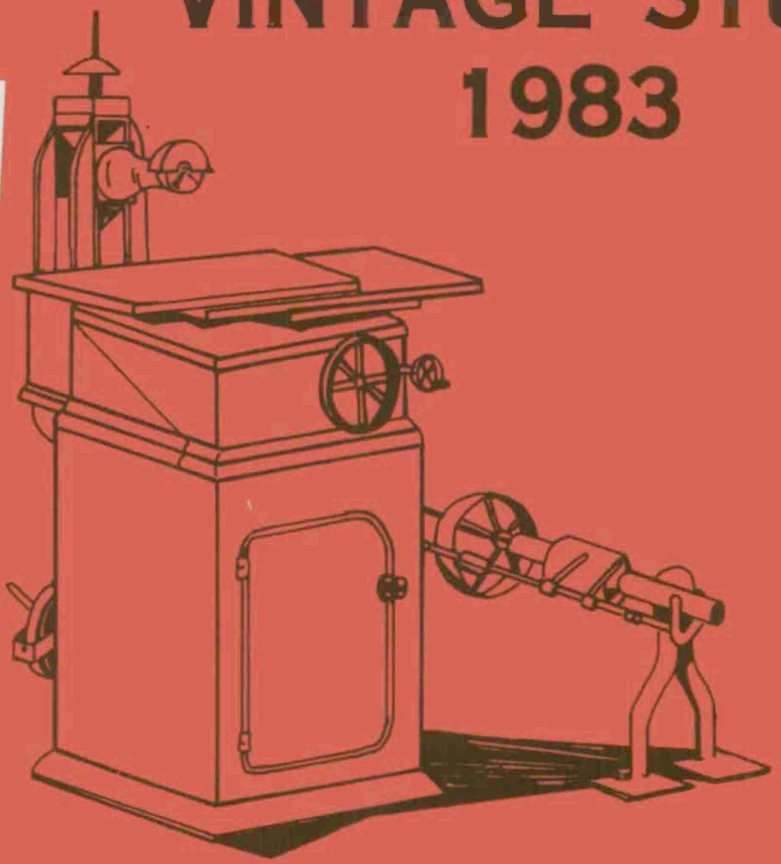
VINTAGE STUDY 1983



DEPARTMENT OF THE ARMY INDUSTRIAL PLANT EQUIPMENT (IPE)

US ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY
ROCK ISLAND, ILLINOIS
61299

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This study is an analysis of Department of the Army industrial plant equipment, active and inactive, based on year of manufacture. A comparison of active Government equipment with private industry is made based on three age groups: 0-9 years old, 10-19 years old, and 20 years or older. The equipment status within the US Army Materiel Development and Readiness Command (DARCOM) is presented for five types of IPE for the major subordinate commands and laboratories and centers. The vintage (age distribution) and quantity and percent

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exceeding useful service life are portrayed for each type. The status of numerical control (NC) equipment is presented showing the classes, quantity and use, and trends of the inventory.

VINTAGE STUDY

1983

Department of the Army

Industrial Plant Equipment

(IPE)

PREPARED BY

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"Reviewed for OPSEC"

PREFACE

This study was conducted in compliance with paragraph 5-2c(6), AR 700-90. It is an analysis of Department of the Army industrial plant equipment, active and inactive, based on year of manufacture. A comparison of active Government equipment with private industry is made based on three age groups: 0-9 years old, 10-19 years old, and 20 years or older. The equipment status within the US Army Materiel Development and Readiness Command (DARCOM) is presented for five types of IPE for the major subordinate commands and laboratories and centers. The vintage (age distribution) and quantity and percent exceeding useful service life are portrayed for each type. The status of numerical control (NC) equipment is presented showing the classes, quantity and use, and trends of the inventory.

The change in the definition for IPE during the year which resulted in a reduction of 66,648 items is reflected in this study. The change increases the acquisition cost criteria and deleted 19 Federal Supply Classes (FSC's). FSC 6625, electrical testing and measuring equipment, is no longer included in this study because it is one of the deleted FSC's.

VINTAGE STUDY

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FIGURES

INTRODUCTION

This study is an analysis of Department of the Army industrial plant equipment (IPE) based on year of manufacture. Five types of IPE are considered: metalcutting, welding, metalforming, heat treating and furnaces, and mechanical testing and measuring equipment. Illustrations of each type and the selected Federal Supply Classes (FSC) are contained in Appendix A. The age of the equipment is illustrated by sorting it into three age groups: 0 to 9 years old, 10 to 19 years old, and 20 years or over. On this basis, Government equipment is compared with private industry. This comparison provides a means to evaluate whether the acquisition of IPE within the Department of the Army is keeping pace with private industry. A comparison of equipment age with useful service life is also made.

The DIPEC SP-57 Report, dated 30 December 1982, The Central Inventory of IPE Report as of 31 December 1982, and the DIPEC SP-50 Report as of 28 January 1983 served as the source documents for Government equipment. Industry data was obtained from the Tenth, Eleventh, and Twelfth Inventories of Metalworking Equipment published in 1968, 1973, and 1978, respectively, by the American Machinist Magazine, a McGraw-Hill publication.

Equipment age is not necessarily the best or only criteria to determine usefulness or capability. Other factors such as use and maintenance strongly influence a machine's serviceability. However, equipment age does provide a convenient yardstick by which a comparison can be made.

It is reasonable to assume that production equipment used by private industry is subjected to essentially uninterrupted service, necessitating earlier replacement. On the other hand, much of the Government equipment is used intermittently. Generally, equipment of a more recent year of manufacture possesses improved operating characteristics, and it follows that the newer equipment possesses improved production capabilities. But, items of equipment with an older year of manufacture may perform very satisfactorily for a given, specific purpose.

This study is not concerned with all these detailed considerations, but concentrates on equipment age only.

SECTION I

DEPARTMENT OF THE ARMY

The Department of the Army (DA) inventory of industrial plant equipment (IPE) consists of 52,228 items with an acquisition cost of $1.568 billion. The change in the definition for IPE during the year resulted in a reduction of 66,648 items. The change increases the acquisition cost criteria and deleted 19 Federal Supply Classes (FSC's). FSC 6625, electrical testing and measuring equipment, is not included in this study because it is one of the deleted FSC's.

The status of the Department of the Army inventory is shown in Figure I-1. The total inventory is characterized by small changes with a decreasing trend except for 1978 and 1979. The increase during these years is attributed to the transfer of IPE from the USN as part of the single manager for conventional ammunition.

Annual inventory status changes for active and inactive equipment are shown in Figure I-2. The large decrease in active IPE in 1974 reflects the reduction of production to support the war in Vietnam; the corresponding increase in inactive IPE reflects the retention of much of it in plant equipment packages (PEP's). The noticeable increase of inactive equipment in 1978 was caused by the transfer of USN PEP's to the Army as part of the single manager for conventional ammunition. The trend since 1979 has been characterized by increases in active IPE and decreases in inactive IPE.

The US Army Materiel Development and Readiness Command (DARCOM) controls 94 percent of the items representing 98 percent of the acquisition cost of the Department of the Army (DA) inventory. As shown in Figure I-3, DARCOM is clearly the major user of IPE within DA.

In view of this, the items controlled by DARCOM can be considered representative of DA.

ACTIVE EQUIPMENT

Most of the equipment controlled by DARCOM, 29,465 items or 60 percent, is active. The quantity and percent of selected types of this equipment exceeding useful service life is shown in Figure I-4.

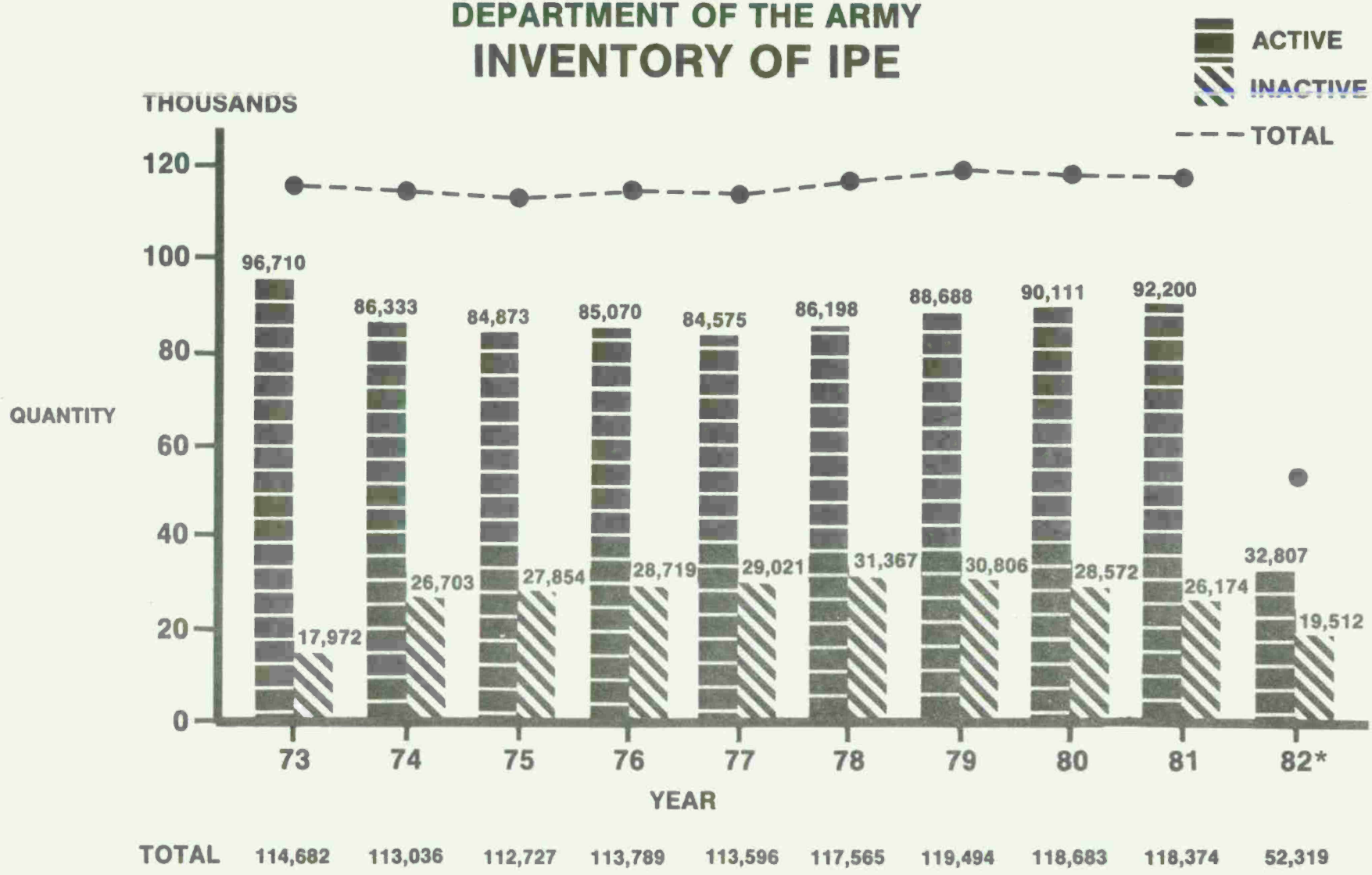
The quantity and percent exceeding useful service life continues to be unfavorable. It varies from 29 percent for welding equipment to 63 percent for metalforming equipment. In 1987, five years from now, these percentages will increase to 49 percent and 68 percent respectively. Metalcutting and metalforming equipment have the highest percent exceeding useful service life. This is significant because of the relatively higher cost of these items. Metalcutting equipment, with 7,921 items, is the type with the greatest number exceeding useful service life; metalforming equipment is a distant second with 1,553 items, and mechanical testing and measuring equipment is third with 766 items.

The vintage (age distribution) of active equipment is shown in Figure I-5. Metalcutting equipment is the oldest with 8,682 items, or 67 percent, 20 or more years old. Welding equipment is the newest with 224 items, or 43 percent, less than ten years old.

INACTIVE EQUIPMENT

The vintage (age distribution) of DARCOM inactive equipment is shown in Figure I-6. As might be expected, the inactive equipment has an older age profile than does the active equipment. Metalcutting equipment has the highest number, 9,160 items, and the highest percent, 89 percent, in the 20 year and over age group. The percentage of metalforming equipment, 20 years old or older is the same as metalcutting equipment but far behind in quantity with only 2,353 items. Mechanical testing and measuring equipment has the most favorable profile with 12 percent, 62 items, less than ten years old and 54 percent, 280 items, more than 20 years old.

DEPARTMENT OF THE ARMY
INVENTORY OF IPE



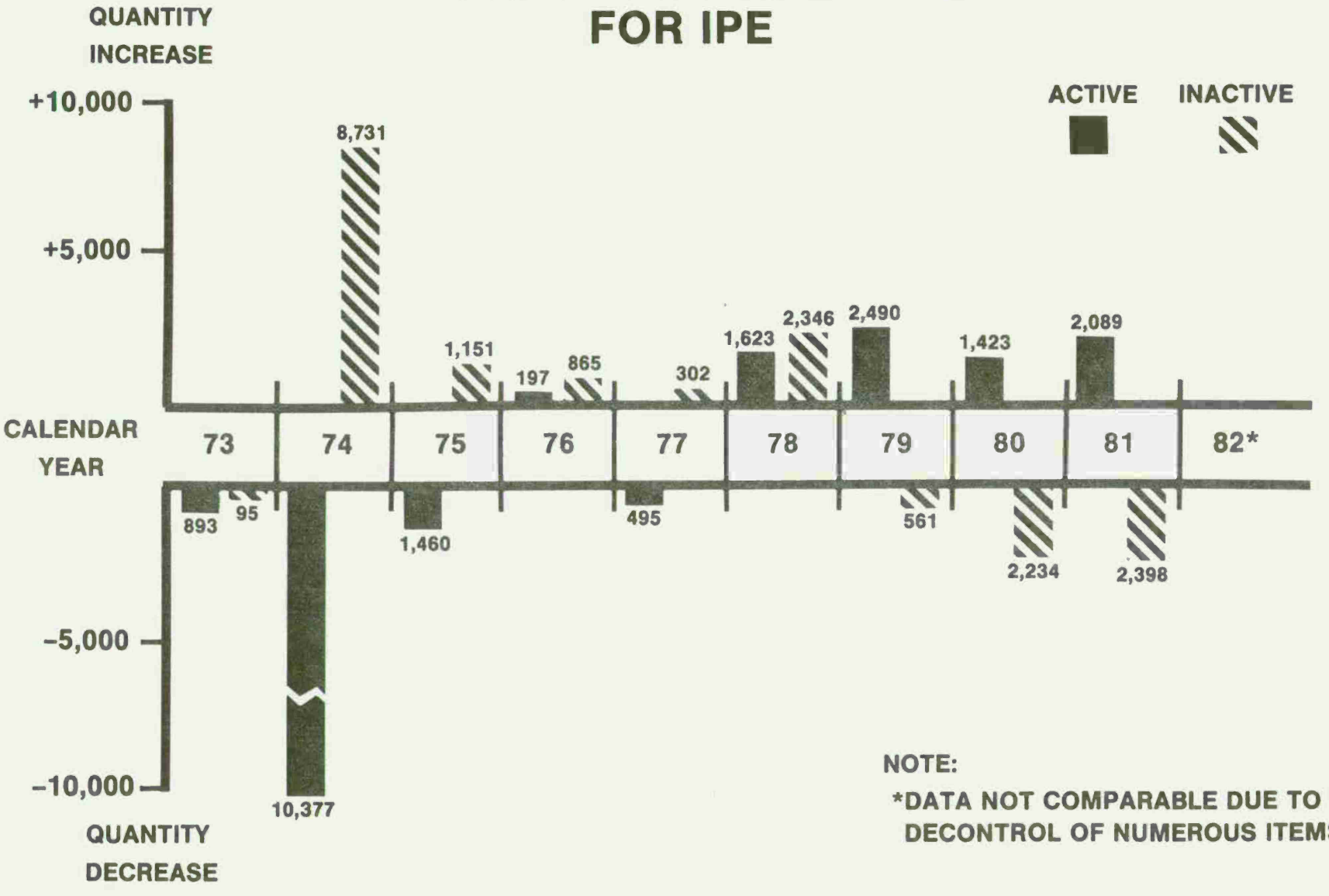
	73	74	75	76	77	78	79	80	81	82*
TOTAL	114,682	113,036	112,727	113,789	113,596	117,565	119,494	118,683	118,374	52,319

NOTE:

* DECONTROL OF NUMEROUS ITEMS WAS RESPONSIBLE FOR THE ABNORMAL DROP OF THE INVENTORY

FIGURE I-1

DEPARTMENT OF THE ARMY
INVENTORY STATUS CHANGES FOR IPE



NOTE:
*DATA NOT COMPARABLE DUE TO DECONTROL OF NUMEROUS ITEMS

FIGURE I-2

INDUSTRIAL PLANT EQUIPMENT

NOTE: DATA IS AS OF 29 NOV 82.

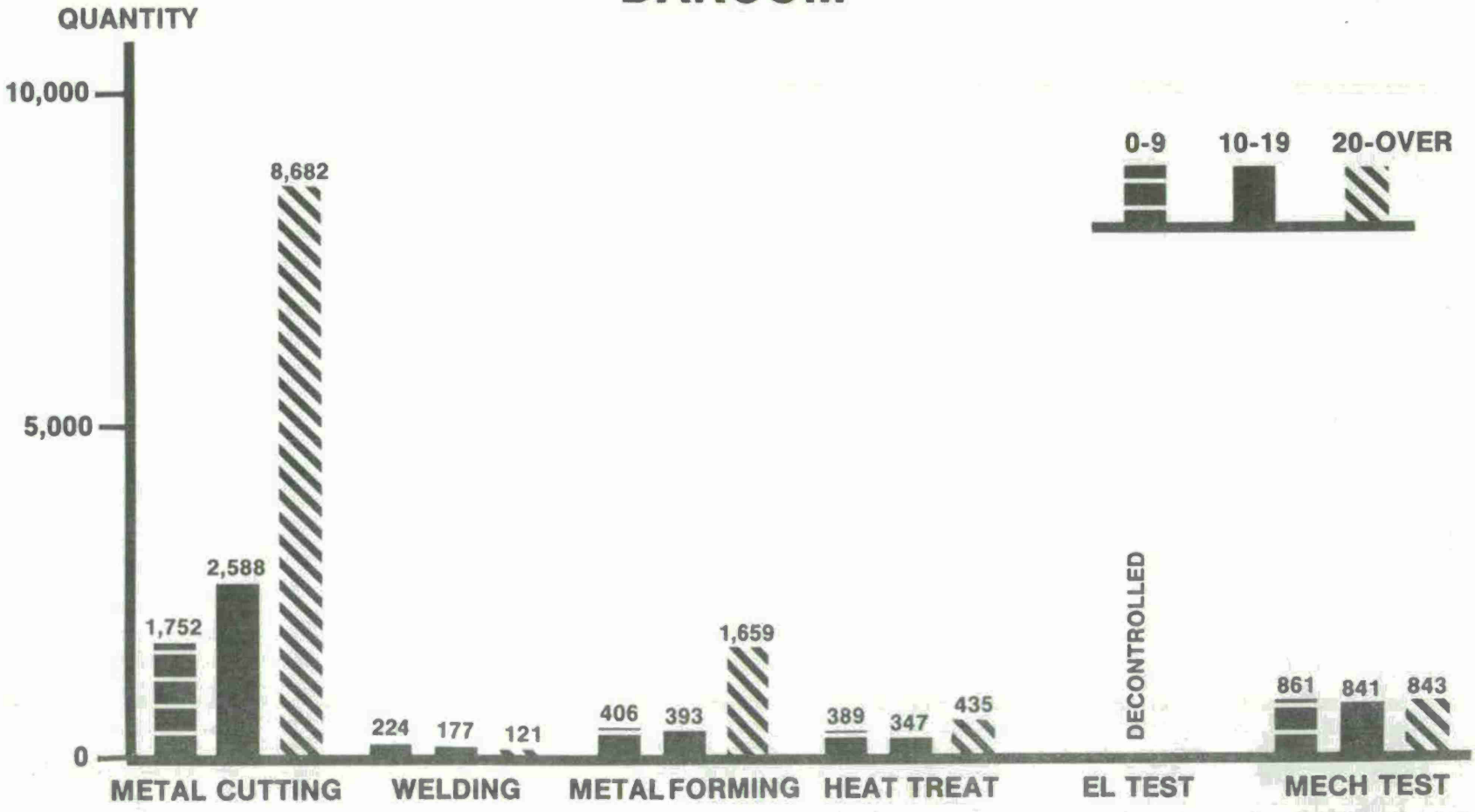
FIGURE I-3

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
DARCOM

PERCENT	METALCUTTING	WELDING	METALFORMING	HEAT TREAT & FURNACES	EL TEST & MEAS	MECH TEST & MEAS
1982	61	29	63	33		30
1987	67	49	68	43		46

FIGURE 1-4

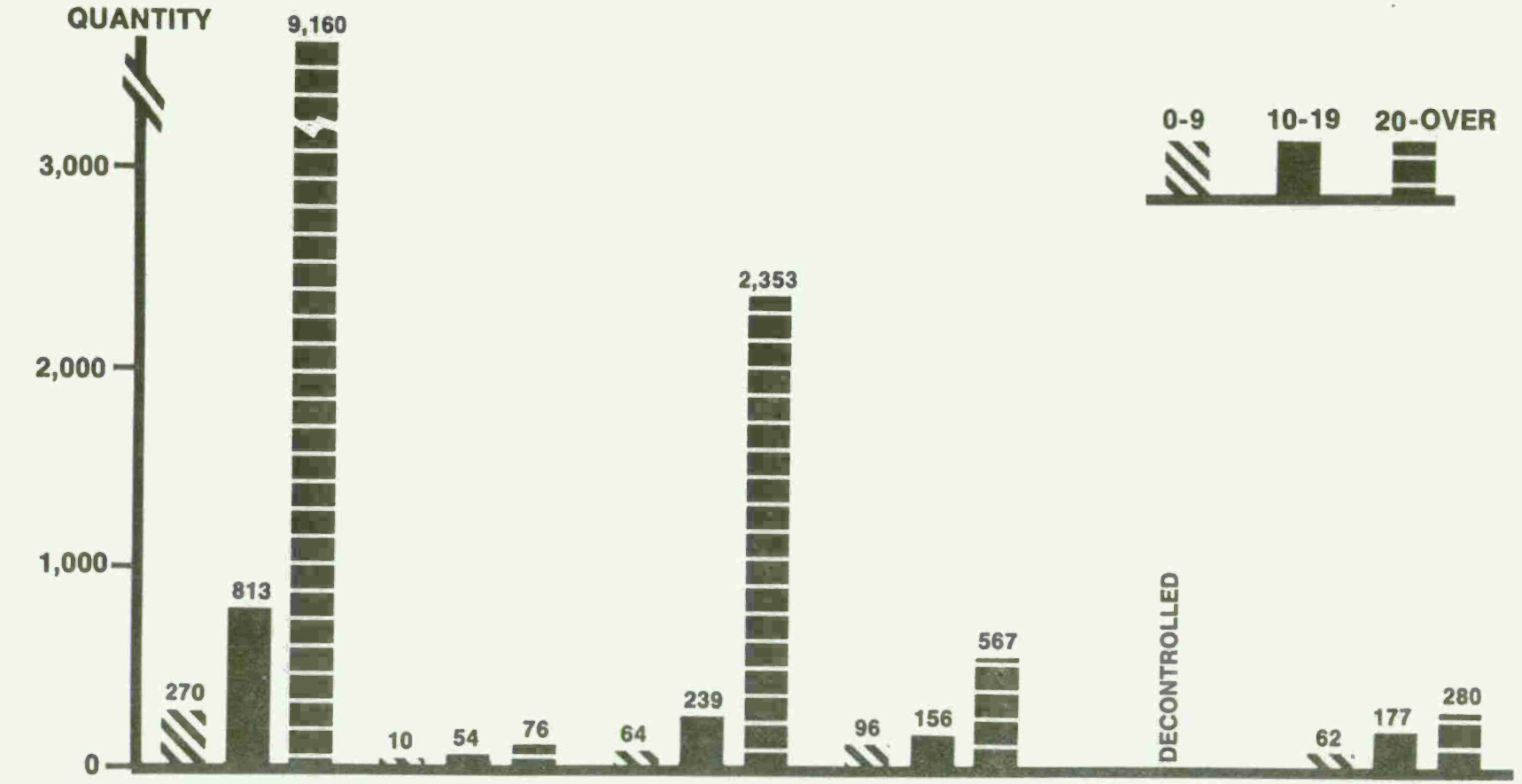
ACTIVE EQUIPMENT
VINTAGE
DARCOM



PERCENT	METAL CUTTING	WELDING	METAL FORMING	HEAT TREAT & FURNACES	EL TEST & MEAS	MECH TEST & MEAS
0-9	13	43	17	33		34
10-19	20	34	16	30		33
20-OVER	67	23	67	37		33

FIGURE 1-5

INACTIVE EQUIPMENT
VINTAGE
DARCOM



PERCENT						
0-9	3	7	2	12		12
10-19	8	39	9	19		34
20-OVER	89	54	89	69		54

FIGURE 1-6

SECTION II

DARCOM vs. INDUSTRY

An age comparison of DARCOM and private industry equipment is shown in Figure II-1. The data for DARCOM were obtained from previous Vintage Studies. Private industry data were obtained from the Tenth, Eleventh, and Twelfth Inventories of Metalcutting Equipment published in 1968, 1973, and 1978, respectively, by the American Machinist Magazine, a McGraw-Hill publication.

METALCUTTING AND METALFORMING EQUIPMENT

The age profile of DARCOM equipment is strongly influenced by the significantly large portion of the inventory that was acquired during the period 1950 to 1954. As a result, the age of the metalcutting and metalforming inventory has shifted from the 10-19 year range in 1968 to the 20 year and over range in 1973 and 1978. This shift also reflects a replacement level that has not kept pace with the aging of the inventory.

Private industry, on the other hand, exhibits a relatively consistent investment in replacement of equipment. As a result, the equipment operated by private industry has a more favorable age profile than the equipment available to the Army. Private industry takes greater advantage of the improved operating characteristics and production capabilities of newer equipment.

WELDING/JOINING EQUIPMENT

Private industry and DARCOM equipment exhibit similar status for this type. The shorter useful life which requires earlier replacement seems to be the major reason for this similarily.

CURRENT STATUS

A comparison of the current status of DARCOM equipment with private industry equipment is shown in Figure II-2. The age profile of DARCOM equipment continues to be inferior to that of private industry. The percentage of DARCOM metalcutting and metalforming equipment 20 years old and over is about double that of private industry. The profile of welding/joining equipment for DARCOM and private industry is reasonably similar but the comparison is still unfavorable for DARCOM.

TRENDS

Private industry appears to have reduced their investment in equipment replacement. A definite decrease in newer equipment, 0-9 years old, and an increase in older equipment, 20 years and older, is evident. In spite of this, the Army is still in an unfavorable position compared to private industry.

EQUIPMENT REPLACEMENT

An indication of replacement of active equipment can be approximated by the number of items less than ten years old and those 10 to 19 years old. In the last ten years, only 1,752 metalcutting items and 406 metalforming items were added to the inventory. During the previous ten years, 2,588 metalcutting items and 393 metalforming items were added to the inventory.

The number of items that would have to be replaced to make DARCOM's newer equipment, 0-9 years old, comparable to private industry is large. It would require replacement of 2,969 metalcutting items and 345 metalforming items. From these figures it can be seen that the replacement rate for DARCOM is much too low.

Estimating the cost to purchase the equipment to cause the inventory of DARCOM metalcutting and metalforming equipment to approach that of private industry is difficult due to the extreme range of acquisition cost for this equipment. A review of the FY 81 projects revealed that the price range for items approved for acquisition ranged from $2,905 to $425,500. The average cost of all IPE as of 31 December 1982 was $30,185. Because of the wide range in the acquisition cost for industrial plant equipment, average acquisition cost is of limited value. Recognizing this, a very rough estimate of the cost to make the Army's inventory of metalcutting and metalforming equipment approach that of private industry is approximately $100,033,090.

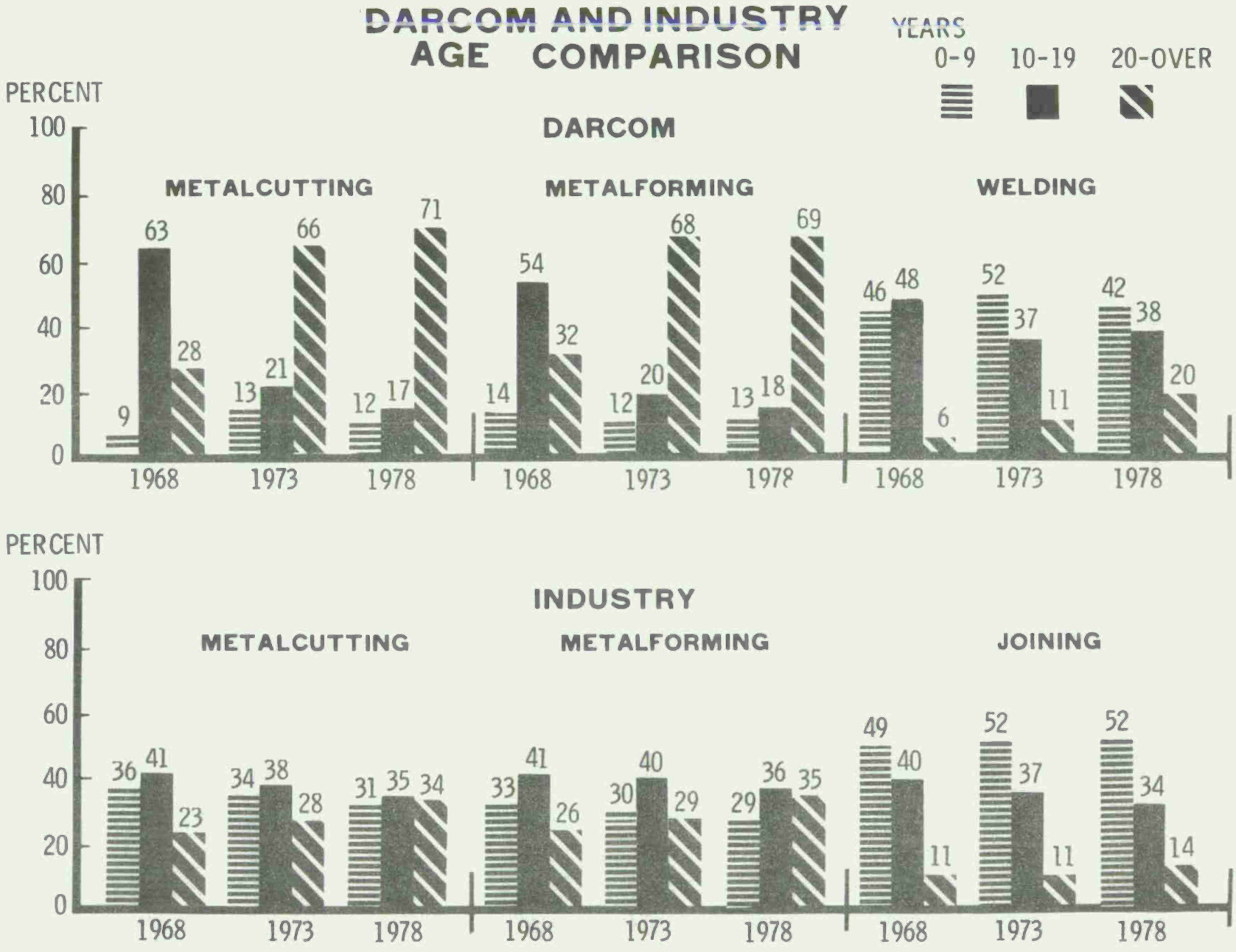

DARCOM AND INDUSTRY
AGE COMPARISON
YEARS
0-9
10-19
20-OVER
PERCENT
DARCOM
METALCUTTING
METALFORMING
WELDING
100
80
60
40
20
0
9
63
28
13
21
66
12
17
71
14
54
32
12
20
68
13
18
69
46
48
6
52
37
11
42
38
20
1968
1973
1978
PERCENT
INDUSTRY
METALCUTTING
METALFORMING
JOINING
36
41
23
34
38
28
31
35
34
33
41
26
30
40
29
29
36
35
49
40
11
52
37
11
52
34
14

FIGURE II-1

DARCOM AND INDUSTRY AGE COMPARISON

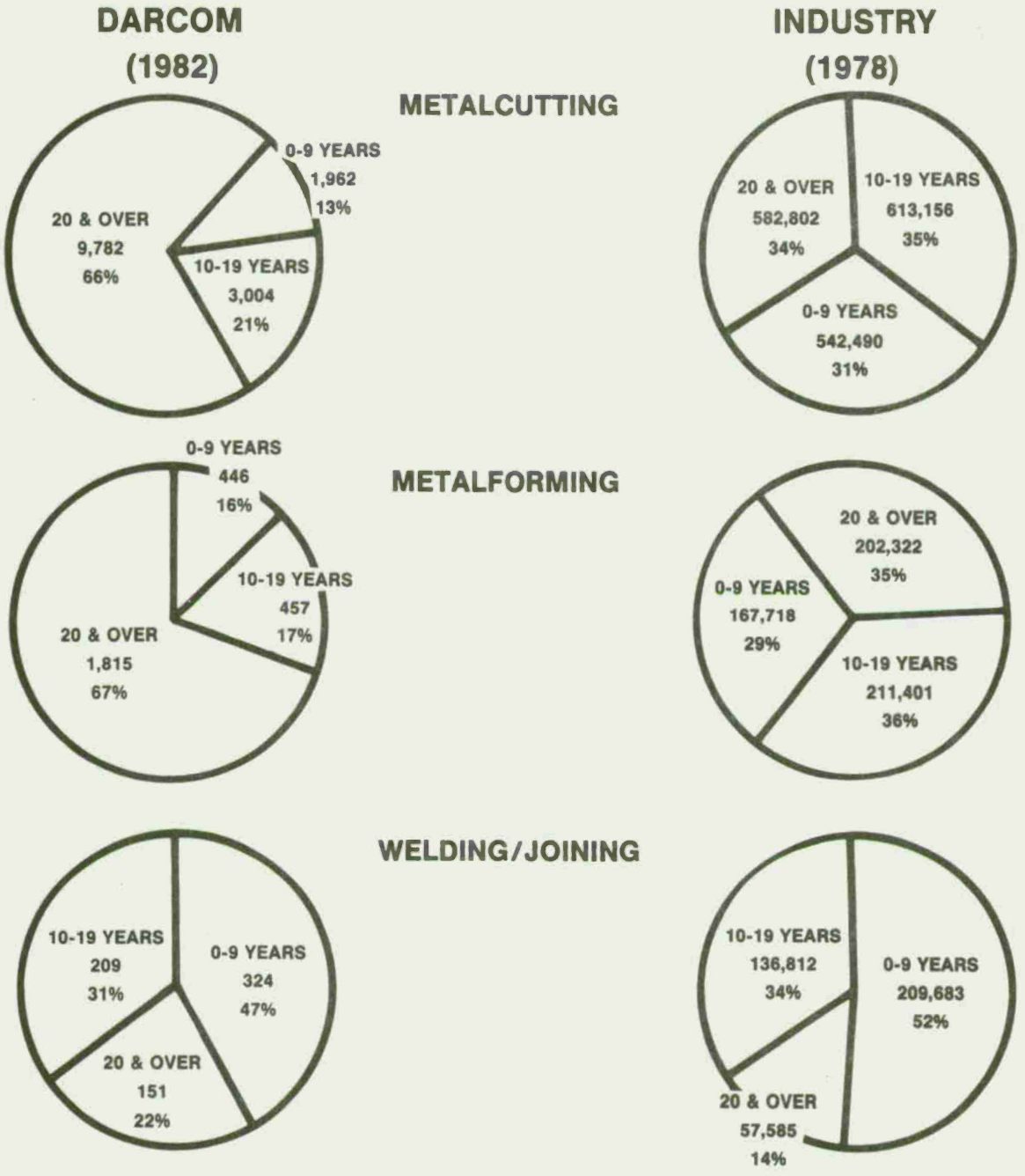


FIGURE II-2

SECTION III

EQUIPMENT STATUS WITHIN DARCOM

This section presents the status of each of the five types of IPE for the major subordinate commands (SUBMACOM's) and laboratories and centers (LABS & CENTERS) within DARCOM. The age distribution (vintage) and the quantity and percent exceeding useful service life are portrayed for each type.

The service life data were calculated by DIPEC based on the useful service life contained in AR 700-43 for each class of equipment within each type. These detailed service life listings were averaged for each type to facilitate data assembly.

ACTIVE EQUIPMENT

Age Distribution (Vintage). The age distribution for each of the five types of equipment is shown in the following figures:

The age distribution of active DARCOM equipment is influenced greatly by the type of the equipment.

Metalcutting and metalforming equipment are the oldest, most of it over 20 years old. This is true regardless of which command owns it.

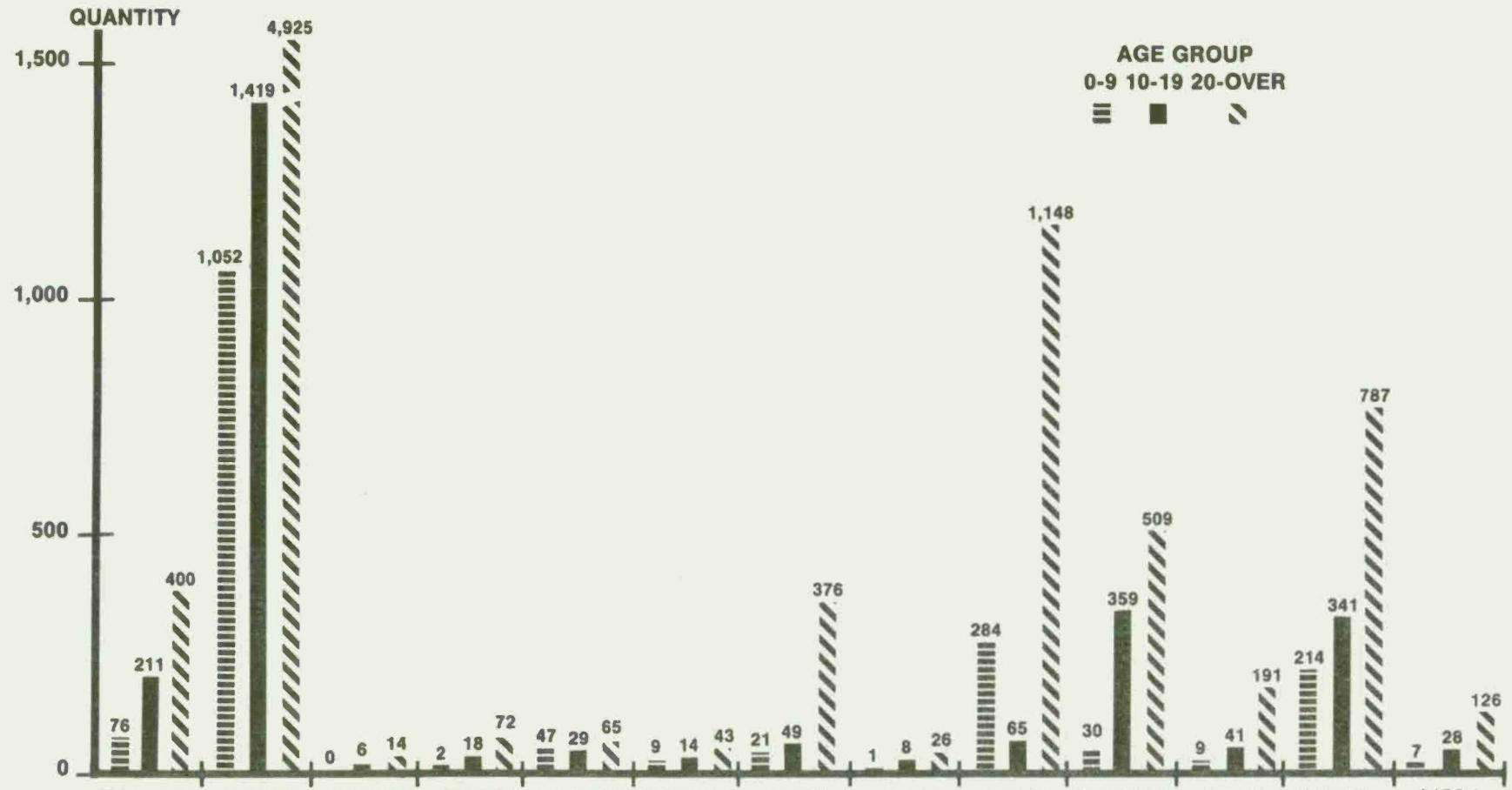
Welding equipment, because of its shorter life, is newer with most of the equipment less than 20 years old.

Heat treating equipment and furnaces are more evenly distributed with respect to age. ERADCOM has the most favorable distribution with 54 percent, 13 items, less than ten years old; and only four percent, one item, over 20 years old. TSARCOM has the most unfavorable distribution with 50 percent, 26 items, over 20 years old.

Electrical testing and measuring equipment has been decontrolled and is no longer included in this study.

Mechanical testing and measuring equipment is generally less than 20 years old. ARRCOM, with 875 items, is by far the greatest user of this type of equipment.

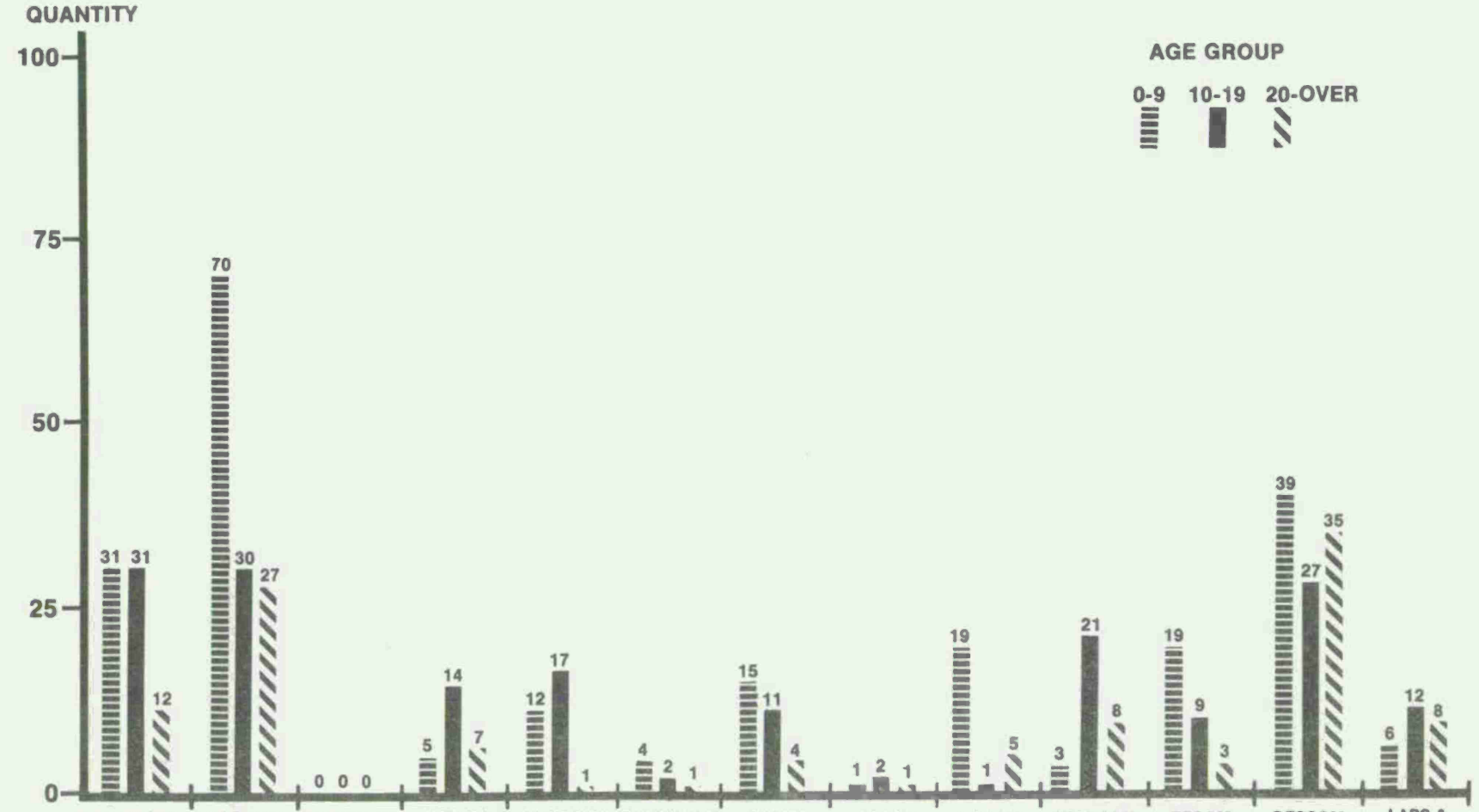
ACTIVE EQUIPMENT
VINTAGE
METAL CUTTING



%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YRS	11	14	0	2	33	14	5	3	19	3	4	16	4
10-19	31	19	30	20	21	21	11	23	4	40	17	25	17
20-OVER	58	67	70	78	46	65	84	74	77	57	79	59	78

FIGURE III-1

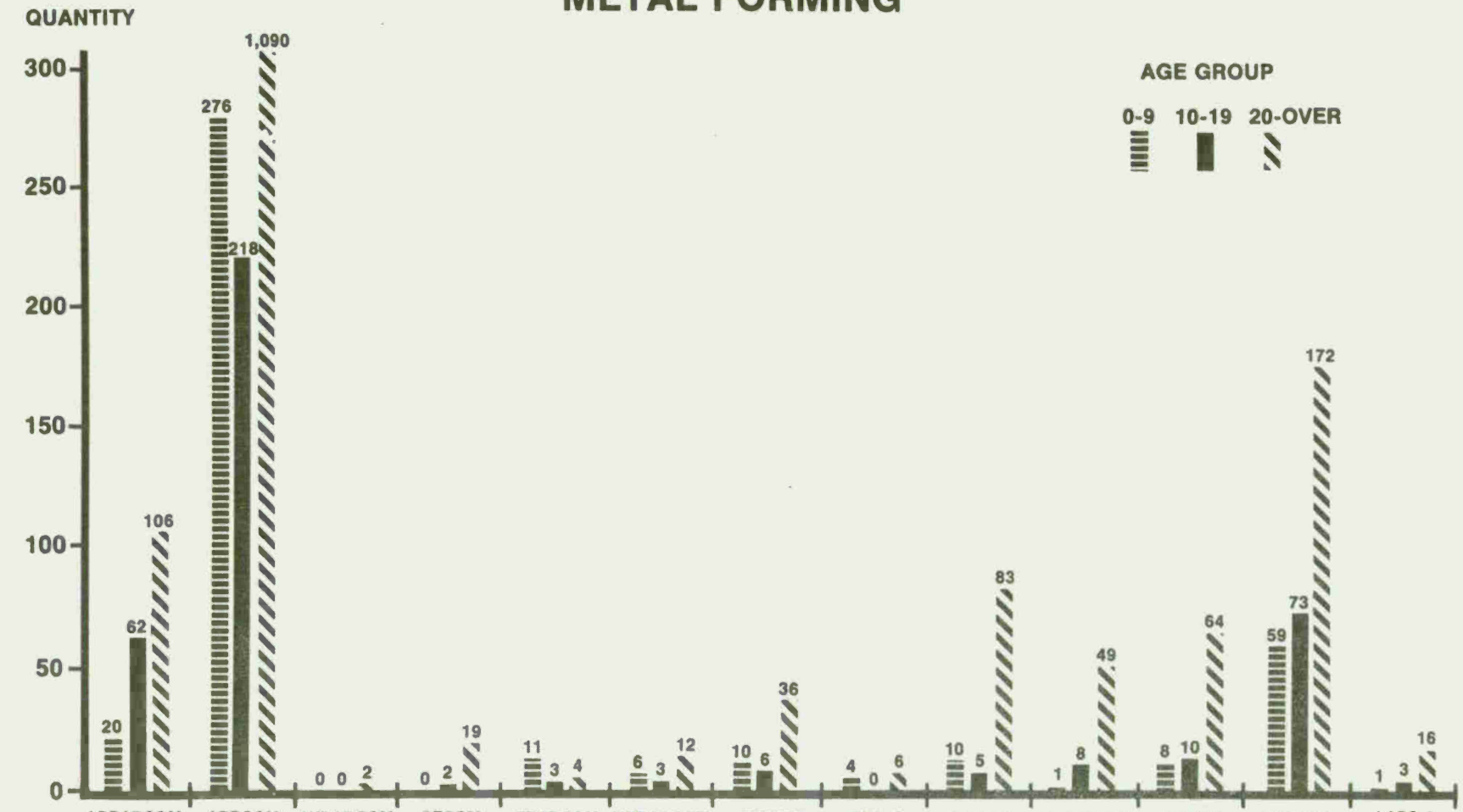
ACTIVE EQUIPMENT
VINTAGE
WELDING



%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YEARS	42	51	0	19	40	57	50	25	76	9	61	38	23
10-19	42	22	0	54	57	29	37	50	4	66	29	27	46
20-OVER	16	27	0	27	3	14	13	25	20	25	10	35	31

FIGURE III-2

ACTIVE EQUIPMENT
VINTAGE
METAL FORMING



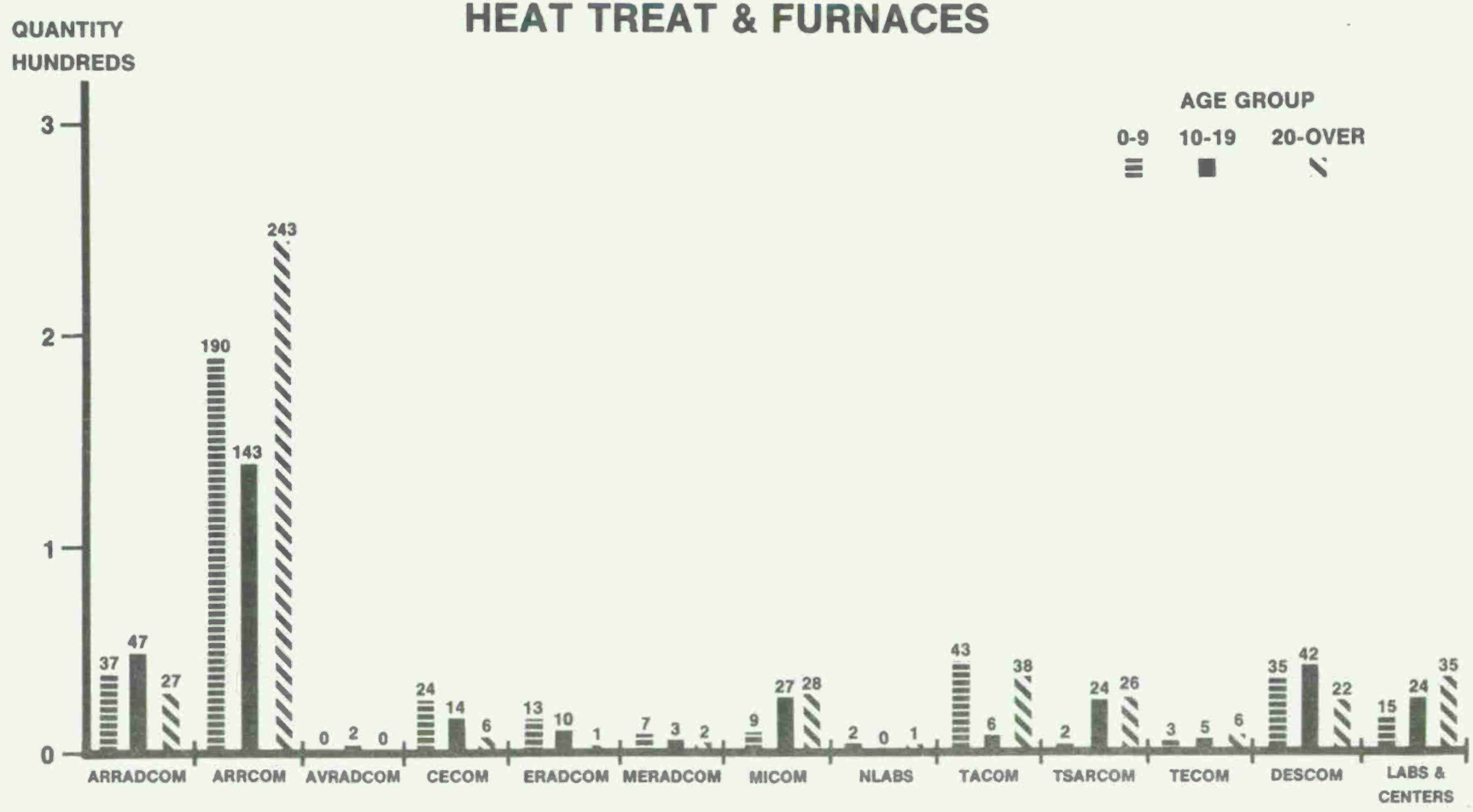
%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YRS	11	17	0	0	61	29	19	40	10	2	10	19	5
10-19	33	14	0	10	17	14	12	0	5	14	12	24	15
20-OVER	56	69	100	90	22	57	69	60	85	84	78	57	80

FIGURE III-3

ACTIVE EQUIPMENT

VINTAGE

HEAT TREAT & FURNACES



0-9 YRS	33	34	0	54	54	58	14	67	49	4	21	35	20
10-19	43	24	100	32	42	25	42	0	7	46	36	43	32
20-OVER	24	42	0	14	4	17	44	33	44	50	43	22	47

FIGURE III-4

ACTIVE EQUIPMENT
VINTAGE
MECHANICAL TEST & MEAS

%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YRS	24	36	0	17	43	31	20	40	58	24	38	29	43
10-19	47	28	75	38	40	52	32	31	15	37	34	36	36
20-OVER	29	36	25	45	17	17	48	29	27	39	28	35	21

FIGURE III-5

Useful Service Life. The quantity and percent of each of the five types of equipment that exceed useful service life are shown in the following figures:

Type	Figure	Page
METALCUTTING	III-6	3-8
WELDING	III-7	3-9
METALFORMING	III-8	3-10
HEAT TREAT AND FURNACES	III-9	3-11
ELECTRICAL TESTING AND MEASURING	Decontrolled	
MECHANICAL TESTING AND MEASURING	III-10	3-12

The percent of metalcutting equipment that exceeds useful service life varies from 33 percent, or 46 items, being used by ERADCOM to 74 percent, or 1,111 items, controlled by TACOM. However, ARRCOM has the most equipment, 4,562 items or 62 percent, that exceed useful service life.

Welding equipment which exceeds useful service life varies from 7 percent (excluding AVRADCOM), or two items, belonging to ERADCOM to 50 percent, or two items controlled by NLABS. DESCOM and ARRCOM have the most items exceeding useful service life, both with 40 items.

TSARCOM has the highest percent of metalforming equipment which exceeds useful service life with 83 percent, or 48 items. ERADCOM has the lowest percent with 17 percent, or three items. ARRCOM has the greatest quantity, 1,035 items, exceeding useful service life which is 65 percent of their items.

ARRCOM has 215 items of heat treating equipment and furnaces that exceed useful service life, more than any other command within DARCOM. AVRADCOM, CECOM, and ERADCOM, with zero, nine, and four percent respectively, have the lowest percent exceeding useful service life. TSARCOM with 48 percent, or 25 items, has the highest percent exceeding useful service life.

Electrical testing and measuring equipment has been decontrolled and is no longer included in this study.

The 283 items, or 32 percent, of ARRCOM's mechanical testing and measuring equipment, which exceed useful service life are the most for a command within DARCOM. The percent exceeding useful service life for this type varies from eight percent, or one item, for AVRADCOM to 45 percent, or 94 items, for MICOM.

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
METAL CUTTING

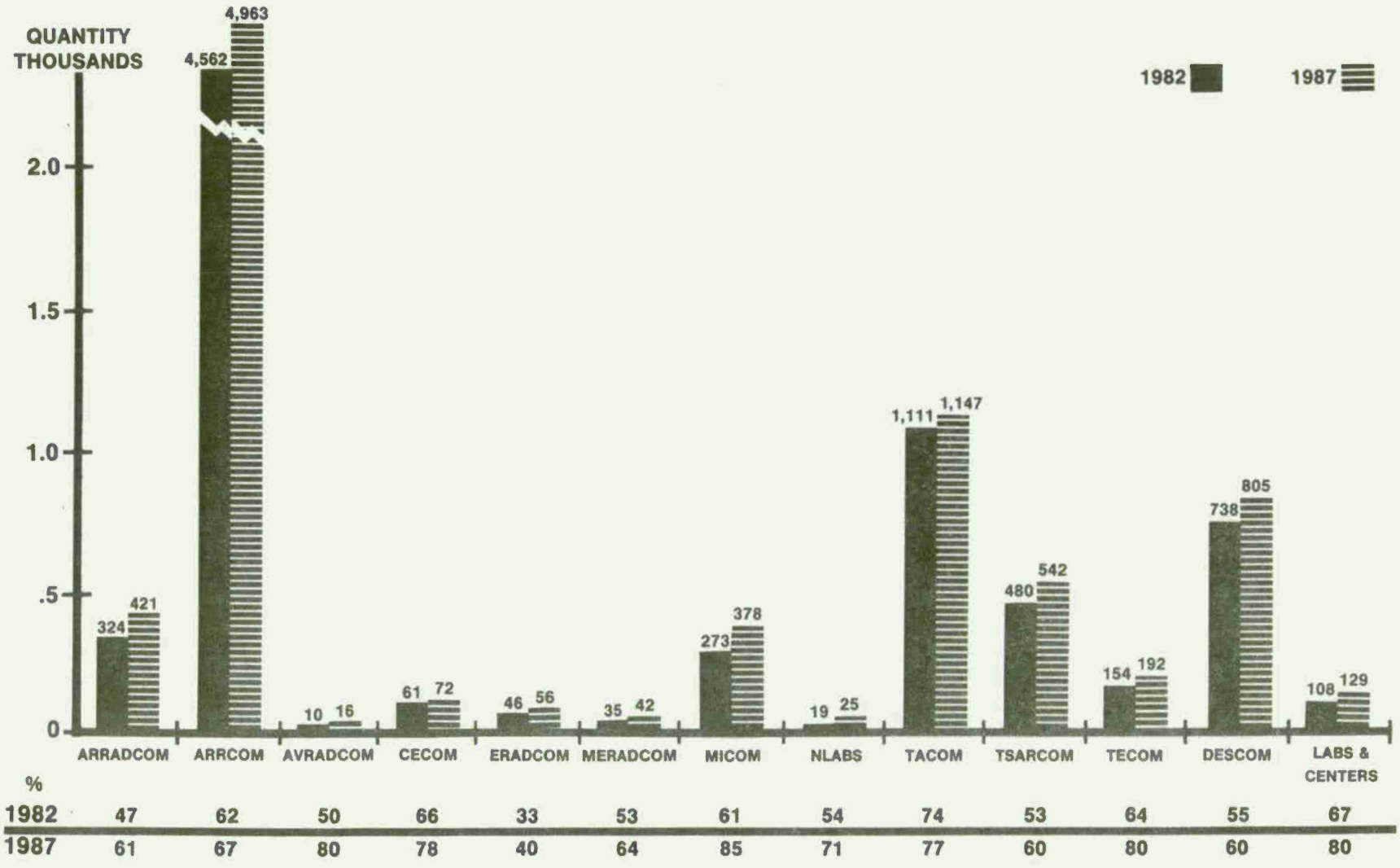


FIGURE III-6

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE
WELDING

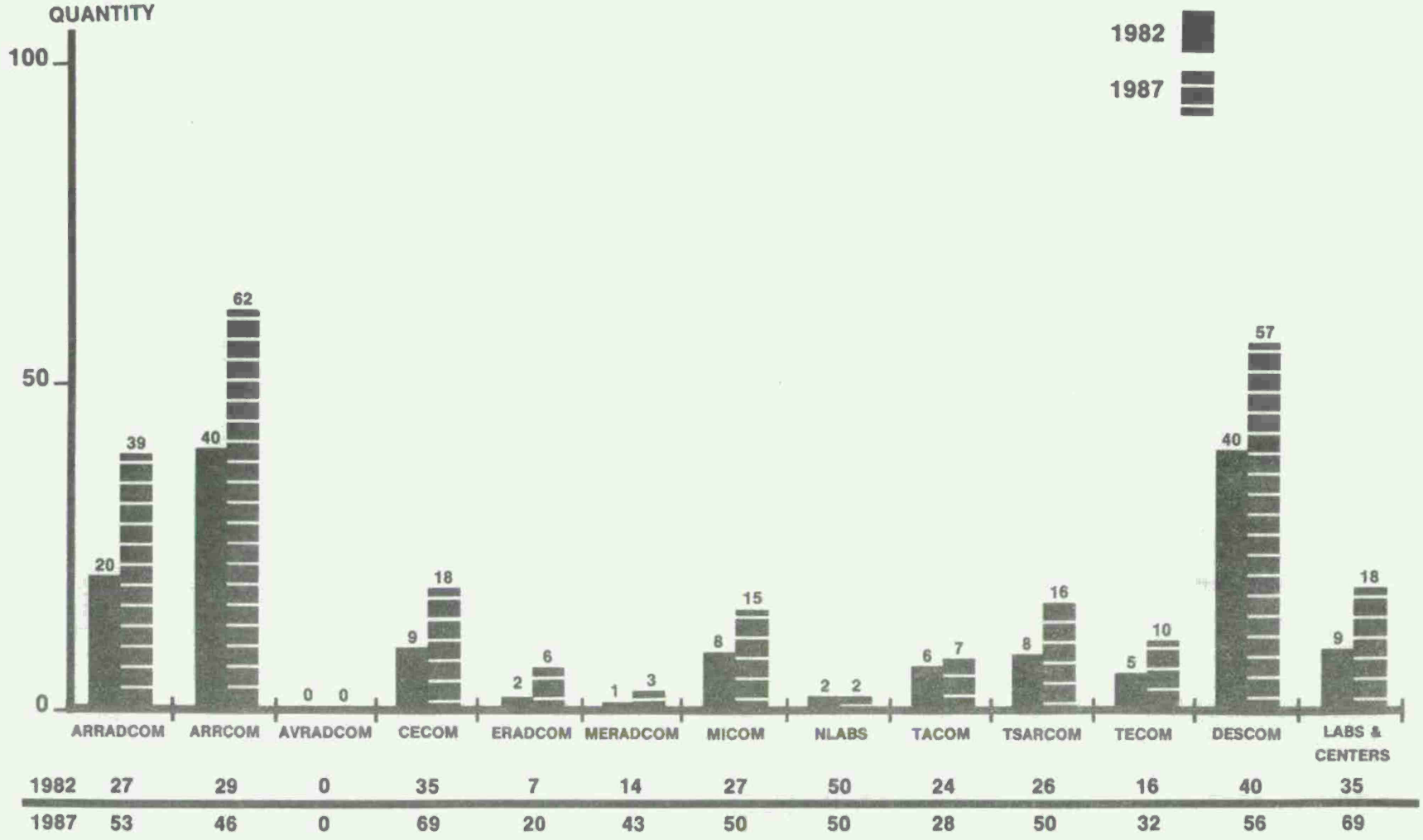


FIGURE III-7

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
METAL FORMING

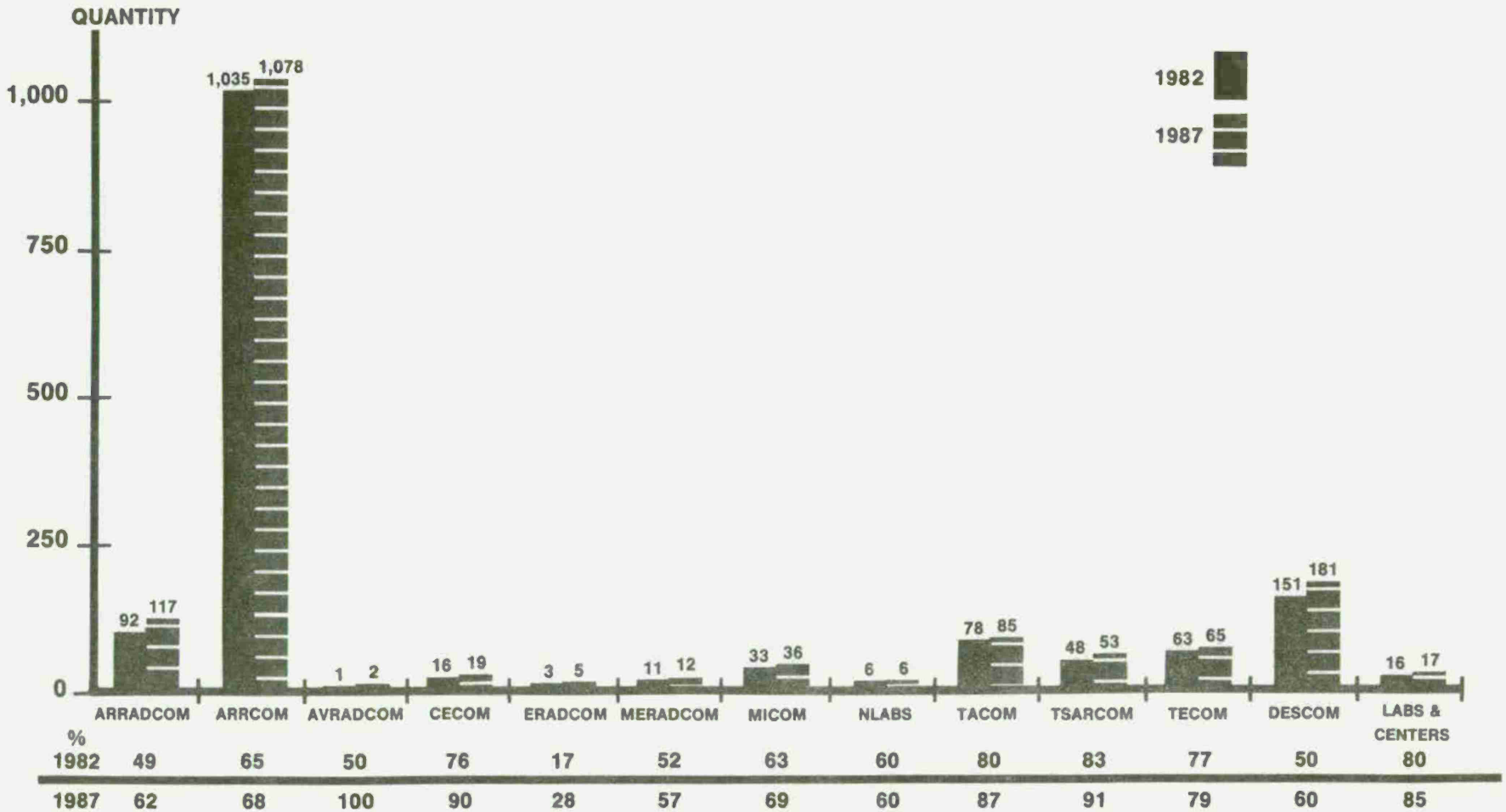


FIGURE III-8

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
HEAT TREAT & FURNACES

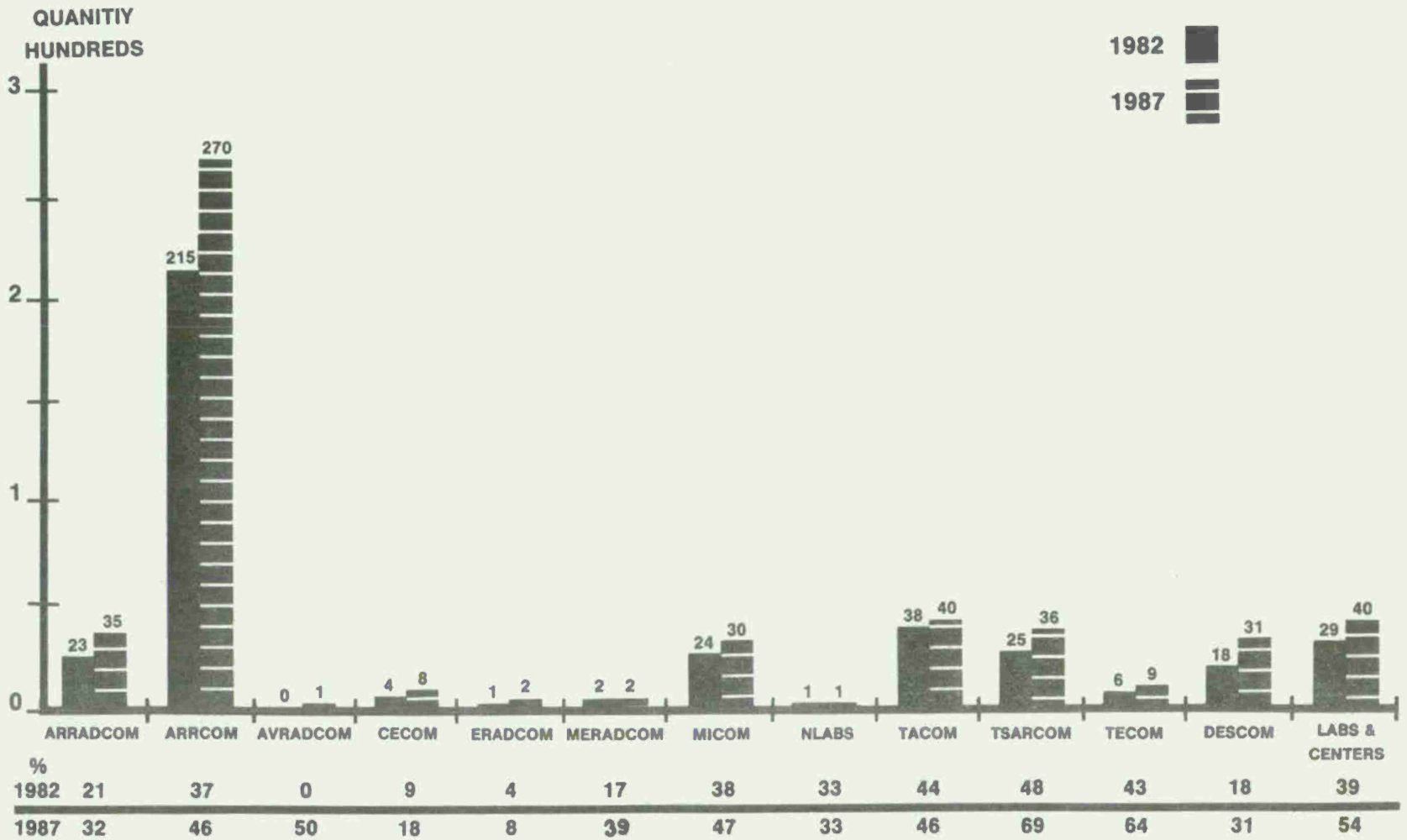


FIGURE III-9

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
MECHANICAL TEST & MEASURE

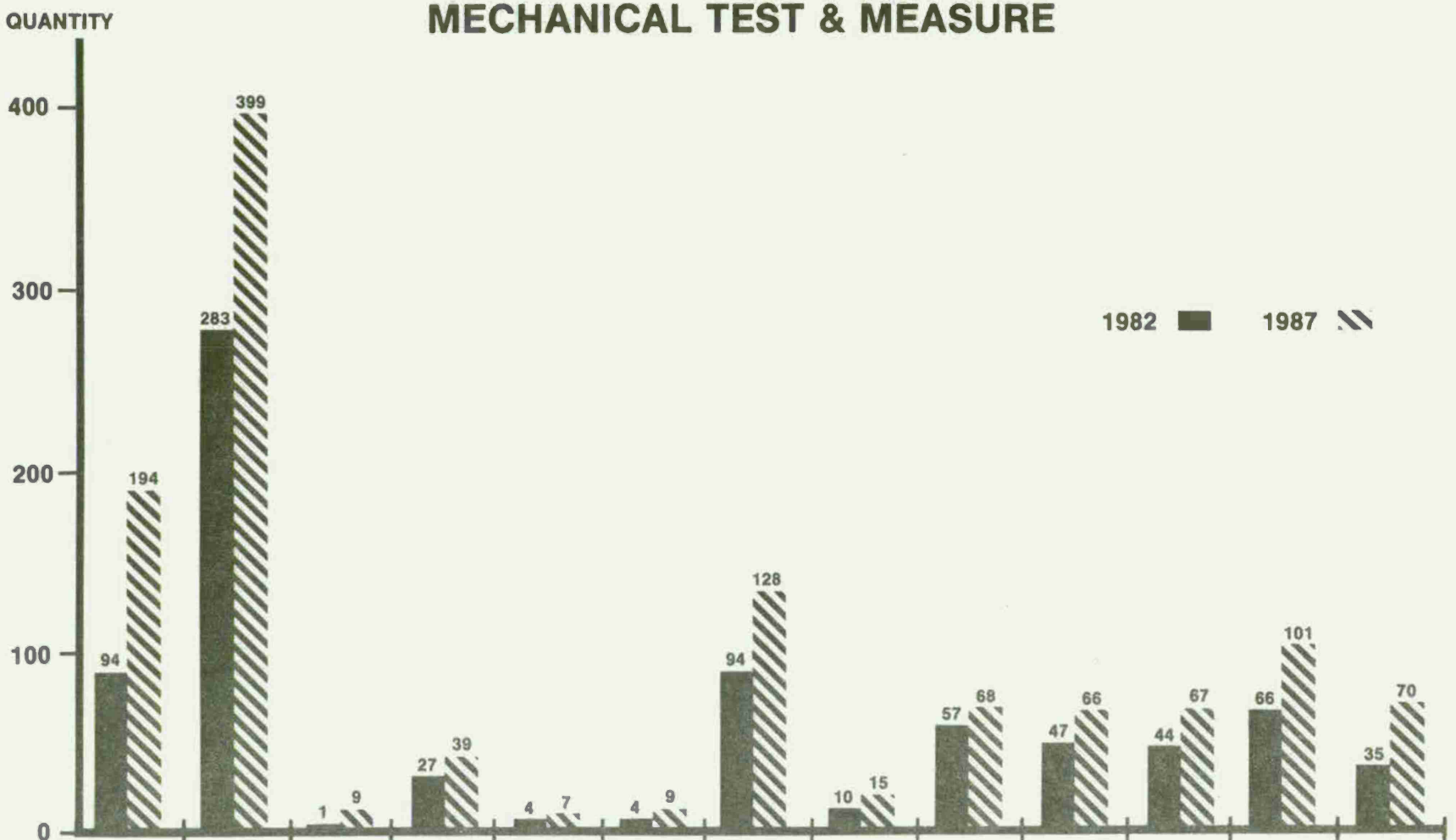


FIGURE III-10

INACTIVE EQUIPMENT

Age Distribution (Vintage). The age distribution for each of the four types of equipment is shown in the following figures:

Type	Figure	Page
METALCUTTING	III-11	3-14
WELDING	III-12	3-15
METALFORMING	III-13	3-16
HEAT TREAT AND FURNACES	III-14	3-17
ELECTRICAL TESTING AND MEASURING	Decontrolled	
MECHANICAL TESTING AND MEASURING	III-15	3-18

As might be expected, the inactive equipment being retained by DARCOM in plant equipment packages (PEP's) has a much older age profile than active equipment.

The bulk of the metalcutting equipment is over 20 years old, varying from 84 percent for TSARCOM to 99 percent for TACOM. However, ARRCOM controls much more of this equipment with TACOM a distant second. Significantly, 88 percent of ARRCOM's 7,975 items and 99 percent of TACOM's 1,911 items are over 20 years old.

ARRCOM has the most welding equipment, 126 items. TACOM is second with 13 items. Fifty-one percent of ARRCOM's items and 84 percent of TACOM's items are over 20 years old. TSARCOM's only item is over 20 years old.

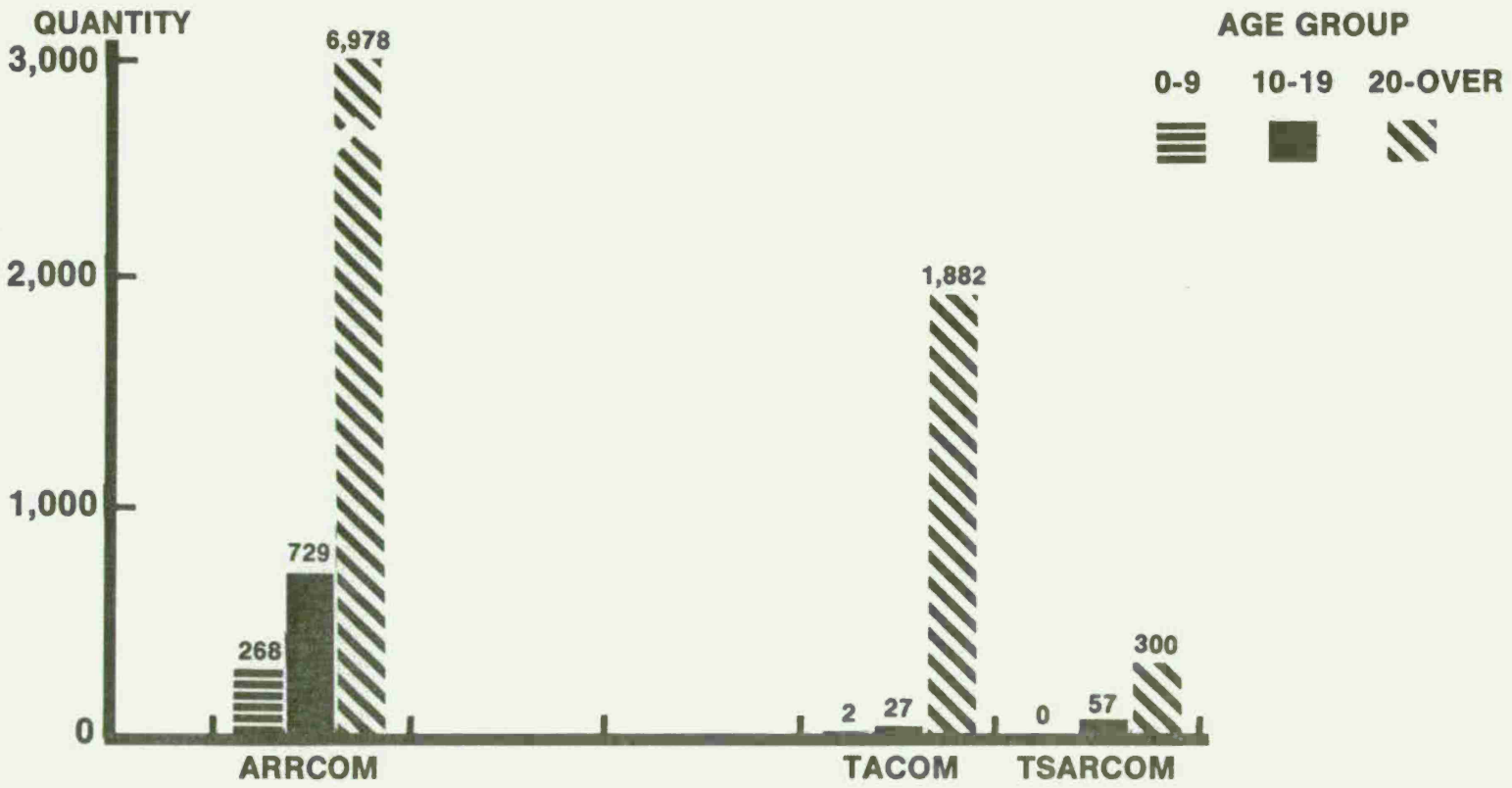
Metalforming equipment is predominantly over 20 years old. Eighty-nine percent of ARRCOM's items and 100 percent of TACOM's and TSARCOM's, items are over 20 years old. ARRCOM controls the bulk of this inactive equipment, 2,626 items, followed by TACOM with 29 items.

ARRCOM has by far the most heat treating equipment and furnaces, 503 items, or 67 percent over 20 years old. However, 93 percent of TACOM's 68 items are over 20 years old.

Electrical testing and measuring equipment has been decontrolled and is no longer included in this study.

ARRCOM has the bulk of the mechanical testing and measuring equipment that is being retained. Forty-five percent of that equipment, or 192 items, is over 20 years old. Ninety-five percent, 84 items, belonging to TACOM are over 20 years old. All four items controlled by TSARCOM are over 20 years old.

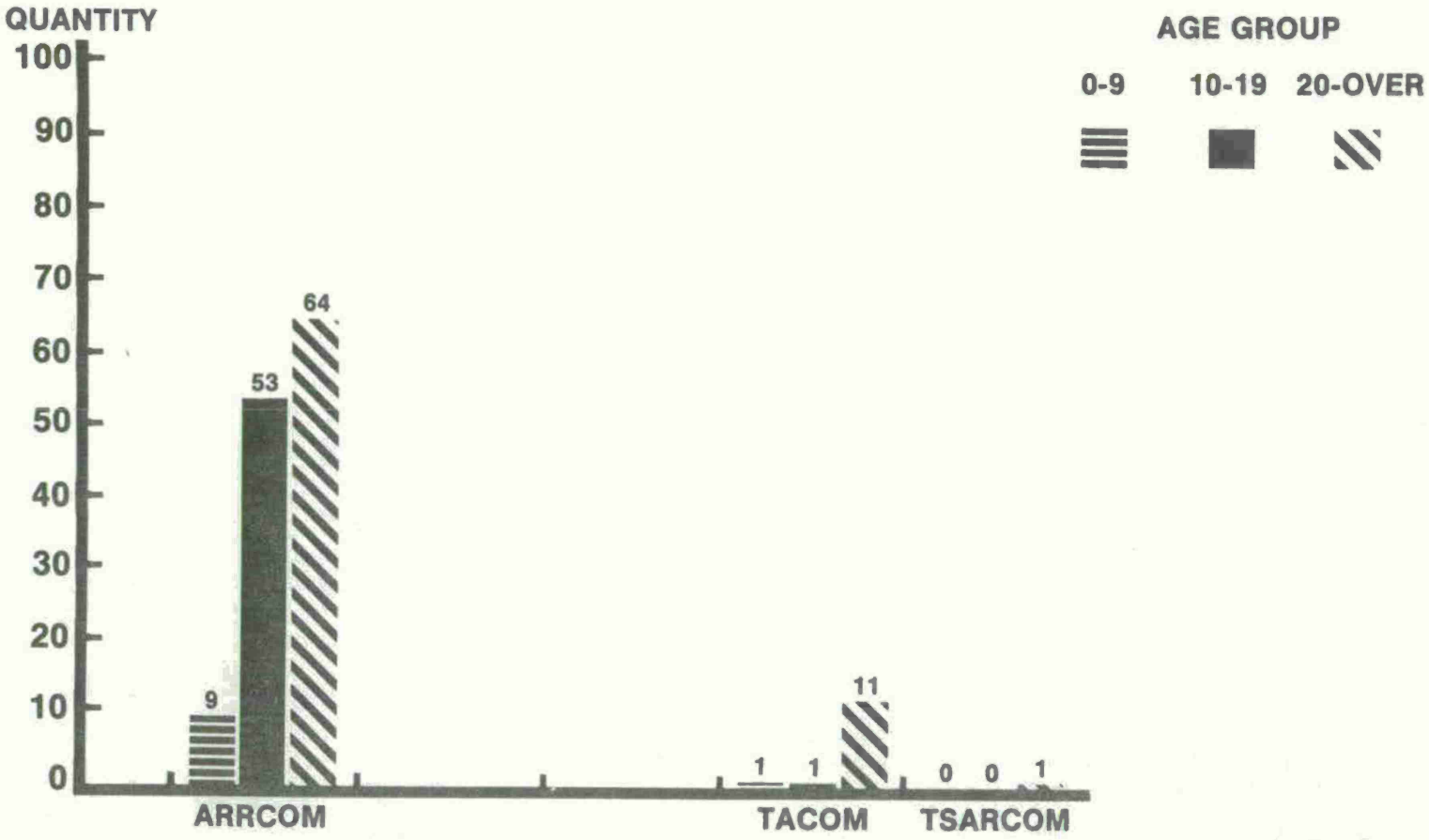
INACTIVE EQUIPMENT
VINTAGE
METAL CUTTING



PERCENT			
0-9 YRS	3	0	0
10-19	9	1	16
20-OVER	88	99	84

FIGURE III-11

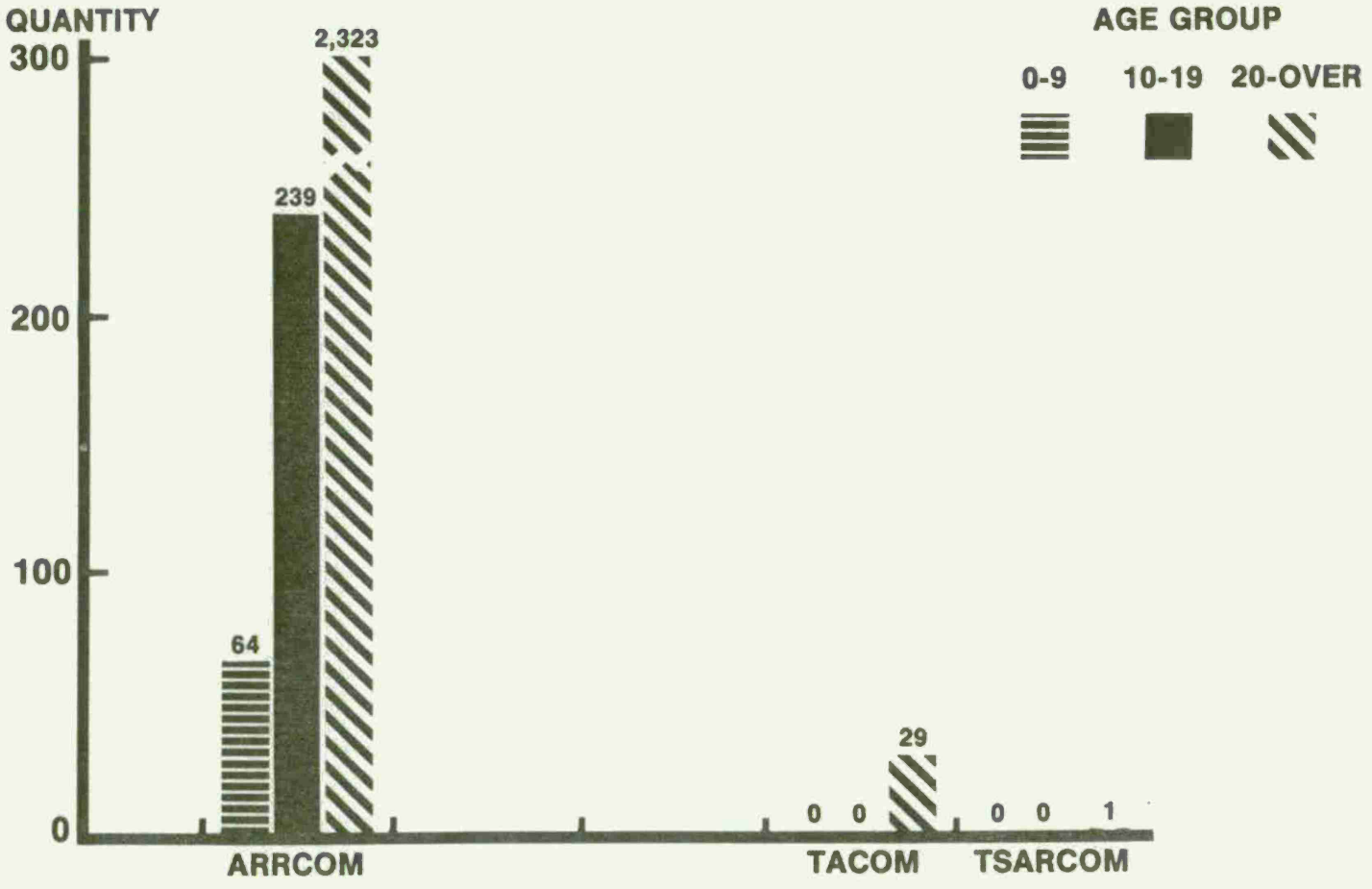
INACTIVE EQUIPMENT
VINTAGE
WELDING



PERCENT			
0-9 YRS	7	8	0
10-19	42	8	0
20-OVER	51	84	100

FIGURE III-12

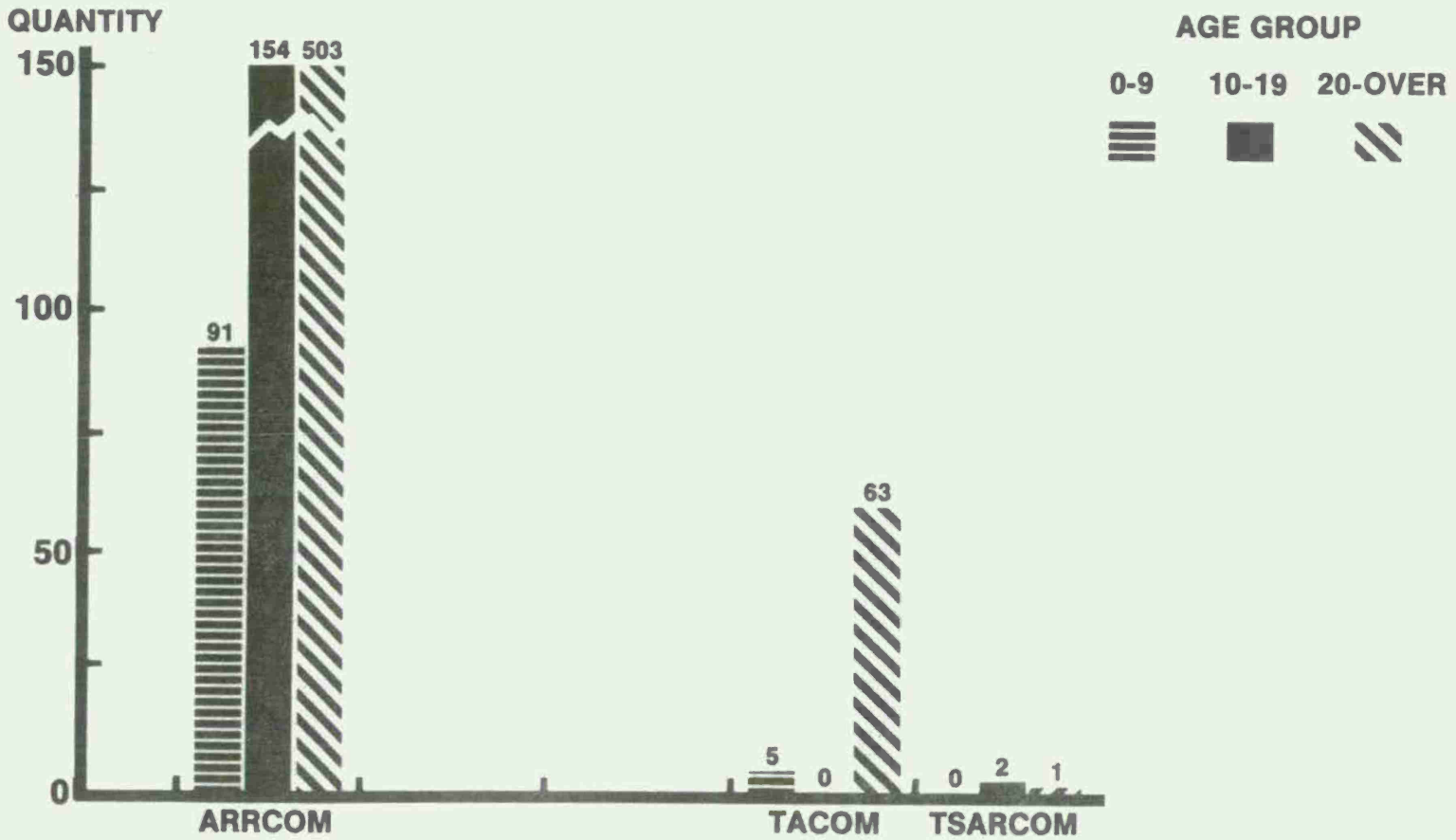
INACTIVE EQUIPMENT
VINTAGE
METAL FORMING



PERCENT			
0-9 YRS	2	0	0
10-19	9	0	0
20-OVER	89	100	100

FIGURE III-13

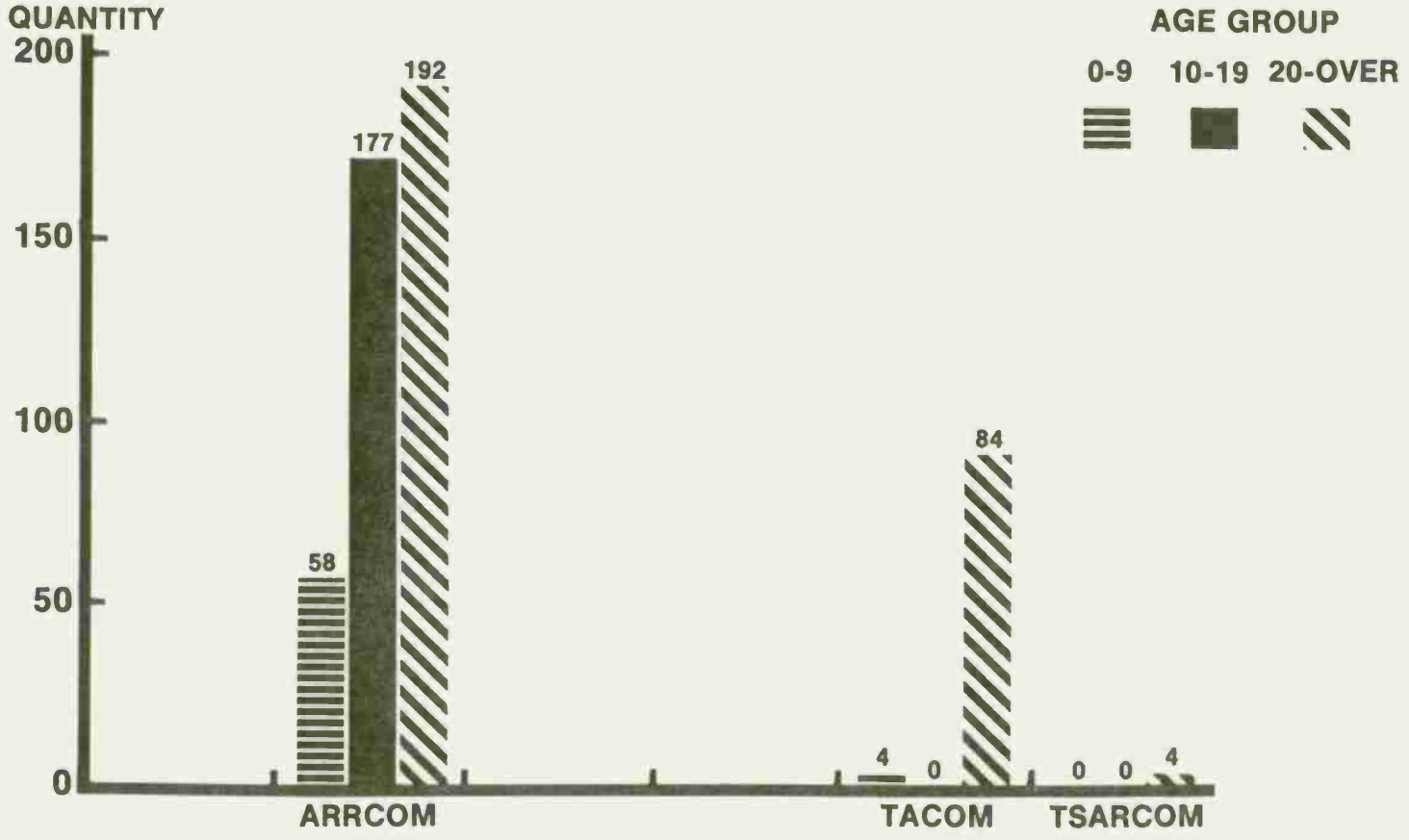
INACTIVE EQUIPMENT
VINTAGE
HEAT TREAT & FURNACES



PERCENT			
0-9 YRS	12	7	0
10-19	21	0	67
20-OVER	67	93	33

FIGURE III-14

INACTIVE EQUIPMENT
VINTAGE
MECHANICAL TEST & MEAS



PERCENT			
0-9 YRS	14	5	0
10-19	41	0	0
20-OVER	45	95	100

FIGURE III-15

Useful Service Life. The quantity and percent of each of the five types of equipment that exceed useful service life are shown in the following figures:

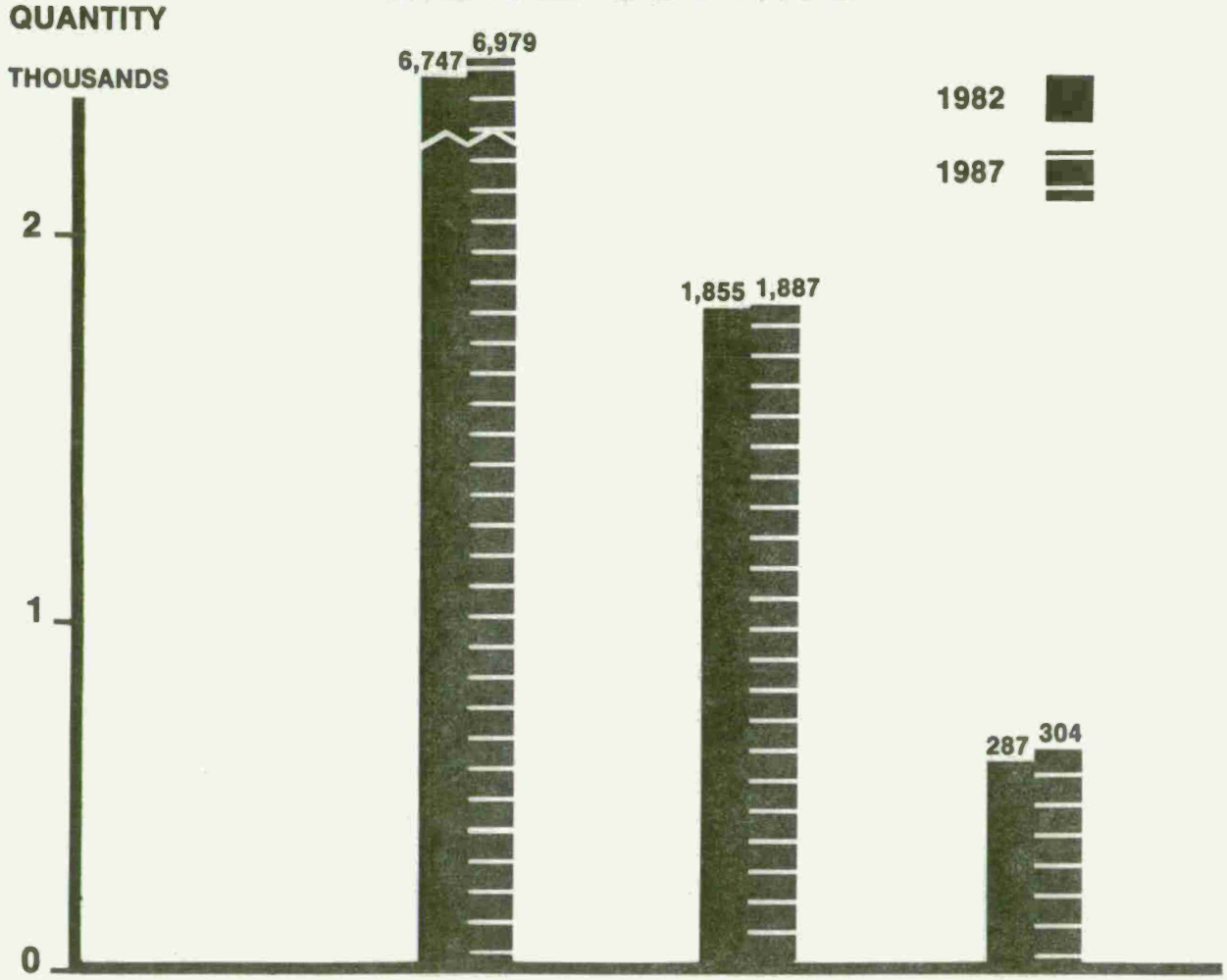
Type	Figure	Page
METALCUTTING	III-16	3-20
WELDING	III-17	3-21
METALFORMING	III-18	3-22
HEAT TREAT AND FURNACES	III-19	3-23
ELECTRICAL TESTING AND MEASURING	Decontrolled	
MECHANICAL TESTING AND MEASURING	III-20	3-24

Useful service life is heavily dependent on use which is not directly related to the age of inactive equipment. Therefore, a comparison of equipment age to useful service life for inactive equipment is of limited value.

ARRCOM and TACOM have almost all of the inactive equipment that exceeds useful service life.

A greater percentage of the equipment controlled by TACOM exceeds useful service life than that being retained by ARRCOM. However, ARRCOM has five times as much inactive equipment that exceeds its useful service life. TSARCOM has only small amounts of equipment that exceed useful service life compared to ARRCOM and TACOM.

INACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
METAL CUTTING



PERCENT	ARRCOM	TACOM	TSARCOM
1982	85	97	80
1987	88	99	85

FIGURE III-16

INACTIVE EQUIPMENT

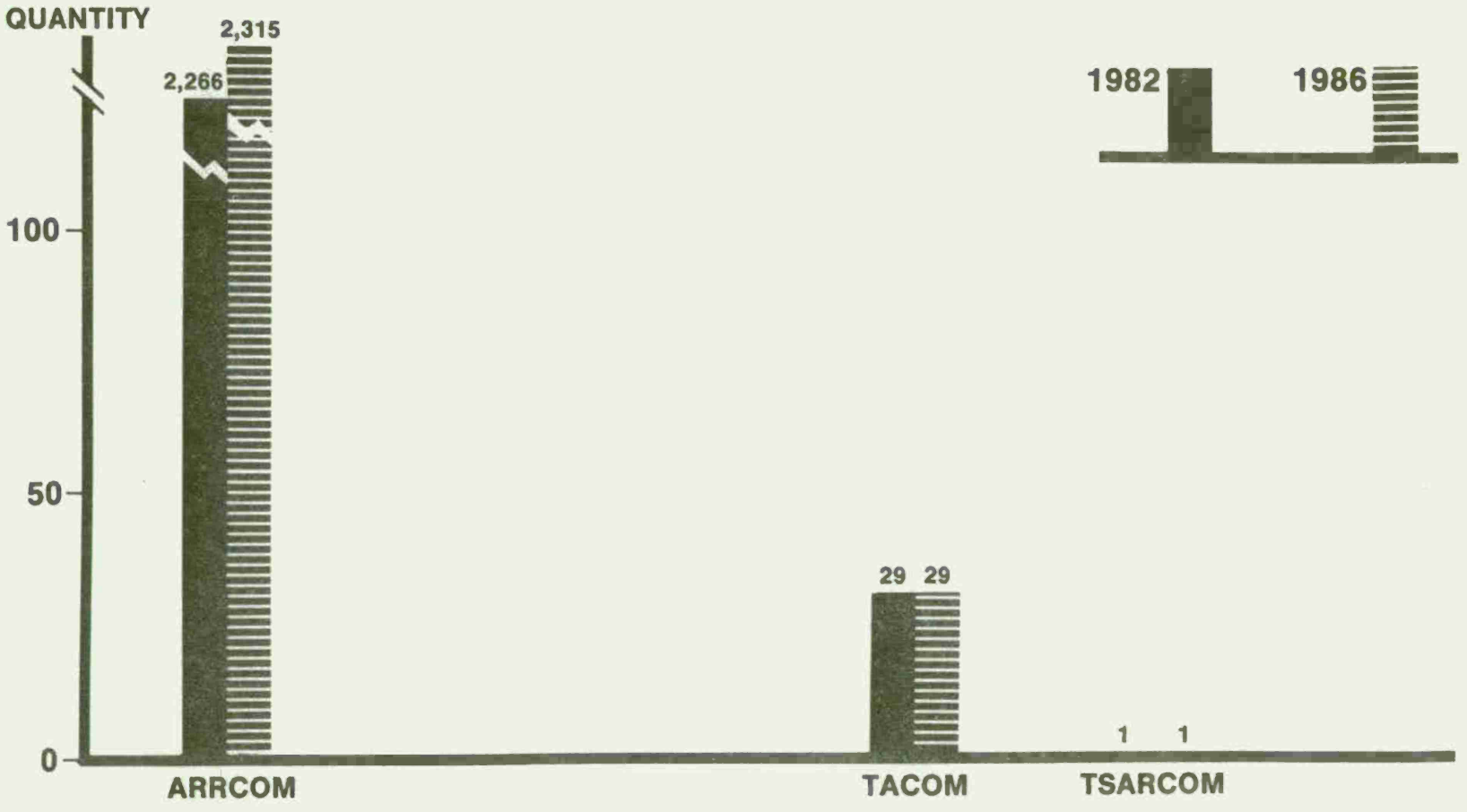
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE

WELDING

PERCENT	ARRCOM	TACOM	TSARCOM
1982	57	85	100
1987	80	85	100

FIGURE III-17

INACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
METAL FORMING



PERCENT

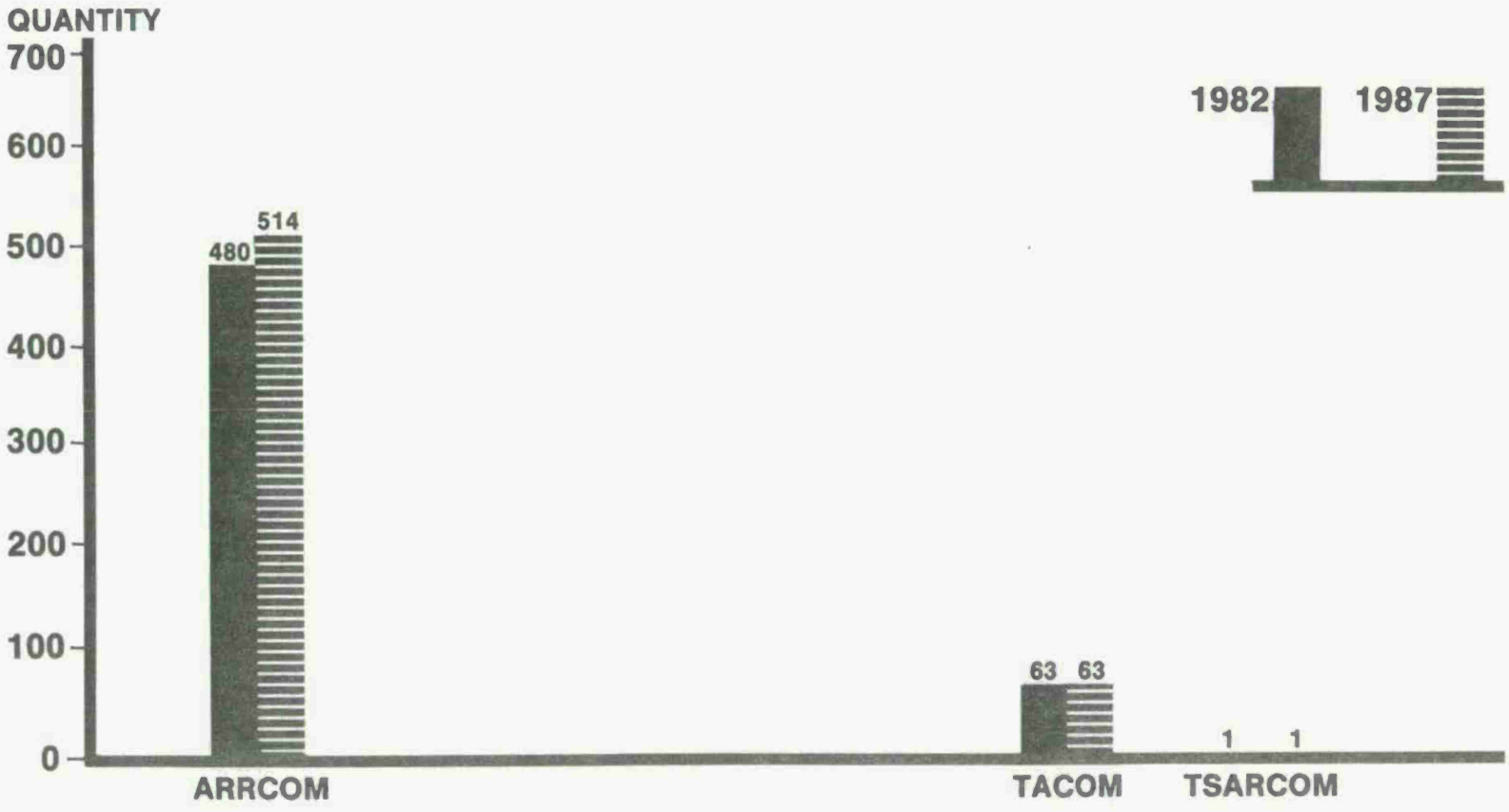
1982	86	100	100
1987	88	100	100

FIGURE III-18

INACTIVE EQUIPMENT

QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE

HEAT TREAT & FURNACES

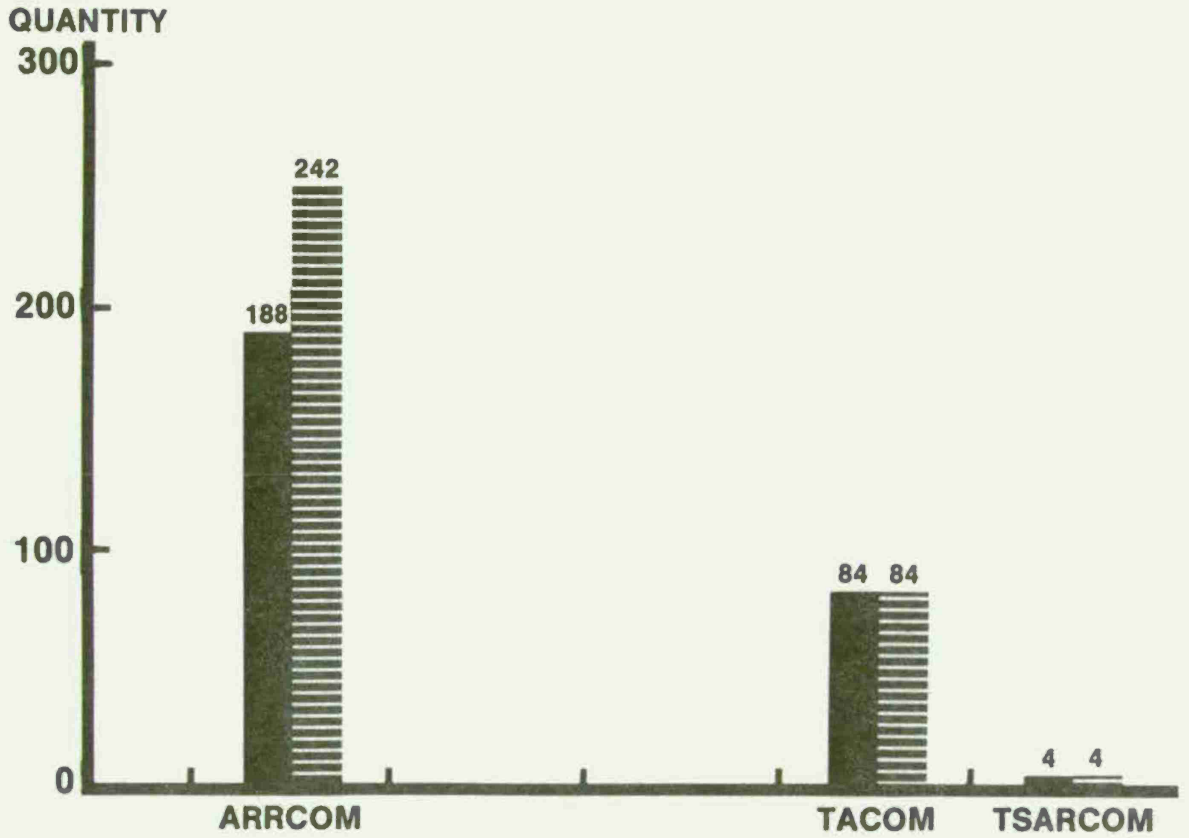


PERCENT

	ARRCOM	TACOM	TSARCOM
1982	64	93	33
1987	69	93	33

FIGURE III-19

INACTIVE EQUIPMENT
QUANTITY & PRECENT EXCEEDING USEFUL SERVICE LIFE
MECHANICAL TEST & MEASURE



PERCENT

1982	44	95	100
1987	57	95	100

FIGURE III-20

SECTION IV

NUMERICAL CONTROL (NC)

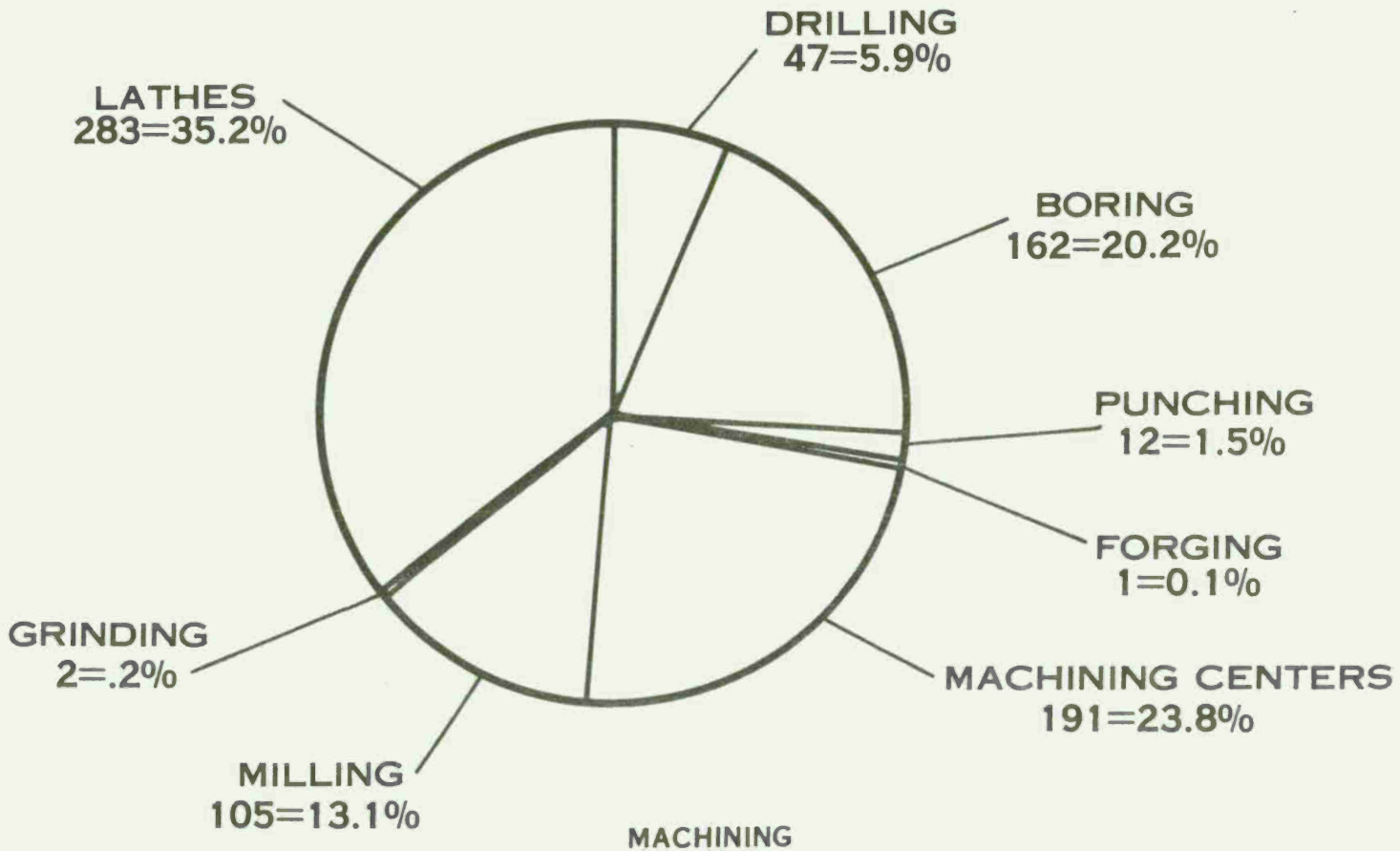
Numerical control (NC) is available in eight classes of metalworking equipment owned by the Army. These classes are: boring, drilling, lathes, milling, machining centers, punching, grinding, and forging. The Army inventory of this equipment is shown in Figure IV-1. Boring machines, lathes, and machining centers make up 79.2 percent of the inventory, or 636 items. Punching, grinding, and forging machines represent only 1.8 percent of the inventory, or 15 items.

Numerically controlled machines make a significant contribution to the production capacity of the industrial base and represent a sizeable investment. The Army numerical control inventory consists of 803 items with an acquisition cost of $190,567,103. All but one of these items are controlled by DARCOM. The distribution of the NC inventory is shown in Figure IV-2. Government-owned, Government-operated (GOGO) facilities are using 20 percent, or 164, of the items and have an additional 7 percent, or 54 items, subject to intermittent use, but required to remain in place in support of the current assigned mission. Government-owned, Contractor-operated (GOCO) facilities have 18 percent, or 144 items, and 25 percent, or 202 items, is provided to contractor-owned, contractor-operated facilities as Government furnished equipment, (GFE). The remaining 30 percent, or 239 items, is assigned to plant equipment packages (PEP's) for use in mobilization production. The significant increase in the number of PEP items resulted from additions to the inventory by ARRCOM.

The trend of the inventory of numerically controlled equipment is shown in Figure IV-3. An increasing trend characterizes the inventory, especially since 1978. The disproportionate increase in acquisition cost shown in 1978 is attributable to the addition of the rotary forge at Watervliet Arsenal at a cost of $6,749,185. The average cost of numerical control equipment has continued to increase at a rapid rate to $229,426.

The source of the data for numerical control equipment is the DIPEC SP-50 Report as of 28 Jan 83.

NUMERICAL CONTROL INVENTORY BY CLASS



	BORING (3411)	DRILLING (3413)	LATHES (3416)	MILLING (3417)	MACHINING CENTERS (3408)	PUNCHING (3445)	GRINDING (3415)	FORGING (3446)	TOTAL
ACTIVE	141	34	249	88	181	7	2	1	703
INACTIVE	12	6	17	8	3	0	0	0	46
INT. USE (3H)	9	7	17	9	7	5	0	0	54
TOTALS	162	47	283	105	191	12	2	1	803

FIGURE IV-I

NUMERICAL CONTROL INVENTORY QUANTITY AND USE

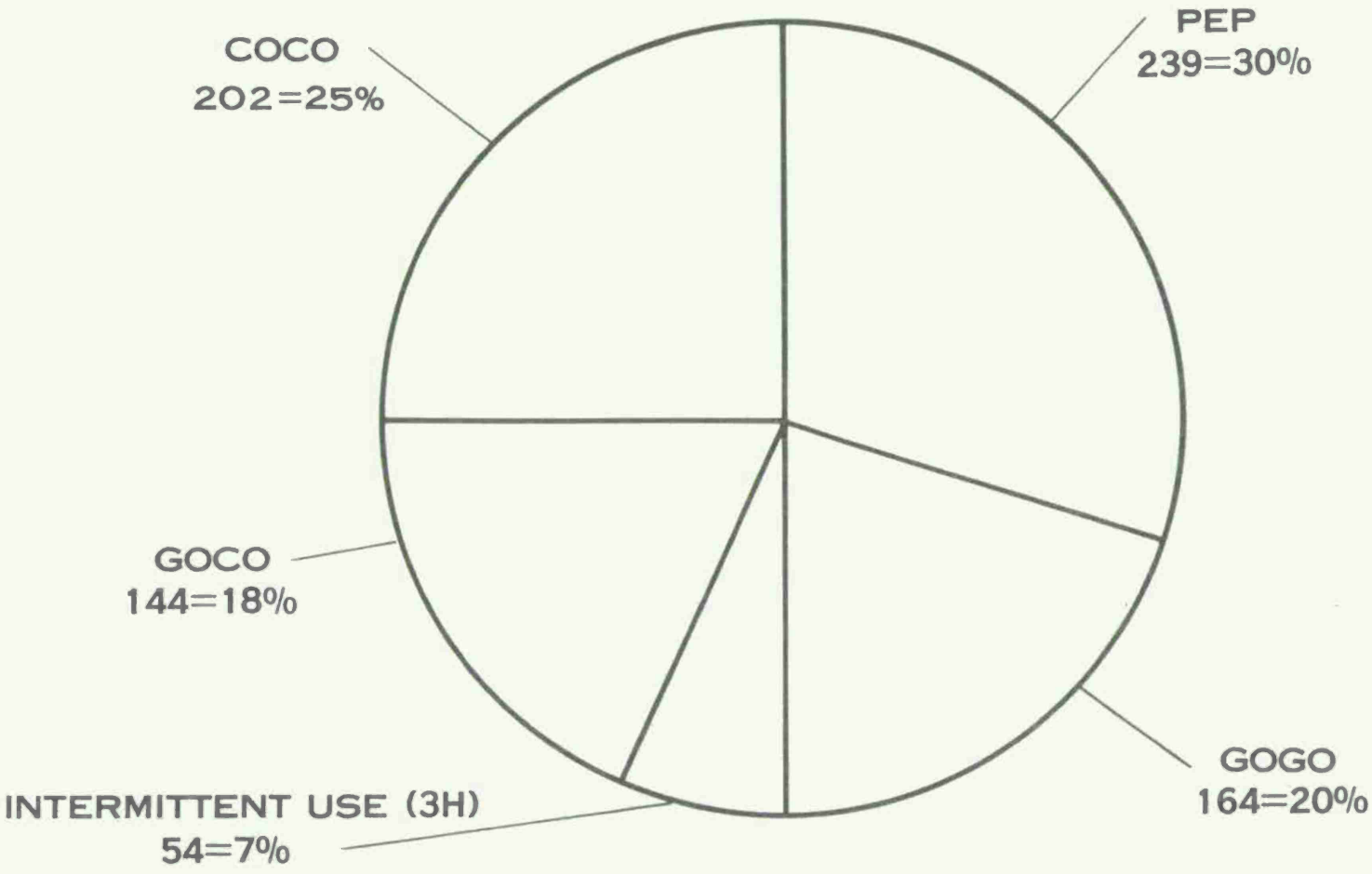
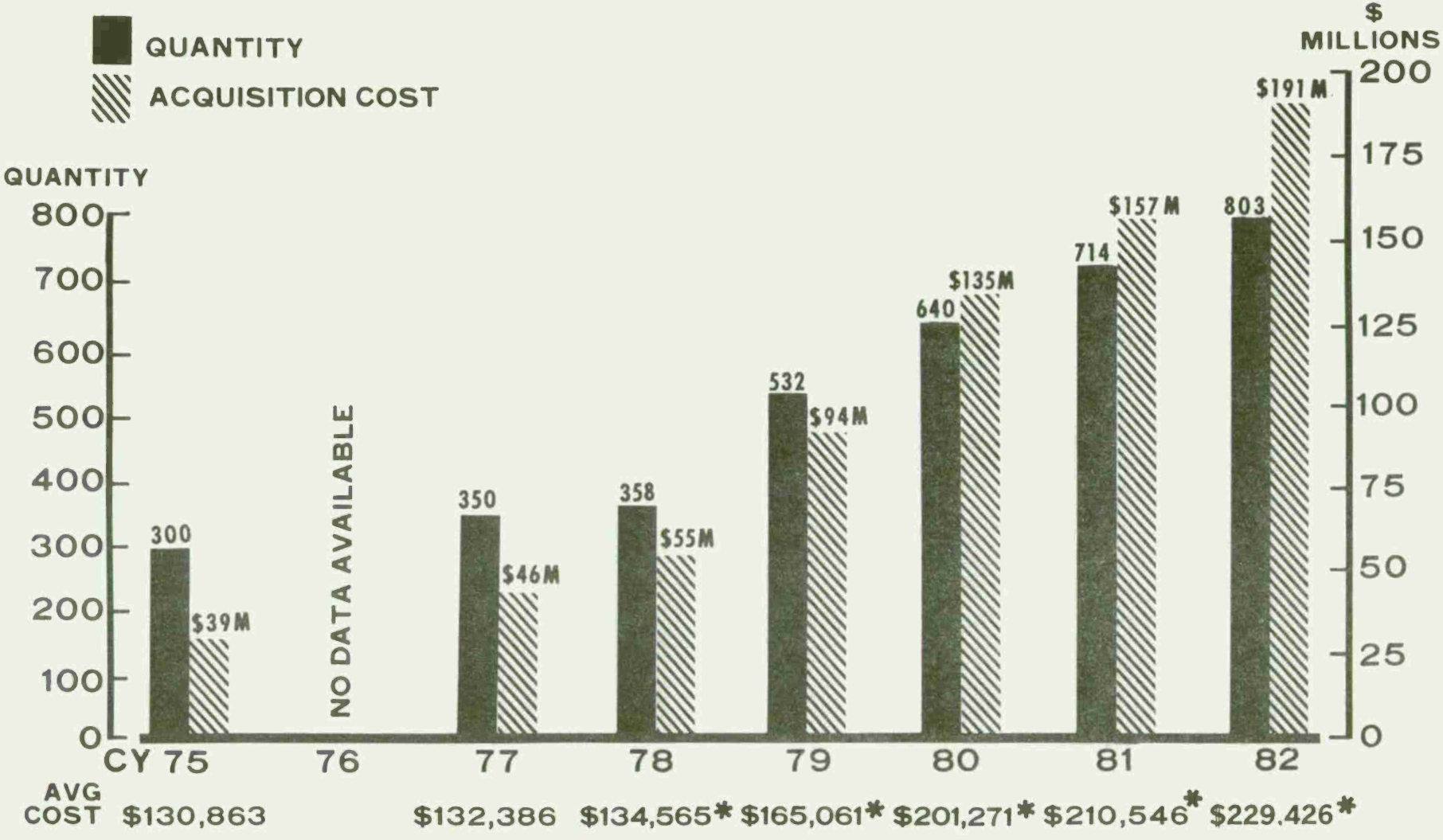


FIGURE IV-2

INVENTORY TRENDS
NUMERICAL CONTROL EQUIPMENT



NOTE: *AVERAGE COST DOES NOT INCLUDE THE ROTARY FORGE AT WATERVLIET ARSENAL WITH A COST OF $6,749,185.

FIGURE IV-3

APPENDIX A

Illustrations of Types of Industrial Plant Equipment (IPE)

with

Federal Supply Classes (FSC's)

APPENDIX A

Illustrations of Types of Industrial Plant Equipment (IPE)

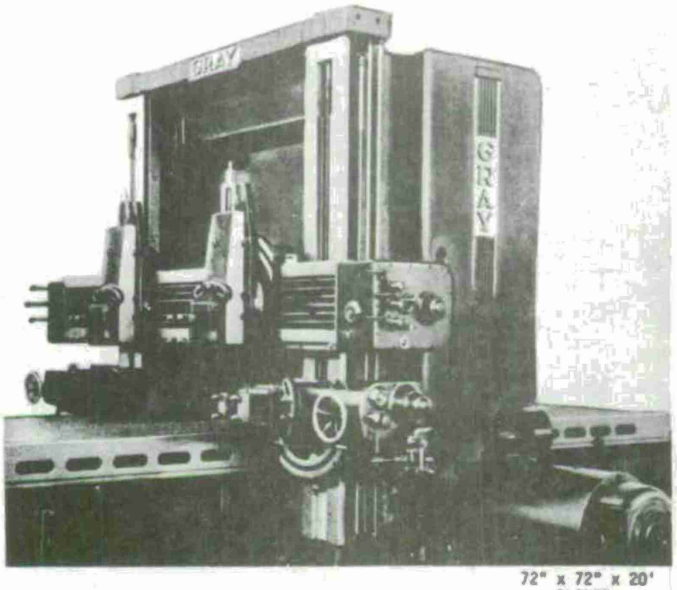
with

Federal Supply Classes (FSC)

METALCUTTING

FSC

3405	Saw and Filing Machines
3408	Machining Centers and Way Type Machines
3410	Electrical and Ultrasonic Erosion Machines
3411	Boring Machines
3412	Broaching Machines
3413	Drilling and Tapping Machines
3414	Gear Cutting and Finishing Machines
3415	Grinding Machines
3416	Lathes
3417	Milling Machines
3418	Planers and Shapers
3419	Miscellaneous Machine Tools



72" x 72" x 20'
PLANER

WELDING

FSC

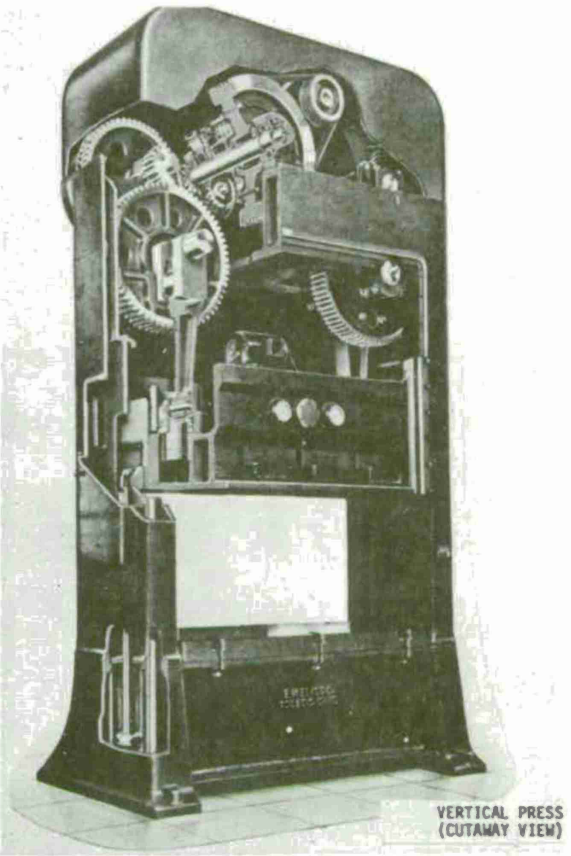
3431	Electric Arc Welding Equipment
3432	Electric Resistance Welding Equipment
3433	Gas Welding, Heat Cutting and Metalizing Equipment
3436	Welding Positioners and Manipulators
3438	Miscellaneous Welding Equipment

ENGINE DRIVEN
ARC WELDER

METAL FORMING

FSC

3422	Rolling Mills and Drawing Machines
3441	Bending and Forming Machines
3442	Hydraulic and Pneumatic Presses, Power Driven
3443	Mechanical Power Presses, Power Driven
3444	Manual Presses
3445	Punching and Shearing Machines
3446	Forging Machinery and Hammers
3447	Wire and Metal Ribbon Forming Machines
3448	Riveting Machines



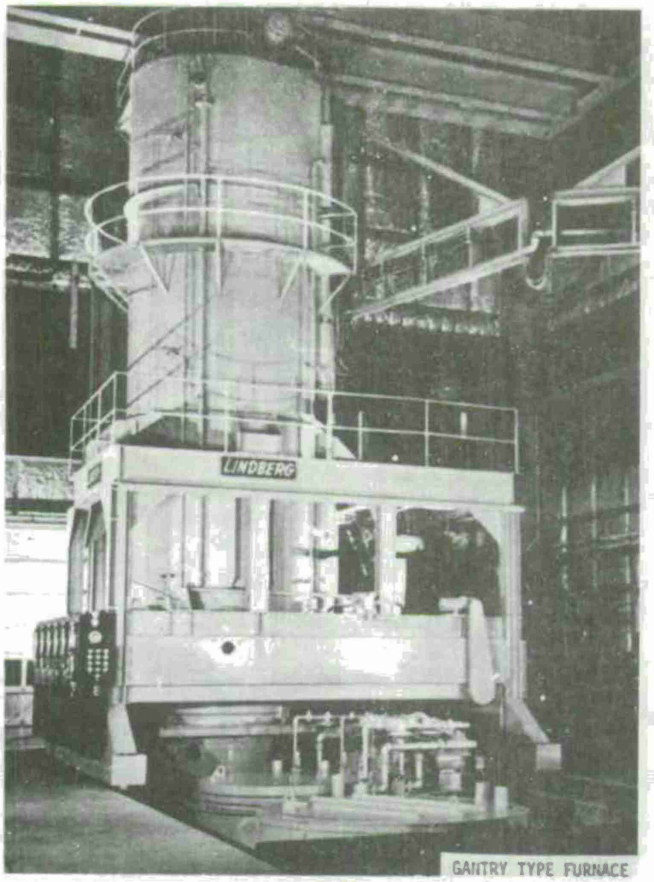
VERTICAL PRESS
(CUTAWAY VIEW)

HEAT TREAT AND FURNACES

FSC

3424 Metal Heat Treating and Nonthermal Treating Equipment

4430 Industrial Furnaces, Kilns, Lehrs, and Ovens

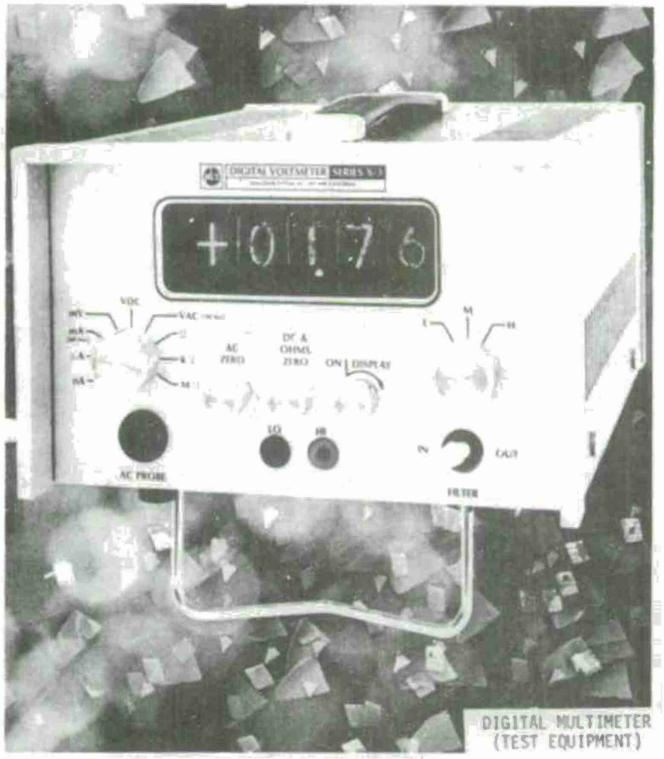


GANTRY TYPE FURNACE

ELECTRICAL TESTING AND MEASURING DEVICES

FSC

6625 Electrical and Electronic Properties Measuring and Testing Instruments

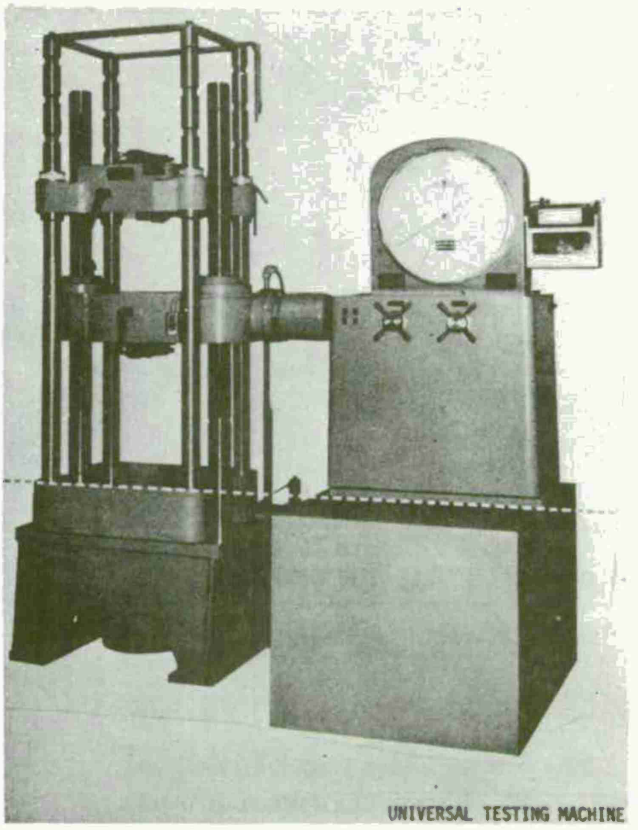


DIGITAL MULTIMETER (TEST EQUIPMENT)

MECHANICAL TESTING AND MEASURING DEVICES

FSC

6635 Physical Properties Testing Equipment



UNIVERSAL TESTING MACHINE