

BY Doc Howard DATE 7-18-68

CHKD. BY _____ DATE _____

SUBJECT PRELIMINARY
MANUFACTURING PLAN
FOR LUNAR SIMULATOR

SHEET NO. 1 OF 6

JOB NO. _____

TO:

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J. GAUME, D. RICHARDSON, G. GARMISH, E. RAMEY,
F. HARRIS & E. CLARK

FROM:

MANUFACTURING PRE-PLANNING

SUBJECT:

PRELIMINARY MANUFACTURING PLAN FOR LUNAR
HOUSING SIMULATOR

REFERENCE:

PROPOSAL AUTHORIZATION - USAF MISC. 18

PURPOSE:

THIS REPORT OUTLINES IN BRIEF THE EFFECT THIS
PROJECT WILL HAVE UPON THE MANUFACTURING DIVISION
RELATIVE TO THE PLANNING TOOLING & MANUFACTURING.
IT ALSO DEPICTS HOW THE LUNAR SIMULATOR WILL BE
FABRICATED & ERECTED ON MARTIN SITE, OUTSIDE
VENDOR & PURCHASING REQUIREMENTS, & SPIN TIMES.

THIS REPORT COVERS ONLY PHASE ONE, (FABRICATION
OF LUNAR SIMULATOR INNER STRUCTURE, ERECTION
ON MARTIN PROPERTY SITE & INSTALLATION OF ASSOCIATED
EQUIPMENT).

APPROVED BY:

LEI. MOWERY

PREPARED BY:

Doc Howard
MFG ENG DEPT

BY Doehl DATE 3-18-62

 SUBJECT MANUFACTURING PLAN

 SHEET NO. 2 OF 6

CHKD. BY _____ DATE _____

 - DESCRIPTION -

JOB NO. _____

THE LUNAR HOUSING SIMULATOR IS BEING DESIGNED IN REPLY TO AIR FORCE REQUEST ZISAF MISC #18. THIS RESEARCH FACILITY WOULD BE CONSTRUCTED ON MARTIN PROPERTY SITE & WOULD BE UTILIZED FOR SPACE RESEARCH PROJECTS TO STUDY & SOLVE PROBLEMS RELATIVE TO LUNAR HABITATION & SPACE TRAVEL.

PHASE ONE INCLUDES THE DESIGN & CONSTRUCTION OF THE INNER STRUCTURE OF THE LUNAR HOUSING SIMULATOR INCLUDING LAB EQUIPMENT ETC, ERECTED ON MARTIN SITE. PHASE II WOULD INCLUDE DESIGN & CONSTRUCTION OF OUTER SHELL OVER INNER SHELL & EVALUATION OF AIR BETWEEN STRUCTURES TO SIMULATE LUNAR ATMOSPHERIC CONDITIONS. PHASE III DEALS WITH FURTHER DEVELOPMENT & REFINEMENT OF THE INTERNAL LAB EQUIPMENT & SPECIMANS ETC, FOR MORE ADVANCED STUDIES & TESTS.

PHASE I INNER STRUCTURE IS APPROX 32 FT DIA SPHERE OF STRUCTURAL STEEL CONSTRUCTION, GLASS PANELS UPR HALF & WELDED SKIN SEGMENTS LOWER HALF, WITH SUPPORT LEGS FROM GROUND TO CENTER RING GIRDER.

THREE FLOORS WILL BE MOUNTED INTERNALLY WITH FULL LENGTH ELEVATOR SHAFT IN CENTER OF SPHERE FOR ELEVATOR SERVICE TO ALL FLOORS & EQUIPMENT BAY IN BASE OF SPHERE.

ACCESS DOORS ARE LOCATED AT EACH FLOOR LEVEL & EQUIPMENT BAY AREA IN ELEVATOR SHAFT & TOP BOTTOM & SIDES ON PERIPHERY OF SPHERE. AN AIR LOCK CHAMBER IS LOCATED AT BASE OF SPHERE, CONNECTING ENTRANCE TUNNEL TO ELEVATOR SHAFT & WILL SERVE AS PRESSURE EQUILIZATION CHAMBER FOR PERSONNEL ENTERING & LEAVING CHAMBER.

BY Draft DATE 3-18-62
CHKD. BY _____ DATE _____SUBJECT MANUFACTURING PLAN
- DESCRIPTION -SHEET NO. 2 OF 6
JOB NO. _____

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BY Don DATE 3-18-8
CHKD. BY _____ DATE _____

SUBJECT MANUFACTURING PLAN -
CONTROL POINT IDENTIFICATION

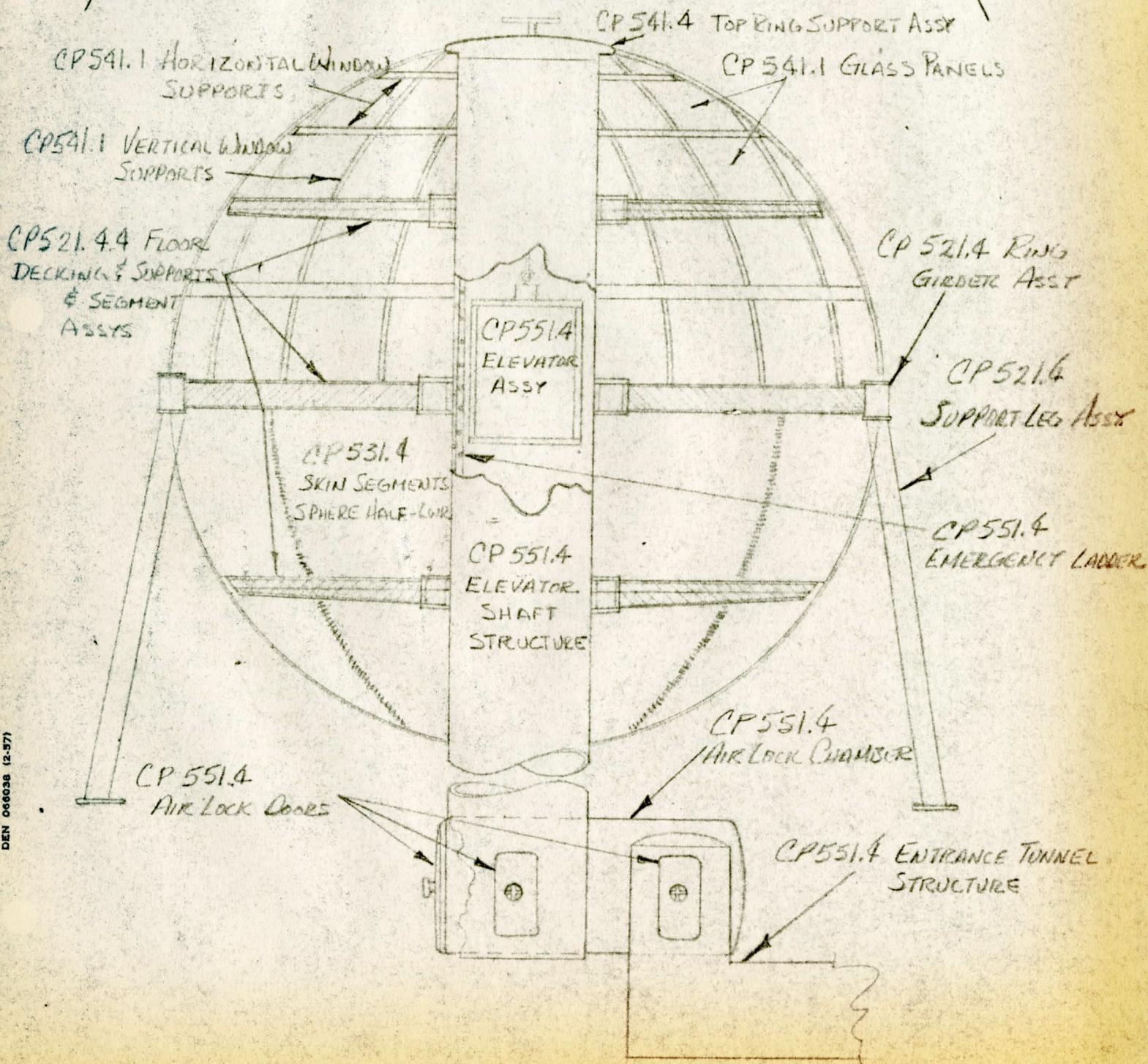
SHEET NO. 3 OF 6
JOB NO. _____

CP500

EQUIPMENT INSTALLATION - CHECK OUT & TEST

CP551

COMPLETE STRUCTURE ASSY AS ERECTED ON MARTIN SITE



LEGEND:

E - FINAL ENGINEERING RELEASE DATE

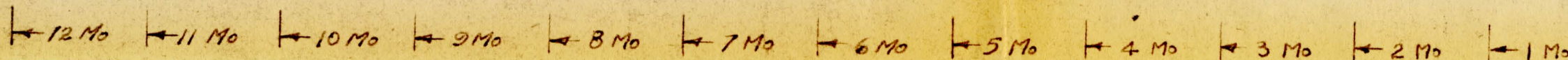
O.V. - OUTSIDE VENDOR REQUIREMENT - INDICATES PARTS AND/OR EQUIPMENT TO BE SUB-CONTRACTED OR PURCHASED PARTIALLY OR COMPLETE.

CONTROL POINT & MANUFACTURING BREAKDOWN:

THE CONTROL POINT BREAKDOWN IS USED TO IDENTIFY INCREMENTS OF WORK, CONTROL SCHEDULING & DEPICTS THE MANUFACTURING FLOW OR BUILDING SEQUENCE.

SHOWN BELOW IS THE PRELIMINARY BREAKDOWN & SPAN TIMES REQUIRED FOR PLANNING, TOOLING, FABRICATION & INSTALLATION OF INNER STRUCTURE FOR LUNAR SIMULATOR ON MARTIN DENVER SITE.

E	PROCUREMENT PLACEMENT	PROCUREMENT OF EQUIPMENT & COMPONENTS COMPLETE	O.V.	560	EQUIPMENT & COMPONENTS
E	PROCUREMENT PLACEMENT	PROCUREMENT OF ELEVATOR ASSY COMPLETE	O.V.	551.4	ELEVATOR ASSY
E	PROCUREMENT PLACEMENT	PROCUREMENT OF GLASS PANELS	O.V.	541.1	GLASS PANELS
E	SUB CONTRACT PLACEMENT	O.V. PLANNING - TOOLING - FORMING - WELD TOP RING ASSY	O.V.	541.4	TOP RING SUPPORT ASSOYS -
E	SUB CONTRACT PLACEMENT	O.V. PLANNING - TOOLING - FORMING - WINDOW FRAME DETAILS	O.V.	541.1	VERTICAL WINDOW FRAME SUPPORTS -
E	PLANNING	TOOLING	MARTIN DENVER FABRICATE	541.1	HORIZONTAL WINDOW FRAME DETAILS -
E	SUB CONTRACT PLACEMENT	O.V. PLANNING - TOOLING - FORMING & TRIM SKIN SEGMENTS	O.V.	531.4	SKIN SEGMENTS - SPHERE HALF - UPPER
E	PROCUREMENT PLACEMENT	PRE FABRICATED FLOOR DECKING	O.V.	521.4	FLOOR DECKING
E	PLANNING	TOOLING	MARTIN DEN FAB	521.4	FLOOR SUPPORTS
E	PLANNING	NO TOOLS - MARTIN DENVER	521.4	FLOOR DECKING & SUPPORT SEGMENT ASSOYS	
E	PLANNING	NO TOOLS - MARTIN DEN FABRICATE	521.4	SUPPORT LEG ASSOYS - RING GIRDER	
E	SUB CONTRACT PLACEMENT	O.V. PLANNING & TOOLING & ROLL FORM & WELD RING SECTION SEGMENTS	O.V.	521.4	RING GIRDER ASSY (WELD SEGMENTS)
E	PLANNING	NO TOOLS - MARTIN - DEN FABRICATE	551.4	EMERGENCY LADDERS & ELEVATOR LADDER	
E	SUB CONTRACT PLACEMENT	O.V. PLANNING & TOOLING - & FORM - WELD & DRILL	O.V.	551.4	AIR LOCK DOORS & DOOR FRAME STRUCTURE
E	SUB CONTRACT PLACEMENT	O.V. PLANNING & TOOLING & ROLL FORM & SEAM WELD SHELL STRUCTURE	O.V.	551.4	ENTRANCE TUNNEL STRUCTURE
E	SUB CONTRACT PLACEMENT	O.V. PLANNING & TOOLING & ROLL FORM & SEAM WELD SHELL STRUCTURE	O.V.	551.4	AIR LOCK CHAMBER STRUCTURE
E	SUB CONTRACT PLACEMENT	O.V. PLANNING & TOOLING & ROLL FORM & SEAM WELD SHELL SEGMENTS	O.V.	551.4	ELEVATOR SHAFT STRUCTURE
	EXCAVATION & PARTIAL CONCRETE WORK	ERECTED ON MARTIN DENVER SITE - COMPLETE STRUCTURE ASSY	551		RING, GIRDER & SUPPORT ASSY COMPLETE
			500		UPPER & LOWER SPHERE HALF ASSOYS COMPLETE
					ELEVATOR SHAFT & AIR LOCK ASSOYS COMPLETE
					EQUIPMENT INSTALLATION, CHECK OUT & TEST



BY D.H. DATE 2-18-68
CHKD. BY _____ DATE _____

SUBJECT MANUFACTURING PLAN
MATERIAL & SPECIAL TOOLING
REQUIREMENTS

SHEET NO. 5 OF 6
JOB NO. _____

MATERIAL REQUIREMENTS:

NO UNUSUAL MATERIALS ARE CONTEMPLATED FOR USE ON THE LUNAR SIMULATOR STRUCTURE.

THE BASIC STRUCTURE TO BE MADE FROM H. R. STEEL PLATE, BAR, ROD & ANGLE, COMMERCIALY AVAILABLE.

THE GLASS PANELS TO BE MADE FROM ANY GOOD QUALITY LIME GLASS (APPROXIMATELY 1" THICK PLATE GLASS.) CORNING CODE #1722 - 1/4" SPECIALLY FORMED GLASS MAY BE CALLED OUT ON FINAL DESIGN FOR ACTUAL LUNAR BASE STRUCTURE.

SPECIAL TOOLING REQUIREMENTS:

TEMPORARY TYPE TOOLING WILL BE USED FOR FABRICATION OF DETAILS & ASSYS ON THE LUNAR SIMULATOR STRUCTURE.

EXISTING STANDARD PRODUCTION TOOLING WILL BE UTILIZED FOR FABRICATION OF DETAILS AT MARTIN-DENVER DIVISION.

DUE TO HEAVY STRUCTURAL STEEL TYPE CONSTRUCTION A LARGE PERCENTAGE OF THE STRUCTURE WILL BE SUB CONTRACTED TO AN OUTSIDE VENDOR FOR SPECIAL TOOLING & FABRICATION, COMPLETE.

FOR OUTSIDE VENDOR ITEMS SEE CONTROL POINT & MANUFACTURING BREAKDOWN - SHT 4

MARTIN
DENVER
BY 1-11-68 DATE 7-18-68
CHKD. BY 1-11-68 DATE 7-18-68

SUBJECT MANUFACTURING PLAN
MANUFACTURING - FACILITIES &
OUTSIDE VENDOR REQUIREMENTS

SHEET NO. 6 OF 6
JOB NO. _____

MANUFACTURING:

DUE TO ONLY (1) LUNAR SIMULATOR BEING BUILT, ALL PARTS BEING FABRICATED AT MARTIN DENVER CAN BE INTEGRATED INTO THE EXISTING SCHEDULE (AT CURRENT PRODUCTION RATE) WITHOUT INCREASING MANPOWER REQUIREMENT.

FACILITIES:

NO ADDITIONAL FLOOR SPACE AND OR FACILITIES WILL BE REQUIRED WITHIN THE FACTORY FOR PARTS FABRICATION STORAGE ETC. PARTS FABRICATED BY OUTSIDE VENDORS CAN BE SCHEDULED INTO THIS FACILITY & DELIVERED DIRECTLY TO THE LUNAR SIMULATOR CONSTRUCTION SITE. DELIVERY SCHEDULE TO BE COMPATIBLE WITH CONSTRUCTION SCHEDULE THEREBY REQUIRING ONLY TEMPORARY TYPE STORAGE FOR INTERIUM PERIOD.

OUTSIDE VENDOR REQUIREMENTS:

(A) THE FOLLOWING PARTS AND ASSOYS CANNOT BE FABRICATED AT MARTIN DENVER BECAUSE FORMING EQUIPMENT ETC, FOR HEAVY TYPE STRUCTURAL STEEL IS NOT AVAILABLE AT THIS FACILITY. THESE ITEMS TO BE SUB CONTRACTED COMPLETE TO AN OUTSIDE VENDOR.

- 1) ELEVATOR SHAFT STRUCTURE
- 2) AIR LOCK CHAMBER STRUCTURE
- 3) ENTRANCE TUNNEL STRUCTURE
- 4) AIR LOCK DOORS & DOOR FRAME STRUCTURE
- 5) RING GIRDER ASSY
- 6) SKIN SEGMENTS FOR LWR HALF SPHERE
- 7) VERTICAL WINDOW FRAME SUPPORTS - UPR HALF SPHERE
- 8) TOP RING SUPPORT ASSY

(B) THE FOLLOWING ITEMS TO BE PURCHASED COMPLETE:

- | | |
|------------------|----------------------------|
| 1) FLOOR DECKING | 3) GLASS PANELS |
| 2) ELEVATOR ASSY | 4) EQUIPMENT & COMPONENTS. |