter. The voltage at COM-MIC-HI (P5-2) with a 150 ohm load to ground shall be as specified.	<T> <T> <F> <127.500>		Un-key Transmitter Frequency 127.500	3.4 ± 1.1 V dc
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A F F F	34.010	Greater than or equal to 6 dB		Inject a 118.025 MHz 3.0 uV signal into the VHF COM antenna connector.			<u>SIGNAL GENERATOR:</u> Set frequency for 118.025 MHz; modulate at 1 kHz 30% AM. R.F. output for 3.0 uV. The audio analyzer SINAD shall read as specified.	greater than or equal to 7 dB
				Verify the SINAD at NAV/COM-AUDIO + (P5-62) is as specified.				
				Select radio channel 136.975.	<F> <136.975>		Frequency 136.975	
				Inject a 136.975 MHz 3.0 uV signal into the antenna port.			<u>SIGNAL GENERATOR:</u> Set frequency for 136.975 MHz; modulate at 1 kHz 30% AM. R.F. output for 3.0 uV. The audio analyzer SINAD shall read as specified.	
B	34.020	Greater than or equal to 6 dB		Verify the SINAD at NAV/COM-AUDIO + (P5-62) is as specified.			<u>SIGNAL GENERATOR:</u> AM modulation OFF, RF: OFF.	greater than or equal to 7 dB
				<u>TRANSMITTER POWER</u>	Test Setup #2		<u>TRANSMITTER POWER</u> Connect per Figure # 3	

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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
F	34.030	16 W min 30 W max		The R.F. output power at the VHF COM antenna connector shall be as specified.			<u>MODULATION ANALYZER:</u> (POWER METER) Measure the output power at the VHF COM antenna connector. Calculate the output power using the meter reading and the attenuation losses. The results shall be as specified.	18 W min 28.5 W max
				Channel the radio to 136.000.	<T>		Un-key Transmitter	
				With no audio applied to COM-MIC-HI (P5-2), key the transmitter by grounding the VHF COM PTT line (P5-24).	<F> <136.000>		Frequency 136.000	
					<T>		Key Transmitter	
D	34.040	16 W min 30 W max		The R.F. output power at the VHF COM antenna connector shall be as specified.			<u>MODULATION ANALYZER:</u> (POWER METER) Measure the output power at the VHF COM antenna connector. Calculate the output power using the meter reading and the attenuation losses. The results shall be as specified.	16 W min 28.5 W max
B								
					<T>		Un-key Transmitter.	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
B F F F	35.010	Greater than or equal to 6 dB		Inject a 118.025 MHz 3.0 uV signal into the VHF COM antenna connector.	<F> <136.975>		<u>SIGNAL GENERATOR:</u> Set frequency for 118.025 MHz; modulate at 1 kHz 30% AM. R.F. output for 3.0 uV. The audio analyzer SINAD shall read as specified. Frequency 136.975	greater than or equal to 7 dB
			Verify the SINAD at NAV/COM-AUDIO + (P5-62) is as specified.			<u>SIGNAL GENERATOR:</u> Set frequency for 136.975 MHz; modulate at 1 kHz 30% AM. R.F. output for 3.0 uV. The audio analyzer SINAD shall read as specified. <u>SIGNAL GENERATOR:</u> AM modulation OFF, RF: OFF. Frequency 127.100		
	35.020	Greater than or equal to 6 dB		Inject a 136.975 MHz 3.0 uV signal into the antenna port.	<F> <127.100>		Set frequency for 136.975 MHz; modulate at 1 kHz 30% AM. R.F. output for 3.0 uV. The audio analyzer SINAD shall read as specified. <u>SIGNAL GENERATOR:</u> AM modulation OFF, RF: OFF. Frequency 127.100	greater than or equal to 7 dB
				Verify the SINAD at NAV/COM-AUDIO + (P5-62) is as specified.				
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
F	35.030	7 W min		The R.F. output power at the VHF COM antenna connector shall be as specified.			<u>MODULATION ANALYZER:</u> (POWER METER) Measure the output power at the VHF COM antenna connector. Calculate the output power using the meter reading and the attenuation losses. The results shall be as specified.	7 W min
					<T>		Un-key Transmitter	
				Channel the radio to 136.000.	<F> <136.000>		Frequency 136.000	
				With no audio applied to COM-MIC-HI (P5-2), key the transmitter by grounding the VHF COM PTT line (P5-24).	<T>		Key Transmitter	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	35.040	7 W min		The R.F. output power at the VHF COM antenna connector shall be as specified.			<u>MODULATION ANALYZER:</u> (POWER METER) Measure the output power at the VHF COM antenna connector. Calculate the output power using the meter reading and the attenuation losses. The results shall be as specified. Un-key Transmitter. <T> <F> <127.500>	7 W min
	36.000			<u>SET VDR COM DASH NO.</u> Place holder for future self test	Test Set up #1		<u>SET VDR COM DASH NO.</u>	
	37.000			<u>CLEAR LOG</u> Place holder for future self test	Test Set up #1		<u>CLEAR LOG</u>	
	38.000			<u>SOFTWARE VERSION</u> Place holder for future self test	Test Setup #1		<u>SOFTWARE VERSION</u>	
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REV	TEST	SPECIFICATION			PROCEDURE		SPECIFICATION	
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	
A	39.020	121.20 R		The radio frequency ACTIVE channel shall be as specified. FREQ/FUNC SEL PORT 3			Verify the following change to FROM COM - ACTIVE CHANNEL. The RTIU shall indicate as specified. FREQ/FUNC SEL PORT 3 <u>JcAir 429 TEST SET:</u> TX SPEED: LOW PARITY: ODD DISPLAY: ENG LABEL: 30 TX DATA: 123.450 ACTIVE: CH1 SDI: 01	121.20 R
	39.030	123.450 R		Send label 30, Data = 123.45, LOW SPEED to P3-56 (H) and P3-55 (L). The radio frequency ACTIVE channel shall be as specified.			Connect 429 Transmitter Output to RTIU P1Y4 (HI) and P1X4 (LO) Verify the following change to FROM COM - ACTIVE CHANNEL. The RTIU shall indicate as specified.	123.450 R
	39.040			CMU #1-VDR-IN A Place holder for future test			CMU #1-VDR-IN A	
	39.050			CMU #2-VDR-IN B Place holder for future test			CMU #2-VDR-IN B	
	39.060			<u>RADIO ARINC TX BUS</u> VDR-CMU 429 OUTPUT Place holder for future test			<u>RADIO ARINC TX BUS</u> VDR-CMU 429 OUTPUT	
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REV	TEST	SPECIFICATION			PROCEDURE			SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
A	39.070			Place holder for future test NAVCOM 429 OUTPUT Measure the LOW SPEED 429 output from the radio on P3-74 (H) and P3-73(L) with radio channeled to 127.500 MHz. Turn ON RCB			NAVCOM 429 OUTPUT Frequency 127.500	
				Channel the radio to 127.500 MHz	<R> <C> <1> <F> <127.500>		Frequency 127.500 <u>JcAir 429 TEST SET:</u> Connect 429 Test Set Receiver Input to P1Y2 (HI) and P1X2 (LO). RX SPEED: LOW DISPLAY: ENG	
	39.080	127.500		Verify the COM is transmitting the specified frequency on the 429 BUS. Measure the LOW SPEED 429 output from the radio on P3-74 (H) and P3-73(L) with radio channeled to 127.100 MHz. Channel the radio to 127.100 MHz			Verify the 429-est set is receiving the specified frequency. Frequency 127.100 <u>JcAir 429 TEST SET:</u> Connect 429 Test Set Receiver Input to P1Y2 (HI) and P1X2 (LO). RX SPEED: LOW DISPLAY: ENG	127.500
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REV	TEST	SPECIFICATION				PROCEDURE		SPECIFICATION
LTR	NO.	OPR LIMITS	C	TEST DESCRIPTION	SWITCH POS	C	WORK STEPS	MFG LIMITS
	39.090	127.100		Verify the COM is transmitting the specified frequency on the 429 BUS. Channel the radio to 127.500 MHz			Verify the 429-est set is receiving the specified frequency. Frequency 127.500	127.100
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APPENDIX A SOFTWARE LOADING TR-86X						
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APPENDIX A
SOFTWARE LOADING TR-86X

A.1 SOFTWARE LOADING



A.1.1 Start the digital radio flash loader by clicking on the icon  on the computer.

A.1.2 Select the Images that need to be loaded or changes. There must be some version of the Boot Block resident in the product in order to program the rest of the blocks. The Boot Block is initially loaded at the card level on the CPU/Power supply.

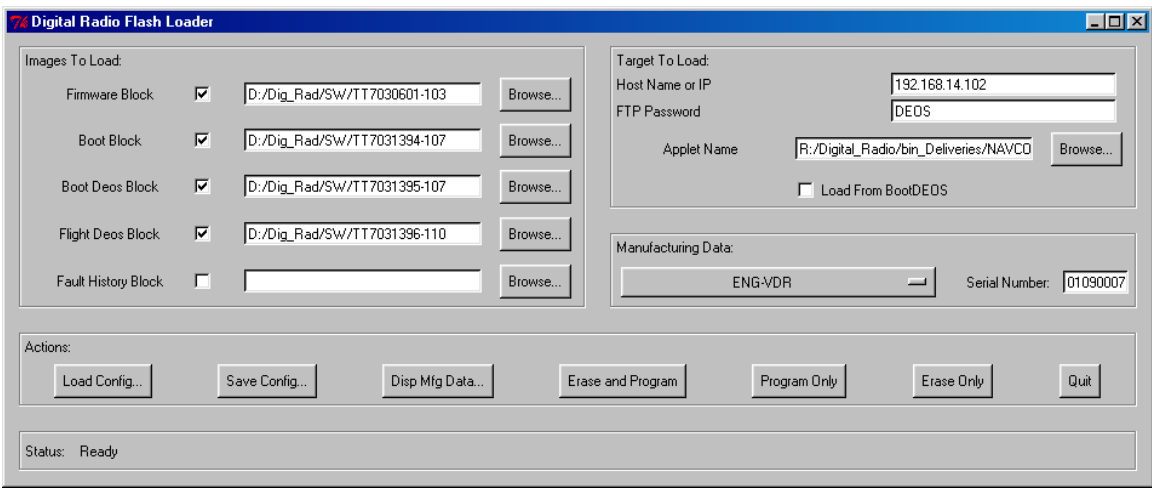
A.1.3 Use the browse button to select the appropriate software blocks to load. The Software Status Table on drawing 7026201 specifies the software part numbers to be loaded. This example indicates the software is stored on drive D: in directory Dig_Rad/SW

A.1.4 Type in the Host Name or IP, FTP Password and the Applet Name as per the table below.

	For MOD G or earlier	For MOD H or Later
Host Name or IP	192.168.14.102	192.168.194.254
FTP Password	DEOS	DEOS
Applet Name	D:Dig_Rad/SW/TT7031395-801	D:Dig_Rad/SW/TT7031395-802

A.1.5 Select the applicable part number from the drop down menu under Manufacturing data. Enter the serial number in the Serial Number window.

A.1.6 Once every thing is selected click on the Erase and Program button. When the computer indicates the programming operation is done click the Quit button.



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APPENDIX B CALIBRATION TR-86X						
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REV LTR H	TCXO CALIBRATION Adjust RXTCXOLEVEL. B1.1 Remove the 28 V dc from the VDR (RTIU +28 V dc switch OFF). B1.2 Connect the Frequency Counter to TP2 on the VHF Receiver CCA using 50 ohm probe. B1.3 Turn on the 28 V dc to the VDR (RTIU 28 V dc switch ON) B1.4 Read the current TCXO value by typing: “r vdr”. Read the value for RXTCXOLEVEL. This is the baseline setting. B1.5 Read the TCXO Frequency Offset from the Frequency Offset Label on the VHF Receiver CCA. B1.6 Calculate the Calibrated TCXO frequency by using the equation: Calibrated TCXO frequency = 52.50000 HMz ± TCXO Frequency Offset B1.7 Re-connect the VDR to the LAN using TELNET as described above. B1.8 Read the TCXO frequency displayed on the frequency counter. B1.9 Adjust the TCXO frequency to the Calibrated TCXO frequency by increasing or decreasing value of RXTCXOLEVEL. To do this, type: “s rxtcxolevel XXX”. Enter “write”. Enter In order fro the VDR to accept this new value, either the active frequency must be changed or the power must be cycled. Change the active frequency and monitor the TCXO frequency displayed on the frequency counter. Repeat these steps			
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REV LTR	TCXO CALIBRATION Adjust RXTCXOLEVEL. B1.1 Remove the 28 V dc from the BDR (RTIU +28 V dc switch OFF). B1.2 Connect the Frequency Counter to TP2 on the VHF Receiver CCA using 50 ohm probe. B1.3 Turn on the 28 V dc to the VDR (RTIU 28 V dc switch ON) B1.4 Read the current TCXO value by typing: "r vdr". Read the value for RXTCXOLEVEL. This is the baseline setting. B1.5 Read the TCXO Frequency Offset from the Frequency Offset Label on the VHF Receiver CCA. B1.6 Calculate the Calibrated TCXO frequency by using the equation: Calibrated TCXO frequency = 52.50000 HMz ± TCXO Frequency Offset B1.7 Re-connect the VDR to the LAN using TELNET as described above. B1.8 Read the TCXO frequency displayed on the frequency counter. B1.9 Adjust the TCXO frequency tot he Calibrated TCXO frequency by increasing or deceasing value of RXTCXOLEVEL. To do this, type: "s rxtcxolevel XXX". Enter "write". Enter In order fro the VDR to accept this new value, either the active frequency must be changed or the power must be cycled. Change the active frequency and monitor the TCXO frequency displayed on the frequency counter. Repeat these steps				
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H	B2 TRANSMITTER BIAS ADJUSTMENT To set the RDAC values, read the data that the transmitter technician has recorded on a calibration label attached to the transmitter assembly. Set these values by typing the following commands For n=1,2...9, and m=1,2...4 <table border="0"> <tr> <td>G</td> <td>s</td> <td>TxDriverBiasCal</td> <td>n</td> <td>m</td> <td>xxx</td> </tr> <tr> <td>G</td> <td>s</td> <td>TxFinalBiasCal</td> <td>n</td> <td>m</td> <td>xxx</td> </tr> <tr> <td>G</td> <td>s</td> <td>TxRFPowerCal</td> <td>n</td> <td>m</td> <td>xxx</td> </tr> <tr> <td>G</td> <td>s</td> <td>TxFWDPowerBiasCal</td> <td>n</td> <td>m</td> <td>xxx</td> </tr> </table> Set the temperature cut back parameters by typing the following commands. <table border="0"> <tr> <td>G</td> <td>s</td> <td>TxCBTemp</td> <td>90</td> </tr> <tr> <td>G</td> <td>s</td> <td>TxCBHyst</td> <td>2</td> </tr> <tr> <td>G</td> <td>s</td> <td>TxCBRFPower</td> <td>6</td> </tr> <tr> <td>G</td> <td>s</td> <td>TxCBDriverBias</td> <td>13</td> </tr> <tr> <td>G</td> <td>s</td> <td>TxCBFinalBias</td> <td>12</td> </tr> </table> write Substitute the values from the calibration label for the appropriate xxx G To set the preselector calibration values, read the data that was recorded on the preselector calibration label that has been included with the VHF Receiver CCA ITA packet (substitute the values from the calibration label in the appropriate xxx below). G Set these values by typing the following commands <table border="0"> <tr> <td>G</td> <td>s</td> <td>PreselCal108</td> <td>xxx</td> <td>xxx</td> <td>xxx</td> <td>xxxx</td> </tr> <tr> <td>G</td> <td>s</td> <td>PreselCal118</td> <td>xxx</td> <td>xxx</td> <td>xxx</td> <td>xxxx</td> </tr> <tr> <td>G</td> <td>s</td> <td>PreselCal130</td> <td>xxx</td> <td>xxx</td> <td>xxx</td> <td>xxxx</td> </tr> <tr> <td>G</td> <td>s</td> <td>PreselCal134</td> <td>xxx</td> <td>xxx</td> <td>xxx</td> <td>xxxx</td> </tr> <tr> <td>G</td> <td>s</td> <td>PreselCal144</td> <td>xxx</td> <td>xxx</td> <td>xxx</td> <td>xxxx</td> </tr> </table>					G	s	TxDriverBiasCal	n	m	xxx	G	s	TxFinalBiasCal	n	m	xxx	G	s	TxRFPowerCal	n	m	xxx	G	s	TxFWDPowerBiasCal	n	m	xxx	G	s	TxCBTemp	90	G	s	TxCBHyst	2	G	s	TxCBRFPower	6	G	s	TxCBDriverBias	13	G	s	TxCBFinalBias	12	G	s	PreselCal108	xxx	xxx	xxx	xxxx	G	s	PreselCal118	xxx	xxx	xxx	xxxx	G	s	PreselCal130	xxx	xxx	xxx	xxxx	G	s	PreselCal134	xxx	xxx	xxx	xxxx	G	s	PreselCal144	xxx	xxx	xxx	xxxx
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REV LTR					
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G	B3 CARRIER SQUELCH				
	B3.1 Set up per Test 5.0 .				
	B3.2 Monitor the SQUELCH status on the RTIU.				
	B3.3 Set the Signal Generator for 15.0 uV R.F. 4000 Hz 30% modulation at the COM MODULE antenna port.				
	NOTE: Signal levels at the generator will vary due to cable losses. Insure that the module is receiving 15.0 uV (equivalent) R.F. input.				
	B3.4 While monitoring the squelch status on the RTIU set the value of CSQref and CSQhyst over the LAN by typing <i>s CSQref xxx and s CSQhyst xxx</i> .				
	B3.5 Set the signal Generator to less than 9 uV R.F. output and verify that the squelch status indicated CLOSED. Slowly increase the Signal Generator R.F. level until the squelch status on the RTIU indicates OPEN. The Signal Generator R.F. level shall be 15.0 ± 3 uV.				
NOTE: Cable losses should always be known and compensated.					
B3.6 Repeat steps B3.3 through B3.5 until the trip level is 15.0 ± 3 uV					
B3.7 Run Test 5.0.					
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REV LTR	B4 NOISE SQUELCH B4.1 Set up per I.T. Test 6.0 and 6.01. B4.2 Channel the radio to 123.505. B4.3 Monitor the SQUELCH status on the RTIU. B4.4 Set the Signal Generator for 2.50 uV R.F. 1000 Hz, 50% modulation at the COM MODULE antenna port. NOTE: Signal levels at the generator will vary due to cable losses. Insure that the module is receiving 2.50 uV (equivalent) R.F. input. B4.5 Initially set NSQref8 to 2000 by typing s NSQref8 2000. While monitoring the squelch status on the RTIU adjust the value of NSQref8 until the squelch status is OPEN. B4.6 Set the Signal Generator to less than 1 uV R.F. output. (The DVM should show a TTI low). Slowly increase the Signal Generator R.F. level until the DVM just goes high (TTL). The Signal Generator R.F. level shall be 2. 5 ± 0.30 uV. NOTE: Cable losses should always be known and compensated. B4.7 Repeat steps 4.4 through 4.6 until the trip level is 2.5 ± 0.3 uV. Adjust NSQref8 and NSQhyst8 until both conditions are satisfied. B4.8 Channel the radio to 123.500. B4.9 Initially set NSQref25 to 2000 by typing s NSQref25 2000. While monitoring the squelch status on the RTIU adjust rthe value of NSQref25 until squelch status is OPEN. B4.10 Set the Signal Generator to less than 1 uV R.F. output. (The DVM should show a TTI low). Slowly increase the Signal Generator R.F. level until the DVM just goes high (TTL). The Signal Generator R.F. level shall be 2. 5 ± 0.30 uV. Cable losses should always be known and compensated. B4.11 Repeat steps 4.4 through 4.6 until the trip level is 2.5 ± 0.3 uV. Adjust NSQref8 and NSQhyst8 until both conditions are satisfied B4.12 Run I.T. Test 6.0.				
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REV LTR					
H	B5 AUDIO OUTPUT LEVEL B5.1 Set up per I.T. Test 7.0, 7.01, and 7.02. (RF power input = 1 mV, with 80% AM at 1 kHz on a carrier of 127.5 MHz) B5.2 Connect DVM to R.T.I.U. (J2S5/J2R5). B5.3 Set DVM to measure Vrms. B5.4 While monitoring the DVM adjust RXAUDIOLEVEL over the LAN by typing s RxAudioLevel xxx. Until the DVM reads 2.9 ± 0.2 Vrms. B5.5 Run test 7.0. D B5.6 Connect DVM tp R.T.I.U. (J2V5/J2U5). D B5.7 While monitoring the DVM adjust NIMRxAudioLevel over the LAN by typing S NIM RxAudioLevel xxx Until the DVM reads 0.71 ± 0.03 Vrms. D B5.8 Set the modulation percentage to 40% on the signal generator. D B5.9 While monitoring the DVM adjust RxCompConvergLevel over the LAN by typing S RxCompConvergLevel xxx Until the DVM reads 0.71 ± 0.15 Vrms.				
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REV LTR	H	B6 SELCAL/ACARS OUTPUT LEVEL B6.1 Set up per I.T. Test 10.0. (RF power input = 1 mV, with 70% AM at 1 kHz on a carrier of 127.5 MHz) B6.2 Connect DVM to R.T.I.U. (J2U2/J2T2). B6.3 Set DVM to measure Vrms. B6.4 While monitoring the DVM adjust SELCALAUDIOLEVEL over the LAN by typing s SelCalAudioLevel xxx until the DVM reads 0.63 ± 0.1 Vrms. D B6.5 Run I.T. test 10.0. B7 CARRIER LEVEL B7.1 Set TXOFFSETD2A by typing s TxOffsetD2A 41948 B7.2 Set TxGain by typing TxGain 10366.			
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REV LTR					
H	B8 MIC LEVEL B8.1 Set up per I.T. Test 22.0 and 22.01. B8.2 Turn the transmitter on and measure the (+) peak and (-) peak with the modulation analyzer. Adjust the MIC LEVEL over the LAN by typing <i>s MicA2Dlevel xxx</i> until the average of both peaks is $50 \pm 5\%$. Write the data into FLASH. B8.3 Turn the transmitter off.				
D	B8.4 Run I.T. Test 22.0 thru 22.02. B9 DATA LEVEL B9.1 Data to be added later. B10 VOICE MODULATION LEVEL B10.1 Set up and run I.T. Test 18.0. Find the frequency with the lowest power level. Note this frequency.				
D	B10.2 Set up per I.T. Test 23.0. B10.3 Set the active radio frequency (R.T.I.U.) to the frequency determined in B10.1.				
G	B10.4 While transmitting on the frequency set in B10.1 adjust the TXGAIN over the LAN by typing <i>s TxCompConvergeLevel xxx</i> mode so the (+) peaks and (-) peaks on the modulation analyzer average $85 \pm 5\%$.				
G	Adjust TxCompConvergeLevel, LimMaxModIndex, MicA2Dlevel, and ModIndex until the modulation requirements of test 22.010, 23.010, 23.020, and 23.030 are met. B10.5 Transmitter off.				
G	B10.6 Run I.T. Test 22.0 and 23.0 all test must pass.				
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REV LTR	H	B11 DATA MODULATION LEVEL B11.1 Procedure to be added later. B12 SIDETONE LEVEL B12.1 Set up per I.T. Test 24.0 and 24.01. B12.2 While monitoring the DVM (R.T.I.U. AUDIO SOURCE DISPLAY [AUD LEVEL]) and the COM MODULE in transmit; Adjust the Sidetone Level over the LAN by typing s <i>NIMTx AudioLevel</i> xxx until the DV reads 0.71 ± 0.03 Vrms. B12.3 Transmit off. B12.4 Run I.T. Test 24.0.				
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REV LTR	CALIBRATION TR-86X With MOD D or Earlier B13. CALIBRATION SETUP VDR Adjustment Procedure To set the various adjustments in the FLASH EPROM, a net debug card must be attached to J3 of 7026230-902 with switches 1 and 5 down and switches 2,3 and 4 up. Power up the VDR with the net debug card attached and connect to the LAN port on J1 of 7026232-901 via telnet. The following parameters must be set RDAC1DriverBiasDat RDAC1DriverBiasVoi RDAC2FinalBiasDat RDAC2FinalBiasVoi RDAC3RFPowerDat RDAC3RFPowerVoi RDAC4FwdPowerDat RDAC4FwdPowerVoi CarrSquelHyst CarrSquelRef MicA2DLevel ModIndex NIMRxAudioLevel NIMTxAudioLevel NSqlHyst25K NSqlHyst8K NSqlRef25K NSqlRef8K Rx CompConvergeLevel RxAudioLevel RxTCXOLevel SelCalAudioLevel SquelPwrRefLevel TxAudioLevel TxGain TxOffsetD2A					
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REV LTR H	B14 TRANSMITTER BIAS ADJUSTMENT To set the RDAC values, read the data that the transmitter technician has recorded on a calibration label attached to the transmitter assembly. Set these values by typing the following commands <i>s rdac1driverbiasvoi xxx</i> <i>s rdac2finalbiasvoi xxx</i> <i>s rdac3rfpowervoi xxx</i> <i>s rdac4fwdpowervoi xxx</i> <i>write</i> Substitute the values from the calibration label for the appropriate xxx B15 CARRIER SQUELCH B15.1 Set up per Test 5.0 . B15.2 Monitor the SQUELCH status on the RTIU. B15.3 Set the Signal Generator for 15.0 uV R.F. 4000 Hz 30% modulation at the COM MODULE antenna port. NOTE: Signal levels at the generator will vary due to cable losses. Insure that the module is receiving 15.0 uV (equivalent) R.F. input. B15.4 While monitoring the squelch status on the RTIU set the value of CarrSquelRef over the LAN by typing <i>s CarrSquelRef xxx</i>. B15.5 Set the signal Generator to less than 9 uV R.F. output and verify that the squelch status indicated CLOSED. Slowly increase the Signal Generator R.F. level until the squelch status on the RTIU indicates OPEN. The Signal Generator R.F. level shall be 15.0 ± 3 uV. NOTE: Cable losses should always be known and compensated. B15.6 Repeat steps B3.3 through B3.5 until the trip level is 15.0 ± 3 uV B15.7 Run Test 5.0.		
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REV LTR H	B16 NOISE SQUELCH B16.1 Set up per I.T. Test 6.0 and 6.01. B16.2 Channel the radio to 127.505. B16.3 Monitor the SQUELCH status on the RTIU. B16.4 Set the Signal Generator for 2.50 uV R.F. 1000 Hz, 50% modulation at the COM MODULE antenna port. NOTE: Signal levels at the generator will vary due to cable losses. Insure that the module is receiving 2.50 uV (equivalent) R.F. input. B16.5 Initially set NsqlRef8k to 2000 by typing <i>s NsqlRef8k 2000</i>. While monitoring the squelch status on the RTIU adjust the value of NsqlRef8k until the squelch status is OPEN. B16.6 Set the Signal Generator to less than 1 uV R.F. output. (The DVM should show a TTI low). Slowly increase the Signal Generator R.F. level until the DVM just goes high (TTL). The Signal Generator R.F. level shall be 2.5 ± 0.30 uV. NOTE: Cable losses should always be known and compensated. B16.7 Repeat steps 4.4 through 4.6 until the trip level is 2.5 ± 0.3 uV. B16.8 Run I.T. Test 6.0.					
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REV LTR	B17 AUDIO OUTPUT LEVEL B17.1 Set up per I.T. Test 7.0, 7.01, and 7.02. (RF power input = 1 mV, with 80% AM at 1 kHz on a carrier of 127.5 MHz) B17.2 Connect DVM to R.T.I.U. (J2S5/J2R5). B17.3 Set DVM to measure Vrms. B17.4 While monitoring the DVM adjust RXAUDIOLEVEL over the LAN by typing s RxAudioLevel xxx. until the DVM reads 2.9 ± 0.2 Vrms. B17.5 Run test 7.0. B17.6 Connect DVM tp R.T.I.U. (J2V5/J2U5). B17.7 While monitoring the DVM adjust NIMRxAudioLevel over the LAN by typing S NIM RxAudioLevel xxx Until the DVM reads 0.71 ± 0.03 Vrms. B17.8 Set the modulation percentage to 40% on the signal generator. B17.9 While monitoring the DVM adjust RxCompConvergLevel over the LAN by typing S RxCompConvergLevel xxx Until the DVM reads 0.71 ± 0.15 Vrms.				
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REV LTR						
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B18 SELCAL/ACARS OUTPUT LEVEL B18.1 Set up per I.T. Test 10.0. (RF power input = 1 mV, with 70% AM at 1 kHz on a carrier of 127.5 MHz) B18.2 Connect DVM to R.T.I.U. (J2U2/J2T2). B18.3 Set DVM to measure Vrms. B18.4 While monitoring the DVM adjust SELCALAUDIOLEVEL over the LAN by typing s SelCalAudioLevel xxx until the DVM reads 0.63 ± 0.1 Vrms. B18.5 Run I.T. test 10.0. B19 CARRIER LEVEL B19.1 Set TXOFFSETD2A by typing s TxOffsetD2A 41948						
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REV LTR	B20 MIC LEVEL B20.1 Set up per I.T. Test 22.0 and 22.01. B20.2 Turn the transmitter on and measure the (+) peak and (-) peak with the modulation analyzer. Adjust the MIC LEVEL over the LAN by typing <i>s MicA2Dlevel xxx</i> until the average of both peaks is $50 \pm 5\%$. Write the data into FLASH. B20.3 Turn the transmitter off. B20.4 Run I.T. Test 22.0 thru 22.02. B21 DATA LEVEL B21.1 Data to be added later. B22 VOICE MODULATION LEVEL B22.1 Set up and run I.T. Test 18.0. Find the frequency with the lowest power level. Note this frequency. B22.2 Set up per I.T. Test 23.0. B22.3 Set the active radio frequency (R.T.I.U.) to the frequency determined in B10.1. B22.4 While transmitting on the frequency set in B10.1 adjust the TxOffsetD2A over the LAN by typing <i>s TxOffsetD2A xxx</i> so the (+) peaks and (-) peaks on the modulation analyzer average $85 \pm 5\%$. B22.5 Transmitter off. B22.6 Run I.T. Test 18.0 and 23.0 all test must pass.					
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REV LTR						
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B23 DATA MODULATION LEVEL B23.1 Procedure to be added later. B24 SIDETONE LEVEL B24.1 Set up per I.T. Test 24.0 and 24.01. B24.2 While monitoring the DVM (R.T.I.U. AUDIO SOURCE DISPLAY [AUD LEVEL]) and the COM MODULE in transmit; Adjust the Sidetone Level over the LAN by typing s <i>NIMTx AudioLevel</i> xxx until the DV reads 0.71 ± 0.03 Vrms. B24.3 Transmit off. B24.4 Run I.T. Test 24.0.						
Honeywell		AW/CRITICAL NOTATION				
		SECURITY NOTATION		SUPPLEMENTS		B-16 PAGE

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REV LTR	APPENDIX C QUALITY CONTROL FUNCTIONAL TEST REPORT				
Honeywell		AW/CRITICAL NOTATION			
		SECURITY NOTATION	SUPPLEMENTS		C-0 PAGE

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				CAGE CODE 55939		REV LTR			
		SEE THE TITLE PAGE FOR PROPRIETARY AND DATA RIGHTS NOTATIONS.							
REV LTR		QUALITY CONTROL FUNCTIONAL TEST REPORT							
PART NO. 7026201-()		SERIAL/SHOP NO.							
1.000 POWER ON CURRENT TEST		4.000 RECEIVER SELECTIVITY							
1.010		ERRORS		4.010				%	
1.020		AMPS		4.020				%	
				4.030				mVrms	
2.000 SELF TEST									
				5.000 CARRIER SQUELCH					
				5.010				mVrms	
				5.020				mVrms	
				5.030				UV	
				5.040				mVrms	
3.000 RECEIVER TEST: SENSITIVITY		5.050						dB	
3.010		dB							
3.020		dB							
3.030		dB							
3.040		dB							
3.050		dB							
TESTER		DATE		FTR SHEET 2 OF 8					
Honeywell		AW/CRITICAL NOTATION							
		SECURITY NOTATION		SUPPLEMENTS		C-2 PAGE			

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REV LTR	QUALITY CONTROL FUNCTIONAL TEST REPORT					
PART NO. 7026201-()				SERIAL NO.		
6.000 Noise Squelch				8.000 AUDIO OUTPUT DISTORTION		
				8.010		%
6.010		uV		8.020		%
6.020		mVrms		8.030		%
6.030		dB				
6.040		uV		9.000 AUDIO FREQUENCY RESPONSE		
6.050		dB		9.010		Vrms
				9.020		Vrms
				9.030		Vrms
				9.040		Vrms
				9.050		dB
				9.060		dB
				10.000 SELCAL/ACARS OUTPUT LEVEL		
7.000 AUDIO OUTPUT LEVEL				10.010		Vrms
7.010		Vrms				
7.020		Vrms		11.000 SELCAL/ACARS OUTPUT DISTORTION		
7.030		Vrms		11.010		%
7.040		dB				
7.050		Vrms				
7.060		dB				
TESTER		DATE		FTR SHEET 3 OF 8		
Honeywell		AW/CRITICAL NOTATION				
		SECURITY NOTATION		SUPPLEMENTS		C-3 PAGE

ENGINEERING SPECIFICATION		SECURITY NOTATION		SPEC NO. IT7026201		SEE PAGE INDEX FOR THIS SHEET REV LETTER	
				CAGE CODE 55939		REV LTR	
		SEE THE TITLE PAGE FOR PROPRIETARY AND DATA RIGHTS NOTATIONS.					
REV LTR		QUALITY CONTROL FUNCTIONAL TEST REPORT					
A							
		PART NO. 7026201-()			SERIAL NO.		
		17.000 CARRIER LEVEL			22.000 MIC AND DATA INPUT LEVEL		
					22.010	%	
					22.020	%	
		18.000 OUTPUT POWER					
		18.010		WATTS			
		18.020		WATTS			
		18.030		WATTS	23.000 VOICE AND DATA MODULATION LEVEL		
		18.040		WATTS	23.010	%	
					23.020	%	
		19.000 EXTENDED TRANSMISSIONS			23.030	%	
		19.010		WATTS	23.040	%	
		19.020		WATTS			
		19.030		SEC			
		20.000 TRANSMIT INPUT CURRENT					
		20.010		AMPS			
		21.000 FREQUENCY TOLERANCE			24.000 SIDETONE LEVEL		
		21.010		MHz	24.010	Vrms	
		TESTER		DATE		FTR SHEET 5 OF 8	
Honeywell		AW/CRITICAL NOTATION					
		SECURITY NOTATION		SUPPLEMENTS		C-5 PAGE	

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				CAGE CODE 55939		
		SEE THE TITLE PAGE FOR PROPRIETARY AND DATA RIGHTS NOTATIONS.				
REV LTR	QUALITY CONTROL FUNCTIONAL TEST REPORT					
E	PART NO. 7026201-()			SERIAL NO.		
	25.000 SIDETONE DISTORTION			27.080		dB
	25.010		%	27.090		%
				27.100		dB
	26.000 VOICE AND ACARS DATA MODULATION DISTORITON					
	26.010		%	28.000 DATA INPUT FREQUENCY AND PHASE RESPONSE		
	26.020		%			
	26.030		%			
	27.000 AUDIO FREQUENCY RESPONSE WIDEBAND & NARROW BAND					
	27.010		%			
	27.020		%	29.000 CARRIER NOISE LEVEL		
	27.030		%	29.010		dB
	27.040		dB			
	E	27.050		%		
	E	27.060		%		
	E	27.070		%		
TESTER			DATE		FTR SHEET 6 OF 8	
Honeywell			AW/CRITICAL NOTATION			
			SECURITY NOTATION		C-6 PAGE	

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		SEE THE TITLE PAGE FOR PROPRIETARY AND DATA RIGHTS NOTATIONS.				
REV LTR	QUALITY CONTROL FUNCTIONAL TEST REPORT					
PART NO. 7026201-()				SERIAL NO.		
30.000 RESIDUAL FREQUENCY MODULATION				33.000 MICROPHONE BIAS		
30.010		Hz		33.010		VDC
30.020		Hz				
30.030		Hz		34.000 OVERVOLTAGE TEST		
				34.010		dB
31.000 SPURIOUS R.F. EMMISONS				34.020		dB
31.010		dBc		34.030		WATTS
31.020		dBc		34.040		WATTS
31.030		dBc				
31.040		dBc		35.000 UNDERVOLTAGE TEST		
31.050		dBc		35.010		dB
31.060		dBc		35.020		dB
				35.030		WATTS
32.000 PHONE AUDIO OUTPUT				35.040		WATTS
32.010		mVrms				
32.020		mVrms		36.000 SET COM DASH NUMBER		
32.030		mVrms				
32.040		mVrms				
32.050		mVrms				
32.060		mVrms				
TESTER		DATE		FTR SHEET 7 OF 8		
Honeywell		AW/CRITICAL NOTATION				
		SECURITY NOTATION		SUPPLEMENTS		C-7 PAGE

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		REV LTR				
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REV LTR G	APPENDIX D DELETED					
Honeywell		AW/CRITICAL NOTATION				
		SECURITY NOTATION		SUPPLEMENTS		D-0 PAGE