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PROJECT AQUILINE
CONCEPT OF OPERATIONS

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PROJECT AQUILINE

JANUARY 1969 STATUS

The AQUILINE program is still in its early conceptual stages. At this stage OSA and ORD are working in close coordination to resolve problems associated with bringing this new program to a practical and viable intelligence tool. The following concept of operations is derived from the latest available planning factors and guidelines. It is designed to present the program's minimum requirements through FY-1975.

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PROJECT AQUILINE

CONCEPT OF OPERATIONS

1. MISSION

To develop, attain and maintain an operational capability to conduct covert aerial reconnaissance of selected worldwide targets.

2. DEFINITIONS

a. For the purpose of brevity, the AQUILINE airborne vehicle is abbreviated as AV.

b. To further identify and segment project AQUILINE required equipments, the Air Ground Control Station is abbreviated as AGCS. The first of these stations (developed by the Office of Research and Development (ORD)) will be given the designation of AGCS-1. As additional stations are completed they will be given subsequent numerical designations - AGCS-2, etc.

c. Pre-Operational Period: (Prior to 1 January 1971)

The period preceding operational readiness to accomplish the primary mission.

d. Operational Period: (Subsequent to 1 January 1971)

(1) Limited Capability: (1 January 1971 to 1 July 1972)

The capability to perform limited operational missions on a "calculated risk" basis should be achieved by 1 January 1971. Non-availability of the full range airborne relay, (micro-miniaturized) system, and equipment reliability experience data will be limiting factors during this period. For planning purposes, one operational mission can be flown per quarter during this period.

(2) Design Capability: (1 July 1972 and on)

Eighteen months subsequent to attaining a limited capability, the program will have the ability to accomplish one (1) operational mission per month. The advanced lightweight micro-miniaturized special systems will increase the range capability and provide a high degree of systems reliability. Operational readiness for all systems will have been demonstrated prior to attaining this, the design capability.

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3. OBJECTIVES - PRE-OPERATIONAL PERIOD

During this period the primary emphasis will be directed toward the accomplishment of the following major tasks:

- a. The development and procurement of new equipment and systems which will comprise the AQUILINE special targeting surveillance system, allied systems, and supporting equipment.
- b. The selection and preparation of the Area-51 airdrome and supporting equipment for project AQUILINE.
- c. The completion and preparation of selected portions of Area-51 support facilities for project AQUILINE.
- d. The logistical build-up at Area-51 required to support the Pre-Operational Period and the continued build-up in logistical capability to support the Operational Period.
- e. The planning, programming and coordination required to be ready to implement the Operational Period programs to include environmental studies, and systems integration.
- f. The completion of specialized communications facilities required for the coordination and control of AGCS-1/AV flight test program.
- g. The training of selected operational teams and supervisory personnel and the continued testing and development of the AQUILINE reconnaissance systems to an operational readiness status.
- h. The training and familiarization of support personnel with the new systems and equipment preparatory to the commencement of AQUILINE operations.
- i. The development and feasibility testing of tactics and operational employment and control procedures.

4. AQUILINE UTILIZATION AND CONTROL

a. AQUILINE Vehicles:

- (1) AQUILINE vehicles which are instrumented as flight test vehicles will be under the control of the Office of Research and

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Development (ORD) until their requirement as test vehicles no longer exists. At this time, to be determined by Project Headquarters, these vehicles will be retrofitted for operational missions and their control transferred to the Field Program Director.

(2) AQUILINE vehicles purchased for operational mission usage will be flight tested for air worthiness by McDonnell Douglas Corporation prior to delivery to the Field Program Director. Vehicle acceptance procedures will be established by Project Headquarters.

(3) Procurement schedule for the operational AQUILINE vehicles is contained in TAB

b. AQUILINE Ground Control Stations (AGCS):

(1) AGCS-1 will be under the management and control of ORD until initial vehicle flight testing and interface requirements have been met. At the conclusion of the ORD testing, the AGCS-1 will be retrofitted for operational usage and management and control of the system will be transferred to the Field Program Director. Project Headquarters will determine the operational configuration of AGCS-1 and will determine the transfer date.

(2) AGCS-2 and subsequent ground control stations will incorporate the improvements dictated during flight testing conducted by ORD on AGCS-1. Management and control of AGCS-2 will be under the Field Program Director.

c. Supporting Aircraft:

During the pre-operational period, a chase and communications relay platform aircraft will be required. A Cessna 210 aircraft, currently in position at Area-51, will satisfy this requirement.

5. CONCEPT - PRE-OPERATIONAL PERIOD

a. Developmental Flight Testing:

(1) The first of the AV's developmental flight tests will begin in June 1970. Following that date, approximately 6-8 months will be devoted to completing the flight tests required to establish the total system airborne parameters of the AV's. Prior to the

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first AV flight, the first air ground control station (AGCS-1) will have been constructed. Concurrent with the AV flight test activities there will be an on-going developmental and product improvement program underway for the AGCS-1.

(2) During the early RD&E period (June 70 - Jan 71) it is envisaged that an aircraft (U-3-T-33-C130) will be used as the interim communications link between the AV's and the AGCS. Subsequent to this testing period, but prior to achieving a limited operational capability with the AV's, it is planned to supplement the aircraft commo link with a satellite communications link. It is possible that at some point during the RD&E phase the transition from aircraft communications link to an in being satellite communications link [] can be made.

(3) During the fourth quarter FY-71 (April 71 - June 71) it may be possible to conduct as many as three limited range operational missions. The capability to conduct operational missions in FY-71 will be dependent upon the completion status of the AGCS-2, the status of training, the satellite command and control link, and other factors having direct bearing on mission capability.

b. Personnel Manning Concept:

(1) Billets for the AQUILINE field unit should be primarily civilian. Complexity of training requirements inherent in management and operation of the airborne vehicle and ground control station, coupled with the expertise required to maintain and support the vehicle and sensor systems, will make recurring recruitment of personnel very impractical. Use of semi-permanent contract and staff personnel that can be retained with the AQUILINE program will enhance the continuing operational capability of the project and will improve necessary project security.

(2) During the early stages of the program (FY-70), initial recruitment of the AQUILINE's field detachment will have been completed. Supervisory personnel by title are: Field Program Director, Manager Flight Systems, and a Manager Systems Support Officer. These individuals will become the nuclei of the AQUILINE operational unit and will be responsible for effecting the orderly and efficient transition of the program from the RD&E phase to an operational ready status.

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(3) The initial months of FY-71 will be devoted to further personnel recruitment, training, and further flight testing of the AV-1's/AGCS. It is envisaged that by January 1971, the personnel complement of the AQUILINE's field unit will be approximately 39 personnel. This strength level includes Agency contract and staff positions. It will be augmented by commercial contractors as required.

(4) It is envisaged that Headquarters, OSA, as presently manned, can assimilate the AQUILINE's program into its pre-operational structure with only minimal increases in manning. These Headquarters tasks have been identified as follows: Program Director, Manager Flight Systems, Manager System Support, and an Automation Data Processing Specialist. Support for the above OSA management personnel assigned to Project AQUILINE will be provided from existing OSA and Agency staff resources.

c. Unit Operational Readiness Training:

(1) During FY-70 the Program Director (PD), the Manager Flight Systems (MFS), and the Manager Systems Support (MSS) will begin training with the AQUILINE program. This training will be on the job type training with the prime and sub-systems contractors. Additionally, these individuals will be in attendance as observers on all developmental tests that will occur during the early stages of the program.

(2) During FY-71 the Field Units Training Program will begin after recruitment of the field personnel has been completed. This training will center around the unit's Flight Teams. It is planned for this training to be divided into two parts; vehicle and system assembly, and flight operations. The purpose of the initial training is to best describe the field unit's training requirements, and to outline the functions of the Flight Team during a typical actual operation.

(3) Pre-Mission Countdown:

(a) Project Headquarters receives targeting requirements for AQUILINE.

(b) Project Headquarters alerts field unit for deployment and operational mission. Targets, suggested flight plan, special systems, etc., are sent to field.

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- *(c) One Flight Team, under the direction of the Manager Flight Systems, assembles the mission data and programs the AGCS computers. As soon as sufficient target information has been programmed into the AGCS, the team will begin simulated mission training.
 - *(d) While the first team is involved in the flight phase preparations, the second team will be responsible for assembling, performing required ground checks (and flight checks if required) on the AV and its special systems. This team will be under the auspices of the Support System Manager during these pre-mission checkouts of the AQUILINE vehicle.
 - *(e) At Headquarters direction, the Flight Teams, Launch and Recovery Teams, the AGCS, the AV's, and necessary support personnel equipment will be deployed to a forward location.
 - *(f) Once deployed, the Flight Teams will have the capability to launch, control, and recover the AQUILINE vehicle on operational missions.
- *Denotes training requirements.

6. OBJECTIVES - OPERATIONAL PERIOD

During this period the following major tasks will be accomplished:

- a. The continued testing of equipment systems and procedures in order to improve the operational capability and reliability of the overall program.
- b. The development of the micro-miniaturized special systems and other weight reduction programs for the purpose of achieving the maximum designed ranges with the AQUILINE vehicle.
- c. The continued training of the Flight Teams and support personnel.
- d. Execute covert aerial technical intelligence collection missions at selected high priority targets.

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7. CONCEPT - OPERATIONAL PERIOD (1 January 71 -)

a. A total of eighteen (18) AQUILINE vehicles will be required to support planned operations. All vehicles will be located at Area-51, which will be used as the permanent training and support base for forward stagings as required. Following is the anticipated disposition of the assigned vehicles:

(1) Six engineering development vehicles are to be used as test vehicles under ORD management and control until Research and Development Engineering is complete. Remaining vehicles, after flight tests by ORD, will be retrofitted and made available to the AQUILINE Field Program Director as replacement vehicles.

(2) One vehicle in modification and retrofit.

(3) One vehicle for training (minus payload).

(4) Four vehicles in the operational fleet to be maintained in an operational readiness status.

(5) Twelve vehicles as operational inventory.

b. Operational missions will be directed and controlled by Project Headquarters against approved AQUILINE target requirements.

c. Operational missions will be planned by the field unit based on directions provided by Project Headquarters. Mission routes will be prepared and assigned to teams that will prepare for deployment. The deployment teams will simulate their operational missions at the training site. At the conclusion of training by each team, they will be given an operational readiness evaluation by Project Headquarters, who will certify that the team is ready to deploy to an advanced location in preparation for a subsequent mission execution by Project Headquarters. When the mobile teams are deployed to an advanced operation location, the following supporting actions will be required:

(1) Necessary ground control and support personnel will be prepositioned at a forward location.

(2) The mission vehicle(s) and spares will be ferried to the forward base from Area-51.

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(3) Mission flight planning (flight plan, controller's charts, route maps, route photos, computer program tapes, etc.) will be prepared at Area-51 and ferried to the forward base.

(4) The mission(s) crew(s) will be airlifted to the forward operating location in sufficient time to provide necessary crew and systems check-out prior to execution of planned missions by Project Headquarters.

8. OPERATIONAL MISSION PLANNING

a. Upon receipt of mission requirements from Project Headquarters, the Field Program Director at Area-51 will direct accomplishment of mission planning and preparation of the mobile AQUILINE teams to satisfy the levied mission requirements. Mission route planning information required to prepare for AQUILINE missions will be supplied by all community services. AQUILINE performance factors, determined during the Pre-Operational Period, will be used in planning for initial operational missions.

b. Missions will be planned and flown along preplanned and rehearsed routes. Mission preplanning and preparation will be accomplished by the teams that will deploy to satisfy dictated mission requirements. During mission preparation, maximum cross-training and coordination will be conducted between the deployment operations teams to insure maximum flexibility during field operations.

9. OPERATIONAL COMMAND/CONTROL

a. Once mission generation has begun Project Headquarters will direct and control AQUILINE operational missions through the use of Policy Directives, Mission Directives, Tactical Doctrine and Reports Control Manual. The responsibility for mission implementation and detailed supervision will be vested in the designated deployed Flight Director.

b. A Command and Execution Chart is included as Attachment

c. An Operational Communications Chart is included as Attachment

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10. OPERATIONAL MISSION GENERATION

The following major actions will be accomplished in the generation of each operational mission. Timing of these actions may vary dependent upon the operational employment concept used as more experience is gained in defining mission "countdown" requirements.

- a. Upon receipt of approval to execute an operational mission, Project Headquarters will direct that an AQUILINE mobility team be dispatched to the pre-planned advanced staging location. The mobility team and associated equipment will be in position, ready to react to mission execution within 96 hours.
- b. Project Headquarters will alert the appropriate overseas locations as required of an impending operation. The notification will provide arrival times of the mobility team to the advanced location.
- c. Based on weather watch information, Project Headquarters will provide weather updating information to the deployed mobility team.
- d. The mobility team will be prepared to launch the AQUILINE vehicle within two hours after receipt of mission launch execution from Project Headquarters.
- e. The senior deployed mobility team's Flight Director will report mission readiness status to Project Headquarters twenty-four hours after arrival at the advanced operating location. Subsequent to the initial status report, mission readiness status will be forwarded to Project Headquarters every eight hours until the go-no-go message is received. The senior Flight Director at the deployed operating location will retain the final prerogative of cancelling a mission for reasons of local weather or other system operating conditions.
- f. At H-hour, the AQUILINE will be launched on the operational mission. During the mission, the duty Flight Director will keep Project Headquarters informed via message traffic (operational immediate precedence) every four hours on vehicle status and mission progress.

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g. The Project Headquarters Weather Staff will begin transmitting AQUILINE mission weather reports as soon as the mobility team is in place and communication is established with Project Headquarters. Weather information necessary to support the alerted operational mission will be transmitted to the mobility teams every twelve hours, and will be updated, as required, by operational immediate precedence during the operational missions.

11. SURVIVABILITY

a. The probability of detection and intercept of the AQUILINE vehicle during operational missions is being thoroughly studied and evaluated in a "Survivability Program" conducted by the McDonnell Douglas Missile and Space Systems Division. Capability of enemy defensive systems to destroy the vehicle, once acquired, are also being studied.

b. Preliminary evaluations indicate that avoidance of detection by defensive systems will be the prime consideration in providing an acceptable survivability rate for the AQUILINE vehicle. A computer program to determine lowest risk routes for the AQUILINE vehicle is being developed.

12. WEATHER SUPPORT

a. Training:

(1) Weather support for all Area-51 training missions will be provided by the weather facilities at Area-51.

(2) Upon request, Global Weather Central will provide route and area forecasts which are beyond the capability of Area-51 Weather Station. All requests will be sent through Project Headquarters Weather Staff, except matters which require immediate action.

b. Operational Missions:

(1) Weather forecasts will be provided by WECEN as required by Project Headquarters. Upon receipt of these forecasts,

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briefings will be prepared and presented to Project Headquarters staff personnel for mission planning, decision making, and direction of missions. Cloud cover above 400 feet is considered acceptable for photographic missions due to the low altitude capability of the vehicle. For ELINT or other type missions, lower cloud cover is not expected to interfere with the mission, since positions can be determined by means other than visual reference to the ground.

(2) AQUILINE missions are of long duration; consequently, the forecast reliability will be a factor in the later stages of a mission. Updated forecasts for command and control will be a necessity. Short range forecasts will be passed to the field station by Project Headquarters Weather Staff. Long range forecasts will be developed at Project Headquarters to determine directed decisions on route and target changes. Missions flown in no data regions will rely on television and Mission Flight Director readout to avoid unacceptable weather.

13. LOGISTICAL SUPPORT

a. Supply:

(1) Supply policies and procedures are based primarily on the support that is provided through contractor-source supplies and equipment. Project Headquarters develops and issues supply policies and procedures for compliance by the field activity in meeting special requirements. Except in special situations attributable to the nature or exigencies of the program, minimum reliance is made on availability of DOD procured assets.

(2) Initial spares provisioning for the air vehicle and its associated systems and ground support equipment are determined by the contractors, and reviewed and approved by Project Headquarters. Follow-on provisioning, as dictated by operational experience and spares consumption factors, includes a joint review by the contractors, the field activity, and Project Headquarters; as approving authority.

(3) Programming and budgeting for spares procurement and for the repair and overhaul of equipment and components are performed at Project Headquarters. Operational concepts, including anticipated flying time, missions planned, and operating locations, as well as engineering and technical performance factors, form the basis for programming these budget requirements.

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(4) Stock levels of hardware, spares and systems components are initially established upon the recommendations made by the contractors and will be approved by Project Headquarters. Consideration is given to providing the contractor's repair facility with sufficient bonded stock to enable the expeditious turn-around of project repairables. Adjustments to stock levels are made as indicated by operational experience and usage data.

(5) The field activity possesses self-contained, self-sustaining supply operation. It is, to all intents and purposes, capable of operating as an activity independent of other support elements in the same locale. At its home station (Area-51) it is provided such additional support as may be required in performance of logistical functions beyond its organic capability.

(6) Functions basic to the supply operation in the field activity are provided in property accounting, issues and receipts, packing and crating, warehousing, and related logistics areas, as fit the needs of the activity.

b. Transportation:

(1) Motor vehicles are not assigned as permanent organizational equipment to the field activity. Personnel transportation support is provided by the home station and at operating locations in keeping with local policies. Commercial transportation is available where time and operational factors are of essence.

(2) Project Headquarters manages and directs the movements of all heavy and bulky items of material from the contractor's facilities to the operating location. Routine requirements are normally shipped parcel post, railway express agency, and/or commercial air freight.

c. Maintenance:

(1) Contractor personnel are responsible for performance of maintenance on the air vehicle and its associated systems and support equipment, under the supervision of the Manager Systems Support in conjunction with the Flight Team.

(2) Maintenance planning factors as pertain to periodic inspections, time between overhauls, quality control and time change requirements are developed by the contractors and defined as operational experience is gained.

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b. Special Communications Support:

(1) Weather information (WECEN to Project Headquarters) is transmitted by digital data with photographic printout, backed up by teletype.

(2) Voice circuits, as well as teletype, will be used between the Ground Control System and launch/recovery sites to coordinate activities.

(3) Command and control of the vehicle is the major function of the Ground Control System. An airborne radio relay system will be used in the test phases. Operational deployment of the vehicle will require a satellite radio relay system. Supporting voice and teletype communications will be provided in the radio relays to coordinate vehicle launch and recovery operations.

CONCEPTUAL SECURITY SUPPORT

Appropriate security support, to include physical, personnel and operational security, is being provided during the Pre-Operational Period and will be provided during the Operational Period. Additionally, security of the entire industrial effort now rests with another Agency component, but will be continued by OSA Security Staff at an appropriate future date.

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a. Physical Security:

- (1) Secure perimeter of operating, training, and testing locations from unauthorized entry.
- (2) Provide appropriate surveillance of vehicles, fuel, subsystems, and other sensitive, associated systems and assets.
- (3) Conduct periodic counter-audio inspections of Detachment areas, installations and associated communications equipment.
- (4) Assure implementation of appropriate security controls for safeguarding the movement and storage of classified equipment and documents.
- (5) Establish physical security program to ensure integrity of sight sensitive characteristics of AV and related systems.

b. Personnel Security:

- (1) Assure that personnel assigned to or visiting industrial work areas and operating locations have been granted the appropriate security clearance and are approved for access to the location by Project Headquarters.
- (2) Requests for program clearances will be processed in accordance with existing OSA Security Staff criteria.
- (3) Establish briefing controls whereby the project knowledge of cleared personnel will be restricted on an individual "must know" basis.
- (4) Monitor the security consciousness of all project-cleared personnel, and advise Project Headquarters of any individual's conduct, personal or official, which might tend to compromise the unit or mission.
- (5) Establish an organized system of periodic security reindoc-trinations for all cleared personnel.
- (6) Investigate security violations and incidents, and recommend appropriate disciplinary action to Project Headquarters.

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c. Operational Security:

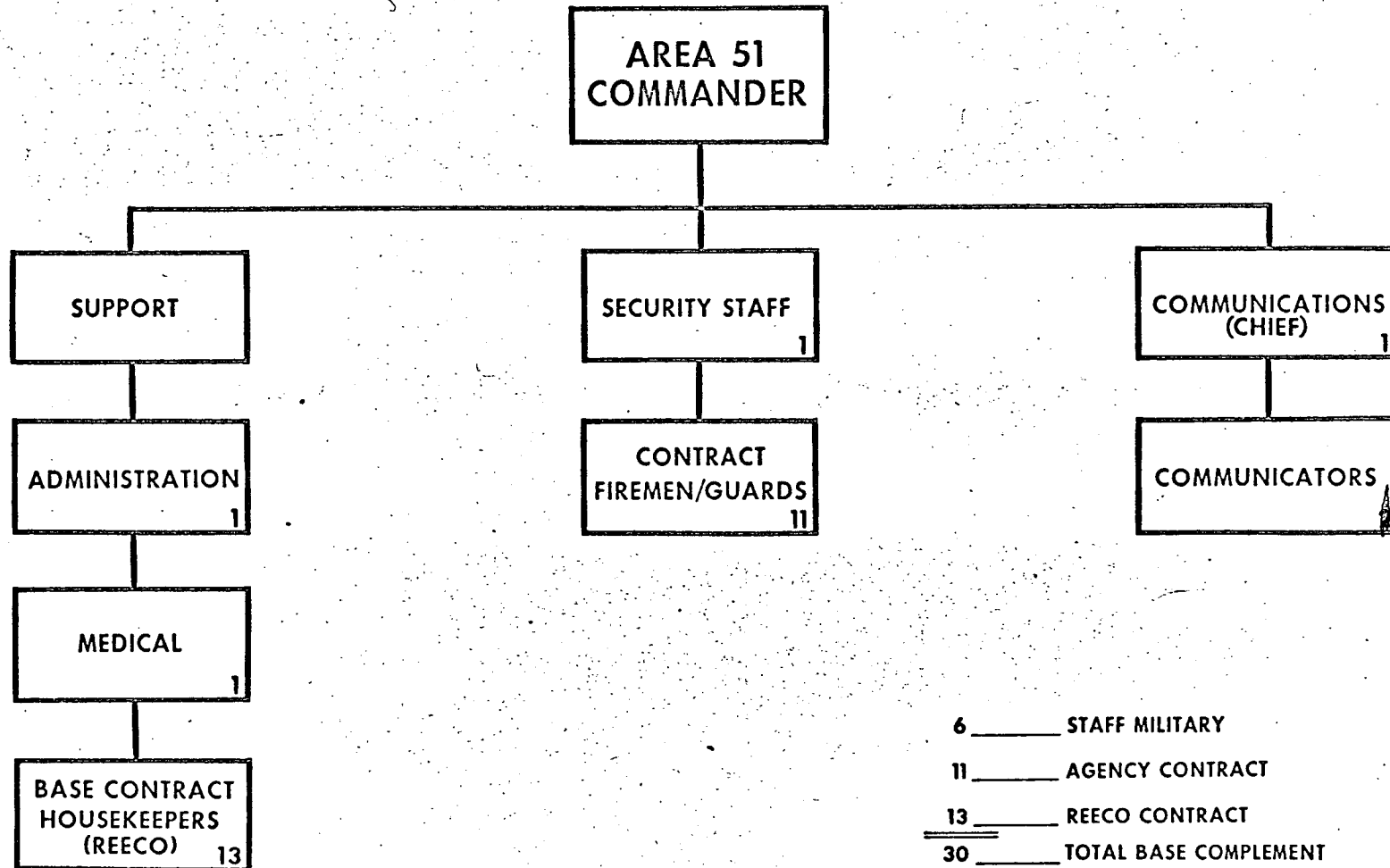
- (1) Employ deceptive techniques when and where appropriate to protect the mission, assets and personnel.
- (2) Maintain liaison with local law enforcement and security forces and solicit their assistance in establishing effective security support.
- (3) Establish security procedures for emergency situations.
- (4) Promulgate mission and unit cover stories to personnel at operating locations.
- (5) Assure sterilization of mission configured vehicle.
- (6) Provide couriers for expeditious movement of mission product to the processing facility and to Headquarters.
- (7) Security Officer member of the Mobility Team will provide security advice and guidance to Mobility Team Commander and will ensure implementation of above security responsibilities.

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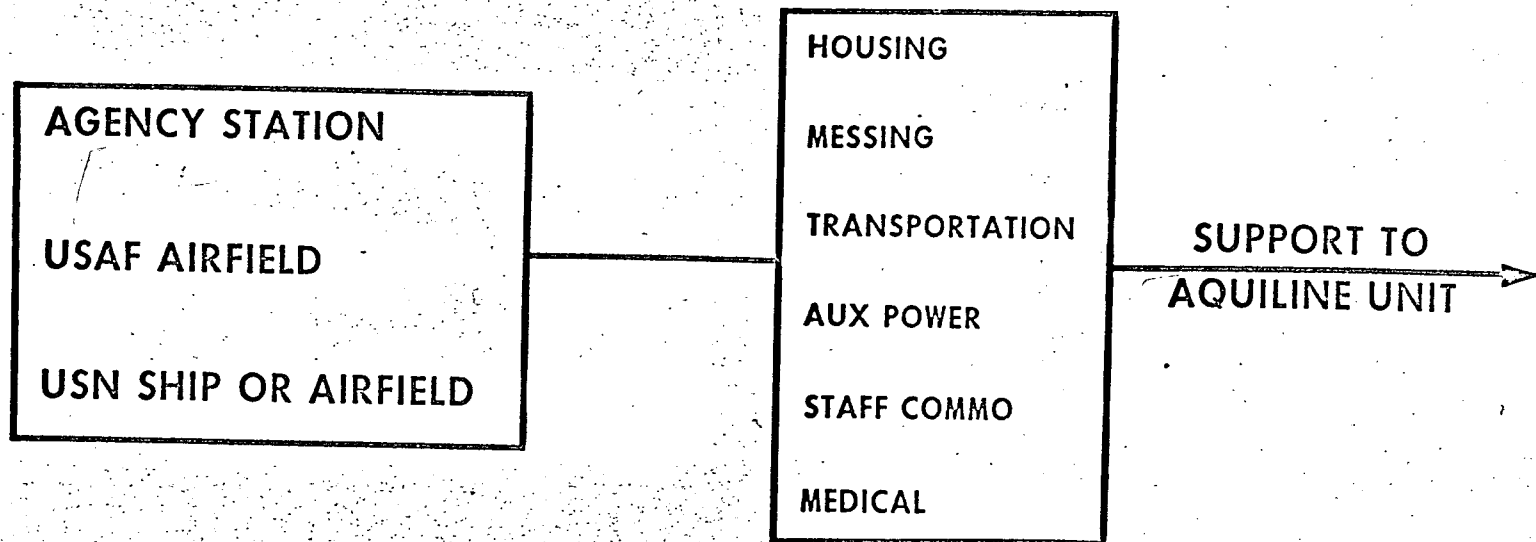
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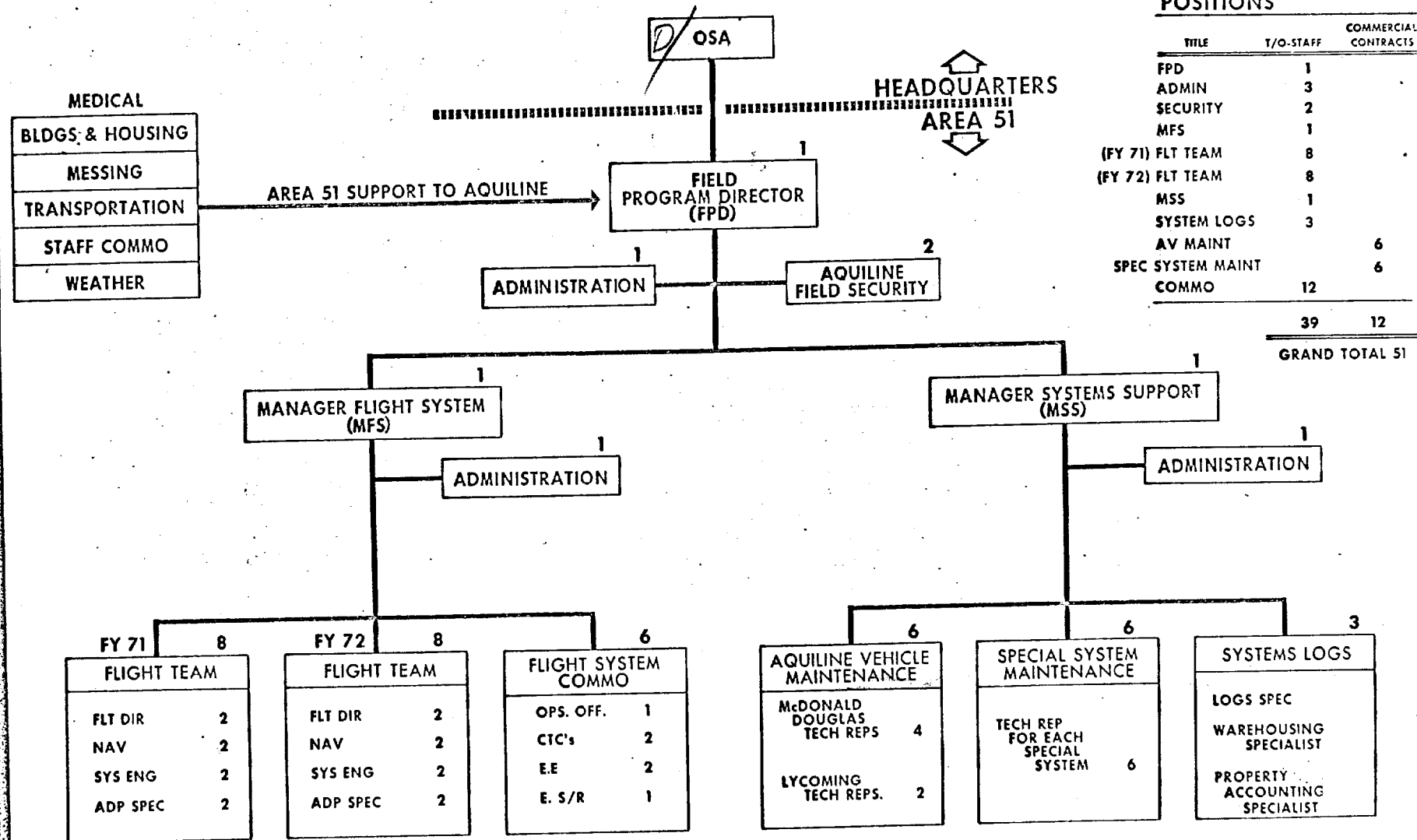
DEPLOYMENT LOCATIONS



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CONCEPTUAL AQUILINE ORGANIZATION AT AREA 51

(FY 71 - FY 72)



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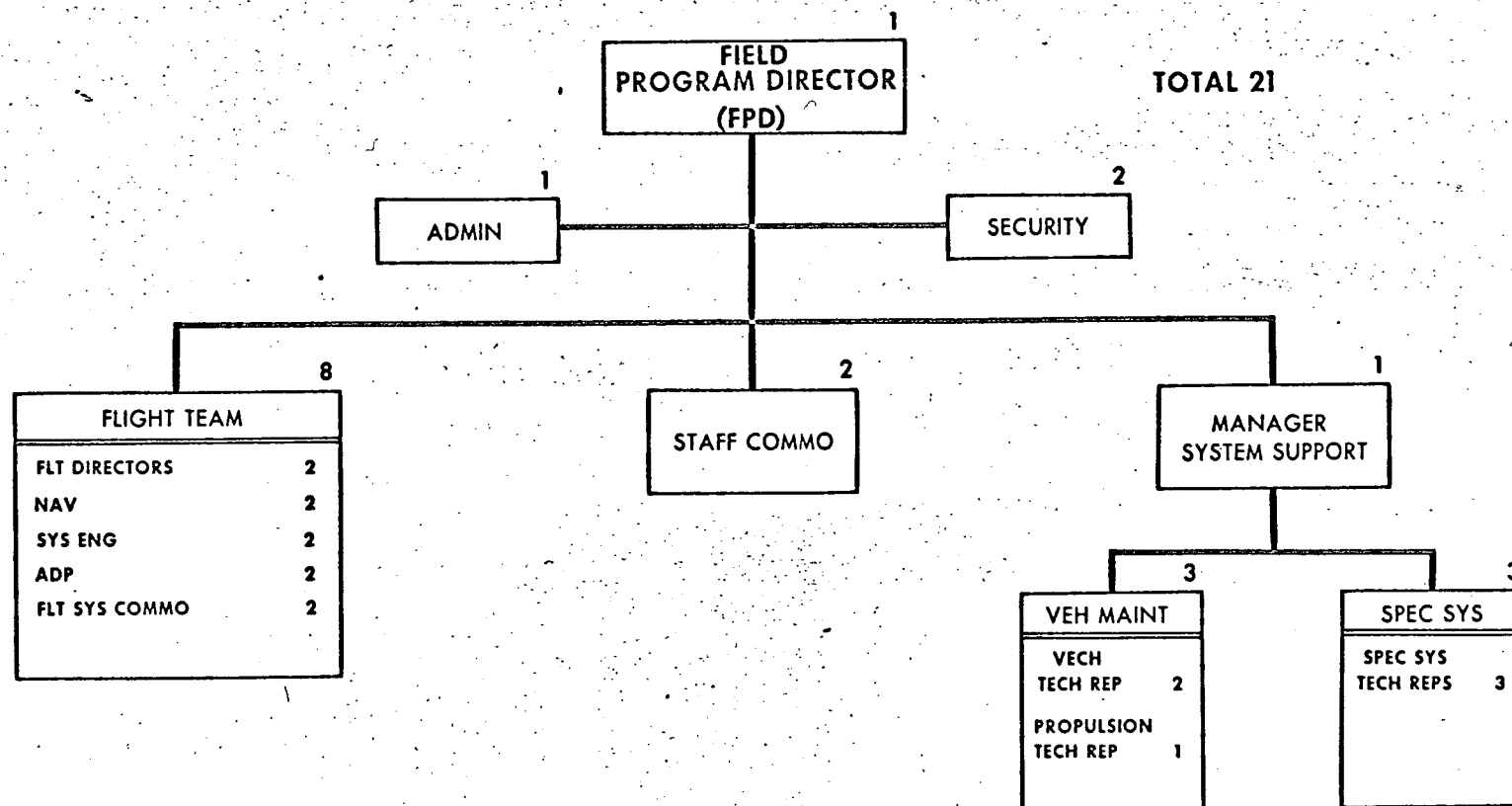
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CONCEPTUAL OVERSEAS DEPLOYMENT

(FY 71)

SINGLE LOCATION FOR LAUNCH-CONTROL-RECOVERY

DEPLOYED AQUILINE TEAM COMPOSITION

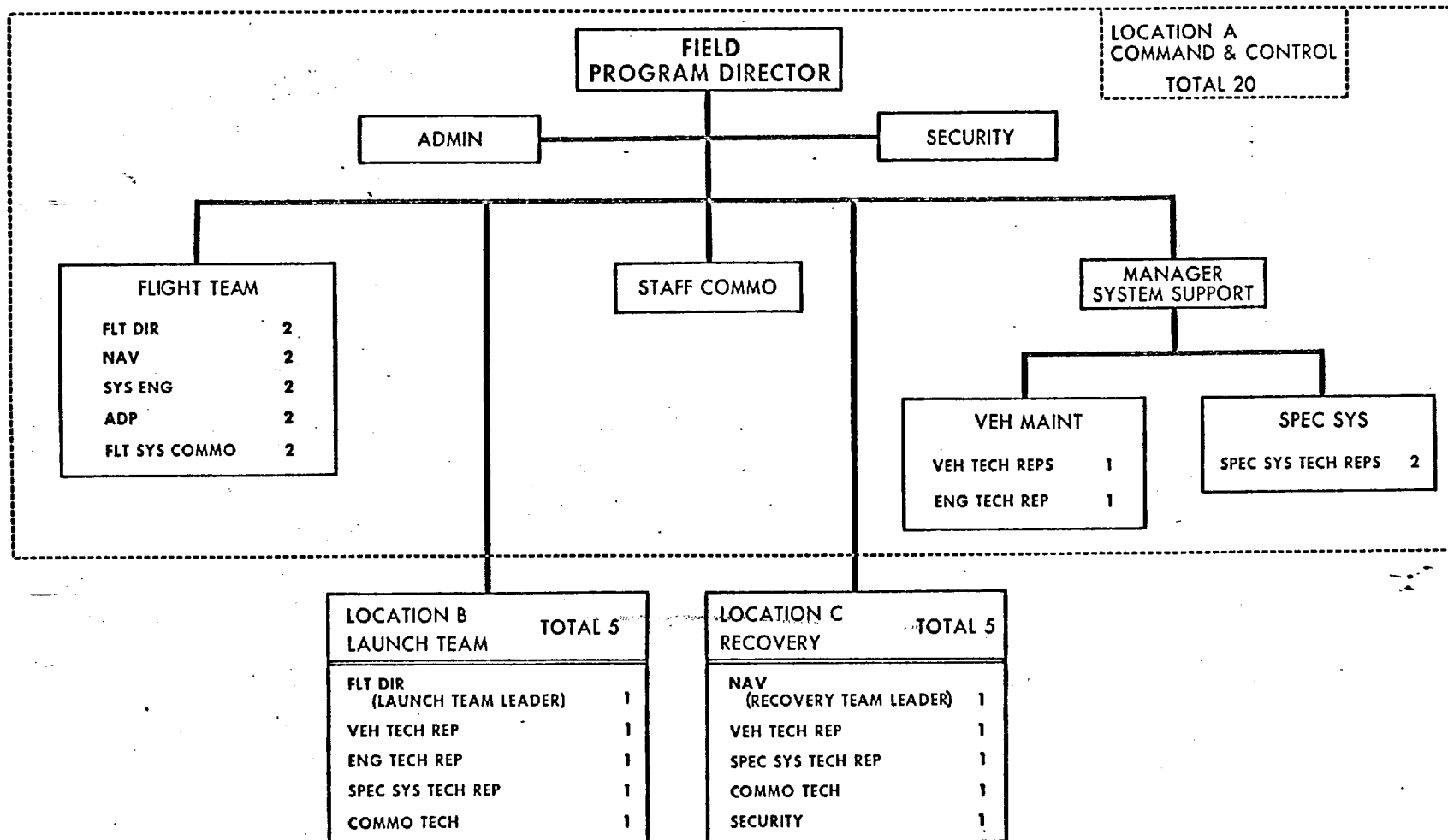


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CONCEPTUAL OVERSEAS DEPLOYMENT

SEPARATE LOCATIONS FOR LAUNCH-CONTROL-RECOVERY (FY 72)

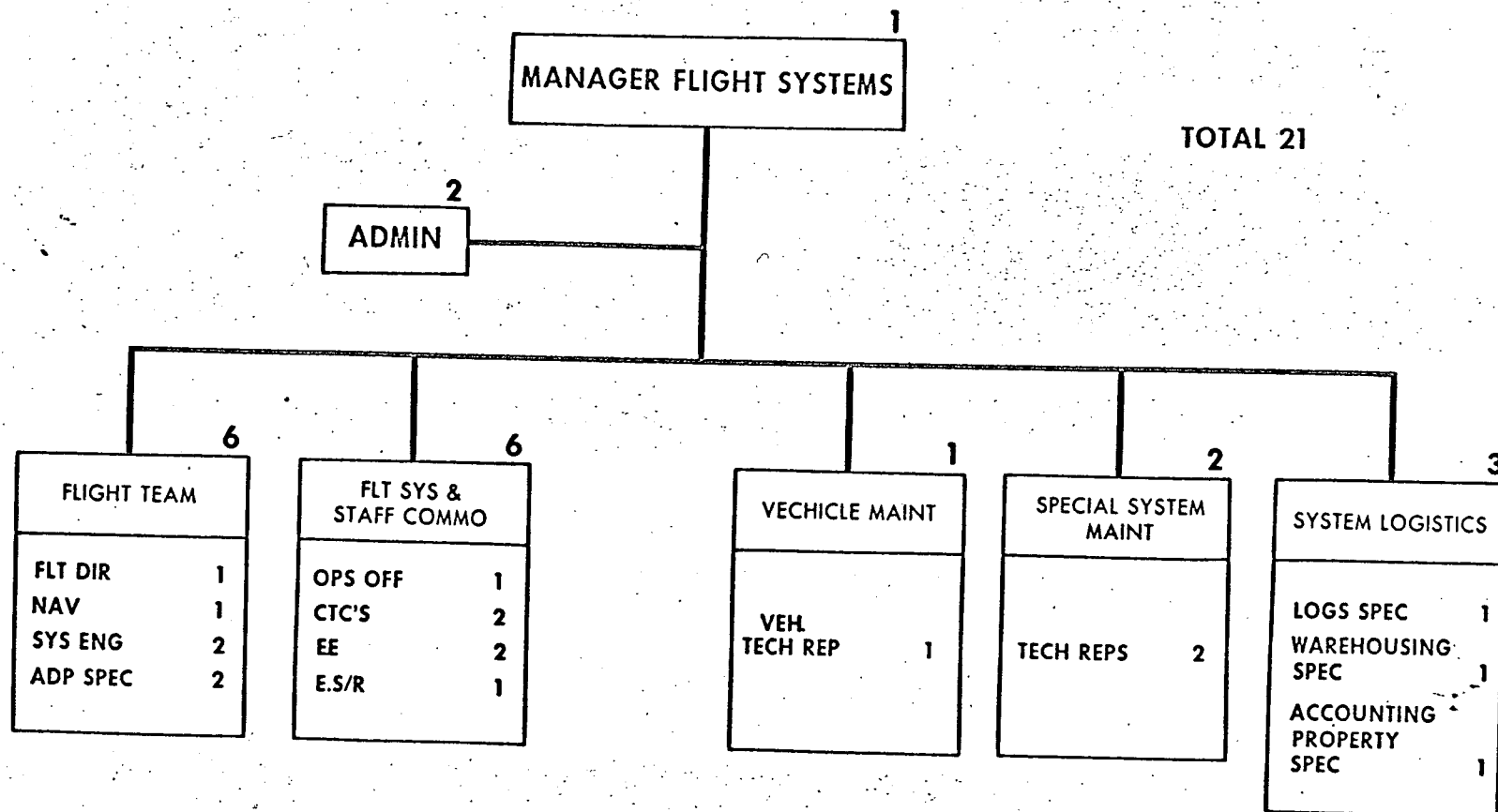


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CONCEPTUAL AREAS TO COMPLEMENT DURING DEPLOYMENT

(TRAINING TESTING)

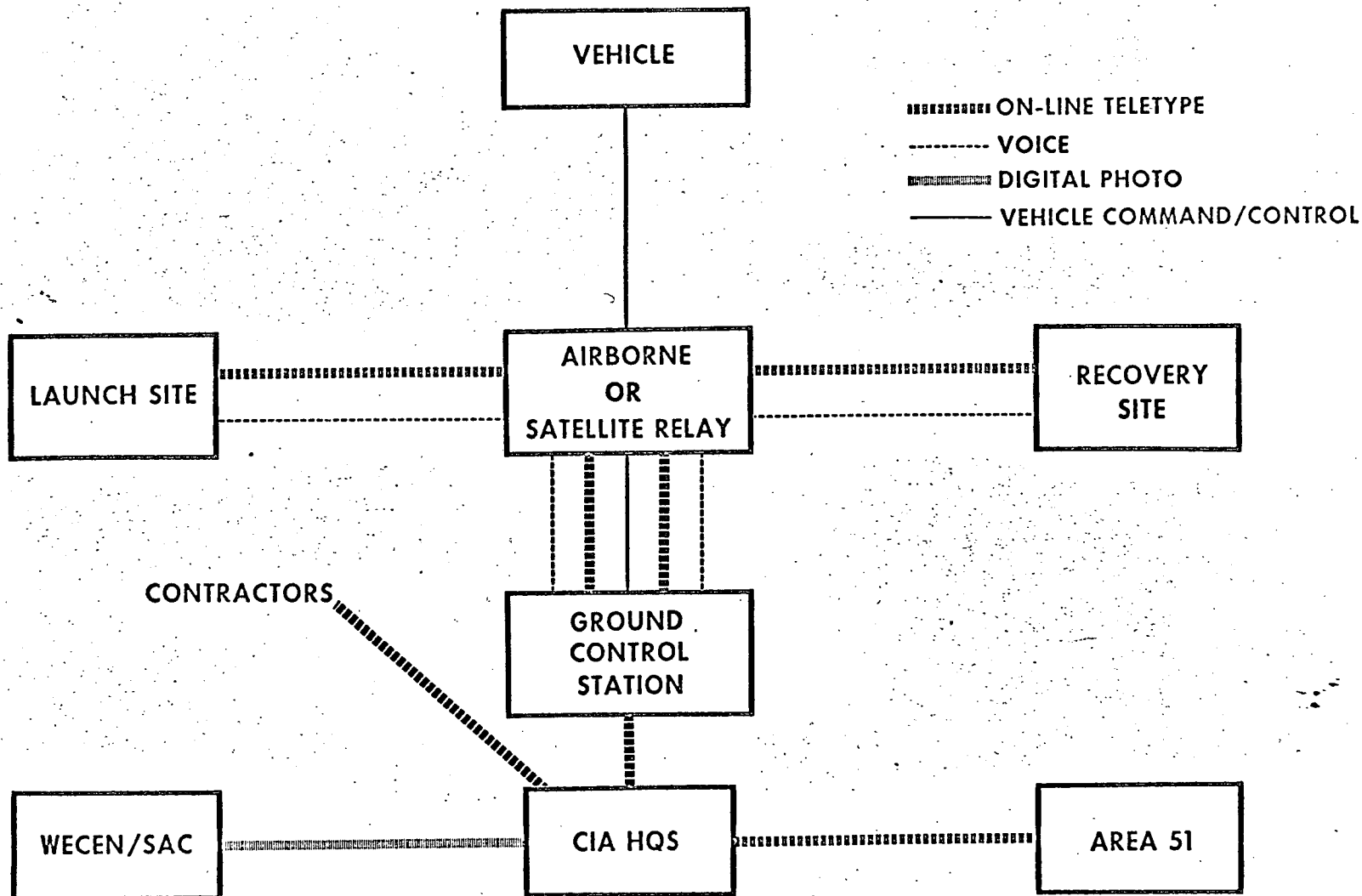
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AQUILINE OPERATIONAL COMMUNICATIONS



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PROJECT AQUILINE PAYLOADS

SYSTEM	CAPABILITY	WEIGHT	POWER REQ
COMINT PACKAGE	20 MIN CAPACITY	5 LBS	60 WATTS AT 28 VDC
ELINT PACKAGE	6 HRS CAPACITY	5 LBS	50 WATTS AT 28 VDC
IR SCANNER	6 HRS CAPACITY	3½ LBS	2.5 WATTS AT 28 VDC
PHOTO CAMERA	10 MIN CAPACITY	5 LBS	20 WATTS AT 28 VDC