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HISTORIC AMERICAN ENGINEERING RECORD

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MARSHALL SPACE FLIGHT CENTER,
NEUTRAL BUOYANCY SIMULATOR FACILITY **HAER No. AL-129-B**
Redstone Arsenal
Huntsville Vicinity
Madison County
Alabama

NOTE: Photographs by Jet Lowe, August 1995.

AL-129-B-1	NEUTRAL BUOYANCY SIMULATOR BUILDING (NBS) EXTERIOR ELEVATION LOOKING NORTH; TANK BUILDING TO LEFT, CONTROL ROOM ETC. TO RIGHT OF CONNECTING BAY.
AL-129-B-2	VIEW LOOKING EAST, NBS FACILITY ON THE LEFT
AL-129-B-3	WIDE ANGLE OF NEUTRAL BUOYANCY SIMULATOR (NBS) FROM WITHIN NBS HIGHBAY DOORS. DIVE BELL IN FOREGROUND.
AL-129-B-4	TOPSIDE VIEW FROM UPPER DECK LOOKING DOWN INTO TANK WITH SHUTTLE CARGO BAY MOCK-UP AT BOTTOM OF 40 FOOT TANK.
AL-129-B-5	TOPSIDE VIEW FROM UPPER DECK LOOKING DOWN INTO TANK WITH SHUTTLE CARGO BAY MOCK-UP AT BOTTOM OF 40 FOOT TANK.
AL-129-B-6	DECK #4 TOPSIDE FROM NORTHEAST CORNER END PIECE FOR ROBOTIC ARM FOR ANCHORING ASTRONAUT FOR MECHANICAL WORK.
AL-129-B-7	LESLIE WICKMAN, EVA (EXTRA VEHICULAR ACTIVITIES) SPECIALIST, IN SPACE SUIT AFTER TESTING IN NEUTRAL BUOYANCY TANK. AVERAGE COST OF SUIT $1,000,000.
AL-129-B-8	LESLIE WICKMAN, EVA (EXTRA VEHICULAR ACTIVITIES) SPECIALIST, GETTING OUT OF SPACE SUIT AFTER TESTING IN NEUTRAL BUOYANCY TANK. AVERAGE COST OF SUIT $1,000,000.
AL-129-B-9	SPACE SUIT AFTER TESTING IN NEUTRAL BUOYANCY TANK.
AL-129-B-10	INTERIOR NEUTRAL BUOYANCY SIMULATOR TANK, AT 2ND LEVEL.

AL-129-B-11 INTERIOR OF NBS TANK FROM THIRD LEVEL, VIEW LOOKING NORTHEAST.

AL-129-B-12 NBS LOWER ROOM. BEHIND FAR GLASS WALL IS VIDEO TAPE EQUIPMENT AND VOICE INTERCOM EQUIPMENT. THE MONITORS ABOVE GLASS WALL DISPLAY UNDERWATER TEST VIDEO TO CONTROL ROOM. FARTHEST CONSOLE ROW CONTAINS CAMERA SWITCHING, PANNING, TILTING, FOCUSING, AND ZOOMING. MIDDLE CONSOLE ROW CONTAINS TEST CONDUCTOR CONSOLES FOR MONITORING TEST ACTIVITIES AND DATA. THE CLOSEST CONSOLE ROW IS NBS FACILITY CONSOLES FOR TEST DIRECTOR, SAFETY AND QUALITY ASSURANCE REPRESENTATIVES.

AL-129-B-13 NBS LOWER ROOM. BEHIND FAR GLASS WALL IS VIDEO TAPE EQUIPMENT AND VOICE INTERCOM EQUIPMENT. THE MONITORS ABOVE GLASS WALL DISPLAY UNDERWATER TEST VIDEO TO CONTROL ROOM. FARTHEST CONSOLE ROW CONTAINS CAMERA SWITCHING, PANNING, TILTING, FOCUSING, AND ZOOMING. MIDDLE CONSOLE ROW CONTAINS TEST CONDUCTOR CONSOLES FOR MONITORING TEST ACTIVITIES AND DATA. THE CLOSEST CONSOLE ROW IS NBS FACILITY CONSOLES FOR TEST DIRECTOR, SAFETY AND QUALITY ASSURANCE REPRESENTATIVES.

AL-129-B-14 NBS REMOTE MANIPULATOR SIMULATOR (RMS) CONTROL ROOM. THE RMS CONTROL PANEL IS IDENTICAL TO THE SHUTTLE ORBITER AFT FLIGHT DECK WITH ALL RMS SWITCHES AND CONTROL KNOBS FOR INVOKING ANY POSSIBLE FLIGHT OPERATIONAL MODE. THIS INCLUDES ALL COMPUTER AIDED OPERATIONAL MODES, AS WELL AS FULL MANUAL MODE. THE MONITORS IN THE AFT FIGHT DECK WINDOWS AND THE GLASSES THE OPERATOR WEARS PROVIDE A 3-D VIDEO PICTURE TO AID THE OPERATOR WITH DEPTH PERCEPTION WHILE OPERATING THE ARM. THIS IS REQUIRED BECAUSE THE RMS OPERATOR CANNOT VIEW RMS MOVEMENTS IN THE WATER WHILE AT THE CONTROL PANEL.

AL-129-B-15 NBS TOP SIDE CONTROL ROOM. THE SUIT SYSTEMS CONSOLE IS USED TO CONTROL AIR FLOW AND WATER FLOW TO THE UNDERWATER SPACE SUIT DURING THE TEST. THE SUIT SYSTEMS ENGINEER MONITORS AIR FLOW ON THE PANEL TO THE LEFT, AND SUIT DATA ON THE COMPUTER MONITOR JUST SLIGHTLY TO HIS LEFT. WATER FLOW IS MONITORED ON THE PANEL JUST SLIGHTLY TO HIS RIGHT AND TEST VIDEO TO HIS FAR RIGHT. THE DECK CHIEF MONITORS THE DIVER'S DIVE TIMES ON THE COMPUTER IN THE UPPER RIGHT. THE DECK CHIEF LOGS THEM IN AS THEY ENTER THE WATER, AND LOGS THEM OUT AS THEY EXIT THE WATER. THE COMPUTER CALCULATES TOTAL DIVE TIME.

AL-129-B-16 NBS TOPSIDE CONTROL ROOM, THE NBS HYPERBARIC CHAMBER IS VERY CLOSE TO THE WATER'S EDGE AND HERE FOR DIVER EMERGENCY SUPPORT. A MEDICAL STAFF IS LOCATED ON THE MARSHALL SPACE FLIGHT CENTER (MSFC) AND SUPPORTS THE NBS PERSONNEL WHEN HYPERBARIC CHAMBER OPERATION IS NECESSARY.

AL-129-B-17 NBS TOOL ROOM. MISCELLANEOUS TOOLS USED DURING EXTRA VEHICULAR ACTIVITY (EVA) MISSIONS AND NBS TRAINING. FROM LEFT TO RIGHT THE TOOLS ARE: SHUTTLE TRANSPORTATION SYSTEM (STS) PORTABLE FOOT RESTRAINT (PFR), ESSEX WRENCH, SOCKET WRENCH, SAFETY TETHER REEL (LEFT REAR), MINI WORKSTATION (CENTER REAR), TETHERS (FRONT CENTER), HUBBLE SPACE TELESCOPE (HST) POWER TOOL (FRONT RIGHT), HUBBLE SPACE TELESCOPE & PORTABLE FOOT RESTRAINT (REAR RIGHT).

AL-129-B-18 NBS SUIT LAB. OVERALL VIEW. ALL WORK TABLES WITH MISCELLANEOUS SUIT COMPONENTS AND SUPPLIES. TERRY WEST TO LEFT, AND PAUL DUMBACHER TO RIGHT.

AL-129-B-19 NBS SUIT LAB. STORAGE SHELF WITH LIQUID COOLING VENTILATION GARMENT (LCVG), SUIT GLOVES, WAIST INSERTS, UPPER AND LOWER ARMS (LEFT, FROM TOP TO BOTTTOM), LOWER TORSO ASSEMBLIES (LTA)(MIDDLE RIGHT TO LOWER RIGHT).

AL-129-B-20 NBS SUIT LAB. TABLE WITH MISCELLANEOUS SUIT PARTS AND TERRY WEST, A SPACE SUIT ASSEMBLY TECHNICIAN LOGGING SUIT PART DATA. PARTS ON THE TABLE ARE A HARD UPPPER TORSO (HUT)(REAR LEFT), FULL HELMET (FRONT LEFT), TWO HELMETS WITHOUT PROTECTIVE VISORS, A PAIR OF GLOVES, AND A BACKPACK WITHOUT VOLUMETRIC COVER (REAR RIGHT). THE BACKPACK ATTACHES TO THE HUT TO MAKE-UP THE UPPER TORSO COMPONENTS OF THE SUIT.

AL-129-B-21 NBS SUIT LAB. THREE GLOVES, HELMET, AND SCREW DRIVER TORQUE WRENCH FOR ASSEMBLY AND REPAIR OF BOTH.