

Description of Testing for the United Arab Emirates S-70M-02 Helicopter

Sikorsky Aircraft is under contract to the U.S. Army to provide 40 S-70M-02 (variant of UH-60M Blackhawk) helicopters through a Foreign Military Sale (FMS) to the United Arab Emirates (UAE).

These aircraft will be equipped with two Rockwell-Collins AN/ARC-210 multi-band, multi-mode radios, and a Raytheon AN/ARC-231 radio.

The Rockwell-Collins AN/ARC-210 radios will have several unique frequency hopping waveforms which are proprietary to Rockwell-Collins. These waveforms are called TALON and Quicklook waveforms, respectively.

The AN/ARC-210 TALON/Quicklook radios will be used aboard the S-70M-02 to communicate with UAE ground forces. The Quicklook frequency hopping waveform is used in the 30 – 90 MHz band. The TALON frequency hopping waveform is used in the 90 to 400 MHz bands.

The AN/ARC-210 TALON/Quicklook radios will be tested for communication range, and to determine if any “dead” spots occur due to masking of the aircraft antennas by other aircraft structures and the main and tail rotors, and during maneuvering of the aircraft.

The radios will be employed to communicate aircraft to aircraft, and with a Harris Corporation RF-5800M Manpack radio (presently used by UAE ground forces) acting as a ground station at Sikorsky Aircraft’s Jupiter Florida flight test facility.

In addition, the radios have the capability of communicating in the 150 – 174 MHz Land Mobile and 156 – 162 MHz International Maritime frequency bands. Sikorsky Aircraft also requires testing in these bands to ensure communications range performance.

The Raytheon AN/ARC-231 radio is installed aboard the S-70M-02 to provide interoperability with U.S. ground forces when UAE is participating in Coalition operations.

This radio provides U.S. force SINCGARS frequency hopping and UHF SATCOM capability. This radio will only be employed in the Aviation band for normal aviation operations (Sikorsky has licensed frequencies in the VHF/UHF bands), as both SINCGARS and SATCOM capability have previously been tested on the UH-60M helicopter, and the installation is the same aboard the S-70M-02.

The specifications for the Rockwell-Collins AN/ARC-210 are as follows:

30.000 – 87.9975 MHz FM
108.000 – 135.9975 MHz AM
136.000 – 155.9975 MHz AM and FM
156.000 – 173.9925 MHz FM
225.000 – 399.9925 MHz AM and FM

Maritime Channel Capability

CHANNEL	TRANSMITTING FREQUENCY (MHz)		CHANNEL	TRANSMITTING FREQUENCY (MHz)	
	SHIP STATION	SHORE STATION		SHIP STATION	SHORE STATION
1	156.050	160.650	2	156.100	160.700
3	156.150	160.750	4	156.200	160.800
5	156.250	160.850	6	156.300	*
7	156.350	160.950	8	156.400	*
9	156.450	156.450	10	156.500	156.500
11	156.550	156.550	12	156.600	156.600
13	156.650	156.650	14	156.700	156.700
15	156.750	156.750	16	156.800	156.800
17	156.850	156.850	18	156.900	161.500
19	156.950	161.550	20	157.000	161.600
21	157.050	161.650	22	157.100	161.700
23	157.150	161.750	24	157.200	161.800
25	157.250	161.850	26	157.300	161.900
27	157.350	161.950	28	157.400	162.00
60	156.025	160.625	61	156.075	160.675
62	156.125	160.725	63	156.175	160.775
64	156.225	160.825	65	156.275	160.875
66	156.325	160.925	67	156.375	156.375
68	156.425	156.425	69	156.475	156.475
70	156.525	156.525	71	156.575	156.575
72	156.625	*	73	156.675	156.675
74	156.725	156.725	75	156.775	156.775
76	156.825	156.825	77	156.875	*
78	156.925	161.525	79	156.975	161.575
80	157.025	161.625	81	157.075	161.675
82	157.125	161.725	83	157.175	161.775
84	157.225	161.825	85	157.275	161.875
86	157.325	161.925	87	157.375	161.975
88	157.425	162.025			

* Channels 06, 08, 72, and 77 are not defined for shore stations. They are ship-to-ship or ship-to-air simplex channels.

Initial Frequency Stability:

Within 10 seconds after power turn-on, the transmit frequency (relative to the selected operating frequency) of the RT shall not exceed ± 0.2 PPM (Parts per Million). Within 60 seconds after power turn-on, the transmit frequency (relative to the selected operating frequency) of the RT shall not exceed ± 0.1 PPM.

Initial Accuracy:

Within 10 minutes after power turn-on, the transmit frequency (relative to the selected operating frequency) of the RT shall not exceed ± 0.03 PPM.

Long Term Stability:

The transmit frequency (relative to the selected operating frequency) of the RT shall not drift more than 0.003 PPM per month from initial setting due to aging. An adjustment capability shall be retained for a period of ten years after the initial delivery date such that an adjustment resolution of 0.005 PPM is provided.

FM Output Power:

The full RF power output (Full Power mode) shall not be less than 15 watts and not more than 23 watts over the frequency ranges of 30.000 to 87.9925 MHz, 136.000 to 173.9875 MHz, and 225.000 to 399.9925 MHz.

AM Output Power:

The full RF power output shall not be less than 10 watts and not more than 15 watts with an unmodulated carrier over the frequency ranges of 118.000 to 155.9975 MHz and 225.000 to 399.9925 MHz.

The specifications for the Harris Corporation RF-5800M Manpack (Ground Station) are as follows:

30-90 MHz FM
90-400 MHz FM
400-512 MHz FM
90-512 MHz AM

Frequency Stability $\pm 1.0 \times 10^{-6}$
Channel Spacing 8.33, 12.5, 25 (kHz)

Power Output
30-90 MHz FM: 1-10 Watts
PEP 90-400 MHz FM: 1-20 Watts PEP
400-512 MHz FM: 1-10 Watts
90-512 MHz AM: 1-10 Watts PEP

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