Section 5
ASSET INPUT DATA REQUIREMENTS

5.1 INTRODUCTION

The primary objective of the ASSET programs is to assist the naval architect in synthesizing a ship design from a set of requirements. To accomplish this objective the ASSET programs require input of some key data items rather than providing algorithms to generate this information. Before starting a design with ASSET, the designer should insure that this information is available. This section identifies the principle items that must be input to ASSET.

5.2 INBOARD PROFILE

The ASSET programs assume that the naval architect will develop a simple inboard profile of the intended design prior to using ASSET. From this inboard profile an initial estimate for length between perpendiculars (LBP) should be calculated. In many ship designs, a minimum length is dictated by the topside arrangement of systems, superstructure requirements, etc. In addition, the number and type of machinery rooms, the approximate location of the aft most transverse bulkhead of the machinery rooms, and any required separation between machinery rooms must be identified. The number of levels in the deckhouse and the extent along the hull length where the deckhouse may be located must also be identified. After a design has been successfully synthesized in ASSET, the initial estimation of the above characteristics may prove to be inadequate or undesirable. However, since there are many potential options to improve a design configuration, changes to the above characteristics are left to the designer rather than automated through algorithms in the program.

5.3 PAYLOADS

The designer must input to ASSET all mission-specific or payload data. Payload data consists of weight, space, and electric load requirements for the various command, surveillance, and armament systems, including expendable loads, carried on board a ship. MONOSC does not contain algorithms for estimating these systems. When using MONOLA, the weight data for these systems can be derived from another parent ship. However, most designs have a unique configuration for these systems, so it is recommended that designers always input the weight, space, and electric load requirements for these systems. Mission-specific equipment may include additional items for certain types of ships. For example, replenishment kingposts, stations, elevators and other cargo handling equipment for underway replenishment ships or shop spaces and machinery for tenders. All cargo must be input as payload data.

This data must be input via the PAYLOAD AND ADJUSTMENT parameters. Table 5-1 lists the weight groups that are commonly classified as payload and for which there are no estimating algorithms in MONOSC. Table 5-2 lists the area groups that are commonly classified as payload and for which there are no estimating algorithms. When assembling payload data the designer should reference these tables to assist in identifying all required payload items. Payload data may be drawn from reference ships or from data banks of payloads data that are available at many user sites. Developing and maintaining a library of payloads data is an important function for most design projects to insure that accurate and consistent payloads data is used for all design variants developed. In addition to the weight, space, and electric load information required as input to ASSET, cost and other system information should be maintained in these libraries. The ASSET Export Utility includes capabilities to transfer payloads information to other cost, analysis, and CAD programs. Whenever possible payload data should be input to ASSET at the 3-digit SWBS level. Payload data may be input at the 1 or 2-digit SWBS level, however this results in inconsistencies in weight accounting at the next level of detail (2 or 3-digit SWBS level) which may confuse other analysis programs.

Table 5-1.
SWBS Weight Groups Which Must Be Input In PAYLOAD AND ADJUSTMENTS

P+A SWBS KEY	SWBS Weight Group	SWBS Group Name
W164	164	Ballistic Plating
W165	165	Sonar Domes (also input via SONAR WT ARRAY)
W191	191	Ballast, Fixed or Fluid, and Buoyancy Units
W237	237	Auxiliary Propulsion Units
W410	410	Command and Control Systems
W440	440	Exterior Communications
W450	450	Surveillance Systems (Surface)
W460	460	Surveillance Systems (Underwater)
W470	470	Countermeasures (except Degaussing SWBS 475)
W480	480	Fire Control Systems
W491	491	Electronic Test, Checkout and Monitoring Equip.
W493	493	Non-Combat Data Processing Systems
W542	542	Aviation and General Purpose Fuel Systems
W553	553	O2 N2 System
W573	573	Cargo Handling Systems (MONOLA)
W588	588	Aircraft Handling, Servicing, and Stowage
W636	636	Hull Damping (also input via SONAR WT ARRAY)
W673	673	Cargo Stowage (MONOLA)
W710	710	Guns and Ammunition Systems
W720	720	Missiles and Rocket Systems
W750	750	Torpedo Systems
W770	770	Cargo Munitions Handling & Stowage (MONOLA)
W780	780	Aircraft Related Weapons Systems
WF20	F20	Mission Related Expendables and Systems
WF42	F42	JP-5
WF51	F51	Sea Water (in compensating tanks)
WF60	F60	Cargo (MONOLA)

Table 5-2.
SSCS Area Groups Which Must Be Input In PAYLOAD AND ADJUSTMENTS

P+A SSCS KEY	SSCS Area Group	SSCS Group Name
A1111	1.111	Exterior Communications - Radio
A1112	1.112	Exterior Communication - Underwater Systems
A1121	1.121	Surface Surveillance - Radar
A1122	1.122	Underwater Surveillance - Sonar
A1131	1.131	Command and Control - Combat Information Center
A1141	1.141	Electronic Countermeasures
A1142	1.142	Torpedo Countermeasures
A1143	1.143	Missile Countermeasures
A1210	1.210	Guns (batteries, control, handling, stowage, etc.)
A1220	1.220	Missiles (launchers, control, handling, stowage, etc.)
A1230	1.230	Rockets (launchers, control, handling, stowage, etc.)
A1240	1.240	Torpedoes (launchers, control, handling, stowage, etc.)
A1250	1.250	Depth Charges (launchers, control, handling, stowage, etc.)
A1260	1.260	Mines (launchers, control, handling, stowage, etc.)
A1270	1.270	Special Weapons (launchers, control, handling, stowage)
A1312	1.312	Aviation - Launching and Recovery Equipment
A1340	1.340	Aircraft Stowage (also via LG OBJ SPACE TYPE TBL)
A1360	1.360	Aviation Maintenance
A1374	1.374	Aviation Ordnance Stowage (also via LG OBJ SPACE TYPE TBL)
A1380	1.380	Aviation Fuel Systems (transfer, handling, stowage, etc.)
A1390	1.390	Aviation Stores
A144001	1.44001	Amphibious Vehicle Stowage (also via LG OBJ SPACE TYPE TBL)
A144002	1.44002	Well Deck (also via LG OBJ SPACE TYPE TBL)
A1541	1.541	Cargo Stowage (also via LG OBJ SPACE TYPE TBL)
A15431	1.5431	Cargo Tankage (also via LG OBJ SPACE TYPE TBL)
A1600	1.600	Intermediate Maintenance Facilities (Tenders)
A4170	4.170	Auxiliary Propulsion Systems

5.4 MANNING

There is no capability in ASSET to estimate the manning requirements of a particular ship design. Manning must be input in the MANNING ARRAY. However, manning is a critical factor is the cost of a new ship and in many types of ships has a significant impact on the overall volume requirements. To achieve a viable design with ASSET, the designer should obtain an good initial estimate of the manning requirements and continue to refine the manning estimate as the design evolves.