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NRL SPECIAL PROJECTS CONTROL NUMBER

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SUBJECT
SEJ W/P ENG & ELINT COL
CAP OF MIS-7103

DISTRIBUTION INFO

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I- Engineering and ELINT Collection capability of 7103/will have been extended in the following areas by the proposed 7104 Launch in early March 1965:

A - FREQUENCY COVERAGE EXTENSION;

7103 highest coverage was 5150 mc while 7104 will cover from 155 mc to 9,500 mc without a gap using 32 separate collection bands. 5 of these are duplicated.

B - NUMBER OF COLLECTION BANDS;

thirty-two separate receiving bands are to be provided, twenty-four more than have ever been contained in a single POPPY launch.

C - DUPLICATIVE COVERAGE OFFERED IN 7104;

155-182*	7104C/D
165-202*	A/B
230-245	A/B
280-292	A/C
550-655*	A/B
595-655	A/B
685-720	A/A
815-1085*	A/B
1820-1850	B/C
2290-2370	A/A
2650-2900	A/B
2940-3090	A/B
3180-3320	A/B
3800-4180	A/B
4900-5300*	C/D

*-NOTE: These five bands are completely duplicated in two of the satellites.

D - FREQUENCY RESOLUTION;

7104 will have improved frequency resolution in certain specific bands by providing smaller coverage in each descrete bands; as an example the "S-Band" from 2650 to 3320 mc is split so that the band edges of the collection bands clearly define 2290 2650, 2900, 2940, 3090, 3180, and 3320 mc. 4180

The band from 550 to 1080 mc has the following descrete band edges; 550, 595, 655, 685, 720, 815, 930 & 1080.

(Understand that any single instant all these bands may NOT be activated but only either the Primary group or the Alternate group.)

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E - SENSITIVITY ON 7104:

In the frequency grange above 3500 mc increased sensitivty is provided by reducing the losses in the collection experiment and in the frequency bands above 4900 mc RF preamplification is being attempted for the first time in this Program. Under the severe restraints imposed by minimizing the power consumption and maintaining a useful life in orbit of at least one year, the extension of receiver sensitivity in this Program is being given a major portion of the engineering effort and the results of 7104 will show improved cabability.

F - ON ORBIT STATION KEEPING

7104 C and D will be synchronized in orbit at a spacing [redacted] This will be possible by providing three axis stabilization of the 7104D satellite and then by use of a low level thruster the speed of the satellite will be altered in small steps until it is in step with 7104C.

Future use of this capability will facilitate use of High gain receiving antennas and [redacted] for this Program.

[redacted]

Tech. Dev. 6.11
3/17/65 has
SLX in 4C
band A2 mHz
345 Bnt 455 Fig 4 agree

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TO WHAT ~~EXTENT~~ [redacted] 104 SATISFY THE REQUIREMENTS????

a - Sensitivity. This requirement for sensitivity is by todays state of the engineering art, unattainable with the POPPY type collection system. Even as fully stabilized satellites with high power and long life capability become available, only limited progress toward the fulfillment of this requirement can be made.

The overall system sensitivity for 7104 in the 4900 to 7300 mc range is expected to be about -65 dbm and in the range from 7300 to 9500 mc the level is expected to be -75 to 80 dbm. This means Main Beam intercepts on 100 kw emitters are expected.

Dangers which are inherent in attempting to utilize the full sensitivity required by COMOR are listed as follows:

a. Possible intercept of Third Harmonic content from lower frequency emitters.

b. Loss of identy of the Main Lobe of the intercepts resulting from ~~and thereby~~ loss of scan information

c. In certain frequency bands the data would be far too densse to allow analysis, unless severe frequency or geographical restraints are applied to the intercept system.

b - PRF within ±1% up to 5 kc and ± 5% above 5 kc.. . . . .

7103 and 7104 will meet this requirement except where the Bands with Wide Pulse data/response and in these bands the PRF is limited to about 2000 pulses per second. Generally these bands are selected with a priori knowledge of the prf and only one time has the pfr/been exceeded. capability of a POPPY satellite

c - Signal frequency within plus or minus 5% is/at specific now available in 7103 frequencies. Again these frequencies where definition is required are carefully chosen to discriminate against known emitters which are closely spaced in the frequency spaectrum.

d. Pulse Width measurement within ~~10%~~ 1 10% can be made with the POPPY system where required. At the present time only 7103 has a capability for [redacted] 7104 has no requi[redacted] for [redacted]

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e. Scan Rate easily met with 7103 and 7104

f. Intercept time is easily met by 7103 and 7104.

g. [redacted] easily meets this requirement.

Priority 2.

a. Identify main lobe signals and [redacted] is only partially possible with 7103 and will be limited in 7104 to the RF Signal Level experiment in the 550 to 650 mc band in 7104

b. [redacted] within plus or minus 10% is now possible on 7103 and 7104 .

[redacted] is not now nor will it be possilbe with 7104. 7105 has this as a potential R & D Experiment, but the frequency of the experiment is as yet uncertain.

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