SECTION III

MASTER SCHEDULES

LUNAR EXPEDITION (U)

(LUNEX)

RECORD OF CHANGES

CHANGE NO.	DESCRIPTION OF CHANGE	DATE OF CHANGE	REFERENCE TO BASIC PART

INDEX

[redacted]

3.0 INTRODUCTION

[redacted]

The establishment of the Lunar Expedition Program as a National objective will provide a worthy goal for the United States industrial and governmental organizations. The Lunar Expedition program has been based on extensive study, design and research work during the past three years.

A Lunar Expedition program will require the use and centralized control of a major portion of the present military space capability. This will have the effect of giving the military program a scheduled long-range objective, and still provide useable military capabilities throughout the period. As an example, manned re-entry vehicles for orbital operations will be available in early 1965. This will be followed by a manned lunar re-entry vehicle in 1966.

Propulsion and Space Launching systems will be required to support the LUNEX program. This program will set orbital and escape velocity payload requirements ranging from 20 to 350 thousand pounds in a 300 mile orbit and from 24,000 to 134,000 pounds at escape velocity. This capability will be obtained at an accelerated pace for the LUNEX program and as a result the same capabilities will be available for military use much earlier than could be achieved if the start of the development programs had to be justified at this time entirely on the basis of military usefulness.

The accomplishment of the LUNEX program will require maximum use of several presently programmed efforts and reorientation of others. The major programs of direct interest to the Lunex are the SAINT and BOSS programs. Therefore, these efforts have been coordinated and integrated with the LUNEX program. The BOSS shots will provide the necessary orbital primate test data to allow the manned life support package for the Lunex Re-entry Vehicle to be designed. The SAINT unmanned and manned program will provide additional orbital information on rendezvous, docking, and personnel and fuel transfer. In the event that the direct shot approach for the Lunar expedition requires reorientation in future years to use orbital assembly techniques this capability will be available from the SAINT program.

3.1 MASTER PROGRAM PHASING CHART

This schedule presents the integrated military program required to accomplish the Lunar Expedition mission and to develop techniques for operating in the earth orbital and lunar areas. It was prepared to indicate the interface between this Lunar Expedition System Package Plan and the Space Launching System. The major national objective of this integrated program is to land men on the moon and return them in August of 1967.

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3.2 LUNAR EXPEDITION PROGRAM SCHEDULE

This schedule presents the major items to be accomplished as a result of the LUNEX program. The costing as shown on the schedule does not include the cost of developing the Space Launching System since this is provided under a separate System Package Plan. However, the cost of purchasing the flight vehicles is included.

The major "prestige" milestones of the program can be summarized as follows:

First Manned Orbital Flight (3 Man Space Vehicle)	April 1965
First Lunar Landing (Cargo)	July 1966
Manned Circumlunar Flight	Sept. 1966
Manned Lunar Landing & Return	Aug. 1967
Permanently Manned Lunar Expedition	Jan. 1968

3.3 LUNAR EXPEDITION MANAGEMENT MILESTONES FY62 - FY63

This schedule indicates the major LUNEX program efforts required during fiscal years 1962 and 1963. The time allocation for management and Air Force technical evaluations have been kept to a minimum in order to meet the end objective of "man on the moon" in August 1967.

Several critical major decisions are required and are summarized below:

Program Approval & Funding	July 1961
Development-Production Funding	Dec. 1962
Design Concept Decision	Jan. 1963
Approval for Hardware Go-Ahead	Feb. 1963

Delays in providing the funding indicated, or in receiving notification of decisions required, will have the direct effect of delaying the end objectives. This problem could be effectively solved by a streamlined management structure having a minimum number of reviewing authorities. The present AFSC procedures are a step in the right direction but more direct channels are desirable at the higher command levels.

3.4 LUNAR EXPEDITION TEST SCHEDULE

This schedule presents the major test items required for the LUNEX program. Upon completion of the program manned transport and unmanned cargo vehicles will be available to support the Lunar expedition. The cargo vehicle will be capable of transporting approximately 45,000 pound "cargo packages" to the lunar surface for supporting the expedition. This same vehicle would be capable of transporting future military payloads to the lunar surface to support space military operations.

A detailed high-speed re-entry test program and an abort system test program is scheduled to provide basic re-entry data and to insure the safety of the men in the Lunex Re-entry Vehicle.

Prior to the first "manned lunar landing and return" flight, a series of test and check-out flights will be required. These will initially consist of orbital flights, and then very high altitude (50,000 miles or more) elliptical flights for testing the vehicles under re-entry conditions. When these have been completed, the first flights will be made around the moon (circumlunar) and return to an earth base. With a completely man-rated vehicle, and unmanned lunar landing flights completed, man will then make the first landing on the moon for the purpose of selecting a site for the Lunar Expedition Facility.

3.5 LUNEX SPACE LAUNCHING REQUIREMENTS

The purpose of this schedule is to summarize the space launching vehicle requirements and indicate when the launches will be needed.

The THOR-ABLE-STAR boosters will be used for the re-entry test program. The Space Launching System boosters designated as A, AB and BC, and solids as required, will be needed as indicated and their payload capabilities are estimated as follows:

Booster	Payload
A 410	20,000 pounds (300 mile orbit)
AB 825	87,000 pounds (300 mile orbit)
AB 825	24,000 pounds (escape velocity)
BC 2720	134,000 pounds (escape velocity)

3.6 PERSONNEL AND TRAINING

The Lunar Expedition program will require military personnel and a military training program. Details of this program are presented in Section IX and summarized on the Lunex Training Schedule included in this section.

The number of personnel required will increase from a limited staff in the early Program Office to a total of 6,000 personnel in the active expedition year. This total does not include "in plant" contractor personnel which is estimated to be on the order of 60 thousand.

Training of military personnel to meet the requirements of the LUNEX program will be done by contractor and military training personnel. Maximum use will be made of program equipment when it can be scheduled for training purposes and in addition, allocation of production equipment is necessary to meet training requirements.

3.7 LUNEX CIVIL ENGINEERING FACILITIES SCHEDULE

The facilities development and construction program is shown on this schedule. The first item to be accomplished is a site survey to determine the extent that the LUNEX program can be supported by AMR and PMR. When this has been accomplished it will be possible to determine if the early LUNEX test launches can be accomplished by using present facilities. Full consideration will be given to the possibility of building the Lunex Launch Complex as an expansion of the AMR or PMR. A more detailed presentation of the facilities program is contained in Section VIII Civil Engineering.

MASTER PROGRAM SCHEDULE

PROGRAM SCHEDULE

DATE	TOTAL	PRIOR
HIGH SPEED RE-ENTRY TEST		
BOSS SUPPORT		
ABORT SYSTEM TESTS		
ORBITAL		
UNMANNED		
MANNED		
CIRCUMLUNAR		
UNMANNED		
MANNED		
LUNAR LANDING & RETURN		
UNMANNED		
MANNED		
LUNAR EXPEDITION		
BOOSTER REQUIREMENTS		
RE-ENTRY TEST		
A-410		
AB-825		
BC-2720		

CY 62 | CY

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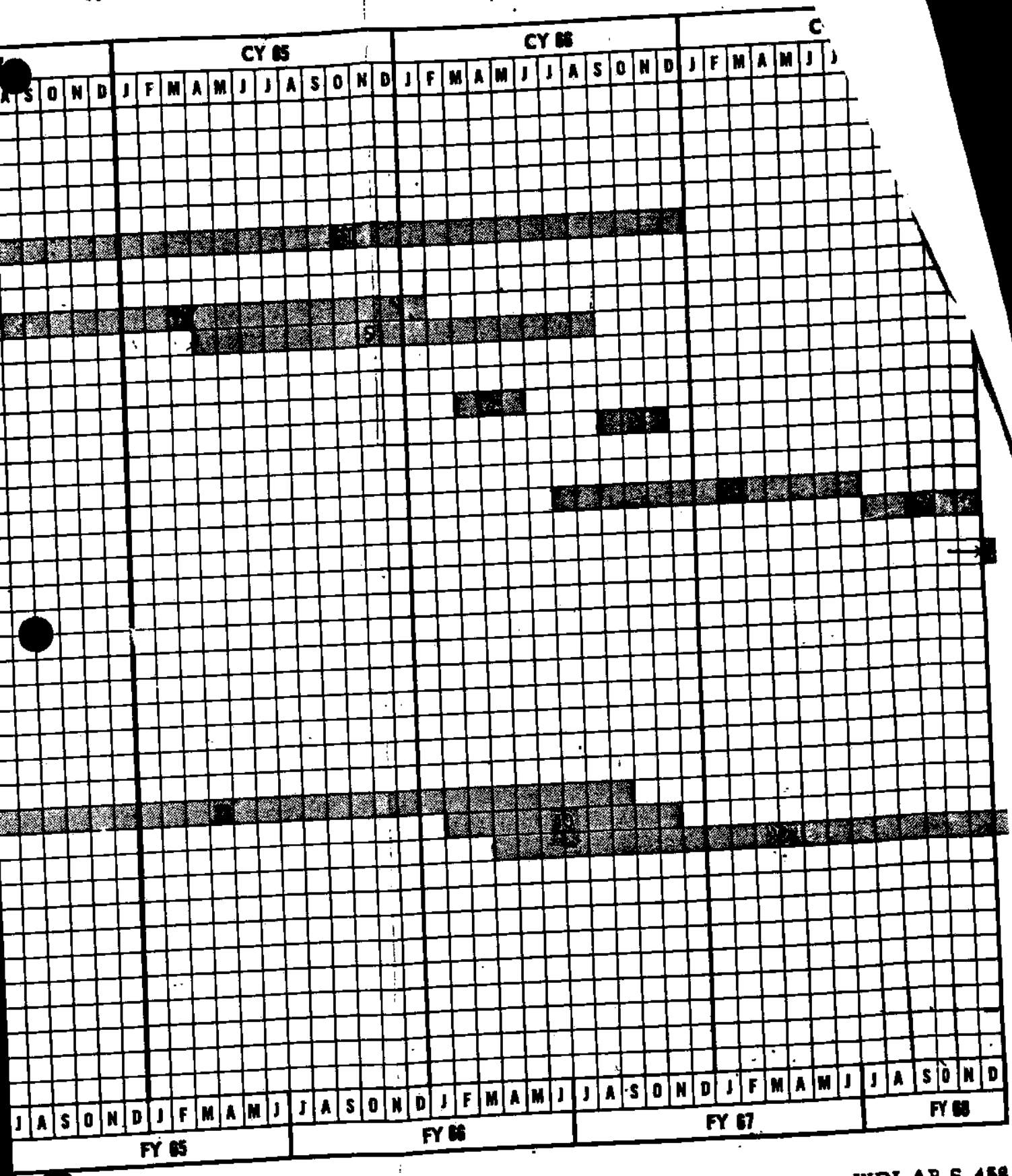
J F M A M J J A S O N D J F M A M J

FY 62 | FY 63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FY 65
FY 66
FY 67
FY 68

WDLAR-S-458

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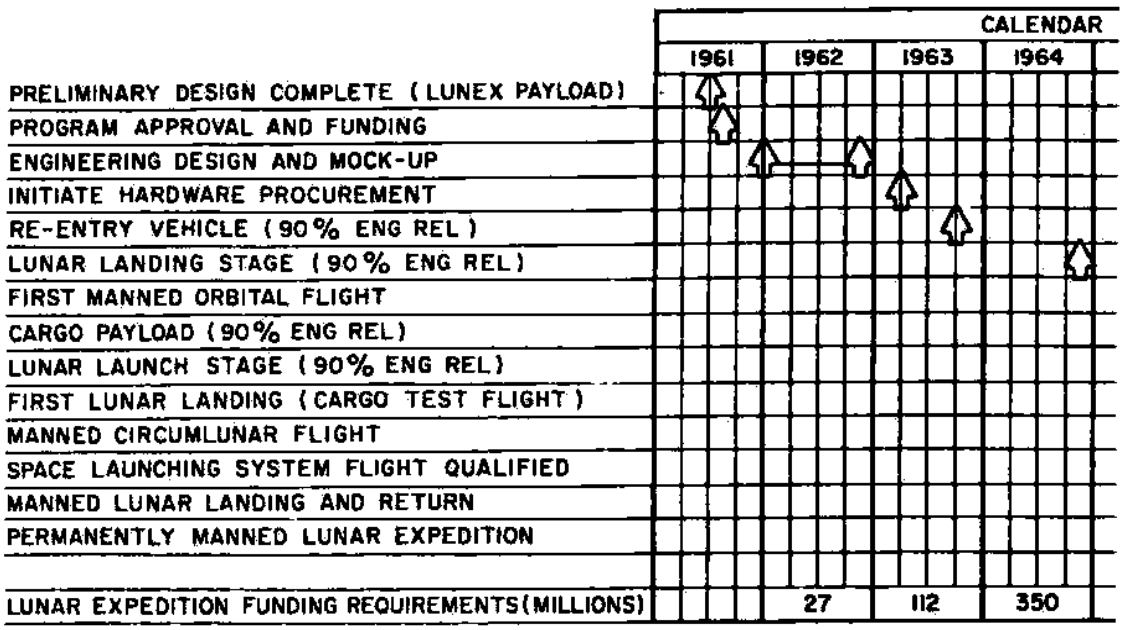
CHART III-8

LUNAR EXPEDITION PROGRAM MILESTONE SCHEDULE



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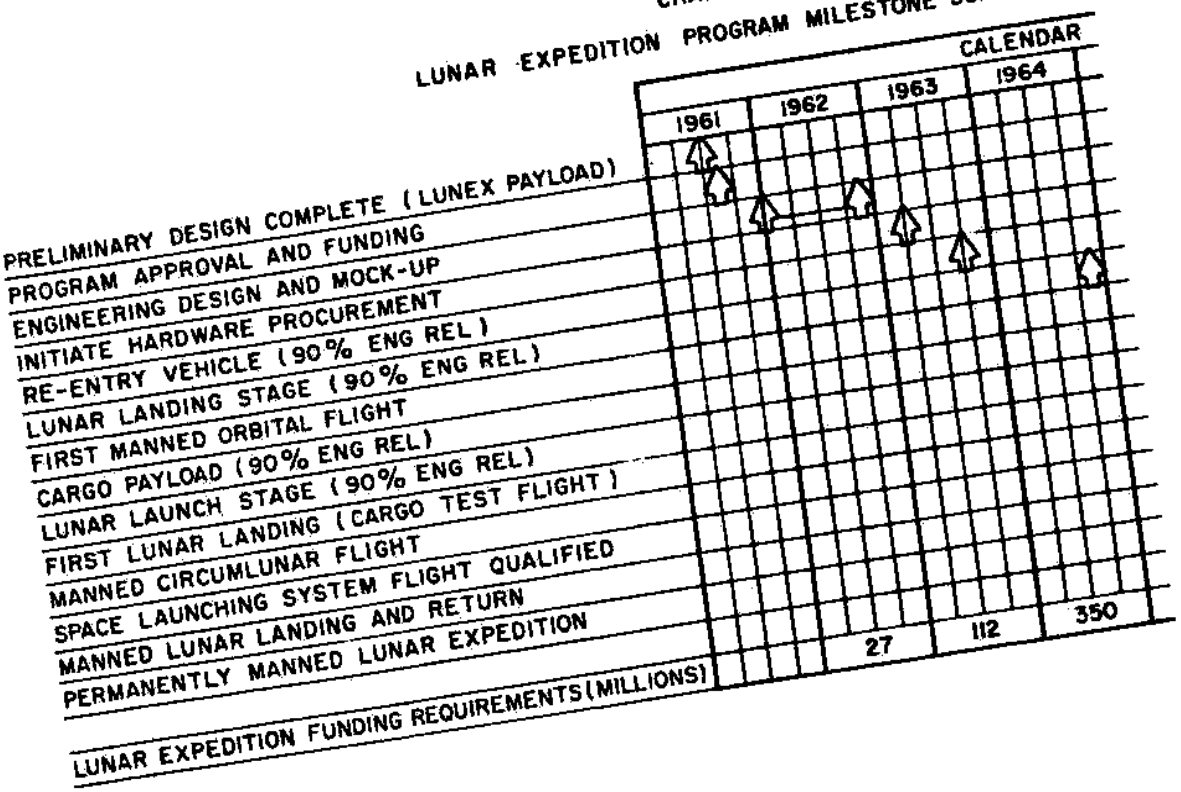
LUNAR EXPEDITION PROGRAM MILESTONE SCHEDULE



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PROGRAM SCHEDULE

III C | LUNAR EXPEDITION

MANAGEMENT MILESTONES FY62 - FY63

CY 60 | CY 61

J F M A M J J A S O N D J F M A M J J A S

1
2 START PRELIMINARY DESIGN (LRV)
3
4 COMPLETE PRELIMINARY DESIGN (LRV)
5
6 PROGRAM APPROVAL AND FUNDING
7
8 ENGINEERING DESIGN COMPETITION
9 AND MOCK-UP
10
11 Contractor No. 1 (Lunex Payloads)
12
13 Contractor No. 2 (Lunex Payloads)
14
15 DEVELOPMENT - PRODUCTION FUNDING
16
17 DESIGN CONCEPT DECISION
18
19 APPROVAL FOR HARDWARE GO-AHEAD
20
21 CONTRACT AWARD
22
23 LUNAR TRANSPORT VEHICLE PROGRAM
24
25 LUNAR EXPEDITION
26 PROGRAM
27
28 REQUIRED FUNDING (MILLIONS)
29
30 FY-62
31
32 FY-63
33
34 FY-64
35
36
37
38
39
40 LRV - Lunex Re-entry Vehicle

J F M A M J J A S O N D J F M A M J J A

FY 61

PROGRAM SCHEDULE - 6 Years

	III D LUNAR EXPEDITION TEST SCHEDULE	CY-61 J F M A M J J A S O N D	CY-62 J F M A M J J A
1	HIGH SPEED RE-ENTRY TEST		
2	25,000 - 35,000 ft/sec		
3	(Sub-Scale)		
4	35,000 - 45,000 ft/sec		
5	(Sub-Scale)		
6			
7	LUNEX RE-ENTRY VEHICLE		
8	Static Test		
9	Eng., Lab., and Gnd. Test		
10	Prototype Drop Test		
11	Unmanned		
12	Manned		
13	Orbital		
14	Unmanned		
15	Manned		
16	Circum Lunar		
17	Unmanned		
18	Manned		
19	Lunar Landing and Return		
20	Unmanned		
21	Manned		
22	Lunar Expedition		
23			
24	CIRCUMLUNAR PROPULSION STAGE		
25	Eng., Lab., and Gnd. Test		
26	Orbital Check-out		
27	Circumlunar		
28	Unmanned		
29	Manned		
30			
31	LUNAR LAUNCH STAGE		
32	Eng., Lab., and Gnd. Test		
33	Earth Launch Test		
34	Orbital Check-out		
35	Lunar Launch		
36	Unmanned		
37	Manned		
38	Lunar Expedition		
39			
40	(Continued)	J F M A M J J A S O N D	J F M A M J J A

FY-62

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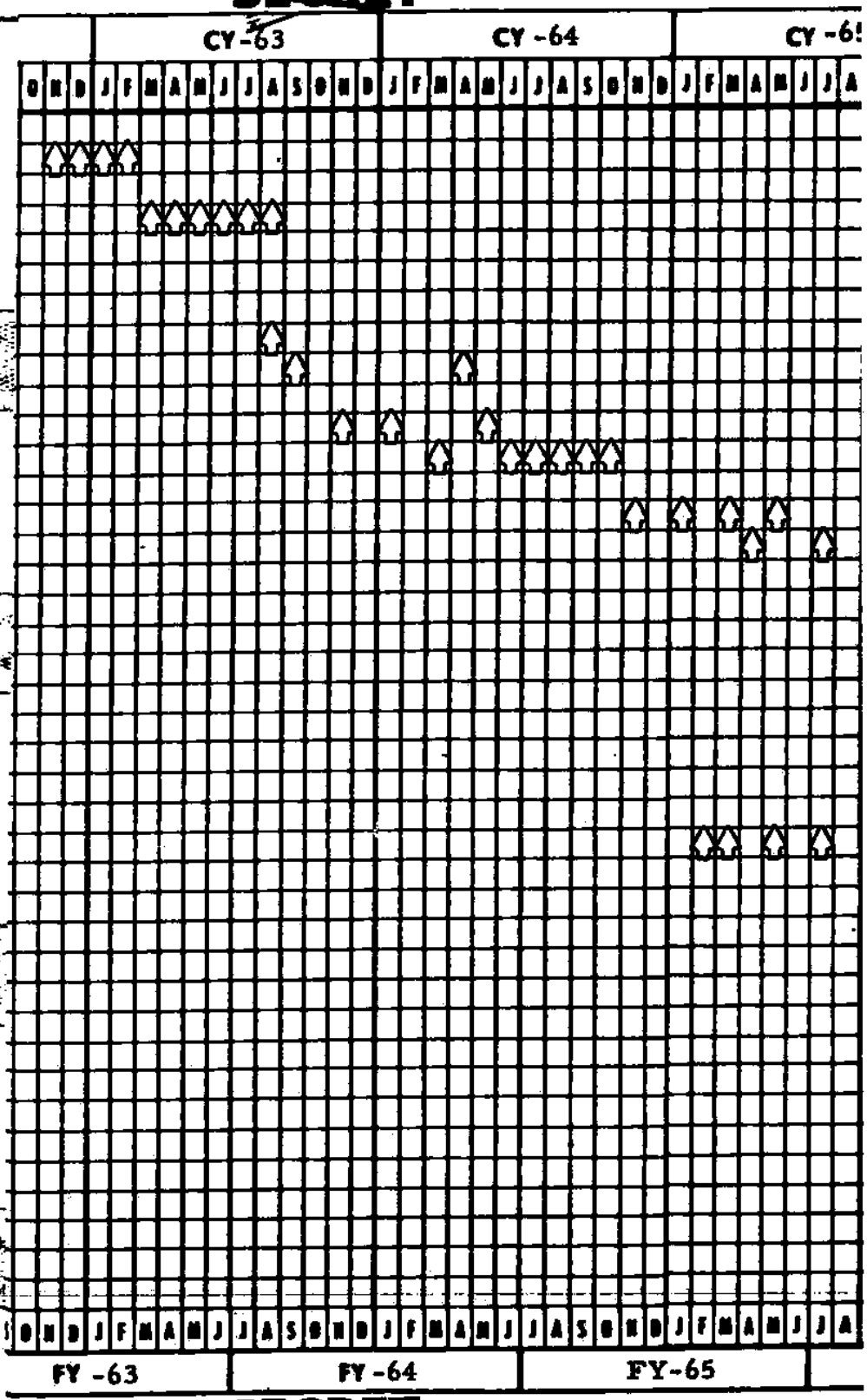

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PROGRAM SCHEDULE - 6 Years

III D (Cont.) LUNAR EXPEDITION

	TEST SCHEDULE	CY-61 J F M A M J J A S O N D	CY-62 J F M A M J J A
1	LUNAR LANDING STAGE		
2	Eng., Lab., and Gnd. Test		
3	Drop Test		
4	Orbital		
5	Cargo		
6	Lunar Landing		
7	Cargo		
8	Unmanned		
9	Manned		
10	Lunar Expedition		
11	Cargo		
12	Manned		
13			
14	CARGO PACKAGE CONFIGURATION		
15	Eng., Lab., and Gnd. Test		
16	Orbital		
17	Lunar Landing		
18	Lunar Expedition		
19			
20	ABORT		
21	Auto. Sensing and Initiation Sys.		
22	Eng. Lab. Overstress Tests		
23	Reliability Demo. Tests		
24	Captive Firing Tests		
25	Flight Tests		
26	Unmanned-Open Loop		
27	A-410		
28	AB-825		
29	BC-2720		
30	Unmanned-Closed Loop		
31	A-410		
32	AB-825		
33	BC-2720		
34	Abort Vehicle Flight Test		
35	Pad Escape		
36	Powered Flt. Separation		
37	A-X		
38	Recovery Ceiling Test		
39	A-X		
40			

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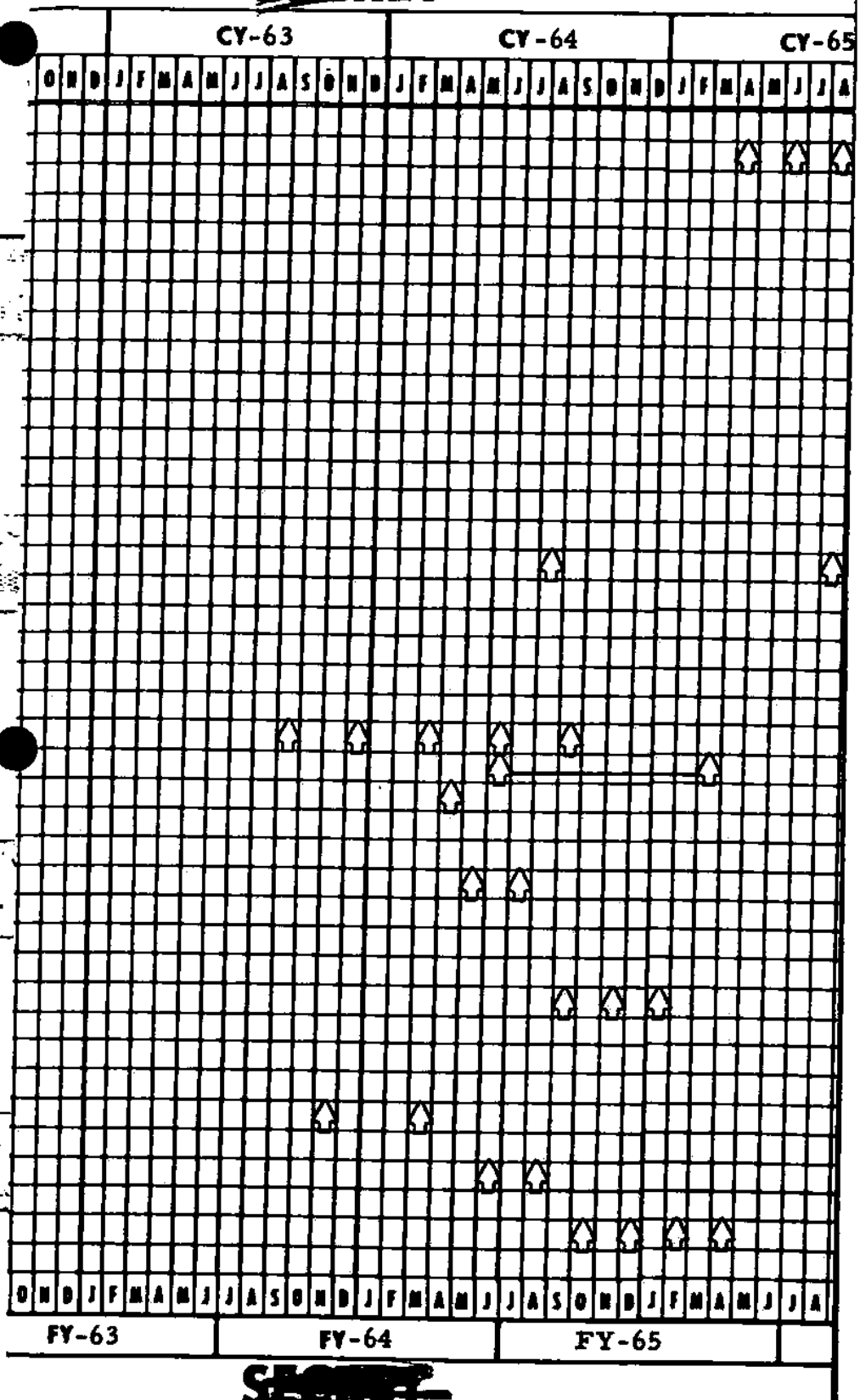
FY-62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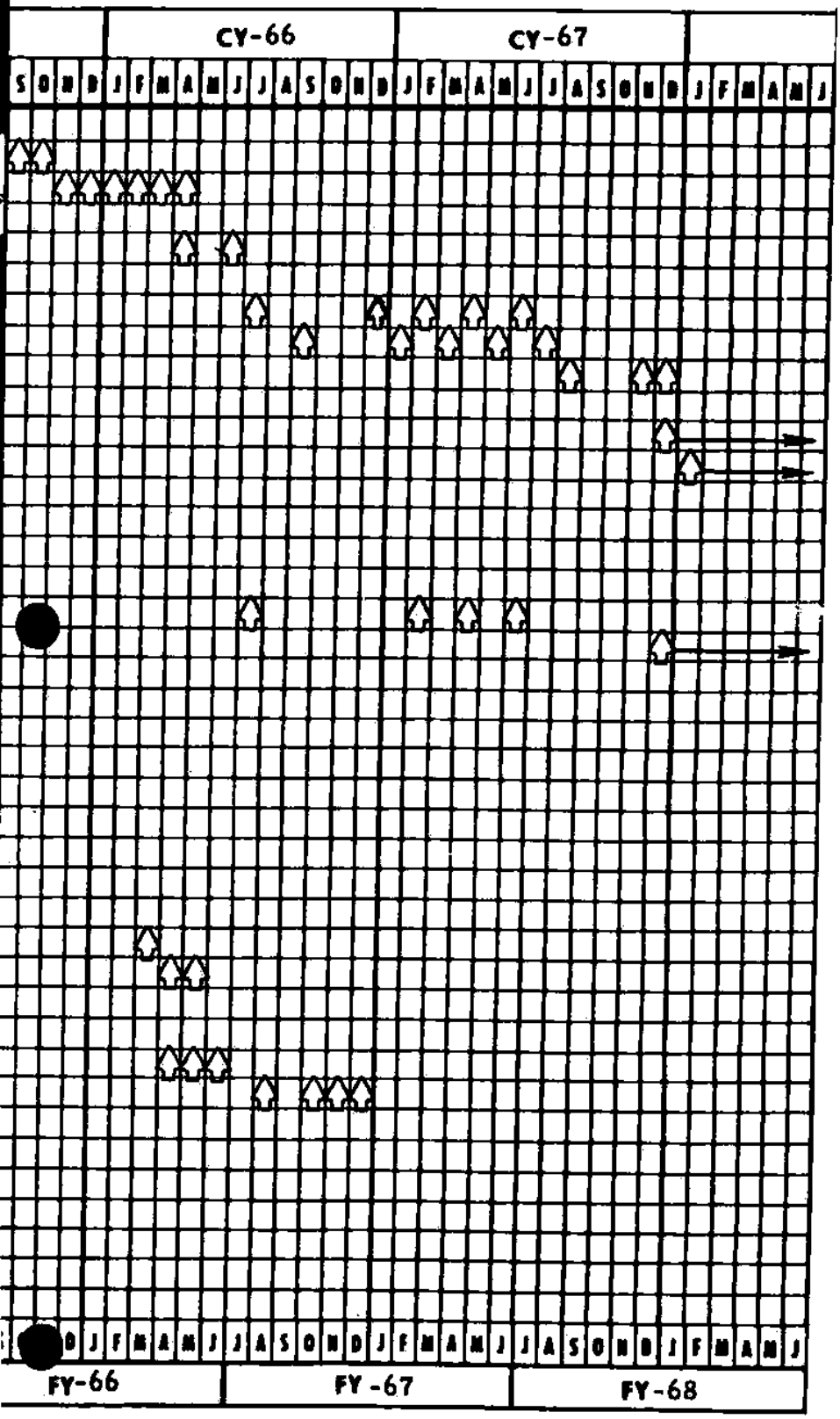
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FY-67
FY-68

PROGRAM SCHEDULE - 6 Years

III E | LUNEX SPACE LAUNCHING REQUIREMENTS

CY-61 | CY-62

J F M A M J J A S O N D | J F M A M J J A S O

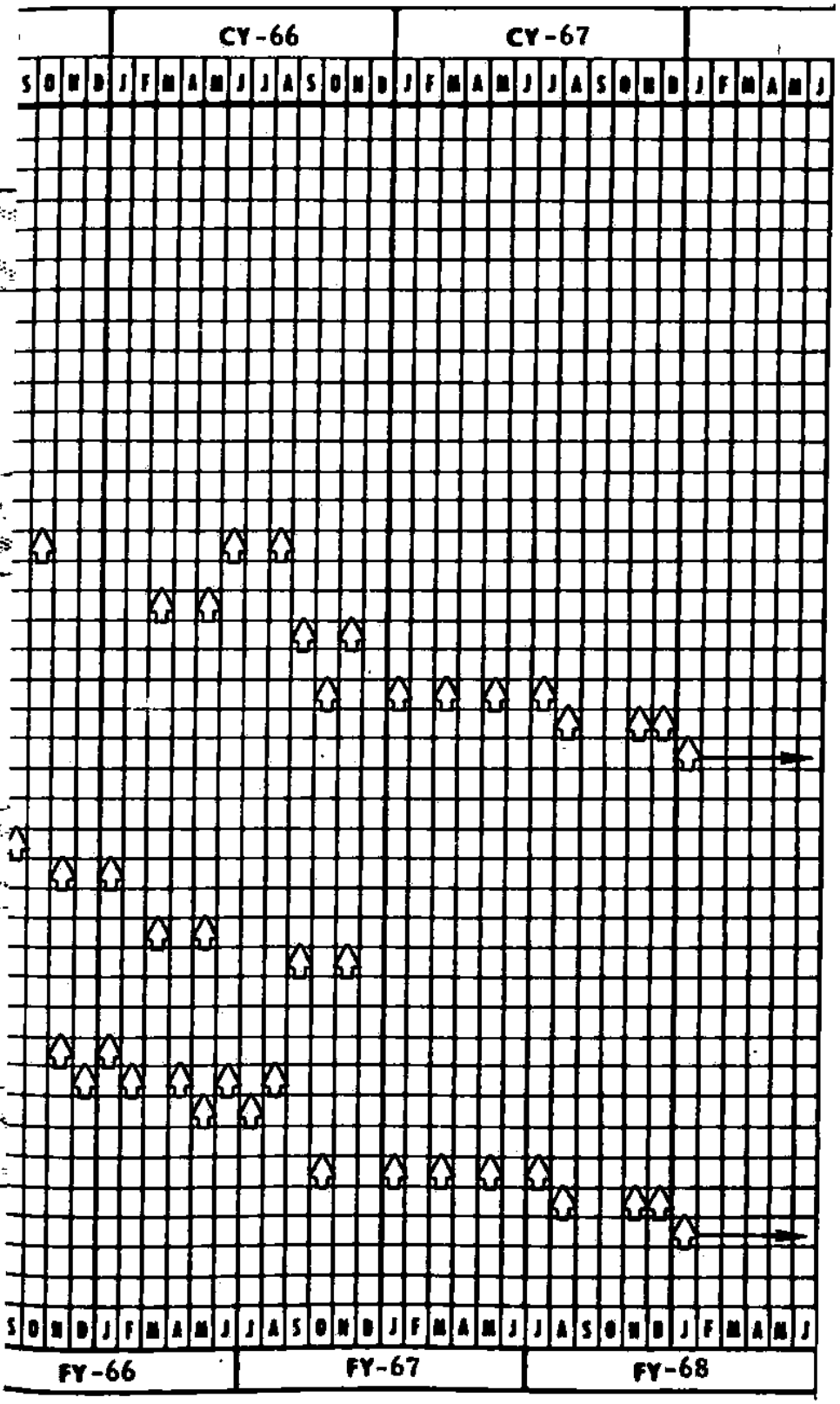
THOR-ABLE-STAR
Unmanned
1 2

SPACE LAUNCHING SYSTEM
A Unmanned
A Man-Rated
AB Unmanned
BC Unmanned
BC Man-Rated

NUMBERS REPRESENT
LAUNCH VEHICLE NUMBER

J F M A M J J A S O N D J F M A M J J A S O

FY -62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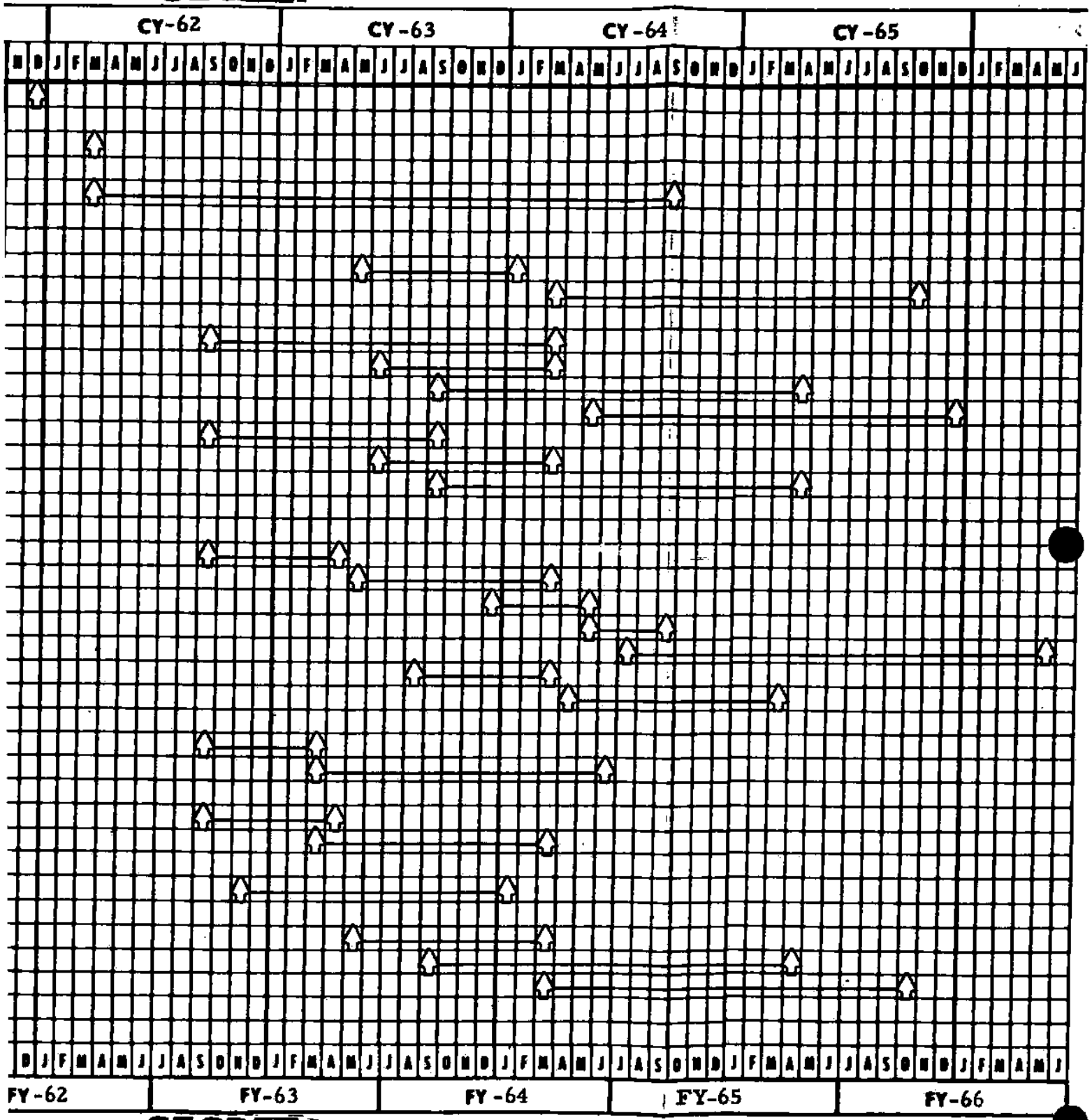

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PROGRAM SCHEDULE - 6 Years

III-F | LUNEX CIVIL ENGINEERING

CY-61 | CY-62

J F M A M J J A S O N D | J F M A M J J A

FACILITIES DEVELOPMENT PROGRAM

1 LUNEX LAUNCH SITE SURVEY
2
3 AWARD A and E CONTRACTS
4
5 DESIGN INTEGR. LAUNCH COMPLEX
6
7
8 DESIGN C and SOLID INTEGR. BLDG
9 CONSTRUCTION
10
11 DESIGN A/B and PAYLOAD INTGR. BLDG
12 Constr. Payload. Intgr Bldg
13 Modif. and Constr. A and Payload Bldg.
14 Modif. and Constr. B and Payload Bldg
15 DESIGN A, B and SOLID INTEGR. BLDG
16 Constr. A and Solid Bldg
17 Modif. and Constr. B and Solid Bldg
18
19 DESIGN LAUNCH PADS
20 1 and 2
21 Construction
22 3 and 4
23 5 and 6 (If Required)
24 3 - 6 Construction
25 DESIGN SOLID FACILITY
26 CONSTRUCTION
27
28 DESIGN PROPELLANT MFG FACIL
29 CONSTRUCTION
30
31 DESIGN HARBOR, DOCK and BARGE
32 CONSTRUCTION
33
34 DESIGN FACIL AGE
35 MANUFACTURE AND INSTALL.
36 A
37 B
38 C
39
40

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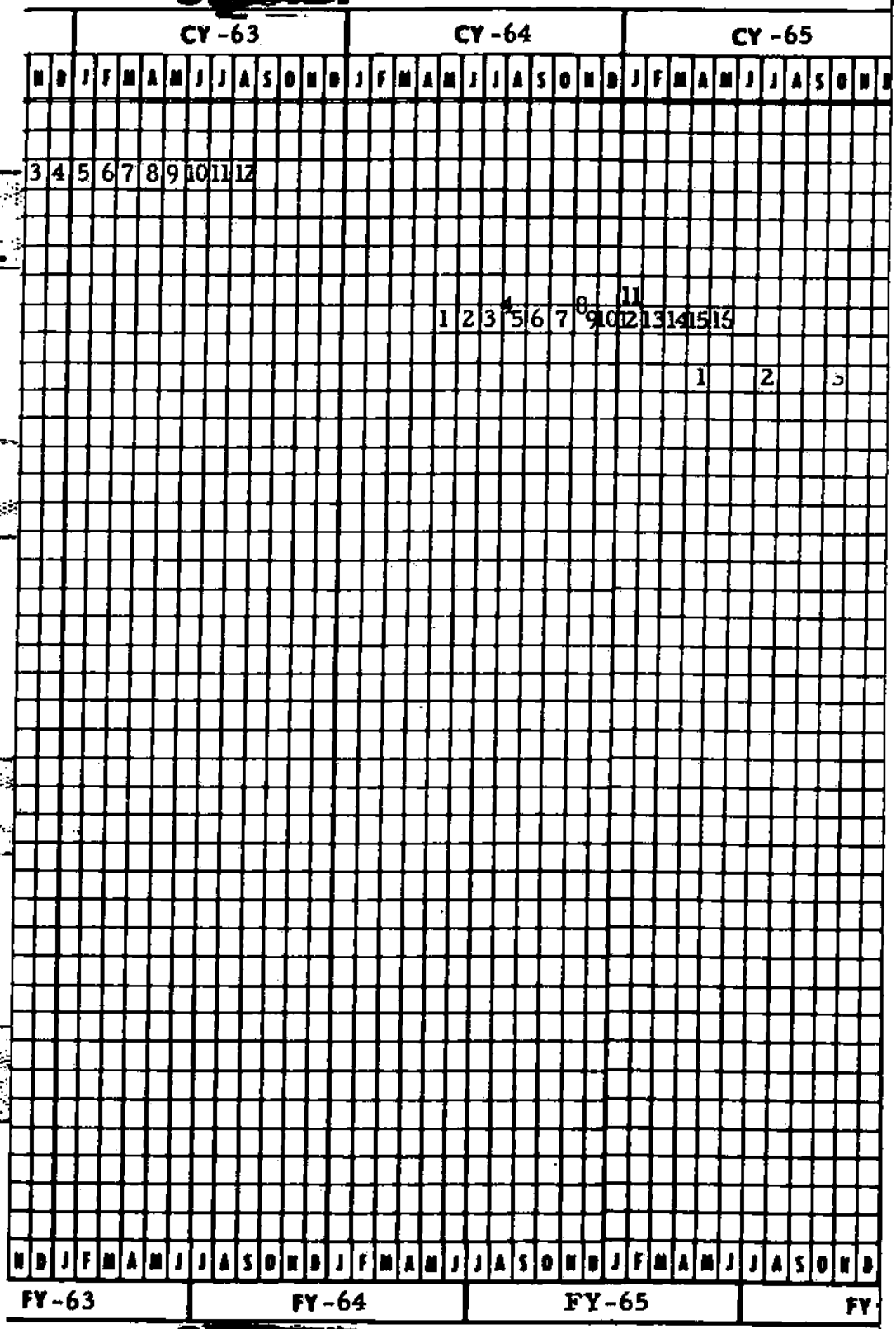

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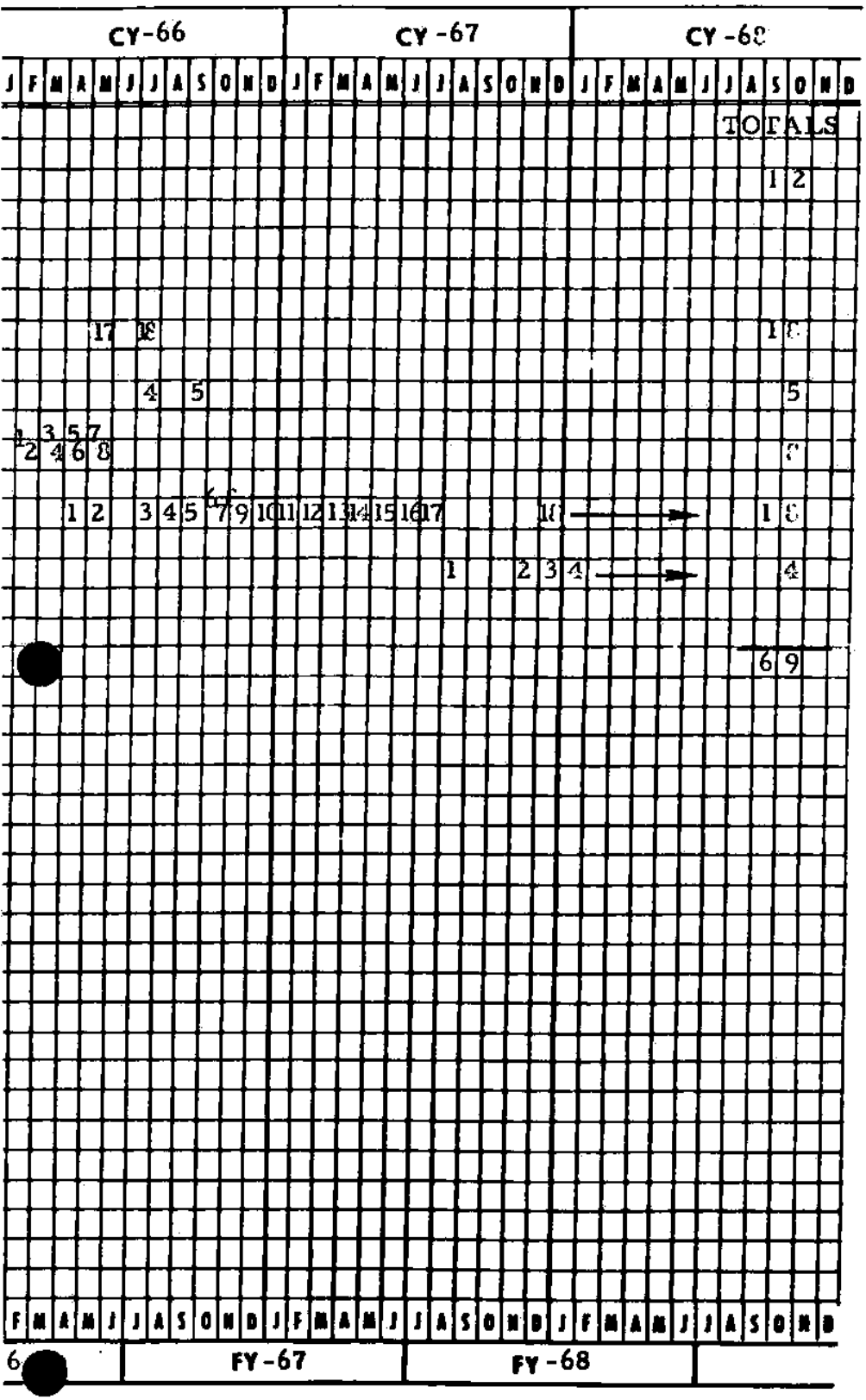
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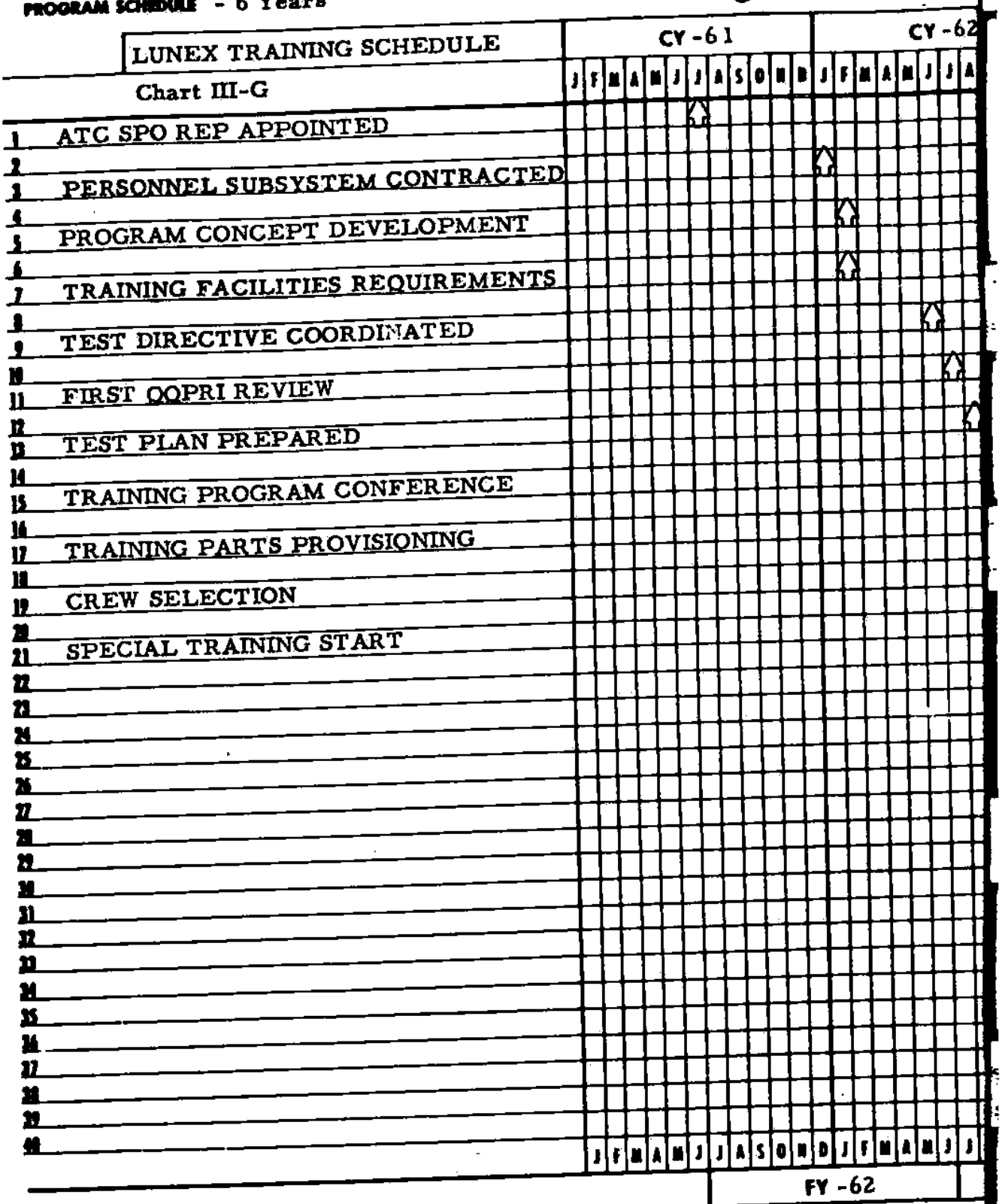
PROGRAM SCHEDULE - 6 Years

LUNEX TRAINING SCHEDULE

Chart III-G



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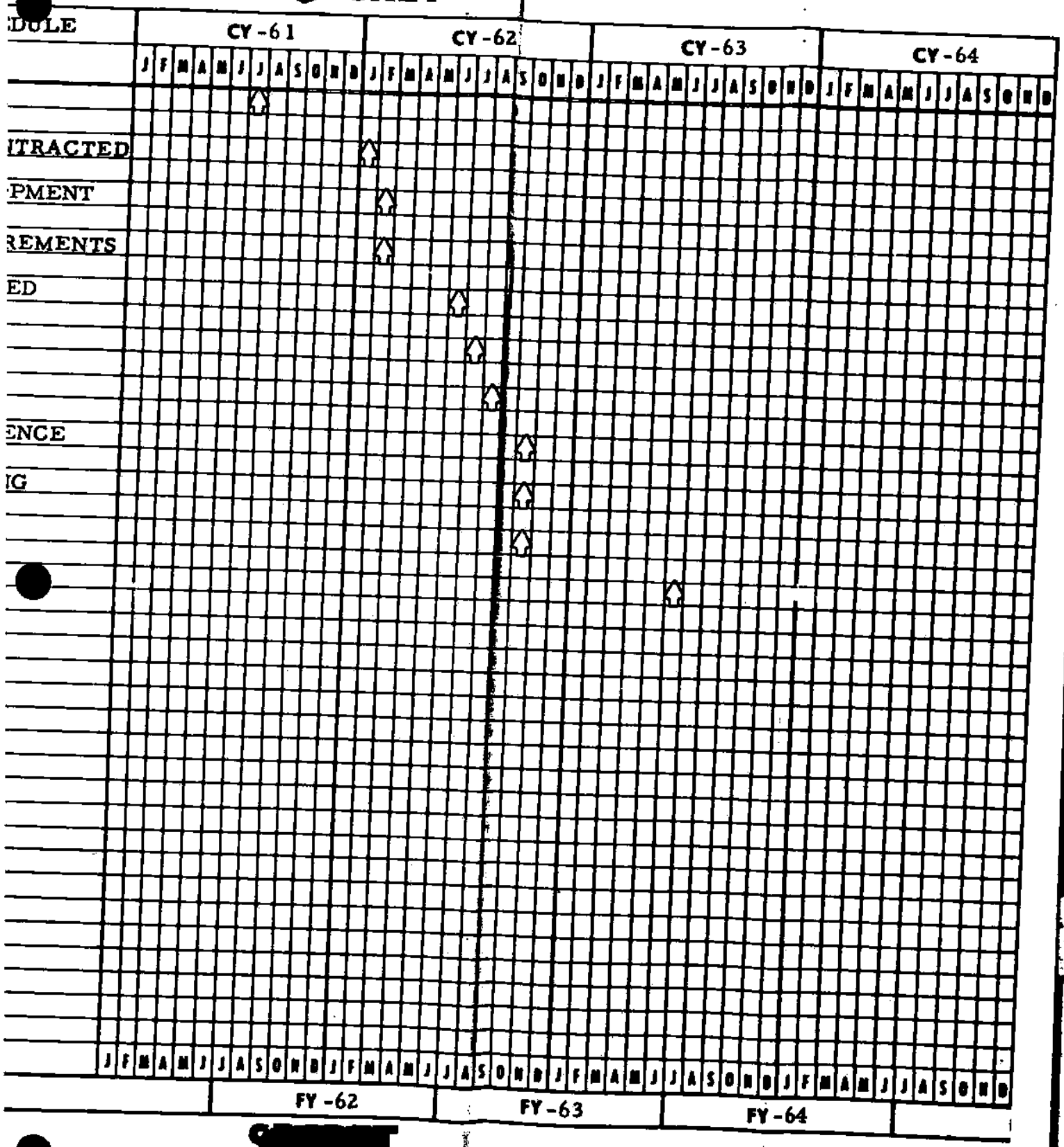

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