

C05228927

NRO APPROVED FOR RELEASE  
1 AUGUST 2015

~~SECRET~~

FINAL REPORT

BIT MISSION 7056

14 May 1965

SAFSS SH0159-65

P-12699

ey7

~~SECRET~~  
SPECIAL HANDLING

File No. H-1212

Page 1

## FINAL REPORT

BIT MISSION 7056

1. ~~(S)~~ MISSION SUMMARY.1.1 ~~(S)~~ Program Objectives.

The objective of the BIT program is to determine if and when the radar system associated with the signal [REDACTED] acquires and tracks the Agena vehicle. The BIT system, designed to fulfill this objective, covers the frequency range from 153 to 163 Mc and accepts only those signals which have characteristics similar to [REDACTED]. On those signals which qualify, the system will measure frequency, PRF, and signal amplitude along with the time of intercept to enable an analyst to identify the signal characteristics and to estimate a geographical area within which the emitter is located.

1.2 ~~(S)~~ Mission Highlights.

During this mission, the BIT system intercepted the [REDACTED] signal on two orbits, 191 and 192. The emitter probably detected the Agena vehicle on orbit 192 when the vehicle passed through the sector of coverage; however, there was no evidence that the Agena was tracked. If it was, a track-while-scan mode was used since the regular scan pattern observed early in the intercept did not change as the vehicle entered and passed through the sector. The intercept on orbit 191 was a back lobe intercept made as the vehicle passed to the east of Sary Shagan. It does not represent a vehicle detection or tracking event. No other signals of interest were observed during this mission which lasted 200 orbits and covered the period from 2200Z on 25 February through approximately 0800Z on 10 March 1965.

1.3 ~~(S)~~ Flight Summary.

Vehicle Number	1611
Launch Date	25 February 1965
Launch Time	2152 GMT
Inclination	75 degrees
Apogee	207.4 nautical miles
Perigee	99.0 nautical miles
Period	90 minutes

~~SECRET~~  
SPECIAL HANDLINGThis Document Consists of *17* Pages.Copy No. *7* of *8* Copies, Series EDL

~~SECRET~~  
SPECIAL HANDLING

2. ~~(S)~~ MISSION COVERAGE.

2.1 ~~(S)~~ Operational Coverage.

The BIT system was programmed on during 198 orbits of the 200 orbit mission life while the vehicle was over the northern hemisphere with an emphasis on the coverage over Europe, the USSR, and Asia. On 26 of the orbits the unit was programmed on throughout the period while the vehicle was over the southern hemisphere. Data were received from all of the orbits which were programmed for operation with the exceptions of orbits 71 and 72, and orbits 166 and 167. The loss of data in the first instance was due to the Channel F VCO on the data link not being received. Orbits 166 and 167 were lost because of tracking station equipment problems.

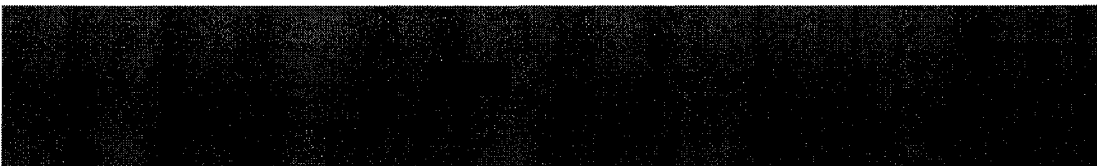
2.2 ~~(S)~~ System Coverage.

The BIT system shown in Figure 1, monitors the 152 to 164 Mc frequency range with a receiver sensitivity of -54 dbm. With the inclusion of the effects of the antenna pattern with different polarizations and aspect angles, the over-all detection sensitivity of the system ranges from -57 dbm to -45 dbm. Signals intercepted by the receiver are checked by a pulse width qualifier to determine if the pulse width is greater than 27 microseconds. The pulses which qualify are counted in a total pulse counter, PRC, over the commutator read-in interval of 400 milliseconds. The qualified pulse train is also checked to determine if the PRF falls within the 95 to 101 pps acceptance band or harmonics of this range. The system measures pulse amplitude and RF frequency on those pulses which satisfy the PRF criterion. If a signal has a power level at the receiver in excess of -30 dbm, its amplitude will be measured in the PLD-A channel regardless of PRF or pulse width. The RF frequency of the high amplitude pulses will not be read unless the signal also satisfies the pulse width and PRF criteria.

3. ~~(S)~~ MISSION RESULTS.

3.1 ~~(S)~~ Qualified Intercepts.

3.1.1 ~~(S)~~ Summary.



~~SECRET~~  
SPECIAL HANDLING

~~SECRET~~

SPECIAL HANDLING

FIRE BOX SYSTEM

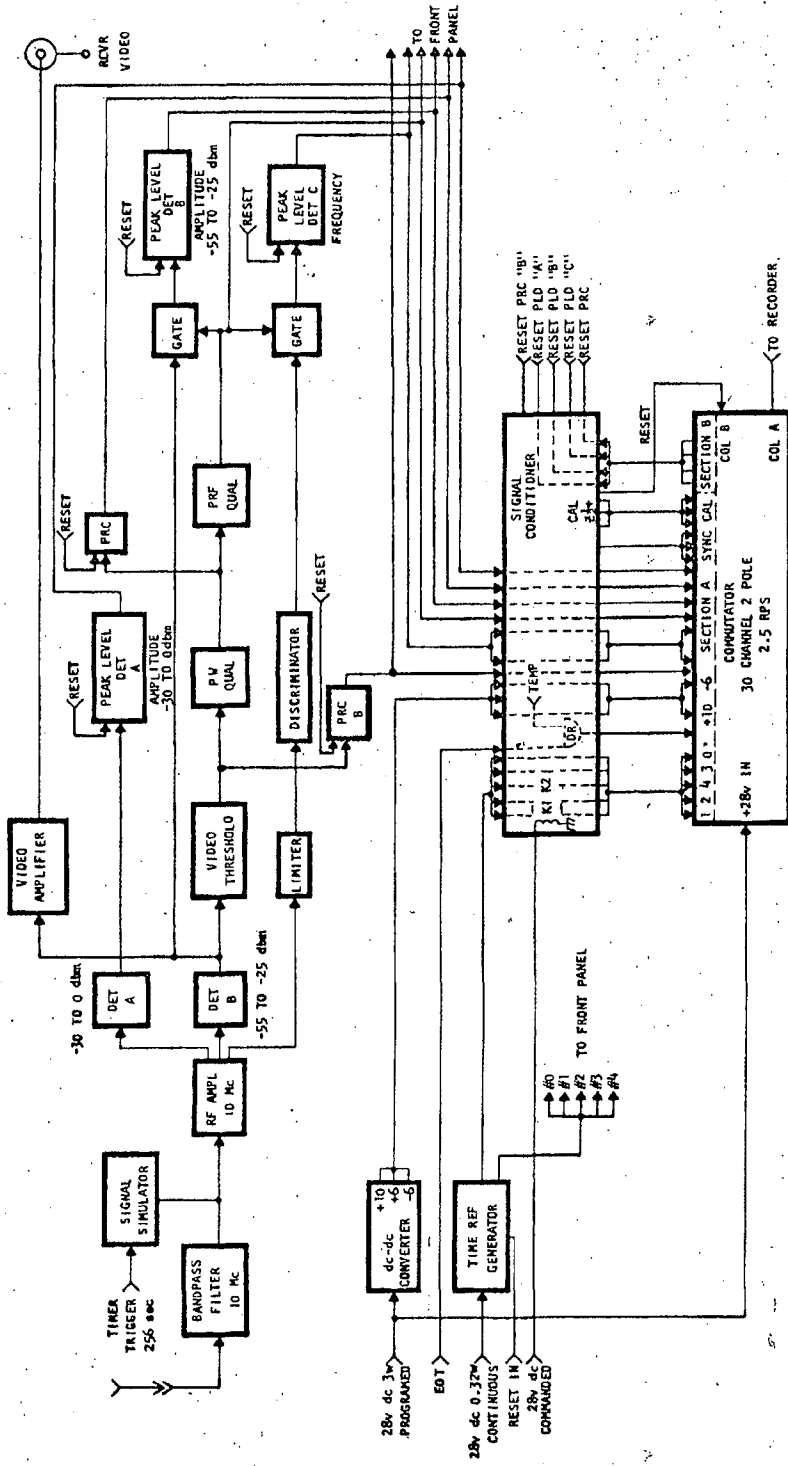


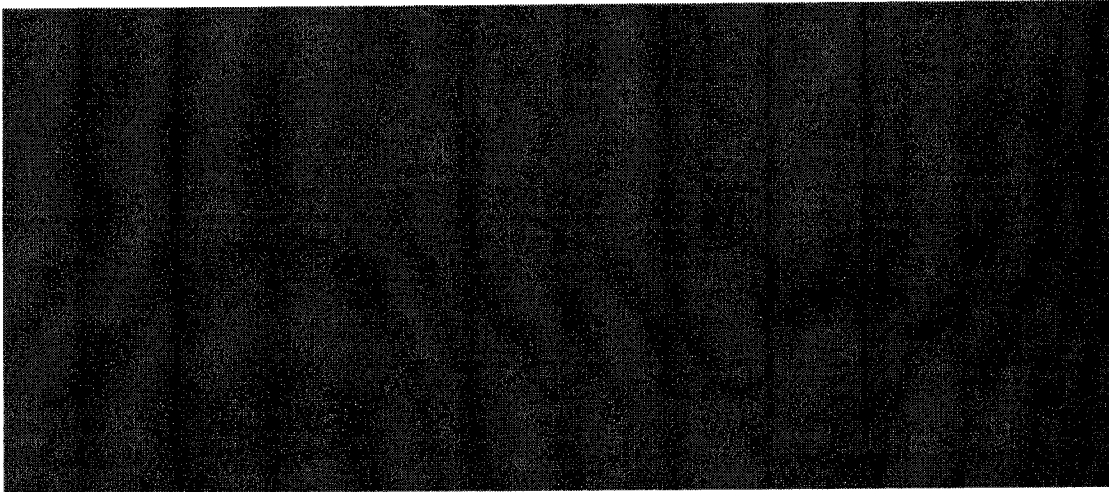
Figure 1

~~SECRET~~

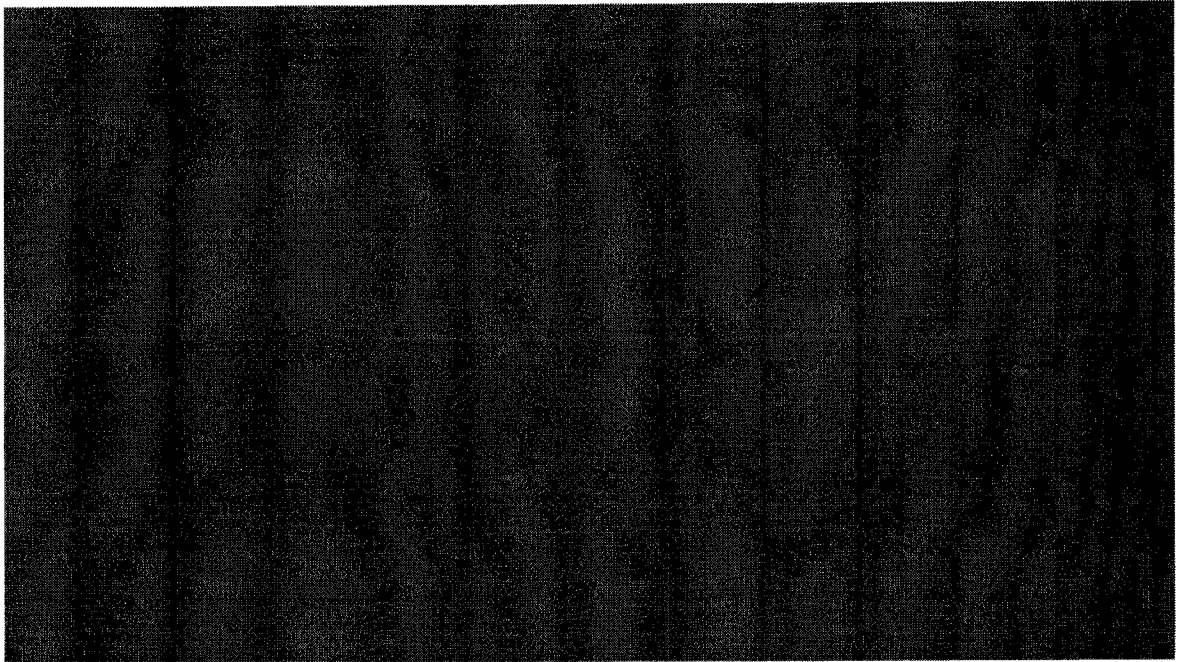
SPECIAL HANDLING

~~SECRET~~  
SPECIAL HANDLING

3.1.1 ~~(S)~~ -- Continued.



3.1.2 ~~(S)~~ Orbit 191 Intercept.



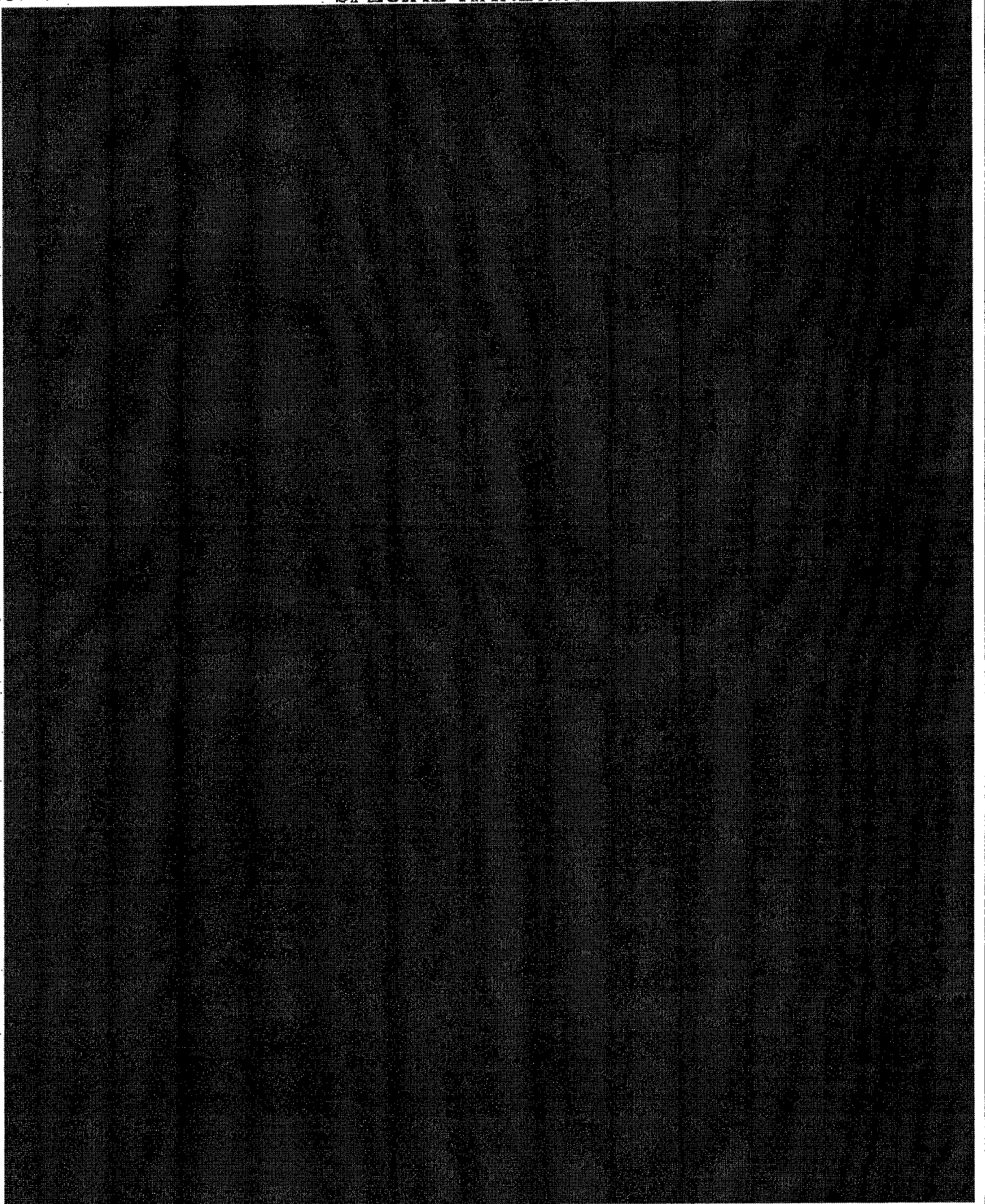
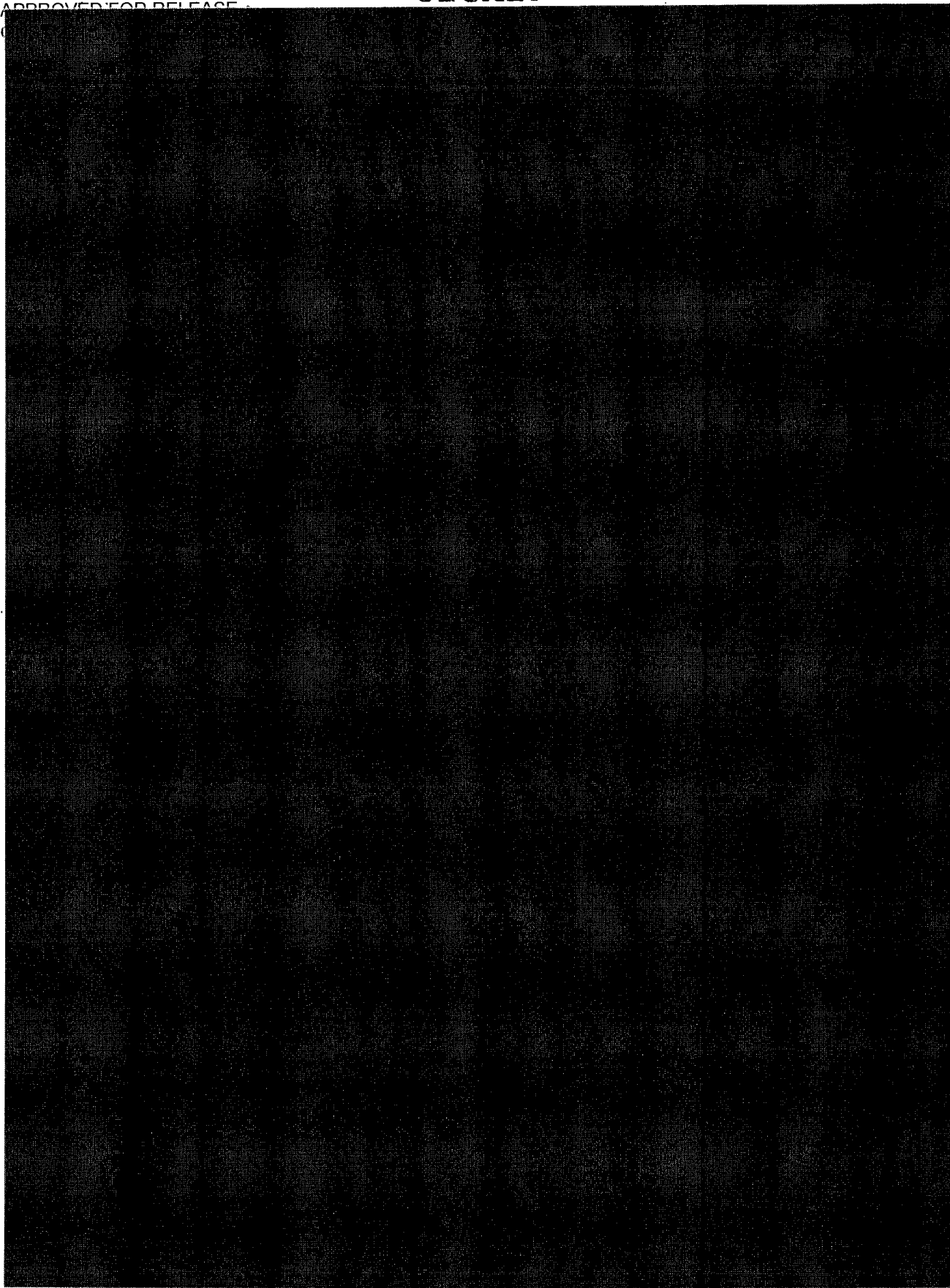


Figure 2

~~SECRET~~

NRO APPROVED FOR RELEASE

1 AUG




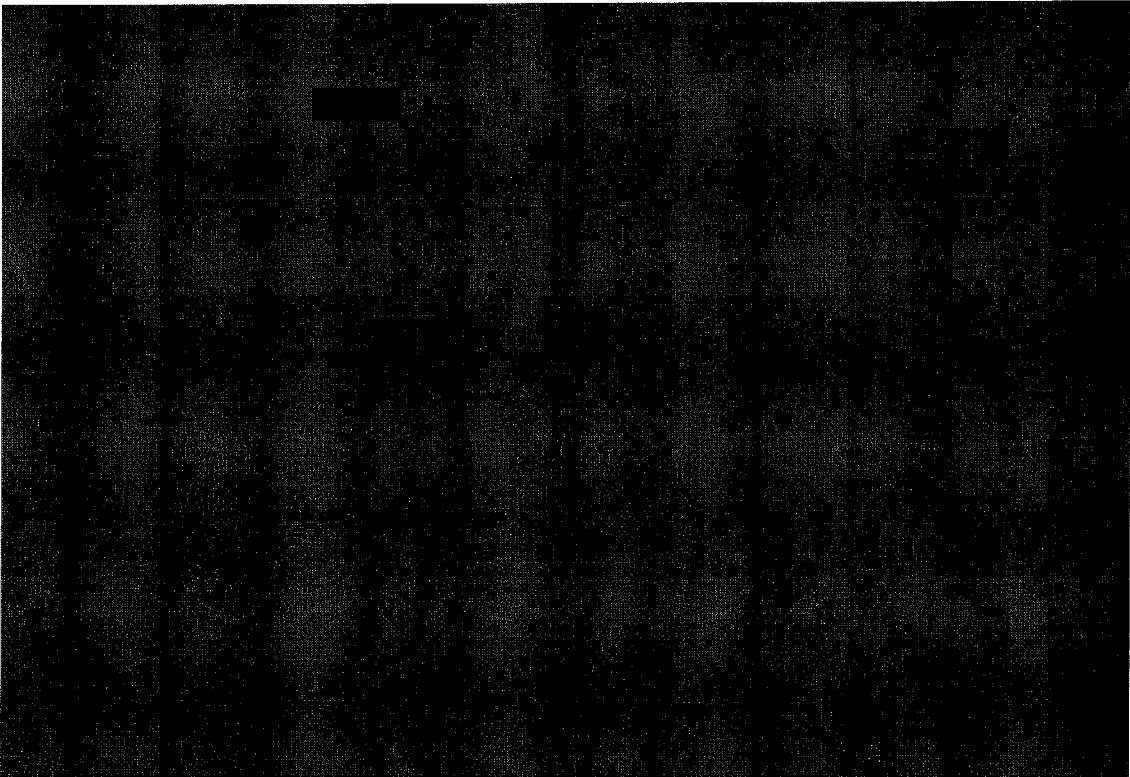
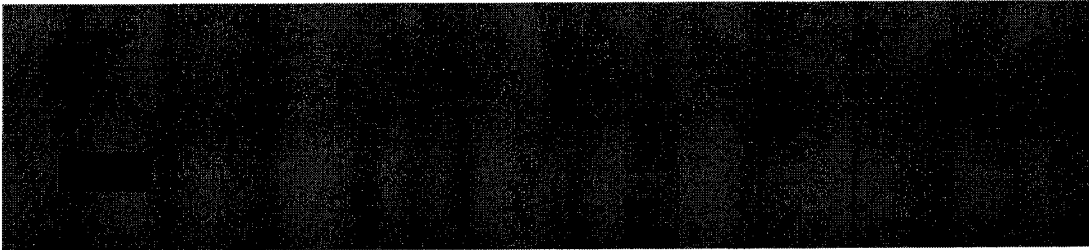
KE  
 3 X 10 INCHES  
 10 X 10 TO 10 X 10 INCH  
 KODAK SAFETY FILM CO.  
 BOSTON, U.S.A.  
 NO. 1353

~~SECRET~~

SPECIAL HANDLING

~~SECRET~~  
SPECIAL HANDLING

3.1.3 ~~(S)~~ 



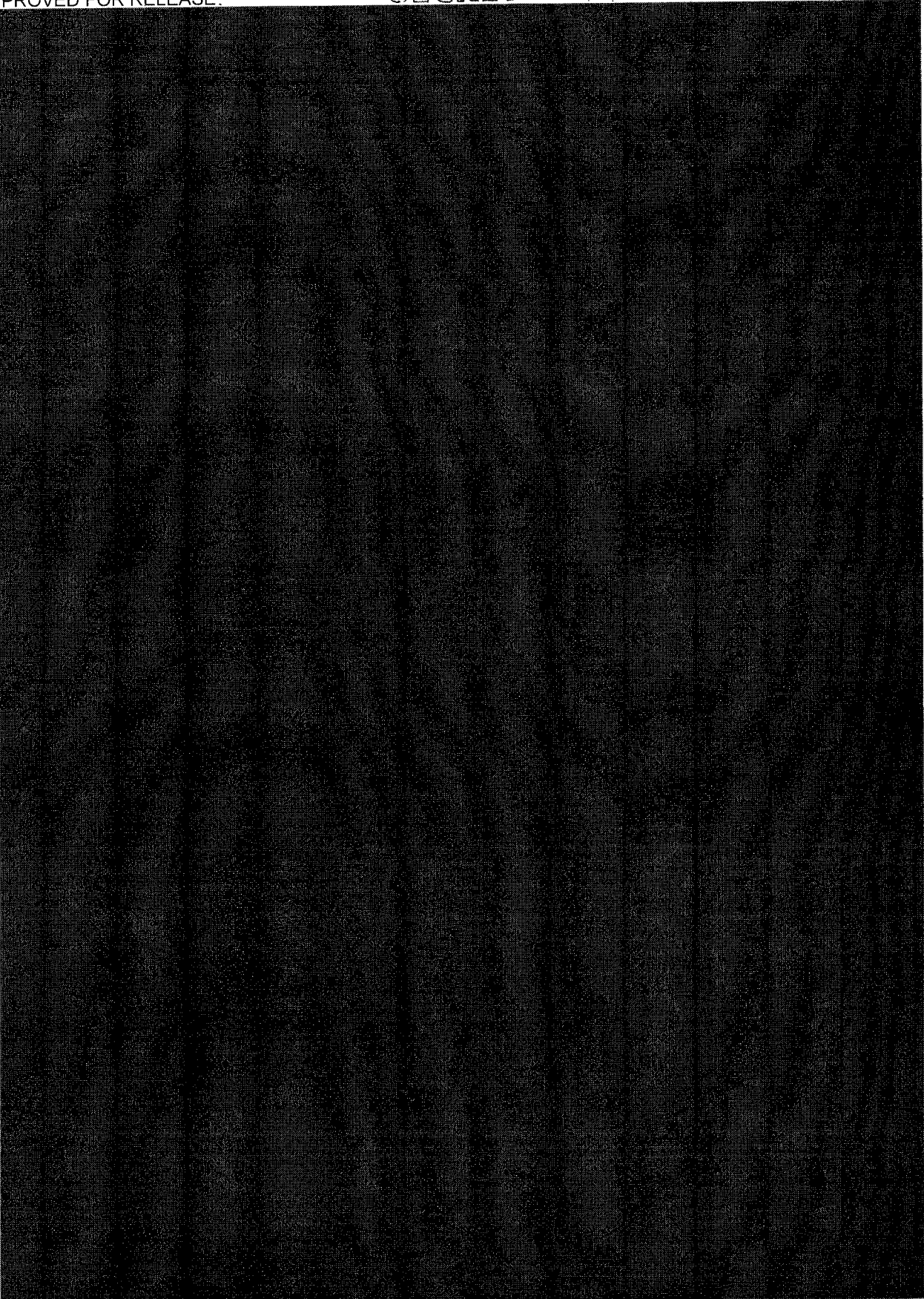
~~SECRET~~  
SPECIAL HANDLING



NRO APPROVED FOR RELEASE

1 AUGU

~~SECRET~~



SET ON HIGH XION  
2 X 10 INCHES  
2 X 10 INCH  
KENNELL & JENSEN CO.  
J. A. 2, 10, 11, 12, 13, 14

Figure 4

~~SECRET~~

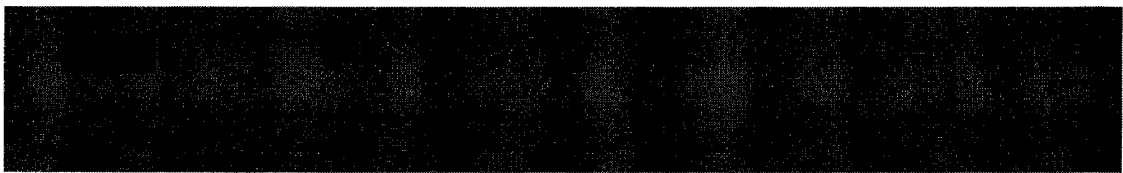
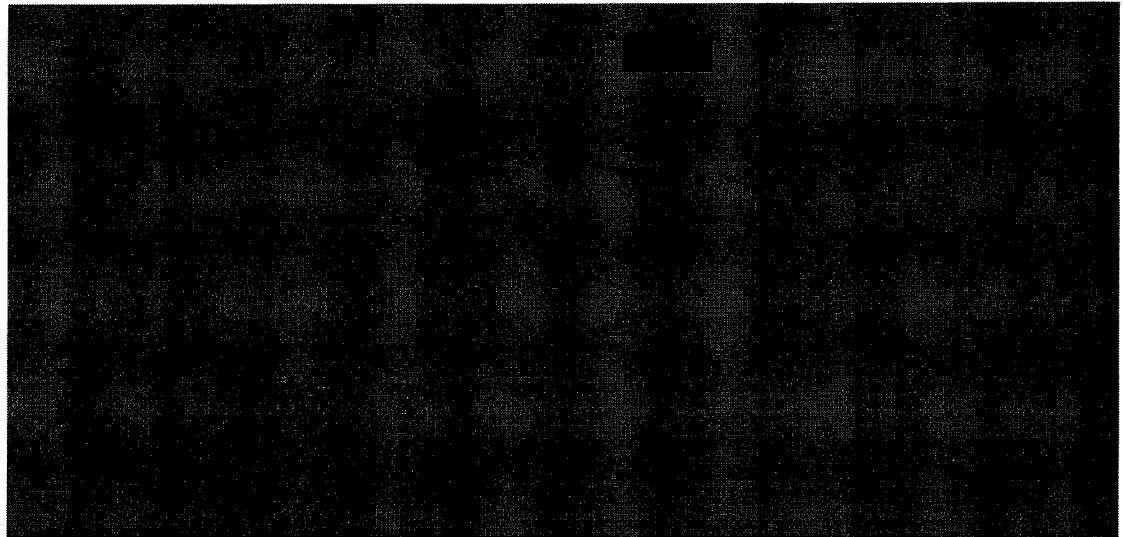
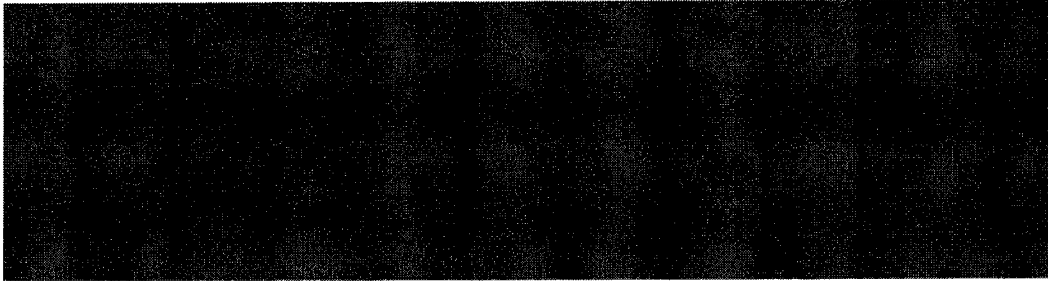
SPECIAL HANDLING

CC

1 SPECIAL HANDLING 1

~~SECRET~~  
SPECIAL HANDLING

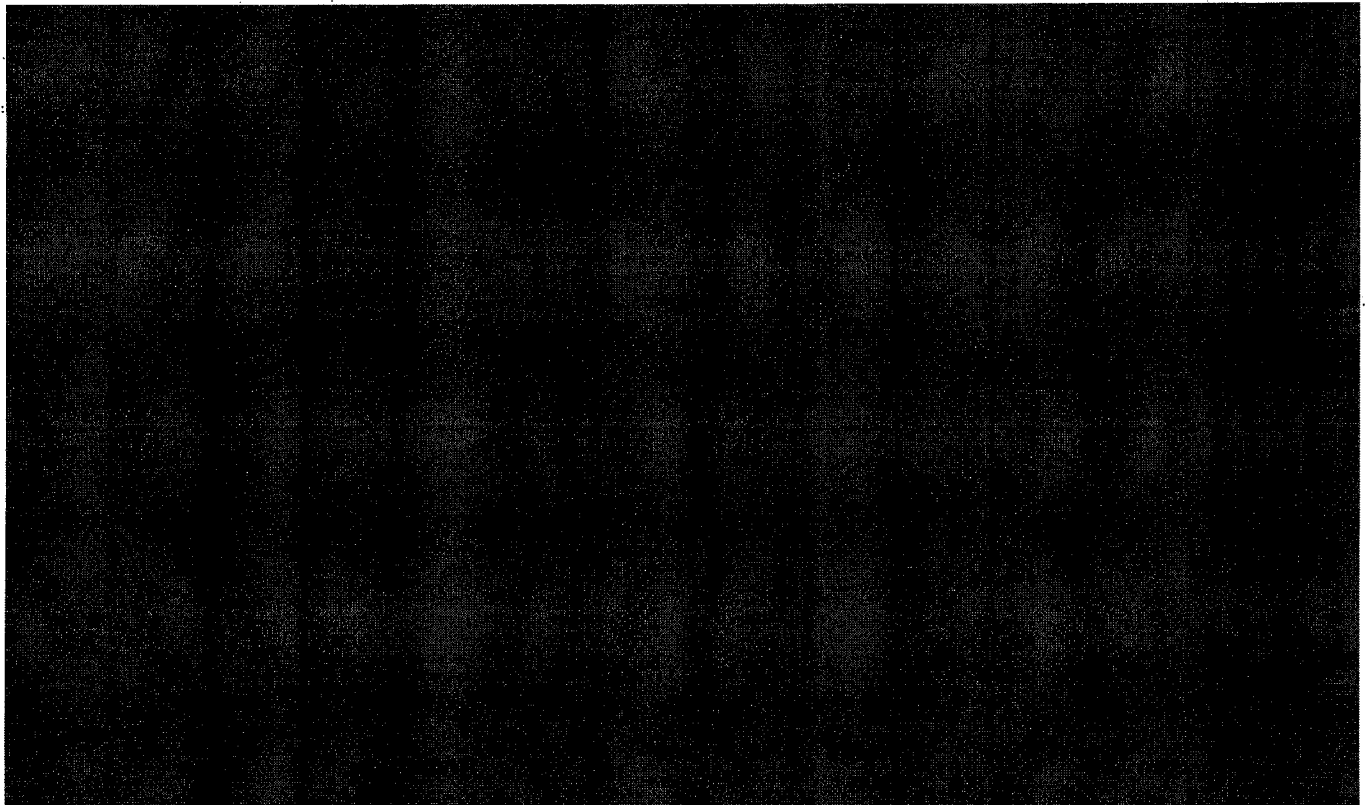
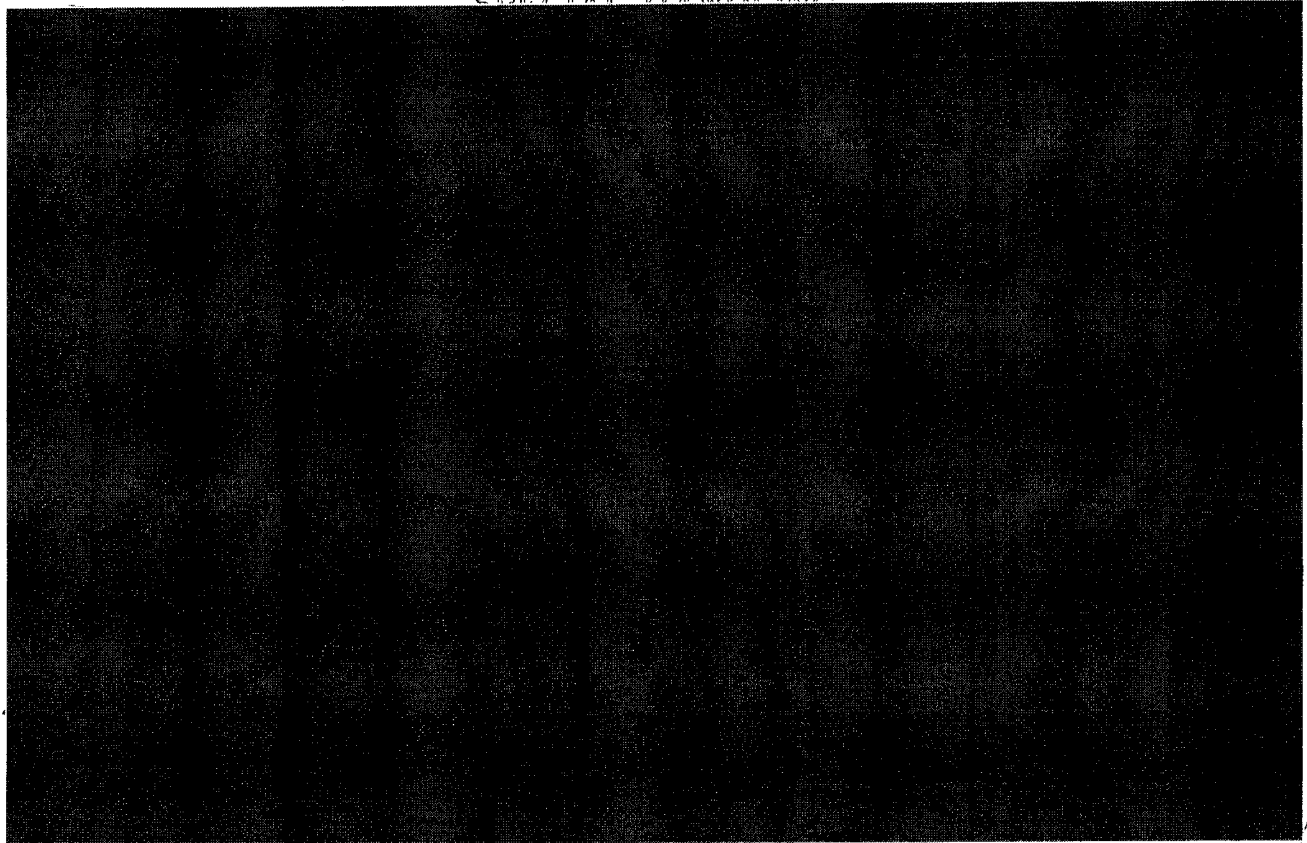
3.1.3 ~~(S)~~ -- Continued.



~~SECRET~~  
SPECIAL HANDLING

~~SECRET~~  
SPECIAL HANDLING

ANTENNA GAIN (db)  
RELATIVE TO ISOTROPIC



1 AUG



REPRODUCED FROM THE  
KODAK SAFETY FILM  
NO. 1353  
KODAK SAFETY FILM  
NO. 1353  
KODAK SAFETY FILM  
NO. 1353

Figure 7

REPLACES WESSEX CO.  
NO. 1353  
MAY 1953  
10 X 10 INCHES  
10 X 10 INCH

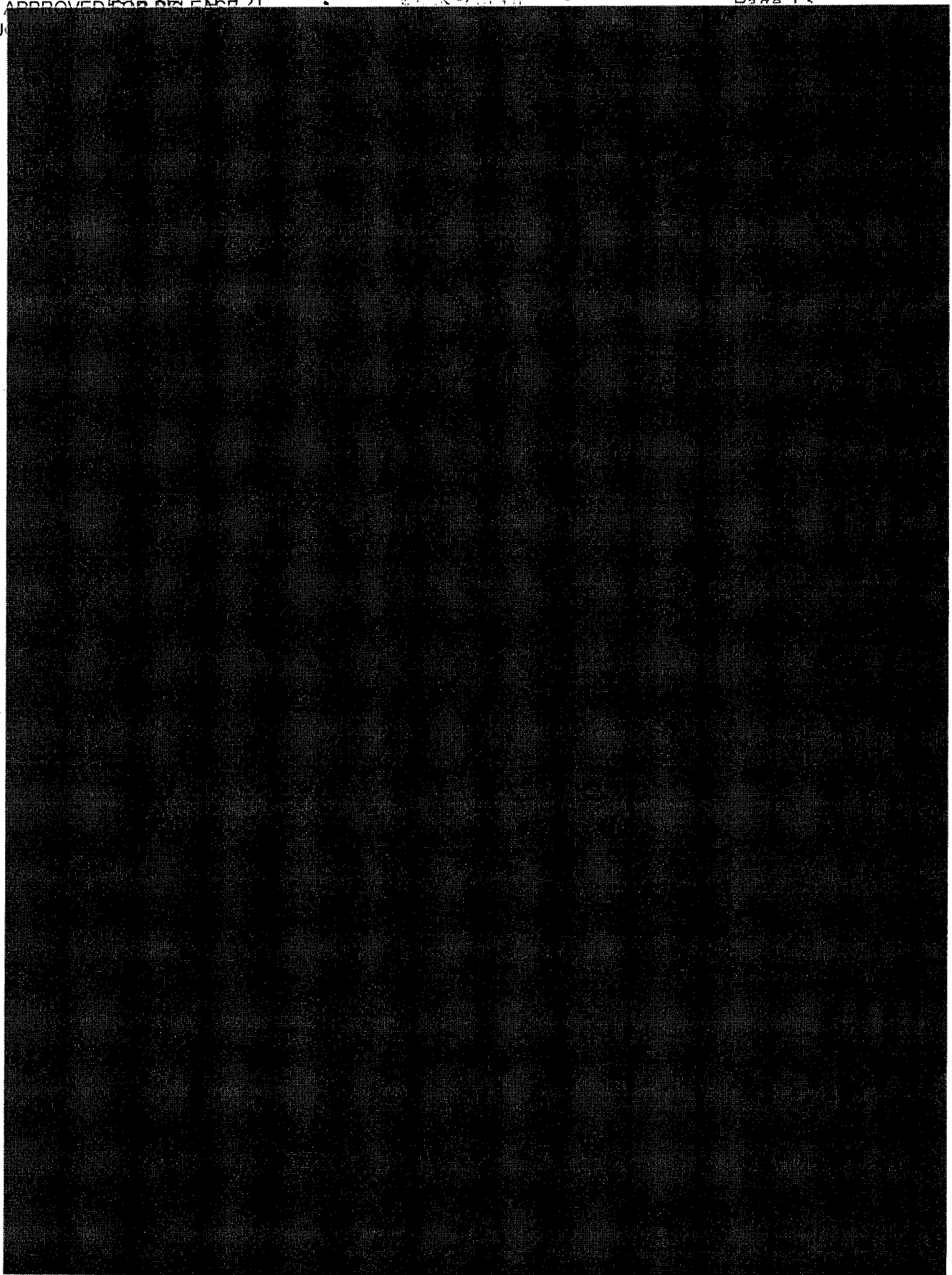


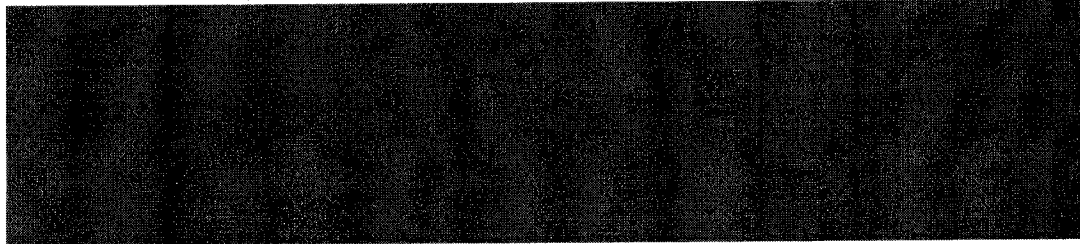
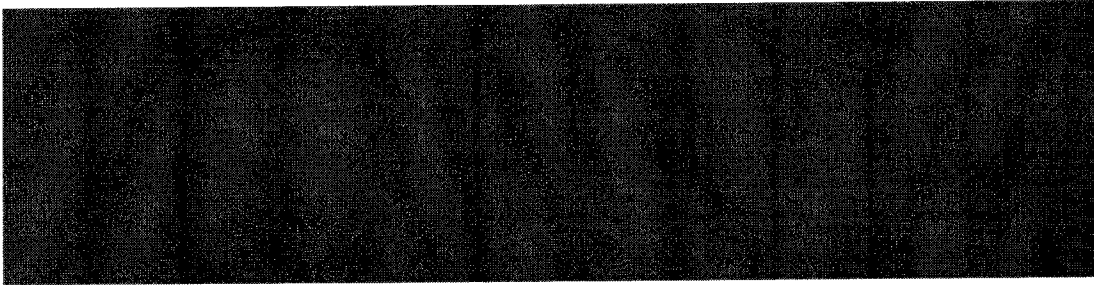
Figure 8

~~SECRET~~

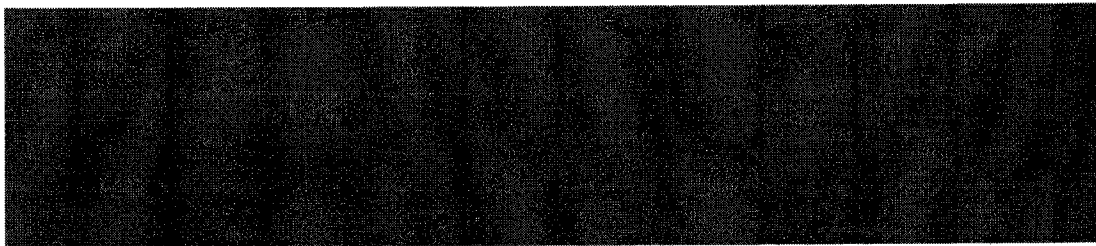
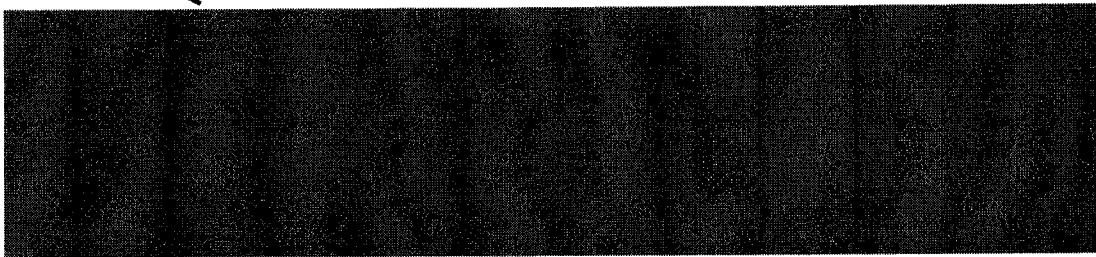
SPECIAL HANDLING

~~SECRET~~  
SPECIAL HANDLING

3.1.3 ~~(S)~~ -- Continued.



3.2 ~~(S)~~ Non Qualified Intercepts.



4. ~~(S)~~ SYSTEM PERFORMANCE.

4.1 ~~(S)~~ System Specifications.

A summary of the system specifications for the BIT system used on this mission is given below. A block diagram of the system is shown in Figure 1.

~~SECRET~~  
SPECIAL HANDLING

~~SECRET~~  
SPECIAL HANDLING4.1 ~~(S)~~ -- Continued.

Minimum Detectable Signal	-54 dbm PLD-B -30 dbm PLD-A
Minimum Acceptable Pulse Width	27 Microseconds
PRF Qualifier Acceptance Range	95-101 pps 189-202 pps (2nd Harmonic)
RF Passband	
-51 dbm	152.3 to 163.7 Mc
-25 dbm	146.2 to 171.1 Mc

4.2 ~~(S)~~ System Operation.

The BIT system performed normally during the entire 200 orbit mission. The system response to the Signal Simulator showed that the calibrations of the amplitude, frequency, and pulse count measurement circuits maintained their original levels to within 0.2 volts. The only problem noted was the response of PLD-A which measures the amplitudes of signals which exceed -30 dbm. Each time PLD-B measured an amplitude, the PLD-A output would shift from its normal zero level to +0.2 volts. This occurred for signal amplitudes well below the -30 dbm threshold. The cause of the cross-talk can not be definitely isolated but it may have been due to feedthrough from the Channel B video standardizer to the Channel A video amplifier via the +10 volt power supply lines. This cross-talk has not been observed on previous systems and it may be peculiar to the unit used on this mission.

The system's operating temperature was initially 87 degrees Fahrenheit on readout orbit 2. It gradually decreased to 77 degrees on orbit 7, 65 degrees on orbit 34, and leveled off at approximately 60 degrees for the remainder of the mission.

~~SECRET~~  
SPECIAL HANDLING