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TECHNICAL REPORT 9113

PATIENT CARE UTILITY MODULE FOR DEPMEDS HOSPITALS

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FINAL REPORT

U S ARMY BIOMEDICAL RESEARCH & DEVELOPMENT LABORATORY

Fort Detrick

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<p>Deficiencies have been identified in the patient care utility capability in Deployable Medical Systems (DEPMEDS) hospitals, especially in the Intensive Care Unit (ICU). A study was conducted to assess space utilization around the patient bedside in DEPMEDS hospitals. Solutions utilizing the space between beds, at the end of beds, and underneath beds were identified and evaluated. Potential solutions included portable instrument mounting systems, shelf trucks, and other storage possibilities. Of the products evaluated, the most suitable unit was a high-strength plastic shelf truck that can be assembled without tools and provides considerable storage space and configuration flexibility.</p>					
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SUMMARY

Deficiencies have been identified in the patient care utility capability in Deployable Medical Systems (DEPMEDS) hospitals, especially in the Intensive Care Unit (ICU). A study was conducted to assess space utilization around the patient bedside in DEPMEDS hospitals. Solutions utilizing the space between beds, at the end of beds, and underneath beds were identified and evaluated. Potential solutions included portable instrument mounting systems, shelf trucks, and other storage possibilities. Of the products evaluated, the most suitable unit was a high-strength plastic shelf truck that can be assembled without tools and provides considerable storage space and configuration flexibility.

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- Table 3. Cost data for MetroMax® shelving system
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INTRODUCTION

In hospital units, equipment and materials such as ventilators, suction devices, monitors, and trays must be kept near the patient for continuous or emergency treatment. Utility services, including electrical and compressed gas outlets, must also be provided. These devices and services should be arranged to provide optimum functional utility, while allowing rapid, unobstructed clinician access to the patient for performance of routine and emergency procedures. In addition, space near the bed is needed for supply storage and maneuvering of bulky equipment (e.g., Crash carts, portable X-ray machines). Manufacturers have designed a variety of patient care utility support systems to meet these needs in fixed facilities.

Provision of well-designed patient care utility support systems is especially important in field hospitals, where space is at a premium. System flexibility is necessary, to accommodate future equipment acquisitions and nonstandard items. The patient care utility support items fielded for Deployable Medical Systems (DEPMEDS) include metal chests, tables, wire shelving systems, and wire baskets (Figures 1-3). Standardized DEPMEDS Intensive Care Unit (ICU) instrumentation and a suggested ICU layout for presently fielded equipment are shown in Figures 4 and 5.

The patient care utility support items fielded were found to be inadequate, primarily due to their insufficient storage space, which has often necessitated placement of equipment on the floor. To address this problem, a request was made by the Defense Medical Standardization Board (DMSB) to investigate space utilization in the patient care area, with particular emphasis on the ICU assemblage (Appendix A). This report documents efforts to identify or develop an improved system for functionally locating utility services, critical devices and materials near the patient bedside in DEPMEDS hospitals.

MATERIALS AND METHODS

Current DEPMEDS equipment and supplies were obtained for a mock setup of a DEPMEDS ICU. Several field exercises were attended to study overall ward configurations and obtain necessary dimensions. A market survey was conducted to identify potentially useful components of patient care utility support systems. The search included approximately 200 manufacturers and distributors of carts, cabinets, patient service consoles, headwall systems and service rails, life support columns, and storage systems. A list of potential suppliers was compiled from the following sources:

1. ECRI Health Devices Sourcebook - 1990
2. Medical Device Register - 1990
3. VSMF® Data Control Services - 1990

Each potential supplier was contacted for product literature and pricing information, which was categorized and analyzed. Clinical and logistical review of the information obtained was sought from a Tri-service DEPMEDS

Coordinating Group (DCG) composed of nurses, physicians, and logisticians. The most promising equipment configuration approaches were selected, and recommended equipment was obtained on loan for evaluation. User comments were solicited on several items from personnel at the Fort Meade, Maryland DEPMEDS setup. Following a hands on evaluation of the most promising equipment, the DCG made a final recommendation regarding the most appropriate solution.

RESULTS AND DISCUSSION

Three types of solutions were identified based on their location with respect to the bed: 1) beside the bed, 2) at the end of the bed, and 3) underneath the bed. Bedside alternatives included adding more chests and tables, using portable instrument mounting systems, and using other freestanding shelving systems. Potential systems for the ends of the bed included use of several instrument mounting systems developed for peacetime applications and placement of equipment mounting rails on Temper tent supports. Systems considered for underneath the bed included crates, tote boxes, and a developmental rail mounting system.

Bedside Alternatives

Two manufacturers of portable instrument mounting systems usable between beds were identified in the market survey. One was Fairfield Medical Products Corp., Tampa, FL, which manufactures the MEMO (Mobile Equipment Module) series. MEMO systems are comprised of a wheeled, 2 foot-square base plate on which vertical support columns are mounted to support any desired number of equipment mounting rails (Figure 6). Equipment, shelving, baskets, and other accessories can be easily clipped on to either side of the rail with a cam action adapter affixed to the item being clipped (Figure 7). Two different heights of support column are available: 47.5 inch and 66.5 inch. The latter height carries up to 40 linear feet of rail on a system that can hold as much as 400 lb of load. The system can be totally disassembled for transport using an Allen (hex) wrench. It can also be used in a less space-consuming configuration (Figure 8). Numerous accessories are available with the system, the price ranges for which are shown in Table 1.

A competing system, Porta-Wall[®], is manufactured by Impact Instrumentation, Inc., West Caldwell, NJ. The Porta-Wall[®] system, shown in Figures 9 and 10, uses a similar clip principle, and the overall unit can be assembled and disassembled without tools. The Porta-Wall[®] base is the same size as the MEMO's, but the overall system is more modular. One, two, or three assembly sections can be used to give heights of 30.25, 51.5, and 71.25 inches, respectively. The rail can be spaced at any specified increment and can be mounted on both sides of the vertical assemblies if desired. The system will support a load of 600 lb, and as much as 55 linear feet of rail can be mounted. Prices for Porta-Wall[®] and accompanying accessories are given in Table 1. Comparative logistical supportability data for the Fairfield and Impact systems are shown in Table 2 (excluding data for mounting brackets that would be required for all equipment).

Another possibility for bedside storage was various types of shelf trucks. The shelving system used in DEPMEDS (Figure 2) is reportedly very time consuming to assemble (one half hour per unit), and lacks mobility. An alternative used by Air Force contingency hospitals is a steel shelf truck manufactured by Dozier Equipment International, Nashville, TN (Figure 11). The size of the truck is 36" long x 18" deep x 57" high, and the shelves can be adjusted at 1 inch intervals. Although the size and weight of the Dozier system are comparable to the DEPMEDS shelving system, tools are required for its assembly and disassembly, making it more cumbersome to deploy.

An alternative shelf truck made of a high strength, proprietary plastic is manufactured by InterMetro Industries Corp., Wilkes-Barre, PA. The MetroMax[®] system (Figure 12) can be assembled without tools, holds up to 800 lb per shelf, and is modular in the sense that as many shelves can be added as desired, at 1/2 inch increments. Post sizes can be selected in 6 inch increments from 13 to 86 inches, and available shelf sizes range from 24 to 72 inches long by 18 to 24 inches deep. A system comparable to the two previously mentioned shelving systems would weigh approximately one fourth less, and be comparable in cost. System components and various accessories for the MetroMax[®] are shown in Figure 13, with prices given in Table 3. Photographs of the unit with ICU equipment and supplies to support 2 patients are shown in Figure 14, followed by suggested layouts in Figures 15 and 16. The layouts are based on a minimum spacing of four feet between ICU beds (recommended by the DCG). Comparative logistical support data for the shelf trucks and DEPMEDS items are given in Table 4.

Bed End Alternatives

One solution for mounting equipment at the end of the bed would be the use of equipment similar to the Fairfield and Impact systems, with a base designed to fit under the bed and equipment mounting rails placed above the head or foot of the bed. Several such systems have been developed for peacetime hospital situations (Ben-Zvi et al., 1990, and Railton et al., 1988), although they are not commercially available. Another solution considered was placement of equipment mounting rail on the tent frame supports (Figure 17), which are accessible through the tent flaps and spaced at 8 foot increments. This approach was rejected conceptually by the DCG, so a formal design was not developed.

Beneath Bed Alternatives

Consideration of the use of space underneath the bed was given, since using this area would provide more circulation space around the bed. Figure 18 shows the (limited) space available for locating equipment and supplies under the current DEPMEDS bed. Solutions considered by the committee included using crates and tote boxes for supplies and a developmental rail mounting system for equipment. As with the tent frame mounting approach, the latter alternative was rejected by the DCG conceptually, so a formal design was not undertaken.

Committee Evaluation

The DCG decided that the MetroMax® system was superior to the others evaluated because it offered considerable space, ease of assembly, configuration flexibility, durability, and relatively low cost. In addition, electrical outlets could be attached, if necessary, and the design allows for adaptation of a gas distribution system. Although both the Impact and Fairfield equipment mounting systems were well received, they were considered too costly to implement. Every piece of DEPMEDS equipment would require a unique mounting bracket, which would add considerably to the cost of deploying these mounting systems. Use of equipment mounting rail attached to the Temper tent support arcs was rejected for similar reasons. In addition, there were concerns for patient safety during high winds, when support arcs have been known to snap. Heavy equipment could fall on the patient or floor, causing significant patient injury and/or instrument damage. A final disadvantage of this approach is the problem with tent sloping, which limits usable space at the head of the bed. Use of the space under the bed was considered unacceptable, especially for instrumentation, because of the nonfunctional location and potential for equipment damage from body fluids. Also, the support arcs and struts of the bed severely compromise the space available, which is already used largely for storage of patient effects.

CONCLUSIONS AND RECOMMENDATIONS

The DCG made the following recommendations for solving the patient care utility problems: 1) use the InterMetro MetroMax® system for locating equipment and supplies near the patient bedside; 2) continue to use chests for storage of supplies during deployment; and 3) use the DEPMEDS Utility Wire Baskets for storage in MILVANS, rather than on the wards. Also, it was recommended that the MetroMax® be field tested to identify any potential deployability problems, and that one 4- or 5-shelf unit be supplied to support every 2 beds in DEPMEDS ICU's.

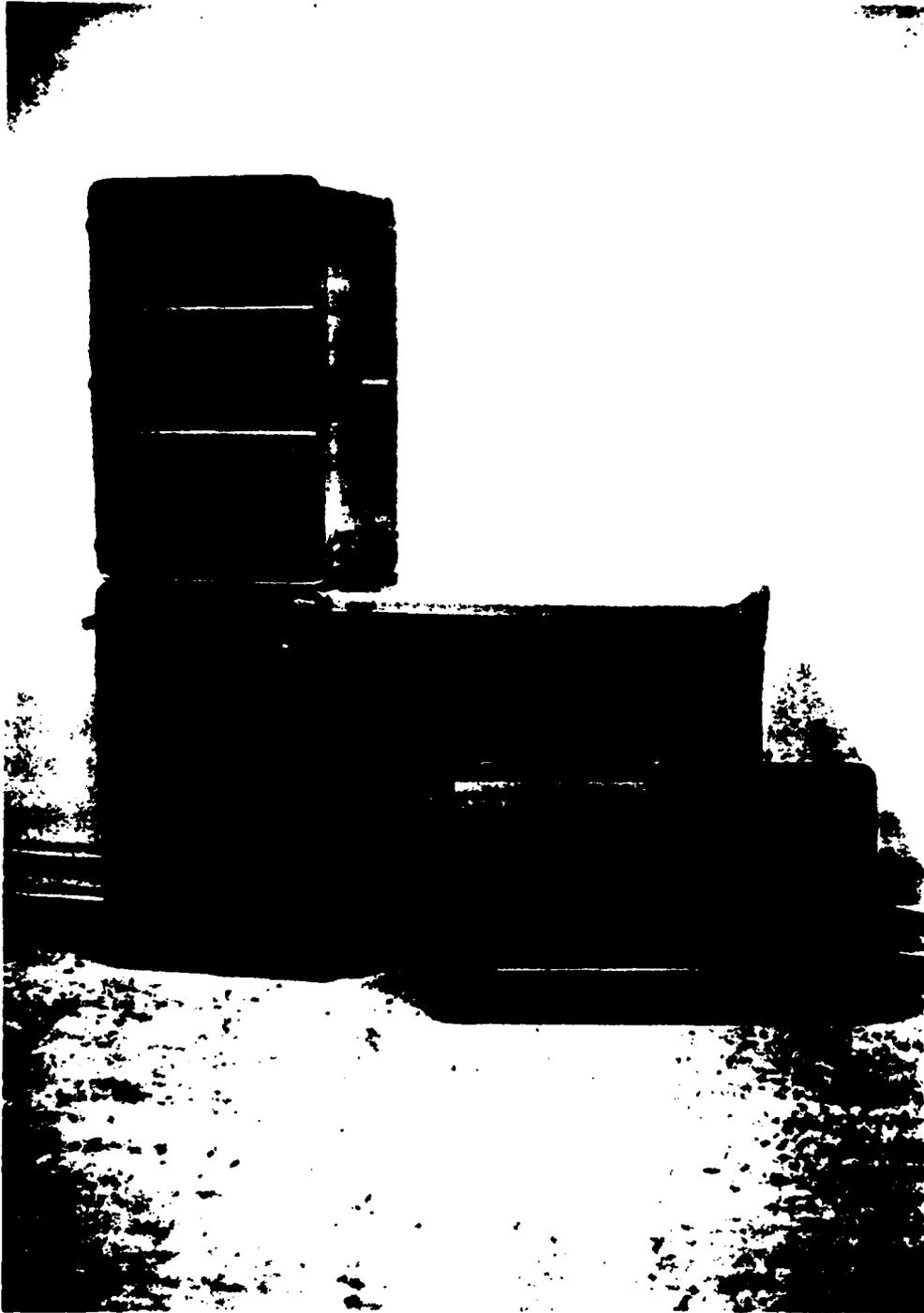


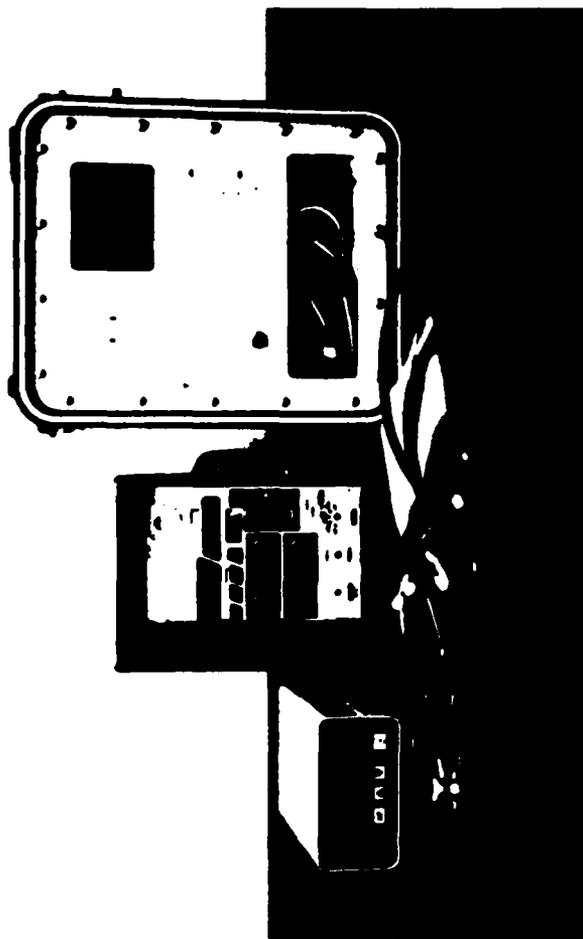
Figure 1. Chest, Medical Instrument and Supply Set, 2 Shelf (NSN 6545-00-118-6248) and Chest, Medical Instrument and Supply Set, 6 Drawer (NSN 6545-00-118-6249)



Figure 2. Super Erecta Shelf® wire shelving assembled and disassembled



Figure 3. DEPMEDS Utility Wire Baskets

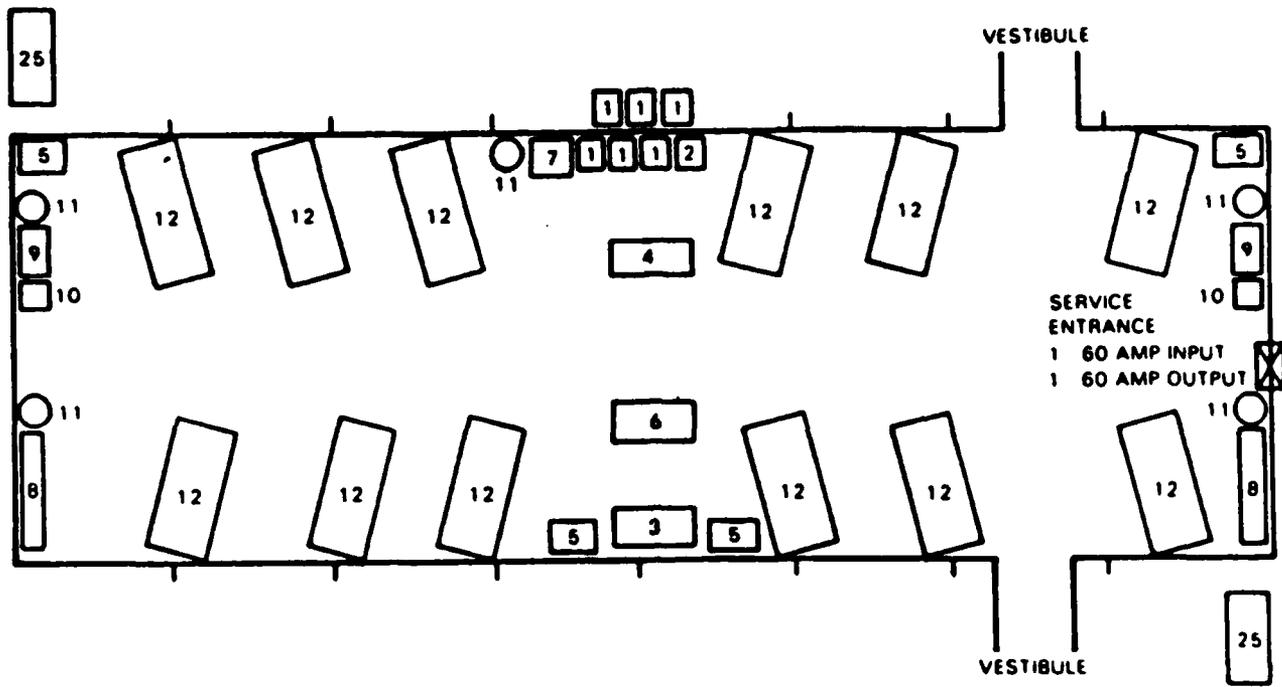


(a)



(b)

Figure 4. DEPMEDS ICU equipment. (a) Pulse oximeter, ventilator, ECG, sphygmomanometer, and stethoscope; (b) suction equipment



TEMPLATE	NOMENCLATURE	TEMPLATE	NOMENCLATURE
1	CHEST, MEDICAL INSTRUMENT, TWO-SHELF	7	REFRIGERATOR-FREEZER
2	CHEST, MEDICAL INSTRUMENT WITH 22-DRAWER INSERT	8	SHELF, CHROME, 1848
3	CART, RESUSCITATION	9	SINK UNIT, SURGICAL
4	DESK, FIELD WITH FOLDING CHAIRS	10	FRAME, CLOTH BASKET, FOLDING
6	LIGHT, FLOOR, OPERATING AND EXAM	11	STAND, BASIN, FOLDING
6	CART, SURGICAL DRESSING	12	BED, ADJUSTABLE, HOSPITAL
		25	AIR CONDITIONER/HEATER

Figure 5. Suggested layout for DEPMEDS ICU (from DEPMEDS handbook)

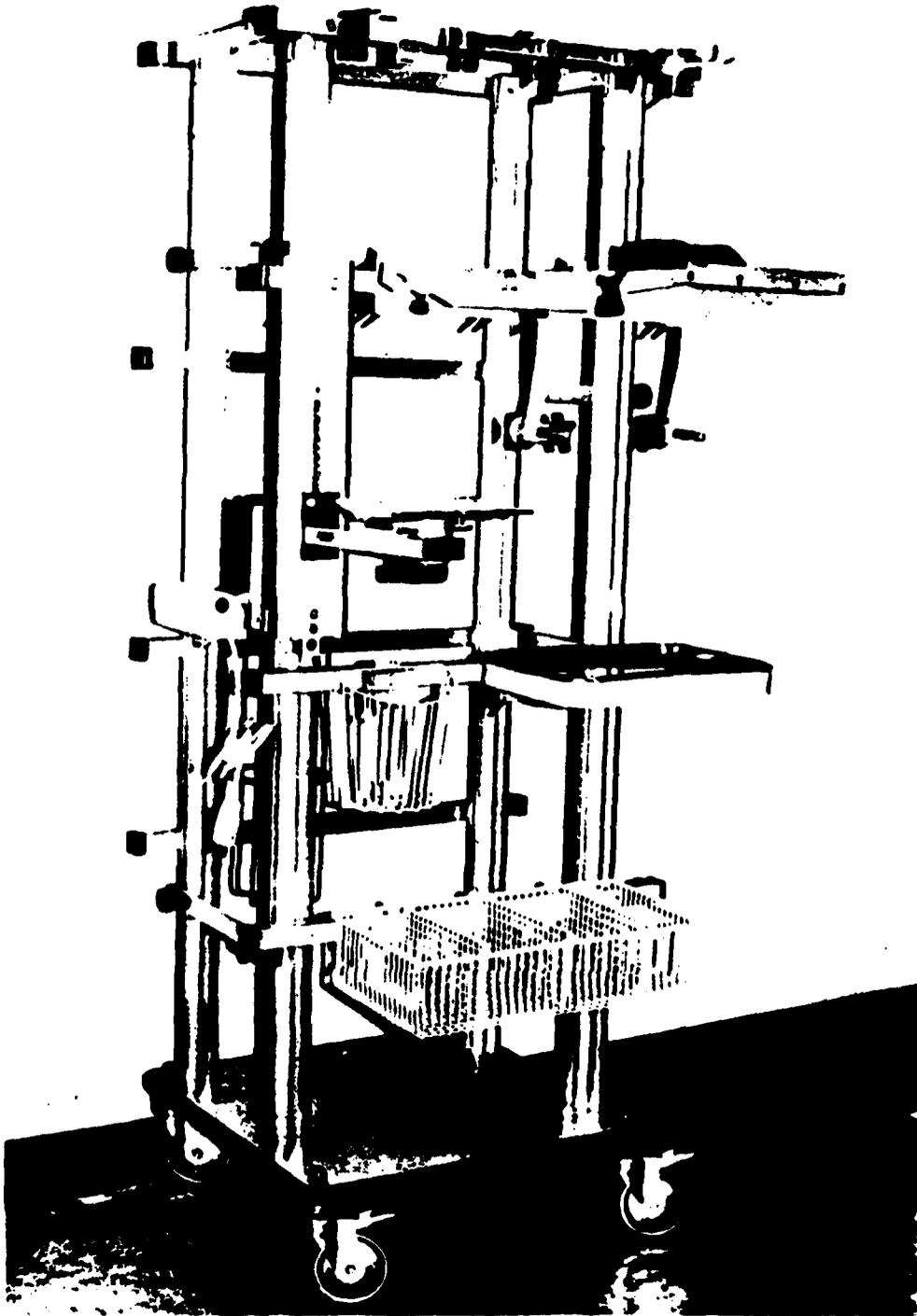
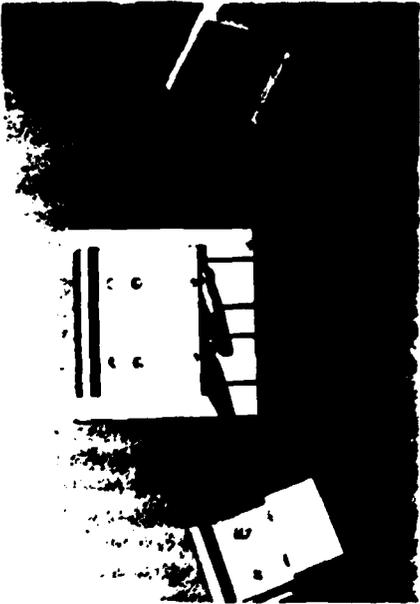
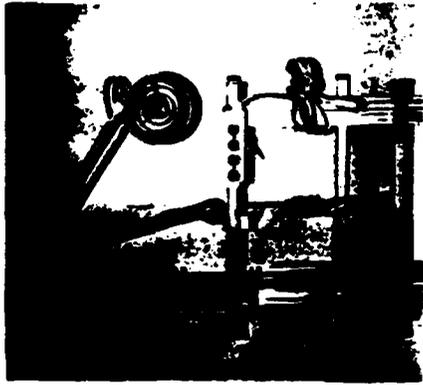


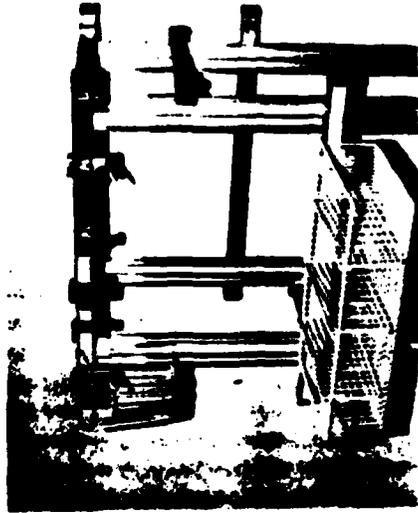
Figure 6. Fairfield MEMO 1 and accessories



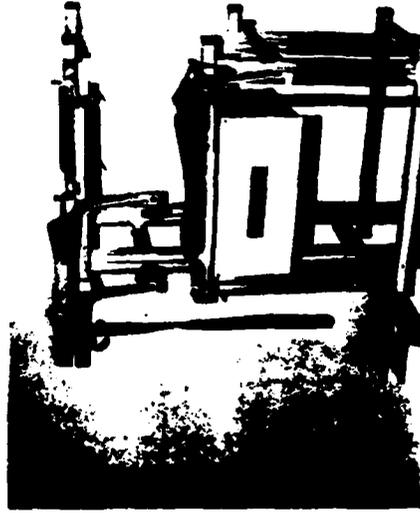
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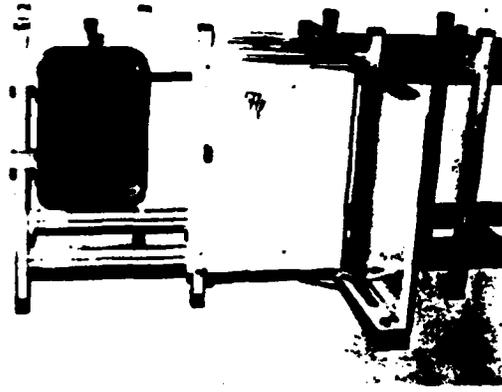
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(c)

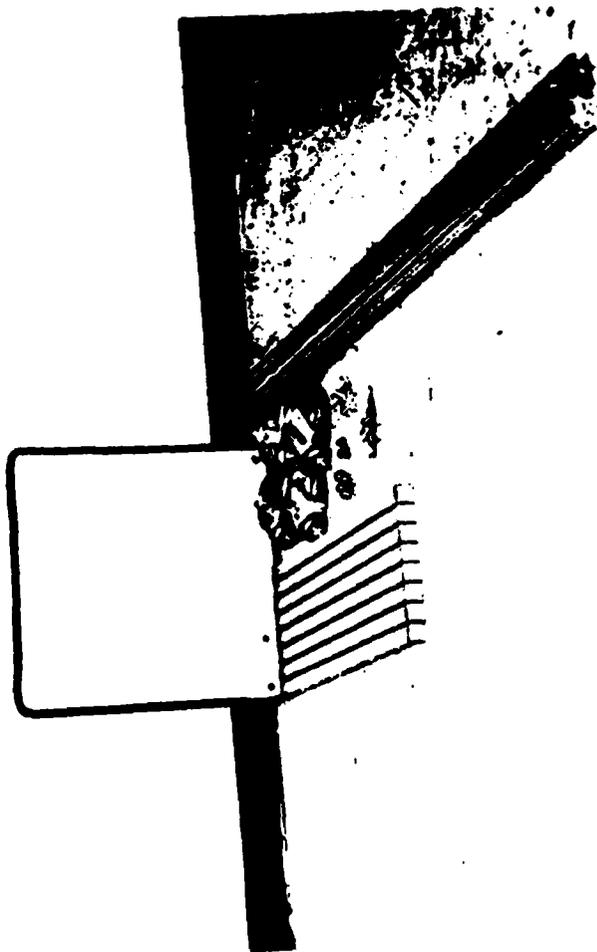


(d)

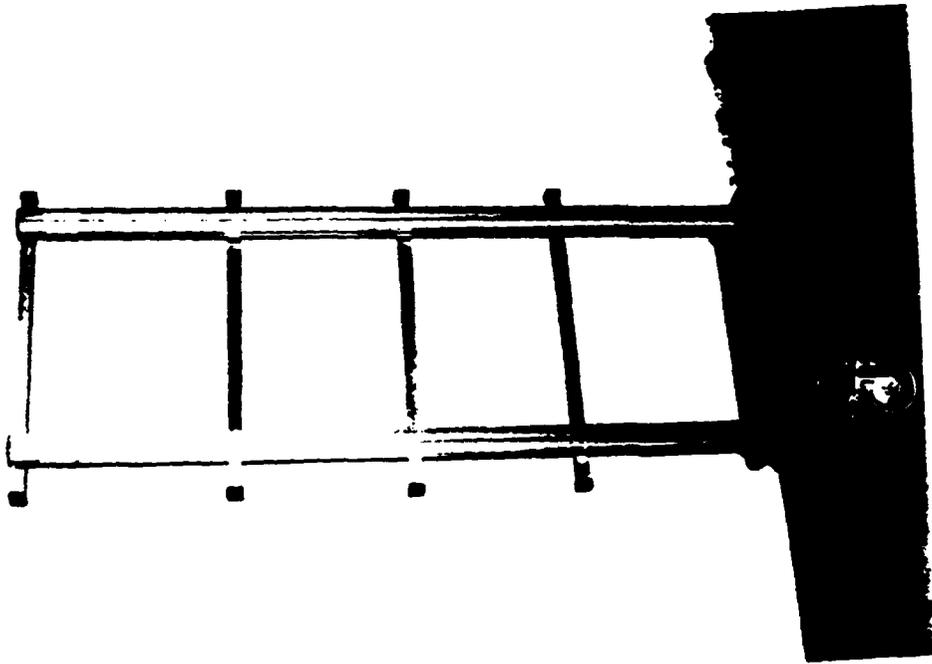


(e)

Figure 7. Selected Fairfield MEMO accessories. (a) Fairfield cam action adapters (clips); (b) cylinder holder, lamp, and power outlet; (c) baskets and clips; (d) instrument shelves (e) hinged Mayo tray and fold-up desk;



(a)



(b)

Figure 8. Fairfield MEMO 1 with front and side rails removed.
(a) Disassembled for transport; (b) fully assembled

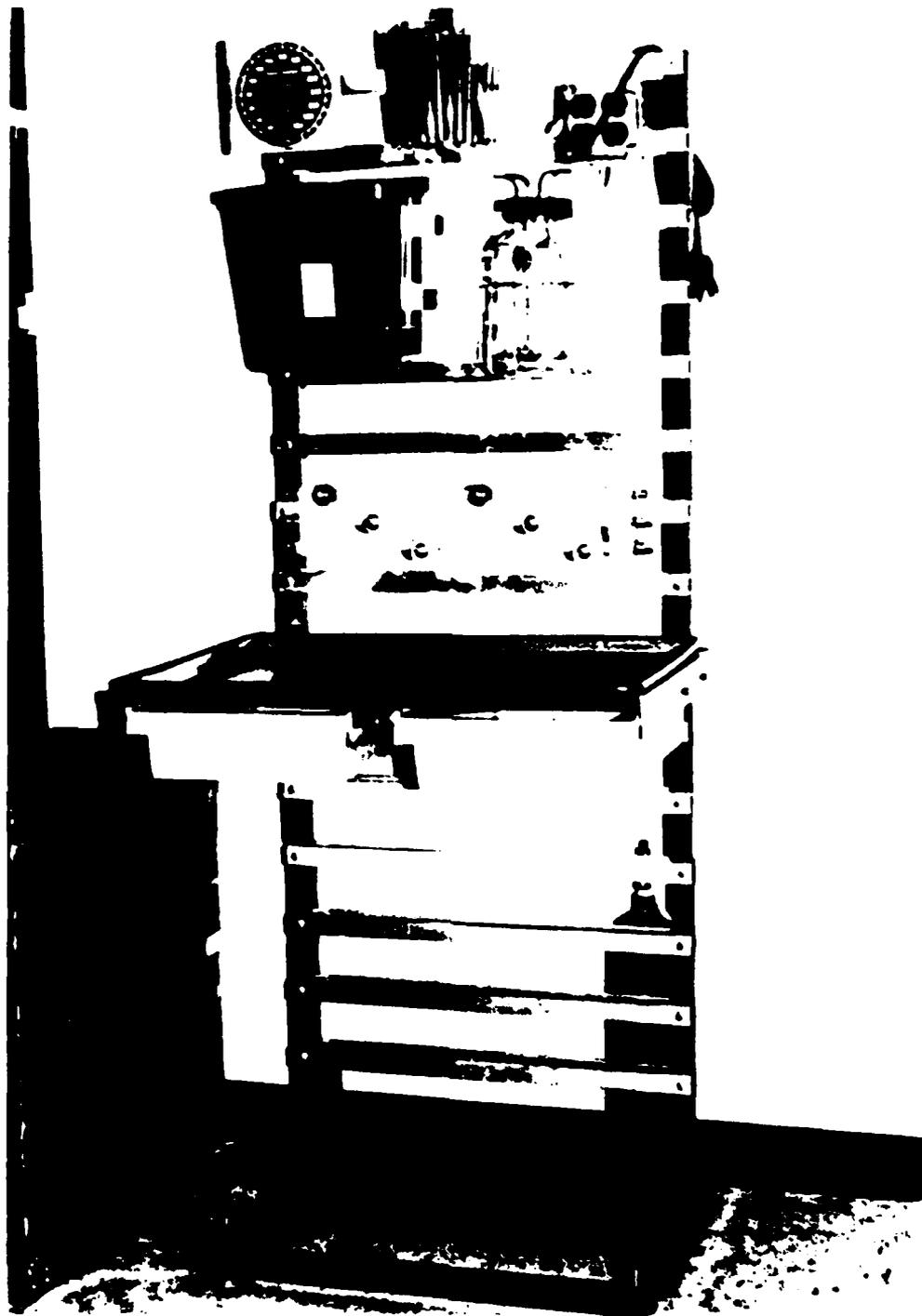


Figure 9. Impact Porta-Wall® and accessories: Sphygmomanometer and cuff basket, electrical power distribution module, biohazards waste container, suction bottle, multi-gas distribution bar assembly, and table assembly with drawers

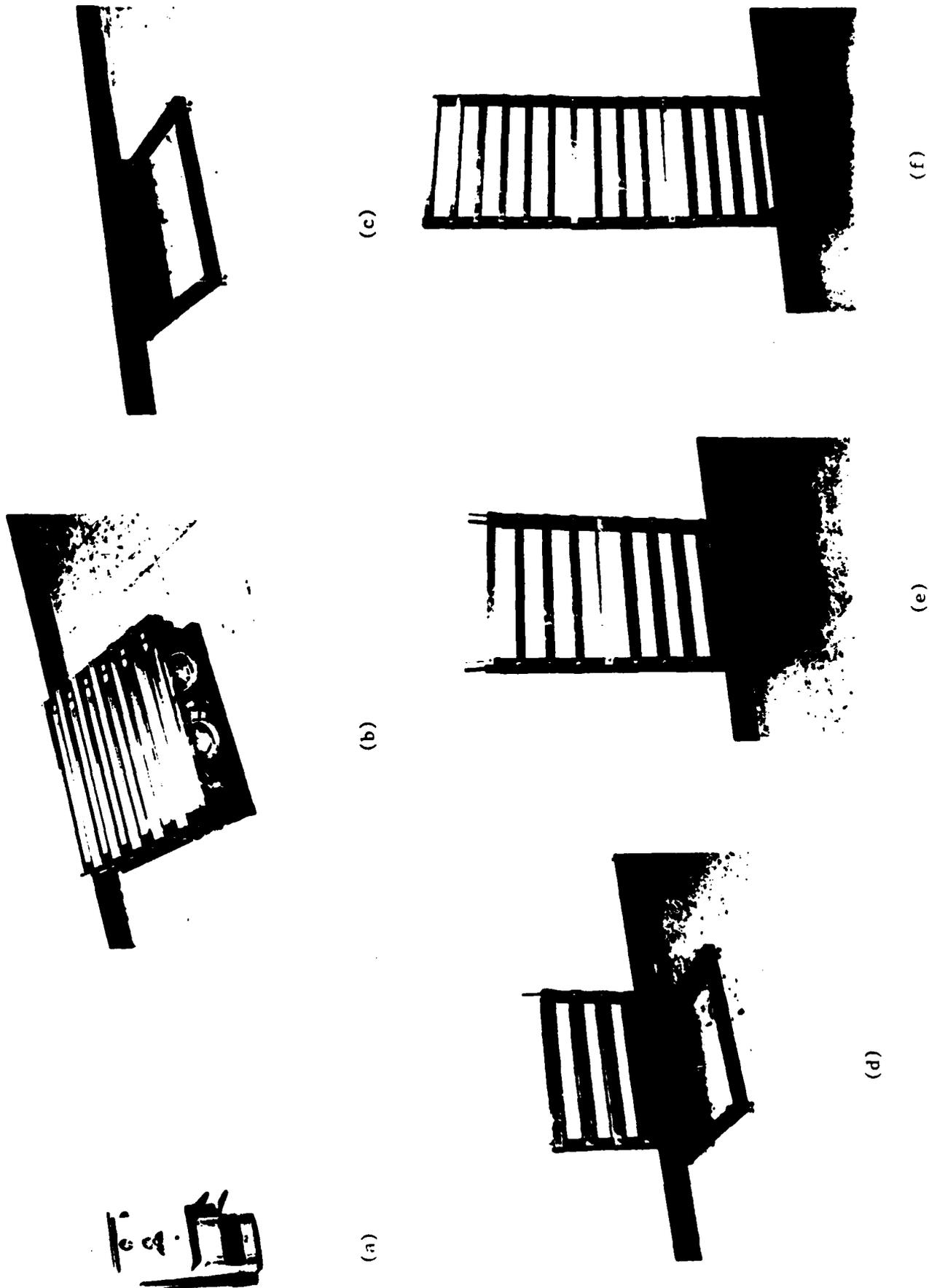


Figure 10. Impact clip and Porta-Wall® in various stages of assembly.
 (a) Quik-Guide® (clip); (b) transport configuration; (c) base assembly; (d) lower vertical assembly added; (e) middle vertical assembly added (f) upper vertical assembly added



Figure 11. Dozier shelf truck

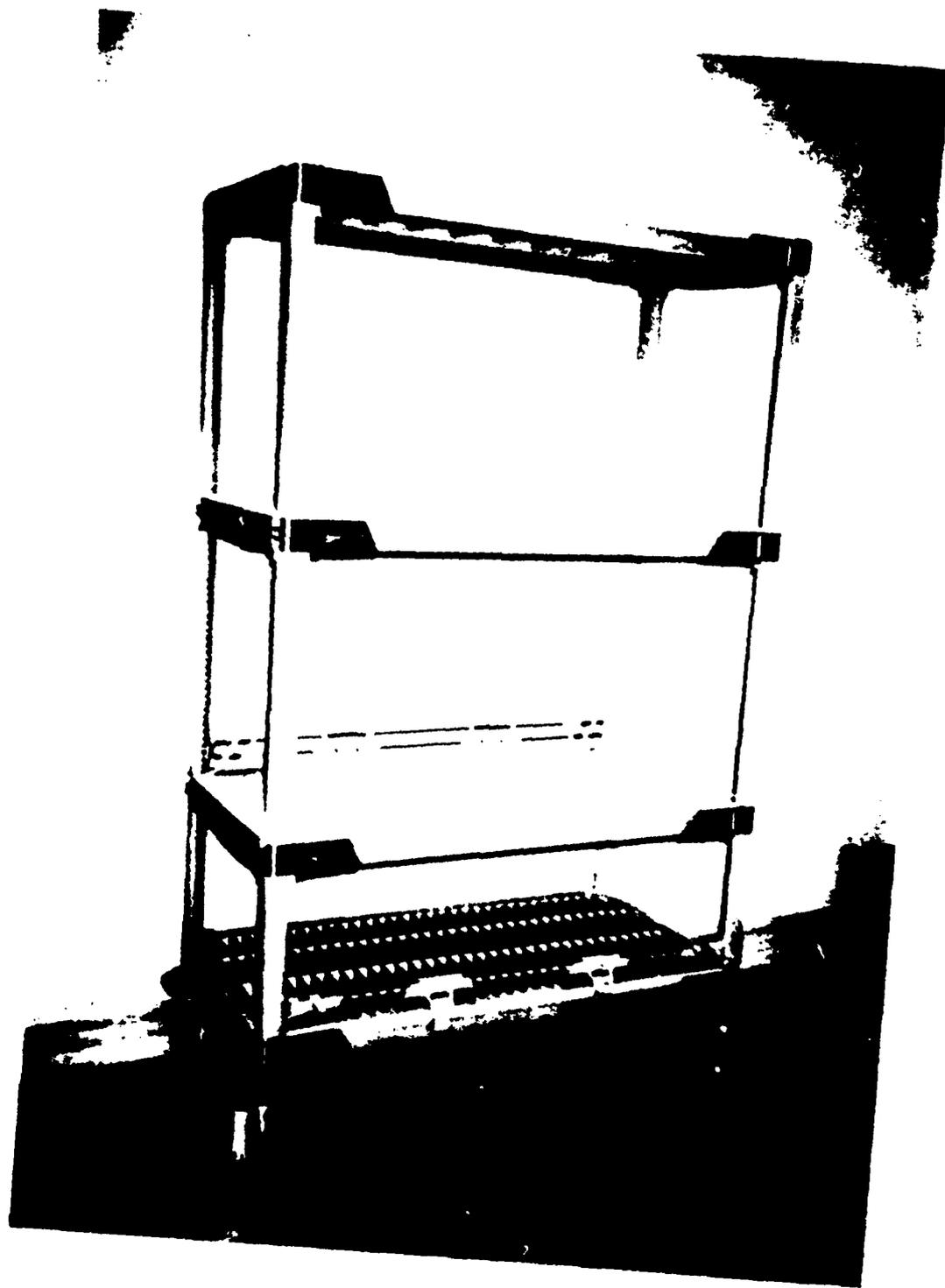


Figure 12. MetroMax® shelving system

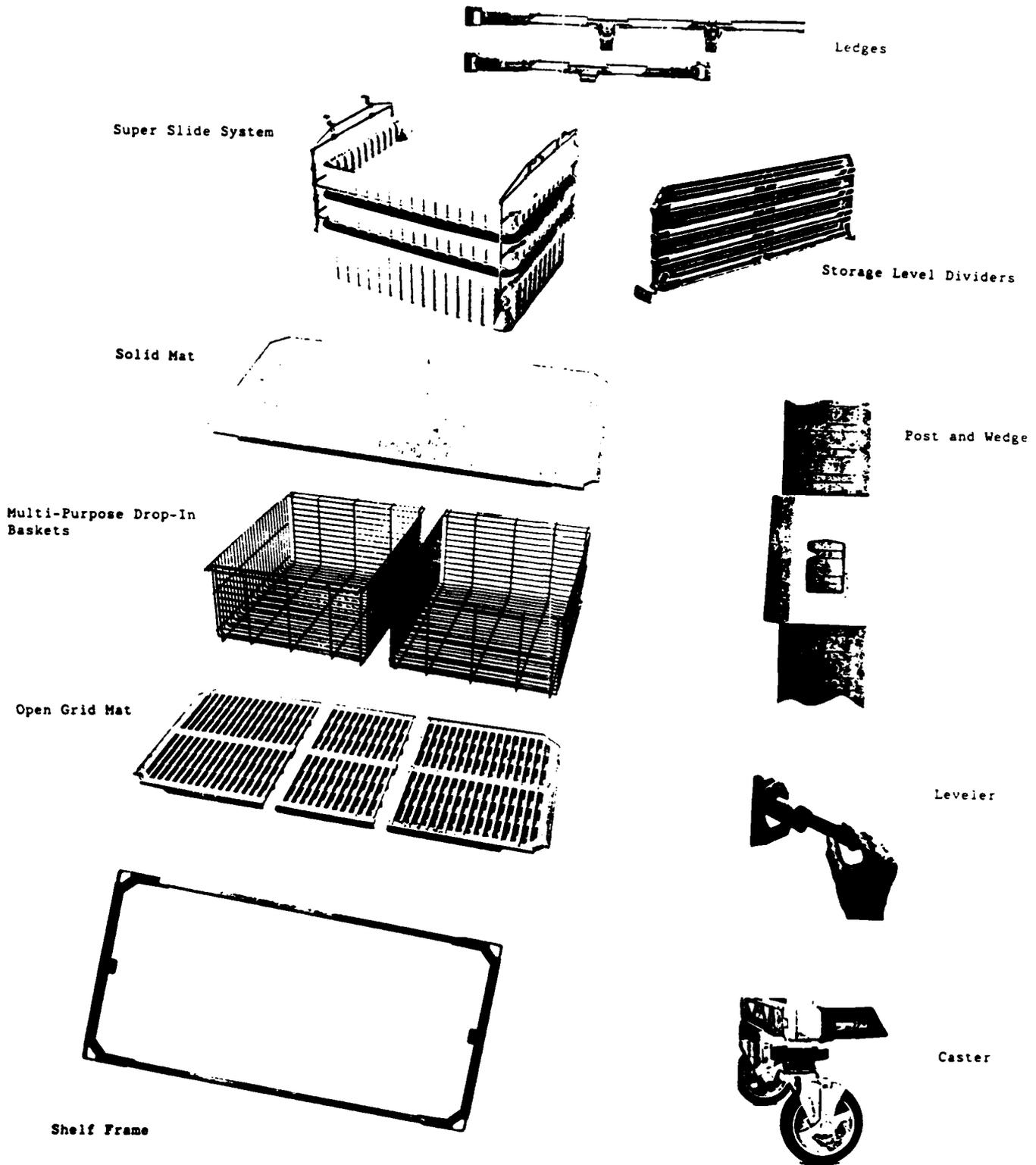


Figure 13. MetroMax[®] shelving system components and selected accessories

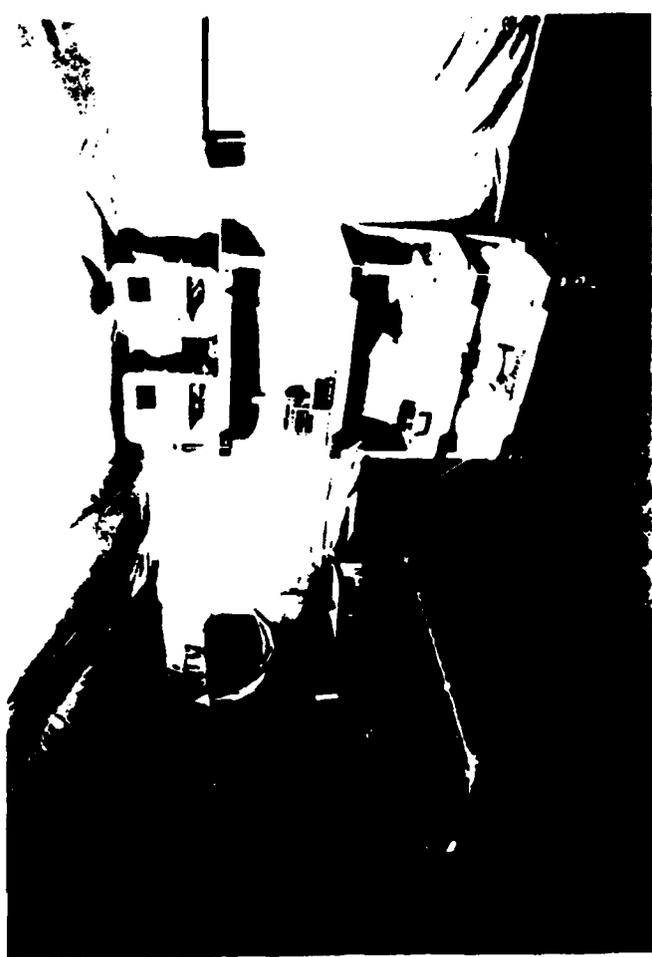


Figure 14. MetroMax® shelving system inside tent with ICU equipment and supplies to support 2 patients

DEPMEDS ICU WITH 8 TEMPER TENT SECTIONS

TEMPER SECTIONS 8 FT X 20 FT

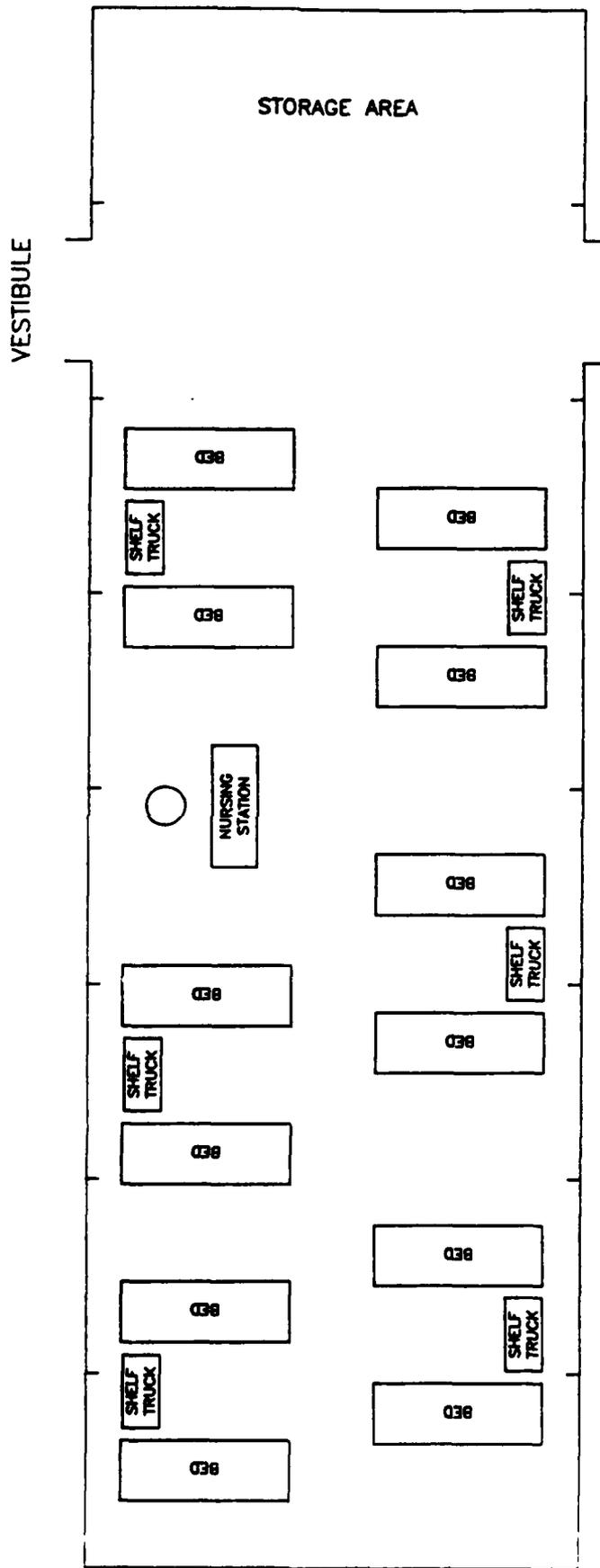


Figure 15. Proposed layout for DEPMEDS ICU with 6 shelf trucks

DEPMEDS ICU WITH 8 TEMPER TENT SECTIONS

TEMPER SECTIONS 8 FT X 20 FT

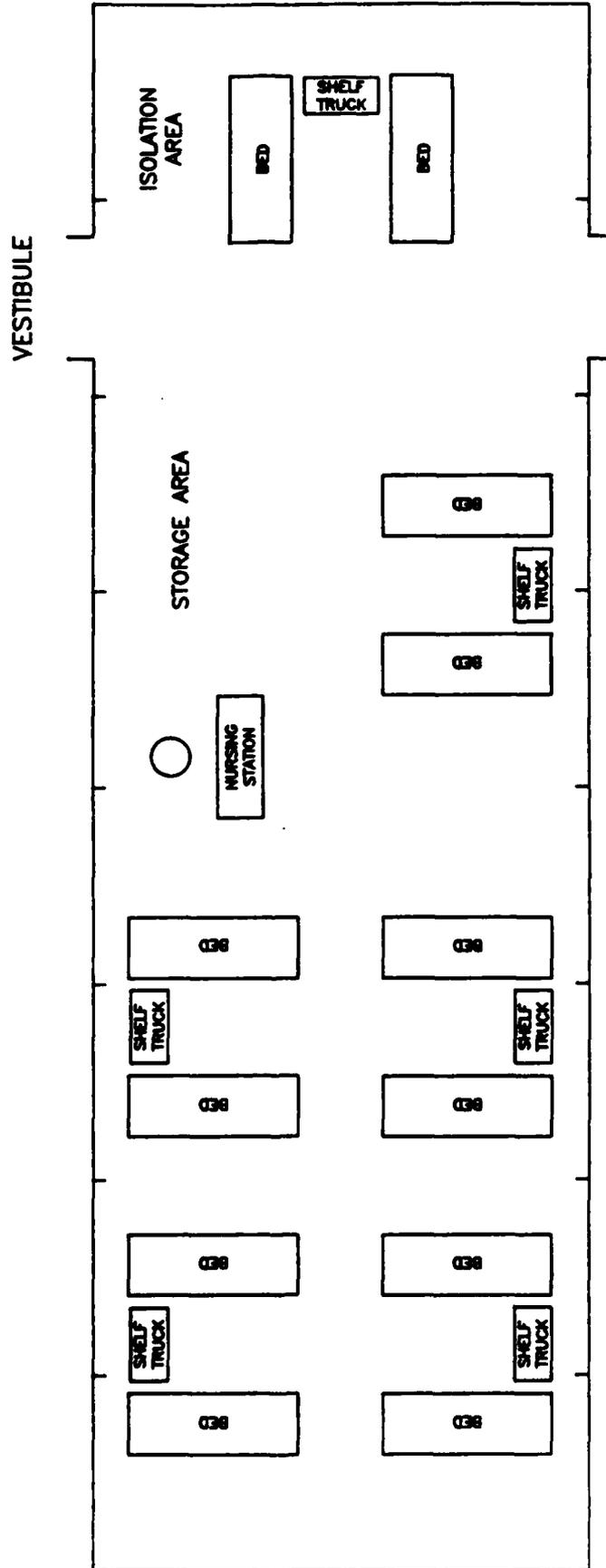


Figure 16. Alternative layout for DEPMEDS ICU with 6 shelf trucks

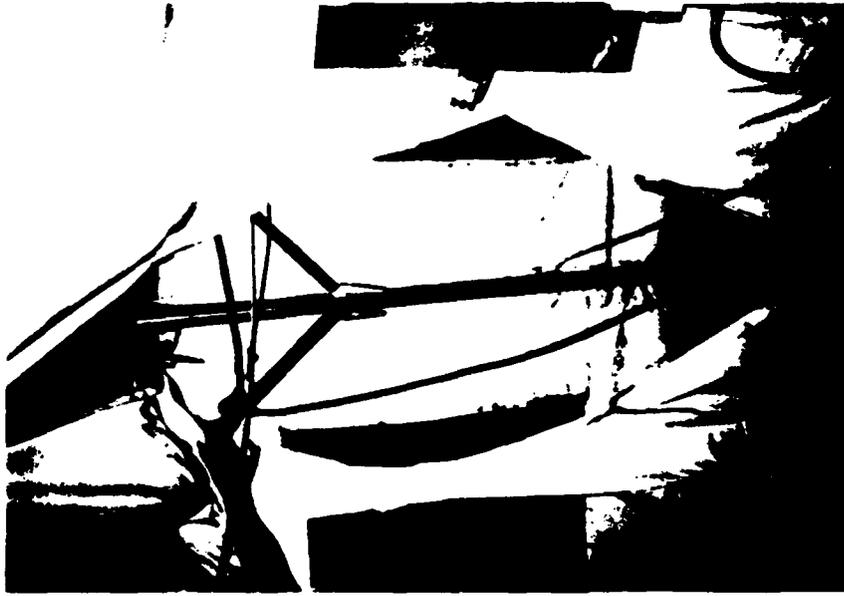


Figure 17. Temper tent frame and view of support arc from tent interior

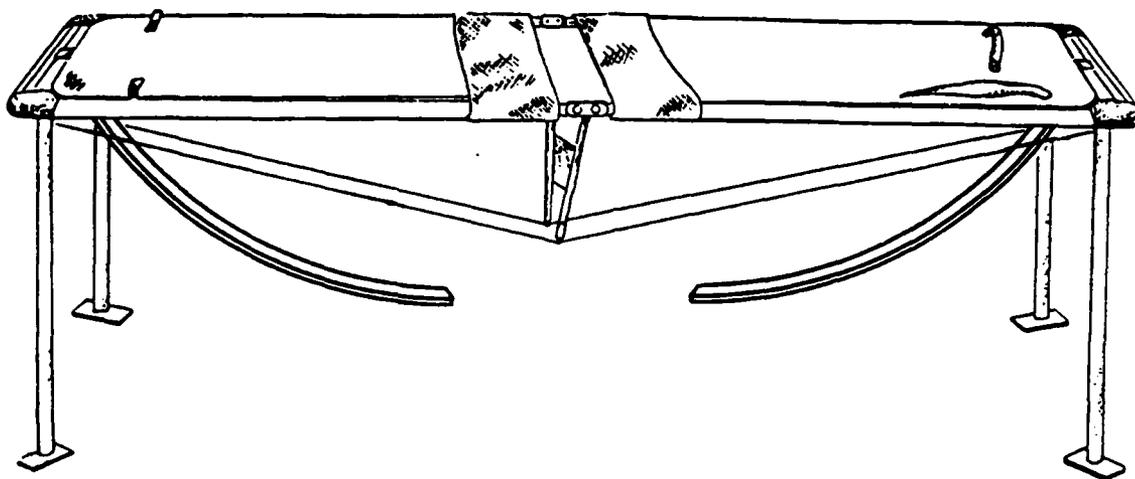


Figure 18. DEPMEDS bed

Table 1. Cost ranges of selected accessories available for portable equipment mounting systems

Accessory	Cost/Range (\$)	
	Impact Instruments	Fairfield Medical
<i>Basic hardware</i>		
Cam action adaptor	15.50	20.80
Coupling bar	160.00	---
Coupling assembly	18.00	---
<i>Utilities</i>		
Hose assembly (gas specific)	72.00	31.20-176.80
Multi-gas distribution bar	480.00	---
Duplex gas outlet	---	77.60-99.20
D/E cylinder holder	---	99.20
Hose guide, clip	---	4.08-20.00
Power distribution module	60.00	64.00-85.60
Light	90.00-360.00	94.40-928.00
<i>Shelves/trays/baskets</i>		
Shelf, flat	56.00	---
Shelf with drawer(s)	134.00	280.00
Equipment shelf (various)	---	115.20-332.00
Cabinet	---	394.40-427.20
Record tray/desk	---	67.20-179.20
Mayo tray	---	84.00-549.60
Clear front container	---	71.20-89.60
Sphygmomanometer cuff basket	53.00	45.60
Basket, wire	26.00-39.00	53.60-165.60
<i>Miscellaneous brackets</i>		
Resuscitation device holder	28.00	29.60-38.40
Suction canister bracket	42.00	46.40-105.60
Biohazards container bracket	57.60	---
Universal instrument holder	---	109.20-252.00
Infusion pump/pole holder	---	147.20-371.20
<i>Hooks/clips</i>		
Utility hook	20.00	29.60
Multiple hook mount	---	69.60
Spring loaded clip(s)	---	36.80-65.60
IV poles/hooks	---	28.00-109.20
<i>Rail-mountable equipment</i>		
Suction controller	130.00	246.40-1140.80
Stop clock	130.00	126.80
Aneroid sphygmomanometer	141.60	166.40
X-ray illuminator	190.00-380.00	---

Table 2. Specifications of portable instrument mounting systems

	Impact Instruments PORTA-WALL®		Fairfield Medical MEMO Series	
	(30 rails)	(16 rails)	(16 rails)	(4 rails)
Shipping Volume (ft ³)	3.0	3.0	1.7-7.2*	1.4-4.1*
Weight (lb)	54	42	90	59
Dimensions - l x w x h (in)	23.25 x 23.25 x 71.25	26.25 x 22.25 x 66.5	26.25 x 22.25 x 66.5	26.25 x 22.25 x 6
Length of Usable Rail (ft)	55	31	36	14
Cost	\$690.00-882.00	\$460.00-652.00	\$767.00-\$867.00	\$982.00-1175.00
Tools Required for Assembly	None**	None**	Allen (hex) wrench	Allen (hex) wrench

*Shipping dimensions specified for Fairfield unit completely disassembled versus partially disassembled (rails left intact)

**Wrench helpful in attaching casters, but not necessary

Table 3. Cost data for MetroMax® shelving system

AVAILABLE SHELF SIZES

18" depth x 24" length

30"

36"

48"

54"

60"

72" (Closed-style shelf not available in 72" length)

Open-style shelf also available in 24" depth at the above lengths

AVAILABLE POST LENGTHS

13"

33"

54"

63"

74"

86"

PRICING FOR SYSTEM EVALUATED

	<u>Unit Cost</u>	<u>Quantity</u>
Open-style shelf, 18" x 36"	\$31.95	2
Closed-style shelf, 18" x 36"	\$35.55	2
Post, 54"	\$9.90	4
Casters with brakes	\$10.53	2
Casters without brakes	\$8.60	2
Ledge, 36"	\$6.30	?
Ledge, 18"	\$4.05	?

Table 4. Specifications for shelf trucks and presently fielded DEPMEDS storage equipment

Item	Shipping Dimensions (ft ³)	Weight (lb)	Cost (\$)
Chest, 2 shelf NSN 6545-00-118-6248	6.2	61	395
Chest, 6 Drawer NSN 6545-00-118-6249	6.2	86	585
Super Erecta Shelf® (4 shelves, 18 x 36)	?	88	?
Utility Wire Basket	4.9	54	?
Dozier Shelf Truck (5 shelves, 18 x 36)	3.0	92	266
MetroMax® Shelving (4 shelves, 18 x 36)	5.2	68	213

REFERENCES

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APPENDIX A

**REQUEST FROM DEFENSE MEDICAL STANDARDIZATION BOARD
TO STUDY SPACE AROUND PATIENT BEDSIDE IN DEPMEDS HOSPITALS**



DEFENSE MEDICAL STANDARDIZATION BOARD

FORT DETRICK
FREDERICK, MARYLAND 21701-5013

ADDRESS REPLY TO:
STAFF DIRECTOR, DEFENSE
MEDICAL STANDARDIZATION BOARD
AND REFER TO:

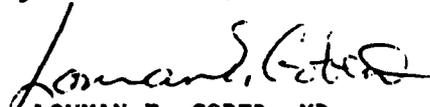
185
13 Nov 89

From: Staff Director
To: Commander, US Army Biomedical Research and Development Laboratory
Via: (1) Commander, US Army Medical Research and Development Command
(2) Director, Research Area II

Subj: STUDY OF PATIENT CARE UTILITY MODULE

Encl: (1) Memorandum of meeting for patient care utility module
(2) USAMRDA ltr SGRD-PLB (70) of 06 Nov 89
(3) Impact literature for Portable Wall

1. Request USABRDL study the space around the bed of a DEPMEDS equipped hospital to ensure that critical items of equipment and material can be functionally located. The DEPMEDS units already fielded lack adequate patient care utility capability. This study should specifically address where items such as ventilators, monitors, suction apparatus, trays, et cetera will be placed and also address electrical outlets, compressed air and oxygen outlets. Enclosure (1) is provided to identify some of the functions and equipment that would be required in the DEPMEDS unit assemblages.
2. The study should also consider the general logistical requirements in the patient care area. Enclosure (2) is one possible partial solution and is referred for your consideration to provide an acceptable modification to the DEPMEDS Utility Wire Basket.
3. Enclosure (3) is submitted as a solution that was developed by industry within the last four or five years. This does not represent a request to consider this solution to the disregard of all others.
4. The DEPMEDS Coordinating Group will provide the clinical and logistical review of your work in this regard. Please submit your proposals or any questions that arise during the study to my office; and we, in turn, will direct action to the appropriate coordinating groups.
5. Thank you for your support. Rest assured this project will be of measurable benefit to the sick and injured soldier, sailor and airman.


LOWMAN E. GOBER, MD
COL, MC, USA

185

8 November 1989

From: Code 185
To: Staff Director

Subj: MEETING FOR PATIENT CARE UTILITY MODULE

1. A meeting was held at Building 1423, FORT Detrick from 0930 to 1120 this date. The following members attended:

LTC Lorna Strzelecki	Army Medical Research and Development Command
Mrs. Gail Jenkins	Army Medical Materiel Agency
Mr. Russell Bennett	Army Medical Materiel Agency

LCDR Ron Fraley	Naval Health Sciences Education and Training
HMC Dennis Donahoe	Naval Medical Materiel Support Command

Mr. Dave Natalie	Air Force Medical Logistics Office
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COL Lowman Gober	Defense Medical Standardization Board
LTC Mike Renn	Defense Medical Standardization Board
LTC Judy Jackson	Defense Medical Standardization Board
LT John Edgmon	Defense Medical Standardization Board
Ms. Belva Hoffman	Defense Medical Standardization Board

2. The purpose of the meeting was to provide input to USABRDL for a study of the patient care area in the DEPMEDS environment. It was requested USABRDL provide a recommendation for the placement of medical equipment, oxygen and compressed air distribution, and electrical distribution; around the patient bed.

3. Discussion centered on the functions required for a patient in the DEPMEDS unit assemblages - #308 (Triage/EMT/Pre-op), #309 (Post-op/ICU), #310 (Intermediate Care Ward), and #311 (Minimal Care Ward). The following matrix provides an indication of the items that would be necessary for the patient in each type unit assemblage:

PATIENT CARE UTILITY MODULE

NSN	ITEM REQUIRED	UA 308 EMT	UA 309 ICU	UA 310 ICW	UA 310 MIN
3920-01-113-0140	TRUCK, HAND TWO WHE	YES	YES	NO	NO
6515-00-132-5181	OXYGEN, 95 GAL	Y	Y	N	N
6515-00-132-5199	OXYGEN, 1650 GAL	Y	Y	N	N
6515-00-935-4088	STETHOSCOPE, COMB	Y	Y	N	N
6515-01-039-4884	SPHYGMANOMETER, ANE	Y	Y	N	N
6515-01-058-7450	DRAINAGE UNIT	Y	Y	Y	N
6515-01-169-0252	MONITOR, RECORD EKG	N	Y	N	N
6515-01-173-2053	DEFIBRILLATOR	Y	Y	N	N
6515-01-180-6962	SUCTION APPA, OROPH	Y	Y	Y	N
6515-01-180-6983	SUCTION APPA, LOPRE	Y	Y	Y	N
6515-01-180-6985	SUCTION APPA, THERM	Y	Y	Y	N
6515-01-204-2670	SUCTION APPA, PORT	Y	Y	Y	N
6515-01-248-5984	OXIMETER, PULSE	Y	Y	N	N
6530-00-783-7905	LITTER, FOLDING	Y	N	N	N
6530-01-015-5189	BED, ADJ, HOSP	N	Y	Y	Y
6530-01-174-2336	LIGHT, FLOOR, EXAM	Y	Y	Y	Y
6530-01-292-1049	VENTILATOR	Y	Y	N	N
6545-00-118-6248	CHEST, MED, 2 SHELF	Y	Y	Y	N
6545-00-118-6249	CHEST, MED, 6 DRAW	Y	Y	Y	N
6680-01-174-6267	REGULATOR, PRESS	Y	Y	N	N
7105-00-269-8463	CHAIR, FOLDING				
	COMPRESSED AIR	Y	Y	N	N
	MINOR PROCEDURES	Y	Y	Y	Y
	PATIENT FEEDING	N	N	Y	N
	PERSONAL PROPERTY	Y	N	N	Y

4. There was also discussion about required functions/equipment in the patient care area but not necessarily at the patient bed side. This would include the following:

- COMMODE AREA
- ILLUMINATOR, X-RAY AREA
- X-RAY, MOBILE (MUST FIT BETWEEN BEDS)
- CART, CARDIAC RES (STORAGE AREA)
- SINK UNIT, SURG and DETERGENT DISPENSER
- CLEAN LINEN AREA
- DIRTY LINEN AREA
- TRAFFIC FLOW SPACE (CIRCULATION SPACE)
- GENERAL SUPPLIES STORAGE
- NURSING STATION

5. The following action is required:

- a. Letter to USABRDL requesting study ---- DMSB
- b. ~~USABRDL~~ to start a market survey and develop recommendations.

6. LTC Jackson appointed temporary chairman due to LT Edgmon on TAD for next three weeks.

7. Next scheduled meeting will depend on progress of ~~USABRDL~~.

J D Edgmon
J. D. EDGMON
LT, MSC, USN

APPENDIX B

**MANUFACTURERS OF EQUIPMENT CONSIDERED
IN PATIENT CARE UTILITY MODULE PROJECT**

Dozier Equipment International
Sidco Industrial Park
Box No. 110336
Nashville, TN 37222-0336

(615) 350-6400

Fairfield Medical Products Corporation
4450 East Adamo Drive
Tampa, FL 33605

(800) ALL-RAIL

Impact Instrumentation, Inc.
P.O. Box 508
West Caldwell, NJ 07006

(201) 882-1212

InterMetro Industries Corporation
North Washington Street
Wilkes-Barre, PA 18705

(717) 825-2741

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U.S. Army Medical Materiel Agency
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1 Commander
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Frederick, MD 21702-5001

1 Commanding Officer
Naval Medical Logistics Command
Bldg. 833
Fort Detrick
Frederick, MD 21702-5015

1 Director
Defense Medical Standardization Board
Bldg. 1423
Fort Detrick
Frederick, MD 21702-5013

1 Chief
Medical Wartime Hospital Integration Office
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Fort Sam Houston, TX 78234-6100

1 Commandant
Academy of Health Sciences
ATTN: HSHA-DCD
Fort Sam Houston, TX 78234-6100

1 Commander
U.S. Army Health Services Command
ATTN: HSCL-P
Fort Sam Houston, TX 78234-6000

1 Commander
Brooke Army Medical Center
ATTN: Department of Clinical Investigations
Beach Pavilion
Fort Sam Houston, TX 78234-6200

1 HQ, HSD/YAM
Brooks Air Force Base, TX 78235-5000

1 HQ, HSD/YAO
Brooks Air Force Base, TX 78235-5000

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Falls Church, VA 22041-3258

1 HQDA (DASG-PSP)
5109 Leesburg Pike
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1 HQDA (DASG-HCD-D)
5109 Leesburg Pike
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5109 Leesburg Pike
Falls Church, VA 22041-3258

1 Nursing Consultant
ATTN: SGPS-CP-N, Room 603
5109 Leesburg Pike
Falls Church, VA 22041-3258

2 Defense Technical Information Center
ATTN: DTIC-FDAC
Alexandria, VA 22304-6145

1 Chief Nurse
Office of The Surgeon (ATMD)
HQ, U.S. Army Training and Doctrine Command
Fort Monroe, VA 23651-5000

1 Chief
Office of The Surgeon
HQ, U.S. Army Forces Command
Fort McPherson, GA 30330-6000

1 Commander
U.S. Army John F. Kennedy Special Warfare Center
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Fort Bragg, NC 28307-5000

1 Commander
44th Medical Brigade
ATTN: AFVH-CG
Fort Bragg, NC 28307-5000

1 Commander
U.S. Special Operations Command
ATTN: SOSG (COL Hughes)
MacDill Air Force Base, FL 33608-6001

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Washington, DC 20380-0001