

# SPACE STATION FREEDOM BIOMEDICAL MONITORING AND COUNTERMEASURES BIOMEDICAL FACILITY HARDWARE CATALOG DEVELOPED BY GENERAL ELECTRIC GOVERNMENT SERVICES ADVANCED PROGRAM PLANNING OFFICE

HOUSTON, TEXAS

FOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

JOHNSON SPACE CENTER

HOUSTON, TEXAS

JUNE 15, 1990

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**1. INTRODUCTION** 

2. PROCESS FLOW

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#### INTRODUCTION

THIS HARDWARE CATALOG COVERS THAT HARDWARE PROPOSED UNDER THE BIOMEDICAL MONITORING AND COUNTERMEASURES DEVELOPMENT PROGRAM SUPPORTED BY THE JOHNSON SPACE CENTER.

THE HARDWARE ITEMS ARE LISTED SEPARATELY BY ITEM, AND ARE IN ALPHABETICAL ORDER.

EACH HARDWARE ITEM SPECIFICATION CONSISTS OF FOUR PAGES.

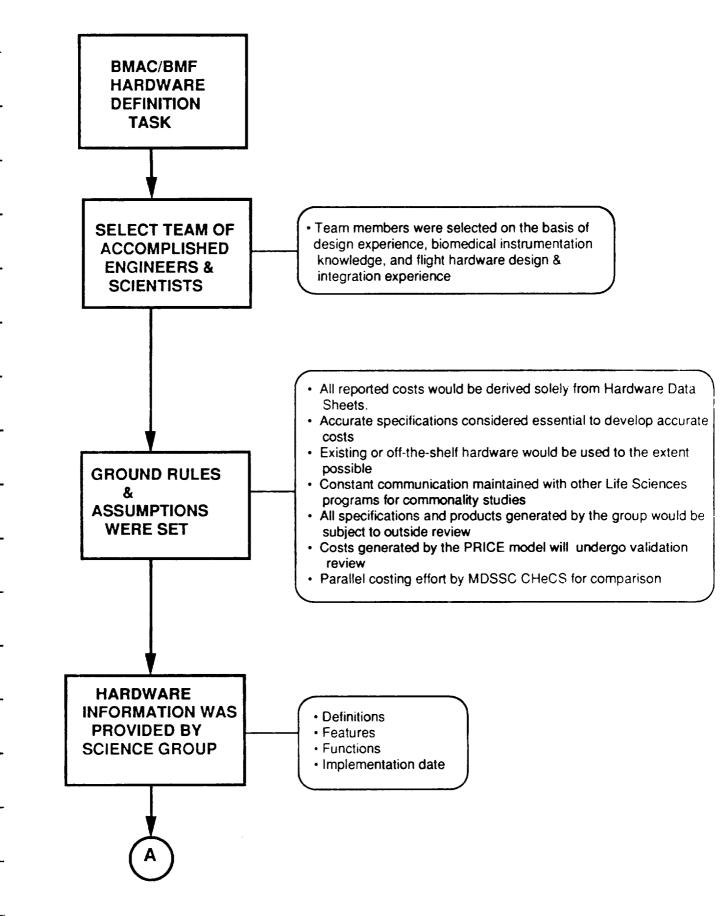
THE FIRST PAGE DESCRIBES BACKGROUND INFORMATION WITH AN ILLUSTRATION, DEFINITION AND A HISTORY/DESIGN STATUS.

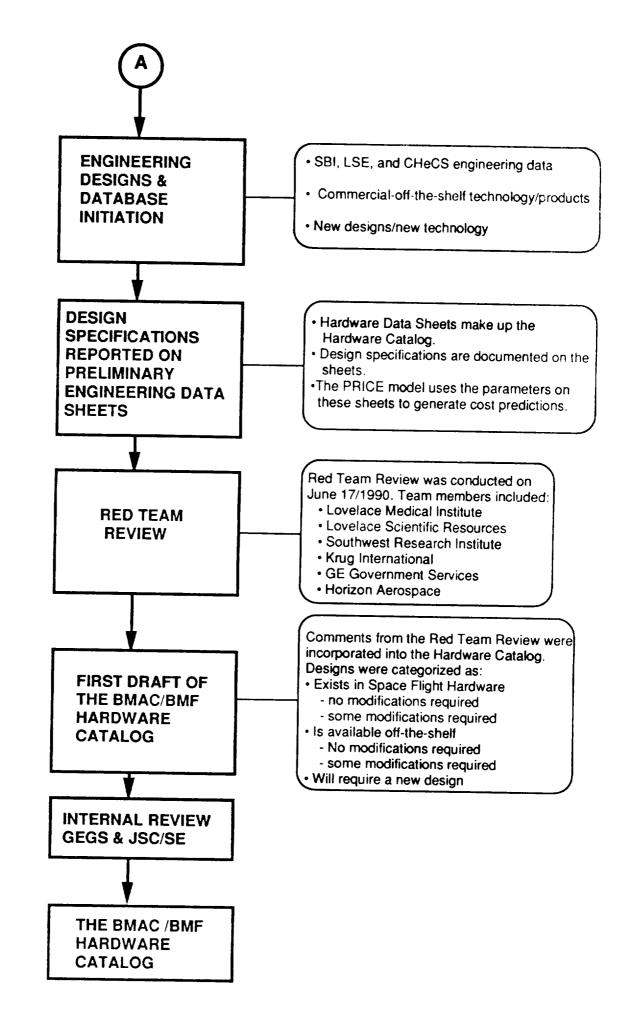
THE SECOND PAGE IDENTIFIES THE GENERAL SPECIFICATIONS, PERFORMANCE, RACK INTERFACE REQUIREMENTS, PROBLEMS, ISSUES, CONCERNS, PHYSICAL DESCRIPTION, AND FUNCTIONAL DESCRIPTION. THE LEVEL OF HARDWARE DESIGN RELIABILITY IS ALSO IDENTIFIED UNDER THE MAINTAINABILITY AND RELIABILITY CATEGORY (MARC I, II, III).

THE THIRD PAGE SPECIFIES THE MECHANICAL DESIGN GUIDELINES AND ASSUMPTIONS. DESCRIBED ARE THE MATERIAL TYPES AND WEIGHTS, MODULES, AND CONSTRUCTION METHODS. ALSO DESCRIBED IS AN ESTIMATION OF PERCENTAGE OF CONSTRUCTION WHICH UTILIZES A PARTICULAR METHOD, AND THE PERCENTAGE OF REQUIRED NEW MECHANICAL DESIGN IS DOCUMENTED.

THE FOURTH PAGE ANALYZES THE ELECTRONICS, THE SCOPE OF DESIGN EFFORT, AND THE SOFTWARE REQUIREMENTS. ELECTRONICS ARE DESCRIBED BY PERCENTAGES OF COMPONENT TYPES AND NEW DESIGN. THE DESIGN EFFORT, AS WELL AS, THE SOFTWARE REQUIREMENTS ARE IDENTIFIED AND CATEGORIZED.

## **BMAC HARDWARE DEFINITION ACTIVITY FLOW**







## ACRONYMS LIST

CHeCS	Crew Health Care System
GEGS	General Electric Government Services
LSE	Laboratory Support Equipment
MARC	Maintainability and Reliability Category
MDSSC	McDonald Douglas Space Station Company
SBI	Space Biology Initiative

### BIOMEDICAL MONITORING AND COUNTERMEASURES HARDWARE CATALOG

BIOWASTE TAC DONTED	ID Number	Pag
BIOWASTE TAG PRINTER	21	
BLOOD FLOW AND PLETHYSMOGRAPH		
BREATH HYDROGEN ANALYZER		
CAROTID SINUS BARORECEPTOR STIMULATOR		1
CELL HANDLING ACCESSORIES		1
CELL HARVESTER		2
CENTRIFUGE, HEMATOCRIT		2
CONTROLLED TESTING UNITS		2
CREW DEBRIEF/ANALYSIS SOFTWARE		3
ECHOCARDIOGRAPH/DOPPLER VELOCIMETER		З
ELECTRO-OCULOGRAPH MODULE		4
ELECTROCARDIOGRAPH MODULE	6	4
ELECTROENCEPHALOGRAPH MODULE		4
ELECTROMYOGRAPH MODULE		5
ELISA READER		5
EXPERIMENT CONTROL COMPUTER SYSTEM		6
FLOW CYTOMETER		6
FUNDUS CAMERA		6
GASTROINTESTINAL PH METER		7
GONIOMETER AND RECORDER		7
IMAGE DIGITIZING SYSTEM		8
IMPEDANCE METER		8
INCUBATOR-CENTRIFUGAL		8
ION CHROMATOGRAPH		9
ION SPECIFIC/PH METER		9
ISOKINETIC DYNAMOMETER		10
MASS SPECTROMETER		10
MICROSCOPE SYSTEM		10
MOTION ANALYSIS SYSTEM		11
OSMOMETER		11
PHYSIOLOGICAL BIO POTENTIAL RECORDER.		12
SALIVA COLLECTION UNIT		12
SAMPLE PREP DEVICE		12
SAMPLE PREP MODULE 1: BLOOD	37	13
SAMPLE PREP MODULE 1: AUTOMATION UNIT		13
SAMPLE PREP MODULE 2: URINE, SALIVA		14
SAMPLE PREP MODULE 3: VORTEX		14
SAMPLE PREP MODULE 4: FILTRATION UNIT		14
SLIDE PREPARATION DEVICE		15
TELETHERMOMETER	27	15
URINE SAMPLE DEVICE	42	16
VISUAL FUNCTION TESTING KIT		16
VISUAL TRACKING SYSTEM		169
VOICE RECORDER	28	173
WRIST ACTIVITY MONITOR		177

HARDWARE ID. NO.: 21 ORIGINATOR: H. Nguyen VERSION : 1	JSC LS-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES JUNE 1 BIOMEDICAL FACILITY HARDWARE CATALOG
DATA SHEET HARDWARE ID. NO.: 21 ORIGINATOR: H. Nguyen VERSION : 1		EQUIPMENT NAME BIOWASTE TAG PRINTER Page
DEFINITION A device used to print self-adhesive labels for attachment to biowaste packages, laborate specimens, and other related items. Bar code system is utilized.	DATA SHEET	HARDWARE ID. NO.: 21 ORIGINATOR: H. Nguyen
A device used to print self-adhesive labels for attachment to biowaste packages, laborate specimens, and other related items. Bar code system is utilized. ISTORY/DESIGN STATUS: Current commercial product design.	ILLUSTRATI	ON
A device used to print self-adhesive labels for attachment to biowaste packages, laborate specimens, and other related items. Bar code system is utilized. ISTORY/DESIGN STATUS: Current commercial product design.		
Current commercial product design.	specimens, a	ind other related items.
	Current comr	nercial product design.
	nouncations	

	ITORING AND COUNTERMEASURES JUNE 15,1990 FACILITY HARDWARE CATALOG					
BMAC EQUIPMENT NAME: BIOWAS	TE TAG PRINTER ID# 21 Page 2 of 4					
HARDWARE DATA SHEET VER : 1	ORIGINATOR: H. Nguyen					
GENERAL SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:					
Mass (kg):3.48	Barcode Language: Code 3 of 9 (developed by the DOD) Recognition of color and black& white barcodes.					
Height (m)08	Keyboard entry and terminal. Information storage and processing.					
Width (m)						
Depth (m)						
Volume (m3):001						
Standby Power (W)						
Operational Power (W)						
Реак Ро <b>wer (W)</b> 15						
Power Source (VDC) battery						
RACK INTERFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS					
ELECTRICAL NONE: 🛛 STANDARD 🗌 EX						
THERMAL:						
WASTE: X						
FLUID: X	<u>H</u>					
Commercial product is available for customizing to space QUANTITY REQUIRED: 2.5 SPECIF PHYSICAL DESCRIPTION:						
LCD display with calculator type keypad for gate on the front panel.	or data entry/date change. Printed label is dispensed via a					
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY,	INCLUDE WHERE AND HOW USED)					
To monitor and inventory biowaste produc	ots.					

HARDWARE DATA SHEET       Construction of struction of structure/mechanics       Discrete stuctural/mechanical modules (e.g. Motors, Fans, Batteries, Antennas)         MATERIAL: aluminum       Discrete stuctural/mechanical modules (e.g. Motors, Fans, Batteries, Antennas)         Total struct/mech wtr. (Exclubing ACTIVE ELECTRONICS):       3.5         Kg       gear         Estimated #of struct Parts (Exclubing NUTS, BOLTS, Screws, ETC.) OF Each A/B/C       PCT. OF total struct Weight:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FO MECH CONFIGURATION:         20       70 %       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FO struct Parts (Exclubing NUTS, BOLTS, Screws, ETC.) OF Each A/B/C       Notice total structures under significant dynamic forces         20       70 %       Support structures under significant dynamic forces         30       30 %       Optical components and assy built to highest precision active optical components and assy built to highest precision (C. Laminated structural composites) (C. Laminated structural composites) (C. Laminated structural composites) (C. Laminated structural supports, Bulkheads, Bonded assy (C. Uningical shaped Fil Amets, Supports, Bulkheads, Bonded assy (C. Uningical shaped Fil Amets, Supports, Bulkheads, Bonded assy (C. Uningical shaped Fil Amets, Supports, Bulkheads, Bonded assy (C. Uningical shaped Fil Amets work) assemblies
CONSTRUCTION OF STRUCTURE/MECHANICS       (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum       motor gear         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       3.5 Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       35 %         ESTIMATED # OF STRUCT PARTS (EXCLUDINS NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL         20       70 %         CONTAINMENT STRUCTURE, NO MOVING PARTS         20       70 %         SUPPORT STRUCTURE SUBJECT TO PRESSURE AND FORCES         20       70 %         B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC MORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, MANY MOVING PARTS         30       30 %         C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY
ACTIVE ELECTRONICS):       3.5       Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       3.5       %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ECC.) OF EACH A/B/C       PCT. OF TOTAL       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FO MECH CONFIGURATION:         X       STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ECC.) OF EACH A/B/C       PCT. OF TOTAL       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FO MECH CONFIGURATION:         X       STRUCT WEIGHT:       X       SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDE X       SUPPORT STRUCTURE, NO MOVING PARTS         20       70 %       X       SIPPORT STRUCTURE SUBJECT TO PRESSURE AND FORCES         20       70 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         30       30 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC X         30       30 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC X         30       30 %       PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN X         30       30 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         30       30 %       C. LAMINATED STRUCTURAL COMPOSITES         30       LAID UP FLAT SURFACE WITH STIFFENERS       STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY
STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEIGHT:       MECH CONFIGURATION:         20       70 %       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDE SUPPORT STRUCTURE, NO MOVING PARTS         20       70 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         20       70 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         30       30 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, MANY MOVING PARTS         30       30 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
30       30 %         30       30 %         X       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, MANY MOVING PARTS OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY
LAID UP FLAT SURFACE WITH STIFFENERS
%CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES

JSC 5-35001							TERMEASURES JUNE CATALOG	IE 15,1990	
BMAC	EQUIP	EQUIPMENT NAME: BIOWASTE TAG PRINTER ID# 21 PAGE							
HARDWARE		1			0	RIGINATO	R: H. Nguyen	4 of 4	
		/ERS, O /O PMM,		DIGITAL GATES, R COMPUTE POWER SI CONVENT RECTIFIC/ & AC-DC (	ERS, ETC. UPPLY TONAL LIN ATION, CH		DISPLAY WITH CRT DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS		
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele			ESTIMATED TOTAL NEW DESIGN OF ELECTRONICS:	%				
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI			
ANALOG	50	10	90	0	0	0	30 %		
DIGITAL	30	25	75	0	0	0			
DISP W/CRT	0	0	0	0	.0	0	WILL ELECTRONICS BE ABOVE AVERAGE DEN		
DISPLAY	20	45	55	0	0	0		h	
XMTR	0	0	0	0	0	0			
PWR SUP	0	0	0	0	0	0			
	DESIGN E MODIFIC		O AN			ATERIALS, F DMPONENT ICROGRAVI	FOR SPACE. USES EXISTING PROCESSES, AND ELECTRONIC S. SIGNIFICANT DESIGN IMPACT E PY ENVIRONMENT. ED SYSTEMS DO NOT EXIST	DUE TO	
MODERATE TO EXTENSIVE MODIFICATION TO AN EXISTING SPACE-BASED DESIGN MODIFICATION TO AN EXISTING AND/OR ELECTRONIC COMPONENTS. AT OR NEAR THE STATE OF THE ART.									
<ul> <li>NEW DESIGN FOR SPACE. USES</li> <li>EXISTING MATERIALS, PROCESSES, AND ELECTRONIC COMPONENTS. NO DESIGN IMPACT DUE TO MICROGRAVITY</li> <li>ENVIRONMENT. GROUND BASED SYSTEMS COMMERCIALLY AVAILABLE</li> </ul>									
ADD	IEEDS SOF S HARDWA ITIONAL AI RENTLY A	RE AVAIL	ABLE W/ ON REQU				W 🗌 меріцм 🗌 н	ЮН	

BMAC	BIOMEDICAL FACILITY HAT		Page
HARDWARE Data Sheet		TOR: J. Stephenson	- 1 of
ILLUSTRATIO			5
DEFINITION A system use organ or limb	d to measure, record, and display char	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ow of ar
occlusion ple	<b>N STATUS:</b> of a laser doppler, an impedance plethy hysmograph system (SLS-1). urrently exist.	ysmograph system and a ve	enous
	eed modification for microgravity.		

		Y HARDWARE CATALOG				
BMAC HARDWARE DATA SHEET		PLETHYSMOGRAPH     ID#     4 5     Page       ORIGINATOR:     J. Stephenson				
	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:				
Mass (kg):	25	Flow measurement in superficial vessels as small as 8-10 microns in diameter.				
Height (m)	.22	Detection of circumference changes as small as .0199 mm. Programmable pressure range of venous occlusion cutf from				
Width (m)	.45	1-300 mm Hg. Impedance measurement:				
Depth (m)		Resistance: range 0-1000 Ohms, resolution 1 Ohm, accuracy				
	n3):041	+- 1%.				
	ower (W)	Reactance: range 0-500 Ohms, resolution 1 Ohm, accuracy +-1 %				
Operationa	al Power (W) 90					
Peak Powe	ər (W)	Frequency range 20-100 KHz Milliamps Max : 1 milliamp				
	ыгсе (VDC) <u>28</u>					
RACK INTE	RFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS				
FIECTRICAL		Bioelectrical impedance is emperical and requires				
THERMAL:		assumptions. Occlusive venous plethysmography is limited to 2 readings/minute, requires many cuff sizes and can be				
WASTE:		uncomfortable. Doppler and impedance portions of the system may need to be				
FLUID:		detachable if the system is not close to exercise facility				
DATA:						
ASSUMPTIO	INS/ JUSTIFICATIONS					
venous occlu	REQUIRED: 2.5 SPECIFICATION SCRIPTION: ures retractable laser doppler probe, CR	T for doppler readout, LCD for impedance and and impedance portions of the system may read				
QUANTITY PHYSICAL DES System featu venous occlu to be detach	REQUIRED: 2.5 SPECIFICATION SCRIPTION: ures retractable laser doppler probe, CR usive plethysmography readout. Doppler	T for doppler readout, LCD for impedance and and impedance portions of the system may reade excercise studies.				

BMAC	EQUIPMENT NAM	E: BLOOD FLOW AND PLETHYSMOGRAPH ID# 4 5 2 4
HARDWARE	VER : 1	ORIGINATOR: J. Stephenson
ACTIVE ELECTRO	ECHANICS MECH WT. (EXCLUDI NICS): 22 - % NEW DESIGN OF	Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C 12	TOTAL I	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:  A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED  SUPPORT STRUCTURE, NO MOVING PARTS  CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES  STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
23	<u> </u>	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
ADDITIONAL CO	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES  RNING STRUCT/MECH COMPONENT:

SC S-35001						ND COUN		MEASURES ATALOG	JUNE 15,199
BMAC EQUIPMENT NAME: BLOOD FLOW AND PLETHYSMOGRAPH ID# 45 PAGE									
HARDWARE		1			0	RIGINATO	DR:	J. Stephenson	4 of 4
	<b>.</b>			· · · · · · · · · · · · · · · · · · ·			<u> </u>	· · · · · · · · · · · · · · · · · · ·	
TYPE OF ELECTRONICS:									
OP AI VIDEC	DG RECEIV MPS, AUDI D, RF, SERV E, ETC.	0	<b>—</b> (	DIGITAL GATES, RI COMPUTE		s, <sup>—</sup>	<b>3</b> . (	DISPLAY WITH CRT	
TV, R	SMITTER ADAR, CO LASER, ET		F	POWER SU CONVENT RECTIFIC/ & AC-DC C	'IONAL LIN ATION, CH	<b>IOPPER</b>		DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele			3.00				ESTIMATED TO NEW DESIGN O ELECTRONICS:	F
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI			
ANALOG	15	25	55	15	0	5		25	%
DIGITAL	60	35	35	15	5	10			
DISP W/CRT	15	25	70	5	0	0		WILL ELECTRONI	
DISPLAY	5	0	0	0	0	0			
XMTR	0	0	0	0	0	0		O Yes	● No
PWR SUP	5	50	50	0	0	0			
1 1	DESIGN LE MODIFIC TING SPAC		O AN			ATERIALS, OMPONEN	PRO TS. S /ITY E	R SPACE. USES EXISTI CESSES, AND ELECTR IGNIFICANT DESIGN IM ENVIRONMENT. SYSTEMS DO NOT EXIS	ONIC PACT DUE TO
MODERATE TO EXTENSIVE MODIFICATION TO AN EXISTING SPACE-BASED DESIGN NEW DESIGN FOR SPACE. REQUIRES THE DEVELOPMENT OF NEW MATERIALS, PROCESSES AND/OR ELECTRONIC COMPONENTS. AT OR NEAR THE STATE OF THE ART.									
<ul> <li>NEW DESIGN FOR SPACE. USES EXISTING MATERIALS, PROCESSES, AND ELECTRONIC COMPONENTS. NO DESIGN IMPACT DUE TO MICROGRAVITY ENVIRONMENT. GROUND BASED SYSTEMS COMMERCIALLY AVAILABLE</li> <li>DEVELOPMENT OF NEW TECHNOLOGY WELL BEYOND EXISTING STATE OF THE ART AND/OR MULTIPLE DESIGN PATHS REQUIRED TO REACH THE GOAL.</li> </ul>									
	NEEDS SOI S HARDW/ DITIONAL A RRENTLY A	ARE AVAI	LABLE W/ ION REQU				.ow		🗌 нісн

BMAC HARDWARE	EQUIPMENT NAME BREATH HYDROGEN ANALYZER	Pag
DATA SHEET	HARDWARE ID. NO.: 9 ORIGINATOR: G. McFadyen VERSION : 1	— <u>1 of</u>
ILLUSTRATIO		
		90 90
DEFINITION Breath hydrog	gen analyzer is an instrument used to measure gastrointestinal tra	nsit times.
HSTORY/DESIC Commercial u Instrument mu		

JSC LS-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	00112 10,1000						
BMAC	EQUIPMENT NAME: BREATH HYDROGEN	ANALYZER ID# 9 Page 2 of 4						
HARDWARE								
GENERAL S Mass (kg): Height (m) Width (m) Depth (m) Volume (m)	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS: Power required 112W Linear response range 2-150 ppm H2 Accuracy +/- 2ppm Sensitivity 1ppm Sample size 15 ml						
Operational Peak Power	Power (W)       112         (W)	PROBLEMS/ISSUES AND CONCERNS Requires calibration and carrier gases Uses Hydrogen Unit must be on standby power at all times to prevent oxidation of sensor.						
QUANTITY R PHYSICAL DES Unit contains	for commercially available manual unit. Space unit car REQUIRED: 2.5 SPECIFICATIONS	MARC I MARC II MARC III						
Subject exhal		ERE AND HOW USED) hdrawn from the bag by syringes and is injected he sample is determined by gas chromatography.						

BMAC E	QUIPMENT NA	AME: BREATH HYDROGEN ANALYZER ID# 9 2 a
HARDWARE	ER : 1	ORIGINATOR: G. McFadyen
DATA SHEET		
CONSTRUCTION	05	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)
STRUCTURE/MI		pump sample part
		GC column
MATERIAL:		control_valve
aluminum		gas cylinder power supply
TOTAL STRUCT/M		
ACTIVE ELECTRO	NICS):	<u>7</u> Kg
ESTIMATED TOTAL		
STRUCT/MECH COI	MPONEN 15:	50 %
ESTIMATED # OF	PCT. OF	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR
STRUCT PARTS	TOTAL	MECH CONFIGURATION:
(EXCLUDING NUTS, BOLTS, SCREWS,	STRUCT WEIGHT:	A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVE FED, WELDED
ETC.) OF EACH		SUPPORT STRUCTURE, NO MOVING PARTS
A/B/C		CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
10	<u> </u>	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
<u> </u>		B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.
		NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM
25	30 %	OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
,, <u></u>		C. LAMINATED STRUCTURAL COMPOSITES
		STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY
	%	CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL CO	MMENTS CON	ICERNING STRUCT/MECH COMPONENT:

ISC S-35001						ND COUN		MEASURES JU Atalog	NE 15,1990
BMAC Hardware Data Sheet			ME: BR	EATHHY		ANALYZER RIGINATO	<b>R</b> : (	ID# 9 G. McFadyen	PAGE 4 of 4
						_	I		
OP AN	DG RECEIV MPS, AUDK ), RF, SERV E, ETC.	0		DIGITAL GATES, RI COMPUTE		s, L_	<b>י</b> נ	DISPLAY WITH CRT	
TV, R/	SMITTER ADAR, CO LASER, ET		C F	POWER SU CONVENT RECTIFICA & AC-DC C	IONAL LIN ATION, CH	Near Hopper		DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele			0.30				ESTIMATED TOTAL NEW DESIGN OF ELECTRONICS:	%
ANALOG	% TOTAL	%DISC	%IC 1 0	%LSI 0	%HYB 0	%VLSI		35 %	
DIGITAL	0	0	0						
DISP W/CRT		0	0	0	0 0	0		WILL ELECTRONICS E	BE OF
DISPLAY	10	100	0	0	0	0		ABOVE AVERAGE DE	NSITY?
XMTR	0	0	0	0	0	0		O Yes 💿	No
PWR SUP	40	100	0	0	0	0			
	DESIGN LE MODIFIC ING SPAC		O AN			IATERIALS, OMPONENT IICROGRAV	PRO S. SI ITY E	R SPACE. USES EXISTING CESSES, AND ELECTRONIC IGNIFICANT DESIGN IMPACT INVIRONMENT. SYSTEMS DO NOT EXIST	
MOD	ERATE TO IFICATION CE-BASED I	TO AN EX				EVELOPME	NT C	R SPACE. REQUIRES THE OF NEW MATERIALS, PROCE ONIC COMPONENTS. E STATE OF THE ART.	ISSES
EXIST ELEC IMPAC ENVIF	DESIGN FO TING MATE TRONIC CO CT DUE TO RONMENT. EMS COMM	RIALS, PF DMPONEN MICROGF GROUND	ROCESSE ITS. NO DI RAVITY BASED	esign		XISTING ST	ATE	F NEW TECHNOLOGY WELL OF THE ART AND/OR MUL EQUIRED TO REACH THE G	TIPLE
	NEEDS SON S HARDWA DITIONAL A RRENTLY A	ARE AVAI	LABLE W/ ION REQU	JIREMEN		<u> </u>	w	🛛 medium 🗌	HIGH

BMAC	EQUIPMENT NAME CAROTID SINUS BARORECEPTOR STIMULATOR	Page ⊢cf4
HARDWARE Data Sheet	HARDWARE ID. NO.: <u>3</u> ORIGINATOR: <u>H. Nguyen</u> VERSION : <u>1</u>	L
ILLUSTRATI	ON	
DEFINITION A system to	stimulate the carotid sinus baroreceptors with positive and negative to	ansmura
pressure an	d from this records the resulting heart responses.	
	<b>SIGN STATUS:</b> neck barocuff system is flight certified and is manifested on SLS-1, SL	S-2, and

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
BMAC Hardware Data sheet	EQUIPMENT NAME: CAROTID SINUS BA	
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
Mass (kg):		Cuff pressure sensitivity to within +/- 1.0 mm Hg Incremental pressure reproducibility to within
		+/- 5.0 mm Hg
		Continuous ECG, respiration, and cuff pressure recording with analog display.
Depth (m)		Digital display of R-R internals in milliseconds. 12 bit analog to digital conversion for data storage
Volume (m3	3):123	
	wər (W)	
	Power (W) 145	
Peak Power	(W)	
Power Sour	ce (VDC) 28	
RACK INTER	FACE Rack Mounted?	PROPIENS/ISSUES AND CONCERNS
ELECTRICAL		PROBLEMS/ISSUES AND CONCERNS Hose connections must be rigid enough to avoid accidental
THERMAL:		crimping. Neck chambers must be custom fit due to inability of present
WASTE:		system to provide reproducible pressure increments.
FLUID:		Moderate discomfort during cutf inflation.
DATA:		
ASSUMPTION General specification EO22 system manife	ns listed are pertaining to those for the neck chamb	per pressure system and neck chamber electronics system of the
QUANTITY RE		
A neck cuff wh CRT display, to rack-mounted	ouch pad, air pump outlets, and ECG plu	etronics and pressure system by an air hose. A ligs are featured on the front panel of the
FUNCTIONAL DE	SCRIPTION (DESCRIBE FULLY, INCLUDE WHE	ERE AND HOW USED)
As the pressu responses are r	re system inflates/deflates the neck cuff made.	, ECG recordings of the resulting cardiac

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ВМАС	EQUIPMENT NA	AME: CAROTID SINUS BARORECEPTOR STIMULATOR ID# 3 2 0
HARDWARE	VER : 1	ORIGINATOR: H. Nguyen
CONSTRUCTION STRUCTURE/M MATERIAL: aluminum		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) CRT pumps (air) fan
ACTIVE ELECTRO	L % NEW DESIGN	40 Kg OF ALL 15 %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL S, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
40	80%	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
10	20%	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES  CERNING STRUCT/MECH COMPONENT:

SC S-35001		BIO	BIOMED	ICAL FA	ORING A	ND COU HARDWAI	NTER Re c	MEASURES JU	NE 15,19
BMAC Hardware Data Shee			AME: C	AROTID S		ORECEPT		IMULATOR ID# 3 H. Nguyen	PAGE 4 of 4
TYPE OF	ELECTR	ONICS:							
VIDEC	og Receiv Mps, audi D. RF, serv E, etc.	0			iegister Ers, etc.	s, <sup>–</sup>	<b>X</b> . c	DISPLAY WITH CRT	
TV, R	ISMITTER IADAR, CO LASER, ET			RECTIFIC	UPPLY FIONAL LIN ATION, CH CONVERT	<b>IOPPER</b>	I	DISPLAY - NO CRT .ED's LIQUID CRYSTAL PRINTERS	
ELECTRONIC		PTION B	Y PERC	ENTAGE	OF				<u> </u>
	Kg. of Ele			5.30				ESTIMATED TOTAL NEW DESIGN OF	%
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI		ELECTRONICS:	
ANALOG	10	70	30	0	0	0	į	20 %	
DIGITAL	70	30	60	10	0	0			
DISP W/CRT	10	80	20	0	0	0		WILL ELECTRONICS BE ABOVE AVERAGE DEM	
DISPLAY	0	0	0	0	0	0		<b>-</b> -	
XMTR	0	0	0	0	0	0		O Yes 💿 N	ю
PWR SUP	10	70	30	0	0	0			
	DESIGN E MODIFIC	CATION T	O AN			ATERIALS, DMPONENT CROGRAV	PROC TS. SIC ITY EN	SPACE. USES EXISTING ESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT E IVIRONMENT. YSTEMS DO NOT EXIST	DUE TO
MODI SPAC	FICATE TO E FICATION 1 E-BASED D	TO AN EX DESIGN	ISTING			VELOPME	NT OF	SPACE. REQUIRES THE NEW MATERIALS, PROCESS NIC COMPONENTS. STATE OF THE ART.	SES
ELECT ELECT IMPAC ENVIR	ESIGN FOR NG MATER RONIC COI T DUE TO N ONMENT. G MS COMM	RIALS, PRO MPONENT MICROGR GROUND E	DCESSES (S. NO DE AVITY BASED	SIGN	L EX	ISTING ST	ATE C	NEW TECHNOLOGY WELL BE DF THE ART AND/OR MULTI QUIRED TO REACH THE GOA	PLE
	HARDWA	RE AVAIL	ABLE W/			FTWARE			
	TIONAL AU RENTLY AV		on requ	IREMENT	S THAN		w		GH

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BMAC HARDWARE DATA SHEET ILLUSTRATIC	EQUIPMENT NAMECELL HANDLING ACCESSORIES       P         1       1         HARDWARE ID. NO.:       22         22       ORIGINATOR:         J. Stephenson         VERSION :       1
DATA SHEET	HARDWARE ID. NO.: 22 ORIGINATOR: J. Stephenson
ILLUSTRATIO	VERSION : 1
ILLUSTRATIC	
	o transfer cells from biological specimens onto microscope slides while wity environment.

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	
BMAC HARDWARE DATA SHEET	EQUIPMENT NAME: CELL HANDLING ACC VER : 1	ESSORIES ID# 2 2 Page 2 of 4 RIGINATOR: J. Stephenson
GENERAL S Mass (kg): Height (m) Width (m) Depth (m) Volume (m)	SPECIFICATIONS 	PERFORMANCE SPECIFICATIONS: Must be capable of transferring samples in volume from 1 drop to 1 ml. The cell handling accessories must be easily cleaned for subsequent cell transfer without any contamination.
Operational Peak Power		<b>PROBLEMS/ISSUES AND CONCERNS</b> The problem of liquids in the microgravity environment.
ASSUMPTION QUANTITY R PHYSICAL DESC Hand-held ins	EQUIRED: 2.5 SPECIFICATIONS CRIPTION:	MARC I MARC II MARC III steel which could be autoclaved and reused.
Replaceable p	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHE bipette or suction devices to prevent cont chanism for volume transfer.	

BMAC E		E: CELL HANDLING ACCESSORIES ID# 2 2 3 of
	'ER : 1	ORIGINATOR: J. Stephenson
CONSTRUCTION STRUCTURE/MI MATERIAL: aluminum TOTAL STRUCT/M		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) none
ACTIVE ELECTRO	% NEW DESIGN OF	Kg ALL %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C		CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
13	20%	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
43	80 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	<ul> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> <li>CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES</li> </ul>
		RNING STRUCT/MECH COMPONENT:

S-35001						ND COUN		MEASURES ATALOG		JUNE 15,19
BMAC Hardware Data Sheet										PAGE 4 of 4
TYPE OF	ELECTR	ONICS:								
OP AN VIDEC	DG RECEIN MPS, AUDI ), RF, SERN E, ETC.	0	(	DIGITAL GATES, R COMPUTE		s, E	] · c	DISPLAY WITH CF	IT	
TV, R.	SMITTER ADAR, CO LASER, E1			POWER SI CONVENT RECTIFIC/ & AC-DC (	IONAL LIN ATION, CH	<b>IOPPE</b> R	' I	DISPLAY - NO CF LED'S LIQUID CRYSTAL PRINTE		
ELECTRONIC			Y PERC	ENTAGE	OF					
	Kg. of Ele		<del></del>	3.76				ESTIMATED NEW DESIG	NOF	NL %
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI				
ANALOG	0	0	0	0	0	0			0 %	
DIGITAL	0	0	0	0	0	0				
DISP W/CRT	0	0	0	0	0	0		WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?		
DISPLAY	0	0	0	0	0	0		O Yes		No
XMTR	0	0	0	0	0	0			```	
PWR SUP	0	0	0	0	0	0				
	DESIGN LE MODIFIO ING SPAC	CATION T	O AN		Ш <u>м</u> С м	ATERIALS, OMPONEN ICROGRAV	PROC TS. Sk /ITY E	SPACE. USES EX CESSES, AND ELE GNIFICANT DESIG NVIRONMENT. SYSTEMS DO NOT	CTRON N IMPA	liC
MODI SPAC	ERATE TO FICATION E-BASED I	TO AN E) DESIGN	(ISTING		ID DI Al	EVELOPME ND/OR ELE	ENT O	SPACE. REQUIRE F NEW MATERIAL ONIC COMPONEN STATE OF THE A	s, PRO FS.	CESSES
EXIST ELECT IMPAC ENVIR	DESIGN FO ING MATEI IRONIC CC T DUE TO IONMENT. EMS COMM	RIALS, PR MPONEN MICROGF GROUND	OCESSE TS. NO DI AVITY BASED	ESIGN		XISTING S	TATE	NEW TECHNOLO OF THE ART AND EQUIRED TO REAC	O/OR M	ULTIPLE
ADD	NEEDS SON S HARDWA NITIONAL A RRENTLY A	ARE AVAII UTOMATI	ABLE W/			_	ow		M	] нюн

BMAC	EQUIPMENT NAME CELL HARVESTER	Page
HARDWARE Data Sheet	HARDWARE ID. NO.: 30 ORIGINATOR: J. Stephenson VERSION : 1	1 of 4
ILLUSTRATIO	)N	
DEFINITION A device used isolated cells	d to isolate biological cells from a large sample, and then deposi into a chamber for further analysis.	t the required
HISTORY/DESIGN New design is This will be a Present syste samples into	s required. highly complex instrument. ms are partially automated and use 'open' wells as the means o	fintroducing

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	
BMAC	EQUIPMENT NAME: CELL HARVESTER	ID# 30 Page 2 of 4
HARDWARE Data Sheet	VER : 1 0	RIGINATOR: J. Stephenson
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
	29	Simultaneously harvests and deposits up to 96 samples into vials.
		Fully automated, once microtiter plate is in place.
Depth (m)		
	.054	
Standby Po	wer (W)	
Operational	Power (W) 50	
Peak Power	· (W)	
Power Sour	ce (VDC) <u>28 VDC</u>	
RACK INTER	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		Automation of unit may not be feasible. Fully automated lab device which harvests just one well
THERMAL:		is much larger than a double rack width. Current technology is gravity dependent.
FLUID:		Some experiments require radioactive tracers. No ground based unit at present is fully automated
DATA:		No ground based unit at present is fully automated.
ASCUMPTION		
Specifications are to weight significantly	that of a partially automated unit packaged for rack m	ounting. A fully automated system will increase the volume and r tray, loading of filter paper, punching of filter paper (containing
QUANTITY R	EQUIRED: 2.5 SPECIFICATIONS	
PHYSICAL DES	CRIPTION:	
microtiter well block (manua	Ils as the microtiter plate is lowered on	ite, a collection head which punctures the to it, a reversible vacuum, a puncture ontaining filter paper, liquid reservoirs and a
FUNCTIONAL D	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHE	ERE AND HOW USED)
	uumed from microtiter wells and deposite filter paper containing the cells are punch	

BMAC HARDWARE DATA SHEET		E: CELL HARVESTER ID# 3 0 ORIGINATOR: J. Stephenson
CONSTRUCTION STRUCTURE/MI MATERIAL: aluminum TOTAL STRUCT/M ACTIVE ELECTRO	OF ECHANICS ECH WT. (EXCLUD NICS): _ 28.8	Kg
ESTIMATED TOTAL STRUCT/MECH COI	% NEW DESIGN OF MPONENTS: 5	ALL 0 % 
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C 30	PCT.OF TOTAL STRUCT WEIGHT: 20%	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
200	80 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES
Information perta	ins to a partially	ERNING STRUCT/MECH COMPONENT: automated system. de mounted enclosure of standard rack size.

JSC LS-35001		BIO	AEDICAL BIOMED	MONITO	CILITY	ND COUNT	ITERMEASURES JUNE 15,19
BMAC HARDWARE	EQUIP	MENT N	AME: C	ELL HARVI	ESTER		ID# 30 PAGE
DATA SHEE	E same as	1			0	RIGINATOF	DR: J. Stephenson 4 of 4
TYPE OF	ELECTR	ONICS:					
VIDEC	og Receiv Mps, aud D, RF, serv E, etc.	Ю		DIGITAL GATES, R COMPUTE			DISPLAY WITH CRT
TV, R	ISMITTER IADAR, CO LASER, ET	•		POWER SI CONVENT RECTIFIC/ & AC-DC (	'IONAL LIN ATION, CH	NEAR HOPPER	DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS
ELECTRONIC			Y PERC	ENTAGE	OF		
	Kg. of Ele	octronics		0.20			ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:
	% TOTAL	T	%IC	%LSI	%HYB	%VLSI	
ANALOG	25	50	50	0	0	0	40 %
	25	0	50	50	0	0	WILL ELECTRONICS BE OF
DISP W/CRT	0 25	0 100	0	0	0	0	ABOVE AVERAGE DENSITY?
XMTR	0	00	0	0	0	0	O Yes 💿 No
PWR SUP	25	0	0	0	0	0	
FWH SUP	23		0	100	0	0	
L	DESIGN LE MODIFIC ING SPACI	CATION T	O AN		M LL CC M	ATERIALS, PF DMPONENTS. ICROGRAVIT	FOR SPACE. USES EXISTING PROCESSES, AND ELECTRONIC 'S. SIGNIFICANT DESIGN IMPACT DUE TO TY ENVIRONMENT. SED SYSTEMS DO NOT EXIST
MODI SPAC	ERATE TO I FICATION E-BASED I	TO AN EX DESIGN	(ISTING		DE At	EVELOPMENT	FOR SPACE. REQUIRES THE NT OF NEW MATERIALS, PROCESSES CTRONIC COMPONENTS. THE STATE OF THE ART.
EXIST ELECT IMPAC ENVIR	Design fo Ing Matef Tronic Co It due to I Onment. ( Ems Comm	RIALS, PR MPONEN MICROGR GROUND I	OCESSES TS. NO DE AVITY BASED	SIGN		<b>KISTING</b> STA	IT OF NEW TECHNOLOGY WELL BEYOND ATE OF THE ART AND/OR MULTIPLE IS REQUIRED TO REACH THE GOAL.
ADD	IEEDS SOF S HARDWA ITIONAL AU RENTLY A		ABLE W/ ON REQU				W 🛛 MEDIUM 🗌 HIGH

ISC S-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES JUNE 15, BIOMEDICAL FACILITY HARDWARE CATALOG
BMAC HARDWARE DATA SHEET	EQUIPMENT NAME CENTRIFUGE, HEMATOCRIT       Page         HARDWARE ID. NO.:       23         ORIGINATOR:       J. Stephenson         VERSION :       1
ILLUSTRATIO	
collected in	t, hand-held and battery operated centrifuge. 9 microliters of venous blood are six capillary tubes for spinning. At the end of the spin the hematocrit is read the graduation scale, which is located on the rotor.
LSLE # JO	IGN STATUS: 16 Its will be necessary for Space Station such as more units or updated

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JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
BMAC HARDWARE	EQUIPMENT NAME: CENTRIFUGE, HEMA	TOCRIT ID# 23 Page
DATA SHEET	VER:1	DRIGINATOR: J. Stephenson
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
		Operating temperature:0-40 degrees centigrade. Stowage temperature:-20 - +55 degrees
Height (m)		centigrade Rotation speed: 11,500 rpm (5396g)
Width (m)		Duration: 3 min. 20sec. Accuracy: +/- 1%
Depth (m)		Range: 10-80% Capacity: 6 capillary tubes
Volume (m3	3):001	32 mm, in length and heparinized
Standby Por	wer (W)	Vot of capillary tube: 9 microliters.
	Power (W)	
	(W)	
	ce (VDC) 1.5 BAT	
RACK INTER	FACE Rack Mounted?	
ELECTRICAL		PROBLEMS/ISSUES AND CONCERNS
THERMAL:		
WASTE:		
FLUID:		
DATA:		
ASSUMPTION	IS/ JUSTIFICATIONS	
QUANTITY RE		
A small hand- capillary tubes	held battery operated device with a sma s of 9 microliters' volume each.	Il rotor that will hold up to 6
· •		
	SCRIPTION (DESCRIBE FULLY, INCLUDE WHEI	
opin bioou sail	nples at 5000g's to separate plasma from	n the cellular components.
		1

BMAC		ME: CENTRIFUGE, HEMATOCRIT ID# 23 3 of 4
HARDWARE	VER : 1	ORIGINATOR: J. Stephenson
DATA SHEET	VEN .	
CONSTRUCTIO		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)
CONSTRUCTIO STRUCTURE/N		6 manganese alkali 1.5.V batteries
		small motor
MATERIAL: Anodized alumin	um.	
ACTIVE ELECTR	MECH WT. (EXCLU DNICS):	8 Kg
	L % NEW DESIGN C	DF ALL
STRUCT/MECH C		15 %
ESTIMATED # OF	PCT. OF	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR
STRUCT PARTS	TOTAL	MECH CONFIGURATION:
(EXCLUDING NUT BOLTS, SCREWS		A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED
ETC.) OF EACH A/B/C		SUPPORT STRUCTURE, NO MOVING PARTS
7	<u>     40</u> %	
		B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.
		NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME
15	60%	
		C. LAMINATED STRUCTURAL COMPOSITES
		LAID UP FLAT SURFACE WITH STIFFENERS
	%	
	/*	
ADDITIONAL C	OMMENTS CON	CERNING STRUCT/MECH COMPONENT:

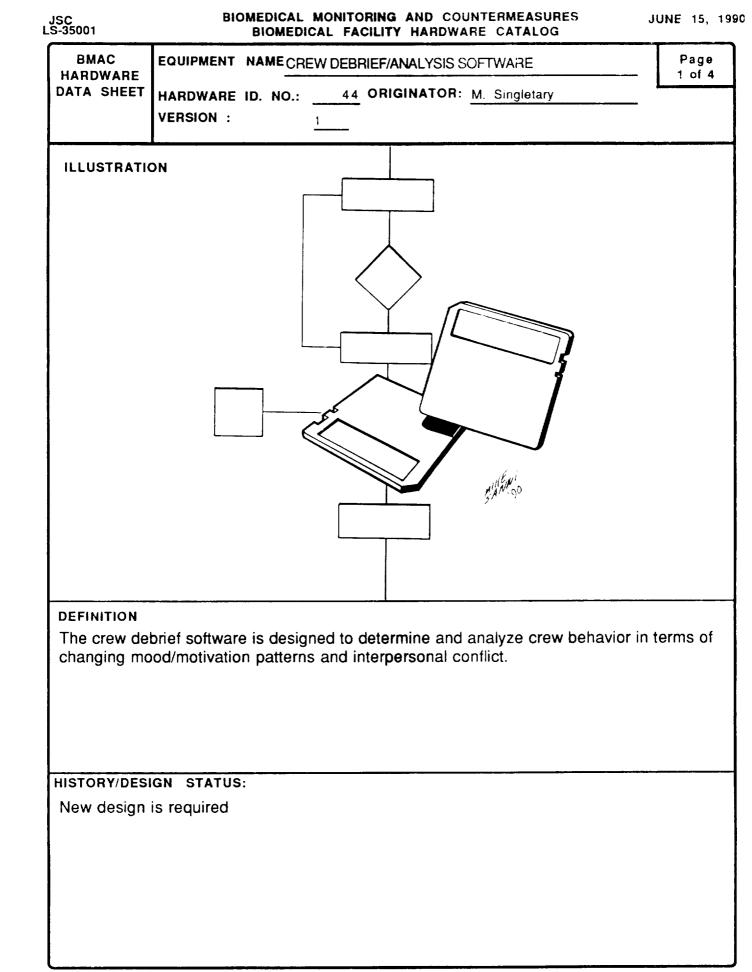
ISC 5-35001		BIO	MEDICAL BIOMED	MONIT	ORING A	AND COU Hardwa	INTER RE C	RMEASURES JUNE 15, CATALOG
BMAC Hardware Data Shee			AME: C	ENTRIFUC			OR:	ID# 23 PAGE J. Stephenson
TYPE OF								
		VERS, IO		DIGITAL GATES, R			<u>,</u>	DISPLAY WITH CRT
DRIVE	E, ETC.	•••						
— TV, R	SMITTER ADAR, CC LASER, E <sup>-</sup>			POWER SI CONVENT RECTIFIC, & AC-DC (	TONAL LII ATION, CI	HOPPER	اليسيدينا	DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS
ELECTRONIC			Y PERC	ENTAGE	OF			
	Kg. of Ele	octronics	••••	0.03				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI		
ANALOG	30	50	50	0	0	0		%
	70	25	45	30	0	0		
DISP W/CRT	0	0	0	0	0	0		WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?
XMTR	0	0	0 0	0	0	0		Yes 💿 No
PWR SUP	0	0	0	0	0	0		
	<u>~</u> _]]	· · · ·			U	<u> </u>		
	<b>DESIGN</b> E MODIFIC ING SPACE		O AN		LI M. CA M	ATERIALS, OMPONEN ICROGRA\	PROC TS. SI /ITY E	SPACE. USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT. SYSTEMS DO NOT EXIST
MODI	RATE TO I FICATION E-BASED [	TO AN EX				Evelopme ND/OR elle	ENT O	SPACE. REQUIRES THE F NEW MATERIALS, PROCESSES NIC COMPONENTS.
EXISTI ELECT IMPAC ENVIR	ESIGN FOI NG MATEF RONIC CO T DUE TO I ONMENT. ( MS COMM	RIALS, PR MPONEN MICROGR GROUND (	OCESSES IS. NO DE AVITY BASED	SIGN		EVELOPME (ISTING S	NT OF TATE	STATE OF THE ART. NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL
<u> </u>	EEDS SOF HARDWA TIONAL AL	RE AVAIL	ABLE W/			FTWARE		
	RENTLY A						WC	🔲 меріим 🔲 нісн

BMAC	EQUIPMENT NAME CONTROLLED TESTING UNITS	Page
HARDWARE		1 of 4
DATA SHEET		
	VERSION :	
ILLUSTRATI		
DEFINITION Auxiliary equ equipment.	ipment necessary to calibrate, set-up and manipulate other host expe	rimental
	IGN STATUS:	
for the perfo	sed on the requirement to store and inventory special equipment rmance of the biomedical tests. is necessary.	

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	
BMAC	EQUIPMENT NAME: CONTROLLED TESTI	
HARDWARE	VER : 01 C	RIGINATOR: H. Nguyen
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
	7.14	0.14 m3 of containment volume, Racks and equipment holders to secure equipment while in
		storage.
Width (m)		
Depth (m)		
	3):144	
Standby Po	wər (W)	
Operational	Power (W) 15	
Peak Power	· (W)	
Power Sour	ce (VDC) 28VDC	
RACK INTER	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		
THERMAL:		
WASTE: FLUID:		
DATA:		
ASSUMPTION BMAC electro-mec Disposables need	hanical instruments require calibration and supplies	
QUANTITY R	EQUIRED: 2.5 SPECIFICATIONS	
PHYSICAL DESC	CRIPTION:	
visual referer Items to be pi	nce. laced in the Controlled Testing Unit inclu els, swabs, wires, electrical testing, and	s and has a plexiglass front door used for quick des vacutainer bottles, reagent storage, auxilary calibration accessories, and other
FUNCTIONAL DI	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHE	RE AND HOW USED)
	uipment rack. Container box for control ore liquid samples, experiment accessor	reagents and assays. ies, sample containers, skin test kitsetc

ВМАС	EQUIPMENT NAI	ME: CONTROLLED TESTING UNITS ID # 2 4 3 0
HARDWARE	VER : 01	ORIGINATOR: H. Nguyen
CONSTRUCTION STRUCTURE/N MATERIAL: aluminum		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) housing racks
ACTIVE ELECTRO	ONICS): 7. AL % NEW DESIGN C	<u>1</u> Kg DFALL 20 %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL S, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDE SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
17	<u> </u>	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
	%	B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC     NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIL     PRECISION MACHINED PARTS, MANY MOVING PARTS     OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
	%	C. LAMINATED STRUCTURAL COMPOSITES
ADDITIONAL	OMMENTS COM	ICERNING STRUCT/MECH COMPONENT:

JSC LS-35001		BIO	NEDICAL BIOMED	MONIT	ORING A	ND COU HARDWA	INTER	MEASURES		JU	INE 15,199
BMAC HARDWARE					ED TESTI	NG UNITS			D#	24	PAGE 4 of 4
DATA SHEE	T VER :	01			0	RIGINAT	OR:	H. Nguyen		L	4 01 4
OP AI VIDEC	ELECTR OG RECEIN MPS, AUD ), RF, SER ), RF, SER ; ETC.	vers, Io			IEGISTER ERS, ETC.		□ <sup>.</sup> เ	DISPLAY WITH C	RT		
TV, R	SMITTER ADAR, CC LASER, ET	•		RECTIFIC	UPPLY FIONAL LIN ATION, CH CONVERT	<b>IOPPER</b>		DISPLAY - NO C LED's LIQUID CRYSTAL PRINT			
ELECTRONIC			Y PERC	ENTAGE	OF	<u></u>	<u></u>				
	Kg. of Ele % TOTAL	octronics	~~~~	0.04		a()/I O		ESTIMATE NEW DESIC ELECTRON	GN O	F	%
ANALOG	0 101AL		%IC 0	%LSI 0	%HYB 0	%VLSI 0			0	%	
DIGITAL	0	0	0	0	0	0					
DISP W/CRT	0	0	0	0	0	0		WILL ELECT			
DISPLAY	0	0	0	0	0	0		ABOVE AVE	RAG	E DE	NSITY?
XMTR	0	0	0	0	0	0		O Yes	6		No
PWRSUP	0	0	0	0	0	0					
	<b>DESIGN</b> E MODIFIC ING SPACE		O AN			ATERIALS, DMPONEN CROGRAN	PROC TS. SK /ITY EI	SPACE. USES E ESSES, AND ELI SNIFICANT DESK VIRONMENT. YSTEMS DO NO	ectr Gn in	IONIC IPACT I	DUE TO
MODII SPACI	RATE TO E	TO AN EX DESIGN	ISTING		L DE AN	VELOPME ID/OR ELE	ENT OF	SPACE. REQUIR NEW MATERIA NIC COMPONEN STATE OF THE .	_S, PI TS.		SES
EXISTI ELECT IMPAC ENVIR	ESIGN FOI NG MATEF RONIC COI T DUE TO I ONMENT. G MS COMM	RIALS, PRO MPONENT MICROGR GROUND E	OCESSES IS. NO DE AVITY BASED	SIGN	LJ EX	ISTING S	TATE	NEW TECHNOLO OF THE ART AN QUIRED TO REA	D/OR	MULT	IPLE
	EEDS SOF HARDWA TIONAL AU RENTLY AV	RE AVAIL JTOMATIC	ABLE W/ " DN REQU			_	OW		м	Пн	IGH



#### BIOMEDICAL MONITORING AND COUNTERMEASURES BIOMEDICAL FACILITY HARDWARE CATALOG

# TITLE: CREW DEBRIEF / ANALYSIS SOFTWARE

This software will provide for interactive graphic and alphanumeric displays to assist in the collection, interpretation and analysis of crew responses and debriefings on operational and functional procedures and investigations.

### QUALITATIVE DESCRIPTORS

_	PROGRAM SPECIFICATION LEVEL	Military	MANAGEMENT COMPLEXITY	1.00
_	SYSTEM INTEGRATION	Yes	DESIGN REVIEWS	Yes
	CODE WALK THRU	Yes	TOP DOWN APPROACH	Yes
	STRUCTURE/MODULE TEST	Yes	REQUIREMENTS GROWTH	12%
—	PLATFORM	2.00	UTILIZATION FACTOR	0.50
	INTERNAL INTEGRATION FACTOR	0.50	EXTERNAL INTEGRATION FACTOR	0.30

# QUANTITATIVE DESCRIPTORS

OUTPUT PAGES	6.0	ALPHANUMERIC DISPLAYS	10.0
GRAPHIC DISPLAYS	5.0	INPUT STREAMS	4.0
OUTPUT STREAMS	4.0	CONTROL STATES	50.0
MESSAGE FIELDS	100.0	OPERATOR ACTIONS	10.0
INPUT ANALOGS	5.0	COMPUTED TABLES	10.0
FUNCTIONAL BULKINESS	1.2		

#### SIZING FACTORS

SIZE CALIBRATION	1.00
LANGUAGE	4th Generation
TARGET SIZE	NONE
ESTIMATED SOURCE INSTRUCTIONS	4046

### LANGUAGE DESCRIPTORS

Language	4TH-GENERATION
Lines of Source Code	4046
Non-executable Fraction	0.10
Complexity 1	1.40
Complexity 2	1.00
Productivity Factor	4.00

## CODE TYPING

Application Categories	% of Total Program	% New Design	% New Code
User Defined	0.00	0.00	0.00
Data Storage & Retrival	0.25	0.25	0.25
Online Communication	0.40	0.80	0.80
Realtime C&C	0.00	0.00	0.00
Interactive	0.10	1.00	1.00
Mathematical	0.20	1.00	1.00
String Manipulation	0.05	1.00	1.00
Operating Systems	0.00	0.00	0.00

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BMAC	EQUIPMENT NAME ECHOCARDIOGRAPH/DOPPLER VELOCIMETER	Pa
HARDWARE Data Sheet		1 0
	HARDWARE ID. NO.: 400 ORIGINATOR: J Stephenson VERSION : 1	
ILLUSTRATIO	ИС	
DEFINITION		
Instrument to detailed image	perform full peripheral vascular imaging. Color imaging capabilities	s deliver
diagnosis of v	es of vascular structures and complete blood flow information for the vascular pathology.	e accura
IISTORY/DESIG	an status: ng technology.	
Further modifi	cation is required notably in the areas of size and weight of the instr	ument.

INGE<u>35436</u> INTENTIONALE

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	NITORING AND COUNTERMEASURES JUNE 15,1990 FACILITY HARDWARE CATALOG
	RDIOGRAPH/DOPPLER VELOCIMETER ID# 400 Page 2 of 4
HARDWARE DATA SHEET VER : 1	ORIGINATOR: J. Stephenson
GENERAL SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
Mass (kg):70	Color monitor: High resolution 2-D imaging 4, 6, 8, 10, 12, 16, 20, and 24 cm depth.
Height (m)352	7.5 MH2 wide - aperature linear array transducer. Doppler: Digital FFT utilizing quadrature detection
Width (m)	Wall filter: 50 HZ to 1500 HZ - 8 setting 32 frame storage capability.
Depth (m)	
Volume (m3):144	
Standby Power (W) 60	
Operational Power (W) 100	
Peak Power (W)	
Power Source (VDC) 28VDC	
RACK INTERFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
	TRA: Highly operator-dependent for test accuracy.
THERMAL:	
WASTE:	
FLUID:	
ASSUMPTIONS/ JUSTIFICATIONS Data is recorded on VHS tapes and downlinked to ground	
QUANTITY REQUIRED: 2.5 SPECIF	
PHYSICAL DESCRIPTION:	
the second second do	opplar, around terminals connected to CRT screen
Instrument consisting of transoucer and do	oppler, ground terminals connected to CRT screen.
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, II	
The function of ECG/Doppler is to perform	blood flow passage through the heart valves and chambers
in order to monitor physiological, structu	ral changes in microgravity.

. . .

ВМАС В		AME: ECHOCARDIOGRAPH/DOPPLER VELOCIMETER ID#400 2 0
HARDWARE		3 01
DATA SHEET	/ER : 1	ORIGINATOR: J. Stephenson
		DISCRETE STUCTURAL/MECHANICAL MODULES
CONSTRUCTION		(e.g. MOTORS, FANS, BATTERIES, ANTENNAS)
STRUCTURE/M	ECHANICS	fan housing
MATERIAL:		sensor unit
aluminum, glass		data storage
TOTAL STRUCT/N	ECH WT. (EXCLI	cables
ACTIVE ELECTRO	,	65 Kg
ESTIMATED TOTAL	. % NEW DESIGN	OF ALL
STRUCT/MECH CO	MPONENTS:	30 %
ESTIMATED # OF		CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR
STRUCT PARTS	PCT. OF TOTAL	MECH CONFIGURATION:
(EXCLUDING NUTS	. STRUCT	A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED
BOLTS, SCREWS, ETC.) OF EACH	WEIGHT:	SUPPORT STRUCTURE, NO MOVING PARTS
A/B/C		CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
38	80%	
		B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.
		NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM
		PRECISION MACHINED PARTS, MANY MOVING PARTS
10	20 %	OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
		C. LAMINATED STRUCTURAL COMPOSITES
		LAID UP FLAT SURFACE WITH STIFFENERS
		STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY
	%	CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
·		
ADDITIONAL CO	MMENTS CON	CERNING STRUCT/MECH COMPONENT:

SC S-35001						ND COUN		MEASURES JUNE 15,19	90
BMAC Hardware Data Sheet			ME: EC	HOCARDI		DOPPLER V RIGINATO		CIMETER ID# 00 PAGE 4 of 4	
TYPE OF	ELECTRO	ONICS:							
	DG RECEIV NPS, AUDI N, RF, SERV S, ETC.	0	- (	DIGITAL GATES, RE COMPUTE			]	ISPLAY WITH CRT	
TV, R/	SMITTER ADAR, CO LASER, ET		F	OWER SU CONVENT RECTIFICA AC-DC C	IONAL LIN ATION, CH	<b>IOPPER</b>	J L	DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele	octronics		5.00				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI			
ANALOG	10	50	40	10	0	0		30 %	
DIGITAL	20	70	20	10	0	0			1
DISP W/CRT	60	80	20	0	0	0		WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?	
DISPLAY	0	0	0	0	0	0		Yes 🔘 No	
XMTR	0	0	0	0	0	0			
PWR SUP	10	50	50	0	0	0			
	DESIGN LE MODIFI ING SPAC	CATION T	O AN			IATERIALS, OMPONEN IICROGRAV	PROC IS. SI	A SPACE. USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT. SYSTEMS DO NOT EXIST	
MODI SPAC	ERATE TO IFICATION E-BASED	TO AN EX DESIGN	XISTING			EVELOPME ND/OR ELE	ENT O	SPACE. REQUIRES THE F NEW MATERIALS, PROCESSES ONIC COMPONENTS. STATE OF THE ART.	
EXIST ELEC IMPAC ENVIF	DESIGN FC ING MATE TRONIC CC CT DUE TO RONMENT. EMS COMM	RIALS, PF DMPONEN MICROGF GROUND	ROCESSE ITS. NO DI RAVITY BASED	Esign	LJ E	XISTING ST	ΓΑΤΕ	FNEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL.	
		ARE AVAI	LABLE W/				ow	MEDIUM 🗌 HIGH	

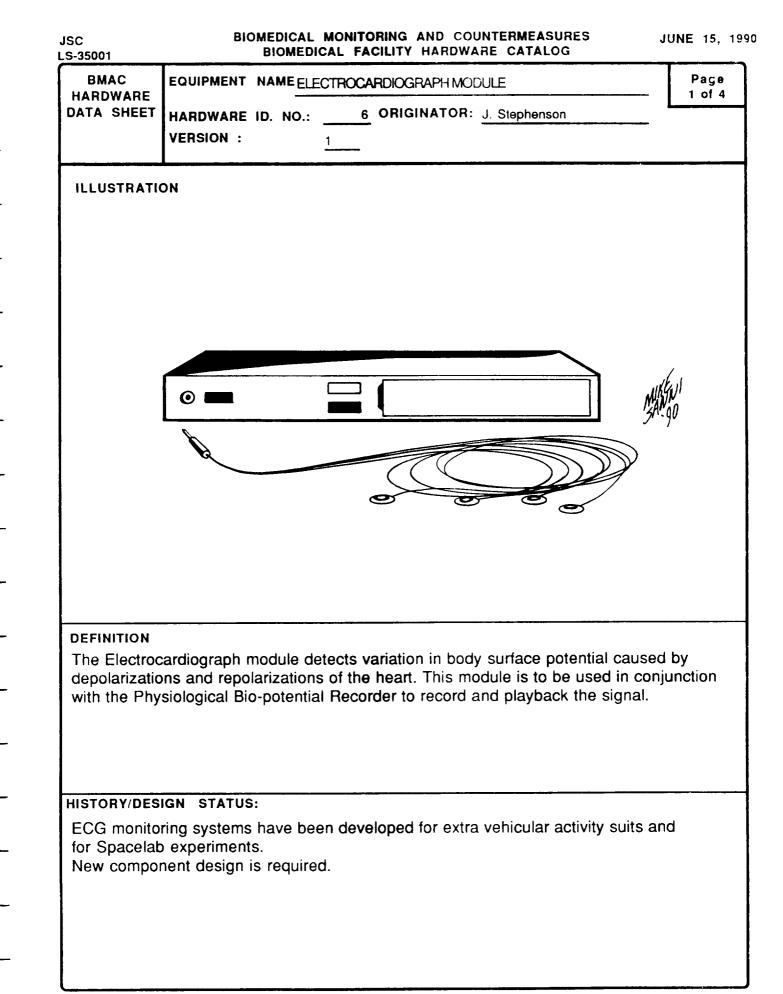
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JUNE 15,
Page - 1 of 4
-
MINE MINE SAM 90
g eye nce.

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
BMAC HARDWARE	EQUIPMENT NAME: ELECTRO-OCULOGR	APH MODULE ID# 5 Page
DATA SHEET	VER:1 C	2 of 4           2 of 4
GENERAL S	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
Mass (kg):	2	Response to 30 Hz 10 millivolts per peak
Height (m)		Amplitude Linearity 2% full scale Amplitude Resolution 50:1
Width (m)		Hysteresis: LESS THAN 0.5 mm Input Impedance: 10 MegaOhms differential,
Depth (m)		5 MegaOhms common mode Noise Level: 5 Micro volts
Volume (m3	.018	Zero suppression: +- 150 millivolts Frequency response: DC to 1000 Hz
Standby Por	wer (W)	Bio-potential isolation provided
Operational	Power (W) 25	
Peak Power	(W)	
Power Sour	ce (VDC) 28	
RACK INTER	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		Operator dependent for accurate results.
THERMAL:		Possible shock risk factor.
WASTE:		
FLUID:		
DATA:		
ASSUMPTION	S/ JUSTIFICATIONS	
Recorder will be us	ed in conjunction with the visual tracking system.	
Module will be a p	art of the physiological bio-potential system, linked to	the multichannel data recorder for processing.
QUANTITY RI	EQUIRED: 2.5 SPECIFICATIONS	
PHYSICAL DESC	CRIPTION:	
Back mounter	d instrument with direct outsilinger and	rol on front name
	d instrument with direct curvilinear cont	tor on front panel.
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
FUNCTIONAL DE	SCRIPTION (DESCRIBE FULLY, INCLUDE WHE	RE AND HOW USED)
Instrument to I calibrates, proc	be used in conjunction with the Physiolo cesses, and stores the data for downlink	ogical Biopotential Recorder, which conditions,
		· · · · · · · · · · · · · · · · · · ·

BOLTS, SCREWS, ETC.) OF EACH A/B/C       WEIGHT:       Image: Construction of the structure o	BMAC	EQUIPMENT NAME: ELECTRO-OCULOGRAPH MODULE ID # 5						
CONSTRUCTION OF STRUCTURE/MECHANICS       (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum       switches cable hamess for electrodes         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       1.5       Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       30 %         ESTIMATED # OF STRUCT/MECH COMPONENTS:       30 %         ESTIMATED # OF STRUCT / MECH COMPONENTS:       30 %         ESTIMATED # OF STRUCT / MECH BOLTS, SCREWS. ETC.) OF EACH A/B/C       PCT. OF TOTAL SUPPORT STRUCTURE, NO MOVING PARTS		<b>VER</b> : 1	ORIGINATOR: J. Stephenson					
STRUCT/MECH COMPONENTS:       30 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT WEIGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: MECH CONTAINMENT STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         7       30 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC. MINIMATED STRUCTURAL COMPOSITES MECH COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         7       30 %       C. LAMINATED STRUCTURAL COMPOSITES MELAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	STRUCTURE/ MATERIAL: aluminum TOTAL STRUCT	MECHANICS MECH WT. (EXCLUDING	(e.g. MOTORS, FANS, BATTERIES, ANTENNAS) switches cable harness for electrodes					
STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEIGHT:       MECH CONFIGURATION:         15       70 %       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         15       70 %       CONTAINMENT STRUCTURE, NO MOVING PARTS         15       70 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         15       70 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         15       70 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         15       70 %       CONTAINMENT STRUCTION FROM DRILLING, MILLING, GRINDING ETC.         15       70 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         16       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, MANY MOVING PARTS         17       30 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         16       C. LAMINATED STRUCTURAL COMPOSITES         16       LAID UP FLAT SURFACE WITH STIFFENERS         17       30 %       STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY         17       90 %       C. LAMINATED STRUCTURAL COMPOSITES         18       LAID UP FLAT SURFACE WITH STIFFENERS         19       STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY<			f f f f f f f f f f f f f f f f f f f					
15       70%       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN         7       30%       PRECISION MACHINED PARTS, MANY MOVING PARTS         0PTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS. BONDED ASSY         CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	STRUCT PARTS (EXCLUDING NU BOLTS, SCREWS ETC.) OF EACH	TOTAL ME	A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED					
7       30 %       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN         PRECISION MACHINED PARTS, MANY MOVING PARTS       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY       CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	15	<u> </u>						
	7		NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM					
ADDITIONAL COMMENTS CONCERNING STRUCT/MECH COMPONENT:		%	LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY					
	ADDITIONAL	COMMENTS CONCER	NING STRUCT/MECH COMPONENT:					

BMAC IARDWAR Ata shee					CULOGR	HARDWARE			ID#	5	JNE 15,1 PAGE 4 of 4
ANAL OP A VIDE	F ELECTF LOG RECEI IMPS, AUD O, RF, SER E, ETC.	VERS, NO	: ⊠ <sup>.</sup>	DIGITAL GATES, F COMPUT	REGISTER	as,		PLAY WITH			
TV, F	ISMITTER RADAR, CC LASER, E			POWER S CONVENT RECTIFIC & AC-DC (	FIONAL LII ATION, CI	OPPER	LED	PLAY - NO 's LIQUID 'STAL PRIN			
ECTRONIC	C DESCRI	PTION IT	BY PERC	ENTAGE	OF						<u></u>
	Kg. of Ele % TOTAL			0.50				ESTIMATE NEW DESI ELECTRO	GN O	F	%
NALOG	40		T	%LSI	%HYB	%VLSI			0.0		
GITAL	40	40		40	0	0			20	%	
SP W/CRT	0		+	10	0	10	W				
SPLAY	20	25		0 30	0 0	0		BOVE AVI			
ITR	0	0	<u>├</u>	0	0	20 0		O Ye	s	•	<b>l</b> o
/R SUP	0	0	0	0	0	0					
COPE OF	DESIGN		······								
SIMPL	E MODIFIC NG SPACE		ΓΟ ΑΝ			W DESIGN FO TERIALS, PRO MPONENTS, S CROGRAVITY OUND BASED	DCESS SIGNIF ENVIR	ES, AND EL CANT DESI ONMENT.	ectro Gn Imf	ONIC PACTE	DUE TO
MODIF	RATE TO E ICATION T E-BASED D	O AN E			DE AN	W DESIGN FOI VELOPMENT ( D/OR ELECTR	OF NEV	V MATERIA XOMPONEN	LS, PR ITS.	E OCESS	SES
	ESIGN FOR		USES		AI	OR NEAR THI	ESTA	e of the	ART.		
ELECTI IMPACI ENVIRC	TONIC CON DUE TO M DIMENT. GI MS COMME	IPONEN IICROGF ROUND	TS. NO DE: AVITY BASED	SIGN	L EXI	VELOPMENTO STING STATE SIGN PATHS R	E OF TI	HE ART AN	D/OR	MULTI	PLE
	EDS SOFT HARDWAF TONAL AU	RE AVAIL	LABLE W/ T			TWARE	- <u></u>				
	ENTLY AV			REMENIS	THAN	LOW	[		мГ	Энк	~u



JSC BIOMEDICA LS-35001 BIOME	L MONITORING AND COUNTERMEASURES JUNE 15,1990 DICAL FACILITY HARDWARE CATALOG
	ELECTROCARDIOGRAPH MODULE ID # 6 Page
DATA SHEET VER : 1	ORIGINATOR: J. Stephenson
GENERAL SPECIFICATIONS         Mass (kg):      4         Height (m)      044         Width (m)      482         Depth (m)      4851         Volume (m3):      018         Standby Power (W)          Operational Power (W)          Peak Power (W)          Power Source (VDC)       28         RACK INTERFACE       Rack Mounted?         ELECTRICAL       NONE:       STANDARD         THERMAL:       X	PERFORMANCE SPECIFICATIONS:         Computation of heart rate based on R waves         Sampling rate>=250 samples/sec         Input Impedance: 10 Mega Ohms differentials         50 Mega Ohms common modes         for leads.         Noise level:       Less than 5 microvolts peak         to peak.         Time constant:       Selectable 3.2 and .3 seconds.         Image: Selectable Seconds         Selectable Seconds
ASSUMPTIONS/ JUSTIFICATIONS	be automatically transferred to the physiological bio-potential data recorder. rcise facility.
PHYSICAL DESCRIPTION:	PECIFICATIONS MARC I MARC II MARC III
during exercise and at rest via the atta	record depolarization and repolarization patterns of the heart

BMAC E	QUIPMENT NAME: FI	ECTROCARDIOGRAPH MODULE ID# 5 2 of						
HARDWARE	ER : 1	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) fan optical storage unit electrical cable harness for electrodes						
ACTIVE ELECTRON	ECHANICS ECH WT. (EXCLUDING NICS): <u>1.8</u> Kg % NEW DESIGN OF ALL							
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS. SCREWS, ETC.) OF EACH A/B/C 15 7	TOTAL MEC	CK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR H CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC. NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME PRECISION MACHINED PARTS, MANY MOVING PARTS OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION C. LAMINATED STRUCTURAL COMPOSITES						
ADDITIONAL CO	MMENTS CONCERNI	LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES NG STRUCT/MECH COMPONENT:						

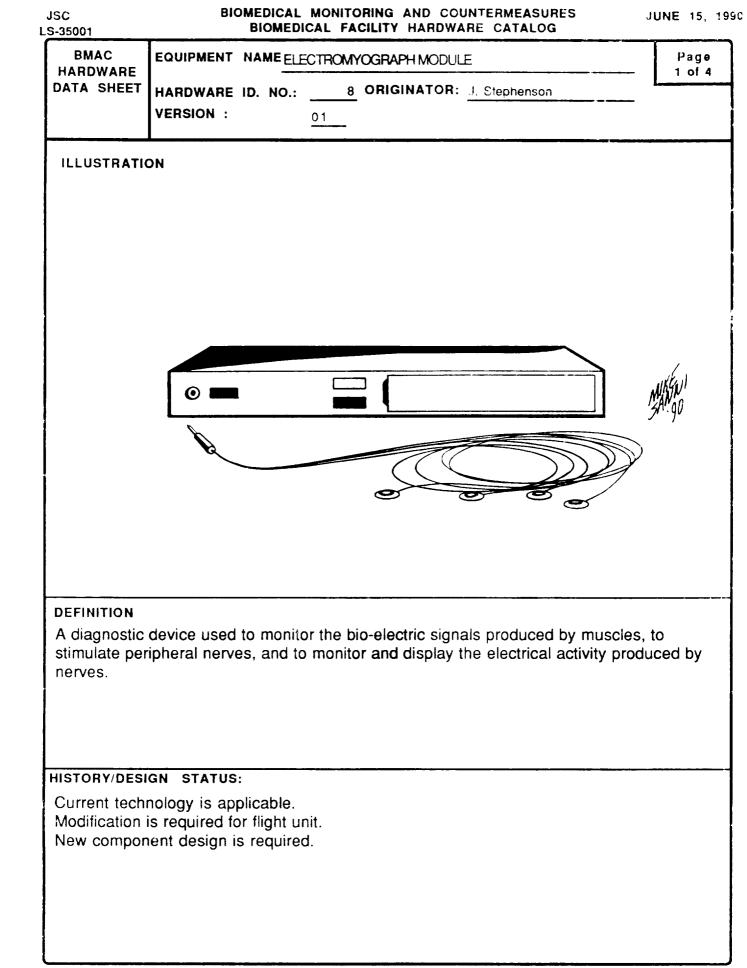
JSC 5-35001						ND COUN		MEASURES JUN Atalog	NE 15,1990
BMAC Hardware Data Sheet	lurn		AME: EL	ECTROC/		PH MODUL RIGINATO		ID# 6 J. Stephenson	PAGE 4 of 4
TYPE OF	ELECTR	ONICS:							
VIDEC	DG RECEIN MPS, AUDI ), RF, SERN E, ETC.	0	— (	digital Gates, R Compute	egister Ers, etc.	s, C	], [	DISPLAY WITH CRT	
<sup>—</sup> TV, R	SMITTER ADAR, CO LASER, ET		С ( Г	RECTIFIC	JPPLY TONAL LIN ATTON, CH CONVERT	Near <sup>-</sup> Hopper	- <b>-</b>	DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF	<del>7*22</del>			
	Kg. of Ele			2.20				ESTIMATED TOTAL NEW DESIGN OF ELECTRONICS:	%
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI			
ANALOG			20	40	40 0 0			35 %	
DIGITAL	40	40	50	0	0	10			
DISP W/CRT	┝────╋	0	0	0	0	0		WILL ELECTRONICS BE Above average dei	
DISPLAY	20	25	25	30	0	20			ю
XMTR	0	0	0	0	0	0			-
PWR SUP	0	0	0	0	0	0			
1 1	DESIGN E MODIFIC		O AN	·····	Ш м са м	<b>ATERIALS,</b> OMPONEN <sup>-</sup> ICROGRAV	PROC TS. SIG TTY E	SYSTEMS DO NOT EXIST SYSTEMS DO NOT EXIST SYSTEMS DO NOT EXIST	DUE TO
MODI SPAC	ERATE TO I	TO AN E) DESIGN	KISTING			EVELOPME ND/OR ELE	NT O	SPACE. REQUIRES THE F NEW MATERIALS, PROCES INIC COMPONENTS. STATE OF THE ART.	SES
EXIST ELEC IMPAC ENVIR	DESIGN FO ING MATER FRONIC CO TOUE TO IONMENT. ( EMS COMM	RIALS, PR MPONEN MICROGF GROUND	OCESSES TS. NO DE RAVITY BASED	ESIGN	L EX	XISTING ST	TATE	FNEW TECHNOLOGY WELL BE OF THE ART AND/OR MULT EQUIRED TO REACH THE GO	IPLE
	NEEDS SOF S HARDWA	ARE AVAI	ABLE W/			<b></b>			
	RENTLY A	VAILABLE		·			<b>w</b>		liGH

ISC 5-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES BIOMEDICAL FACILITY HARDWARE CATALOG	JUNE 15,
BMAC HARDWARE	EQUIPMENT NAME ELECTROENCEPHALOGRAPH MODULE	Page 1 of 4
DATA SHEET	HARDWARE ID. NO.: 7 ORIGINATOR: H. Nguyen	L
	VERSION : <u>01</u>	
ILLUSTRATI	ON	
		MANgo
DEFINITION		
	ed to measure and record neural electrical activities via electrodes p ad.	placed on
Current tech	IGN STATUS: Inology available. nent design is required.	
·····		

SC BIOMEDICAL MONITORIN S-35001 BIOMEDICAL FACILIT	G AND COUNTERMEASURES JUNE 15,1990 TY HARDWARE CATALOG
BMAC EQUIPMENT NAME: ELECTROENCEPH HARDWARE VER : 01	ALOGRAPH MODULE ID# 7 Page ORIGINATOR: H. Nguyen 2 of 4
GENERAL SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
Mass (kg): 7.5	Twenty four bio-electric signal channels input via differential
Height (m)	amplifiers impedance 10 mOhm.
Width (m)	Skin voltage tolerance: 500 mV or greater.
	Electrode selections are programmable up to 18 combinations.
Depth (m)	Electrode to skin contact impedance checking is displayed on CRT or LED.
Volume (m3):	Range from 1 to 10 KOhm and 10 to 100 KOhm.
Standby Power (W)	Remote control capability to enable one crew man operation
Operational Power (W) 25	
Peak Power (W)	
Power Source (VDC) 28 VDC	
RACK INTERFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
	Possible leakage of current to subject.
THERMAL:	
WASTE:	
ASSUMPTIONS/ JUSTIFICATIONS Operator must be properly trained.in this complex procedure. Wenty-four channels are available.	
QUANTITY REQUIRED: 2.5 SPECIFICATION	
HYSICAL DESCRIPTION:	
Digital readouts and controls are positioned horizon slide drawer to maximize its compact configuration	
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE W	/HERE AND HOW USED)
The EEG module will be used to collect bio-electrica when required. The EEG cap facilitates easy crew use.	al data to measure brain activity

BMAC E		AE: ELECTROENCEPHALOGRAPH MODULE 1D# 7 3 o
HARDWARE DATA SHEET	E <b>R</b> : 01	ORIGINATOR: H. Nguyen
CONSTRUCTION STRUCTURE/ME MATERIAL: aluminum TOTAL STRUCT/MI ACTIVE ELECTRON	CHANICS ECH WT. (EXCLU	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) electrical cable harness for electrodes surface electrodes gel
ESTIMATED TOTAL STRUCT/MECH COM		F ALL %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C	PCT. OF TOTAL STRUCT WEIGHT:	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE. NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
6	<u> </u>	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
6_	25 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN</li> <li>PRECISION MACHINED PARTS. MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	<ul> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> <li>CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES</li> </ul>
ADDITIONAL CO	MMENTS CON	CERNING STRUCT/MECH COMPONENT:

BMAC Hardware Data Sheet	I	IENT N				HARDWA				
	VEH : (	UIPMENT NAME: ELECTROENCEPHALOGRAPH MODULE       ID# 7       PAGE         R:01       ORIGINATOR: H. Nguyen       4 of 4								
TYPE OF	ELECTRO	ONICS:								
	IPS, AUDIO RF, SERV	0		DIGITAL GATES, R COMPUTE		*		DISPLAY WITH CRT		
TV, RA	MITTER DAR, COI ASER, ET	•		POWER SI CONVENT RECTIFIC/ & AC-DC (	'IONAL LIN ATION, CH	iear Iopper		DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS		
ELECTRONIC ELECTRONICS	DESCRIP 5 WEIGH	PTION B	Y PERC	ENTAGE	OF	<u> </u>			<u> </u>	
к	g. of Elec	ctronics		5.00				ESTIMATED TO NEW DESIGN O ELECTRONICS:	F	
Г	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI				
ANALOG			20	40	0	0		20 %		
DIGITAL	40	40	50	0	0	1 0				
DISP W/CRT	0	0	0	0	0	0		WILL ELECTRONI		
DISPLAY	20	25	25	30	0	20			_	
XMTR	0	0	0	0	0	0		O Yes	🔘 No	
PWRSUP	0	0	0	0	0	0				
11	DESIGN I MODIFIC IG SPACE		O AN	<del></del>	M LL CC MI	ATERIALS, DMPONEN CROGRAV	PRO TS. SI (ITY E	A SPACE. USES EXISTI CESSES, AND ELECTR GNIFICANT DESIGN IM NVIRONMENT. SYSTEMS DO NOT EXIS	ONIC PACT DUE 1	го
MODIFI	RATE TO E ICATION T -BASED DI	OANEX				id/or ele	ENT O	SPACE. REQUIRES TH F NEW MATERIALS, PF DNIC COMPONENTS. STATE OF THE ART.		
EXISTIN ELECTR IMPACT ENVIROI	SIGN FOR IG MATERI IONIC CON DUE TO M NMENT. G IS COMME	IALS, PRI IPONENT IICROGR ROUND E	OCESSES IS. NO DE AVITY BASED	SIGN		VELOPME	NT OF TATE	FNEW TECHNOLOGY W OF THE ART AND/OR EQUIRED TO REACH TH	MULTIPLE	D
ADDIT	EDS SOFT HARDWAF IONAL AU ENTLY AV	RE AVAIL TOMATIK	ABLE W/			_	w		Пнісн	



SC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	
BMAC HARDWARE	EQUIPMENT NAME: ELECTROMYOGRAPH	HMODULE ID# 8 Page 2 of 4
DATA SHEET	VER : 01 C	PRIGINATOR: J. Stephenson
	SPECIFICATIONS	PERFORMANCE         SPECIFICATIONS:           Solid         state         stimulator         with         low         impedance         of         isolated,         square
	4	wave voltage output.
Height (m)		Voltage, frequency, and duration are all independently adjustable.
Width (m)		Output wave form: 5 microseconds rise time 10 microseconds fall time
Depth (m)		Output impedance: 500 ohms on all ranges. Stimulus Frequency: single or continuous pulse from .2 to 250
Volume (m:	3):018	pulses/second in 3 ranges. Stimulus duration. 0.1 to 120ms in 3 ranges.
Standby Po	wer (W)	Frequency Response: .05 to 10kHz
Operational	Power (W)25	Time Constant: 3.2, 0.3, 0.03 seconds. Input Impedance: 10 megaohms differential,
Peak Power	r (W)	50 megaohms common mode
	rce (VDC) 28	Noise level: Less than 5 microvolts peak to peak.
RACK INTER		
ELECTRICAL		PROBLEMS/ISSUES AND CONCERNS FDA recommends the operation of this device to be restricted
THERMAL:		to physicians trained in diagnostic electro-myography. Risks include:
WASTE:		<ol> <li>Electrical shock.</li> <li>Misdiagnosis due to inaccurate measurements .</li> </ol>
FLUID:		3) Local burns and tissue damage.
DATA:		
	NS/ JUSTIFICATIONS signal is recorded, modulated, processed and stored e data will be recorded on VHS tape and down-linked	to ground control center for
QUANTITY R	EQUIRED: 2.5 SPECIFICATIONS	MARC I 🛛 MARC II 🔲 MARC III
PHYSICAL DES	CRIPTION:	
	art of the bio-potential measuring device located on the front panel.	system
FUNCTIONALD	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHE	ERE AND HOW USED)
	ill be used to test muscle degeneration win for further analysis.	eekly. Data will be down-linked to ground

	DUIPMENT NAM	IE: ELECTROMYOGRAPH MODULE ID# 8 3 o
HARDWARE DATA SHEET	E <b>R</b> : 01	ORIGINATOR: J. Stephenson
CONSTRUCTION STRUCTURE/ME		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) electrical cable harness for electrodes surface electrodes
aluminum		gel
TOTAL STRUCT/ME ACTIVE ELECTRON ESTIMATED TOTAL	NCS): <u>1.8</u> % NEW DESIGN O	<u>B</u> Kg
STRUCT/MECH CON	APONENTS: 3	30 %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C	PCT. OF TOTAL STRUCT WEIGHT:	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDE SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
26	100%	
	%	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIL</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	<ul> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> <li>CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES</li> </ul>
ADDITIONAL CO	DMMENTS CON	CERNING STRUCT/MECH COMPONENT:

ISC S-35001		BIO	MEDICA BIOMEI	L MONIT		AND COUN HARDWARI	TERMEASURES JUNE 15,199
BMAC Hardwari Data Shee					YOGRAPI	MODULE	ID# 8 PAGE R: J. Stephenson
	F ELECTR .OG RECEI <sup>N</sup> .MPS, AUD O, RF. SER	vers, 10		DIGITAL GATES, F COMPUT	REGISTER	is,	DISPLAY WITH CRT
TRAN	e, etc. Ismitter Radar, cc Laser, et			POWER S CONVENT RECTIFIC & AC-DC (	UPPLY FIONAL LII ATION, CI		DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS
ELECTRONIC	DESCRI	PTION B	Y PERC	ENTAGE	OF		
	Kg. of Ele		<del></del>	2.20			ESTIMATED TOTAL % NEW DESIGN OF
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI	ELECTRONICS:
ANALOG	40	40	20	40	0	0	35 %
DIGITAL	40	40	50	0	0	10	
ISP W/CRT	0	0	0	0	0	0	WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?
DISPLAY	20	25	25	30	0	20	
XMTR	0	0	0	0	0	0	• Yes O No
WR SUP	0	0	0	0	0	0	
SCOPE OF		FEFORT			NC		
	E MODIFIC NG SPACE		) AN			TERIALS, PR MPONENTS. CROGRAVITY	OR SPACE. USES EXISTING IOCESSES, AND ELECTRONIC SIGNIFICANT DESIGN IMPACT DUE TO Y ENVIRONMENT. D SYSTEMS DO NOT EXIST
MODIF	RATE TO E FICATION T E-BASED DI	O AN EXI			DE AN	VELOPMENT D/OR ELECTI	OR SPACE. REQUIRES THE OF NEW MATERIALS, PROCESSES RONIC COMPONENTS.
	ESIGN FOR NG MATERI						E STATE OF THE ART.
ELECTI IMPACT ENVIRC	RONIC CON FDUE TO M DNMENT. GI MS COMME	IPONENT: IICROGRA ROUND B	S. NO DE: VITY ASED	SIGN	EX	STING STAT	OF NEW TECHNOLOGY WELL BEYOND E OF THE ART AND/OR MULTIPLE REQUIRED TO REACH THE GOAL
ARDWARE N							
	HARDWAF					TWARE	
	ENTLY AV			- (La 1970ka 1974 C	/ 111/5/N	LOW	🔲 меріим 🔲 нісн

BMAC	EQUIPMENT NAME ELISA READER	Page 1 of 4
HARDWARE Data Sheet	HARDWARE ID. NO.: 31 ORIGINATOR: J. Stephenson VERSION : 1	
ILLUSTRATIO		
immunoassa	eader quantitatively analyzes levels of erythropoietin by enzyme linke y. It also has the capability to perform other ELISA tests such as cel globulin levels.	ed I activity

SC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILIT	AND COUNTERMEASURES JUNE 15,199 Y HARDWARE CATALOG
BMAC EC	UIPMENT NAME: ELISA READER	ID# 31 Page
DATA SHEET VE	<b>R</b> : 1	ORIGINATOR: J. Stephenson 2 of 4
GENERAL SPE	CIFICATIONS	PERFORMANCE SPECIFICATIONS:
Mass (kg):	<u>18</u>	Capable of processing twenty samples sequentially per batch.
Height (m)		Manual and automatic modes
Width (m)	.482	
Depth (m)		
Vol <b>ume (m3)</b> :		
Standby Power	(W)	
	wer (W)150	
Peak Power (W	)	
Power Source (		
RACK INTERFAC	E Rack Mounted?	
ELECTRICAL NO		PROBLEMS/ISSUES AND CONCERNS Modification is required for liquids used in this type of testing
THERMAL:		-
WASTE:		
FLUID:		
DATA:		
Calibration to be perfor	JUSTIFICATIONS ed to reduce crew requirements. med via commands from ground control center aintained at set temperature to prevent degrad	
QUANTITY REQI		MARC I MARC II 🔲 MARC III
PHYSICAL DESCRIF	PTION:	
Rack mounted ur	nit with:	
		1
1. Automated flui	d dispenser to wash enzymes betwe	en stages of the chemical process.
<ol> <li>Automated flui</li> <li>Servo-motor c</li> </ol>	d dispenser to wash enzymes betwe	en stages of the chemical process. Io manipulate samples between washes.
<ol> <li>Automated flui</li> <li>Servo-motor c</li> </ol>	d dispenser to wash enzymes betwe Iriven sample movement assembly t	en stages of the chemical process. to manipulate samples between washes.
<ol> <li>Automated flui</li> <li>Servo-motor c</li> <li>Light source</li> </ol>	d dispenser to wash enzymes betwe Iriven sample movement assembly t	o manipulate samples between washes.
<ol> <li>Automated flui</li> <li>Servo-motor c</li> <li>Light source</li> </ol> FUNCTIONAL DESC	d dispenser to wash enzymes betwe Iriven sample movement assembly f for colorimetric measurement.	io manipulate samples between washes. HERE AND HOW USED)
<ol> <li>Automated flui</li> <li>Servo-motor c</li> <li>Light source</li> </ol> FUNCTIONAL DESC	d dispenser to wash enzymes betwe Iriven sample movement assembly to for colorimetric measurement. RIPTION (DESCRIBE FULLY, INCLUDE WH	io manipulate samples between washes. HERE AND HOW USED)
<ol> <li>Automated flui</li> <li>Servo-motor c</li> <li>Light source</li> </ol> FUNCTIONAL DESC	d dispenser to wash enzymes betwe Iriven sample movement assembly to for colorimetric measurement. RIPTION (DESCRIBE FULLY, INCLUDE WH	io manipulate samples between washes. HERE AND HOW USED)
<ol> <li>Automated flui</li> <li>Servo-motor c</li> <li>Light source</li> </ol> FUNCTIONAL DESC	d dispenser to wash enzymes betwe Iriven sample movement assembly to for colorimetric measurement. RIPTION (DESCRIBE FULLY, INCLUDE WH	io manipulate samples between washes. HERE AND HOW USED)
1. Automated flui 2. Servo-motor c 3. Light source FUNCTIONAL DESC	d dispenser to wash enzymes betwe Iriven sample movement assembly to for colorimetric measurement. RIPTION (DESCRIBE FULLY, INCLUDE WH	io manipulate samples between washes. HERE AND HOW USED)
<ol> <li>Automated flui</li> <li>Servo-motor c</li> <li>Light source</li> </ol> FUNCTIONAL DESC	d dispenser to wash enzymes betwe Iriven sample movement assembly to for colorimetric measurement. RIPTION (DESCRIBE FULLY, INCLUDE WH	io manipulate samples between washes. HERE AND HOW USED)

HARDWARE	QUIPMENT NAME ER : 1	ELISA READER ID# 3 1 3 0 ORIGINATOR: J. Stephenson
CONSTRUCTION STRUCTURE/ME MATERIAL: aluminum TOTAL STRUCT/M ACTIVE ELECTROI	ECHANICS ECH WT. (EXCLUDI NICS): 16	Kg
ESTIMATED TOTAL STRUCT/MECH COI		) % -
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
6	<u> </u>	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
20	<u> </u>	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	<ul> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> <li>CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES</li> </ul>
ADDITIONAL CO	MMENTS CONC	ERNING STRUCT/MECH COMPONENT:

15-35001		BIO	MEDICAL BIOMED	. MONIT	ORING A	ND COU	NTEI RE (	RMEASURES JUNE 15,1 CATALOG
BMAC Hardware Data Shee	= ]			LISA REAL	DER			ID# 31 PAGE J. Stephenson 4 of 4
	ELECTR OG RECEIN MPS, AUDI O, RF, SERN E, ETC. ISMITTER MADAR, CO LASER, ET	/ERS, IO VO		COMPUTE POWER S CONVENT RECTIFIC	REGISTER ERS, ETC. UPPLY FIONAL LIN ATION, CH CONVERT	IEAR IOPPER		DISPLAY WITH CRT DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS
ELECTRONIC ELECTRONIC	C DESCRII CS WEIGH Kg. of Ele	IT	Y PERC	ENTAGE	OF			ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:
ANALOG DIGITAL	% TOTAL 25 40	%DISC 20	%IC 80 30	%LSI 0 7 0	%НҮВ 0	%VLSI		<u> </u>
DISP W/CRT DISPLAY	0 1 5	0	0 0	0 0	0 0 0	0 0 0		WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?
XMTR PWR SUP	0 20	0 0	0 0	0 100	0 0	0 0		O Yes
EXIST	DESIGN E MODIFIC ING SPACE	ATION TO BASED I	o an Design			ATERIALS, F MPONENT CROGRAVI ROUND BAS	PROC S. Sk ITY E SED S	SPACE, USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT. SYSTEMS DO NOT EXIST
MODI SPAC	FICATION T E-BASED D DESIGN FOR	O AN EX ESIGN	ISTING		DE AN	VELOPMEN D/OR ELEC	NT OI CTRC	SPACE. REQUIRES THE F NEW MATERIALS, PROCESSES ONIC COMPONENTS. STATE OF THE ART.
EXISTI ELECT IMPAC ENVIR	NG MATER RONIC CON T DUE TO N ONMENT. G	IALS, PRO IPONENT IICROGRI ROUND E	DCESSES 'S. NO DE AVITY BASED	SKGN	L EX	ISTING ST	ATE	NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL.
	EEDS SOFT HARDWAR TIONAL AU RENTLY AV	RE AVAIL/ TOMATIC	ABLE W/ 1				w	🗆 medium 🛛 High

BMAC		Pag
HARDWARE	EQUIPMENT NAME EXPERIMENT CONTROL COMPUTER SYSTEM	— 1 of
DATA SHEET		
	VERSION : 1	
ILLUSTRATIO		10-9D
downloading	nent Control Computer System provides acquisition, processing, s g of data generated by Life Sciences instrumentation and proced is used as a sequencer for experiment and inter-experiment contr	ures.
	BIGN STATUS: nodification to current computer technology	

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
BMAC	EQUIPMENT NAME: EXPERIMENT CONTR	
HARDWARE		DRIGINATOR: H. Nguyen
	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
	67	Must be capable of handling data produced from all Life Sciences experiments while being conducted simultaneously.
1		Must have adequate storage available. May have remote crew member interfaces (more than one
		monitor and keyboard)
	.073	
1	wer (W) 15	
1	Power (W) 250	
	(W)	
Power Source		
RACK INTERI	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		
THERMAL: WASTE:		
FLUID:		
DATA:		
ASSUMPTION	S/ JUSTIFICATIONS	
QUANTITY RE		
PHYSICAL DESC	RIPTION:	
A computer sy	stem with CRT, keyboard and disk drives	5.
FUNCTIONAL DE	SCRIPTION (DESCRIBE FULLY, INCLUDE WHEI	RE AND HOW USED)
This is the con experiments, c appropriate de	oordinating inter-experiment activities, p	es experiments. It drives the sequences of processing and routing data to the
		I

ВМАС	EQUIPMENT NAME:	EXPERIMENT CONTROL COMPUTER SYSTEM ID# 43 3 of
HARDWARE	VER : 1	ORIGINATOR: H. Nguyen
ACTIVE ELECTRO	MECHANICS MECH WT. (EXCLUDING DNICS): <u>59</u> K L % NEW DESIGN OF AL	ίg Ι.
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL MI S, STRUCT S	A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
8	75%	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
15	25 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL	OMMENTS CONCER	INING STRUCT/MECH COMPONENT:

ISC S-35001		BIO	MEDICAL BIOMED	MONIT	ORING A	ND COU HARDWA	INTER Re c	RMEASURES JUNE 15,19 CATALOG	990
BMAC Hardware Data Shee	:				IT CONTR	OL COMP	UTER		
		VERS,		DIGITAL		_ [	<b>⊠</b> . t	DISPLAY WITH CRT	
VIDEO	D, RF, SER E, ETC.			gates, r Compute		•			
	ISMITTER IADAR, CO LASER, E <sup>-</sup>			POWER SI CONVENT RECTIFIC, & AC-DC (	'IONAL LIN ATION, CH	<b>IOPPER</b>		DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele			8.00				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
ANALOG	% TOTAL	1 5	%IC 55	%LSI 30	%HYB 0	%VLSI 0	2	30 %	
DIGITAL	40	10	35	55	0	0			
DISP W/CRT	20	10	60	30	0	0		WILL ELECTRONICS BE OF	
DISPLAY	0	0	0	0	0	0		ABOVE AVERAGE DENSITY?	
XMTR	10	0	60	40	0	0	I	🔿 Yes 💿 No	
PWR SUP	10	20	80	0	0	0			
SCOPE OF	DESIGN	EFFORT	<u> </u>			W DESIGI	N FOR	SPACE. USES EXISTING	-
	E MODIFIC				CC MI	OMPONEN CROGRAV	TS. SK /ITY EI	CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT. SYSTEMS DO NOT EXIST	
MODI	ERATE TO I FICATION E-BASED [	TO AN EX				EVELOPME ID/OR ELE	ENT OF	SPACE. REQUIRES THE F NEW MATERIALS, PROCESSES INIC COMPONENTS. STATE OF THE ART.	
EXIST ELECI IMPAC	Design fo Ing Matef Tronic Co It due to I	RIALS, PR MPONEN <sup>-</sup> MICROGR	OCESSES TS. NO DE AVITY			VELOPME		NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE	
SYSTE	ONMENT. ( EMS COMM		Y AVAILAE	BLE				QUIRED TO REACH THE GOAL	
ADD 🛛	IEEDS SOF 3 HARDWA ITIONAL AU RENTLY A'	RE AVAIL	ABLE W/ ON REQU				ow	🗆 меріцм 🛛 нісн	
					GE - 64				,

BMAC Hardware	EQUIPMENT NAME FLOW CYTOMETER	Page
DATA SHEET		1 of 4
ILLUSTRATIO	N	
The Flow Cyte	t used to perform primarily DNA analysis. ometer features a unique flow chamber with epi-illumination and hotomultiplier tubes.	
	AN STATUS:	

ISC LS-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	ND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
ВМАС	EQUIPMENT NAME: FLOW CYTOMETER	ID# 32 Page 2 of 4
HARDWARE	VER : 1 0	RIGINATOR: H. Nguyen
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS: Mercury arc lamp (100 watt)
	36	Flow chamber design produces stable flow. Back wash system using air burst injection
		Self aligning optic system with remote control capabilities. Differential pressure head
		Non achromatic condenser allows heat dissipation without heat filter, saving 20% of light intensity.
Depth (m)		Solid state photodiode and photomultiplier tube are used interchangeably, depending on the required sensitivity.
Volume (m	3):303	All Iluids, waste, and components are housed in one
Standby Po	ower (W)	containment unit.
Operational	Power (W) 250	
	r (W)	
	rce (VDC) 28	
RACK INTER	RFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		Fluids waste diposal management Mercuric arc lamp poses the hazard of contamination
THERMAL:		on-board .
WASTE: FLUID:		4
DATA:		
ASSUMPTIO Need for cytomet	NS/ JUSTIFICATIONS er for cell analysis on Space Station.	
QUANTITY PHYSICAL DES		
The self-con Unit will be p not exceed 2	ntained unit will fit into a standard 19" rad powered by 28VDC at a maximum of 25 a 250 Watts.	ck on slides for access. amps and the total power shall not
FUNCTIONAL	DESCRIPTION (DESCRIBE FULLY, INCLUDE WH	IERE AND HOW USED)
This instrum automation Manual adiu	ent is used primarily for DNA analysis.	The design requirements puts emphasis on nize crew time. mponents are controlled and adjusted by software

BMAC Hardware Data Sheet	EQUIPMENT NAME: VER : 1	FLOW CYTOMETER ID# 3 2 PAC ORIGINATOR: H. Nguyen
ACTIVE ELECTRO	ECHANICS IECH WT. (EXCLUDING NICS): <u>31</u> Kg	an control, clopper motors, micrometer positioning
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C 25		ECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR         CH CONFIGURATION:         A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         SUPPORT STRUCTURE, NO MOVING PARTS         CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES         STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
70	<u>35</u> %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
DDITIONAL CO		C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES  NG STRUCT/MECH COMPONENT:

BMAC HARDWARE Ata Sheet	EQUIPM		ME: FLC	W CYTON		IGINATOR:	ID# 32 PAGE H. Nguyen
TYPE OF	ELECTRO	NICS:					
	1PS, AUDK , RF, SERV	2	- 0	IGITAL ATES, RE OMPUTEI		, <b>X</b>	DISPLAY WITH CRT
TV, R/	SMITTER ADAR, CO _ASER, ET		C F	OWER SU CONVENTI RECTIFICA AC-DC C	ONAL LIN TION, CH	opper	DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS
ELECTRONIC			Y PERC	ENTAGE	OF		ESTIMATED TOTAL %
	Kg. of Ele	ctronics		5.00			NEW DESIGN OF ELECTRONICS:
	% TOTAL	%DISC	%IC	%LSI	%НҮВ	%VLSI	30 %
ANALOG	20	30	20	30	20	0	70
DIGITAL	30	20	20	50	0	10	WILL ELECTRONICS BE OF
DISP W/CRT	<b>├</b> ──── <b>†</b>	10	20	50	20	0	ABOVE AVERAGE DENSITY?
DISPLAY	0	0	0	0	0	0	🔿 Yes 💿 No
XMTR PWR SUP	10	0 40	0 40	0	0 20	0	
LT EXIS	F DESIGN	ICATION <sup>-</sup> CE-BASED	fo an Design			IATERIALS, PF COMPONENTS IICROGRAVIT SROUND BASE	OR SPACE. USES EXISTING ROCESSES, AND ELECTRONIC . SIGNIFICANT DESIGN IMPACT DUE TO Y ENVIRONMENT. D SYSTEMS DO NOT EXIST OR SPACE. REQUIRES THE
MOE SPA	)IFICATION CE-BASED	I TO AN E DESIGN	XISTING			ND/OR ELEC	T OF NEW MATERIALS, PROCESSES TRONIC COMPONENTS. THE STATE OF THE ART.
EXIS ELEC IMPA ENVI	DESIGN FO TING MATE TRONIC C ACT DUE TO RONMENT TEMS COM	ERIALS, PI OMPONEI OMICROG , GROUNE	ROCESSE NTS. NO [ RAVITY ) BASED	DESIGN		XISTING STA	T OF NEW TECHNOLOGY WELL BEYOND ATE OF THE ART AND/OR MULTIPLE S REQUIRED TO REACH THE GOAL.

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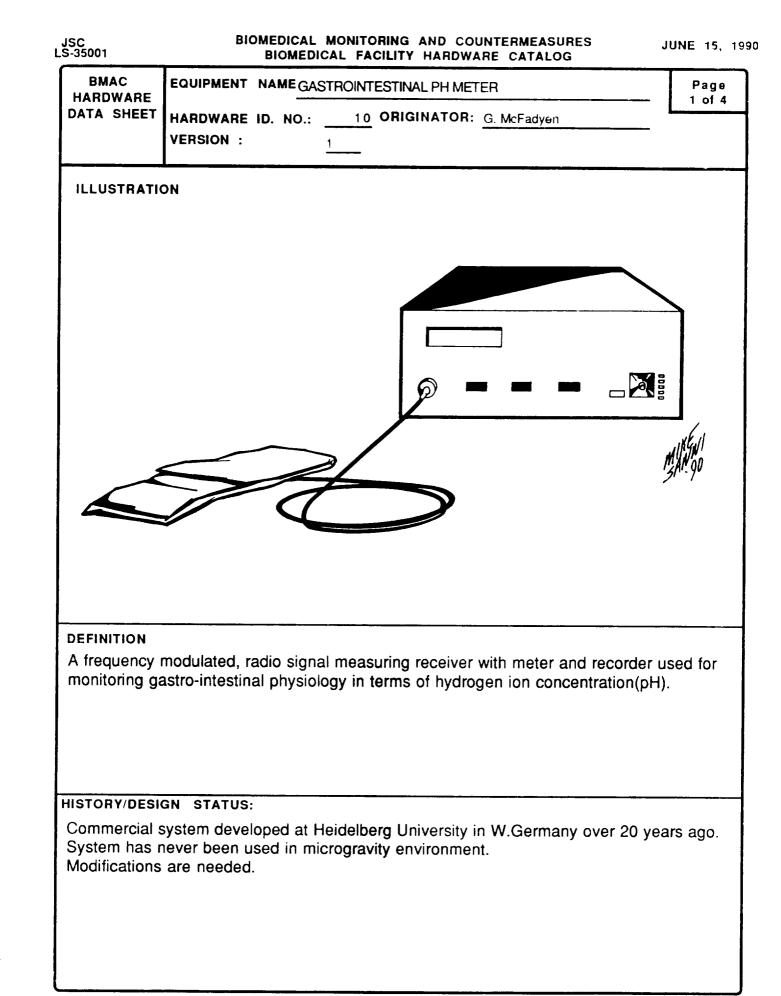
BMAC Hardware Data Sheet	
	EQUIPMENT NAME FUNDUS CAMERA Part 1 o
DATA SHEET	HARDWARE ID. NO.: 15 ORIGINATOR: H. Nguyen
ILLUSTRATIO	SN
pupil). The Fundus (	instrument used in examining the fundus (the part of the eye opposite the Camera utilizes either a camera pack for still photographic recording, erface for observing live retinal images.
A hand-held i pupil). The Fundus (	Camera utilizes either a camera pack for still photographic recording, erface for observing live retinal images.
A hand-held i pupil). The Fundus ( or a video inte HISTORY/DESIG The fundus ca	Camera utilizes either a camera pack for still photographic recording, erface for observing live retinal images.

SC BIOMEDICAL MONITORING LS-35001 BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG					
BMAC EQUIPMENT NAME: FUNDUS CAMERA	ID# 15 Page 2 of 4					
DATA SHEET VER : 1	DRIGINATOR: H. Nguyen					
GENERAL SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:					
Mass (kg):2	Must be capable of capturing high quality black & white and/or color images of the retinal					
Height (m)	area. Must contain a continuous light source for video					
Width (m)05	and digital imaging and a flash source for photography.					
Depth (m)	Must interface with video system and image digitizing system.					
Volume (m3):						
Standby Power (W)						
Operational Power (W)						
Peak Power (W)						
Power Source (VDC) battery						
RACK INTERFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS					
	For best results, the subject's head should be					
THERMAL:						
WASTE:	] [					
FLUID:         Image: Constraint of the second						
ASSUMPTIONS/ JUSTIFICATIONS The camera interfaces directly with the image digitizing system. Due to the odd shape of the camera, volume is calculated based on the Dimensions are based on video configuration.	largest dimensions.					
QUANTITY REQUIRED: 2.5 SPECIFICATIONS	MARC I 🔀 MARC II 🔲 MARC III					
PHYSICAL DESCRIPTION:	1					
The camera is a compact, light-weight, battery power An adaptor plate on the back of the camera allows for interface. A miniature light source just below the le	or still (35mm) or video (CCTV)					
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHI	ERE AND HOW USED)					
The camera is held close to the crew member's eye and	d photographs or sends video images of					
the retina to a video system and/or digitizing system.						

HARDWARE	<b>VER</b> : 1	ORIGINATOR: H. Nguyen
ACTIVE ELECTR	MECHANICS MECH WT. (EXCLUDING ONICS): <u>1.7</u> Kg AL % NEW DESIGN OF ALL	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) batteries lens, prism and mirror miniature lamp miniature strobe
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS ETC.) OF EACH A/B/C 5 30	TOTAL MEC	CK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR   CK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR   CONFIGURATION:   A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED   SUPPORT STRUCTURE, NO MOVING PARTS   CONTAINMENT STRUCTURE, NO MOVING PARTS   CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES   STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES   B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.   NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM   PRECISION MACHINED PARTS, MANY MOVING PARTS   OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION   C. LAMINATED STRUCTURAL COMPOSITES   LAID UP FLAT SURFACE WITH STIFFENERS   STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY
		CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
Stabilization o	f camera and head restr	aint may be required for quality images.

BMAC Hardwar Data Shee	C	MENT N			AMERA			ID# 15 PAGE H. Nguyen
	F ELECT							
OP A VIDE	LOG RECE MPS, AUD O, RF, SER E, ETC.	010		DIGITAL GATES, F COMPUT	REGISTER ERS, ETC	RS,		DISPLAY WITH CRT
	NSMITTER RADAR, CO LASER, E	DMM,		POWER S CONVEN <sup>-</sup> RECTIFIC & AC-DC (	FIONAL LI ATION, CI	HOPPER	<b>•</b>	DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS
	C DESCRI		BY PERC	ENTAGE	OF			
	Kg. of Ele			0.30				ESTIMATED TOTAL % NEW DESIGN OF
	% TOTAL	. %DISC	%IC	%LSI	%НҮВ	%VLSI		ELECTRONICS:
ANALOG	30	10	10	80	0	0		10 %
DIGITAL	50	10	75	5	5	5		
SP W/CRT	20	o	40	20	0	40		WILL ELECTRONICS BE OF
ISPLAY	0	0	0	0	0	0		ABOVE AVERAGE DENSITY?
MTR	0	0	0	0	0	0		🔿 Yes 💿 No
WRSUP	0	о	0	0	0	0		
SCORE OF								
SCOPE OF	E MODIFIC		) AN			NTERIALS, MPONEN CROGRAV	PROC TS. SIC 'ITY EN	SPACE. USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO VVIRONMENT. YSTEMS DO NOT EXIST
MODIF	RATE TO E FICATION T E-BASED D	O AN EXI ESIGN	ISTING		DE AN	VELOPME D/OR ELE	NT OF	SPACE. REQUIRES THE NEW MATERIALS, PROCESSES NIC COMPONENTS. STATE OF THE ART.
EXISTIN	ESIGN FOR	IALS, PRC	CESSES.					
ELECTF IMPACT ENVIRC	RONIC CON DUE TO M DNMENT. G MS COMME	APONENT IICROGRA ROUND B	S. NO DES WITY ASED	GN	EX	ISTING ST	ATE C	NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE QUIRED TO REACH THE GOAL
ARDWARE NE	EDS SOFT HARDWAF IONAL AU	RE AVAILA	BLE W/T		IRED SOF	TWARE		
CURR	ENTLY AV	AILABLE				🔲 ца	W	MEDIUM 🗍 HIGH

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ISC LS-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	
BMAC	EQUIPMENT NAME: GASTROINTESTINAL	
HARDWARE	VER : 1 O	RIGINATOR: G. McFadyen
GENERAL S Mass (kg): Height (m) Width (m) Depth (m) Volume (m) Standby Po Operational Peak Power	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:         Frequency 1.9 - 2.0 Mega Herzt         Range       1.0 - 7.0 pH         Capsule battery life       20 hours         Sensitivity       10 KHz/pH         Accuracy       +- 0.5 pH         PROBLEMS/ISSUES AND CONCERNS         Capsule is excreted in feces and may cause problem with waste management system.         Capsule needs to be calibrated in pH2 and pH7 solutions at 37 degrees Centigrade prior to use.         Current design requires subject to be connected to control unit via belt.         Possible RFI problems due to transmitter system requiring
ASSUMPTION This system provic Capsule is not re-u QUANTITY R PHYSICAL DESC Capsule is de Receiving bel	IS/ JUSTIFICATIONS les in-vivo pH measurements in the gastrointestinal to isable. EQUIRED: 2.5 SPECIFICATIONS	/Silver Chloride battery and transistor.
· · · · · · · · · · · · · · · · · · ·	·····	
	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHE	, , , , , , , , , , , , , , , , , , ,
Receiving bell printer and me	antenna is connected to control unit, white the antenna is connected to control unit, white the antenna is connected to control unit, white the antenna is connected to control unit, white an term of the control unit, and the control unit, white an term of the control unit, white an term of the control unit, and the control unit, white an term of the control unit, and the control unit, white an term of the control unit, and the control u	enna. Transmitted frequency is related to pH. ich calculates the pH and displays results on act and is excreted in feces. er and transmitted to ground control center as

HARDWARE	RUIPMENT NA	ME: GASTROINTESTINAL PH METER ID# 1 0 3 of ORIGINATOR: G. McFadyen
CONSTRUCTION ( STRUCTURE/ME( MATERIAL: Sheet metal/alumin	CHANICS	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) batteries power supply meter capsule
TOTAL STRUCT/ME ACTIVE ELECTRONI ESTIMATED TOTAL % STRUCT/MECH COMP	CS):29.	<u>9</u> Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C 20	PCT. OF TOTAL STRUCT WEIGHT: 84%	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
7	<u> </u>	B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.     NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM     PRECISION MACHINED PARTS, MANY MOVING PARTS     OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY

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LS-35001						ND COUN		MEASURES JUNE 15,199 ATALOG	0
BMAC Hardware Data Sheet	1	EQUIPMENT NAME: GASTROINTESTINAL PH METERID# 10PAGEVER : 1ORIGINATOR: G. McFadyen4 of 4							
ANALOG RECEIVERS, DIGITAL DISPLAY WITH CRT OP AMPS, AUDIO GATES, REGISTERS, VIDEO, RF, SERVO COMPUTERS, ETC. DRIVE, ETC.									
<ul> <li>TRANSMITTER TV, RADAR, COMM, NAV, LASER, ETC.</li> <li>POWER SUPPLY CONVENTIONAL LINEAR RECTIFICATION, CHOPPER &amp; AC-DC CONVERTERS</li> <li>DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS</li> </ul>									
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele	octronics		1.90				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
ANALOG	% TOTAL	4 0	%IC 60	%LSI 0	%НҮВ 0	%VLSI		35 %	
DIGITAL	0	0	00			<u> </u>			
DISP W/CRT		20	40	0 40	0 0	0		WILL ELECTRONICS BE OF	
DISPLAY	0	0	40	40	0	0		ABOVE AVERAGE DENSITY?	
XMTR	30	10	55	25	0	10		🔿 Yes 💿 No	
PWR SUP	15	30	70	0	0	0			
SCOPE OF	DESIGN	EFFORT	·		N	EW DESIGI		SPACE. USES EXISTING	
	E MODIFI	CATION T	OAN		C M	OMPONEN ICROGRAV	TS. SK /ITY E	CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT. SYSTEMS DO NOT EXIST	
MODERATE TO EXTENSIVE MODIFICATION TO AN EXISTING SPACE-BASED DESIGN									
AT OR NEAR THE STATE OF THE ART. AT OR NEAR THE STATE OF THE ART. AT OR NEAR THE STATE OF THE ART. DEVELOPMENT OF NEW TECHNOLOGY WELL BEYOND ELECTRONIC COMPONENTS. NO DESIGN IMPACT DUE TO MICROGRAVITY ENVIRONMENT. GROUND BASED SYSTEMS COMMERCIALLY AVAILABLE									
	NEEDS SON S HARDWA DITIONAL A RRENTLY A	ARE AVAIL	ABLE W/	JIREMEN'		<u> </u>	ow	🔲 меріим 🔲 нісян	

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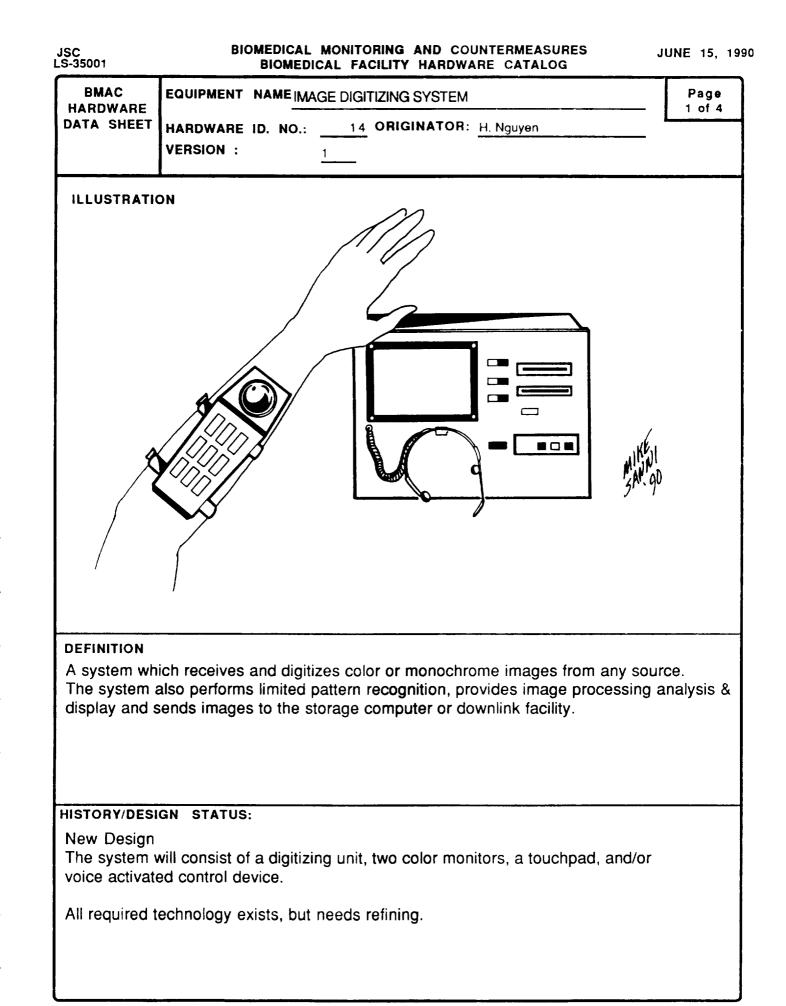
BMAC Hardware	EQUIPMENT NAME GONIOMETER AND RECORDER	Page 1 of 4
DATA SHEET	HARDWARE ID. NO.: 19 ORIGINATOR: J. Stephenson VERSION : 1	
ILLUSTRATI	DN	
	The second secon	
Uncalibrated the Physiolog	nt used to detect variations in the range of motion of major joints. signals will be recorded on a portable recorder and periodically gical Bio-potential Recorder for signal conditioning, modulation, downlinked to ground control center for further analyses.	r transferred to
Modification	IGN STATUS: of current technology hent design is required.	

ISC LS-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	
BMAC	EQUIPMENT NAME: GONIOMETER AND RE	CORDER ID# 19 Page 2 of 4
HARDWARE	VER : 1 0	RIGINATOR: J. Stephenson
GENERAL S Mass (kg): Height (m) Width (m) Depth (m) Volume (m Standby Po	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS: Measurement of angle adjustments. Accuracy: +- 3 degrees Streamlined protractor strapped on subject's legs for minimal interference with daily activities.
Peak Power Power Sour RACK INTER	r (W)	PROBLEMS/ISSUES AND CONCERNS
Battery will be use QUANTITY R	by the Physiological Bio-potential Recorder ad to record data and then transmitted to above reco REQUIRED: 2.5 SPECIFICATIONS	rder for translation.
	CRIPTION: le instrument with photoelectric sensing raps for connection to limb.	device for measurement.
An instrumen microgravity.	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHI t used to measure the range of motion o Recording is performed by a battery-po a is loaded into the Bio-potential recorde	f joints (angles) of crew members in wered portable recorder, attached to subject's

BMAC	EQUIPMENT NA	ME: GONIOMETER AND RECORDER ID # 19 3 of
HARDWARE	<b>VER</b> : 1	ORIGINATOR: J. Stephenson
CONSTRUCTIO STRUCTURE/I		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) battery
MATERIAL: aluminum		
ACTIVE ELECTR	-	<u>1</u> Kg
ESTIMATED TOTA STRUCT/MECH C	NL % NEW DESIGN C OMPONENTS:	0F ALL 25 %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL S, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
6	<u> </u>	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
32	<u> </u>	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMINATE PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL C	OMMENTS CON	ERNING STRUCT/MECH COMPONENT:

JSC LS-35001						ND COUN		MEASURES ATALOG	JUNE 15,1990
BMAC Hardware Data Sheet	VED		ME: GC	DNIOMETE			DR: J	ID <b># 1</b> . Stephenson	9 PAGE 4 of 4
	ELECTRO OG RECEIV MPS, AUDI	ÆRS,		DIGITAL GATES, RI	EGISTED		<b>]</b> , D	DISPLAY WITH CRT	
	, RF, SER\			COMPUTE		5,			
TV, R/	SMITTER Adar, Co _Aser, Et			POWER SU CONVENT RECTIFIC/ & AC-DC C	'IONAL LIN ATION, CH	iear <sup>-</sup> Iopper	i	DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele			3.90				ESTIMATED TOT NEW DESIGN OF ELECTRONICS:	AL %
ANALOG	% TOTAL 30	%DISC 25	%IC 75	%LSI 0	%HYB 0	%VLSI		40 %	
DIGITAL	35	75	25	0	0	0			
DISP W/CRT	0	0	0	0	0	0		WILL ELECTRONIC	
DISPLAY	20	90	10	0	0	0		ABOVE AVERAGE	DENSITY?
XMTR	0	0	0	0	0	0		O Yes	● No
PWR SUP	15	75	25	0	0	0			
SCOPE OF	DESIGN	EFFORT	·					SPACE. USES EXISTIN	-
	E MODIFIC	CATION T	O AN		Ci M	OMPONEN ICROGRAV	TS. SK /ITY EI	CESSES, AND ELECTRO GNIFICANT DESIGN IMP NVIRONMENT. SYSTEMS DO NOT EXIST	ACT DUE TO
MODI	ERATE TO FICATION E-BASED [	TO AN EX			ILI DI Al	evelopme ND/OR ele	ENT OF	SPACE. REQUIRES THE F NEW MATERIALS, PRO INIC COMPONENTS. STATE OF THE ART.	
EXIST ELECI IMPAC ENVIR	DESIGN FO ING MATEI IRONIC CC T DUE TO ONMENT. ( EMS COMM	rials, pr Mponen Microgf Ground	IOCESSE TS. NO DI AVITY BASED	esign		EVELOPME KISTING S		NEW TECHNOLOGY WE OF THE ART AND/OR NEQUIRED TO REACH TH	NULTIPLE
	IEEDS SOF S HARDWA ITIONAL A RENTLY A	RE AVAIL	.ABLE W/ ON REQU				OW		] нюн

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		HARDWARE CATALOG				
BMAC	EQUIPMENT NAME: IMAGE DIGITIZING S					
HARDWARE Data Sheet	VER:1	DRIGINATOR: H. Nguyen				
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:				
Mass (kg):		Must meet NTSC standards of 30 frames per second. The option between black and white or color images must be				
Height (m)		available. Voice recognition/activation required.				
Width (m)		Section between 512x512 or 1024x1024 processing capability.				
Depth (m)						
Volume (m	.090					
Standby Po	ower (W)					
Operational	Power (W) 500					
Peak Powe	or (W)					
Power Sou	rce (VDC) 28					
RACK INTER	RFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS				
ELECTRICAL		Storage space is a major concern for the expected large				
THERMAL:		numbers of digital images to be produced. Adequate downlink rates and times between the event				
WASTE:		and ground evaluation are also needed. Training of voice recognition system needs				
FLUID:		simplification.				
DATA:		Compatible bus interlace 1553				
ASSUMPTIO	NS/ JUSTIFICATIONS					
Video input into ti	he system will occur through a direct interlace port or hrough video ports in the back of the racks.	a the front of the panel				
Video input into ti	REQUIRED: 2.5 SPECIFICATIONS					
Video input into the system or the system of the System of the System of the PHYSICAL DES	REQUIRED: 2.5 SPECIFICATIONS	☐ MARC I ⊠ MARC II ☐ MARC III ptical disk ports, two 9 in.				
Video input into the system or the system of the System of the PHYSICAL DES The system in diagonal colors.	REQUIRED: 2.5 SPECIFICATIONS CRIPTION:	MARC I MARC II MARC III				

BMAC Hardware Data Sheet	_	ME: IMAGE DIGITIZING SYSTEM ID# 14 ORIGINATOR: H. Nguyen
CONSTRUCTIO STRUCTURE/I MATERIAL: aluminum	MECHANICS	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) color monitors two optical storage units two optical storage unit cartridge fan voice activation system infrared touchpad 8 Kg
	AL % NEW DESIGN O	40 %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS ETC.) OF EACH A/B/C	TOTAL TS, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
14	<u> </u>	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
20	<u>75</u> %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES

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SC S-35001		BIO	MEDICA BIOME	L MONIT		AND COU	UNTE ARE	RMEASURES CATALOG	JUNE 15,1
BMAC Hardwari Data Shee	= [			MAGE DIG	ITIZING S	YSTEM			14 PAGE 4 of 4
	MPS, AUD O, RF, SER E, ETC. ISMITTER	VERS, HO VO		DIGITAL GATES, F COMPUTI POWER S CONVENT	ers, etc. Upply	IS,		DISPLAY WITH CRT	
	ADAR, CO LASER, E			RECTIFIC & AC-DC (	ATION, CH	<b>IOPPER</b>		LED'S LIQUID CRYSTAL PRINTERS	5
ELECTRONIC ELECTRONIC	DESCRI	PTION E	BY PERC	ENTAGE	OF				
	Kg. of Ele	ectronics		3.00				ESTIMATED T NEW DESIGN	OF
	% TOTAL	. %DISC	%IC	%LSI	%HYB	%VLSI	ł	ELECTRONICS	S:
ANALOG	15	25	75	0	0	0			%
DIGITAL	60	0	0	20	30	50			
DISP W/CRT	10	0	0	100	0	0		WILL ELECTRON	
DISPLAY XMTR	0	0	0	0	0	0		Yes	
		0	0	0	0	0		<b>U</b> 163	
PWR SUP	15	0	0	100	0	0			
SCOPE OF	DESIGN	EFFORT	·.		NF	WDESIG		SPACE. USES EXIST	
	E MODIFIC		O AN		M LL CC MI	ATERIALS, DMPONEN CROGRAV	, PRO TS. SI /ITY E	CESSES, AND ELECTI GNIFICANT DESIGN II NVIRONMENT. SYSTEMS DO NOT EX	RONIC MPACT DUE TO
MODI	FICATION FICATION E-BASED D	TO AN EX				VELOPME	ENT O	SPACE. REQUIRES T F NEW MATERIALS, F NIC COMPONENTS. STATE OF THE ART	PROCESSES
	ESIGN FOR			AND					
ELECT IMPAC ENVIRO	RONIC CON T DUE TO N DNMENT. G MS COMM	MPONENT AICROGR ROUND E	IS. NO DE AVITY BASED	Sign		ISTING ST	TATE	NEW TECHNOLOGY OF THE ART AND/OF EQUIRED TO REACH 1	RMULTIPLE
ARDWARE N				<u> </u>					
ADDI	HARDWAI TIONAL AU	TOMATIC	ON REQU					5	
CURF		AILABLE					WC		Пнісн

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BMAC	EQUIPMENT NAME IMPEDANCE METER	Page
HARDWARE Data Sheet	HARDWARE ID. NO.: 500 ORIGINATOR: G. McFadyen	1 of 4
	VERSION : 1	
ILLUSTRATI	ON	
	O O O O O O O O O O O O O O O O O O O	
DEFINITION A device us	ed to ensure low impedance when measuring bio-electrical impulses.	

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 -
BMAC Hardware Data Sheet	EQUIPMENT NAME: IMPEDANCE METER	
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
	3.76	Rapid assessments of applied electrodes through touch
		control electronics (36 seconds for 36 electrodes).
		LED indicators of impedances above preset values (5,10,20, or 30 KOhm)
Depth (m)		LCD displays of electrode impedances from 100-200.000 Ohms
Volume (m3	3):018	Hand-held portable device.
Standby Por	wer (W)	-
1	Power (W)	
1	(W)	-
Power Sour		
RACK INTER		-   -
FLECTRICAL		PROBLEMS/ISSUES AND CONCERNS Will batteries be disposable or rechargable?
THERMAL:		
WASTE:		
FLUID:		-
DATA:		
ASSUMPTION Device will be used Modification to exis	to check resistances on all biomedical surface electr	rodes.
QUANTITY RI	EQUIRED: 2.5 SPECIFICATIONS	
PHYSICAL DESC		
Box containing Also consists at proper freq	g electronic meter (analog or LED) to d of power switch, batteries, attachment le uency.	isplay reading.,
		-
FUNCTIONAL DE	SCRIPTION (DESCRIBE FULLY, INCLUDE WHE	RE AND HOW USED)
The leads attac	ch to electrodes mounted on the skin. W	tage is measured to determine the impedance.
Used for ECG, E	EMG, EEG, and EOG electrodes.	
		-

HARDWARE	/ER : 1	E: IMPEDANCE METER ID#500 3 of
DATA SHEET	<b>EN</b> :1	ORIGINATOR: G. McFadyen
	ECHANICS ECH WT. (EXCLUDI	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) batteries meter circuitboard box
ACTIVE ELECTRON ESTIMATED TOTAL STRUCT/MECH CON	% NEW DESIGN OF	5
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C 20		CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:  A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED  SUPPORT STRUCTURE, NO MOVING PARTS  CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES  STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
25	<u> </u>	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	% [	C. LAMINATED STRUCTURAL COMPOSITES   LAID UP FLAT SURFACE WITH STIFFENERS  STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES  STRUCT/MECH COMPONENT:

JSC LS-35001						ND COUN		MEASURES J	UNE 15,1990
BMAC Hardware Data Sheet	VED .		ME: IM	PEDANCE		RIGINATO	DR: G	ID# ;00 6. McFadyen	PAGE 4 of 4
	XG RECEIV 1PS, AUDI 1, RF, SERV	iers, o /o MM,		DIGITAL GATES, RI COMPUTE POWER SL CONVENT RECTIFICA & AC-DC C	RS, ETC. JPPLY IONAL LIN ATION, CH	NEAR HOPPER		DISPLAY WITH CRT DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC		IT	Y PERC	ENTAGE 1.06	OF			ESTIMATED TOTAL NEW DESIGN OF	- %
ANALOG	% TOTAL 0	%DISC	%IC 0	%LSI 0	%НҮВ 0	%VLSI 0		ELECTRONICS:	
DIGITAL DISP W/CRT	30 0	50 0	50 0	0	0 0	0 0		WILL ELECTRONICS Above average D	
DISPLAY XMTR	70 0	0 0	100 0	0	0 0	0 0		O Yes	) No
PWR SUP	0	0	0	0	0			SPACE. USES EXISTING	
	DESIGN E MODIFI ING SPAC	CATION T	O AN			ATERIALS, COMPONEN (ICROGRA)	PROC TS. SH /ITY E	CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPAC INVIRONMENT. SYSTEMS DO NOT EXIST	
MODI	ERATE TO FICATION E-BASED I	TO AN E				EVELOPMI ND/OR ELE	ENT O	RSPACE. REQUIRES THE F NEW MATERIALS, PROC DNIC COMPONENTS. E STATE OF THE ART.	ESSES
EXIST ELECT IMPAC ENVIR	DESIGN FC ING MATE IRONIC CC T DUE TO CONMENT. EMS COMM	RIALS, PF DMPONEN MICROGI GROUND	ROCESSE ITS. NO DI RAVITY BASED	ESIGN		XISTING S	TATE	F NEW TECHNOLOGY WELL OF THE ART AND/OR MU EQUIRED TO REACH THE (	LTIPLE
		ARE AVAI	LABLE WA				ØW		нісн

JSC LS-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES BIOMEDICAL FACILITY HARDWARE CATALOG	UNE 15, 1
BMAC Hardware	EQUIPMENT NAME INCUBATOR-CENTRIFUGAL	Page
DATA SHEET	HARDWARE ID. NO.: 25 ORIGINATOR: G. McFadyen	1 of 4
ILLUSTRATIO		)
DEFINITION Equipment for	the mitogenic stimulation assay to simulate a 1g environment in space	9.
IISTORY/DESIG Extensive mod centrifuge is re	ification of incubator cell attachment test (ICAT) apparatus to incorport	ate 1g

-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,199 HARDWARE CATALOG
BMAC Ardware	EQUIPMENT NAME: INCUBATOR-CENTRI	2 01 4
ATA SHEET	VER:1	ORIGINATOR: G. McFadyen
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS: Temperature Control: 37 degrees C.
Mass (kg):	12	Chamber Rotates to Produce 1g. Chamber is sealed during operation to contain carbon dioxide
Height (m)		and/or mitogen.
Width (m)		
Depth (m)		
Volume (m	3):	
Standby Po	wer (W)	
Operational	Power (W) 500	
Peak Powe	r (W)	
Power Sou	rce (VDC) <u>28</u>	
RACK INTER	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		Carbon dioxide must be supplied and disposed of. Mitogen must be contained.
THERMAL:		
WASTE:		-
FLUID: DATA:		-
ASSUMPTIO Ilhough based o QUANTITY	n ICAT, requirements are sufficiently different to requ	
PHYSICAL DE	SCRIPTION:	
Unit contain introducing	s holders for cell culture vessels, centri CO2 during centrifugation.	fuge arms and motor,heater, and mechanism for
Name of Concession, 1997		
	DESCRIPTION (DESCRIBE FULLY, INCLUDE W	
Produces 1 includes CO	g at 37 degrees with controlled environr 2 and mitogen.	nent to culture cells. Controlled environment

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BMAC Hardware Data Sheet		AME: INCUBATOR-CENTRIFUGAL ID# 25 3 o ORIGINATOR: G. McFadyen
CONSTRUCTION STRUCTURE/M MATERIAL: aluminum TOTAL STRUCT/M ACTIVE ELECTRO ESTIMATED TOTAL STRUCT/MECH CO	IECHANICS /IECH WT. (EXCL )NICS): 	<u>13</u> Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C 20	PCT. OF TOTAL STRUCT WEIGHT: <u>60</u> %	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
30	<u>40</u> %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS. BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL CO	MMENTS CON	ICERNING STRUCT/MECH COMPONENT:

BMAC Ardware Ata Sheet			ME: ING	CUBATOR			<b>R</b> : G		AGE of 4
TYPE OF	ELECTRO	DNICS:							
	IPS, AUDK , RF, SERV	C	- (	DIGITAL GATES, RE COMPUTE		s, 🗆	· D	ISPLAY WITH CRT	
<b>TV</b> , R/	Smitter Adar, Co Aser, Et		ſ	POWER SU CONVENT RECTIFICA & AC-DC C	IONAL LIN ATION, CH	iear — Iopper	" L	DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
			Y PERC	ENTAGE	OF				
	Kg. of Ele	ctronics		-1.00				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI			
ANALOG	30	50	30	20	0	0		30 %	
DIGITAL	30	0	50	50	0	0			
DISP W/CRT	0	0	0	0	0	0		WILL ELECTRONICS BE C Above Average Densi	
DISPLAY	30	70	30	0	0	0			
XMTR	0	0	0	0	0	0		O Yes 🔘 No	
PWR SUP	10	50	50	0	0	0			
	<b>DESIGN</b> E MODIFI ING SPAC	CATION T	O AN			ATERIALS, F OMPONENT ICROGRAVI	PROC S. SI TY E	SPACE, USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUI NVIRONMENT. SYSTEMS DO NOT EXIST	E TO
MODI SPAC	ERATE TO IFICATION E-BASED	TO AN EX DESIGN	XISTING			EVELOPMEI ND/OR ELEC	NT O	SPACE, REQUIRES THE F NEW MATERIALS, PROCESSE ONIC COMPONENTS. STATE OF THE ART.	S
EXIST ELEC IMPAC ENVIF	DESIGN FO ING MATE TRONIC CC T DUE TO RONMENT. EMS COMI	RIALS, PF DMPONEN MICROGF GROUND	ROCESSE ITS. NO D RAVITY BASED	ESIGN		XISTING ST	ATE	FNEW TECHNOLOGY WELL BEYO OF THE ART AND/OR MULTIPL EQUIRED TO REACH THE GOAL	.E
	15500.00								
and the second se	NEEDS SO S HARDW/ DITIONAL A	ARE AVAI	LABLE W			OFTWARE			

JSC _S-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES JUNE 15, BIOMEDICAL FACILITY HARDWARE CATALOG
BMAC Hardware	EQUIPMENT NAME ION CHROMATOGRAPH Page
DATA SHEET	HARDWARE ID. NO.:       11       ORIGINATOR:       J. Stephenson       1 of a         VERSION :       1       1
ILLUSTRATIO	DN NC
DEFINITION Instrument to potassium lev	measure both anion and cation contaminants in urine, as well as serum vels.
IISTORY/DESIG	nology available.
Modification -	1000ccopy for upo in microgravity
Modification r	necessary for use in microgravity.

SC LS-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	
BMAC	EQUIPMENT NAME: ION CHROMATOGRAF	어 ID# 11 Page
HARDWARE	VER : 1 0	RIGINATOR: J. Stephenson
GENERAL S Mass (kg): Height (m) Width (m) Depth (m) Volume (m) Standby Po Operational	VER : 1       0         SPECIFICATIONS       31	<b>PERFORMANCE SPECIFICATIONS:</b> Halides, calcium, magnesium and potassium concentration quantitation.         Concentration limits: 1ppb to .01%         Detection wavelength: 190-700nm         Flow rate: 0.001 to 9.99 mi/minute         Adjustable in .01 mi increments
	rce (VDC) 28	PROBLEMS/ISSUES AND CONCERNS Waste management of solvent and diluent Performance of ion exchange column in microgravity environment
ASSUMPTION An instrument cap magnitude of their QUANTITY F	able of separating and identifying components of a sol ionic charges.	lution (urine) by the virtue of their differences in polarities and           MARC I         MARC II         MARC III
PHYSICAL DES		
	d instrument with fan, heat sources, and	pumps
	DESCRIPTION (DESCRIBE FULLY, INCLUDE WHE	
	kly crewmembers' calcium concentration arises, serum potassium quantitative analy	

BMAC	EQUIPMENT NAM	IE: ION CHROMATOGRAPH ID# 1 1 3 of 4
HARDWARE Data Sheet	<b>VER</b> : 1	ORIGINATOR: J. Stephenson
CONSTRUCTIC STRUCTURE/ MATERIAL: aluminum TOTAL STRUCT		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) fan heat source pumps
ACTIVE ELECTE	RONICS): 29 AL % NEW DESIGN 0	9 Kg
ESTIMATED # O STRUCT PARTS (EXCLUDING NU BOLTS, SCREW) ETC.) OF EACH A/B/C	TOTAL TS, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
12	20%	
35	80 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> </ul>
	%	<ul> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> <li>CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES</li> </ul>
ADDITIONAL	COMMENTS CON	CERNING STRUCT/MECH COMPONENT:

BMAC			BIUME		ACILITY	HARD	WARE	ERMEASURES CATALOG		UNE 15,
HARDWAR			NAME:	ION CHRO					D# 11	PAGE
ATA SHE	ET VER :	1				RIGIN	ATOR	J. Stephenson		4 of 4
TYPE O										
	F ELECTI		<b>i</b> :							
OP /	LOG RECE AMPS, AUE	010	X			20		DISPLAY WITH CF	RT	
VIDE	:O, RF, SEF 'E, ETC.	RVO		COMPUT	REGISTER ERS, ETC	4 <b>5</b> ,				
	NSMITTER			POWERS			_			
TV, I	RADAR, CO	DMM,		CONVEN	TIONAL LI	NEAR		DISPLAY - NO CF LED's LIQUID	IT	
NAV,	LASER, E	IC.		RECTIFIC & AC-DC	CONVERT	Hoppef Ters	l	CRYSTAL PRINTE	RS	
LECTRONI	C DESCRI	ΡΤΙΟΝ	RY DED						·	
LECTRONI	CS WEIGI	HT		CHIAGE						
	Kg. of Ele	ectronic	s	2.00				ESTIMATED NEW DESIGN	I OF	%
	% TOTAL	" %Disc	C %IC	%LSI	%HYB	%VL	SI	ELECTRONI	CS:	
NALOG	40	80	20	0	0		0	3	5%	
GITAL	35	70	30	0	0		0		_	
ISP W/CRT	0	0	0	0	0		0	WILL ELECTRO	DNICS B	E OF
ISPLAY	20	70	20	10	0		5	ABOVE AVER	AGE DE	NSITY?
MTR	0	0	0	0	0	(	>	O Yes		No
WR SUP	5	100	0	0	0		् 2			
SCOPE OF								SPACE. USES EXIS	TING	
	E MODIFIC NG SPACE	ATION	DESIGN		0	MPONE	NTS. SK	GNIFICANT DESIGN	IMPACT	DUE TO
					GR	OUND B	ASED S	YSTEMS DO NOT E	XIST	
	RATE TO E					W DESIG	NFOR	SPACE. REQUIRES	THE	i
SPACE	BASED D	ESIGN			AN	D/OR EL	ECTRO	NEW MATERIALS, NIC COMPONENTS		SES
		SPACE	USES		AT	OR NEA	RTHE	STATE OF THE AR	T.	
ELECT	NG MATERI RONIC CON	<b>IPONEN</b>	TS. NO DE	, and Sign		/ELOPM		NEW TECHNOLOGY	WELL BE	YOND
ENVIRC	DUE TO M	ROUND	BASED		DES	SIGN PA	THS RE	OF THE ART AND/C QUIRED TO REACH	THE GO	PLE V.
5151E	MS COMME		Y AVAILAB	LE						
	EDS SOFT HARDWAR	WARE T							1	
	IONAL AUT	romatk	<b>ON REQUI</b>	REMENTS	THAN	_	ar			
	ENTLY AV				GE - 96		.OW		Цн	GH

ISC S-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES BIOMEDICAL FACILITY HARDWARE CATALOG	JUNE 15, 1					
BMAC Hardware Data Sheet							
ILLUSTRATIC							
	Contraction of the second seco						
	d to measure the acid-base status of various types of samples. By a lectrodes to the meter, concentration of particular ionic species in a mined.						
IISTORY/DESIC Commercially Modification f							

BMAC HARDWARE ATA SHEET       EQUIPMENT NAME: ION SPECIFIC/PH METER VER : 1       IDF 1 2       Page 2 of 4         GENERAL SPECIFICATIONS       VER : 1       ORIGINATOR: H. Nguyan       PERFORMANCE SPECIFICATIONS:         Mass (kg):	SC S-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	
ATA SHEET       VER : 1       ORIGINATOR: H. Nguyen         GENERAL SPECIFICATIONS		EQUIPMENT NAME: ION SPECIFIC/PH ME	
General Specifications       7         Mass (kg):       7         Height (m)       089         Width (m)       486         Depth (m)       486         Depth (m)       851         Volume (m3):       036         Standby Power (W)       Power Source (VDC)         Depth (m)       036         Standby Power (W)       Power Source (VDC)         Power Source (VDC)       batteries         RACK INTERFACE       Rack Mounted?         Provide measurement repeatability to within += 01 pH units.         ELECTRICAL       NONE:         XSTANDARD       EXTRA:         THERMAL:       Image: I		VER:1 C	DRIGINATOR: H. Nguyen
Mass (kg):	GENERAL	SPECIFICATIONS	
Provide measurement repeatability to within +- 01 pH units.         Width (m)	Mass (kg):	<u>7</u>	Conduct 'self-test' in stand-by mode and report malfunctions.
With (III)	Height (m)		
Volume (m3):	Width (m)		Conduct 'self test' in stand-by mode to report any malfunction.
Standby Power (W)   Operational Power (W)   Peak Power (W)   Power Source (VDC)   batteries   RACK INTERFACE   Rack Mounted?   PROBLEMS/ISSUES AND CONCERNS   PROBLEMS/ISSUES AND CONCERNS ELECTRICAL_NONE: STANDARD EXTRA: THERMAL: WASTE: SIDE CONCERNS FLUID: DATA:	Depth (m)		
Operational Power (W)   Peak Power (W)   Power Source (VDC)   batteries <b>RACK INTERFACE</b> Rack Mounted? <b>PROBLEMS/ISSUES AND CONCERNS</b> ELECTRICAL   NONE:   STANDARD   ELECTRICAL   NARC:   MARC:   MARC:   MARC:   MARC:    MARC:   MARC:   MARC:   MARC:   Image:   MARC:   MARC:   MARC:   MARC:   Image:   Marc:   Image:   Provide the main unit and are interchangeable. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Volume (m	3):036	
Peak Power (W)   Power Source (VDC)   batteries   RACK INTERFACE Rack Mounted? PROBLEMS/ISSUES AND CONCERNS  ELECTRICAL NONE: STANDARD EXTRA: ELECTRICAL NONE: STANDARD EXTRA: THERMAL: WASTE: STANDARD EXTRA: THERMAL: WASTE: STANDARD EXTRA: DATA:	Standby Po	оwer (W)	
Power Source (VDC)       batteries         RACK INTERFACE       Rack Mounted?         RACK INTERFACE       Rack Mounted?         ELECTRICAL       NONE:       STANDARD         PROBLEMS/ISSUES       AND CONCERNS         WASTE:       Image: Concerns         FLUID:       Image: Concerns         DATA:       Image: Concerns         ASSUMPTIONS/       JUSTIFICATIONS    QUANTITY REQUIRED: 2.5 SPECIFICATIONS          MARC I       Image: MARC II         PHYSICAL DESCRIPTION:         Battery powered, handheld stowable device         LED readout and touchpad controls. Electrodes are cable linked to the main unit and are interchangeable.    FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Operational	Power (W)	
RACK INTERFACE Rack Mounted?   ELECTRICAL NONE:   STANDARD EXTRA:   THERMAL: Image: Standard Image: Stand	Peak Powe	r (W)	
ELECTRICAL NONE: STANDARD   WASTE: Image: Standard	Power Sou	rce (VDC) <u>batteries</u>	
ELECTRICAL NONE: STANDARD EXTRA:   THERMAL: Image: Constraint of the standard Image: Constraint of the standard   WASTE: Image: Constraint of the standard Image: Constraint of the standard   WASTE: Image: Constraint of the standard Image: Constraint of the standard   FLUID: Image: Constraint of the standard Image: Constraint of the standard   FLUID: Image: Constraint of the standard Image: Constraint of the standard   OUANTITY REQUIRED: 2.5 SPECIFICATIONS    PHYSICAL DESCRIPTION:  Battery powered, handheld stowable device LED readout and touchpad controls. Electrodes are cable linked to the main unit and are interchangeable.  FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	RACK INTER	RFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
THERMAL:   WASTE:   FLUID:   DATA:   MARCI     ASSUMPTIONS/   JUSTIFICATIONS     QUANTITY REQUIRED:   2.5   SPECIFICATIONS     MARCI   MARCI   MARCI   MARCI     MARCI	ELECTRICAL	NONE: 🛛 STANDARD 🗋 EXTRA: 🗖	]
FLUID:       Image: Constraint of the state			
DATA:       Image: Constraint of the second se			4
ASSUMPTIONS/ JUSTIFICATIONS QUANTITY REQUIRED: 2.5 SPECIFICATIONS MARC I MARC II MARC III PHYSICAL DESCRIPTION: Battery powered, handheld stowable device LED readout and touchpad controls. Electrodes are cable linked to the main unit and are interchangeable. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)			4
	PHYSICAL DES Battery powe LED readout	CRIPTION: ared, handheld stowable device and touchpad controls. Electrodes are ca	
Measure acid-base status and ionic concentrations of various samples.	FUNCTIONAL [	DESCRIPTION (DESCRIBE FULLY, INCLUDE WH	ERE AND HOW USED)
	Measure acid	d-base status and ionic concentrations of	various samples.

I HARDWARE I	QUIPMENT NA Er: 1	: ION SPECIFIC/PH METER ORIGINATOR: H. Nguye	ID# 12 PAG 3 of
CONSTRUCTION STRUCTURE/ME MATERIAL: anodized aluminum	CHANICS	DISCRETE STUCTURAL/MECH (e.g. MOTORS, FANS, BATT) batteries	
TOTAL STRUCT/ME ACTIVE ELECTRON ESTIMATED TOTAL STRUCT/MECH COM	ICS): % NEW DESIGN (	Kg	
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C	PCT.OF TOTAL STRUCT WEIGHT:	HECK THE APPROPRIATE MAJOR AND S ECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SI SUPPORT STRUCTURE, NO MOVING PART CONTAINMENT STRUCTURE SUBJECT TO P	HAPES, RIVETED, WELDED S
815	<u>70</u> %	STRUCTURES UNDER SIGNIFICANT DYNAM         B. MACHINED CONSTRUCTION FROM DRILLING,         NORMAL MACHINED PARTS, FUNCTION IS         PRECISION MACHINED PARTS, MANY MON	MILLING, GRINDING ETC. SUPPORT AND CONTAINME VING PARTS
	<u> </u>	OPTICAL COMPONENTS AND ASSY BUILT 1 C. LAMINATED STRUCTURAL COMPOSITES LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKH CYLINDRICAL SHAPED, FILAMENT WOUND NING STRUCT/MECH COMPONENT:	S HEADS, BONDED ASSY

ISC S-35001						ND COUNT		MEASURES JUNE 15,199 ATALOG	0
BMAC Hardware Data Sheet			<b>ME:</b> 101	N SPECIFI			R: ⊦	ID# 12 PAGE 4 of 4	
TYPE OF			_						
	NPS, AUDI , RF, SER\	0	<b>—</b> (	DIGITAL GATES, RI XOMPUTE		S,	· C	DISPLAY WITH CRT	
TV, R/	SMITTER Adar, Co Jaser, Et			POWER SU CONVENT RECTIFICA & AC-DC C	IONAL LIN ATION, CH	iear — Iopper		DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele			1.00				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI		05.00	
ANALOG	30	25	60	15	0	0		35_%	
DIGITAL	50	30	50	20	0	0		WILL ELECTRONICS BE OF	
DISP W/CRT	0	0	0	0	0	0		ABOVE AVERAGE DENSITY?	
DISPLAY	20	10	90	0	0	0		🔿 Yes 💿 No	
XMTR	0	0	0	0	0	0			
PWR SUP	0	0	0	0	0	0			
	<b>DESIGN</b> E MODIFI		o an			IATERIALS, I OMPONENT IICROGRAVI	PRO 'S. SI ITY E	R SPACE. USES EXISTING CESSES, AND ELECTRONIC IGNIFICANT DESIGN IMPACT DUE TO ENVIRONMENT. SYSTEMS DO NOT EXIST	
MODI SPAC	ERATE TO IFICATION E-BASED	TO AN E DESIGN	XISTING			EVELOPME ND/OR ELEC	NT C	R SPACE, REQUIRES THE OF NEW MATERIALS, PROCESSES ONIC COMPONENTS. E STATE OF THE ART.	
EXIST ELEC IMPAC ENVIF	DESIGN FO TING MATE TRONIC CO CT DUE TO RONMENT. EMS COMI	RIALS, PF DMPONEN MICROGI GROUND	ROCESSE ITS. NO D RAVITY BASED	esign	L	XISTING ST	ATE	F NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE REQUIRED TO REACH THE GOAL	
	NEEDS SO 'S HARDW DITIONAL A RRENTLY /	ARE AVA	ILABLE W			OFTWARE	w	🗌 меріцм 🔲 нісн	]

BMAC Hardware	EQUIPMENT NAME ISOKINETIC DYNAMOMETER	Page 1 of 4
DATA SHEET	HARDWARE ID. NO.: 20 ORIGINATOR: H. Nguyen	
ILLUSTRATIO		
	d for the measurement of muscle fatigue. nd range of muscle movement are controlled by this device.	
	GN STATUS: ilable on the commercial market. to streamline and to reduce mass to meet flight constraints are required.	

	BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
BMAC Hardware	EQUIPMENT NAME: ISOKINETIC DYNAM	OMETER ID# 20 Page ORIGINATOR: H. Nguyen
DATA SHEET		PERFORMANCE SPECIFICATIONS:
	SPECIFICATIONS 	Tension varies between 1 to 200 foot pounds
		Self calibration capabilities
		LCD read out of peak and average force in pounds.
		Computer controlled speeds and ranges of motion.
	.073	
	wer (W)	
	Power (W) 50	
	r (W)	
RACK INTER		-
	Hack Mounted:	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL THERMAL:		
WASTE:		
FLUID:		-
DATA:		
QUANTITY R PHYSICAL DES		
A handle to a	but on the front plate. accommodate arms and wrists with a for pard to immobilize subject's body.	ot fitting for leg muscles quantification.
A handle to a Strapdown bo	accommodate arms and wrists with a for	
A handle to a Strapdown bo FUNCTIONAL D Used daily to	ESCRIPTION (DESCRIBE FULLY, INCLUDE WF measure fluctuation in muscle strength	HERE AND HOW USED)
A handle to a Strapdown bo FUNCTIONAL D Used daily to	ESCRIPTION (DESCRIBE FULLY, INCLUDE WF measure fluctuation in muscle strength	HERE AND HOW USED)
A handle to a Strapdown by FUNCTIONAL D Used daily to	ESCRIPTION (DESCRIBE FULLY, INCLUDE WF measure fluctuation in muscle strength	HERE AND HOW USED)

CONSTRUCTION OF STRUCTURE/MECHANICS       DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum,steel       digital read-out foot fitting hand bar strapdown board         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       11.7         Kg       Strandbar strapdown board         ESTIMATED FOTAL % NEW DESIGN OF ALL STRUCT PARTS       25 %         ESTIMATED #OF STRUCT PARTS       PCT. OF TOTAL STRUCT WEGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         ESTIMATED #OF STRUCT PARTS       PCT. OF TOTAL STRUCT WEGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         ESTIMATED #OF STRUCT PARTS       PCT. OF TOTAL STRUCT WEGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         ESTIMATED #OF STRUCT PARTS       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         STRUCT PARTS       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         25       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         15       20 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         15       20 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION OPTICAL COMPONENTS, SUPPORTS, BULKHEAD	CONSTRUCTION OF STRUCTURE/MECHANICS       DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) digital read-out foot fitting hand bar strapdown board         MATERIAL: aluminum,steel       iting hand bar         aluminum,steel       11.7 Kg         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       11.7 Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       25 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT WEIGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         M       A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED BOLTS, SCREWS, ETC.) OF EACH A/B/C       A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED MECH CONFIGURATION:         M       A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES         25       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         25       80 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         15       20 %       B. MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, MANY MOVING PARTS         15       20 %       C. LAMINATED STRUCTURAL COMPOSITES       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION	BMAC Hardware Data Sheet		ME: ISOKINETIC DYNAMOMETER ID# 20 ORIGINATOR: H. Nguyen
STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEGHT:       MECH CONFIGURATION:         25       80 %       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         25       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         25       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         15       20 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC. NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, MANY MOVING PARTS         15       20 %       C. LAMINATED STRUCTURAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         15       20 %       C. LAMINATED STRUCTURAL COMPOSITES         16       C. LAMINATED STRUCTURAL COMPOSITES         17       20 %       C. LAMINATED STRUCTURAL SUPPORTS, BULKHEADS, BONDED ASSY OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION	STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEGHT:       MECH CONFIGURATION:         25       80 %       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         25       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         25       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         15       20 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC. NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINING PRECISION MACHINED PARTS, MANY MOVING PARTS         15       20 %       C. LAMINATED STRUCTURAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         15       20 %       C. LAMINATED STRUCTURAL COMPOSITES         16       C. LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS         5       %       CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	CONSTRUCTION STRUCTURE/M MATERIAL: aluminum,steel TOTAL STRUCT/ ACTIVE ELECTRO ESTIMATED TOTA	N OF IECHANICS MECH WT. (EXCLU DNICS): <u>11.</u> L % NEW DESIGN (	(e.g. MOTORS, FANS, BATTERIES, ANTENNAS) digital read-out foot fitting hand bar strapdown board DING .7 Kg DF ALL
15       20 %         C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS         %	15       20 %         C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS         %	STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL 3, STRUCT WEIGHT:	MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
LAID UP FLAT SURFACE WITH STIFFENERS LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	LAID UP FLAT SURFACE WITH STIFFENERS LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	15	<u>20</u> %	NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAIN PRECISION MACHINED PARTS, MANY MOVING PARTS
				LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES

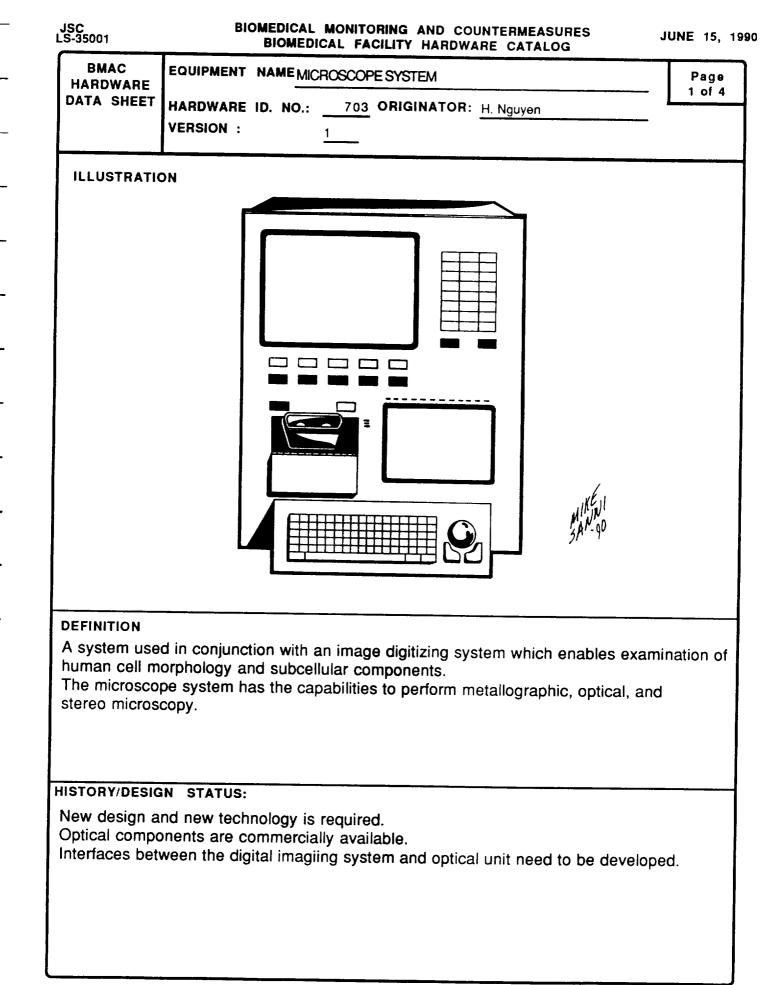
JSC BIOMEDICAL MONITORING AND COUNTERMEASURES JUNE 15, LS-35001 BIOMEDICAL FACILITY HARDWARE CATALOG	1990
BMAC HARDWARE DATA SHEET       EQUIPMENT NAME: ISOKINETIC DYNAMOMETER       ID# 20       PAGE 4 of 4         ORIGINATOR: H. Nguyen       10# 20       PAGE	
TYPE OF ELECTRONICS:	
<ul> <li>ANALOG RECEIVERS, OP AMPS, AUDIO</li> <li>VIDEO, RF, SERVO</li> <li>DIGITAL</li> <li>DISPLAY WITH CRT</li> <li>DISPLAY WITH CRT</li> <li>COMPUTERS, ETC.</li> </ul>	
TRANSMITTER TV, RADAR, COMM, NAV, LASER, ETC.	
ELECTRONIC DESCRIPTION BY PERCENTAGE OF ELECTRONICS WEIGHT	1
Kg. of Electronics 20.30 ESTIMATED TOTAL % REW DESIGN OF ELECTRONICS:	
% TOTAL %DISC %IC %LSI %HYB %VLSI	
ANALOG 60 10 90 0 0 0 15 %	
DIGITAL 10 0 68 32 0 0	-
DISP W/CRT 0 0 0 0 0 0 0 0 WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?	
DISPLAY 20 64 24 12 0 0	
XMTR 0 0 0 0 0 0 0 Yes O No	
PWR SUP 10 50 50 0 0 0	
SCOPE OF DESIGN EFFORT:       NEW DESIGN FOR SPACE. USES EXISTING         MATERIALS, PROCESSES, AND ELECTRONIC         COMPONENTS. SIGNIFICANT DESIGN IMPACT DUE TO         MICROGRAVITY ENVIRONMENT.         GROUND BASED SYSTEMS DO NOT EXIST	
MODERATE TO EXTENSIVE MODIFICATION TO AN EXISTING SPACE-BASED DESIGN NEW DESIGN FOR SPACE. REQUIRES THE DEVELOPMENT OF NEW MATERIALS, PROCESSES AND/OR ELECTRONIC COMPONENTS. AT OR NEAR THE STATE OF THE ART.	
NEW DESIGN FOR SPACE. USES EXISTING MATERIALS, PROCESSES, AND ELECTRONIC COMPONENTS. NO DESIGN IMPACT DUE TO MICROGRAVITY ENVIRONMENT. GROUND BASED SYSTEMS COMMERCIALLY AVAILABLE	
IF HARDWARE NEEDS SOFTWARE TO RUN:	
ADDITIONAL AUTOMATION REQUIREMENTS THAN CURRENTLY AVAILABLE	

HARDWARE       Line       Line	BMAC Hardware	EQUIPMENT NAME MASS SPECTROMETER	Page				
DEFINITON         An instrument which analyzes subject's inspired and/or expired gases by ionization of the eluting compounds into molecular fragments. The molecular fragments are then analyzed		HARDWARE ID. NO.: 13 ORIGINATOR: J. Stephenson					
DEFINITION An instrument which analyzes subject's inspired and/or expired gases by ionization of the eluting compounds into molecular fragments. The molecular fragments are then analyzed	ILLUSTRATIO	ON					
DEFINITION An instrument which analyzes subject's inspired and/or expired gases by ionization of the eluting compounds into molecular fragments. The molecular fragments are then analyzed							

JSC LS-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	
BMAC	EQUIPMENT NAME: MASS SPECTROMET	ER ID# 13 Page 2 of 4
HARDWARE Data Sheet	VER : 1 0	RIGINATOR: J. Stephenson
GENERAL S Mass (kg): Height (m) Width (m) Depth (m) Volume (m Standby Po Operational	SPECIFICATIONS         40.7	PERFORMANCE SPECIFICATIONS:         Concentration range:         O2, N2       0-100%         CO2, Ar, N2O He, SF6 0-10%         C180, Acetylene       0-1%         Precision:         O2, N2       0.1%         CO2, Ar, N2O Fe, SF6 0.01%         C180, Acetylene       0.001%         Mass range:       1-200 AMU         Response time:       Less than 100 milli seconds         Scan speed:       1-2 milliseconds         Scan period:       40 milliseconds
RACK INTER ELECTRICAL THERMAL: WASTE: FLUID: DATA: ASSUMPTION Dimensions are ba	rce (VDC)       28         FACE       Rack Mounted?       Image: Comparison of the system of the sys	-
system. Con	CRIPTION: d system consisting of a control console a sole contains quadruple drive electronics or. The breath -through system consist	MARC I MARC II MARC III nd an extendable/detachable breath through s, flow measuring electronics, ion pump, ts of mouthpiece with inlet valve, ion pump,
Direct sample bombardment And from this	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHE es inspired and/o expired air from a resp ionizer through a servo-controlled need analyzes the resulting molecular fragmen ill be used in conjunction with pulmonary	piratory valve are conducted into a high lle valve. nts according to atomic mass.

aluminum       breathing inlet system         TOTAL STRUCT/MECH WT. (EXCLUDING       breathing inlet system         ACTIVE ELECTRONICS):       37.1 Kg         STIMATED TOTAL % NEW DESIGN OF ALL       optical storage unit recorder         STRUCT/MECH COMPONENTS:       30 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS.)       PCT. OF TOTAL         STRUCT       PCT. OF TOTAL       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         SUPPORT STRUCT PARTS (EXCLUDING NUTS.)       PCT. OF TOTAL       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         SUPPORT STRUCT PARTS (EXCLUDING NUTS.)       PCT. OF TOTAL       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR TOTAL         STRUCT       WEGHT:       A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         BOLTS, SCREWS, ETC.) OF EACH A/B/C       SUPPORT STRUCTURE, NO MOVING PARTS        20       80 %       SUPPORT STRUCTURE SUBJECT TO PRESSURE AND FORCES        20       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES        20       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES        20 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.        20 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION	BMAC Hardware Data Sheet		ME: MASS SPECTROMETER ID# 1 3 of 4 ORIGINATOR: J. Stephenson
STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEIGHT:       MECH CONFIGURATION: MECH CONFIGURATION: MECH CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         20       80 %       SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES         20       80 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         65       20 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         MORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMEN PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMEN OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         65       20 %       C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS       STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY	STRUCTURE/I MATERIAL: aluminum TOTAL STRUCT/ ACTIVE ELECTRO ESTIMATED TOTA	MECHANICS MECH WT. (EXCLU DNICS): <u>37</u> . L % NEW DESIGN C	(e.g. MOTORS, FANS, BATTERIES, ANTENNAS) cooling fan ion pump flow meter system breathing inlet system quadrupole analyzer OING <u>1</u> Kg optical storage unit optical storage unit recorder
65       20 %         B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMEN         PRECISION MACHINED PARTS, MANY MOVING PARTS         OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY	STRUCT PARTS (EXCLUDING NUT: BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL STRUCT WEIGHT:	MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY			<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMEN</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> </ul>
		%	LAID UP FLAT SURFACE WITH STIFFENERS

LSC S-35001							ERMEASURES CATALOG	J	UNE 15,1990
BMAC	EQUIP	AENT NA	ME: M	ASS SPEC	TROMET	ER		D# 13	PAGE
HARDWARE		1			0	RIGINATOF	R: J. Stephenson		4 of 4
			57			_			
VIDEC	MPS, AUD MPS, AUD D, RF, SER E, ETC.	Ю		digital Gates, R Compute		s,	DISPLAY WITH C	RT	
TV, R	SMITTER ADAR, CO LASER, ET			POWER SI CONVENT RECTIFIC/ & AC-DC (	'IONAL LIN ATION, CH	<b>IOPPER</b>	DISPLAY - NO C LED'S LIQUID CRYSTAL PRINT		
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele	octronics		3.60			ESTIMATE NEW DESIG	GN OF	. %
1	% TOTAL	. %DISC	%IC	%LSI	%HYB	%VLSI			
ANALOG	40	40	40	10	10	0		35 %	
DIGITAL	30	10	55	20	0	15			
DISP W/CRT	0	0	0	0	0	0	ABOVE AVE		
DISPLAY	20	30	50	20	0	0			
XMTR	0	0	0	0	0	0	O Ye	s U	No
PWR SUP	10	32	40	28	0	0			
	DESIGN E MODIFIC		O AN			ATERIALS, PE DMPONENTS ICROGRAVIT	FOR SPACE. USES E ROCESSES, AND EL SIGNIFICANT DESI Y ENVIRONMENT. D SYSTEMS DO NO	ECTRONIC GN IMPAC	
MODI SPAC	FICATE TO FICATION E-BASED I	TO AN EX DESIGN	<b>XISTING</b>			EVELOPMEN	OR SPACE. REQUIR T OF NEW MATERIA TRONIC COMPONEN THE STATE OF THE	LS, PROCI	ESSES
EXIST ELECT IMPAC ENVIR	DESIGN FO ING MATEI 'RONIC CO IT DUE TO ONMENT. ( EMS COMM	RIALS, PR MPONEN MICROGR GROUND I	OCESSES IS. NO DE AVITY BASED	SIGN		(ISTING STA	OF NEW TECHNOL TE OF THE ART AN REQUIRED TO RE/	D/OR MU	TIPLE
	IEEDS SOF S HARDWA ITIONAL A RENTLY A	ARE AVAIL	ABLE W/ ON REQU			OFTWARE		ли 🗌	нсн



	ER: 1	ORIGINATOR: H. Nguyen
MATERIAL: glass, aluminum TOTAL STRUCT/ME ACTIVE ELECTRON ESTIMATED TOTAL ? STRUCT/MECH COM	CHANICS CHWT. (EXCLUDIN ICS): <u>49</u> % NEW DESIGN OF A	Kg LL
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS,	TOTAL N	HECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR ECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED
ETC.) OF EACH A/B/C 17_	<u>     42</u> %	SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
39	<u>58</u> %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINN</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL COM	MMENTS CONCE	INING STRUCT/MECH COMPONENT:

SC S-35001						ND COUN		RMEASURES JUNI CATALOG	E 15,19
BMAC HARDWARE	EQUIPM	ENT NA	ME: M	CROSCO	PE SYSTE	EM			PAGE 4 of 4
DATA SHEET		1			0	RIGINATO	0R:	H. Nguyen	
VIDEC		/ERS, O		DIGITAL GATES, R COMPUTE		ns, T	<b>X</b> .	DISPLAY WITH CRT	
<b>TV, R</b>	SMITTER ADAR, CO LASER, ET		- ( F	POWER SI CONVENT RECTIFIC/ & AC-DC (	'IONAL LII ATION, CI	HOPPER	<u></u> .	DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele	octronics		11.00				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	•
	% TOTAL %DISC %IC %LSI %HYB %VLSI NALOG 20 75 25 0 0 0							38 %	
	55	75 45				11			
DIGITAL		45	35	20	0	0		WILL ELECTRONICS BE	OF
DISPLAY	0	40	60 0	0	0	0 0		ABOVE AVERAGE DEN	
XMTR	0	0	0	0	0				
PWR SUP	10	78	22	0	0	0			
		<u> </u>		0					
	DESIGN LE MODIFIC ING SPACI	CATION T	OAN		K C N	IATERIALS, COMPONEN IICROGRAV	. PRO TS. S /ITY E	R SPACE. USES EXISTING DEESSES, AND ELECTRONIC DIGNIFICANT DESIGN IMPACT DI ENVIRONMENT. SYSTEMS DO NOT EXIST	JE TO
MODI	ERATE TO I IFICATION E-BASED (	TO AN EX				EVELOPME ND/OR ELE	ENT C	R SPACE. REQUIRES THE OF NEW MATERIALS, PROCESS ONIC COMPONENTS. E STATE OF THE ART.	ES
EXIST ELECT IMPAC ENVIR	DESIGN FO ING MATEI TRONIC CO TO DUE TO IONMENT. ( EMS COMM	RIALS, PR MPONEN MICROGF GROUND	OCESSES TS. NO DE IAVITY BASED	SIGN		XISTING S	TATE	OF NEW TECHNOLOGY WELL BEY E OF THE ART AND/OR MULTIF REQUIRED TO REACH THE GOA	PLE
	S HARDWA	RE AVAIL	ABLE W/ ON REQU				ØW	🛛 меріим 🗔 нк	34
CUR	RENTLY A	VAILABLE			GE - 112	 	~~ • •		

BMAC	BIOMEDICAL FACILITY HARDWARE CATALOG EQUIPMENT NAME MOTION ANALYSIS SYSTEM	Page
HARDWARE Data Sheet	HARDWARE ID. NO.: 16 ORIGINATOR: J. Stephenson VERSION : 1	1 of
ILLUSTRATIC	ON	
	Jr 40	
DEFINITION		
weiginiessnes	m used to monitor, record, and analyze the motion of the crew memberss. cameras and background grid.	rs durin
	samerae and background gnd.	
ISTORY/DESIG		
Entire system Currently, the s Some work do	is available commercially. system is designed to do analysis on the ground only. one on KC-135 flights. a required for microgravity.	

C \$-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	ND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
BMAC	EQUIPMENT NAME: MOTION ANALYSIS S	YSTEM ID# 16 Page 2 of 4
IARDWARE Ata sheet	VER:1 O	RIGINATOR: J. Stephenson
	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
		Captures data at frame rates up to 200 Hs for direct transfer o 2000 Hx for recording on standard 1/2 inch magnetic tape.
Height (m)		Paths of 30 markers can be identified and tracked. Incorporate up to 16 analog channels, accelerometer, load
Width (m)	.482	cells, EMGs, forceplates, etc. and match them to the video. Includes 3 professional quality 30 frame quality 30
Depth (m)		frame/second video cameras with digital timers, camera cases, two mobile video recording stations, dual camera cases, dual
Volume (m	3):018	camera timing control center and cable for external control of camera timers.
Standby Po	ower (W)	
Operational	Power (W)	
Peak Powe	r (W)	
Power Sou	rce (VDC) Batteries	
RACK INTER	RFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		Calibration fixture required for initiating each video sequence Ground based version-PVC pipe, Rectangualar frame.
THERMAL:		
WASTE:		
FLUID: DATA:		
		MARC I MARC II MARC II
Video Camer	a	
FUNCTIONAL	DESCRIPTION (DESCRIBE FULLY, INCLUDE WH	IERE AND HOW USED)
The system during mic	will be used in conjunction with wrist me	onitor to track crew members' body motions

	QUIPMENT NAME:	MOTION ANALYSIS SYSTEM ID# 16 3 of
HARDWARE Data sheet <sup>V</sup>	ER : 1	ORIGINATOR: J. Stephenson
ACTIVE ELECTRO	ECHANICS ECH WT. (EXCLUDING NICS): 7.8 K % NEW DESIGN OF AL	g L
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C <u>3</u>	TOTAL ME	SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
20	20 %	NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES  NING STRUCT/MECH COMPONENT:

ISC S-35001							TERMEASURES JUNE 15,1990 E CATALOG
BMAC Hardware Data Shee			AME: M				ID# 16 PAGE 4 of 4 R: J. Stephenson
Video Drive		/ers, Io Vo		DIGITAL GATES, R COMPUTE POWER SI CONVENT	ERS, ETC. UPPLY TONAL LIN		DISPLAY WITH CRT DISPLAY - NO CRT LED'S LIQUID
NAV,	LASER, ET	TC.		RECTIFIC/ & AC-DC (			CRYSTAL PRINTERS
ELECTRONIC ELECTRONIC	<b>CS WEIGH</b> Kg. of Ele	<b>IT</b> octronics	Y PERC	0.90	OF		ESTIMATED TOTAL % New Design of Electronics:
	% TOTAL		%IC	%LSI	%HYB	%VLSI	15.9/
	60 20	0	50	50	0	0	<u> </u>
DIGITAL DISP W/CRT	20	0 0	50	0	50	0	WILL ELECTRONICS BE OF
	10	0	0	0	0	0	ABOVE AVERAGE DENSITY?
XMTR	0	0	0	100 0	0 0	0	O Yes 🔘 No
PWR SUP	10	0	100	0	0	0	
	<b>DESIGN</b> E MODIFIC ING SPACE		O AN			ATERIALS, PI OMPONENTS ICROGRAVIT	FOR SPACE. USES EXISTING PROCESSES, AND ELECTRONIC S. SIGNIFICANT DESIGN IMPACT DUE TO TY ENVIRONMENT. ED SYSTEMS DO NOT EXIST
MODI SPAC	ERATE TO I FICATION E-BASED [	TO AN EX DESIGN	ISTING			EVELOPMEN ND/OR ELECT	FOR SPACE. REQUIRES THE IT OF NEW MATERIALS, PROCESSES TRONIC COMPONENTS. THE STATE OF THE ART.
ELECT ELECT IMPAC ENVIR	Design foi Ing Matef Tronic Co It due to I Onment. ( Ems Comm	RIALS, PR MPONEN <sup>-</sup> MICROGR GROUND (	OCESSES IS. NO DE AVITY BASED	ESIGN	L EX	(ISTING STA	IT OF NEW TECHNOLOGY WELL BEYOND ATE OF THE ART AND/OR MULTIPLE S REQUIRED TO REACH THE GOAL
	IEEDS SOF S HARDWA ITIONAL AU RENTLY AV	RE AVAIL JTOMATK	ABLE W/ ON REQU				w Пмерілім Пнісн

JSC S-35001	I DIGMEDICAL PACIENT HARDWARE CATALOG	<b>JNE</b> 15,
BMAC Hardware	EQUIPMENT NAME OSMOMETER	Page
DATA SHEET	HARDWARE ID. NO.: 33 ORIGINATOR: H. Nguyen VERSION : 01	1 of 4
DEFINITION An instrument Osmotic press solution freezi	used to measure the osmotic pressure of body fluids. Sure is a function of solution concentration and has direct relationship to ing point.	) the
IISTORY/DESIG	ology available. dification is required for microgravity use.	

SC BIOMEDICAL MONITORING S-35001 BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1 HARDWARE CATALOG
BMAC EQUIPMENT NAME: OSMOMETER	ID# 33 Page 2 of 4
ATA SHEET       VER : 01         GENERAL SPECIFICATIONS         Mass (kg):       13.7         Height (m)       .178         Width (m)       .482         Depth (m)       .851         Volume (m3):       .073         Standby Power (W)       .150	PERFORMANCE SPECIFICATIONS: Sample transfer is executed by collecting 20 micro-liter of sample, and then the entire pipettor with sample ,is placed in the osmometer.
Peak Power (W) 130   Peak Power (W)   Power Source (VDC) 28   RACK INTERFACE Rack Mounted?   ELECTRICAL NONE:   STANDARD EXTRA:   THERMAL: Image: Comparison of the sector of the	PROBLEMS/ISSUES AND CONCERNS Disposable plastic tips used in pipettors may be an environmental concern.
ASSUMPTIONS/ JUSTIFICATIONS To be used with minimal crew training and familiarizations. QUANTITY REQUIRED: 2.5 SPECIFICATION PHYSICAL DESCRIPTION: An electro-mechanical device which ismicro-proce	
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE V Used to measure osmolality of fluids with freezing p	WHERE AND HOW USED)

BMAC	EQUIPMENT NAME:	OSMOMETER ID# 3 3 PAG
HARDWARE Data Sheet	<b>VER</b> : 01	ORIGINATOR: H. Nguyen
ACTIVE ELECTRO	MECHANICS	9
STRUCT/MECH CO		•
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT: BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL ME	ECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR         CH CONFIGURATION:         A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         Image: Support Structure, NO MOVING PARTS         Image: CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
25	60%	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
25	40 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
		IING STRUCT/MECH COMPONENT:

JSC LS-35001						ND COUN Hardwar		IMEASURES JUNE 15,19 Atalog	90 _
BMAC Hardware Data Sheet			AME: 08	SMOMETE		RIGINATO	DR:	ID# 33 PAGE 4 of 4	] -
	ELECTR DG RECEIN MPS, AUDI D, RF, SERV	/ERS, O	<b>—</b> (	DIGITAL GATES, R COMPUTE		s,	]. I	DISPLAY WITH CRT	
DRIVE	E, ETC. SMITTER ADAR, CC LASER, ET	MM,		POWER SI CONVENT RECTIFIC/ & AC-DC (	JPPLY IONAL LIN ATION, CH	iear – Kopper		DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	-
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele	octronics		2.70				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
ANALOG	% TOTAL		%IC	%LSI	%НҮВ	%VLSI		45 %	
	15	25	50	25	0	0			-
DIGITAL DISP W/CRT	0	20	20	0	35	25		WILL ELECTRONICS BE OF	]
	25	0 40	0	0	0	0		ABOVE AVEHAGE DENSITY?	-
XMTR	0	40	50 0	10	0	0		Yes 🔘 No	
PWR SUP	15	90	10	0	0 0	0			
						<u> </u>			
SCOPE OF	DESIGN	EFFORT	·.			EW DESIGN	I FOF	SPACE. USES EXISTING	
	.E <b>M</b> ODIFIC ING SPACI				CC M	OMPONENT ICROGRAVI	IS. SI	CESSES, AND ELECTRONIC IGNIFICANT DESIGN IMPACT DUE TO INVIRONMENT. SYSTEMS DO NOT EXIST	-
MODI	ERATE TO FICATION E-BASED [	TO AN EX			DE At	EVELOPMEI ND/OR ELEC	NT O	R SPACE, REQUIRES THE F NEW MATERIALS, PROCESSES DNIC COMPONENTS.	
1 1	ESIGN FO				A		1 HE	STATE OF THE ART.	-
ELECT IMPAC ENVIR	ING MATER TRONIC CO T DUE TO ONMENT. ( EMS COMM	MPONEN MICROGF GROUND	TS. NO DE VAVITY BASED	ŚIGN		<b>KISTING ST</b>	TATE	F NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL.	-
IF HARDWARE N	IEEDS SOF	TWARE 1	O RUN:						- 1
	S HARDWA ITIONAL AI RENTLY A	RE AVAIL	ABLE W/ ON REQU				w	MEDIUM 🗌 HIGH	-

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HARDWARE DATA SHEET       HARDWARE ID. NO.:       4 ORIGINATOR: H. Nguyen         VERSION :       1         ILLUSTRATION		EQUIPMENT NAME PHYSIOLOGICAL BIO-POTENTIAL RECORDER
<b>DEFINITION</b>	HARDWARE DATA SHEET	HARDWARE ID. NO.:4 ORIGINATOR: H. Nguyen
DEFINITION An electrical signal measurement device which is capable of measuring and	ILLUSTRATI	ON
An electrical signal measurement device which is capable of measuring and		
	DEFINITION	
	An electrical recording ne HISTORY/DES New design In order to o	IGN STATUS: ptimize hardware utilization and to save mass & volume on Space Station es between individual bio-potential measuring devices are integrated into

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990
BMAC	EQUIPMENT NAME: PHYSIOLOGICAL BIO	
HARDWARE		PRIGINATOR: H. Nguyen
Mass (kg): Height (m) Width (m)	SPECIFICATIONS 20 	PERFORMANCE SPECIFICATIONS: Automatic calibration for each input channel. High frequency amplifier. Butterworth low pass filter to remove undesirable high frequency components in data- i.e. 1,10,30,100Hz and 10Khz Peripheral device interface Noise level <5 microvolts peak to peak.
Volume (m3 Standby Po Operational Peak Power	3):	Must be capable of displaying signal channels during recording and playback.
Power Sour RACK INTER ELECTRICAL THERMAL: WASTE: FLUID: DATA:	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS Need power source with low noise and surge protection.
ASSUMPTION All biopotential sign The data is recorde	S/ JUSTIFICATIONS nais will be conditioned, measured, and recorded by d by use of VHS tape and then downlinked to ground	the Physiological Bio-potential Recorder. control center.
QUANTITY R PHYSICAL DESC CRT display Seven coupler		MARC II MARC III ARC III G, Goniometer applications.
	SCRIPTION (DESCRIBE FULLY, INCLUDE WHE	
recording a pro When the indiv	which measures biopotential activities for e-determined amount of channels of anal vidual modules, such as EMG, are inserted ower source and recorder (mother-board	
Each type mod	dule has its own unique required electrod	les for recording.
		_

HARDWARE DATA SHEET       VER : 1       ORIGINATOR: H. Nguyen         CONSTRUCTION OF STRUCTURE/MECHANICS       DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum,glass       aluminum,glass         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       12         Kg       Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT MECH COMPONENTS:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MALTER ARD STRUCT STRUCT WEIGHT:       PCT. OF TOTAL STRUCT WEIGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: STRUCTION, EXTRUDED SHAPES, RIVETED, WELDED WEIGHT:         MALTER ARD STRUCT SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE, NO MOVING PARTS STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10	HARDWARE DATA SHEET       VER : 1       ORIGINATOR: H. Nguyen       3 or ORIGINATOR: H. Nguyen         CONSTRUCTION OF STRUCTURE/MECHANICS       DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum,glass       fan         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       12 kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED #OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, EXTRUCT PARTS       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         ESTIMATED #OF STRUCT PARTS       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         ESTIMATED #OF STRUCT PARTS       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         STRUCT PARTS       PCT. OF TOTAL STRUCT PARTS       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         STRUCT PARTS       STRUCT PARTS       STRUCT PARTS         BOLTS, SCREWS, 10       MCH       CONTAINMENT STRUCTURE, NO MOVING PARTS	HARDWARE DATA SHEET       VER : 1       ORIGINATOR: H. Nguyen       3 or S or S or S or S or S or S or S or S	BMAC	EQUIPMENT NA	AME: PHYSIOLOGICAL BIO-POTENTIAL RECORDER ID# 4 2 4
CONSTRUCTION OF STRUCTURE/MECHANICS       (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum,glass       fan         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       12 Kg         ESTIMATED TOTAL, % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       POT. OF TOTAL         10       60 %         CONTAINMENT STRUCTURE, NO MOVING PARTS         10       60 %         B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         10       60 %         B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         10       40 %         0       07KCAL COMPONENTS. AND AND AND AND CONTAINNENT STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       40 %         0       07KCAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         10       40 %         0       07KCAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         10       40 %       07KCAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION	CONSTRUCTION OF STRUCTURE/MECHANICS       (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum,glass       fan         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       12 Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MECH CONFIGURATION:       A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED WEIGHT:       A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         10	CONSTRUCTION OF STRUCTURE/MECHANICS       (e.g. MOTORS, FANS, BATTERIES, ANTENNAS)         MATERIAL: aluminum,glass       fan         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       12 Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MASHET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MACHINED # OF STRUCT PARTS       PCT. OF TOTAL STRUCT       CONTAINMENT STRUCTURE, NO MOVING PARTS         10			3 01
aluminum,glass         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       12       Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT WEKHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         Machine Construction, extruded shapes, Riveted, welded SUPPORT STRUCTURE, NO MOVING PARTS       A. SHEET METAL CONSTRUCTURE, NO MOVING PARTS         10       60 %       STRUCT URES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         More Mal Machined Parts, Function is Support and containing PRECISION MACHINED PARTS, MANY MOVING PARTS       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         10       40 %       C. LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS	aluminum,glass         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):	aluminum,glass         TOTAL STRUCT/MECH WT. (EXCLUDING ACTIVE ELECTRONICS):       12       Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         ESTIMATED # OF STRUCT PARTS       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         SUPPORT STRUCTURES, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         Image: Dolts, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         Image: Dolts, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         Image: Dolts, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CONTAINMENT STRUCTURE, NO MOVING PARTS         Image: Dolts       60 %       Image: STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         Image: Dolts       MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         Image: Dolts       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINING PRECISION MACHINED PARTS, MANY MOVING PARTS         Image: Dolts       Image: Dolts       Image: Dolts         Image: Dolts       Image: Dolts       Image: Dolts <td></td> <td></td> <td>(e.g. MOTORS, FANS, BATTERIES, ANTENNAS)</td>			(e.g. MOTORS, FANS, BATTERIES, ANTENNAS)
ACTIVE ELECTRONICS):       12       Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MECH CONFIGURATION:       STRUCT       MECH CONFIGURATION:         STRUCT, SCREWS, ETC.) OF EACH A/B/C       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MECH CONFIGURATION:       SUPPORT STRUCTURE, NO MOVING PARTS         10	ACTIVE ELECTRONICS):       12       Kg         ESTIMATED TOTAL % NEW DESKEN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MECH CONFIGURATION:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MECH CONFIGURATION:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MEGHT:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MACHINED       SUPPORT STRUCTURE, NO MOVING PARTS         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         MORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS         10       40 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         I       LAID UP FLAT SURFACE WITH STIFFENERS       STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY	ACTIVE ELECTRONICS):       12       Kg         ESTIMATED TOTAL % NEW DESIGN OF ALL STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MECH CONFIGURATION:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MECH CONFIGURATION:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MEGHT:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MACHINED       SUPPORT STRUCTURE, NO MOVING PARTS         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         MORIMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINNE PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINNE PRECISION MACHINED PARTS, MANY MOVING PARTS         10       40 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         10       40 %       C. LAMINATED STRUCTURAL COMPOSITES         10       40 %       C. LAMINATED STRUCTURAL COMPOSITES         110       40 %       C. LAMINATED STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY			
STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT WEIGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MECH CONFIGURATION:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MAB/C       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED         MOVING PARTS       SUPPORT STRUCTURE, NO MOVING PARTS         IO       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         IO       60 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         IN NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINNENT STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINNENT PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINNENT PRECISION MACHINED PARTS, MANY MOVING PARTS         IO       40 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         IC       LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS         ISTRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY       STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY	STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT WEKGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         M       Check the appropriate major and sub category for NECH CONFIGURATION:         M       STRUCT WEKGHT:       A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         10       60 %       SUPPORT STRUCTURE SUBJECT TO PRESSURE AND FORCES         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         10       40 %       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMENT OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         10       40 %       C. LAMINATED STRUCTURAL COMPOSITES         10       40 %       C. LAMINATED STRUCTURAL SHAPED, FILAMENT WOUND ASSEMBLIES	STRUCT/MECH COMPONENTS:       60 %         ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       PCT. OF TOTAL STRUCT WEKGHT:       CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION:         MECH CONFIGURATION:       STRUCT WEKGHT:       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         10       60 %       SUPPORT STRUCTURE SUBJECT TO PRESSURE AND FORCES         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         10       40 %       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMENT OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         10       40 %       C. LAMINATED STRUCTURAL COMPOSITES         110       40 %       C. LAMINATED STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY		•	
STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEIGHT:       MECH CONFIGURATION:         10       60 %       A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       60 %       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS         10       40 %       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         10       40 %       C. LAMINATED STRUCTURAL COMPOSITES         10       LAID UP FLAT SURFACE WITH STIFFENERS       STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY	STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEGHT:       MECH CONFIGURATION: MECH CONFIGURATION: MECH CONFIGURATION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         10	STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C       TOTAL STRUCT WEGHT:       MECH CONFIGURATION: MECH CONFIGURATION: MECH CONFIGURATION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS         10			
10       60%       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINN         10       40%       PRECISION MACHINED PARTS, MANY MOVING PARTS         0       0PTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY	10       60%       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       K       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         NORMAL MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM         10       40%       PRECISION MACHINED PARTS, MANY MOVING PARTS         0       0       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS         %       CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	10       60 %       STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES         10       K       B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.         NORMAL MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM         10       40 %       PRECISION MACHINED PARTS, MANY MOVING PARTS         0       0       OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS         %       CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS ETC.) OF EACH	TOTAL S, STRUCT	MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS
10 40 % NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINN PRECISION MACHINED PARTS, MANY MOVING PARTS OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION C. LAMINATED STRUCTURAL COMPOSITES LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY	10       40 %       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM         PRECISION MACHINED PARTS, MANY MOVING PARTS       PRECISION MACHINED PARTS, MANY MOVING PARTS         0       00 %       0PTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES       LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY       CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	10       40 %       NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM         PRECISION MACHINED PARTS, MANY MOVING PARTS       PRECISION MACHINED PARTS, MANY MOVING PARTS         OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION         C. LAMINATED STRUCTURAL COMPOSITES         LAID UP FLAT SURFACE WITH STIFFENERS         STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY         %       CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	10	60%	
LAID UP FLAT SURFACE WITH STIFFENERS	LAID UP FLAT SURFACE WITH STIFFENERS  LAID UP FLAT SURFACE WITH STIFFENERS  STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	LAID UP FLAT SURFACE WITH STIFFENERS  LAID UP FLAT SURFACE WITH STIFFENERS  STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES	10	40%	NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM PRECISION MACHINED PARTS, MANY MOVING PARTS
	ADDITIONAL COMMENTS CONCERNING STRUCT/MECH COMPONENT:	ADDITIONAL COMMENTS CONCERNING STRUCT/MECH COMPONENT:		%	LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY

LS-35001						ND COUNTE	RMEASURES JUNE 15,1990 CATALOG	
BMAC Hardware Data Sheet			ME: PH	IYSIOLOG		POTENTIAL RE	4 of 4	
		/ers, o /o /mm,		DIGITAL GATES, RI COMPUTE POWER SI CONVENT RECTIFIC/ & AC-DC C	ERS, ETC. JPPLY KONAL LIN ATION, CH		DISPLAY WITH CRT DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC ELECTRONIC		IT	Y PERC	ENTAGE 8.00	OF		ESTIMATED TOTAL % NEW DESIGN OF	
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI	ELECTRONICS:	
ANALOG	10	30	20	50	0	0	<u> </u>	
DIGITAL	35	0	100	0	0	0		
DISP W/CRT	40	0	100	0	0	0	WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?	
DISPLAY								
XMTR	0	0	0	0	0	0		
PWR SUP	15	50	50	0	0	0		
1 1	DESIGN E MODIFI ING SPAC		O AN		Ш <u>м</u> СС М	<b>ATERIALS,</b> PRO OMPONENTS, 1 ICROGRAVITY	DR SPACE. USES EXISTING OCESSES, AND ELECTRONIC SIGNIFICANT DESIGN IMPACT DUE TO ENVIRONMENT. D SYSTEMS DO NOT EXIST	
MODI SPAC	ERATE TO IFICATION E-BASED I	to an e) Design	KISTING			EVELOPMENT	OR SPACE. REQUIRES THE OF NEW MATERIALS, PROCESSES RONIC COMPONENTS. HE STATE OF THE ART.	
EXIST ELEC IMPAC ENVIR	DESIGN FO ING MATE TRONIC CC CT DUE TO IONMENT. EMS COMM	RIALS, PR MPONEN MICROGF GROUND	IOCESSE TS. NO DI AVITY BASED	Esign		XISTING STAT	OF NEW TECHNOLOGY WELL BEYOND TE OF THE ART AND/OR MULTIPLE REQUIRED TO REACH THE GOAL.	
	NEEDS SON S HARDW/ NITIONAL A RRENTLY A	ARE AVAI	LABLE W/				🛛 MEDIUM 🔲 HIGH	

ISC <u>5-35001</u>	BIOMEDICAL MONITORING AND COUNTERMEASURES BIOMEDICAL FACILITY HARDWARE CATALOG	<b>JUNE</b> 15,
BMAC HARDWARE	EQUIPMENT NAME SALIVA COLLECTION UNIT	Page 1 of 4
DATA SHEET	HARDWARE ID. NO.: 26 ORIGINATOR: J. Stephenson VERSION : 1	
ILLUSTRATIO		N1 90
	temporarily collect and store saliva samples for later on-board or ses in support of pharmokinetic and pharmacologic periments.	
Supplementa	GN STATUS: lesign is flight certified, and has been flown several times as a Detail ry Objective (DSO). will be required for the future requirements.	ed

		Y HARDWARE CATALOG
BMAC HARDWARE	EQUIPMENT NAME: SALIVA COLLECTION	2 of 4
DATA SHEET	VER : 1	ORIGINATOR: J. Stephenson
	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS: Mass of kit w/o vial: 125 kg
		Mass of vial: .004 kg
Height (m)		
Width (m)		
Depth (m)		
Volume (m	3):001	
Standby Po	ower (W)	
Operational	Power (W)	
Peak Powe	r (W)	
Power Sou	rce (VDC) none	
RACK INTER	IFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		none
THERMAL:		
WASTE:		
FLUID:		
DATA:		
	REQUIRED: 40 SPECIFICATIONS	
PHYSICAL DES Contains a c squares.		the sample vial, and ziplock bag with teflon

BMAC E Hardware	QUIPMENT NAME: S	ALIVA COLLECTION UNIT ID# 26 3 of
DATA SHEET	' <b>ER</b> : 1	ORIGINATOR: J. Stephenson
ACTIVE ELECTRO	ECHANICS IECH WT. (EXCLUDING NICS): .17 Kg .% NEW DESKGN OF ALL	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) tube plug teflon gauze
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C 2	TOTAL MEC	CK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC. NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINN PRECISION MACHINED PARTS, MANY MOVING PARTS OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
ADDITIONAL CO	MMENTS CONCERN	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES  ING STRUCT/MECH COMPONENT:

JSC LS-35001		BIO				ND COUI		MEASURES JUNE 15,1	1990
BMAC Hardware Data Shee			AME: SA	ALIVA CO			DR: 、	ID# 26 PAGE J. Stephenson 4 of 4	
OP AI VIDEC	og Recei Mps, aud D, RF, ser	VERS, IO			egister E <b>rs</b> , etc.		]. ı	DISPLAY WITH CRT	-
TRAN	E, ETC. ISMITTER ADAR, CC LASER, E <sup>-</sup>			RECTIFIC	UPPLY TONAL LIN ATION, CH CONVERT	<b>IOPPER</b>		DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS	-
ELECTRONIC			Y PERC	ENTAGE	OF				1_
	Kg. of Ele	octronics		0.00				ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
	% TOTAL		%IC	%LSI	%HYB	%VLSI			
ANALOG	0	0	0	0	0	0		%	
DIGITAL DISP W/CRT	0 0	0 0	0	0	0	0		WILL ELECTRONICS BE OF	1
	0	0	0	0	0	0		ABOVE AVERAGE DENSITY?	-
XMTR	0	0	0	0	0	0		🔿 Yes 💿 No	
PWR SUP	0	0	0	0	0	0			-
	·								
	E MODIFK		OAN		L M	ATERIALS, OMPONENT	proc FS. Sk	SPACE. USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT.	_
EVDI	ING SPACI	E-BASED	DESIGN					SYSTEMS DO NOT EXIST	
MODI SPAC	ERATE TO I FICATION E-BASED [	TO AN EX DESIGN	ISTING			EVELOPME	NT O	SPACE. REQUIRES THE F NEW MATERIALS, PROCESSES INIC COMPONENTS. STATE OF THE ART.	
EXISTI ELECT IMPAC ENVIR	DESIGN FO ING MATER TRONIC CO IT DUE TO ONMENT. ( EMS COMM	RIALS, PR MPONEN MICROGR GROUND	OCESSES TS. NO DE AVITY BASED	SIGN	L E)	(ISTING ST	ATE	NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL	_
	IEEDS SOF			THE REQ	UIRED SC	FTWARE			
	ITIONAL AI RENTLY A			IREMENT	S THAN	<u>ы</u>	W	🔲 меріцм 🔲 нісн	- ا

BMAC	EQUIPMENT	NAME SAMPLE PREP DEVICE	Pag
HARDWARE Data Sheet		ID. NO.: 300 ORIGINATOR: H. Nguyen	1 of
ILLUSTRATIO	DN .		
A device which	udes the pro	e various biological samples for subsequent analyses. Der addition of specific reagents and required	
IISTORY/DESIC Some models Extensive mo	s exists with a	a portion of the needed capabilities. equired for use in microgravity.	

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BMAC	BIOMEDICAL FACILITY HARDWARE CATALOG	
HARDWARE Data Sheet	EQUIPMENT NAME SAMPLE PREP MODULE 1: BLOOD	Pag 1 of
DATA SHEET	HARDWARE ID. NO.: 37 ORIGINATOR: H. Nguyen	L
	VERSION : 1	
ILLUSTRATIO	2N	<u> </u>
	JAN-90	
DEFINITION		
	of the sample preparation device for processing blood samples.	
	samples.	
STORY/DESIG	N STATUS:	
	quired in co-ordination with the Sample Preparation Device.	
	and campie reparation Device.	

SC _S-35001	BIOMEDICAL MONITORING A BIOMEDICAL FACILITY	ND COUNTERMEASURES JUNE 15,199 HARDWARE CATALOG
BMAC Hardware	EQUIPMENT NAME: SAMPLE PREP MODU	LE 1: BLOOD ID# 37 Page 2 of 4 RIGINATOR: H. Nguyen
ATA SHEET		PERFORMANCE SPECIFICATIONS:
Mass (kg): Height (m) Width (m) Depth (m)	SPECIFICATIONS         14.09         .133         .482         .851         3):	This part of the module separates blood components into solids and liquids for appropriate testing. Adds preservative for other analysis. Automatically dispenses appropriate volumes for specific tests such as, antibody titer and Coombs test.
Standby Po Operationa Peak Powe	ower (W) Power (W)55 r (W) rce (VDC)	
RACK INTER ELECTRICAL THERMAL: WASTE: FLUID: DATA:		PROBLEMS/ISSUES AND CONCERNS
QUANTITY	used in conjunction with the central Sample Preparation REQUIRED: 2.5 SPECIFICATIONS	MARC I MARC II MARC III
PHYSICAL DES	d on Coulter Blood Preparation System	
Instrument s The sample These tests agalutinatior	DESCRIPTION (DESCRIBE FULLY, INCLUDE WH amples blood from vaccutainer tubes as is diluted and subjected to various reager include: flow cytometry, coagulation and assays, and enzyme or flourescence imm e stored in replaceable containers.	supplied by the inflight blood collection system. Its for specific tests. Alysis, antigen-antibody reactions,

	EQUIPMENT NAI Ver : 1	ME: SAMPLE PREP MODULE 1: BLOOD ID # 3 7 3 of 4 ORIGINATOR: H. Nguyen
ACTIVE ELECTRO	IECHANICS CS MECH WT. (EXCLUI DNICS): 1 L % NEW DESIGN O	<u>3</u> Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C 30	PCT. OF TOTAL STRUCT WEIGHT:	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.
55	60%	<ul> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMEN</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	<ul> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> <li>CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES</li> </ul>
		ERNING STRUCT/MECH COMPONENT: of the liquid reagents.

SC S-35001						ID COUNT ARDWARE		MEASURES JUNE 15,199	0
BMAC Hardware Data Sheet			ME: SA	MPLE PRE		E 1: BLOO		ID# 37 PAGE 4 of 4	
TYPE OF	ELECTRO	ONICS:							
	<b>APS, AUDK</b> ), RF, SERV	0	(	Digital Gates, RE Xompute	egisters RS, etc.	s, 🗆	' D	DISPLAY WITH CRT	
TRANS	SMITTER Adar, Co Laser, Et		C F	RECTIFICA	JPPLY KONAL LIN ITION, CH KONVERTE	opper	ี เ	DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF			ESTIMATED TOTAL %	
	Kg. of Ele	octronics		1.09				NEW DESIGN OF ELECTRONICS:	
1	% TOTAL	. %DISC	%IC	%LSI	%HYB	%VLSI		30 %	
ANALOG	20	25	50	25	0	0			
	60	10	40	40	0	10		WILL ELECTRONICS BE OF	
	0	0	0	0	0	0		ABOVE AVERAGE DENSITY?	
DISPLAY XMTR	0	40	40	20 0	0	0		Yes O No	
PWRSUP	10	75	25	0	0	0			
	DESIGN LE MODIFI FING SPAC				Шм са м	ATERIALS, F OMPONENT ICROGRAVI	PRO 'S. SI ITY E	R SPACE. USES EXISTING CESSES, AND ELECTRONIC IGNIFICANT DESIGN IMPACT DUE TO INVIRONMENT. SYSTEMS DO NOT EXIST	
MOD SPAC	ERATE TO IFICATION CE-BASED	TO AN E DESIGN	XISTING			EVELOPMEI	NT C	R SPACE, REQUIRES THE OF NEW MATERIALS, PROCESSES ONIC COMPONENTS. E STATE OF THE ART.	
EXIST ELEC IMPAG	DESIGN FO FING MATE TRONIC CO CT DUE TO RONMENT. TEMS COMI	RIALS, PF OMPONEN MICROGI GROUND	ROCESSE ITS. NO D RAVITY BASED	esign		XISTING ST	ATE	F NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL.	
	NEEDS SO I'S HARDW DITIONAL A RRENTLY	ARE AVA	ILABLE W 'ION REQ				w	🗌 меріим 🔲 нісн	J

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JSC LS-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES BIOMEDICAL FACILITY HARDWARE CATALOG	JUNE 15,
BMAC Hardware Data Sheet	EQUIPMENT NAME SAMPLE PREP MODULE 1: AUTOMATION UNIT         HARDWARE ID. NO.:       36         ORIGINATOR:       H. Nguyen         VERSION :       1	Page 1 of 4
ILLUSTRATIC	)N	
DEFINITION The Automatio preparation me	n Unit processes, controls, and stores information from the other sar odules.	nple
ISTORY/DESIGI New design re	N STATUS: equired in co-ordination with the Sample Preparation Device.	

BMAC EQUIPMENT NAME: SAMPLE FREF WODULE THOTOMETHON OT THE 2 of 4	BMAC       ECOMMENT NAME: SAMPLETHER MODEL THORDING 1       2 of 4         ATA SHEET       VER : 1       ORIGINATOR: H. Nguyen       2 of 4         GENERAL SPECIFICATIONS       GENERAL SPECIFICATIONS:       Self-diagnostic program capabilities maritain and control all functions of other sub-sub-systems. 8086 microprocessor         Height (m)       .089       .036       Self-diagnostic program capabilities maritain and control all functions of other sub-sub-systems. 8086 microprocessor         Width (m)       .036       Standby Power (W)       .036         Standby Power (W)       .036       Standby Power (W)       .036         Power Source (VDC)       28       PROBLEMS/ISSUES AND CONCERNS         Mass TE:		Y		LUNIT ID# 36 Page
GENERAL SPECIFICATIONS       PERFORMANCE SPECIFICATIONS:         Mass (kg):       7.5         Height (m)       0.89         Width (m)       483         Depth (m)	ATA SHEET       PERFORMANCE SPECIFICATIONS:         GENERAL SPECIFICATIONS       Self-diagnostic program capabilities maintain and control all functions of other sub-subsystems. 8086 microprocessor based.         Mass (kg):	ARDWARE			2 of 4
Mass (kg):       7.5         Height (m)       .089         Width (m)       .483         Depth (m)       .851         Volume (m3):       .036         Standby Power (W)       .15         Operational Power (W)       .200         Peak Power (W)       .200         Peak Power (W)       .200         Power Source (VDC)       .28         RACK INTERFACE       Rack Mounted?         Rack INTERFACE       Rack Mounted?         WASTE:	Mass (kg):       7.5         Height (m)       .089         Width (m)       .483         Depth (m)       .851         Volume (m3):       .036         Standby Power (W)       .15         Operational Power (W)       .200         Paak Power (W)       .200         Paak Power (W)			PERFORMANCE	SPECIFICATIONS:
Height (m)       .089         Width (m)       .483         Depth (m)       .851         Volume (m3):       .036         Standby Power (W)       .15         Operational Power (W)       .200         Peak Power (W)       .200         Pake Three Component of the entire system.         PhoBLEMS/ISSUES AND CONCERNS         Master:	Height (m)       089       based.         Width (m)       483       based.         Depth (m)	-		Self-diagnostic program	n capabilities maintain and control all -subsystems. 8086 microprocessor
Width (m)	Width (m)				
Depth (m)	Depth (m)				
Volume (m3):	Volume (m3):				
Operational Power (W)       200         Peak Power (W)	Operational Power (W)       200         Peak Power (W)	Volume (n	.036		
Peak Power (W)   Power Source (VDC)   28 <b>RACK INTERFACE</b> Rack Mounted?   Rack Monted?   ELECTRICAL NONE:   STANDARD   FLUID:   DATA:   DATA:   DATA:   DATA:   DATA:   DATA:   COLANTITY REQUIRED:   2.5   SPECIFICATIONS   MARC I   MARC III   PHYSICAL DESCRIPTION:   Unit processes, controls, and stores information from the other sample preparation modules.   FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Peak Power (W)				
Power Source (VDC)       28         RACK INTERFACE       Rack Mounted?       Image: Component of the entire system. Redundancy should be considered.         ELECTRICAL       NONE:       STANDARD       EXTRA:       Image: Component of the entire system. Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Redundancy should be considered.         ASSUMPTIONS/       JUSTIFICATIONS       Image: Component of the entire system.         Assume of the command and control center for the entire system.       Image: Component of the entire system.         QUANTITY REQUIRED:       2.5       SPECIFICATIONS       Image: Component of the entire sample preparation modules.         Unit processes, controls, and stores information from the other sample preparation modules.       FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Power Source (VDC)       23         RACK INTERFACE       Rack Mounted?       Image: Component of the entire system.         ELECTRICAL       NONE:       STANDARD       EXTRA:         THERMAL:       Image: Component of the entire system.       Redundancy should be considered.         WASTE:       Image: Component of the entire system.       Redundancy should be considered.         FLUID:       Image: Component of the entire system.       Redundancy should be considered.         ASSUMPTIONS/       JUSTIFICATIONS       Image: Component of the entire system.         ASSUMPTIONS/       JUSTIFICATIONS         This unit is the command and control center for the entire system.       Image: Component of the entire system.         QUANTITY REQUIRED:       2.5       SPECIFICATIONS         PHYSICAL DESCRIPTION:       Image: Component of the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)       FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Operationa	I Power (W)200		
RACK INTERFACE       Rack Mounted?       Image: Component of the entire system.       PROBLEMS/ISSUES AND CONCERNS         ELECTRICAL       NONE:       STANDARD       EXTRA:       Image: Component of the entire system.       Moet critical component of the entire system.       Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Image: Component of the entire system.       Redundancy should be considered.         WASTE:       Image: Component of the entire system.       Image: Component of the entire system.       Redundancy should be considered.         FLUID:       Image: Component of the entire system.       Image: Component of the entire system.       Redundancy should be considered.         DATA:       Image: Component of the entire system.       Image: Component of the entire system.       Redundancy should be considered.         ASSUMPTIONS/       JUSTIFICATIONS       Image: Component of the entire system.       Image: Component of the entire system.         QUANTITY REQUIRED:       2.5       SPECIFICATIONS       Image: Component of the entire system.       Image: Component of the entire system.         PHYSICAL DESCRIPTION:       Image: Component of the entire system.       Image: Component of the entire system.       Image: Component of the entire system.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)       Image: Component of the entire system.       Image: Component of the e	RACK INTERFACE       Rack Mounted?       Image: Component of the entire system.       PROBLEMS/ISSUES AND CONCERNS         ELECTRICAL       NONE       STANDARD       EXTRA:       Image: Component of the entire system.       Redundancy should be considered.         THERMAL:       Image: Component of the entire system.       Image: Component of the entire system.       Redundancy should be considered.         WASTE:       Image: Component of the entire system.       Image: Component of the entire system.       Redundancy should be considered.         FLUID:       Image: Component of the entire system.       Image: Component of the entire system.       Redundancy should be considered.         ASSUMPTIONS/       JUSTIFICATIONS       Image: Component of the entire system.       Image: Component of the entire system.         QUANTITY REQUIRED:       2.5       SPECIFICATIONS       Image: Component of the entire system.         PHYSICAL DESCRIPTION:       Unit processes, controls, and stores information from the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)       FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Peak Powe	ər (W)		
ELECTRICAL NONE: STANDARD EXTRA:     THERMAL: Image: Considered     WASTE: Image: Considered     FLUID: Image: Considered     ASSUMPTIONS/ JUSTIFICATIONS     This unit is the command and control center for the entire system.     ASSUMPTIONS/ JUSTIFICATIONS     This unit is the command and control center for the entire system.     OUANTITY REQUIRED: 2.5     SPECIFICATIONS     Image: Physical DESCRIPTION:   Unit processes, controls, and stores information from the other sample preparation modules.   FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	ELECTRICAL NONE: STANDARD EXTRA:     THERMAL: Image: Construction of the entire system.     WASTE: Image: Construction of the entire system.     FLUID: Image: Construction of the entire system.     ASSUMPTIONS/ JUSTIFICATIONS   This unit is the command and control center for the entire system.   OUANTITY REQUIRED: 2.5   SPECIFICATIONS      PHYSICAL DESCRIPTION:   Unit processes, controls, and stores information from the other sample preparation modules.    FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Power Sou	urce (VDC) 28		
ELECTRICAL NONE: STANDARD EXTRA:   THERMAL: Image: Standard in Extra: Image: Standard in Extra:   WASTE: Image: Standard in Extra: Image: Standard in Extra:   FLUID: Image: Standard in Extra: Image: Standard in Extra:   DATA: Image: Standard in Extra: Image: Standard in Extra:   DATA: Image: Standard in Extra: Image: Standard in Extra:   ASSUMPTIONS/ JUSTIFICATIONS   This unit is the command and control center for the entire system.	ELECTRICAL NONE: STANDARD EXTRA:   THERMAL: Image: Standard in Extra: Image: Should be considered.   WASTE: FLUID: DATA: Image: DA	RACK INTE	RFACE Rack Mounted?		
WASTE:       Image: Control of the system of the command and control center for the entire system.         ASSUMPTIONS/ JUSTIFICATIONS         This unit is the command and control center for the entire system.         QUANTITY REQUIRED:       2.5       SPECIFICATIONS       Image: MARC II       Image: MARC III         PHYSICAL DESCRIPTION:       Unit processes, controls, and stores information from the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	WASTE:       Image: Control of the system         FLUID:       Image: Control of the system         DATA:       Image: Control of the system         ASSUMPTIONS/       JUSTIFICATIONS         ASSUMPTIONS/       JUSTIFICATIONS         OUANTITY REQUIRED:       2.5       SPECIFICATIONS       Image: MARC II       Image: MARC III         PHYSICAL DESCRIPTION:       Image: Marc III       MARC III       Image: Marc III         Unit processes, controls, and stores information from the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	ELECTRICAL	NONE: STANDARD 🛛 E		
FLUID:       Image: Constraint of the system of the command and control center for the entire system.         ASSUMPTIONS/       JUSTIFICATIONS         This unit is the command and control center for the entire system.         QUANTITY REQUIRED:       2.5       SPECIFICATIONS       Image: MARC II       Image: MARC III       MARC III         PHYSICAL DESCRIPTION:       Image: Marcon the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	FLUID:       Image: Compared and control center for the entire system.         ASSUMPTIONS/ JUSTIFICATIONS         This unit is the command and control center for the entire system.         QUANTITY REQUIRED:       2.5       SPECIFICATIONS       Image: MARC II       Image: MARC III       MARC III         PHYSICAL DESCRIPTION:       Image: Marc III       MARC III       Image: Marc III       MARC III         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)       FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)				
DATA:       Image: Constraint of the constraint of the entire system.         ASSUMPTIONS/ JUSTIFICATIONS         This unit is the command and control center for the entire system.         QUANTITY REQUIRED:       2.5 SPECIFICATIONS         PHYSICAL DESCRIPTION:         Unit processes, controls, and stores information from the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	DATA:       Image: Constraint of the command and control center for the entire system.         ASSUMPTIONS/ JUSTIFICATIONS         This unit is the command and control center for the entire system.         QUANTITY REQUIRED:       2.5 SPECIFICATIONS         PHYSICAL DESCRIPTION:         Unit processes, controls, and stores information from the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)			<u></u>	
ASSUMPTIONS/ JUSTIFICATIONS This unit is the command and control center for the entire system.          QUANTITY REQUIRED:       2.5       SPECIFICATIONS       MARC I       MARC II       MARC III         PHYSICAL DESCRIPTION:       Unit processes, controls, and stores information from the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	ASSUMPTIONS/ JUSTIFICATIONS This unit is the command and control center for the entire system.          QUANTITY REQUIRED:       2.5       SPECIFICATIONS       MARC I       MARC II       MARC III         PHYSICAL DESCRIPTION:       Unit processes, controls, and stores information from the other sample preparation modules.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)				
Unit processes, controls, and stores information from the other sample preparation modules. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Unit processes, controls, and stores information from the other sample preparation modules. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		REQUIRED: 2.5 SPEC		
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		SURIFININ.		
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED) Performs automation and information processing for other units, especially in blood processing.	FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED) Performs automation and information processing for other units, especially in blood processing.	PHYSICAL DE		nation from the other sample	o nrenaralion illouules.
Performs automation and information processing for other units, especially in blood processing.	Performs automation and information processing for other units, especially in blood processing.	PHYSICAL DE	ses, controls, and stores info	nation from the other sampl	e preparation modules.
		PHYSICAL DE Unit proces FUNCTIONAL	DESCRIPTION (DESCRIBE FULLY	NCLUDE WHERE AND HOW USE	D)
		PHYSICAL DE Unit proces FUNCTIONAL	DESCRIPTION (DESCRIBE FULLY	NCLUDE WHERE AND HOW USE	D)
		PHYSICAL DE Unit proces FUNCTIONAL	DESCRIPTION (DESCRIBE FULLY	NCLUDE WHERE AND HOW USE	D)
		PHYSICAL DE Unit proces	DESCRIPTION (DESCRIBE FULLY	NCLUDE WHERE AND HOW USE	D)
		PHYSICAL DE Unit proces	DESCRIPTION (DESCRIBE FULLY	NCLUDE WHERE AND HOW USE	D)

BMAC	EQUIPMENT NA	ME: SAMPLE PREP MODULE 1: AUTOMATION UNIT ID# 36 3 of
HARDWARE Data Sheet	<b>VER</b> : 1	ORIGINATOR: H. Nguyen
CONSTRUCTIC STRUCTURE/I MATERIAL: aluminum		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) optical drives fans motor
ACTIVE ELECTR	AL % NEW DESIGN (	<u>.5</u> Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS ETC.) OF EACH A/B/C 30	TOTAL S, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
3	5 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
ADDITIONAL (	%	CERNING STRUCT/MECH COMPONENT:

JSC LS-35001		BION	AEDICAL BIOMED	MONIT	ORING A	ND COUN	TERM	EASURES TALOG	JUN	IE 15,1990
BMAC Hardware Data Shee			AME: S/	AMPLE PF		ULE 1: AUTO RIGINATO			36	PAGE 4 of 4
VIDEC		vers, Io		digital Gates, R Compute	E <b>rs</b> , etc.	is, 🗖	) Dis	SPLAY WITH CRT		
	SMITTER ADAR, CC LASER, E <sup>-</sup>			POWER SI CONVENT RECTIFIC, & AC-DC (	'IONAL LII ATION, CH	<b>IOPPER</b>		SPLAY - NO CRT D's LIQUID RYSTAL PRINTERS		
ELECTRONIC			Y PERC	ENTAGE	OF					
	Kg. of Ele % TOTAL			5.00	0/11VD	2(1)// OI		ESTIMATED TO New Design of Electronics	)F	%
ANALOG	10 10 10	20	%IC 0	%LSI 30	%HYB 50	%VLSI		40	%	
DIGITAL	40	20	0			0				
DISP W/CRT	20	80	10	0 10	250	75		WILL ELECTRON		
DISPLAY	0	0	0	0	0	0		ABOVE AVERAG	E DEN	ISITY?
XMTR	15	0	40	20	40	0		• Yes	ОN	0
PWR SUP	15	50	50	0	0	0				
SCOPE OF	DESIGN	FFFORT	·····			EW DESIGN	FOR S	PACE. USES EXIST		
	E MODIFIC		O AN		KA M	ATERIALS, P OMPONENTS ICROGRAVII	PROCE: S. SIGN TY ENV	SSES, AND ELECTE IIFICANT DESIGN IN VIRONMENT. STEMS DO NOT EXI	RONIC MPACT D	UE TO
MODI	FRATE TO FICATION E-BASED [	TO AN EX				Evelopmen ND/OR Elec	NT OF N	PACE. REQUIRES TI NEW MATERIALS, P IC COMPONENTS. TATE OF THE ART.	ROCESS	SES
EXISTI ELECT IMPAC ENVIR	DESIGN FO ING MATER RONIC CO T DUE TO ONMENT. ( IMS COMM	RIALS, PR MPONEN MICROGR GROUND I	OCESSES FS. NO DE AVITY BASED	SIGN		EVELOPMEN KISTING STA	IT OF N ATE OF	EW TECHNOLOGY ( THE ART AND/OF UIRED TO REACH 1	WELL BE	PLE
	EEDS SOF HARDWA TIONAL AU RENTLY A	RE AVAIL	ABLE W/ ON REQU			OFTWARE	N		Пнк	ЭН

BMAC	EQUIPMENT	NAME SAMPLE PREP MODULE 2: URINE, SALIVA	Pag
HARDWARE Data Sheet	[	ID. NO.: 40 ORIGINATOR: H. Nguyen	1 of
ILLUSTRATIO	L		
	L	37-90	
		nt module of the Sample Preparation Device. It process nens for appropriate analyses.	ses urine
HISTORY/DESI			
New design	in co-ordinat	on with the Sample Preparation Device.	

ISC LS-35001		G AND COUNTERMEASURES JUNE 15,199 Ty hardware catalog
BMAC Hardware Data sheet	EQUIPMENT NAME: SAMPLE PREP M	ODULE 2: URINE, SALIVA ID# 40 Page ORIGINATOR: H. Nguyen
	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
	7.63	
Width (m)		
Depth (m)		
Volume (m	3):054	
Standby Po	wer (W)	
	Power (W) 65	
Peak Power	r (W)	
Power Sour	rce (VDC) 28	
RACK INTER	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ELECTRICAL		
THERMAL:		
WASTE:		
FLUID: DATA:		
ASSUMPTION Module will be use QUANTITY R PHYSICAL DESC	EQUIRED: 2.5 SPECIFICATION	
Urine, saliva,	of reagent dispenser and diluter. and semi-solid wastes, such as emesi d through a series of dilution and filtra	• •
FUNCTIONAL D	ESCRIPTION (DESCRIBE FULLY, INCLUDE W	VHERE AND HOW USED)
	ule of the Sample Preparation Device to laboratory processing.	o process solids into homogeneous

HARDWARE	QUIPMENT NAN Er :	IE: SAMPLE PREP MODULE 2: URINE, SALIVA ID# 40 ORIGINATOR: H. Nguyen
CONSTRUCTION STRUCTURE/ME MATERIAL: aluminum, plastics TOTAL STRUCT/ME ACTIVE ELECTRON ESTIMATED TOTAL STRUCT/MECH COM	CHANICS CHWT. (EXCLUE ICS): 5.2 % NEW DESIGN OF	Kg ALL
ESTIMATED # OF	PCT. OF	0 % CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR
STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL STRUCT WEIGHT:	MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
50	<u>72</u> %	<ul> <li>STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES</li> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS  STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL COM		ERNING STRUCT/MECH COMPONENT:

JSC LS-35001		BION				ND COU		MEASURES JUNE 15	,1990
BMAC Hardware Data Shee		MENT N	AME: S	AMPLE PF		ULE 2: UR RIGINAT		SALIVA ID# 40 PAG H. Nguyen	
VIDEC		/ERS, IO		Digital Gates, R Compute		•	], (	DISPLAY WITH CRT	
TV, R	SMITTER ADAR, CO LASER, ET			POWER SI CONVENT RECTIFIC/ & AC-DC (	'IONAL LIN ATION, CH	iear <sup>-</sup> Iopper		DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC			Y PERC	ENTAGE	OF				
	Kg. of Ele		 %IC	2.43 %LSI	%HYB	%VLSI		ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
ANALOG	40	65	35	0		0		40 %	
DIGITAL	40	10	75	15	0	0			
DISP W/CRT	0	0	0	0	0	0		WILL ELECTRONICS BE OF	
DISPLAY	10	50	50	0	0	0		ABOVE AVERAGE DENSITY?	
XMTR	0	0	0	0	0	0		O Yes 💿 No	
PWR SUP	10	68	32	0	0	0			
L	DESIGN E MODIFIC					ATERIALS, DMPONEN <sup>®</sup> CROGRAV	PROC TS. Sk 'ITY E	SPACE. USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT. SYSTEMS DO NOT EXIST	
MODI SPAC	FICATE TO I FICATION E-BASED [	TO AN EX DESIGN	ISTING			EVELOPME	INT O	SPACE. REQUIRES THE F NEW MATERIALS, PROCESSES ONIC COMPONENTS. STATE OF THE ART.	
EXISTI ELECT IMPAC ENVIR	DESIGN FO ING MATEF TRONIC CO IT DUE TO I ONMENT. ( EMS COMM	RIALS, PR MPONEN MICROGR GROUND I	OCESSES FS. NO DE AVITY BASED	ESIGN .	Ш <sub>Е</sub> )	(ISTING ST	ΓΑΤΕ	NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL.	
	EEDS SOF SHARDWA ITIONAL AU RENTLY A'	RE AVAIL JTOMATK	ABLE W/ ON REQU				ow	- Medium - High	

BMAC Hardware	EQUIPMENT NAME SAMPLE PREP MODULE 3: VORTEX	Pag
DATA SHEET	HARDWARE ID. NO.: 38 ORIGINATOR: H. Nguyen VERSION : 1	1 of
ILLUSTRATIO	N	
		ale
		MIKW/ 31.90
Module of the	Sample Preparation Device used to mix specimens.	
ISTORY/DESIG	N STATUS:	
lew design in	co-ordination with the Sample Preparation Device.	

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILIT	AND COUNTERMEASURES JUNE 15,1990 Y HARDWARE CATALOG
BMAC Hardware Data Sheet	EQUIPMENT NAME: SAMPLE PREP MC VER : 1	ODULE 3: VORTEX     ID#     3 8     Page       ORIGINATOR: H. Nguyen     2 of 4
GENERAL Mass (kg): Height (m) Width (m) Depth (m) Volume (m Standby Po	SPECIFICATIONS         1.5	PERFORMANCE SPECIFICATIONS: Mixes all biological specimens homogeneously for future analyses. Automatic timer
Peak Powe Power Sou RACK INTER ELECTRICAL THERMAL: WASTE: FLUID: DATA:	RFACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS
ASSUMPTIO This is a module	NS/ JUSTIFICATIONS used in-conjunction with the central Sample Prepara	
QUANTITY PHYSICAL DES Rack mount		
Standard la	DESCRIPTION (DESCRIBE FULLY, INCLUDE) boratory vortex mixer or a new model is to mix solids and liquids.	

HARDWARE	EQUIPMENT NA	ME: SAMPLE PREP MODULE 3: VORTEX ID# 38 ORIGINATOR: H. Nguyen
DATA SHEET	VEN : ]	
CONSTRUCTIO STRUCTURE/M MATERIAL: aluminum		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) motor
ACTIVE ELECTRO	DNICS):         1           L % NEW DESIGN (	<u>.4</u> Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL S, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
7	80%	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
5	20 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
ADDITIONAL C	OMMENTS CON	C. LAMINATED STRUCTURAL COMPOSITES

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JSC LS-35001		BION	AEDICAL BIOMED	MONIT	ORING A	ND COUN HARDWARI	TERMEASURES E catalog	JUNE 15,1990
BMAC Hardware Data Shee			AME: S	AMPLE PF		JLE 3: VOR <sup>-</sup> RIGINATO	TEX ID R: H. Nguyen	0# 38 PAGE 4 of 4
VIDEC		vers, 10		DIGITAL GATES, R COMPUTE	E <b>RS, E</b> TC.	•	] · DISPLAY WITH CF	
TV, R	SMITTER ADAR, CO LASER, E			POWER SI CONVENT RECTIFIC, & AC-DC (	TONAL LIN ATION, CH	<b>IOPPER</b>	DISPLAY - NO CF LED's LIQUID CRYSTAL PRINTE	
ELECTRONIC			Y PERC	ENTAGE	OF			
	Kg. of Ele	octronics		0.10			ESTIMATED NEW DESIG ELECTRONI	N OF
ANALOG	% TOTAL	90	%IC 1 0	%LSI 0	%HYB 0	%VLSI	3	30 %
DIGITAL	0	0	0	0	0	0		-
DISP W/CRT	0	0	0	0	0	0		ONICS BE OF
DISPLAY	10	50	50	0	0	0	ABOVE AVEF	RAGE DENSITY?
XMTR	0	0	0	0	0	0	O Yes	
PWR SUP	45	60	40	0	0	0		
	<b>DESIGN</b> LE MODIFIC ING SPACI		O AN		M CC M	ATERIALS, P DMPONENTS CROGRAVII	FOR SPACE. USES EX PROCESSES, AND ELE S. SIGNIFICANT DESIG ITY ENVIRONMENT. ED SYSTEMS DO NOT	CTRONIC N IMPACT DUE TO
MODI SPAC	ERATE TO FICATION E-BASED [	TO AN EX DESIGN	ISTING		L DE At	EVELOPMEN	FOR SPACE. REQUIRE IT OF NEW MATERIAL TRONIC COMPONENT THE STATE OF THE A	S, PROCESSES TS.
ELECT ELECT IMPAC ENVIR	DESIGN FO ING MATER TRONIC CO T DUE TO ONMENT. ( EMS COMM	RIALS, PR MPONEN MICROGR GROUND I	OCESSES TS. NO DE AVITY BASED	ŚIGN	LJ E)	(ISTING STA	T OF NEW TECHNOLO ATE OF THE ART AND S REQUIRED TO REAC	OR MULTIPLE
	IEEDS SOF S HARDWA ITIONAL AI RENTLY A	RE AVAIL	ABLE W/ ON REQU			FTWARE		и 🗌 нісін

HARDWARE	EQUIPMENT NAME SAMPLE PREP MODULE 4: FILTRATION UNIT	Pa
DATA SHEET		1 0
ILLUSTRATIO	ON	
DEFINITION Module of the	e Sample Preparation Device used to separate fluids from solids.	
	e Sample Preparation Device used to separate fluids from solids.	
	e Sample Preparation Device used to separate fluids from solids.	
Module of the		
Module of the	IN STATUS:	
Module of the		
Module of the	IN STATUS:	

BMAC HARDWARE HARDWARE HARDWARE VER : 1       EQUIPMENT NAME: SAMPLE PREP MODULE 4: FILTRATION UNIT       IDI::: 3.9       Pegg 2 2.14         GENERAL SPECIFICATIONS       VER : 1       ORIGINATOR: H. Nguyan       IDI:: 3.9       Pegg 2 2.14         GENERAL SPECIFICATIONS       4.2       Height (m)       0.090       IDI:: 3.9       Pegg 2 2.14         GENERAL SPECIFICATIONS       4.2       Height (m)       0.090       IDI:: 3.9       Pegg 2 2.14         Mass (kg):       4.2       Height (m)       0.090       IDI:: 3.9       Pegg 2 2.14         Jopht (m)	SC -S-35001	BIOMEDICAL MONITORING AND COUNTERMEASURES JUNE 15,1990 BIOMEDICAL FACILITY HARDWARE CATALOG
HARDWARE ATA SHEET       VER : 1       ORIGINATOR: H. Nguyen         GENERAL SPECIFICATIONS       PERFORMANCE SPECIFICATIONS:         Mass (kg):       4.2         Height (m)       .089         Width (m)       .482         Depth (m)	BMAC	
GENERAL SPECIFICATIONS       PERFORMANCE SPECIFICATIONS:         Mass (kg):       4.2         Height (m)       .089         Width (m)       .482         Depth (m)       .851         Volume (m3):       .036         Standby Power (W)       .036         Pack Power (W)       .60         Peak Power (W)       .60         Peak Power (W)       .60         Peak Power (W)       .60         Pack INTERFACE       Rack Mounted?         MASSTE:	HARDWARE	VER : 1 ORIGINATOR: H. Nguyen
Height (m) 089   Width (m)		DEREORMANCE SPECIFICATIONS:
Width (m)	Mass (kg):	4.2
Depth (m)	Height (m)	.089
Volume (m3):	Width (m)	
Standby Power (W)   Operational Power (W)   Peak Power (W)   Power Source (VDC)   28   RACK INTERFACE   Rack Mounted?   ARCK INTERFACE   Rack Mounted?   MARC I   CHECTRICAL NONE:   STANDARD   ELECTRICAL NONE:   STANDARD   FLUID:   MARC:   MARC II         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Depth (m)	
Operational Power (W) 60   Peak Power (W)	Volume (m	
Peak Power (W)   Power Source (VDC)   28 <b>RACK INTERFACE</b> Rack Mounted?   Rack INTERFACE   Rack Mounted? <b>PROBLEMS/ISSUES AND CONCERNS</b> ELECTRICAL   NONE:   STANDARD   ELECTRICAL   NONE:   THERMAL:   Image: Standard Standa	Standby Po	ower (W)
Power Source (VDC) 23 <b>RACK INTERFACE</b> Rack Mounted?   RACK INTERFACE Rack Mounted? <b>PROBLEMS/ISSUES AND CONCERNS</b> ELECTRICAL NONE:   STANDARD   STANDARD EXTRA: <b>PROBLEMS/ISSUES AND CONCERNS</b> THERMAL: Image: Content of the state of	Operationa	Power (W)60
RACK INTERFACE Rack Mounted?   ELECTRICAL NONE:   STANDARD EXTRA:   THERMAL: Image: Concerns   WASTE: Image: Concerns   FLUID: Image: Concerns   DATA: Image: Concerns   DATA: Image: Concerns   ASSUMPTIONS/ JUSTIFICATIONS   This unit is used in conjunction with the central Sample Preparation Device     QUANTITY REQUIRED: SPECIFICATIONS   PHYSICAL DESCRIPTION:   The device is a container with filters or strainers to accomplish the filtration process.   FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	Peak Powe	ər (W)
ELECTRICAL NONE: STANDARD EXTRA:   THERMAL: Image: Constraint of the standard extraint extraint of the standard extraint of the standard extraint of the standard extraint extrai	Power Sou	urce (VDC) 28
THERMAL:   WASTE:   FLUID:   DATA:     ASSUMPTIONS/ JUSTIFICATIONS   This unit is used in conjunction with the central Sample Preparation Device     QUANTITY REQUIRED:   SPECIFICATIONS   MARC I   MARC II   MARC III   PHYSICAL DESCRIPTION: The device is a container with filters or strainers to accomplish the filtration process. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		
WASTE:   FLUID:   DATA:   ASSUMPTIONS/ JUSTIFICATIONS   This unit is used in conjunction with the central Sample Preparation Device     QUANTITY REQUIRED:   SPECIFICATIONS   MARC I   MARC II   MARC III   MARC III MARC III MARC III MARC III PHYSICAL DESCRIPTION: The device is a container with filters or strainers to accomplish the filtration process. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	ELECTRICAL	
FLUID:       Image: Comparison of the second strainers in the second strainer strainer strainer strainer strainers in the second strainer strainer strainers in the second strainer strainer strainer strainers in the second strainer strainer strainer strainer strainers in the second strainer		
DATA:       Image: Compare the second s		
ASSUMPTIONS/ JUSTIFICATIONS This unit is used in conjunction with the central Sample Preparation Device          QUANTITY REQUIRED:       SPECIFICATIONS       MARC I       MARC II       MARC III         PHYSICAL DESCRIPTION:       The device is a container with filters or strainers to accomplish the filtration process.       FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		
This unit is used in conjunction with the central Sample Preparation Device         QUANTITY REQUIRED:       SPECIFICATIONS       MARC I       MARC II       MARC III         PHYSICAL DESCRIPTION:       The device is a container with filters or strainers to accomplish the filtration process.       FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		
QUANTITY REQUIRED:       SPECIFICATIONS       MARC I       MARC II       MARC III         PHYSICAL DESCRIPTION:       The device is a container with filters or strainers to accomplish the filtration process.       FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	ASSUMPTIC	
QUANTITY REQUIRED:       SPECIFICATIONS       Image: Market Fill         PHYSICAL DESCRIPTION:         The device is a container with filters or strainers to accomplish the filtration process.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		
QUANTITY REQUIRED:       SPECIFICATIONS       Image: Market Fill         PHYSICAL DESCRIPTION:         The device is a container with filters or strainers to accomplish the filtration process.         FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		
PHYSICAL DESCRIPTION: The device is a container with filters or strainers to accomplish the filtration process. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	QUANTITY	REQUIRED: SPECIFICATIONS MARC I MARC II MARC III
The device is a container with filters or strainers to accomplish the filtration process. FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)		
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED) Unit filters, sterilizes, deposits, or separates samples from other sample prep modules.	The device	is a container with inters of strainers to accomption are averaging to
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED) Unit filters, sterilizes, deposits, or separates samples from other sample prep modules.		
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED) Unit filters, sterilizes, deposits, or separates samples from other sample prep modules.		
FUNCTIONAL DESCRIPTION (DESCRIBE FOLLT, include and include the end of the en		
Unit filters, sterilizes, deposits, or separates samples from other sample property	FUNCTIONAL	_DESCRIPTION (DESCRIBE FOLLT, INSCOLUTING EACH AND A STATE OF A DESCRIPTION (DESCRIBE FOLLT, INSCOLUTING EACH AND A DESCRIPTION (DESCRIBE FOLLT)
	Unit filters,	sterilizes, deposits, or separates samples norm other sample proprime to the

	EQUIPMENT NA	AME: SAMPLE PREP MODULE 4: FILTRATION UNIT ID# 39 3 o ORIGINATOR: H. Nguyen
CONSTRUCTION STRUCTURE/M MATERIAL: aluminum, plastic TOTAL STRUCT/M ACTIVE ELECTRO ESTIMATED TOTAL STRUCT/MECH CO	ECHANICS s IECH WT. (EXCLU NICS): <u>3</u> % NEW DESIGN (	1.9 Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C 20	PCT. OF TOTAL STRUCT WEIGHT:	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
10	33 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINM</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	CERNING STRUCT/MECH COMPONENT:
		PENNING STRUCT/MECH COMPONENT:

5-35001		BIOM		MONITO	RING AI	ND COUNTE	CATALOG
BMAC Hardware Data Sheet			ME: SA	MPLE PR		ILE 4: FILTRA	4 of 4
TYPE OF	ELECTRO	ONICS:					-
VIDEO	DG RECEIV MPS, AUDIO , RF, SERV , ETC.	0		DIGITAL GATES, RE COMPUTE		s, 🔲 '	DISPLAY WITH CRT
TRANS TV, R/	MITTER Adar, co Laser, et			POWER SU CONVENT RECTIFICA & AC-DC C	IONAL LIN ATION, CH	OPPER	DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS
ELECTRONIC ELECTRONIC	S WEIGH	IT	Y PERC		OF		ESTIMATED TOTAL %
	Kg. of Ele			0.30			NEW DESIGN OF ELECTRONICS:
	% TOTAL	r1	%IC	%LSI	%HYB	%VLSI	20 %
ANALOG DIGITAL	25 25	70 70	<u> </u>	0	0	0	
	0	0	0	10 0	0	0	WILL ELECTRONICS BE OF
DISPLAY	15	60	40	0	0	0	ABOVE AVERAGE DENSITY?
XMTR	0	0	0	0	0	0	O Yes 💿 No
PWR SUP	35	75	25	0	0	0	
	DESIGN LE MODIFI TING SPAC					ATERIALS, PF OMPONENTS	OR SPACE. USES EXISTING ROCESSES, AND ELECTRONIC . SIGNIFICANT DESIGN IMPACT DUE TO Y ENVIRONMENT. D SYSTEMS DO NOT EXIST
MOD	ERATE TO IFICATION CE-BASED	TO AN E				EVELOPMEN" ND/OR ELECT	OR SPACE. REQUIRES THE T OF NEW MATERIALS, PROCESSES TRONIC COMPONENTS. THE STATE OF THE ART.
EXIST ELEC IMPAC ENVIR	DESIGN FO FING MATE TRONIC CO CT DUE TO RONMENT. EMS COMI	RIALS, PF DMPONEN MICROGI GROUND	ROCESSE ITS. NO D RAVITY BASED	esign		<b>XISTING STA</b>	OF NEW TECHNOLOGY WELL BEYOND TE OF THE ART AND/OR MULTIPLE REQUIRED TO REACH THE GOAL
	NEEDS SO S HARDW DITIONAL A RRENTLY /	ARE AVA	ILABLE W			OFTWARE	V 🔲 меріцм 🗌 нісн

BMAC	EQUIPMENT NAME SLIDE PREPARATION DEVICE	Pag 1 of					
HARDWARE Data Sheet							
ILLUSTRATI	ON						
DEFINITION The Slide Pr by microsco	reparation Device automatically prepares blood samples on a slide for	r viewir					
by merosco	μ <b>γγ</b> .						
HISTORY/DES	IGN STATUS: units are not applicable to microgravity.						
	ntual design is required.						
	otual design is required.						

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG
BMAC	EQUIPMENT NAME: SLIDE PREPARATION	
HARDWARE Data sheet	VER : 1 C	DRIGINATOR: G. McFadyen
GENERAL S Mass (kg): Height (m) Width (m) Depth (m) Volume (m3 Standby Pow Operational	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS: Simulate 1g for chromosomal slide preparation. Dispense consistent quantity of sample, fixes, washes and stains slides as needed. Must be capable of dispensing at least 4 stains.
Power Source RACK INTERI ELECTRICAL THERMAL: WASTE: FLUID: DATA: ASSUMPTION Important item to re	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS Requires advances in state-of-the-art technology. Must provide handling and containment of biological samples. Will require long lead time for development and testing. Complex, automated item.
QUANTITY RE PHYSICAL DESC Consists of bla and storage,		MARC I MARC II MARC III
Prepares micro Slides for chro	SCRIPTION (DESCRIBE FULLY, INCLUDE WHE oscope slides of blood samples for imagi mosomal analysis must allow sample to be evenly dispersed onto slide, then fixed	ng analysis. "drop" onto slide.
		· · · · · · · · · · · · · · · · · · ·

HARDWARE I	EQUIPMENT NA	ME: SLIDE PREPARATION DEVICE ID# 4 1 ORIGINATOR: G. McFadyen
ACTIVE ELECTRO	AS MECH WT. (EXCLU DNICS): 2 L % NEW DESIGN (	3 Kg Transport mechanism
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C 20	PCT. OF TOTAL	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
40	<u> </u>	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMENT</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	<ul> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> <li>CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES</li> </ul>

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Device will handle contaminated samples. Structure must be sealed from environment or able to be cleaned.

S-35001		BIO	BIOMED	ICAL FA	ORING A	ND COUN		MEASURES CATALOG	JUNE 15,199	
BMAC HARDWARE	EQUIP	MENT N	AME: S	LIDE PREF	PARATION	DEVICE		ID# 4		
DATA SHEE		1	ORIGINATOR: G. McFadyen 4 of 4						4 of 4	
Video Drivi Tran TV, r		VERS, 10 VO DMM,		DIGITAL GATES, R COMPUTE POWER SI CONVENT RECTIFIC & AC-DC (	ERS, ETC. UPPLY TONAL LIN ATION, CH		<b>3</b> '	DISPLAY WITH CRT DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS		
			Y PERC	ENTAGE	OF					
	Kg. of Ele	ectronics	<u> </u>	2.00				ESTIMATED TOTAL % New Design of Electronics:		
	% TOTAL		%IC	%LSI	%HYB	%VLSI		50 %		
ANALOG DIGITAL	30 40	65 0	35	0	0	0		50 %	, 	
DISP W/CRT		0	0 0	<u>50</u>	25	25		WILL ELECTRONIC	S BE OF	
DISPLAY	15	70	30	0	0	0 0		ABOVE AVERAGE		
XMTR	0	0	0	0	0	0		Yes	O No	
PWR SUP	15	70	30	0	0	0				
	<b>DESIGN</b> E MODIFIC ING SPACI		O AN		СС СС МІ	ATERIALS, P DMPONENTS CROGRAVIT	Proc S. Sk Ty Ei	SPACE. USES EXISTING CESSES, AND ELECTRO GNIFICANT DESIGN IMP, NVIRONMENT. SYSTEMS DO NOT EXIST	NIC ACT DUE TO	
MODI SPAC	ERATE TO I FICATION E-BASED [	TO AN EX DESIGN	- Isting		DE AN	VELOPMEN	NT OF	SPACE. REQUIRES THE F NEW MATERIALS, PRO NIC COMPONENTS. STATE OF THE ART.		
ELECT ELECT IMPAC ENVIR	Design fo Ing Matef Tronic Co It due to I Onment. ( Ems Comm	RIALS, PRO MPONENT MICROGR GROUND E	OCESSES TS. NO DE AVITY BASED	SIGN	L <sub>EX</sub>	ISTING ST	ATE	NEW TECHNOLOGY WE OF THE ART AND/OR N QUIRED TO REACH THE	IULTIPLE	
	IEEDS SOF 5 HARDWA ITIONAL AU RENTLY A'	RE AVAIL	ABLE W/			FTWARE	w		🛾 нюн	

BMAC	BIOMEDICAL FACILITY HARDWARE CATALOG	
HARDWARE Data Sheet	EQUIPMENT       NAME TELETHERMOMETER         HARDWARE ID. NO.:       27         ORIGINATOR:       J. Stephenson         VERSION:       1	Page 1 of
ILLUSTRATIO	ON	
(	ANKEN SO	
DEFINITION Instrument to	measure minute incremental changes in body core temperature.	
ISTORY/DESIG The currently a and telemetry.	available commercial off-the-shelf design needs modifications for reco	rding

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	
BMAC HARDWARE	EQUIPMENT NAME: TELETHERMOMETER	
DATA SHEET	VER : 1 0	RIGINATOR: J. Stephenson
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:
Mass (kg):	2.5	High accuracy and sensitivity: 0.1 degrees C. Repeatability is 0.01degrees C.
Height (m)		High stability: No calibration necessary. Safety: Low voltage battery operation.
Width (m)	.08	Long battery life: 1200 hours. Calibration conforms to National Bureau of Standards.
Depth (m)		Monograph: 125.
Volume (m	3):00	
Standby Po	wer (W)	
Operational	Power (W)	
Peak Powe	r (W)	
	rce (VDC) Battery	
RACK INTER		PROBLEMS/ISSUES AND CONCERNS
FLECTRICAL		FRODLEMS/1990L9 AND CONCERNS
THERMAL:		1 1
WASTE:		]
FLUID:		
DATA:		
	NS/ JUSTIFICATIONS not have recording capability at present.	
QUANTITY I		
	need to be pleased upday the arm pit to re	poord body core temperature
Digital record	nsor to be placed under the arm pit to re ding of temperature to be stored or proc	essed for future reference.
g		
	DESCRIPTION (DESCRIBE FULLY, INCLUDE WH	
The sensor i	s placed in subject's arm-pit after exerc	ise to record temperature.

BMAC Hardware Data Sheet		ME: TELETHERMOMETER ID # 2 7 3 of 4 ORIGINATOR: J. Stephenson
CONSTRUCTIO STRUCTURE/I MATERIAL: plastic, aluminu TOTAL STRUCT/ ACTIVE ELECTR	N OF MECHANICS MECH WT. (EXCLL DNICS):	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) battery
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C	TOTAL S. STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
5	20%	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
10	<u> </u>	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINMEN</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
DDITIONAL CC	%	C. LAMINATED STRUCTURAL COMPOSITES   LAID UP FLAT SURFACE WITH STIFFENERS  STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY  CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES  CRNING STRUCT/MECH COMPONENT:

JSC _S-35001							FERMEASURESJUNE 15,1990E CATALOG	0
BMAC	EQUIPM	IENT NA	ME: TE	LETHERM	OMETER		ID# 27 PAGE	
HARDWARE Data Sheet	VER :	1			OF	RIGINATOR	R: J. Stephenson	
TYPE OF								
	/IPS, AUDI ), RF, SER\	0	<b>—</b> (	DIGITAL GATES, RI COMPUTE		s, 🔲 '	· DISPLAY WITH CRT	
TV, R/	SMITTER Adar, Co Laser, E1		 F	POWER SU CONVENT RECTIFICA & AC-DC C	IONAL LIN ATION, CH	iear Iopper	<ul> <li>DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS</li> </ul>	-
ELECTRONIC			Y PERC	ENTAGE	OF	<u> </u>		_
	Kg. of Ele			0.50			ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	_
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI		
ANALOG	20	0	0	100	0	0	<u> </u>	
DIGITAL	50	40	0	60	0	0		
DISP W/CRT	0	0	0	0	0	0	WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?	-
DISPLAY	30	100	0	0	0	0		
XMTR	0	0	0	0	0	0	O Yes 💿 No	-
PWR SUP	0	0	0	0	0	0		
	DESIGN E MODIFI ING SPAC		O AN			ATERIALS, PI OMPONENTS	FOR SPACE. USES EXISTING PROCESSES, AND ELECTRONIC S. SIGNIFICANT DESIGN IMPACT DUE TO TY ENVIRONMENT. SED SYSTEMS DO NOT EXIST	
MOD SPAC	ERATE TO IFICATION CE-BASED	TO AN E	XISTING			EVELOPMEN ND/OR ELEC	FOR SPACE. REQUIRES THE NT OF NEW MATERIALS, PROCESSES CTRONIC COMPONENTS. THE STATE OF THE ART.	
EXIST ELEC IMPAC ENVIF	DESIGN FC ING MATE TRONIC CC CT DUE TO RONMENT. EMS COMI	RIALS, PF DMPONEN MICROGI GROUND	ROCESSE ITS. NO D RAVITY BASED	esign	LΙ <sub>Ε</sub>	XISTING STA	NT OF NEW TECHNOLOGY WELL BEYOND ATE OF THE ART AND/OR MULTIPLE IS REQUIRED TO REACH THE GOAL.	
	NEEDS SO S HARDW DITIONAL A RRENTLY A	ARE AVA	LABLE W			OFTWARE	ож 🗆 меріим 🗌 нісн	

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	EQUIPMENT NAME URINE SAMPLE DEVICE Pag
HARDWARE Data Sheet	HARDWARE ID. NO.: 42 ORIGINATOR: M. Singletary
	VERSION : 1
ILLUSTRATI	ON
/	
The volumet Upon the pas	ample Device is used for collecting a specific volume of urine for future analysi ric device will project an electromagnetic field across the flow tube. ssage of the urine, the disturbance of the electromagnetic field will be nd calibrated to quantitate the flow.
The Urine Sa The volumet Upon the pas measured ar	ric device will project an electromagnetic field across the flow tube. ssage of the urine, the disturbance of the electromagnetic field will be nd calibrated to quantitate the flow.
The Urine Sa The volumet Upon the pa measured ar	ric device will project an electromagnetic field across the flow tube. ssage of the urine, the disturbance of the electromagnetic field will be nd calibrated to quantitate the flow.
The Urine Sa The volumet Upon the pa measured ar	ric device will project an electromagnetic field across the flow tube. ssage of the urine, the disturbance of the electromagnetic field will be nd calibrated to quantitate the flow.

BMAC HARDWARE DATA SHEET       EQUIPMENT NAME: URINE SAMPLE DEVICE       ID#         GENERAL SPECIFICATIONS       VER : 1       ORIGINATOR: M. Singletary         GENERAL SPECIFICATIONS       Mass (kg):       3         Height (m)       .044       Will automatically collect 15 ml of urine with operation.         Width (m)       .482       Volumetric accuracy or the measuring compt 0.05 ml         Depth (m)       .851       Volume (m3):       .018         Standby Power (W)       .00       .05 ml       PROBLEMS/ISSUES AND CONC         Peak Power (W)       .00       battery       PROBLEMS/ISSUES AND CONC         ELECTRICAL NONE:       STANDARD       EXTRA:       PROBLEMS/ISSUES AND CONC         FLUID:	2 of TIONS: without hands on
GENERAL SPECIFICATIONS       PERFORMANCE SPECIFICATION         Mass (kg):      3         Height (m)      044         Width (m)      044         Width (m)      044         Width (m)      044         Depth (m)      0851         Volume (m3):      018         Standby Power (W)          Operational Power (W)          Power Source (VDC)       battery         Power Source (VDC)       battery         RACK INTERFACE       Rack Mounted?         THERMAL:	without hands on
mass (kg):	
Width (m)	component is within
Width (m)       .482         Depth (m)       .851         Volume (m3):       .018         Standby Power (W)       .018         Operational Power (W)       20         Peak Power (W)       .20         Peak Power (W)       .20         Peak Power (W)          Power Source (VDC)       battery         Power Source (VDC)       battery         Problems/Issues and conc         ELECTRICAL NONE:       STANDARD         ELECTRICAL NONE:       STANDARD         ELECTRICAL NONE:       STANDARD         PROBLEMS/ISSUES AND CONC         ELECTRICAL NONE:       STANDARD         PROBLEMS/ISSUES AND CONC         Standby	
Volume (m3):       .018         Standby Power (W)       .018         Operational Power (W)       .00         Peak Power (W)       .00         Power Source (VDC)       battery         Power Source (VDC)       battery         RACK INTERFACE       Rack Mounted?         PROBLEMS/ISSUES AND CONC         ELECTRICAL       NONE:         STANDARD       EXTRA:         THERMAL:	
Standby Power (W)   Operational Power (W)   20   Peak Power (W)   Power Source (VDC)   battery   PROBLEMS/ISSUES AND CONC   ELECTRICAL   NONE:   STANDARD   ELECTRICAL   NONE:   STANDARD   EXTRA:   THERMAL:   WASTE:   Image: Stand S	
Operational Power (W) 20   Peak Power (W)	
Operational Power (W) 20   Peak Power (W)	
Power Source (VDC)       battery         RACK INTERFACE       Rack Mounted?         ELECTRICAL       NONE:       STANDARD         ELECTRICAL       NONE:       STANDARD         EXTRA:       Image: Standard       Image: Standard         THERMAL:       Image: Standard       Image: Standard         WASTE:       Image: Standard       Image: Standard         FLUID:       Image: Standard       Image: Standard         DATA:       Image: Standard       Image: Standard         ASSUMPTIONS/       JUSTIFICATIONS         The design is based on the assumption that the Urine Sample Device will be integrated into the Space Station Waste C         WCS). The scope of this design, therefore, does not include the human-interface collection and the disposal of the urint	
Power Source (VDC)       battery         RACK INTERFACE       Rack Mounted?         ELECTRICAL       NONE:       STANDARD         EXTRA:       Image: Standard         THERMAL:       Image: Standard         WASTE:       Image: Standard         FLUID:       Image: Standard         DATA:       Image: Standard         ASSUMPTIONS/       JUSTIFICATIONS         The design is based on the assumption that the Urine Sample Device will be integrated into the Space Station Waste C         WCS). The scope of this design, therefore, does not include the human-interface collection and the disposal of the urinformation of the space of the space of the urinformation of the space of the urinformation of the space of the uniformation of the space of the uniformation of the space of the uniformation of the uniformatic of the uniformation of the uniformatic	
ELECTRICAL NONE:       STANDARD       EXTRA:       PROBLEMS/ISSUES AND CONC         THERMAL:       Image: Concentration of the	
ELECTRICAL NONE:       STANDARD       EXTRA:	
THERMAL:       Image: Constraint of the system         WASTE:       Image: Constraint of the system         FLUID:       Image: Constraint of the system         DATA:       Image: Constraint of the system         ASSUMPTIONS/       JUSTIFICATIONS         The design is based on the assumption that the Urine Sample Device will be integrated into the Space Station Waste C (WCS). The scope of this design, therefore, does not include the human-interface collection and the disposal of the urin	
FLUID:       Image: Comparison of the system o	
DATA: ASSUMPTIONS/ JUSTIFICATIONS The design is based on the assumption that the Urine Sample Device will be integrated into the Space Station Waste C WCS). The scope of this design, therefore, does not include the human-interface collection and the disposal of the urin	
ASSUMPTIONS/ JUSTIFICATIONS The design is based on the assumption that the Urine Sample Device will be integrated into the Space Station Waste C WCS). The scope of this design, therefore, does not include the human-interface collection and the disposal of the urin	
The design is based on the assumption that the Urine Sample Device will be integrated into the Space Station Waste C WCS). The scope of this design, therefore, does not include the human-interface collection and the disposal of the urin	
QUANTITY REQUIRED: 2.5 SPECIFICATIONS MARCI MARCI MARCI	a urine. The collection
PHYSICAL DESCRIPTION:	
A flow tube with a volumetric measuring device wrapping around the circumference and chamber loaded with a disposable wick for fluid collection. Automatic labeling provides date, time, crew-member identification and volume.	and followed by
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUDE WHERE AND HOW USED)	
Device will be used for all required urine samplings. The passage of urine through the f be quantitated. A sampling amount of urine will be trapped in the wick chamber, which	

BMAC	EQUIPMENT NAME: (	JRINE SAMPLE DEVICE ID# 4 2 2 2 4
	VER:1	ORIGINATOR: M. Singletary
ACTIVE ELECTRO	MECHANICS MECH WT. (EXCLUDING DNICS):7 Kg L % NEW DESIGN OF ALL	
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C 5 3	TOTAL MEC	<ul> <li>CK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR CONFIGURATION:</li> <li>A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED</li> <li>SUPPORT STRUCTURE, NO MOVING PARTS</li> <li>CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES</li> <li>STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES</li> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> <li>STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY</li> </ul>
ADDITIONAL CC	MMENTS CONCERNI	CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES

JSC LS-35001						ND COUNTE	CATALOG
BMAC HARDWARE			ME: UF	RINE SAM	PLE DEVK		ID# 4 2 PAGE 4 of 4
DATA SHEET		1			OF		: M. Singletary
OP AN VIDEC	DG RECEIV /IPS, AUDI ), RF, SER\	/ERS, O	- (	DIGITAL GATES, RI COMPUTE	Egister: :RS, etc.	s, D`	DISPLAY WITH CRT
TRAN	E, ETC. SMITTER ADAR, CO LASER, ET			RECTIFIC	JPPLY IONAL LIN ATION, CH XONVERT	OPPER	DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS
ELECTRONIC			Y PERC	ENTAGE	OF		
	Kg. of Ele	octronics		2.30			ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:
	% TOTAL	. %DISC	%IC	%LSI	%HYB	%VLSI	60 %
ANALOG	0	0	0	0	0	0	<u> </u>
	80	40	40	15	0	5	WILL ELECTRONICS BE OF
DISP W/CRT	0 20	0 25	0	0	0	0	ABOVE AVERAGE DENSITY?
XMTR	0	25	60 0	15 0	0 0	0	🔿 Yes 💿 No
PWR SUP	o	0	0	0	0	0	
	DESIGN LE MODIFIO ING SPAC		O AN			ATERIALS, PR OMPONENTS. ICROGRAVITY	OR SPACE. USES EXISTING OCESSES, AND ELECTRONIC SIGNIFICANT DESIGN IMPACT DUE TO Y ENVIRONMENT. D SYSTEMS DO NOT EXIST
MODI SPAC	ERATE TO IFICATION E-BASED I	to an ex Design	KISTING		Di Al	EVELOPMENT	DR SPACE. REQUIRES THE OF NEW MATERIALS, PROCESSES RONIC COMPONENTS. HE STATE OF THE ART.
ELEC ELEC IMPAC ENVIR	DESIGN FO ING MATEI IRONIC CC T DUE TO IONMENT. EMS COMM	RIALS, PF MPONEN MICROGF GROUND	IOCESSE TS. NO DI RAVITY BASED	ESIGN		XISTING STAT	OF NEW TECHNOLOGY WELL BEYOND TE OF THE ART AND/OR MULTIPLE REQUIRED TO REACH THE GOAL
	NEEDS SON S HARDW/ NITIONAL A RRENTLY A	ARE AVAI	LABLE W/			OFTWARE	и Памеріцім Панісін

	SUAL FUNCTION TESTING KIT	lephenson	Page 1 of 4
VERSION :	<u>17</u> ORIGINATOR: <u>J. Si</u>	tephenson	
4			
		MINI	
human vision. A poi	rtion of these tests include v	visual acuity, muscle	veral balance,
	ction Testing kit is a numan vision. A po	ction Testing kit is a hand-held instrument, whi	ction Testing kit is a hand-held instrument, which is used to test se numan vision. A portion of these tests include visual acuity, muscle contract threshold, and target accommodation.

	ING AND COUNTERMEASURES JUNE 15,1990
BMAC EQUIPMENT NAME: VISUAL FUNCT	2 of 4
DATA SHEET VER : 1	ORIGINATOR: J. Stephenson
GENERAL SPECIFICATIONS	PERFORMANCE SPECIFICATIONS: Accurate amplitude and latency measurement using cursors.
Mass (kg):10.4	Displays eight wave forms simulataneously with up to eight cursors per waveform,
Height (m)	Automatic electrode impedance test
Width (m)	Automatic artifact rejection. Transfer waveforms and data via modem
Depth (m)	Performs Arden Ratio determination.
Volume (m3):	
Standby Power (W)	
Operational Power (W) 115	
Peak Power (W)	
Power Source (VDC) 28	
RACK INTERFACE Rack Mounted?	
	PROBLEMS/ISSUES AND CONCERNS
THERMAL:	
WASTE:	
FLUID:	
ASSUMPTIONS/ JUSTIFICATIONS Modification to existing Air Force unit	
QUANTITY REQUIRED: 2.5 SPECIFICATI Physical description:	
A rack mounted instrument with an eye piece, co	ontrols and readouts for selection of optical images.
FUNCTIONAL DESCRIPTION (DESCRIBE FULLY, INCLUD	E WHERE AND HOW USED)
Subject looks at the optical images through the ey Images are selected by subject to test for vision	

HARDWARE	QUIPMENT NAME: ER : 1	VISUAL FUNCTION TESTING KIT ID# 17 ORIGINATOR: J. Stephenson
CONSTRUCTION STRUCTURE/MI MATERIAL: aluminum,glass TOTAL STRUCT/M ACTIVE ELECTROI	ECHANICS ECH WT. (EXCLUDIN NICS): 6.6 % NEW DESIGN OF A	Kg LL
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS, BOLTS, SCREWS, ETC.) OF EACH A/B/C 10	TOTAL M	HECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR HECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
23	<u>    60</u> %	B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC. NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINA PRECISION MACHINED PARTS, MANY MOVING PARTS OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION
	% [	C. LAMINATED STRUCTURAL COMPOSITES  LAID UP FLAT SURFACE WITH STIFFENERS STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL CO	MMENTS CONCE	RNING STRUCT/MECH COMPONENT:

JSC LS-35001		BIO	MEDICAI BIOMEL	L MONIT	ORING A	AND CO Hardw		RMEASURES J Catalog	UNE 15,1990
BMAC HARDWARE	EQUIP	MENT N		_				ID# 17	PAGE
DATA SHEE								J. Stephenson	4 of 4
	OG RECEI	VERS,		DIGITAL				DISPLAY WITH CRT	
VIDE	MPS, AUD D, RF, SER E, ETC.				REGISTER ERS, ETC.				
— TV, F	ISMITTER Adar, Co Laser, E	D <b>MM</b> ,		RECTIFIC	UPPLY FIONAL LIP ATION, CH CONVERT	<b>IOPPER</b>		DISPLAY - NO CRT LED's LIQUID CRYSTAL PRINTERS	
ELECTRONIC	DESCRI	PTION B	Y PERC	ENTAGE	OF				
	Kg. of Ele % TOTAL		 %IC	3.80 %LSI	0/ LIVD	o( ) (I )		ESTIMATED TOTAL NEW DESIGN OF ELECTRONICS:	%
ANALOG	30	85	15	<sup>%LSI</sup>	%HYB 0	%VLS	٦.	20 %	
DIGITAL	30	10	75	15	0	(	1		
DISP W/CRT	0	0	0	0	0	(	1	WILL ELECTRONICS E	
DISPLAY	10	60	40	0	0	C	1	ABOVE AVERAGE DE	INSITY?
XMTR	0	0	0	0	0	0		O Yes 💿	No
PWR SUP	30	100	0	0	0	0			
SCOPE OF	DESIGN	EFFORT	<u></u>		NE	WDESK		SPACE. USES EXISTING	
	E MODIFIC				MA CC MI	ATERIALS MPONEI CROGRA	, PROC ITS. SK VITY E	CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT NVIRONMENT. SYSTEMS DO NOT EXIST	DUE TO
MODI	RATE TO E FICATION T E-BASED E	TO AN EX	_			Velopm D/Or eli	ENT O	SPACE. REQUIRES THE F NEW MATERIALS, PROCES NIC COMPONENTS. STATE OF THE ART.	SSES
EXISTI ELECT	ESIGN FOI NG MATEF RONIC COI T DUE TO N DNMENT, G	RIALS, PRO MPONENT MICROGRA	DCESSES 'S. NO DE AVITY	s, and Sign		VELOPM ISTING S	ENT OF	NEW TECHNOLOGY WELL B OF THE ART AND/OR MULT QUIRED TO REACH THE GO	IPLE
SYSTE	MS COMM	ERCIALLY	AVAILAE		<u>.</u>				
ADDI	HARDWA	JTOMATIC				<b></b>	.ow		HGH

	BIOMEDICAL FACILITY HARDWARE CATALOG
BMAC Hardware	EQUIPMENT NAME VISUAL TRACKING SYSTEM
DATA SHEET	
	VERSION : <u>1</u>
ILLUSTRATIO	ИС
Į	SAL 90
DEFINITION	
	bed LED display serves as a focusing target for crew members during lar testing.
A cross-shap	bed LED display serves as a focusing target for crew members during lar testing.
A cross-shap	bed LED display serves as a focusing target for crew members during lar testing.
A cross-shap	bed LED display serves as a focusing target for crew members during lar testing.
A cross-shap neurovestibu	bed LED display serves as a focusing target for crew members during lar testing.
A cross-shap neurovestibu HISTORY/DESI System is su Will be flight	IGN STATUS: IGN STATUS: Itable for use in a space environment. certified for IML-1 and IML-2 as part of the microgravity vestibular
A cross-shap neurovestibu HISTORY/DESI System is su Will be flight investigation	IGN STATUS: IGN STATUS: Itable for use in a space environment. certified for IML-1 and IML-2 as part of the microgravity vestibular
A cross-shap neurovestibu HISTORY/DESI System is su Will be flight investigation	IGN STATUS: IGN STATUS: Initable for use in a space environment. Certified for IML-1 and IML-2 as part of the microgravity vestibular IS.

JSC LS-35001		AND COUNTERMEASURES JUNE 15,1990 HARDWARE CATALOG	) _
BMAC Hardware	EQUIPMENT NAME: VISUAL TRACKING		
DATA SHEET	VER:1	ORIGINATOR: J. Stephenson	
GENERAL	SPECIFICATIONS	PERFORMANCE SPECIFICATIONS:	
Mass (kg):	<u>2</u>		-
Height (m)			
Width (m)			
Depth (m)			
Volume (m	3):		_
Standby Po	wer (W)		
	Power (W) 20		
Peak Power	r (W)	1	
	rce (VDC) 28		_
RACK INTER	FACE Rack Mounted?	PROBLEMS/ISSUES AND CONCERNS	
ELECTRICAL		PHOBLEMS/ISSUES AND CONCERNS	
THERMAL:			
WASTE:			
FLUID: DATA:		4	
	NS/ JUSTIFICATIONS controlled by the Experiment Control Computer con	trole this item instead of excurd	
		THIS THIS THETT THISTERED OF GLOUING	
QUANTITY R	EQUIRED: 2.5 SPECIFICATIONS		
PHYSICAL DESC			
	sts of 4 curved fiberglass boards cover ts are arranged in a cross pattern with L	ed by fire resistant cotton cloth. EDs placed at various angles from horizontal and	
vertical axes.		Los placed al various angles nom nonzontal and	
In its deployed	d position, it is connected to a handrail	by a telescoping arm.	-
	ESCRIPTION (DESCRIBE FULLY, INCLUDE WH	,	
The system w Computer will	rill be used as a focusing target during a control the LEDs lighting sequences an	neurovestibular testing. The Experiment Control	
Southard, Mill	and the cross ingining sequences all		-
			<u>her</u>
			الزنيسة

BMAC	EQUIPMENT NA	ME: VISUAL TRACKING SYSTEM ID# 18 3 of 4
HARDWARE Data Sheet	<b>VER</b> : 1	ORIGINATOR: J. Stephenson
CONSTRUCTIO STRUCTURE/I		DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) LEDs
MATERIAL: phenoglass		
TOTAL STRUCT	MECH WT. (EXCLU ONICS): <u>1.9</u>	IDING 18 Kg
ESTIMATED TOTA STRUCT/MECH C	AL % NEW DESIGN ( OMPONENTS: 	DF ALL 15 %
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS ETC.) OF EACH A/B/C	TOTAL S, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES
8	<u> </u>	STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
12	<u> </u>	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES

JSC .S-35001						ND COUNTE	RMEASURES JUNE 15 CATALOG	,1990
BMAC Hardware Data Sheet		AENT NA	\ <b>ME:</b> ∨I	SUAL TRA			ID# 18 PAGI J. Stephenson	
	ELECTR DG RECEIN MPS, AUDI D, RF, SER E, ETC. SMITTER ADAR, CC LASER, ET	/ERS, IO VO		COMPUTE POWER SI CONVENT RECTIFIC/	·	IEAR IOPPER	DISPLAY WITH CRT DISPLAY - NO CRT LED'S LIQUID CRYSTAL PRINTERS	
ELECTRONIC		нт	Y PERC	ENTAGE 0.02	OF		ESTIMATED TOTAL % NEW DESIGN OF ELECTRONICS:	
ANALOG	% TOTAL	0	%IC 0	%LSI 0	%HYB 0	%VLSI 0	15 %	
DIGITAL DISP W/CRT	39 0	55 0	35 0	10 0	0	0 0	WILL ELECTRONICS BE OF ABOVE AVERAGE DENSITY?	,
DISPLAY XMTR	61 0	57 0	24	19	0	0	Yes O No	
PWR SUP	0	0	0	0	0	0		
	DESIGN LE MODIFI ING SPAC	CATION T	O AN	<del> </del>	M CC M	<b>ATERIALS</b> , PRO DMPONENTS. S ICROGRAVITY	R SPACE. USES EXISTING DCESSES, AND ELECTRONIC BIGNIFICANT DESIGN IMPACT DUE TO ENVIRONMENT. SYSTEMS DO NOT EXIST	
MODI	ERATE TO FICATION E-BASED I	TO AN EX				EVELOPMENT	R SPACE. REQUIRES THE OF NEW MATERIALS, PROCESSES IONIC COMPONENTS. E STATE OF THE ART.	
EXIST ELECT IMPAC ENVIR	DESIGN FO ING MATEI IRONIC CC T DUE TO IONMENT. EMS COMM	RIALS, PR MPONEN MICROGR GROUND	OCESSES TS. NO DI AVITY BASED	ESIGN		EVELOPMENT (	OF NEW TECHNOLOGY WELL BEYOND E OF THE ART AND/OR MULTIPLE REQUIRED TO REACH THE GOAL	
ADD	IEEDS SOI S HARDWA ITIONAL A IRENTLY A	ARE AVAIL UTOMATI	.ABLE W/ ON REQU			OFTWARE	🗆 меріцм 🔲 нісн	

BMAC	FOURPMENT NAMELIONS DECORDER
HARDWARE	EQUIPMENT NAME VOICE RECORDER Pa
DATA SHEET	TARDWARE ID. NO.: 28 ONIGINATOR. J. Stephenson
ILLUSTRATIO	ON
	A REAL PROVIDENCE AND
DEFINITION A hand-held a	audio device used to record crew voices during experiment procedures.
ISTORY/DESIC	
Suitable off-th	
Suitable off-th	being replaced with this model in 1990. ne -shelf pecifications will require improvements.

JSC LS-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	
BMAC Hardware Data Sheet	EQUIPMENT NAME: VOICE RECORDER VER : 1 0	ID# 28 Page 2 of 4 PRIGINATOR: J. Stephenson
Mass (kg): Height (m) Width (m) Depth (m) Volume (m)		PERFORMANCE SPECIFICATIONS: 2 speeds, 2.4 cm/sec and 1.2 cm/sec Built in microphone Minimum 2 hour recording per cassette Speaker 2.8 cm diameter Power output 250 mW@ 10% harmonic distortion.
Operational Peak Power	Power (W)	PROBLEMS/ISSUES AND CONCERNS Magnetic tape used could be damaged by external fields.
	CRIPTION:	
Voice recorde	ESCRIPTION (DESCRIBE FULLY, INCLUDE WHE r is stowed when not in use. assettes to make audio recordings	ERE AND HOW USED)

BMAC	EQUIPMENT NAME: V	OCERECORDER ID# 28 3 of
HARDWARE Data Sheet	VER : 1	ORIGINATOR: J. Stephenson
ACTIVE ELECTRO	MECHANICS MECH WT. (EXCLUDING DNICS):15 Kg L % NEW DESIGN OF ALL	DISCRETE STUCTURAL/MECHANICAL MODULES (e.g. MOTORS, FANS, BATTERIES, ANTENNAS) batteries motors
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUTS BOLTS, SCREWS, ETC.) OF EACH A/B/C 20 80	TOTAL MEC	<ul> <li>CK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR CONFIGURATION:</li> <li>A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED</li> <li>SUPPORT STRUCTURE, NO MOVING PARTS</li> <li>CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES</li> <li>STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES</li> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINME PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> <li>C. LAMINATED STRUCTURAL COMPOSITES</li> <li>LAID UP FLAT SURFACE WITH STIFFENERS</li> </ul>
ADDITIONAL CO	MMENTS CONCERNI	STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES NG STRUCT/MECH COMPONENT:

JSC _S-35001							TER <b>measures</b> E catalog	JL	JNE 15,1990	
BMAC Hardware Data Sheet	I		ME: VC	XCE RECO		RIGINATO	ID R: J. Stephenson	# 28	PAGE 4 of 4	
TYPE OF	ELECTR	ONICS:								
ANALOG RECEIVERS, DIGITAL DISPLAY WITH CRT OP AMPS, AUDIO GATES, REGISTERS, VIDEO, RF, SERVO COMPUTERS, ETC. DRIVE, ETC.										
📕 💆 TV, R	TRANSMITTER       POWER SUPPLY       DISPLAY - NO CRT         TV, RADAR, COMM,       CONVENTIONAL LINEAR       LED's LIQUID         NAV, LASER, ETC.       RECTIFICATION, CHOPPER       CRYSTAL PRINTERS									
			Y PERC	ENTAGE	OF					زهره ا
	Kg. of Ele % TOTAL		 %IC	0.04 %LSI	%HYB	%VLSI	ESTIMATED NEW DESIG ELECTRON	N OF	~	
ANALOG	70	30	70	0	0	0		5 %		
DIGITAL	30	0	100	0	0	0				
DISP W/CRT	0	0	0	0	0	0	WILL ELECT			
DISPLAY	0	0	0	0	0	0	ABOVE AVE	AGE D	ENSILY?	
XMTR	0	0	0	0	0	0	O Yes	۲	No	-
PWR SUP	0	0	0	0	0	0				
SCOPE OF	DESIGN	EFFORT	•				FOR SPACE. USES EX			
SIMPI EXIST	LE MODIFI ING SPAC	CATION T E-BASED	O AN DESIGN			OMPONENT	PROCESSES, AND ELE S. SIGNIFICANT DESIG TY ENVIRONMENT. ED SYSTEMS DO NOT	IMPAC		-
MOD	ERATE TO IFICATION CE-BASED	TO AN EX				EVELOPMEN	FOR SPACE. REQUIRE NT OF NEW MATERIAL CTRONIC COMPONEN THE STATE OF THE A	.S, PROCI TS.	ESSES	
EXIST ELEC IMPAC ENVIF	AT OR NEAR THE STATE OF THE ART. AT OR NEAR THE STATE OF THE ART. AT OR NEAR THE STATE OF THE ART. AT OR NEAR THE STATE OF THE ART. DEVELOPMENT OF NEW TECHNOLOGY WELL BEYOND ELECTRONIC COMPONENTS. NO DESIGN IMPACT DUE TO MICROGRAVITY ENVIRONMENT. GROUND BASED SYSTEMS COMMERCIALLY AVAILABLE									
	NEEDS SO S HARDW/ DITIONAL A RRENTLY A	ARE AVAI	LABLE W			_		м 🗌	нан	-

	BIOMEDICAL MONITORING AND COUNTERMEASURES J BIOMEDICAL FACILITY HARDWARE CATALOG	UNE 15,
BMAC Hardware	EQUIPMENT NAME WRIST ACTIVITY MONITOR	Page 1 of 4
DATA SHEET	HARDWARE ID. NO.: 29 ORIGINATOR: G. McFadyen VERSION : 1	
ILLUSTRATIO	)N	
	All and a second s	
DEFINITION The device r	nonitors patterns in limb motion during prolonged periods in microgram	vity.

ISC .S-35001	BIOMEDICAL MONITORING BIOMEDICAL FACILITY	AND COUNTERMEASURES JUNE 19 HARDWARE CATALOG	5,199
BMAC	EQUIPMENT NAME: WRIST ACTIVITY MC		•
HARDWARE	VER:1 C	RIGINATOR: G. McFadyen 2 of	4
Mass (kg): <sub>.</sub> Height (m) <sub>.</sub> Width (m) <sub>.</sub> Depth (m) .	3PECIFICATIONS         1.2         .05	<b>PERFORMANCE SPECIFICATIONS:</b> Advanced microprocessor technology Detects, processes and accurately quantifies motor activity all 3 directions over any period of time.	' in
Operational Peak Power Power Source RACK INTERI		PROBLEMS/ISSUES AND CONCERNS	
ASSUMPTION Device will be attac	S/ JUSTIFICATIONS ned to subject's wrist. Data will be recorded on mag	netic tape by built in recorder.	
QUANTITY RI PHYSICAL DESC		MARC I 🕅 MARC II 🗍 MARC III	
A device with	built-in recorder to be attached to subju	ect's wrist.	
	······································		
The wrist mon	SCRIPTION (DESCRIBE FULLY, INCLUDE WHE) itor is worn for prolonged periods (4 ho vements of the wrist will be recorded for	urs and during sleep).	

BMAC Hardware Data Sheet		ME: WRIST ACTIVITY MONITOR ID# 2 9 ORIGINATOR: G. McFadyen
ACTIVE ELECTR	MECHANICS MECH WT. (EXCLU DNICS):	<u>8</u> Kg
ESTIMATED # OF STRUCT PARTS (EXCLUDING NUT BOLTS, SCREWS ETC.) OF EACH A/B/C 8	TOTAL S, STRUCT	CHECK THE APPROPRIATE MAJOR AND SUB CATEGORY FOR MECH CONFIGURATION: A. SHEET METAL CONSTRUCTION, EXTRUDED SHAPES, RIVETED, WELDED SUPPORT STRUCTURE, NO MOVING PARTS CONTAINMENT STRUCTURE SUBJECT TO PRESSURE AND FORCES STRUCTURES UNDER SIGNIFICANT DYNAMIC FORCES
12	55 %	<ul> <li>B. MACHINED CONSTRUCTION FROM DRILLING, MILLING, GRINDING ETC.</li> <li>NORMAL MACHINED PARTS, FUNCTION IS SUPPORT AND CONTAINN</li> <li>PRECISION MACHINED PARTS, MANY MOVING PARTS</li> <li>OPTICAL COMPONENTS AND ASSY BUILT TO HIGHEST PRECISION</li> </ul>
	%	C. LAMINATED STRUCTURAL COMPOSITES   LAID UP FLAT SURFACE WITH STIFFENERS  STRUCTURAL FRAMES, SUPPORTS, BULKHEADS, BONDED ASSY  CYLINDRICAL SHAPED, FILAMENT WOUND ASSEMBLIES
ADDITIONAL C	OMMENTS CON	CERNING STRUCT/MECH COMPONENT:

SC S-35001						ID COUNTE ARDWARE		
BMAC Hardware Data Sheet	VED		ME: WF	RIST ACTI			: G	ID# 29 PAGE 4 of 4
TYPE OF						_		
	<b>APS, AUDK</b> , RF, SERV	0		DIGITAL BATES, RE XOMPUTE		з, П` з,	DI	SPLAY WITH CRT
τν, r/	SMITTER Adar, Co Laser, Et		C F	OWER SU CONVENTI RECTIFICA AC-DC C	IONAL LIN (TION, CH	ear — Opper —	L	DISPLAY - NO CRT ED's LIQUID RYSTAL PRINTERS
ELECTRONIC ELECTRONIC			Y PERC	ENTAGE	OF			ESTIMATED TOTAL %
	Kg. of Ele	octronics		0.40				NEW DESIGN OF ELECTRONICS:
	% TOTAL	%DISC	%IC	%LSI	%HYB	%VLSI		
ANALOG	0	0	0	0	0	0		<u>40</u> %
DIGITAL	10	0	100	0	0	0		
DISP W/CRT	0	0	0	0	0	0		WILL ELECTRONICS BE OF Above Average Density?
DISPLAY	50	100	0	0	0	0		O Yes 💿 No
XMTR	0	0	0	0	0	0		
PWR SUP	40	0	100	0	0	0		
	DESIGN LE MODIFI FING SPAC				Ш м о м	ATERIALS, P OMPONENTS ICROGRAVIT	ROC 5. SK TY El	SPACE. USES EXISTING CESSES, AND ELECTRONIC GNIFICANT DESIGN IMPACT DUE TO NVIRONMENT. SYSTEMS DO NOT EXIST
MOD SPAC	ERATE TO IFICATION CE-BASED	TO AN E DESIGN	XISTING			EVELOPMEN ND/OR ELEC	IT O	SPACE. REQUIRES THE F NEW MATERIALS, PROCESSES INIC COMPONENTS. STATE OF THE ART.
EXIS ELEC IMPA ENVI	DESIGN FO TING MATE TRONIC CO CT DUE TO RONMENT. TEMS COM	RIALS, PR OMPONEN MICROG GROUND	ROCESSE NTS. NO D RAVITY BASED	esign		XISTING ST	ATE	F NEW TECHNOLOGY WELL BEYOND OF THE ART AND/OR MULTIPLE EQUIRED TO REACH THE GOAL
	NEEDS SC I'S HARDW DITIONAL / RRENTLY /	ARE AVA	ILABLE W				w	Пиеріим Пикан

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