

TO A
MASTER

<h1 style="margin: 0;">ENGINEERING SPECIFICATION</h1>	SECURITY NOTATION		SPEC NO. EB7516219	SEE PAGE INDEX FOR THIS SHEET REV LETTER
			CAGE CODE 55939	
	SEE THE TITLE PAGE FOR PROPRIETARY AND DATA RIGHTS NOTATIONS.			

REV LTR	<p><u>TITLE:</u> SD-700 HONEYWELL/RACAL MULTI-CHANNEL SATCOM SYSTEM SATELLITE DATA UNIT</p> <p>1. INTRODUCTION</p> <p>This report consists of data establishing the conformance of the Honeywell/Racal SD-700 Satellite Data Unit (SDU) to the requirements established by the Federal Communications Commission in its rules and regulations as referenced in Section 2 of this paper. Transmit tests were performed in the two cases where the SD-700 is transmitting with either a 20W High Power Amplifier (HPA) or a 40W HPA as indicated in the report.</p> <p>The SD-700 Satellite Data Unit supports four different equipment configurations or variants:</p> <ul style="list-style-type: none"> 7-channel SDU with a 115V AC supply 4-channel SDU with a 115V AC supply 7-channel SDU with a 28V DC supply 4-channel SDU with a 28V DC supply <p>The transmit characteristics of all four versions are identical since the RF Module (RFM), which contains the entire transmit chain, is the same for all four variants. The AC or DC variants are realized by changing the Power Supply in the SD-700. Both Power Supplies have been previously tested and qualified with the SD-600, an earlier model currently in production. The 4-channel variant is realized by simply removing one of the Triple Transcoder Modem cards (TTCM). The 7-channel AC version is the baseline configuration and has been chosen as the test SDU reflected in this report.</p> <p>The Honeywell/Racal Multichannel Satcom system (MCS-7000) baseline configuration is a seven channel system comprised of two Line Replaceable Units (LRUs): the SDU, Honeywell part number 7516118-XXXXX and the 20 W or 40W HPA, Honeywell part number 7516251-XXXXX or 7516250-XXXXX respectively. It is a full duplex communication system capable of transmitting and receiving simultaneously any number of modulated carriers up to the channel capabilities of the system. The reference oscillator is located in the SDU. The multichannel power output is rated at 40 watts when a 40W HPA is used and at 20 watts when a 20W HPA is used. ←</p> <p>This report contains the performance parameters with both HPAs and the Diplexer/LNA (Phase Atlantic Model WGE-0090-00), except as noted in the various test sections of this report. The HPAs were included to demonstrate the overall transmit characteristics of the SDU/HPA transmit line-up. The Diplexer/LNA was used in the testing to include its transmit passband and reject band characteristics.</p> <p>Honeywell has assigned the following model numbers to its system LRUs:</p> <p>SDU – SD700 40W HPA – HP600 20W HPA – HP700</p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto; font-family: cursive;"> <p>The SD700 output by itself is 31.6 mW.</p> </div> <p style="margin-left: 100px;">ADD</p>
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<h1 style="margin: 0;">Honeywell</h1>	AW/CRITICAL NOTATION		
	SECURITY NOTATION	SUPPLEMENTS	1 PAGE

REV LTR	<div style="margin-bottom: 20px;"> <p>2.2.2 System Description and Installation Manual</p> <p>A15-5111-001-00</p> </div> <p>3. TEST CERTIFICATION</p> <p>I do hereby certify that to the best of my knowledge the technical test data contained in this report are true and correct and that the SD-700 has been shown to have completely met the cited requirements.</p> <p>SIGNED _____</p> <p style="margin-left: 200px;">Peter D. Bailey</p> <p>Test Engineer Certification</p> <p>Peter D. Bailey</p> <p>BS Arizona State University, 1969</p> <p>15 Years Experience in Commercial Avionics</p> <p>4. GENERAL INFORMATION</p> <p>4.1 <u>Type Designation</u></p> <p>The equipment has been designated by Honeywell, Inc., Commercial Electronic Systems, as an SD-700 Satellite Data Unit for use in a Multichannel SATCOM System, MCS-7000.</p> <p>4.2 <u>Service and Rule for Intended Operation</u></p> <p>Aeronautical Mobile Satellite Service</p> <p>Part 87, Subpart A</p> <p>4.3 <u>Description of Equipment</u></p> <p>4.3.1 Type of Emission</p> <p>G1W</p> <p>4.3.2 Frequency Range [MHz]</p> <p>1626.5 - 1660.5</p> <p>4.3.3 Power Rating</p> <p>40 Watts Maximum for MCS-7000 with 40 W HPA.</p> <p>20 Watts Maximum for MCS-7000 with 20 W HPA.</p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block; margin-top: 10px;"> 31.6 mW Maximum for the SD700 alone. </div> <div style="margin-left: 20px; margin-top: -20px;"> — ADD </div>
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REV LTR	<p>Synthesizers:</p> <p>There are basically five synthesizers used in the SDU all of which reside in the RFM.</p> <ul style="list-style-type: none"> Channel synthesizer: One per channel, nested dual loop design capable of tuning in 2.5 kHz increments over a 34 MHz range centered at 209.575 MHz. There are four channel synthesizers on each of the Rx and Tx assemblies, 7516114 and 7616116 respectively. Each synthesizer is dedicated simultaneously to both a Tx and Rx channel. Doppler synthesizer: Cascaded dual loop design capable of tuning in 10 Hz increments over a range of +/- 2180 Hz centered at 163.845 MHz. It is located on the Tx assembly, 7516116. 1270.08 MHz PLO: Fixed frequency, located on the Tx assembly, 7516116. 1159.2 MHz PLO: Fixed frequency, located on the Rx assembly, 7516114. 173.0566 MHz PLO: Fixed frequency, located on the Rx assembly, 7516114. <p>4.3.15.3.1 The Honeywell MCS system does employ Doppler correction techniques as required by ARINC 741 Part 2 Paragraph 4.1.2.</p> <p>4.3.15.4 RF Signal Path through HPA</p> <p>20W HPA:</p> <p>INPUT: 1626.5 MHz to 1660.5 MHz</p> <p>Gain 57 dB \pm 1 dB with 0 dB back-off attenuation</p> <p>OUTPUT: 1626.5 MHz to 1660.5 MHz</p> <p style="padding-left: 40px;">20 Watts operational (continuous)</p> <p style="padding-left: 40px;">40 Watts maximum</p> <p>40W HPA:</p> <p>INPUT: 1626.5 MHz to 1660.5 MHz</p> <p>Gain 60 dB \pm 1 dB with 0 dB back-off attenuation</p> <p>OUTPUT: 1626.5 MHz to 1660.5 MHz</p> <p style="padding-left: 40px;">40 Watts operational (continuous)</p> <p style="padding-left: 40px;">60 Watts maximum</p> <p>For both the 20 watt and 40 watt HPA, the RF signals in the HPA pass through five stages of class A amplification followed by two stages of class AB amplification. The signals then are routed through an output power detector after which they exit the HPA. The HPA output is connected to the diplexer and antenna subsystem.</p> <p>A description of the 20W HPA circuitry can be found in the previously submitted FCC report, EB7516254.</p> <p>A description of the 40W HPA circuitry can be found in the previously submitted FCC report, A72-5111-122.</p> <div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;"> The FCC ID for both HPAs is GB8MCS-6000. </div> DELETE
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<h1 style="margin: 0;">Honeywell</h1>	AW/CRITICAL NOTATION		
	SECURITY NOTATION	SUPPLEMENTS	10 PAGE