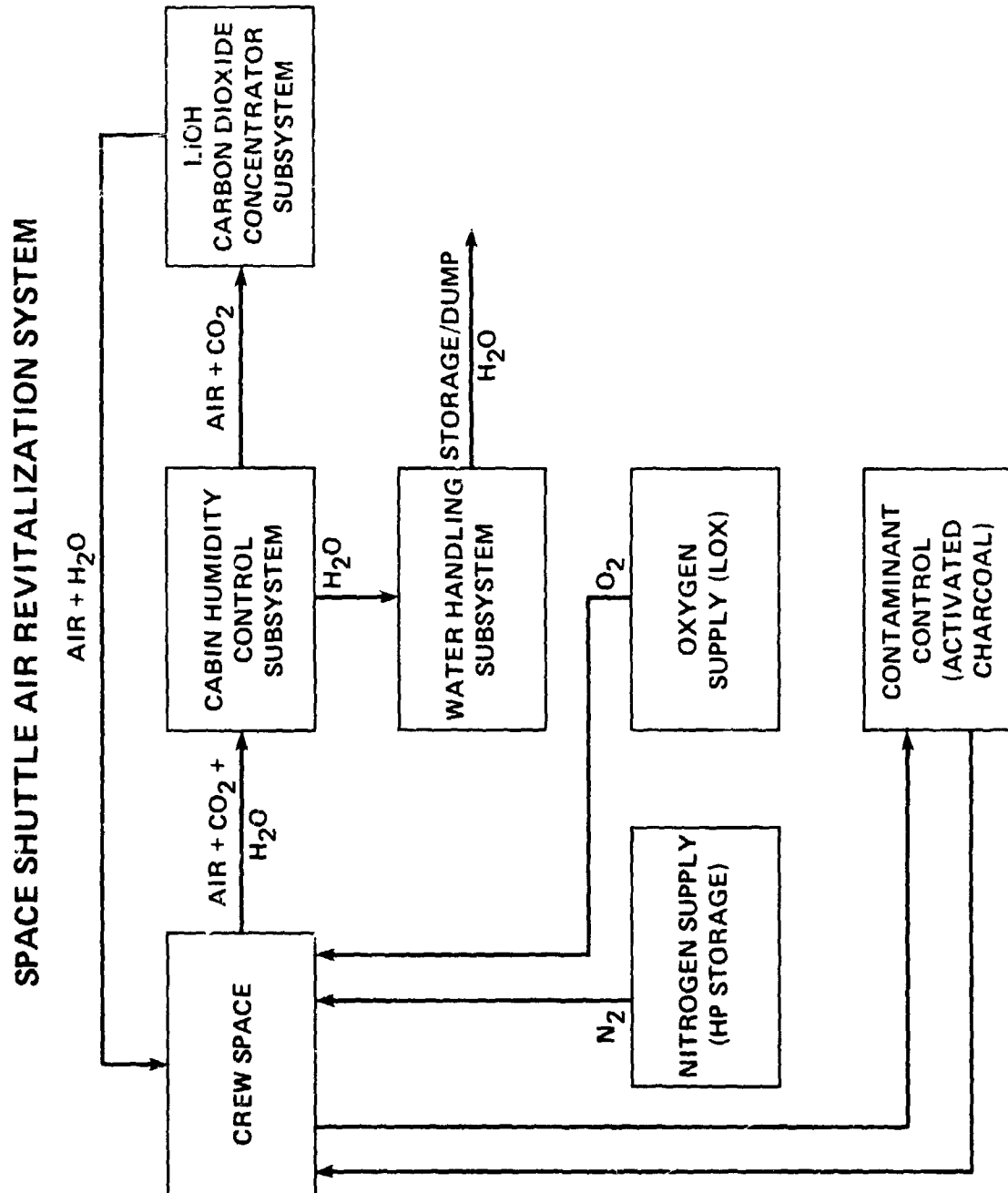


N85-29548

QUATTRONE FIGURE 1  
SPACE SHUTTLE AIR REVITALIZATION  
SYSTEM

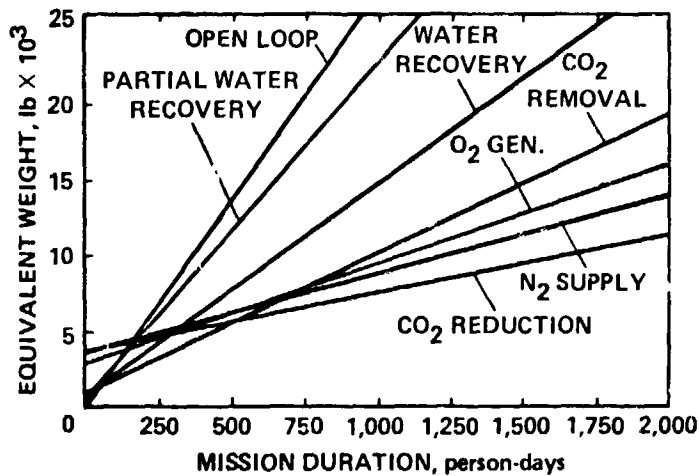


QUATRONE

FIGURE 2

REGENERATIVE vs OPEN LOOP ECLSS  
TRADE-OFFZ

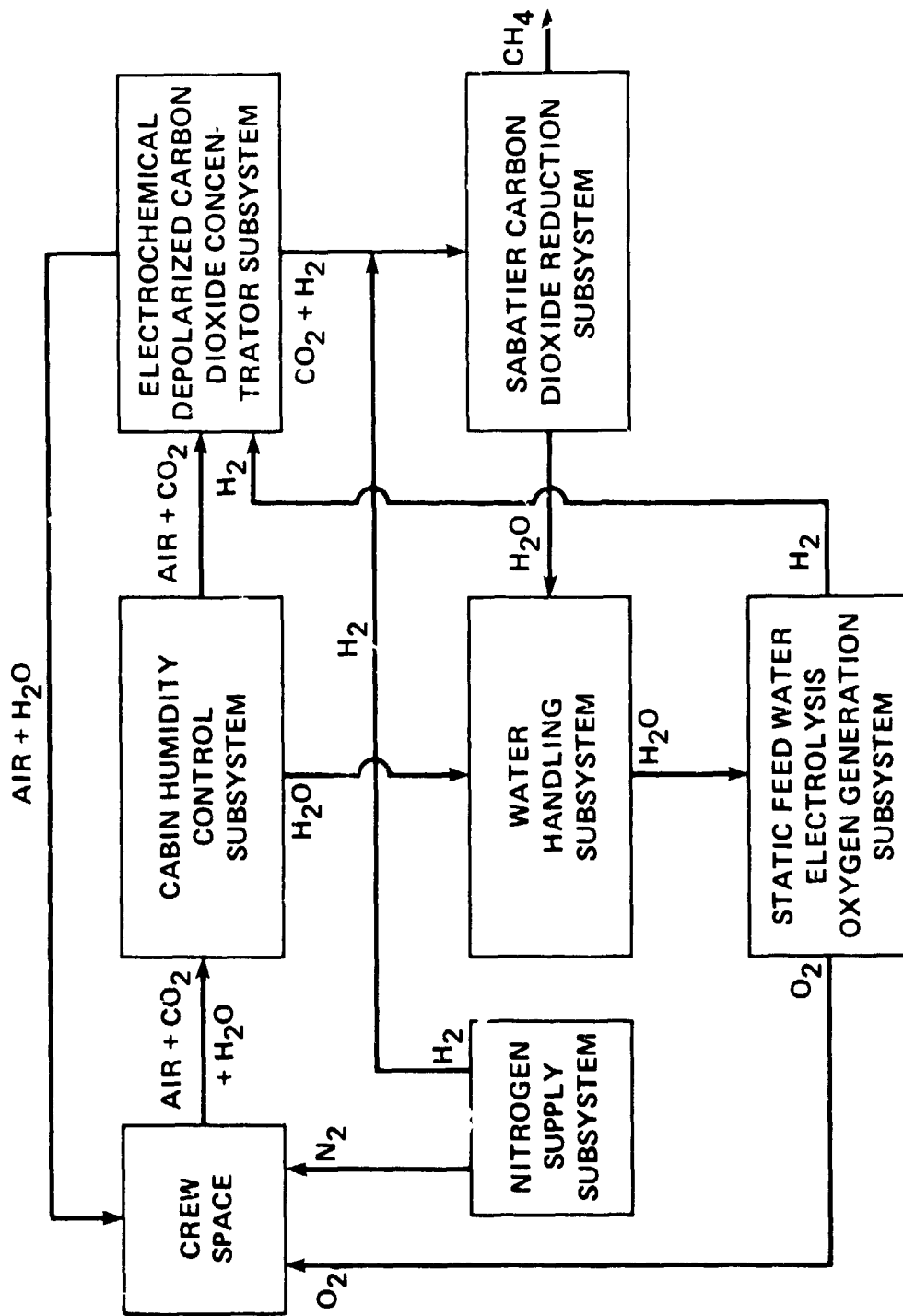
### REGENERATIVE vs OPEN LOOP EC/LSS



### SEQUENTIAL STEPS IN LOOP CLOSURE

DEFINITION	DESCRIPTION
PARTIAL WATER RECOVERY	HUMIDITY CONDENSATE COLLECTION
WATER RECOVERY	POTABLE WATER RECOVERY AND TREATMENT FROM URINE AND WASH WATER
CO <sub>2</sub> REMOVAL (NONEXPENDABLE)	REPLACEMENT OF EXPENDABLE LiOH WITH REGENERATIVE CO <sub>2</sub> COLLECTION TECHNIQUE
O <sub>2</sub> GENERATION	GENERATION OF O <sub>2</sub> THROUGH WATER ELECTROLYSIS USING RECLAIMED WATER
N <sub>2</sub> GENERATION	GENERATION OF N <sub>2</sub> THROUGH DISSOCIATION OF HYDRAZINE
CO <sub>2</sub> REDUCTION	DECREASE IN EXPENDABLE WATER BY RECOVERING PRODUCT FROM CO <sub>2</sub> REDUCTION (SABATIER) PROCESS

# REGENERATIVE AIR REVITALIZATION SYSTEM

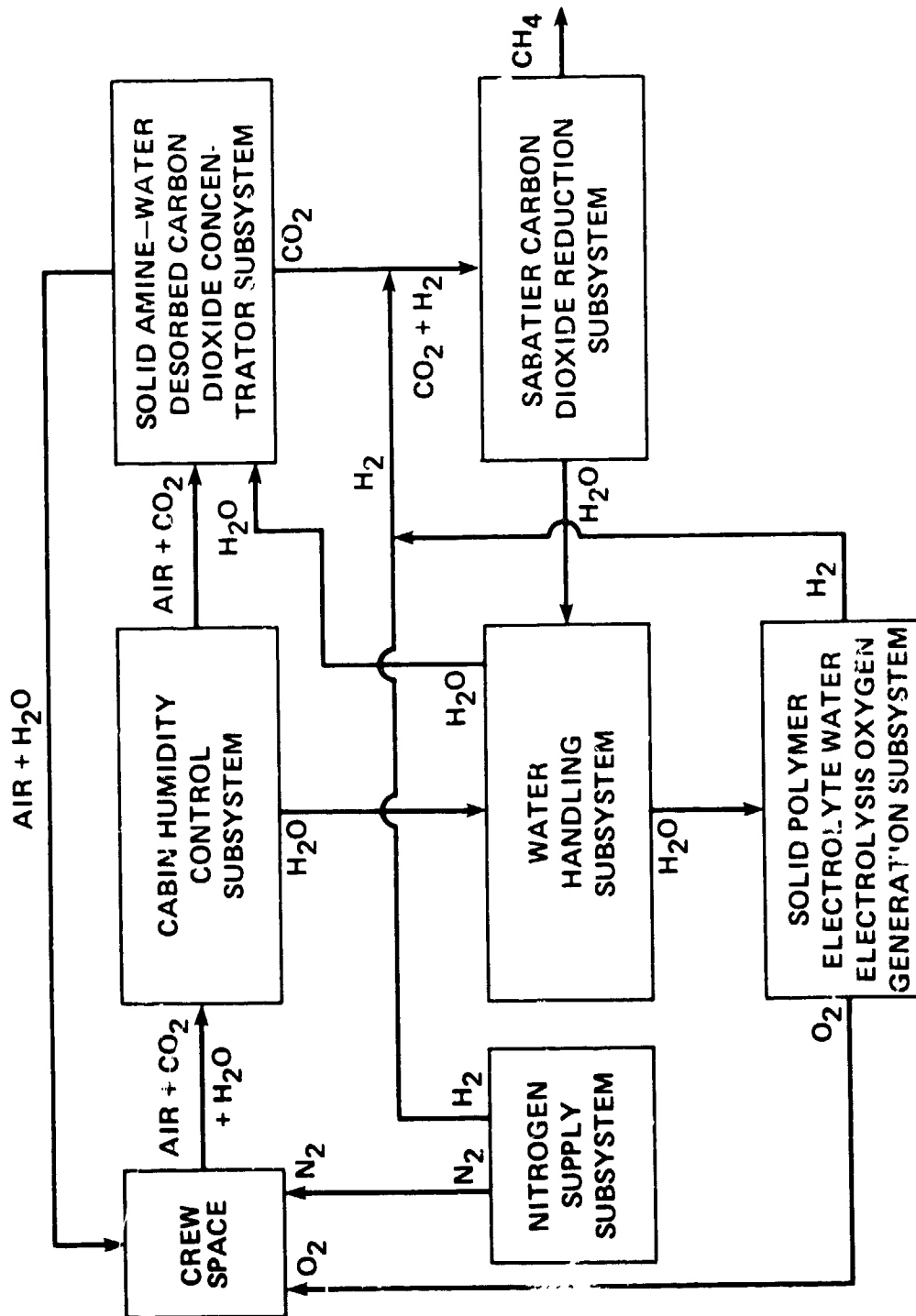


QUATTRONE

FIGURE 3

REGENERATIVE AIR REVITALIZATION  
SYSTEM SCHEMATIC

# REGENERATIVE AIR REVITALIZATION SYSTEM



QUATRONE

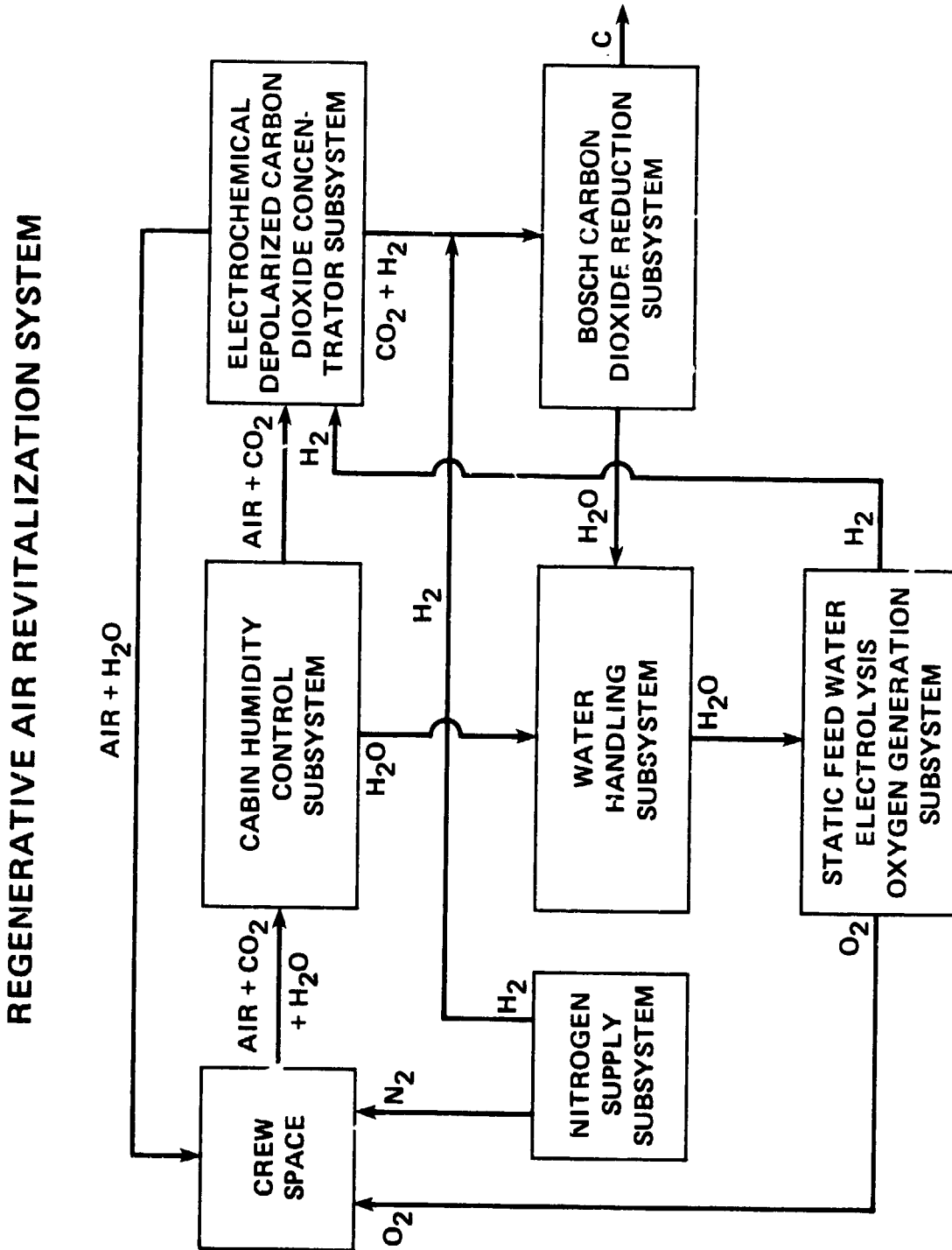
FIGURE 4

REGENERATIVE AIR REVITALIZATION  
SYSTEM SCHEMATIC

QUATTRONE

FIGURE 5

REGENERATIVE AIR VITALIZATION SYSTEM SCHEMATIC, NUMBER 2.

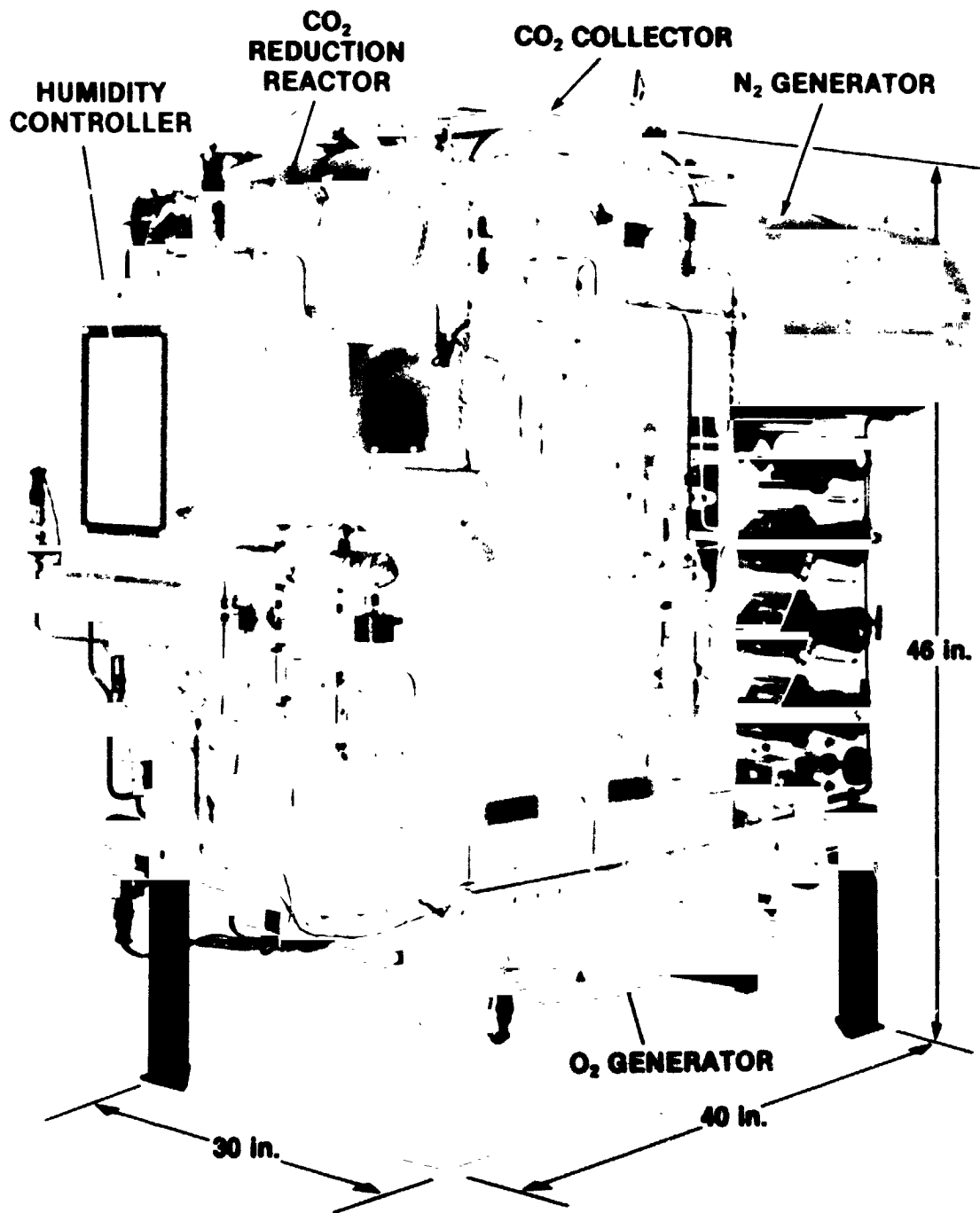


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QUATTRONE

FIGURE 6

EXPERIMENTAL AIR REVITALIZATION  
SYSTEM

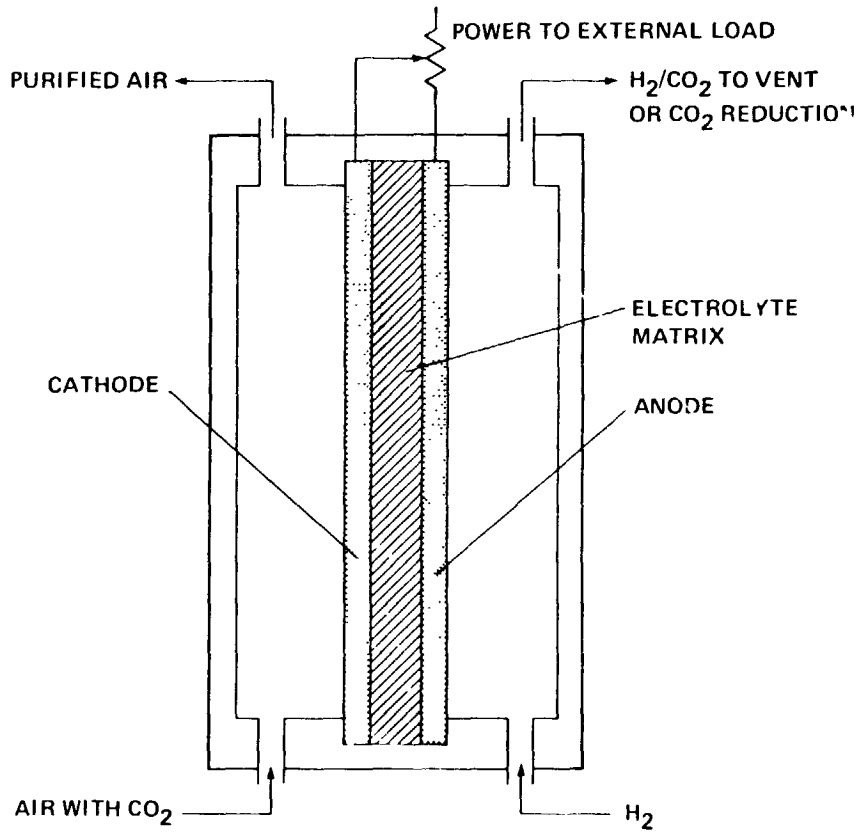




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OF POOR QUALITY

QUATRONE FIGURE 8  
ELECTROCHEMICAL DEPOLARIZED CARBON  
DIOXIDE CONCENTRATOR CELL  
SCHEMATIC

EDC CELL FUNCTIONAL SCHEMATIC





ORIGINAL FILMS  
OF POOR QUALITY

QUATTRONE

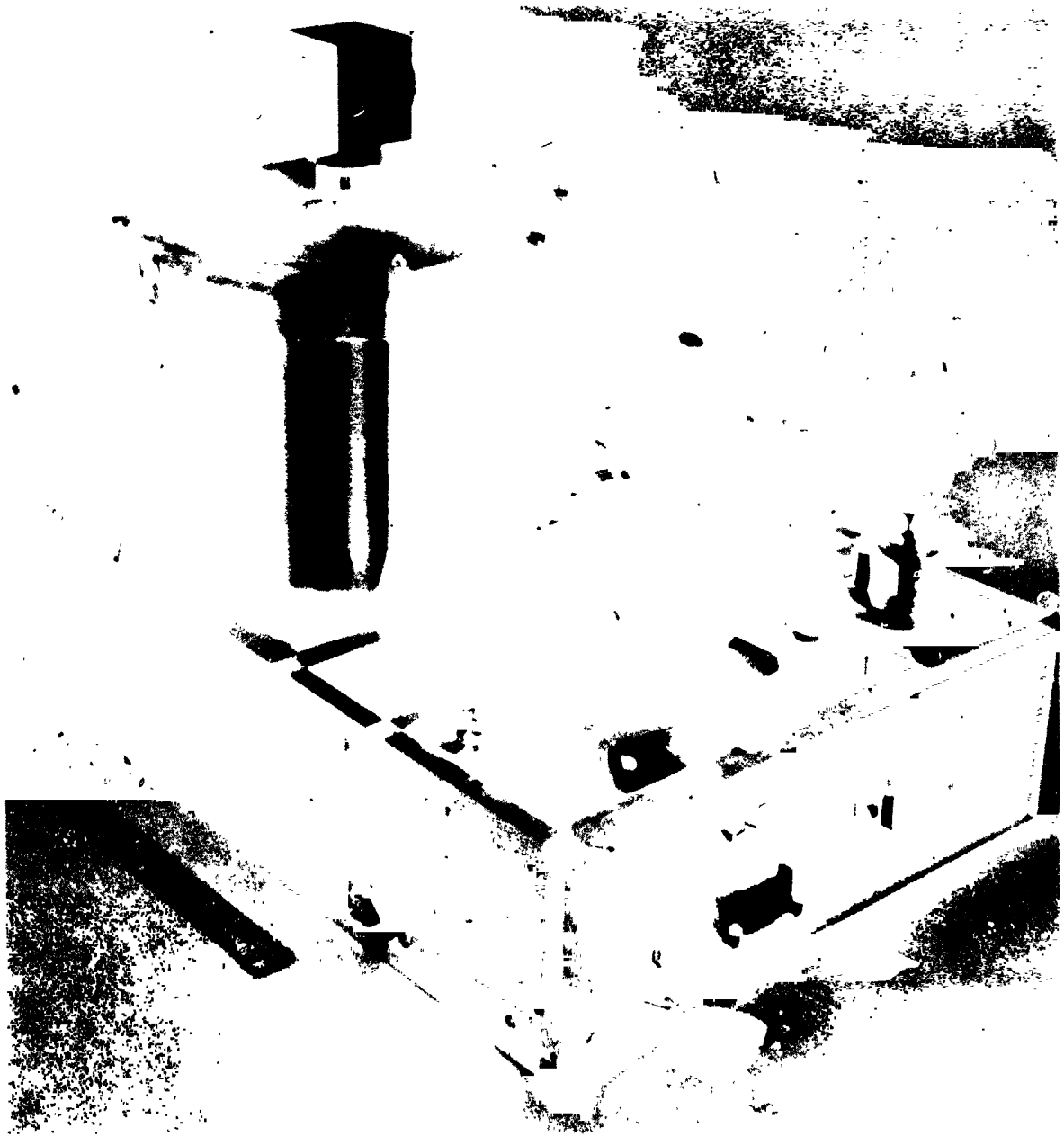
FIGURE 9

ELECTROCHEMICAL DEPOLARIZED CARBON  
DIOXIDE CONCENTRATOR SUBSYSTEM

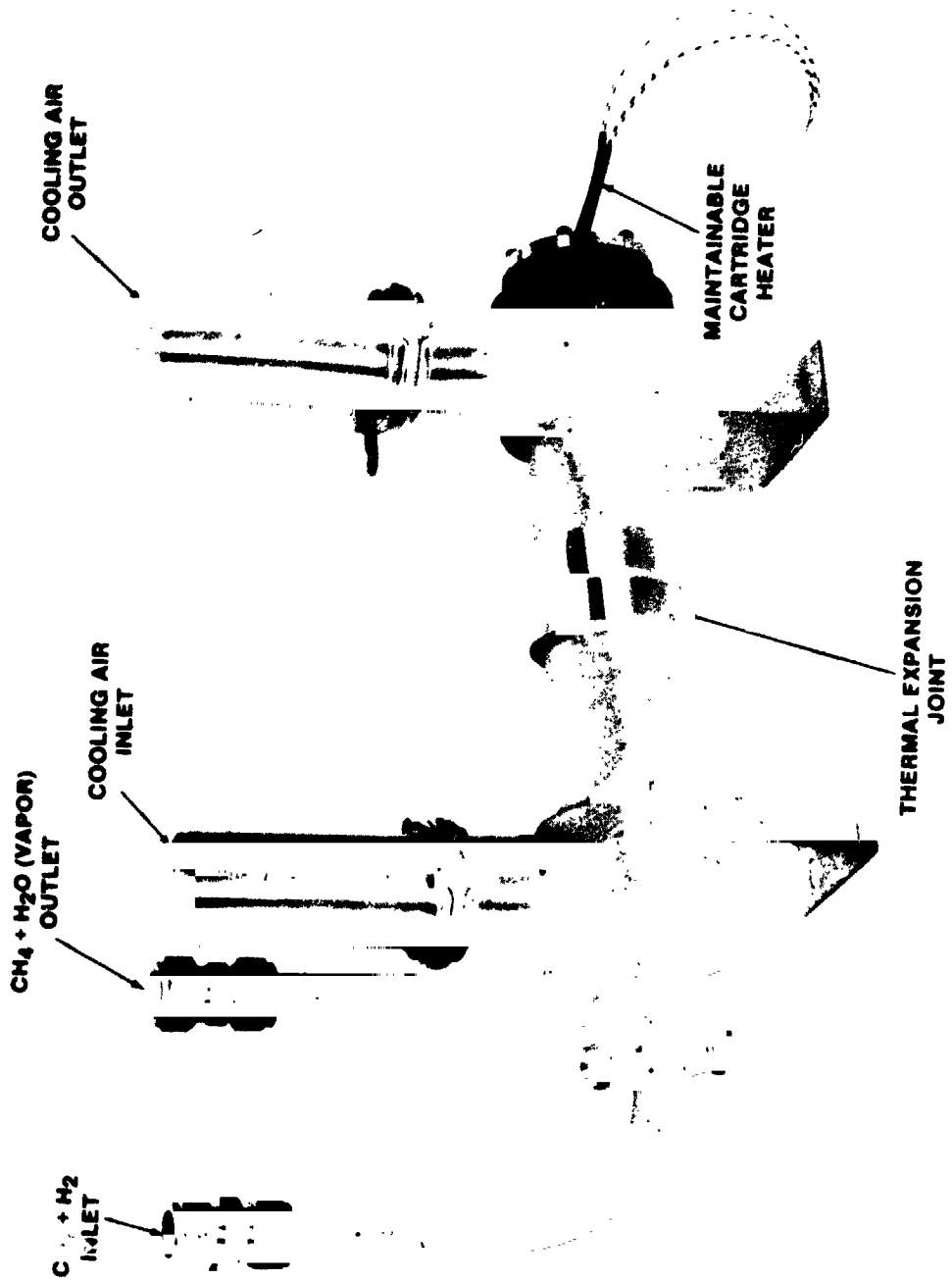


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OF POOR QUALITY

QUATTRONE                      FIGURE 10  
SOLID AMINE-WATER DESORBED CARBON  
DIOXIDE CONCENTRATOR SUBSYSTEM



QUATRONE  
SABATIER CARBON DIOXIDE  
REDUCTION SUBSYSTEM



CRITICAL FAILURE  
OF POOR QUALITY

QUATTRONE

FIGURE 12

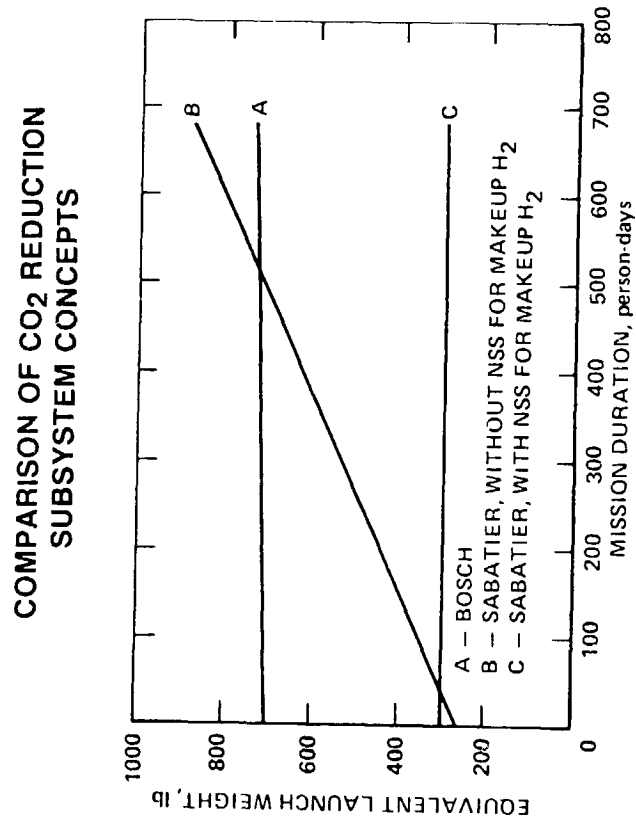
BOSCH CARBON DIOXIDE REDUCTION  
SUBSYSTEM

BOSCH LABORATORY BREADBOARD SUBSYSTEM



OF POOR QUALITY

QUATRONE                      FIGURE 13  
SABATIER/BOSCH TRADE-OFF COMPARISON



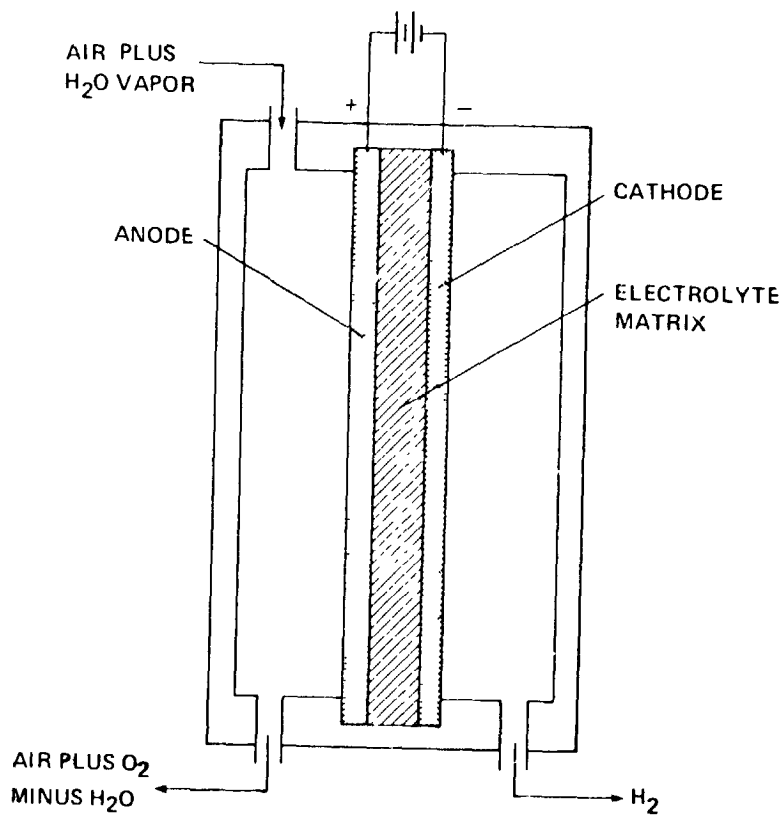
OF POOR QUALITY

QUATRONE

FIGURE 14

WATER VAPOR ELECTROLYSIS CELL  
SCHEMATIC

WVE CELL FUNCTIONAL SCHEMATIC



OF FOUR QUARTS

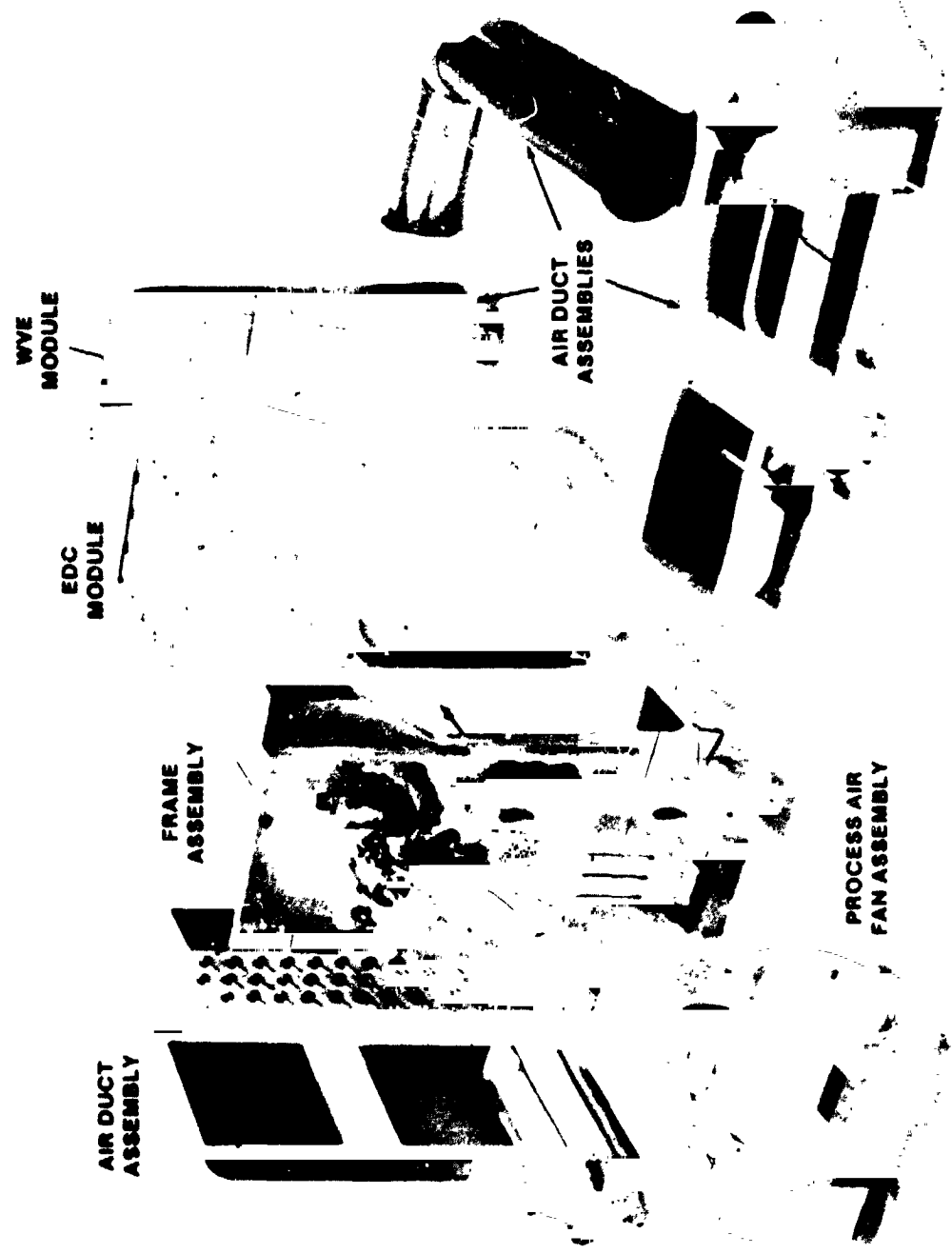
QUATRONE                      FIGURE 15  
WATER VAPOR ELECTROLYSIS SUBSYSTEM



OF FOOD QUALITY

QUATTRONE  
INDEPENDENT AIR REVITALIZATION SYSTEM

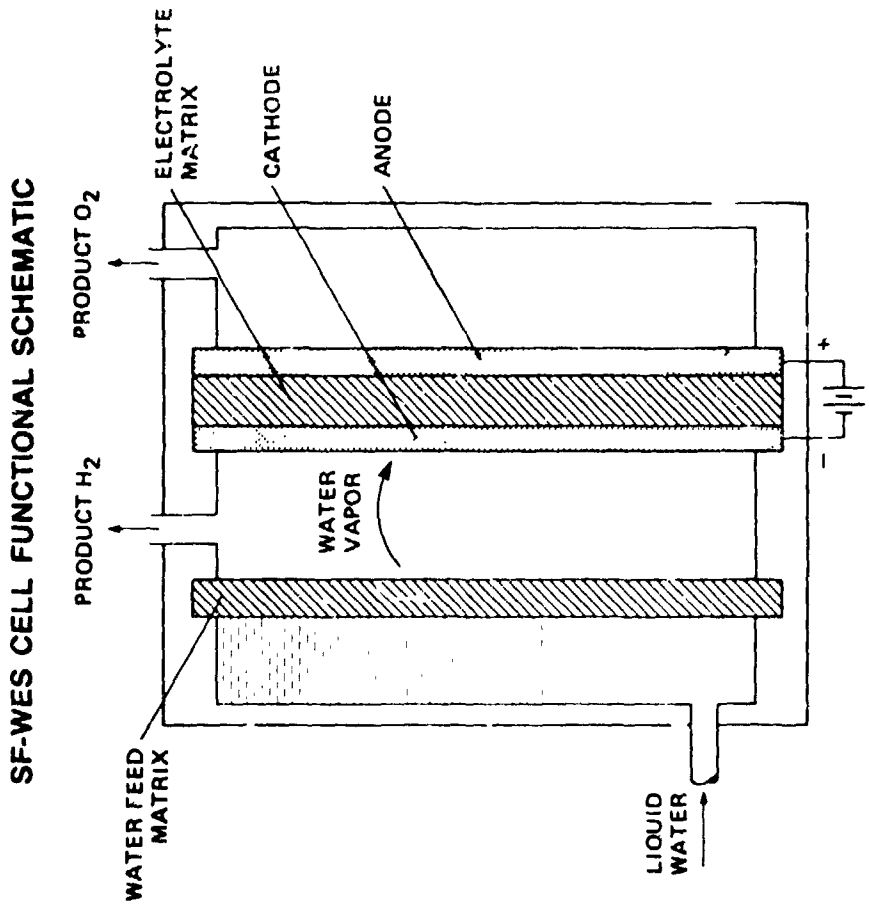
IARS RLSE DEVELOPMENT HARDWARE





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QUATRONE  
FIGURE 17  
STATIC FEED WATER ELECTROLYSIS CELL  
SCHEMATIC



QUATTRONE

FIGURE 18

STATIC FEED WATER ELECTROLYSIS  
SUBSYSTEM

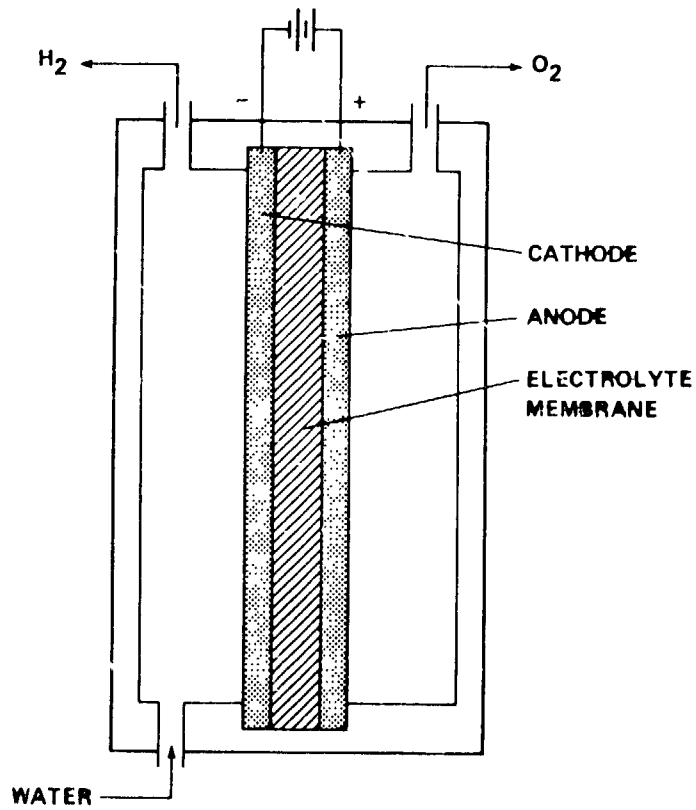


QUATRONE

FIGURE 19

SOLID POLYMER ELECTROLYTE WATER  
ELECTROLYSIS CELL SCHEMATIC

**SPE-WES CELL FUNCTIONAL SCHEMATIC**

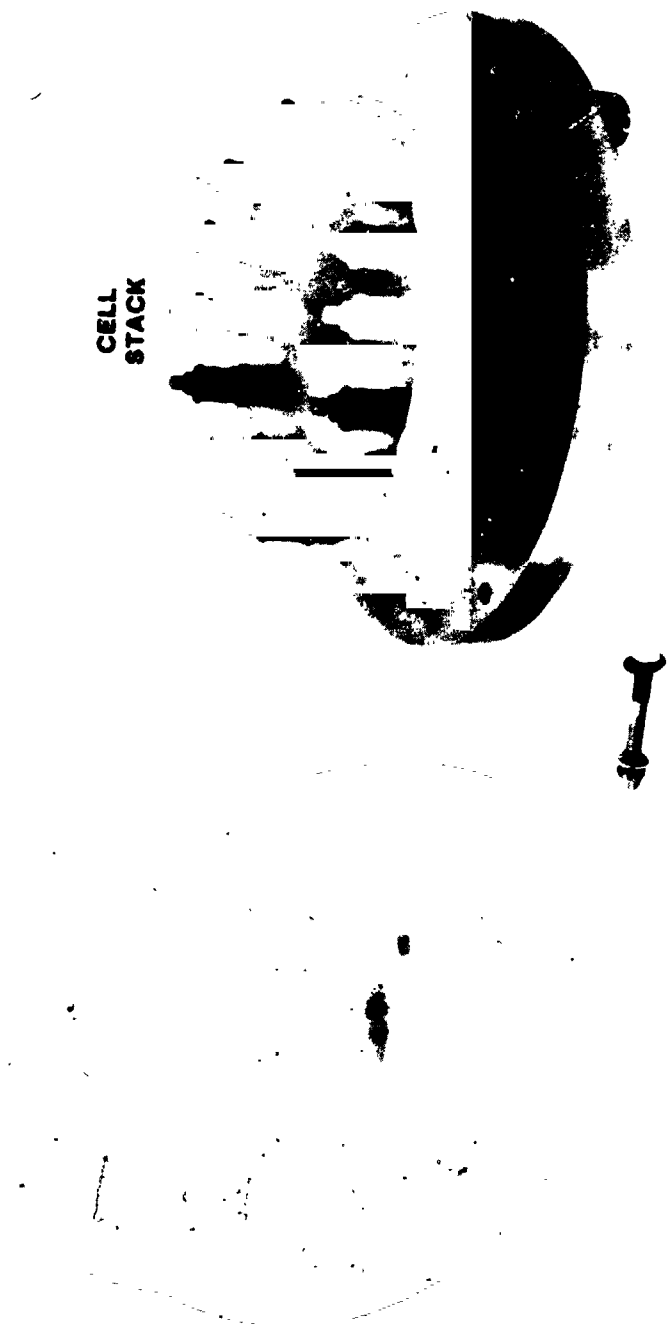


**RLSE SPE-WES MODULE**

QUATRONE  
FIGURE 20  
SOLID POLYMER ELECTROLYTE WATER  
ELECTROLYSIS MODULE

**PRESSURE  
HOUSING**

**CELL  
STACK**





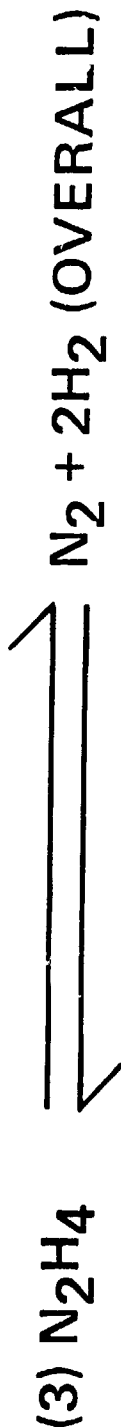
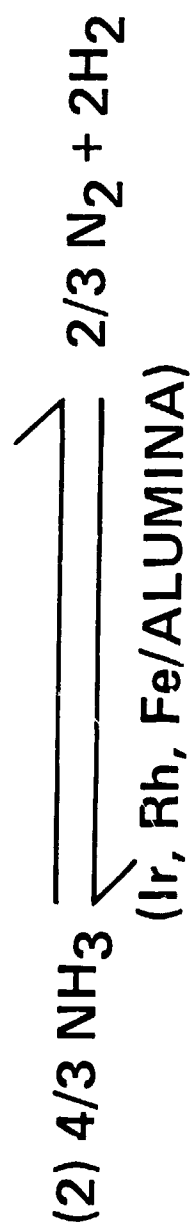
QUATTRONE      FIGURE 22  
NITROGEN GENERATION REACTIONS

# NITROGEN GENERATION

(1000 ° K; 200 PSIA)



(PT)





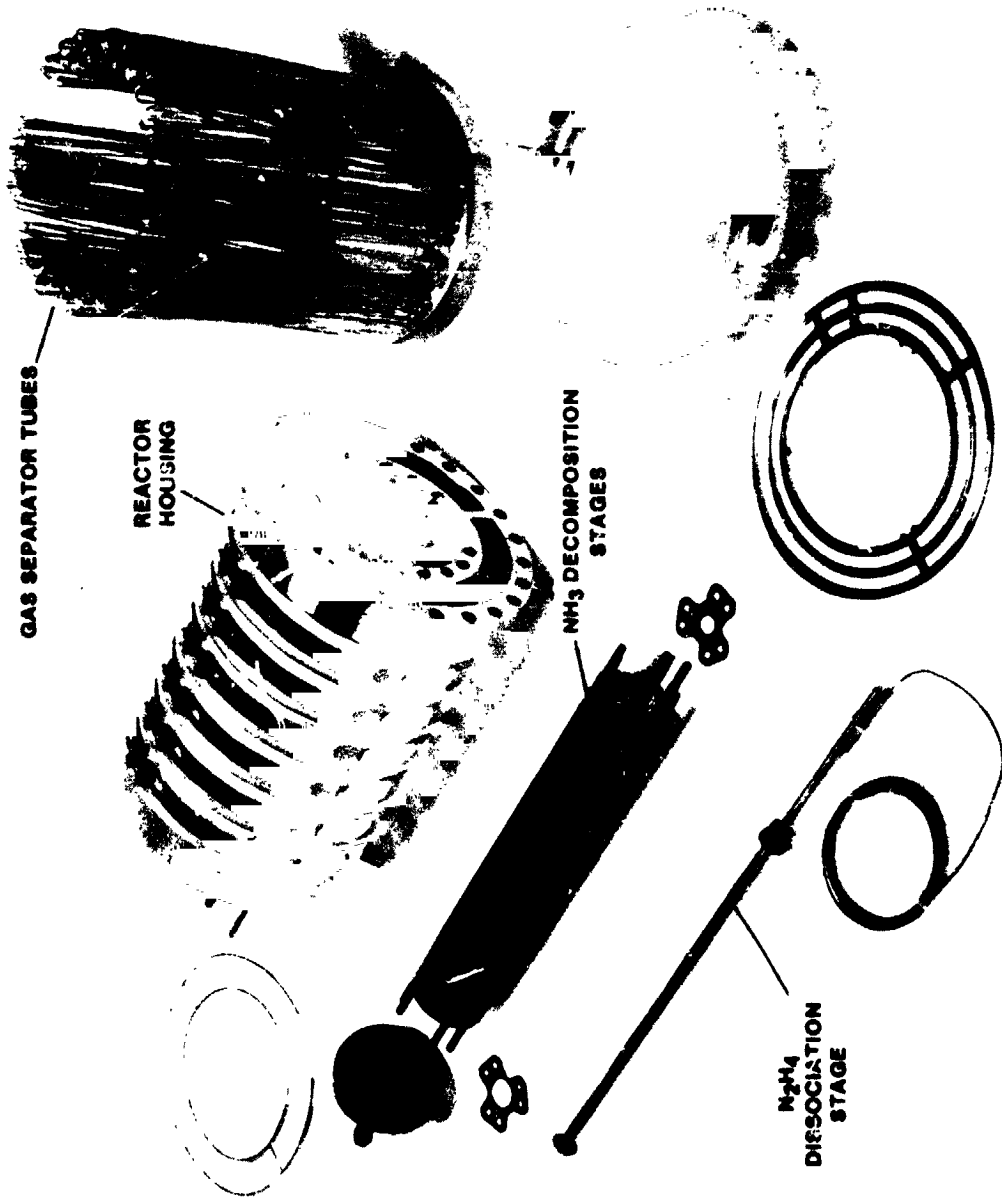
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FIGURE 24

NITROGEN SUPPLY SUBSYSTEM MODULE

ADVANCED N<sub>2</sub> GENERATION MODULE



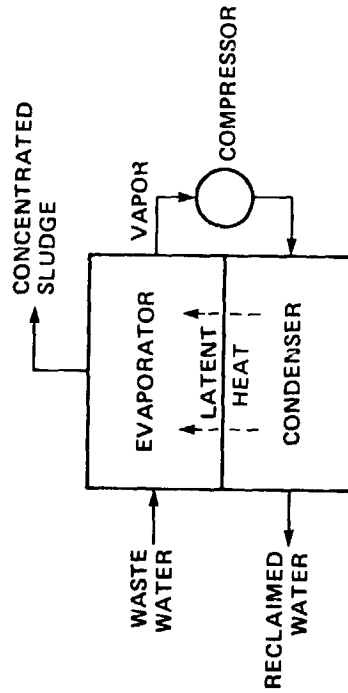


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FIGURE 25

VAPOR COMPRESSION DISTILLATION SUB-SYSTEM SCHEMATIC

VAPOR COMPRESSION  
DISTILLATION SCHEMATIC



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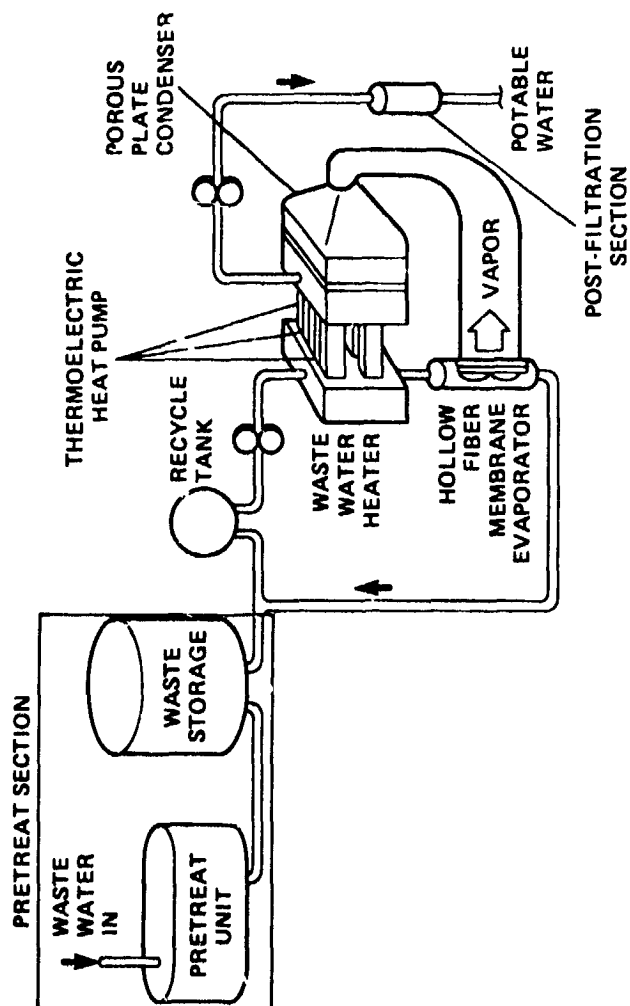


QUATTRONE  
VAPOR COMPRESSION DISTILLATION SUB-  
SYSTEM HARDWARE

FIGURE 26

THERMOELECTRIC INTEGRATED MEMBRANE  
EVAPORATION SUBSYSTEM SCHEMATIC

THERMOELECTRIC INTEGRATED MEMBRANE  
EVAPORATION SUBSYSTEM FUNCTIONAL SCHEMATIC

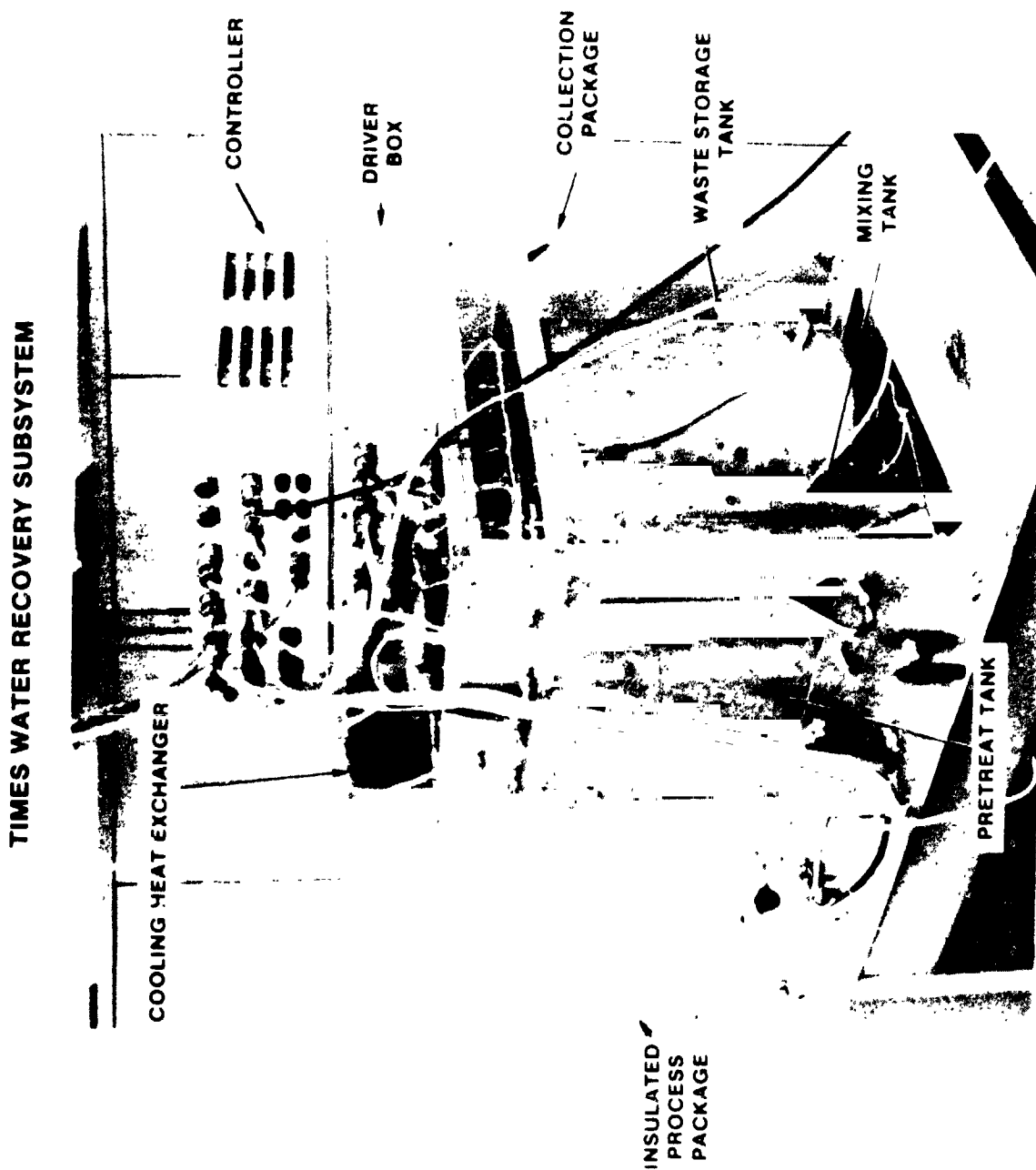


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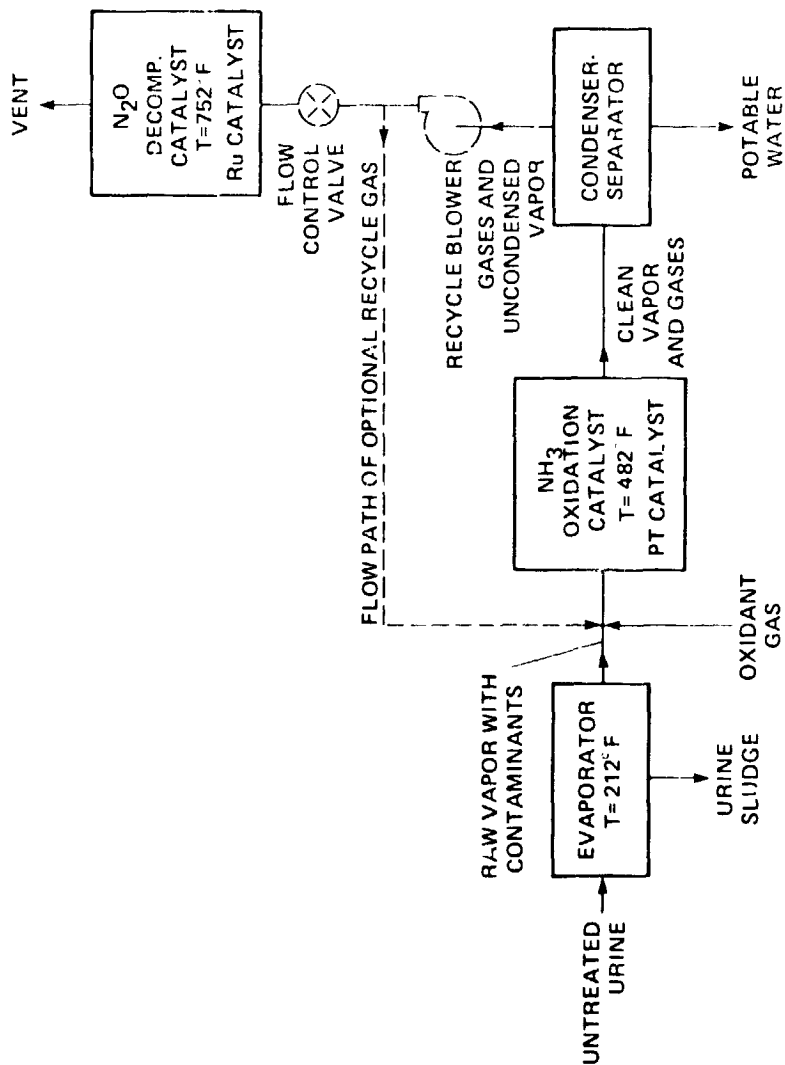
QUATTRONE

FIGURE 28

THERMOELECTRIC INTEGRATED MEMBRANE  
EVAPORATION SUBSYSTEM HARDWARE



VAPOR PHASE CATALYTIC AMMONIA REMOVAL  
FUNCTIONAL SCHEMATIC



QUATTRONE  
FIGURE 29  
CATALYTIC DISTILLATION WATER RECLAMATION  
SUBSYSTEM SCHEMATIC

QUATTRONE

FIGURE 30

SPACE SHUTTLE SOLID WASTE MANAGEMENT SYSTEM

