

IS



**PRESENTATION
ADVANCED ASTRIONICS
PROJECT REVIEW
IBM NO. 68-K05-0001
30 JANUARY 1968**

TECHNICAL DATA CONTAINED IN THIS DOCUMENT SHALL NOT BE USED OR DISCLOSED, EXCEPT FOR EVALUATION PURPOSES, PROVIDED THAT IF A CONTRACT IS AWARDED TO THIS OFFEROR AS A RESULT OF OR IN CONNECTION WITH THE SUBMISSION OF THIS DATA, THE GOVERNMENT SHALL HAVE THE RIGHT TO USE OR DISCLOSE THIS TECHNICAL DATA TO THE EXTENT PROVIDED IN THE CONTRACT. THIS RESTRICTION DOES NOT LIMIT THE GOVERNMENT'S RIGHT TO USE OR DISCLOSE ANY TECHNICAL DATA OBTAINED FROM ANOTHER SOURCE WITHOUT RESTRICTIONS.

IBM Federal Systems Division, Space Systems Center, Huntsville, Alabama

PROJECT REVIEW

ADVANCED ASTRIONICS

IRAD TECHNICAL SEMINAR
GAITHERSBURG, MARYLAND
JANUARY 30, 1968

F. L. PUGH
PRINCIPAL INVESTIGATOR

E. C. CALDWELL
ADVANCED IU SYSTEMS
IBM HUNTSVILLE

SUMMARY OF PREVIOUS AND CURRENT EFFORTS

- 1967 : REQUIREMENTS AND TECHNOLOGY STUDIES
- 1968
 - CONTINUE
 - START LAB TESTS (IU - S-IVB SEPARATION)
 - PRELIMINARY REQUIREMENTS/TECHNOLOGY REPORT BY 3/1/68
- EFFORTS SUMMARIZED IN SUBSEQUENT TECHNICAL DATA
 - ANALYTICAL
 - LAB TEST

ANALYTICAL

RESULTS

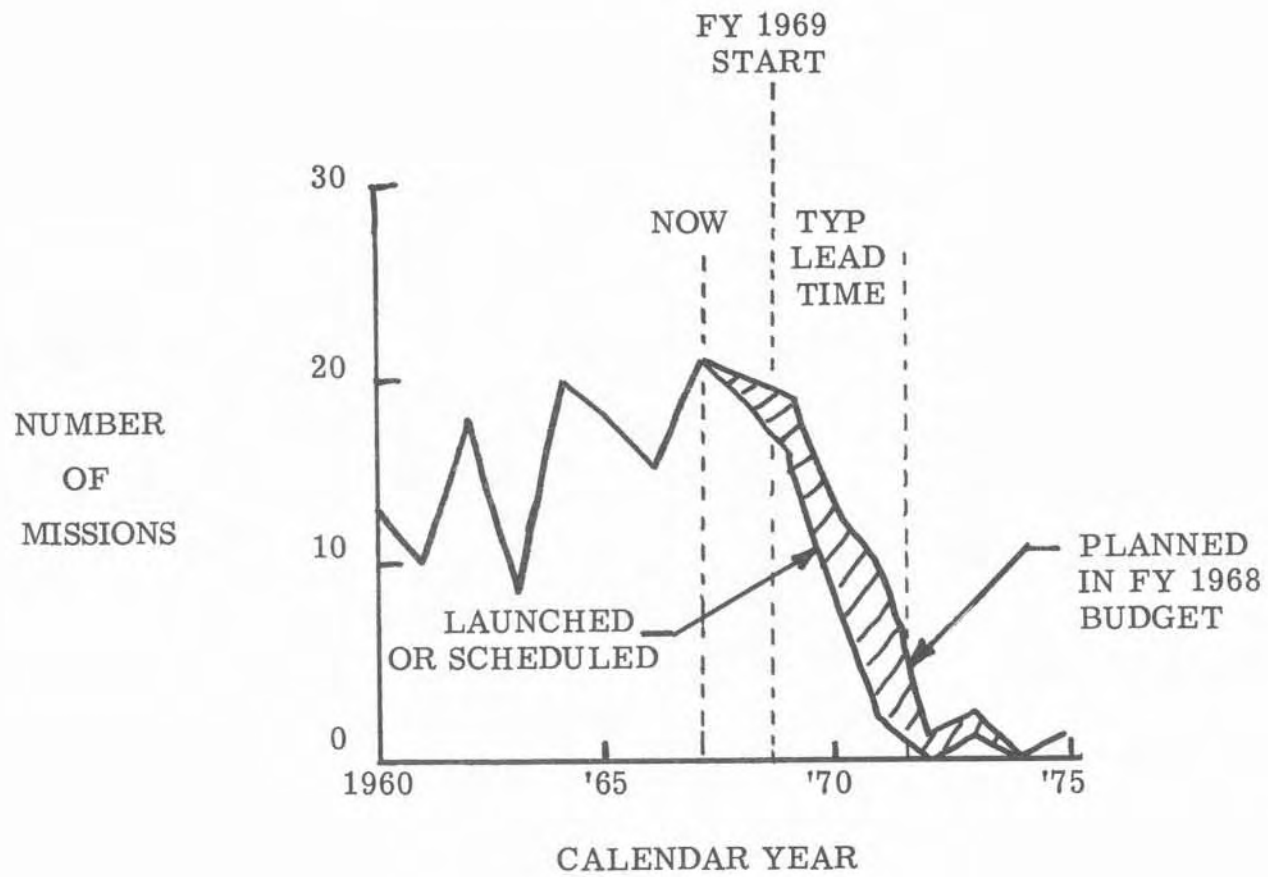
MISSIONS (1970 - '85)

- PROFILES
 - EARTH ORBITAL
 - LUNAR
 - PLANETARY
 - VEHICLE TESTS
- OBJECTIVES
 - SPACE SCIENCES (ASTRONOMY, BIOMEDICINE, ASTROPHYSICS, ETC.)
 - NASA APPLICATIONS
 - COMMUNICATIONS
 - RESOURCES
 - GEODESY
 - METEOROLOGY
 - NAVIGATION
 - DEVELOPMENT (VEHICLES,
RESCUE, INDUSTRY)
 - MILITARY
 - RECON
 - COMMUNICATIONS
 - NAVIGATION
 - COMMAND/CONTROL/COMMUNICATION
 - MANNED PLANETARY EXPLORATION

MISSION PREMISE (1970 - '85)

- PLANETARY (SCIENCE AND EXPLORATION)
 - NASA
 - UNMANNED (SOLAR PROBES, FLYBY, ORBITERS, ETC.)
 - 0.1 TO 5.6 AU
 - SOFT LANDINGS IN '80'S
- LUNAR
 - NASA
 - LIMITED MANNED SURFACE
 - LUNAR ORBITAL SUPPORT, E.G., COMMUNICATIONS
 - SEVERAL WEEKS - MONTH
- EARTH ORBITAL (SCIENCES, APPLICATIONS, ENGINEERING DEVELOP.)
 - NASA AND USAF
 - MANNED / UNMANNED
 - DEVELOP MANNED PLANETARY CAPABILITY
 - ASTRONOMICAL SCIENCES
 - EARTH RESOURCES SURVEY / APPLICATIONS
 - MILITARY RECON, COMM. AND NAVIGATION SATELLITES
 - LAUNCH AND SPACE VEHICLE DEVELOPMENT

TRENDS IN UNMANNED MISSIONS



EXAMPLE SPACE SCIENCE APPLICATIONS PLAN - COMMUNICATIONS

(BASIS FOR FLIGHT PLAN)

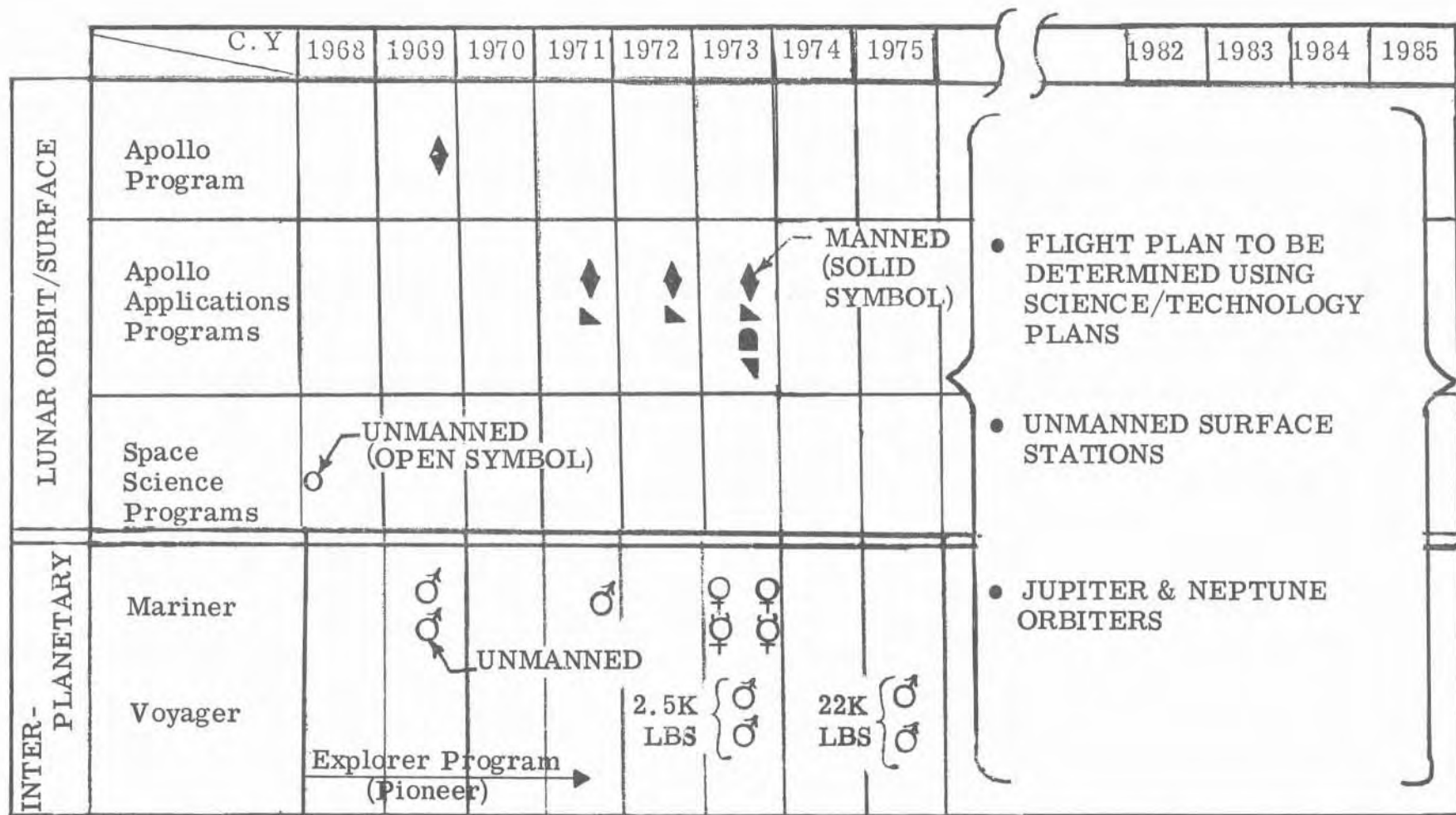
CY	1960	1965	1970	1975	1980
MULTIPLE ACCESS	<ul style="list-style-type: none"> ● ECHO I ● ECHO II - RELAY - SYNCOM 	<ul style="list-style-type: none"> ● COMSAT-INTELSAT (COMMON CARRIER) - TV - VOICE 	<ul style="list-style-type: none"> ● APPLIED TECHNOLOGY SERIES 	<ul style="list-style-type: none"> ● UNIFIED APPLICATIONS SATELLITES 	
BROADCAST SATELLITE		<ul style="list-style-type: none"> ● MIDWEST AIRBORNE ETV 	<ul style="list-style-type: none"> ● APPLIED TECHNOLOGY SERIES ● TV STUDIES DIRECT COMMUNITY 	<ul style="list-style-type: none"> ● AAP EXPERIMENTS ● SYNCOM DIRECT TV 	
LUNAR, PLANETARY, DEEP SPACE	<ul style="list-style-type: none"> ● UNIFIED S-BAND (USB) 		<ul style="list-style-type: none"> ● LOW ORBIT AAP EXP. ● SYNC ORBIT EXP ● LUNAR COMM. SATS (ABANDONED MODULES) 	<ul style="list-style-type: none"> ● COMM. SAT LOW ORBIT ● MARS COMM. SATS. 	<ul style="list-style-type: none"> ● DEEP SPACE RELAYS
DATA COLLECTION & PROCESSING		<ul style="list-style-type: none"> ● NIMBUS D ● ATS-C 	<ul style="list-style-type: none"> ● NIMBUS E - INTERROGATE - RECORD - LOCATE ● FRENCH SATELLITE* 		
DATA RELAY		<ul style="list-style-type: none"> ● APPLIED TECHNOLOGY SERIES 	<ul style="list-style-type: none"> ● AAP (USB) - SYNCOM TRACK RELAY ● ORBITING RELAY 		

* RELAY OF BALLOON COLLECTED DATA

MSFC PROVIDED SPACE DEVELOPMENT PLAN
"SATURN UTILIZATION STUDY"

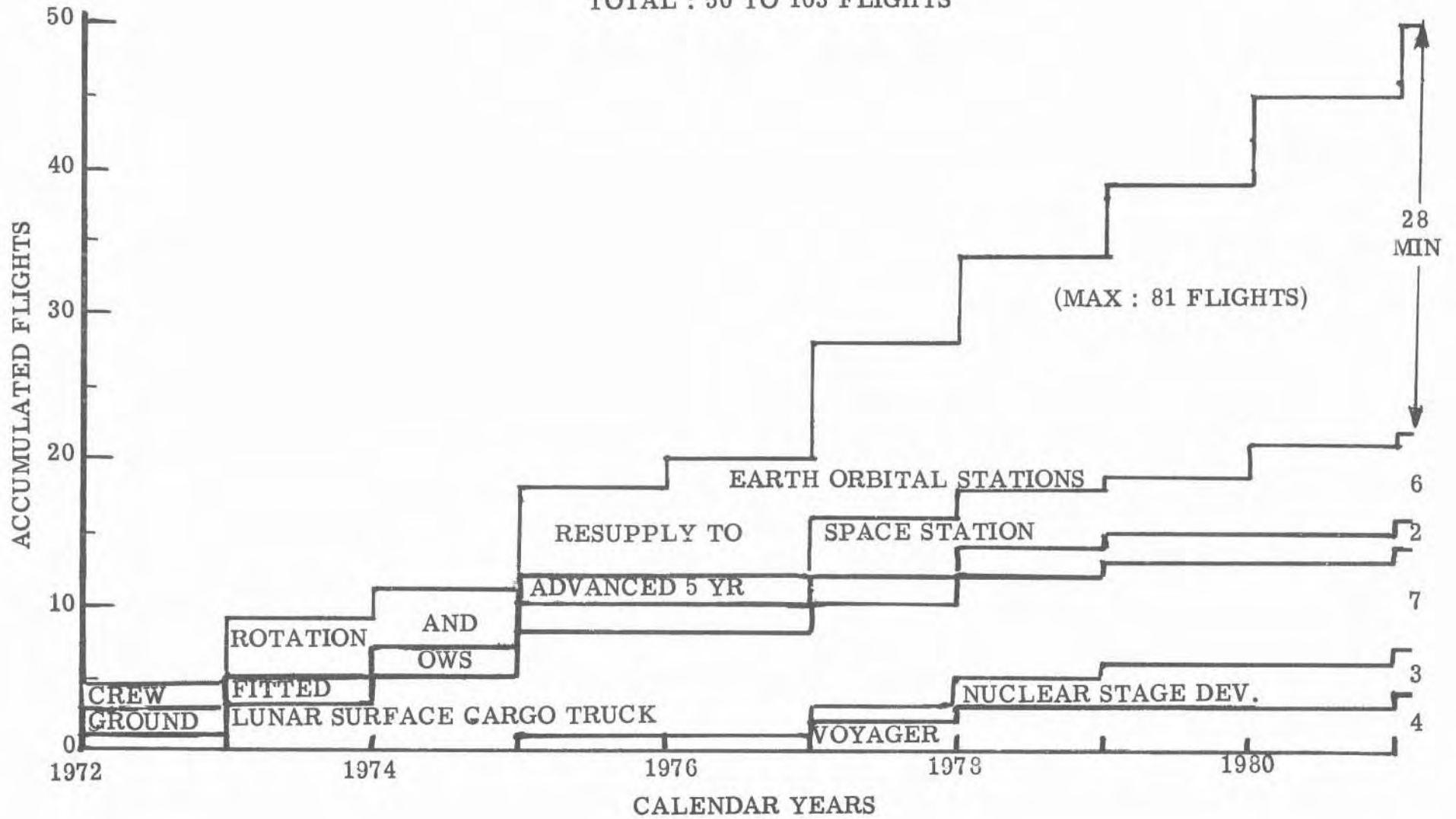
	1968	1975	1985
LUNAR	<ul style="list-style-type: none"> ● MANNED <ul style="list-style-type: none"> - SPACE OPS - LANDING ● SURFACE & ORBITAL <ul style="list-style-type: none"> - LAUNCH/RENDEZVOUS - MANNED OPS - SOIL SAMPLES 	<ul style="list-style-type: none"> ● SURFACE <ul style="list-style-type: none"> - MOBILITY - RENDEZVOUS - UNMANNED LOGISTICS ● SCIENCE <ul style="list-style-type: none"> - DAY/NITE OPS - ASTRONOMY 	<ul style="list-style-type: none"> - SUB-SURFACE SAMPLING
ORBITAL	<ul style="list-style-type: none"> ● MAN ZERO "G" 	<ul style="list-style-type: none"> ● LONG DURATION (2 YRS) <ul style="list-style-type: none"> - MAN - SUBSYSTEMS ● MAN <ul style="list-style-type: none"> - SYNC ORBIT - EVA LARGE STRUCTURES 	<ul style="list-style-type: none"> ● SCIENCE INCREASE (ALL YEARS)
PLANETARY	<ul style="list-style-type: none"> ● NUCLEAR <ul style="list-style-type: none"> - STAGE DEV. - PROP. CLUSTERING 	<ul style="list-style-type: none"> ● HIGH SPEED REENTRY ● SPACE <ul style="list-style-type: none"> - RAD. - METEOROIDS 	<ul style="list-style-type: none"> ● MANNED PLANETARY ENCOUNTER ● PLANETARY VEHICLE ASSEMBLY
VEHICLE	<ul style="list-style-type: none"> ● INTEGRATE AF / NASA SYSTEMS/MISSIONS 	<ul style="list-style-type: none"> ● LARGE SOLIDS TO EARTH ORBIT 	<ul style="list-style-type: none"> ● DEV. DEEP SPACE CAPSULE ● DEV. 400K LBS EARTH ORBIT

LUNAR AND INTERPLANETARY FLIGHT PLAN



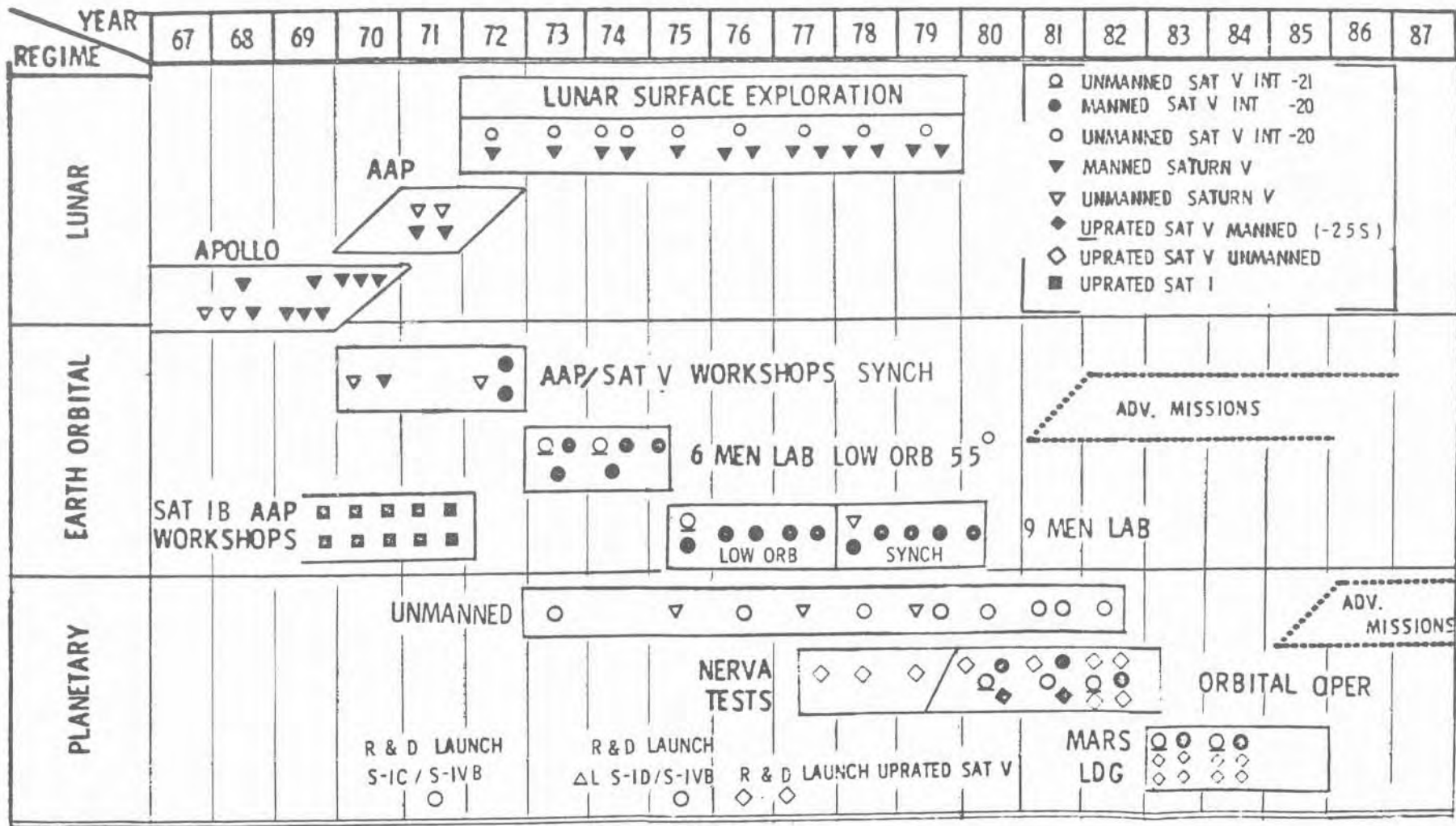
NASA / OMSF MISSION PROSPECTUS

TOTAL : 50 TO 103 FLIGHTS



MSFC SUPPLIED FLIGHT PLAN - OPTIMISTIC
 ("SATURN UTILIZATION STUDY")

BALANCED - BUDGET CONSTRAINED



TOTAL LAUNCH VEHICLES : 116

