[redacted]

FLIGHT PAYLOAD SYSTEM

ENGINEERING AUDIT

[redacted] Controlled
COPY NO. [redacted]

J-21

FTV-1615

INSTRUMENTS 166 and 167

SRV 674 (A) & 670 (B)

LOGGED 17 May 65 FILED ✓

[redacted] Controlled
COPY NO. [redacted]

[redacted] typed 8 April, '65

[redacted]

J-21 CONFIGURATION

BASIC CONFIGURATION:
[redacted] ELECTRICAL BLOCK DIAGRAM
INSTALLATION SUMMARY DRAWING

NUMBER*	TITLE
TD-2032	LIGHTWEIGHT BLOSSOM T/M SYSTEM
2054	SRV SINK VALVE MODIFICATION
2088	PRESSURE MAKE-UP SYSTEM
2098	ACCESS DOORS FOR PAYLOAD TRACKING AND ROLLER ADJUSTMENT
2099	BACK-UP CUTTER (S.I.)
2100 GE	SIGNAL REDUNDANCY (TRANSFER AND ARM)
2101B LMSC	PYRO RELAY RELOCATION -- AGENA TO PAYLOAD
2104	GENEVA DRIVE FAIL-SAFE
2106	REDUNDANT POWER PATHS TO T/U CASSETTES
2121	
2124	STORED STEREO/MONO PROGRAM
EJA-2033	IMPROVED DATA HEAD
TD-2125	FAIRING ACCESS DOORS
EJA-2016	INSTRUMENTATION CHANGES
2028	BUCKET RESET CAPABILITY FOR R/F ON PAD
2030	[redacted]
[redacted]	SEPARATION SWITCH
2059	SEPARATION SPRING ON RECOVERY CABLE
2544	HOT WIRE CUTTER (and TRANSFER BOX REWIRING)
2565	DRCG TO OPERATE ON REGULATED VOLTAGE ONLY
EJRT-2699	FELT DOOR CLOSED AT ARM
2522	
2563	3840 SECOND V/H PROGRAMMER
(OTHER)	COMMUTATOR HARDWIRED ON
---	IMPROVED "B" CASSETTE ROLLER CLEARANCE
---	LOW VOLTAGE (5V) T/M
---	MODULAR GENEVA DRIVE
---	INTERMEDIATE ROLLER T/M (INSTEAD OF T/U CASSETTE T/M)
---	INTERMIX BYPASS
---	NEW 21 PIN PYRO PLUG (WAS 55 PIN)
---	IMPROVED WATER SEAL
---	ENABLE P/L T/M BY RECOVERY ARM SIGNAL
---	

* These major changes are those which make J-21 different from J-5

typed 9 April, 1965

[redacted]

[redacted]

MAJOR DIFFERENCES in CONFIGURATION between

J/21 and the previous Flight, J/04, are as follows:

J/21 HAS:

Low Voltage (5V) T/M
Modular Geneva Drive
Intermediate Roller T/M (instead of T/U Cassette T/M)
Intermix Bypass
New Pyro Interface
New 21 Pin Pyro Plug (was 55 Pin)
Improved Water Seal
Enable Payload T/M by Recovery Arm Signal
Redundant Power Paths to T/U Cassettes
Reversed IMC

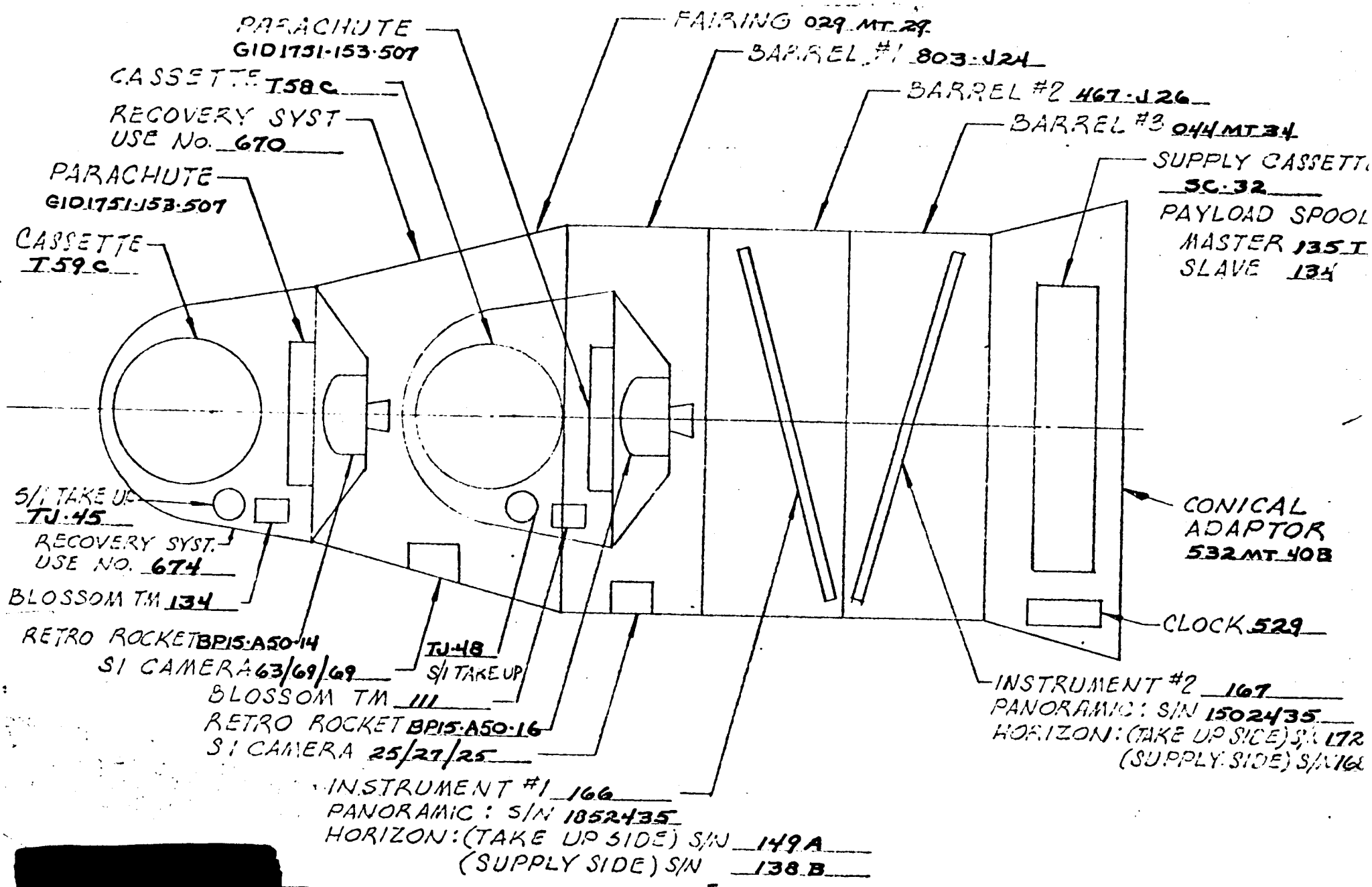
J/21 DOES NOT HAVE:

'B' Hot Wire Cutter
DFD Units [redacted] fused

[redacted]

[redacted]

CJ SERIALIZATION FLIGHT 1615-J21



[redacted]

[redacted]

9 APRIL, 1965

J-21 TEST HISTORY

PRE-CHAMBER TESTS

Systems Tests began on 6 January, 1965.
Capping Shutter rework done (by Boston) per E.O. 36604

22 January, 1965. Temperature Sensor T/M showed intermittent ground due to switching to "T/M RET." in Transfer Box; should switch to 5-volt T/S RET. E.O. made to change this on J-21 and future.

Phase VI, Sub-System Testing, COMPLETED on 28 January, 1965.
Phase VII, Sub-System Assembly and Functional Testing, COMPLETED on 4 February, 1965.
Vibration Test and Pre-TASC Preparations COMPLETED on 9 February, 1965.

CHAMBER TESTS

Went to TASC on 10 February, 1965. "A" mission Cut and Wrap on 15 February; start "B" mission on 17 February, "B" SRV dump and finish TASC Test on 19 February. The only problem during the TASC test was failure of the PMU, on 12 February. The PMU did not work after that in the test. Upon completion of test (on 19 February at A/P) PMU worked O.K. when checked with test equipment (not with TASC vehicle configuration). Extensive trouble shooting and TEAL Chamber tests found no failure in operation. Recommended for flight.

POST CHAMBER TESTS

Ran block test on 24 February; re-ran on 26 February – Master Instrument (S/N 166) resolution degraded since tests at Boston.
2 March 1965, Boston doing static Optical Tests on Block
3 March 1965, Master Instrument shipped back to Boston for rework.
16 March 1965, Master Instrument received from Boston.
24 March 1965, Block Test re-run, results check O.K.

29 March 1965, Begin Pre-Ship Preparations.

6 April 1965, PMU OPERATION VERIFIED FOR FLIGHT.

7 April 1965, Installed Security Covers; ready for shipment.

9 April 1965, Pre-Ship Audit Meeting scheduled (1;30 P.M.)

19 April 1965, Completed IMC modifications.

28 April,1965, Shipping preps completed.

[redacted]

[redacted]

STI LIST, J/21

NUMBER	TITLE
J2101	Tach Motors Voltage Measurement
J2102	Altitude Testing of Pressure Make-Up System
J2103	Static Optical Testing
J2104	Load Test of Recovery Batteries
J2105	Format Width on Master Instrument (S/N 166)
J2106	J/21B Forebody - Electrical Circuitry Retest
J2107	System Test of SI Modification on J/21
J2108	Light-Leak Check and Repair of Forebodies
J2109	Dynamic Balance Verification (SRV-A)
J2110	Pre-Pad Pressure Make-Up System Procedure Change
J2111	Take-Up Verification Test
J2112	Relay Pull-In Voltage Verification

[redacted]

[redacted]

J21 LEO LIST

NUMBER	DESCRIPTION
T22-602	Recovery Barrel Stellar Baffle Change
T22-603	Fairing Stellar Baffle Change
T22-731	Parachute Assembly Change
T22-732	Parachute Assembly Change
T22-444	Change Rivet Call-Out
T22-510	Tape and Stow AFC Plug
T22-301	Tape and Stow Pirani Plug
T22-639	Change Screw Call-Out
T22-649	Change Black Paint Call-Out
T22-656	Change Black Paint Call-Out
T22-824	Change Black Paint Call-Out
198 R 315	Remove Forebody Temp Sensor

[redacted]

[redacted]

MAJOR EQUIPMENT LIST - PAYLOAD J-21

1615

I ASSOCIATE CONTRACTOR EQUIPMENT

ITEM	PART NUMBER	SERIAL NUMBER	NOMENCLATURE
1	42600	166	Master Instrument
2	42650	167	Slave Instrument
3	5400	D67/85/80	"A" Double Frame Camera
4	5400	D25/27/25	"B" Double Frame Camera
5	T22-731	674	"A" Re-entry Vehicle
6	T22-732	670	"B" Re-entry Vehicle
7	56545	SC-32	Supply Cassette

II A/P MANUFACTURED EQUIPMENT

8	T22-3028-501	121	Temp Sensor J-Box
9	T22-3013-501	121	Aft Pyro J-Box
10	T22-3016-501	121	Command Box
11	T22-3018-501	121	T/M Power J-Box
12	T22-3020-501	121	J-Box
13	T22-3022-501	121	Transfer Box
14	T22-3024-501	121	FWD Pyro J-Box
15	T22-3026-501	121	Fairing J-Box
16	T22-738-503	1001	Pressure Make-up Unit
17	T44-661-	A605 & 606 B603 & 604	Water Seal

III SUB-CONTRACTOR EQUIPMENT

18	1089-B1	529	DRCG (Clock)

[redacted]

FEDR/CARD SUMMARY
PAYLOAD J 21 VEHICLE
FEDRs AGAINST MAJOR PAYLOAD EQUIPMENT

[redacted]

A,
Sheet 1

MAJOR EQUIP. & S/N	PART OR ASSEMBLY (REMOVED)	S/N	FEDR	DATE AREA FOUND	DESCRIPTION OF DISCREPANCY	REPAIR OR REPLACEMENT DATA & CORRECTIVE ACTION	SUPPLEMENTAL ANALYSIS AND CORRECTIVE ACTION
Payload Assy. T22-600	Instr. Complete Bbl. Assy. #1 T22-607	467-J26	1983	1/8/5 Sys. Test	The horizon optics boot (input side) has pinhole.	Fabricate 2 ea. patches of fairpreme 5040 as per sketch on [redacted] Install one patch in ea. side of boot. Use Dupont 4678 adhesive.	
	Payload Assembly Complete T22-600	N/A	1906	3/12/5 Sys. Test	Acceptance TASC Test Pressure makeup didn't operate.	3/18/5: PMU Syst. was re-tested, no malfunction was found. Lack of voltage to regulator solenoid could have been the problem. The payload integration dept. has determined the J-21 P/L Assy is operational and no further action is req'd as a result of this FEDR. Eng. concurs with this decision.	

[redacted]

Copy No. [redacted]

LAUNCH READINESS REVIEW

J-21 / 1615

Approved: [redacted]

[redacted] Manager
VAFB A/P Payload Operations

[redacted]

[redacted]

SECTION I

MILESTONE CHRONOLOGICAL EVENTS [redacted]

Received Payload from Advanced Projects		29 April 1965
System Run		
Phase I	(with Payload)	7 May 1965
Phase II	(with Payload)	8 May 1965
Instrument Preparations		11 May 1965
System Assembly and Supply Cassette Loading		12 May 1965
Final Run		13 May 1965
Mate	(scheduled)	16 May 1965
Launch	(scheduled)	18 May 1965

[redacted]

VAFB SUPPLEMENTARY WORK CHART J21/1615

FUNCTION	STI	ATPW	PRINT/EO	SQUAWK	FEDR
Paint Payload		J2101	[redacted]		
Forebody Rework		J2102	[redacted]		
Dynamic Balance of RV with A/P weights installed ('A' Capsule)	J2109	J2103			
Parachute Installation Photographs		J2104			
USE 670 Recovery Tray trouble-shooting and replacement		J2105		37	V3930
Take-Up Brake verification	J2111	J2106			
Troubleshoot 'B' Bucket Beacon roblem		J2107			
Gold Dollar rework		J2108	[redacted]		
Relay Pull-In Test and Diode Continuity	J2112	J2109		Conic 37 R/BBL 60 Compl 11	
Cassette T59C Checkout		J2110			
Change to 5" flip-flop baffles		J2111	[redacted]		
Rework Slits		J2112			
Continuity Check of Data block bit No. 25, Instrument 166		J2113			
RH Sensor change		J2114		Conic 33	1972
Tape and stow plugs		J2115	[redacted]		

[redacted]

SECTION II [redacted]

VAFB SUPPLEMENTARY WORK CHART J21/1615

FUNCTION	STI	ATPW	PRINT/EO	SQUAWK	FEDR
DFC 63/69/69 Installation	J2011	J2116	[redacted]		1401
All LMSC plug sockets checked for spring-tension				18	
Change Parachute Type to GID-1751-153-507			[redacted]		
Change paint callout. (Paint print)			[redacted]		
Change paint callout for Fairing baffle			[redacted]		
Change paint callout for Recovery baffle			[redacted]		

[redacted]

[redacted]

SECTION III

PAYLOAD LIMITED LIFE COMPONENTS

1615/J21

COMPONENT Name and Number	No. Req. per P/L	USED IN:	Shelf Life (Months)	Shelf L EXPIR (Date)
M-11 Squib	42	8 - Horizon Doors 8 - S/I Doors 4 - Fairing Elect Disc 4 - "A" Spin and Despin 4 - "B" Spin and Despin 6 - Fairing Sep PP 8 - N/C Release PP	24	1-1-6
M-130 Squib	4	Main Doors	12	7-1-6
Squib 102B7560P4	4	P28A and P28B Disc	12	10-1-6
Squib 102B7560P5	4	W1P1 (A and B) Disc	12	6-1-6
Squib (Adapter Charge Nut) 111C5501P2	8	A and B N/C Pistons	12	1-1-66
Explosive Bolts 025C8-4G2	4	A and B T-C/Forebody Sep	12	6-1-66
[illegible] Battery CAP-1007B	2	A and B Capsules	12	6-1-6
Thermal Battery 007C787C1 or C3	4	A and B Thrust Cones	30	7-1-6

[redacted]

[redacted]

SECTION III

PAYLOAD LIMITED LIFE COMPONENTS 1615/J21

COMPONENT Name and Number	No. Req. per P/L	USED IN:	Shelf Life (Months)	Shelf L EXPIR (Date
Retro-Rocket 863C772P3	2	A and B Thrust Cone	15	6-2-(
W8-Harness 937C302G2	2	A and B Main Water Seals	12	7-1-(
W12-Harness 922C706	2	A and B S/I Water Seals	12	7-1-(
Harness 922C705	1	Payload Door	12	7-1-(
Reefing Line Cutter 887C482P1	8	A and B Parachutes	12	Jan 6
Bag Line Cutter 887C491P1	4	A and B Parachutes	12	Oct 6
Lanyard Assembly [illegible]	2	A and B Capsule Beanie Cap	12	12-1-(
Battery 5 AH [illegible]	1	A Capsule	36 (Unactive)	Sept 65
			30 Days (Activated)	6-5-6
Battery [illegible]	1	B Capsule	24 (Unactive)	Aug 65
			60 Days (Activated)	6-18-6

[redacted]

SYSTEM TEST PERFORMANCE EVALUATION

SECTION IV

PREPARED BY: [redacted]

ORGN. Dept 77-11

SYSTEM TEST Phase 1 VEHICLE 1615/J21 RUN DATE 8 May 1965

SUBSYSTEM

MEAS. NO.	CHANNEL-LINK-PIN	MEASUREMENT	PROBLEM (INCLUDE DESCRIPTION OF NORMAL OPERATION)	RESOLUTION	FURTHER ACTION REQUIRED
		CEC 13	During Zero Passive Test 'A', at Transfer (T+1570), CEC 13 did not deflect per the Test Procedure. It deflected normally in the succeeding tests. (Zero Passive 'B' and 'C').	Cleaned dirty contact on light bulb which is in series with galvo.	NONE

[redacted]

SYSTEM TEST PERFORMANCE EVALUATION

SECTION IV

PREPARED BY: [redacted]

SYSTEM TEST Phase 2 VEHICLE 1615/J21 RUN DATE 8 May 1965

SUBSYSTEM A/P Payloads ORGN. Dept 77-11

MEAS. NO.	CHANNEL-LINK-PIN	MEASUREMENT	PROBLEM (INCLUDE DESCRIPTION OF NORMAL OPERATION)	RESOLUTION	FURTHER ACTION REQUIRED
	13-1-21 13-1-22 13-1-23 13-1-24	Cycle Counter Instrument No. 1	Counter failed to register two cycles during $\phi 2$. This problem occurred again during Instrument Flight Readiness when the Counter failed to register one cycle.	Squawk bought-off.	NONE
	11-1-0		At T+5987, Channel 11 should go commutated at finish of slewing operation. Instead it continued to slew until T+6021.2 when AP power was removed. At that time the Channel commutated normally.	Operator error. DFC was replaced with DFC D/63/69/69.	NONE

[redacted]