

From CAPT W. H. M. N. A. C-14

REVISOR *[Signature]*

File 7305

2 November 1964

COPY → 7305 → TEST TAPE TECH DEC 11

STEP 13

Test Tape and Tech Description Critique

The Test Tape furnished for this mission was received on 28 October 1964 although its launch was successfully achieved on 23 October 1964. The tests furnished included static (fixed frequency-non-scanning) and the normal system scanning mode.

Specific test deficiencies noted include:

- A. Pulse-width - omission of minimum detectable pulse width.
- B. PRF (990pps) - not considered representative of the PRF range to be bracketed by known emitters in the programmed receiving frequency range.
- C. Power Level - representative pulse widths were not presented at a known saturation power level (6 to 9 db above actual receiver system saturation).
- D. Omission of Step 13 clock and commutator run-up in both the static and signal acquisition mode.
- E. Omission of Step 13 internal reference frequency.
- F. Omission of a block diagram of the test equipment set up used for tests (this would permit analysts to estimate the degree of instability to be encountered in mission analysis and would permit identification of probable primary "component" which is responsible for the instabilities noted. This might assist in identification of certain high level noise bursts encountered).

Testing

After Brackets

Char F

50 Records

CY 4 OF 4

- G. System internal calibration cycle, to be encountered prior to each collection signal read-in, not included.
- H. The test tape was programmed to include pulse type signals as presented to the FM discriminator. These are of high interest to the analyst as an aid to future mission analysis. However, the tests were not programmed to include any samples of FM receiver system against actual FM test emissions. *or pulsed*
- I. No simultaneous tests were conducted to permit a comparison between the 150-168 mc stepped receiver and the WB/NB crystal video fixed receiver which is also covering this frequency range.
- J. Tapes were found to be incorrectly marked. Tape 1 was tape 2. FM test as logged was the AM test and vice versa.
- K. Receiver scan cycle for the AM stepped channel was 27.43 seconds while the cycle for the fixed tuned frequency range and the stepped receiver FM video output cycle was 27.60 sec. *at different time*
- L. Signal feed through (unidentified as to source) was noted on the AM sweep (168-230) with an output polarity opposite of the signal output. No test exists during the FM sweep to provide a comparison.
- M. ^{RF}VCO's not used for recording signals on test tape. (~~direct recording was used~~). Test tape is of little use in setting up ground processing system.
- N. Signal to noise ratio of time marks was too low to allow automatic processing. At least 6db is required.

Tech Description:

- A. Fails to identify the inclusion or exclusion of a system reference frequency.
- B. Fails to identify whether data will amplitude modulate the channel F carrier frequency or will FM modulate this carrier frequency.
- C. Reconstruction of various statements contained in Tech Description indicates pre-collection read-in of system calibration occupies 70 seconds tape time for two pre-collection calibration cycles. This reconstruction indicates 150 to 168 ms (48 steps) 24 seconds, 168 to 230 ms (448 steps) 2.7 seconds; ^{138 steps, 6 sec} staircase oscillator recycle time 0.3 seconds (29 Sept-20 Oct meeting), and an 8 second reset time provides 35 seconds per calibration receiving scan cycle. However, test tape exclusion of this operating mode precludes verification.
- D. Receiver scan cycle for signal collection as stated in the Tech description is not the same as the appearance on the test tapes:

- (1) 0.3 second staircase oscillator reset time may have been changed since the 29 Sept/ 2 Oct. discussions.
- (2) does not include the 8-second reset which is expected to be encountered during the calibration cycle.
- (3) test tapes indicates the collection cycle is 27.43 seconds for the AM channel and 27.60 seconds for
ed on different tapes.
the companion channel record

- E. Time clock type and format was not included.
- F. Leach recorder read out not identified as reverse dump, rewind dump or loop dump. Dump ratio not verified.
- G. No pass-band curves were included as to the representative pass-band of the voltage tuned pre-selector at specific frequency points within the frequency band covered by the system.
- H. Commutated data voltage calibration data/curves not provided.
- I. No explanation of negative portions of test signals.

SPECIAL PROBLEMS:

The system, based on data in Tech description has no identified internal means which would identify as a part of the collection take whether:

- A. the 30bd system attenuator is in or out of the system
- B. the xytal video receiver is operating in the narrow band or wide band mode.

It is to be noted that the 15-point commutator has used points could conceivably have been used to identify the foregoing and as such would confirm " command response "....