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PRIORITY [redacted]

CORONA HANDLE VIA TWX FACILITY ONLY

REF MSN 1005

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FROM LT COL WEBB

SUBJ REPORT ON REENTRY MSN 1005

1. FINDINGS AND OBSERVATIONS

USE 618 WAS RECEIVED IN THE CONFERENCE ROOM OF BUILDING 6 AT AP ON 13 AUGUST 1964, IN 2 PLYWOOD BOXES. THE BOXES WERE OPENED AND THE PIECES WERE REMOVED AND SORTED INTO 5 GROUPS: (1) ABLATIVE SHIELD (FOREBODY); (2) CAPSULE, INCLUDING BALLAST; (3) AFT COVER; (4) PARACHUTE AND THERMAL COVER; (5) THRUST CONE. THE FOLLOWING OBSERVATIONS WERE MADE UPON EXAMINATION.

A. FOREBODY

1) APPROXIMATELY 35 PERCENT OF THE FOREBODY ABLATIVE SHIELD WAS PRESENT. THE NOSE PIECES (FIG. 34) SHOWED DISTINCT IMPRESSIONS OF RADIATION DISKS LOCATED ON THE BALLAST ASSEMBLY. A LARGE NUMBER OF THE SMALL PIECES OF ABLATIVE MATERIAL EVIDENTLY CAME FROM THE CENTER SECTION, HAVING BEEN SHATTERED BY IMPACT FORCES. THE AFT SECTION (FIGS.24 AND 25) WAS ESSENTIALLY INTACT AND HAD BEEN SAWED IN HALF FOR SHIPPING PURPOSES. THE AFT RING WAS INTACT AND CONTAINED THE EXPLOSIVE BOLT ENDS IN THE MOUNTING NUTS. THE EXPLOSIVE BOLT THREADED ENDS SHOWED TORN JAGGED MATERIAL AT THE

SEPARATION POINT ON ONE EDGE OF EACH BOLT. THE AFT FACE OF THE FOREBODY MOUNTING RING SHOWED SOME EVIDENCE OF MODERATE RE-ENTRY HEAT. THE 4 EJECTOR PISTONS WERE INTACT AND THO THE STUDS WERE MODERATELY BENT, THE PISTONS HAD OBVIOUSLY NOT BEEN FIRED. ABOUT 80 PERCENT OF THE PISTON RING (FIG. 31) WAS RECEIVED. THE CABLE MOUNTING RING, (FIG. 33), ALTHO TORN, WAS APPROX. 95 PERCENT COMPLETE. AFTER COMPLETION OF THE FOREBODY INSPECTION THE PISTONS WERE DIS-ARMED (PYROS REMOVED FOR SAFETY PURPOSES).

2) IN VIEWING THE AFT RING THE OBSERVER COULD NOTE AN APPARENT SHEARING PATTERN BETWEEN THE THRUST CONE AND THE FOREBODY AS EVIDENCED BY THREE FACTORS: THE SEPARATION SWITCH LEAF SPRINGS WERE BENT IN THE DIRECTION OF THE PLUS Z AZIS; THE MOUNTING STUDS WERE BOTH BENT IN THE DIRECTION OF THE PLUS Z AXIS (STUD NEAREST PLUS Z AXIS BENT MOST SEVERELY); THE PATTERN OF SHEAR OF THE EXPLOSIVE BOLT ENDS (FIGS. 28 AND 29) WAS IN THE APPROX. DIRECTION OF THE PLUS Z AXIS. THE AFT SECTION OF THE FOREBODY SHOWED A FAIRLY UNIFORM BREAKAGE PATTERN WHICH WOULD INDICATE THAT THE CAPSULE IMPACTED NOSE DOWN AND VERTICALLY. ALL FOREBODY CAPSULE GUIDES (FIG. 32) WERE FOUND WITH THE EXCEPTION OF ONE FORWARD GUIDE. THE SLIGHT DAMAGE TO THE GUIDES WAS ESSENTIALLY UNIFORM AND ALSO INDICATED A NOSE-ON IMPACT.

B. CAPSULE INCLUDING BALLAST

1) THE IMPACT PATTERN OF THE FORWARD END OF THE CAPSULE ALSO INDICATED A NOSE-ON IMPACT. THE MASTER PAYLOAD SHOWED AN IMPRESSIVELY DEEP IMPRINT IN THE CASULE NOSE, BALLAST, AND FOREBODY

(FIGS. 1, 23, AND 24). UPON PRIMARY EXAMINATION OF THE CAPSULE INTERIOR AND COMPONENTS (FIG. 5, 6 AND 7) IT WAS APPARENT SEVERE DAMAGE WAS CAUSED BY IMPACT. IT WAS ALSO APPARENT THAT THE TM TRANSMITTER PROPER WAS MISSING AS WELL AS THE 4A5 ARM MODULE AND THE UPPER SECTION OF THE 2A14 MODULE. UPON EXAMINATION OF THE TM PARTS RECEIVED (FIG. 16) IT WAS EVIDENT THAT THE TRANSMITTER HAD BEEN FORCED OPEN. TOOL MARKS FROM TOOLS SUCH AS ONE MIGHT USE FOR THE PURPOSE WERE NOTED ON THE MINALGA CANISTER (FIG. 14 AND 15), DESTRUCT TIMER (FIG. 7) AND THE TM BATTERY AS WELL. THE CAPSULE COMPONENTS HAD APPARENTLY BEEN SUBJECTED TO POST IMPACT DAMAGE.

2) LT. COL. WEBB DIRECTED THAT THE PAYLOAD BE REMOVED FROM THE CAPSULE AND STORED IN A SHIPPING CONTAINER FOR SHIPMENT TO A PROCESSING ORGANIZATION. THE S/I, MAIN AND SLAVE SPOOLS WERE THEN REMOVED WITH CONSIDERABLE EFFORT AND WITH SOME DAMAGE TO THE CAPSULE. DURING REMOVAL OF THE 2 LARGE SPOOLS IT WAS NOTED THAT THE MOTOR HUB HAD BEEN BROKEN AT THE CENTER AND THE MAIN SPOOL FLANGES SEPARATED FROM THE HUB (FIGS. 9, 10 AND 11). THE MAIN SPOOL HAD BEEN FILLED TO APPROX. 1/2 INCH RADIUS BEYOND THE RIM OF THE SPOOL. THE SLAVE SPOOL CONTAINED APPROX. 1/2 INCH RADIUS FROM THE HUB. THE S/I SPOOLS WERE APPARENTLY FULL (FIG. 8). AFTER REMOVAL IT WAS NOTED THAT THE FORWARD END OF THE FLANGES WERE WRINKLED AND THAT THE INNER FLANGES HAD OVERLAPPED AND LOCKED TOGETHER. THE CASSETTE MOTORS WERE THEN REMOVED FROM THE SPOOL HUBS. THE MAIN PAYLOAD WAS PLACED IN A LIGHT TIGHT BLACK BAG

(WITHOUT FLANGES) AS IT WOULD NOT FIT THE SHIPPING CAN. THE SLAVE SPOOL WAS PLACED IN A SHIPPING CAN AS WERE THE 2 S/I SPOOLS. EXAMINATION OF THE MOTOR ARMATURES SHOWED THEM TO BE FLATTENED AT THE IMPACT END (FIG. 13), INDICATING THE HIGH IMPACT FORCES EXPERIENCED BY THE CAPSULE. THE RECOVERY TRAY WAS THEN REMOVED FROM THE CAPSULE (FIG. 41 THRU 43) AND AN ATTEMPT WAS MADE TO MEASURE THE ARM RELAYS, K1 AND K2, AND THE TRANSFER RELAY K3 TO ESTABLISH WHETHER THE ARM AND TRANSFER SIGNALS HAD BEEN RECEIVED. NO MEASUREMENTS WERE POSSIBLE AS THE RECOVERY TRAY WAS SEVERELY DAMAGED BY IMPACT. THE DESTRUCT TIMER WAS ALSO CHECKED FOR CONTINUITY TO DETERMINE IF ANY ARM SIGNAL HAD BEEN RECEIVED. IT WAS FOUND THAT THE TIMER WAS IN RESET POSITION. THIS INDICATED THAT NO ARM SIGNAL WAS GIVEN. THE BALLAST, WHICH WAS BETWEEN THE CAPSULE AND THE FOREBODY NOSE, HAD BEEN BENT AROUND THE MAIN SPOOL. THE LEAF SPRING ATTACHING THE BALLAST TO THE CAPSULE HAD BROKEN APPROX. 7 INCHES FROM THE CAPSULE END. THE BALLAST RELEASE MECHANISM HAD BEEN COMPLETELY SEPARATED FROM THE BALLAST (FIG. 22 AND 23). NO RADIATION DISKS HAD REMAINED FIXED TO THE BALLAST. THE BALLAST CABLE CUTTERS WERE NOT PRESENT. RADIATION SAMPLES INCLUDED IN THE SHIPMENT WERE AS FOLLOWS: 45 EA THIN METALIC DISKS; 2 EA LEAD DISKS; 1 GOLD DISK; 1 SET OF DISKS CONTAINING 9 SAMPLES OF THIN DISKS; 3 COMPLETE SETS OF DISKS WITHIN HOLDERS; 5 EA SAMPLE HOLDERS; 3 EA SAMPLE HOLDER COVERS; 3 EA BLACK, PLASTIC WRAPPED, DISK SHAPED, EXPERIMENTS. OTHER RADIATION EXPERIMENTS INCLUDED 1 SOLAR CELL ATTACHED TO CAPSULE, CONTENTS OF

MINALGA CANISTER, AND ONE RADIATION FILM PACK MOUNTED ON CASSETTE FRAME. THE FILM PACK WAS AN A/P EXPERIMENT.

C. AFT COVER

THE FOLLOWING AFT COVER PARTS WERE RECEIVED AT AP: THE COVER RING, (FIG. 20), INCLUDING THE 2 WATER SEALS; THE BASE OF THE FLASHING LIGHT; THE ASCENT VALVE; THE W2J1 CONNECTOR AND W2 HARNESS; 95 PERCENT OF THE COVER MATERIAL; AND THE 4 SEGMENTED RETAINING RINGS, (FIG. 19). MISSING PARTS WERE: THE UPPER SECTION OF THE FLASHING LIGHT; THE W4 CABLE; THE RE-ENTRY VALVE, BOTH DIMPLE MOTOR HARNESSES; AND BOTH WATER SEAL RELEASE MECHANISMS. THE WATER SEALS WERE FOUND TO BE IN THE CLOSED POSITION; HOWEVER, CLOSE EXAMINATION OF THE WATER SEALS REVEALED THAT THEY HAD BEEN OPEN DURING RE-ENTRY AS EVIDENCED BY SOME HEAT MARKS ON THE INSIDE OF THE BLADES. THE HEAT PATTERN ON THE OUTSIDE OF THE COVER INDICATED THAT MOST HEAT WAS SEEN BY THE COVER AT THE MINUS Z AXIS. THE COVER HAD APPARENTLY BEEN BROKEN BY THE MAIN SPOOL PAYLOAD BEING PUSHED THRU THE COVER AT IMPACT.

D. PARACHUTE AND THERMAL COVER

1) THE THERMAL COVER FRAME WAS COMPLETELY INTACT AND SHOWED ESSENTIALLY NO IMPACT DAMAGE (FIG. 36 AND 37). THE THERMAL MATERIAL HAD APPARENTLY BEEN BROKEN AND SHATTERED BY THE PARA-CHUTE BEING FORCED UPWARD AT IMPACT. APPROX. 80 PERCENT OF THIS MATERIAL WAS RECEIVED. THE FLASHING LIGHT COVER OF THE THERMAL COVER WAS UNBROKEN AND UNMARRED AND WOULD INDICATE THAT THE FLASHING LIGHT WAS INTACT AFTER IMPACT. THE AFT SIDE OF THE

THERMAL COVER SHOWED NO INDICATIONS OF SHRAPNEL PENETRATION OR SCORCHING, INDICATING THAT NEITHER THE HIGH PRESSURE BOTTLES NOR THE RETRO ROCKET HAD EXPLODED NEAR THE THERMAL COVER. THE PAYLOAD CHUTE, WHICH IS ATTACHED TO THE THERMAL COVER, WAS FOUND TO BE SEVERELY BURNED AND DEFORMED.

2) THE PARACHUTE HARDWARE SHOWN IN FIGURE 35 INDICATES THAT THE PARACHUTE WAS INTACT AT IMPACT. THE PARACHUTE ITSELF WAS NOT RECEIVED AT A/P.

E. THRUST CONE

ONLY 2 ITEMS OF THE THRUST CONE WERE FOUND IN THE SHIPMENT. THESE WERE THE W1P1 EXPLOSIVE DISCONNECT WITH 10 PERCENT OF THE HARNESS AND, SIGNIFICANTLY, THE W1J1 CONNECTOR (FIG. 38). EVEN AFTER CAREFUL SIFTING AND EXAMINATION OF BAGS CONTAINING PIECES AND REMNANTS OF THE SRV FOUND AT THE IMPACT SITE, NOTHING MORE COULD BE FOUND OF THE THRUST CONE. EXAMINATION OF THE W1 HARNESS REVEALED SEVERE BURNING TOWARDS THE W1J1 END. THE HEAT PATTERN INDICATED PROGRESSIVELY LESS HEAT TOWARDS THE W1P1 END OF THE CABLE. THE SQUIBS WERE REMOVED FROM THE EXPLOSIVE DISCONNECT AND WERE FOUND TO BE INTACT AND UNFIRED.

2. ANALYSIS

FROM THE INFORMATION GATHERED IN THE FIRST PART OF THIS REPORT THE FOLLOWING CONDITIONS APPEAR TO HAVE EXISTED DURING RE-ENTRY AND IMPACT OF THIS SRV.

A. NO ARM SIGNAL WAS RECEIVED PRIOR TO RE-ENTRY. THIS IS EVIDENCED BY THE FOLLOWING:

1) THE TM BATTERY SQUIB HAD NOT FIRED. THE RESISTENCE MEASURED ACROSS PINS 4 AND 5 OF THE TM BATTERY CONNECTOR READ APPROX. 15 OHMS. IT WAS NOTED WHILE TAKING THIS READING THAT POOR CONNECTIONS EXISTED BETWEEN THE PINS AND THE SQUIB WIRES. IT SHOULD BE NOTED HERE THAT THE TM BATTERY HAD BEEN SUBJECTED TO MIS-HANDLING WHICH WOULD CONTRIBUTE TO THE DIFFICULTY IN READING. 22 VOLTS WAS APPLIED ACROSS THE BRIDGE WIRE AND A SUBSEQUENT RESISTANCE CHECK SHOWED THAT THE BRIDGE WIRE HAD OPENED AFTER CURRENT APPLICATION.

2) THE DESTRUCT TIMER WAS FOUND TO BE IN THE RESET POSITION AND THEREFORE COULD NOT HAVE RECEIVED AN ARM SIGNAL SINCE RECYCLING TIME IS APPROX. 35 MINUTES AND RE-ENTRY TIME WOULD HAVE BEEN LESS.

3) ALTHO THE ARM RELAYS, K1 AND K3, OF THE RECOVERY PROGRAMMER WERE DAMAGED BEYOND READABILITY, THEY COULD NOT HAVE BEEN ACTUATED OR THE EJECTOR PISTONS WOULD HAVE FIRED AFTER G SWITCH TRIGGERING.

4) THE MAIN WATER SEAL WAS APPARENTLY OPENED DURING RE-ENTRY AS EVIDENCED BY HEAT MARKS ON THE INSIDE OF THE BLADE.

B. THE TRANSFER SIGNAL WAS NOT RECEIVED FOR THE FOLLOWING REASONS:

1) K3 OF THE RECOVERY PROGRAMMER COULD NOT HAVE BEEN ACTUATED OR IT WOULD HAVE ALSO CAUSED THE EJECTOR PISTONS TO FIRE AFTER G SWITCH TRIGGERING.

2) THRUST CONE PROGRAMMER DID NOT FIRE EXPLOSIVE BOLTS OR W1P1 EXPLOSIVE DISCONNECT.

3) THE S/I WATER SEAL WAS OPEN DURING RE-ENTRY AS EVIDENCED BY HEAT ON INSIDE OF BLADE.

C. SEPARATION OF THE SRV FROM THE INSTRUMENT FAIRING WAS THEREFORE CAUSED BY RE-ENTRY FORCES FOR THE FOLLOWING REASONS:

1) THE FOREBODY MATING STUDS AND THE THRUST CONE BOLTS WERE SHEARED, AND THE SEPARATION SWITCH LEAF SPRINGS WERE ALL BENT IN THE SAME DIRECTION (TOWARDS THE PLUS Z AXIS) INDICATING A LARGE SHEAR FORCE BETWEEN THE SRV AND THE FAIRING.

2) THE FOREBODY MOUNTING STUD ON THE MINUS Z AXIS WAS MORE SEVERELY BENT THAN THE OTHER MOUNTING STUD INDICATING THAT THE MOUNTING STUD AT THE MINUS Z AXIS HAD BEEN ATTACHED LONGER THAN THE OTHER STUD. THIS COULD HAVE BEEN CAUSED BY THE PIN PULLER ON THE PLUS Z AXIS HAVING FIRED AS A RESULT OF RE-ENTRY HEAT RELEASING THAT SIDE OF THE SRV. IT IS AT THIS TIME THAT THE THRUST CONE MAY HAVE BEEN SHEARED BY COLLIDING WITH THE INSTRUMENT FAIRING.

D. RE-ENTRY AND IMPACT. HAVING FOUND W1J1 OF THE THRUST CONE IN THE IMPACT AREA INDICATES THAT THE THRUST CONE REMAINED WITH THE SRV DURING MOST OF THE RE-ENTRY. HAVING OBSERVED NO SHRAPNEL OR SEARING DAMAGE TO THE AFT SECTION OF THE SRV INDICATES THAT THE RETRO AND HIGH PRESSURE BOTTLES HAD NOT BLOWN NEAR THE SRV. WITH THE INTENSE HEAT EXPERIENCED DURING RE-ENTRY BY AN UNPROTECTED BODY IT IS ALMOST CERTAIN THAT THE HIGH PRESSURE BOTTLES WOULD HAVE BLOWN AND THE RETRO ROCKET WOULD HAVE EITHER BLOWN OR GONE HIGH ORDER. IT WOULD ALSO APPEAR THAT SINCE THE THRUST CONE WAS CONNECTED TO THE CAPSULE THRU W1 HARNESSES FOR AT LEAST THE

FIRST PART OF THE RE-ENTRY THAT IT WOULD ACT AS A DROGUE CHUTE AND STABILIZE THE SRV. THIS WOULD EXPLAIN THE NOSE-ON IMPACT CONDTION.

3. CONCLUSIONS

A. THE SRV RE-ENTRY WAS A RESULT OF NORMAL ORBIT DEGENERATION WITH SEPARATION FROM THE INSTRUMENT FAIRING BEING CAUSED BY RE-ENTRY FORCES. NEITHER ARM NOR TRANSFER SIGNALS WERE RECEIVED BY THE SRV. THE THRUST CONE WAS SHEARED DURING SEPARATION BUT WAS RETAINED BY THE W1 HARNESS AND ACTED AS A DROGUE CHUTE TO STABILIZE THE RECOVERY VEHICLE AND NOSE-ON IMPACT WAS EXPERIENCED.

B. IT IS THE OPINION OF THE ANALYSIS TEAM THAT THE THRUST CONE WOULD HAVE BURNED BEYOND RECOGNITION FROM THE TREMENDOUS HEATS EXPERIENCED DURING RE-ENTRY. IN VIEW OF THE FACT THAT THE THRUST CONE AND ITS COMPONENTS ARE COMPLETELY UNPROTECTED FROM THE SEARING HEAT AND THAT THE RETRO ROCKET AND HIGH PRESSURE SPIN BOTTLES WOULD HAVE BLOWN AS A RESULT OF THIS, IT IS EXTREMELY UNLIKELY THAT ANY RECOGNIZEABLE PIECES WOULD HAVE IMPACTED.

C. FROM EXAMINATION OF THE CONTENTS OF THE 2 BOXES RECEIVED AT AP THE FOLLOWING ITEMS WERE FOUND TO BE MISSING:

1) FOREBODY:

A) 65 PERCENT OF THE ABLATIVE MATERIAL

B) 1 FORWARD CAPSULE GUIDE

C) UPPER SECTIONS OF EXPLOSIVE BOLTS.

2) CAPSULE:

A) CABLE CUTTERS (BALLAST RELEASE)

B) RADIATION SAMPLES (UNDETERMINED NUMBER)

C) MINALGA CANISTER CONTENTS (UNDETERMINED)

D) 2A14 MODULE (ARM AND TRANSFER SIGNAL DISTRIBUTION MODULE)

E) 4A5 ARM MODULE (TM BATTERY PROTECTION MODULE)

F) TM TRANSMITTER AND VCO'S

G) TM CONNECTOR PLUG

H) 50 PERCENT OF W2 HARNESS

3) AFT COVER:

A) WATER SEAL RELEASE MECHANISMS (BOTH)

B) WATER SEAL DIMPLE MOTOR HARNESSES (BOTH)

C) RE-ENTRY VALVE

D) W4 CABLE (INTERFACE BETWEEN CAPSULE AND FOREBODY)

E) FLASHING LIGHT (BASE FOUND ON COVER)

4) PARACHUTE:

(ALL EXCEPT ITEMS SHOWN IN FIG. 35)

5) THRUST CONE:

ALL EXCEPT W1J1 AND W1P1 AND 10 PERCENT OF HARNESS.

4. FOLLOWING IS LIST OF ILLUSTRATIONS REFERRED TO IN TEXT ABOVE. THESE PHOTOGRAPHS ARE BEING SENT BY NEXT POUCH.

1. VIEW OF FORWARD END OF CAPSULE LOOKING AFT SHOWING IMPACT PATTERN, PARTICULARLY PATTERN OF MASTER SPOOL.

2. FORWARD END OF CAPSULE LOOKING AFT, PLUS Y AXIS AT LEFT.

3. FORWARD END OF CAPSULE LOOKING AFT, MINUS Y AXIS AT RIGHT.

4. INTERNAL VIEW OF CAPSULE LOOKING FORWARD SHOWING IMPACT

DAMAGE. PLUS Z AXIS ON BOTTOM AND PLUS Y AXIS ON RIGHT. NOTE ABSENCE OF TM TRANSMITTER NORMALLY LOCATED BETWEEN PLUS Z AND MINUS Y AXIS.

5. INTERNAL VIEW OF CAPSULE SHOWING IMPACT DAMAGE.

6. INTERNAL VIEW OF CAPSULE SHOWING IMPACT DAMAGE. NOTE SMALL AMOUNT OF PAYLOAD ON SLAVE SPOOL.

7. INTERNAL VIEW OF SLAVE SIDE OF CAPSULE. NOTE TEAR IN CASE OF DISTRUCT TIMER.

8. VIEW OF DAMAGE TO S/I CASSETTE.

9. SLAVE SPOOL AFTER DIS-ASSEMBLY.

10. MASTER SPOOL IN-BOARD FLANGE AFTER DIS-ASSEMBLY.

11. MASTER SPOOL OUT-BOARD FLANGE AFTER DIS-ASSEMBLY.

12. LOOSE PAYLOAD RECEIVED.

13. MASTER MOTOR ARMATURE AFTER DIS-ASSEMBLY SHOWING DEFORMATION CAUSED BY IMPACT.

14. MINALGA CANISTER AND TM BATTERY AS RECEIVED.

15. OPPOSITE VIEW OF MINALGA CANISTER AND TM BATTERY. NOTE MARKS AND DENTS ON CANISTER AND BATTERY. PROBABLY CAUSED BY FORCIBLE ENTRY.

16. TM TRANSMITTER PARTS RECEIVED; 80 PERCENT MISSING. NOTE MARKS AND DEFORMATION INDICATING FORCIBLE ENTRY.

17. MISCELLANEOUS LOOSE CASSETTE PARTS RECEIVED.

18. LOOSE CAPSULE PARTS RECEIVED.

19. AFT VIEW OF AFT COVER AFTER RE-ASSEMBLY OF PARTS. NOTE ABSENCE OF W4 CABLE TO RIGHT OF S/I WATER SEAL.

20. UNDER SIDE VIEW OF AFT COVER RING SHOWING POSITIONS OF WATER SEALS AS RECEIVED.

21. W2 CABLE HARNESS AND SECTION OF AFT COVER.

22. BALLAST AND RADIATION DISKS. (MINUS Y AXIS TOWARDS VIEWER).

23. BALLAST AND ASSOCIATED PARTS.

24. AFT END OF ABLATIVE SHIELD.

25. AFT END OF ABLATIVE SHIELD. (OPPOSITE VIEW)

26. ABLATIVE SHIELD MOUNTING STUD (MATES WITH PIN-PULLERS ON INSTRUMENT FAIRING). NOTE METAL FLOWAGE CAUSED BY RE-ENTRY HEAT.

27. ABLATIVE SHIELD MOUNTING STUD ON PLUS Z AXIS. NOTE AFT END OF STUD MISSING CAUSED BY EITHER BREAKAGE OR RE-ENTRY HEAT.

28. THE THREADED END OF EXPLOSIVE BOLT NEAR THE PLUS Z AXIS. NOTE TEARING OF METAL AT BOLT SEPARATION POINT.

29. THE THREADED END OF EXPLOSIVE BOLT NEAR MINUS Z AXIS. NOTE TEARING OF METAL AT BOLT SEPARATION POINT.

30. RESULTS OF TESTS USING EXPLOSIVE BOLTS IDENTICAL TO THOSE USED IN RECOVERED SRV. THESE TESTS WERE RUN UNDER PRE-LOADED, FLIGHT-SIMULATED, CONDITIONS. THE BOLT ON RIGHT WAS BROKEN BY A SHARP HAMMER IMPACT PERPENDICULAR TO THE BOLT AXIS AND SHOWS THIN METAL HAVING STAYED WITH THE THREADED END OF THE BOLT. THE OTHER 2 BOLTS WERE FIRED. NOTE THE CLEANNESS OF SEPARATION AND THE LACK OF THIN MATERIAL ON THE THREADED ENDS.

31. ABLATIVE SHIELD CAPSULE MOUNTING RING.

32. ABLATIVE SHIELD CAPSULE GUIDES.

33. ABLATIVE SHIELD W5 HARNESS AND FORWARD MOUNTING RING.

34. LOOSE PIECES OF ABLATIVE SHIELD. NOTE RADIATION DISK IMPRESSIONS IN FORWARD PIECES.

35. PARACHUTE HARDWARE RECEIVED.

36. THERMAL COVER AND PIECES AS RECEIVED.

37. THERMAL COVER FRAME AND S/I PAYLOAD CHUTE.

38. THRUST CONE HARNESS WITH W1P1 ATTACHED.

39. W1J1 CONNECTOR. NOTE HEAT DAMAGE.

40. AFT VIEW OF CAPSULE AFTER REMOVAL OF RECOVERY BATTERY, SI CASSETTE, AND MAIN PAYLOAD SPOOLS.

41. AFT VIEW OF CAPSULE AFTER CASSETTE REMOVAL SHOWING VIEW OF RECOVERY TRAY.

42. END VIEW OF RECOVERY TRAY AFTER REMOVAL.

43. BOTTOM VIEW OF RECOVERY TRAY AFTER REMOVAL. NOTE SEVERE IMPACT DAMAGE TO COMPONENTS.

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