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MANUFACTURING METHODS AND TECHNOLOGY, CAM RELATED PROJECTS, FY --ETC(U)
AUG 80 J H SULLIVAN

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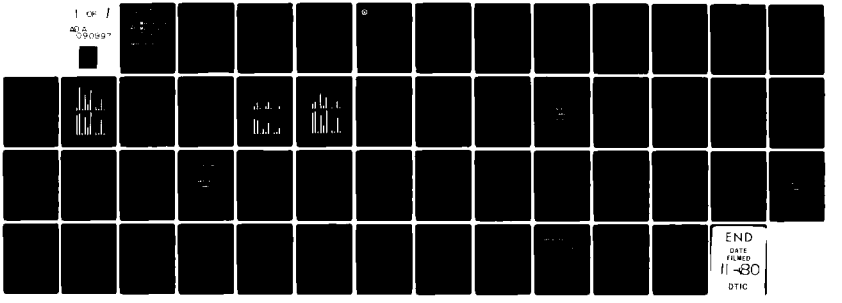

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U.S. ARMY
MATERIEL DEVELOPMENT AND READINESS COMMAND

(12) 43

LEVEL II

MANUFACTURING METHODS & TECHNOLOGY

CAM RELATED PROJECTS

FY 80-82

PREPARED BY
USA INDUSTRIAL BASE ENGINEERING ACTIVITY
MANUFACTURING TECHNOLOGY DIVISION
ROCK ISLAND, ILLINOIS 61299

AUGUST 1980

DISCLAIMER

- The data provided within this report is provided for planning and discussion purposes only and not as information usable in pricing or contracting for the work.
- The projects listed and the dollar amounts shown are subject to change without notice.

None

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides a summary of the Army's FY 80-82 Manufacturing Methods and Technology Program directed toward computer-aided manufacturing. The following information is provided for 73 projects. Project number, title, projected funding, a statement of the problem and proposed solution, and the technology thrust area into which the project is categorized. The current status of FY80 projects is also provided.

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None

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DEPARTMENT OF THE ARMY
US ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY
ROCK ISLAND, ILLINOIS 61299

DRXIB

28 August 1980

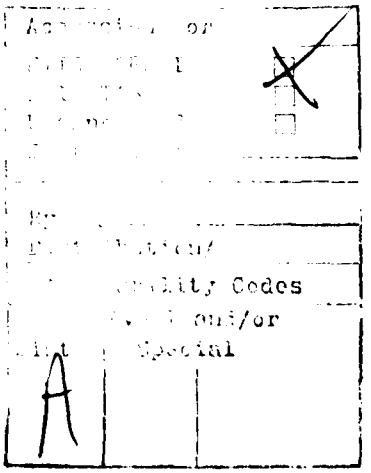
SUBJECT: CAM Related Projects

SEE DISTRIBUTION

1. Inclosed for your information is a listing of CAM Related (MMT) Projects. This publication provides a comprehensive picture of where US Army Materiel Development and Readiness Command plans to invest MMT funds on CAM technology. Lists and summaries of the individual CAM related projects submitted by various DARCOM organizations are provided.

2. Questions regarding the contents of this report should be directed to Mr. Jim Sullivan, US Army Industrial Base Engineering Activity, Rock Island Arsenal, IL 61299; AV 793-6172, Commercial (309) 794-6172.

J. R. GALLAUGHER
Director
Industrial Base Engineering Activity



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BY SUBORDINATE MAJOR SUBCOMMANDS

INTRODUCTION

This report contains a listing of the active FY80 and planned FY81-82 CAM related MMT projects. Data presented on each project includes the project number, title, projected funding, a statement of the problem and proposed solution, and the technology thrust area into which the project is coded. The current status of FY80 projects is also provided. Project information is presented in three sections, one for each fiscal year. Within each section, projects are grouped according to technology thrust areas. Descriptions of the technology thrust areas are included.

An analysis, summary, and an index relating projects to commands responsible for project execution are provided.

CAM TECHNOLOGY THRUST AREAS

To aid in analyzing MMT projects, each CAM related project is categorized into one of the following technology thrust areas. These thrust areas were originally identified in the Air Force's ICAM Program and were refined by the MTAG CAD/CAM Subcommittee.

Underlying the optimum benefits obtainable from utilizing CAM technology is the systems approach. Interrelationships between the various subsystems within an organization must be taken into consideration. These technology areas represent the "system" and direct thinking toward an integrated approach.

100 ARCHITECTURE

The purpose of the manufacturing architecture is to provide a clear understanding of the manufacturing environment and the interrelationships between subsystems that exist today. The manufacturing architecture, or framework, provides a common baseline in building integrated manufacturing systems.

200 FABRICATION

The fabrication technology area serves as a focus for all other technology area activities. Projects categorized into this area are directed toward increasing the productivity of manufacturing by systematically applying computer technology to all functions which directly and indirectly participate in fabricating parts.

300 DATA BASE/DATA AUTOMATION

Data base and data automation technology required to support integration of the many stages and disciplines of manufacturing.

400 CAD/CAM INTERACTION

The purpose of this technology thrust area is to establish subsystems and procedures which will integrate the efforts of product design and manufacturing. The underlying concept is that of a common data base between engineering and manufacturing and the application of computer graphics.

500 PLANNING AND GROUP TECHNOLOGY

Technology directed at optimizing process planning, production scheduling and control, factory layout and other tasks normally performed by indirect personnel that have a significant impact on manufacturing cost.

600 MANUFACTURING CONTROL

Generic technology for producing management oriented information tools for scheduling, monitoring and controlling operations within the manufacturing environment. Closely related to the fabrication and planning and group technology areas.

700 ASSEMBLY

The integration of computer aided technology into assembly operations.

800 SIMULATION, MODELING AND OPERATIONS RESEARCH

Soft technology for optimizing manufacturing systems through the application of operations research techniques.

900 MATERIALS HANDLING AND STORAGE

The integration of computer aided technology to aid in material handling. Objectives here include complying with OSHA and EPA standards and reducing costs and materials handling time through automated material storage, handling, and retrieval systems.

1000 TEST, INSPECTION AND EVALUATION

Develop and transition real time, computerized, nondestructive testing techniques for use in fabrication and assembly operations. Emphasis is put on automatic, in-process inspection and decision making without human intervention.

1100 CONTINUOUS FLOW PROCESSES

This technology area addresses the range of manufacturing processes that, for the most part, are continuous with minimum human interaction.

ANALYSIS

• Seventy-three CAM related Manufacturing Methods and Technology (MMT) projects are planned in this publication. The proposed funding and relative percent of the yearly MMT programs are:

CAM Related Projects		Percent of Program
FY 80	$ 5.5 Million	8.5
FY 81	$12.7 Million	18.2
FY 82	$11.4 Million	10.2

• The projects are coded into one of eleven technology thrust areas. The thrust areas where planning is concentrated are:

	($ Millions)			
Technology Thrust Area	FY 80	FY 81	FY 82	Total
Architecture	.7	3.5	1.0	5.2
Fabrication	1.5	3.3	1.4	6.2
CAD/CAM Interaction	.2	1.2	3.3	4.7
Manufacturing Control	1.8	2.4	2.5	6.7

The charts provided on page 8 depict a comparison between this year's plan (FY80-82) and the plan prepared a year ago for FY79-81. A significant increase in Architecture is noted and can be explained by the introduction of DOD's Electronics Computer Aided Manufacturing (ECAM) program.

• The DARCOM Subordinate Major Commands that have proposed the largest CAM programs for the three years combined are:

MICOM	$10.6 Million
TARADCOM	$ 6.5 Million
ARRADCOM/ARRCOM	$ 6.1 Million
CORADCOM	$ 2.3 Million
ERADCOM	$ 2.2 Million
AVRADCOM	$ 1.8 Million

TECHNOLOGY THRUST AREAS

ANALYSIS OF PREVIOUS PLANNING

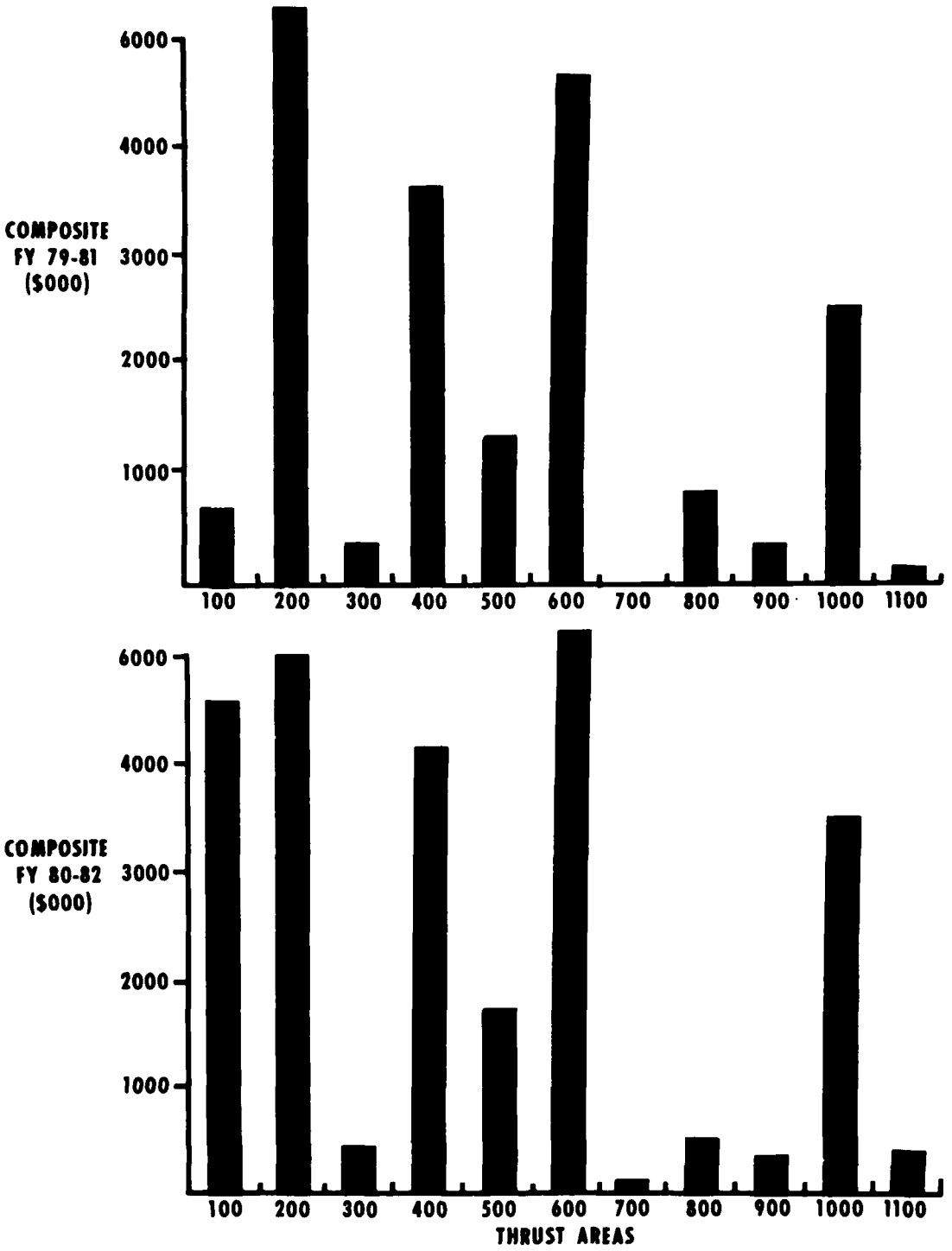

Chart 1: Comparison of distribution of funds across thrust areas, FY 79-81 vs FY 80-82.

SUMMARY

The tables and charts provided on the following six pages provide information relative to the distribution of funds across the CAM technology thrust areas. The first table provides a composite of planned funding. This information is then presented on bar charts. The following three tables identify the projected funding for each individual MMT project and the thrust area associated with the project.

TECHNOLOGY THRUST AREAS
SUMMARY

FISCAL YEAR	THRUST AREA ($000)											
	100	200	300	400	500	600	700	800	900	1000	1100	Total
80	715	1507	100	20	698	1807	113	-	-	542	-	5502
81	3500	3267	85	1125	474	2440	-	237	287	1332	-	12,747
82	1000	1430	205	3340	600	2543	-	286	-	1642	350	11,396
Total	5215	6204	390	4485	1772	6790	113	523	287	3516	350	29,645

This matrix provides a summary of the dollar values of CAM related projects relative to the technology thrust areas listed. The above data is depicted in bar charts on the following two pages.

TECHNOLOGY THRUST AREAS
SUMMARY (CONT)

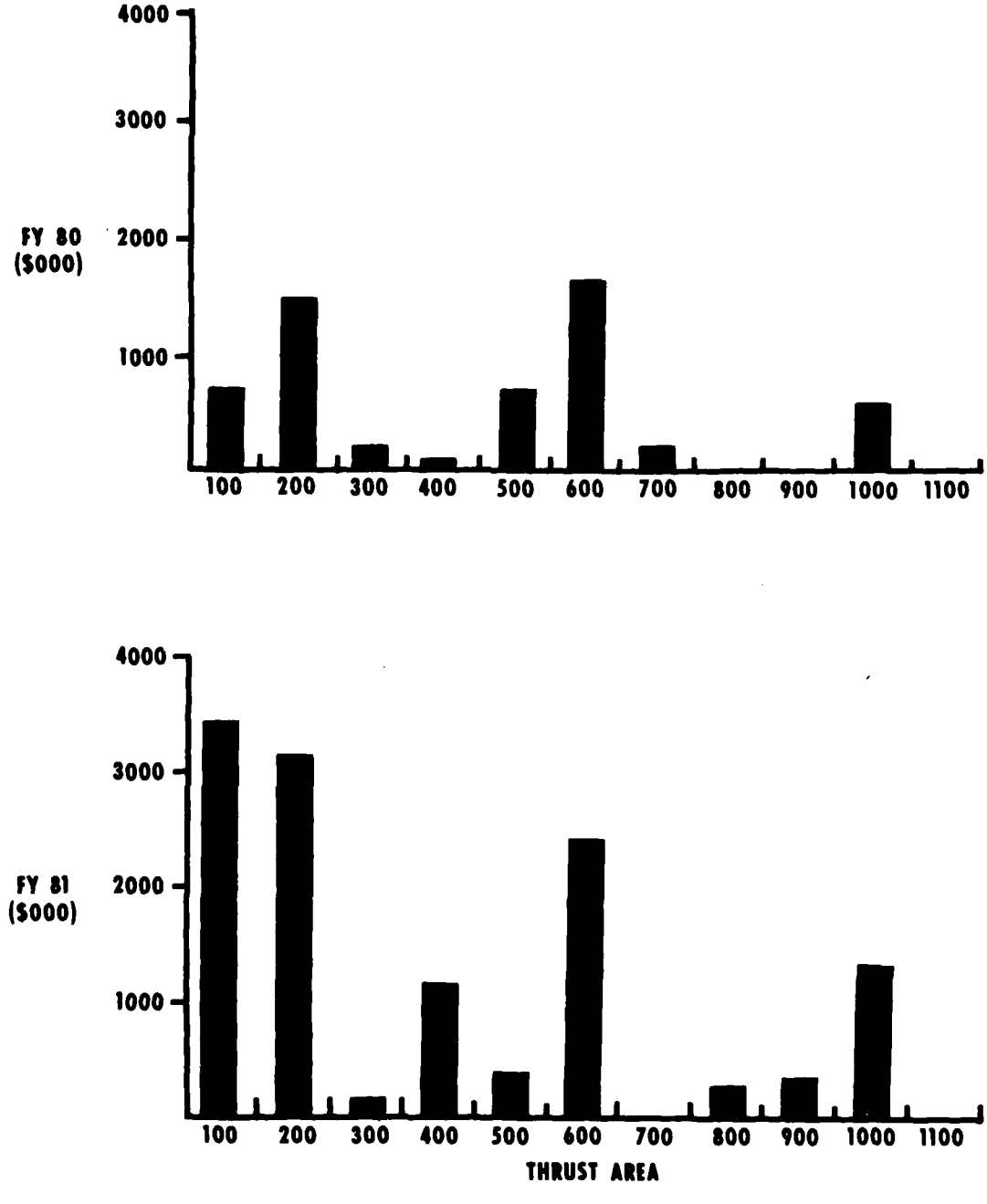

Chart 2: Distribution of funds across thrust areas.

TECHNOLOGY THRUST AREAS
SUMMARY (CONT)

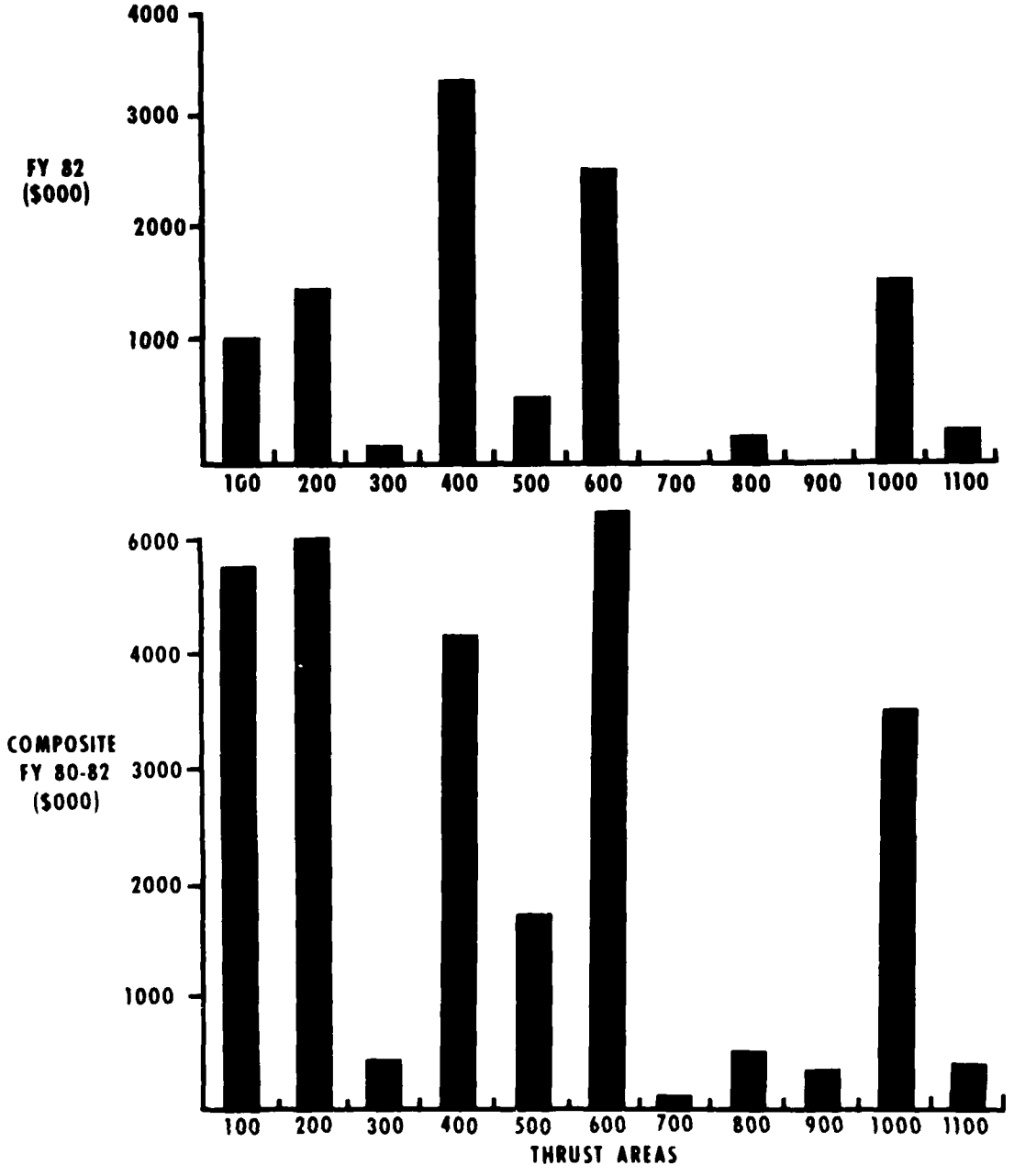

Chart 2 (cont.): Distribution of funds across thrust areas.

TECHNOLOGY THRUST AREAS
PROJECT LISTING
FY 80 PROJECTS

PROJECT	THRUST AREA ($000)										
	100	200	300	400	500	600	700	800	900	1000	1100
F 80 3036				20							
G 80 0001		92									
H 80 3010						892					
R 80 1018 R 80 1021 R 80 1071 R 80 1075 R 80 3169 R 80 3445	100 300	380			240	400				90	
T 80 5082		880									
1 80 7371 1 80 7183		155								100	
5 80 3961 5 80 4322 5 80 6736	315					515				352	
6 80 7928 6 80 7949 6 80 7963 6 80 8051			100		155 303		113				
Total	715	1507	100	20	698	1807	113	-	-	542	-

This chart provides a listing of all the CAM related FY 80 projects. The dollar value of the project is provided in the appropriate thrust area column. Similar charts for FY 80 and FY 81 follow.

TECHNOLOGY THRUST AREAS
PROJECT LISTING (CONT)
FY 81 PROJECTS

PROJECT	THRUST AREA ($000)										
	100	200	300	400	500	600	700	800	900	1000	1100
F 81 3005				125							
F 81 3036				1000							
H 81 5006		768									
H 81 9845		518									
T 81 5082		880									
T 81 5086		255									
T 81 5091		420									
T 81 6053						350					
1 81 7371										357	
1 81 7183		300									
3 81 1021					250						
3 81 1060										375	
3 81 1071	1000										
3 81 1073										200	
3 81 1075	2500										
3 81 1076										400	
3 81 3281						250					
3 81 3445						625					
5 81 6716								157			
6 81 7724					224						
6 81 7807		126									
6 81 7928									287		
6 81 8051			85								
6 81 8120						225					
6 81 8135						653					
6 81 8136								80			
6 81 8154						337					
Total	3500	3267	85	1125	474	2440	-	237	287	1332	-

TECHNOLOGY THRUST AREAS

PROJECT LISTING (CONT)

FY 82 PROJECTS

PROJECT	THRUST AREA ($000)										
	100	200	300	400	500	600	700	800	900	1000	1100
F 82 3036				1000							
F 82 3069										120	
Q 82 8073										218	
T 82 5005				300							
T 82 5024				640							
T 82 5082		750									
T 82 5091		180									
T 82 6008		250									
T 82 6030					300						
T 82 6041						500					
T 82 6053						500					
T 82 6057-12					300						
1 82 7345						200					
1 82 7371										654	
3 82 1072				1200							
3 82 1075	1000										
3 82 1076										400	
3 82 1079						350					
3 82 1092										250	
3 82 1095		250									
5 82 4237											350
6 82 7707						133					
6 82 8135						557					
6 82 8226			205								
6 82 8231				200							
6 82 8241						303					
6 82 8244								286			
Total	1000	1430	205	3340	600	2543	-	286	-	1642	350

FISCAL YEAR

80

CAM RELATED

MM&T

PROJECTS

PROJ NUMBER	TITLE	PROJ COST
R 80 1071	HYBRID INTEGRATED CAD AND MANUFACTURING (HICADAM)	100

PROBLEM	SOLUTION	TECHNOLOGY AREA
HYBRID CIRCUIT DESIGN AND MANUFACTURE IS LABOR INTENSIVE. THE CAD DATA BASE HAS NOT BEEN EXTENDED TO MANUFACTURING PROCESS CONTROL.	ANALYZE FUNCTIONAL FLOW AND MANUFACTURING PROCESS CONTROLS AND MODIFY THE DESIGN DATA BASE TO MAKE IT CAPABLE OF DEFINING FUNCTIONS, INPUT, OUTPUT, CONTROLS AND INTERFACES. USE ICAM METHODOLOGY TO DEVELOP SYSTEM ARCHITECTURE.	ARCHITECTURE

WORK STATUS

PROCUREMENT PACKAGE IS 75% COMPLETE. A CONTRACTOR WILL ESTABLISH AUTOMATED PROCEDURES FOR DESIGNING, LAYING OUT, AND BUILDING HYBRID CIRCUITS. WILL USE IPAD AND ICAM METHODS AND TIE IN WITH CURRENT HYBRID PROJECTS.

PROJ NUMBER	TITLE	PROJ COST
R 80 1075	ELECTRONICS COMPUTER AIDED MANUFACTURING (ECAM)	300

PROBLEM	SOLUTION	TECHNOLOGY AREA
ALTHOUGH INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS AND CABLES ARE DESIGNED ON A COMPUTER, THERE IS LITTLE COMPUTERIZED CONTROL OF PROCESSES USED TO PRODUCE THESE ITEMS. A MASTER PLAN IS NEEDED TO DEFINE THE AREA AND REQUIREMENTS.	DEVELOP A DOD MASTER PLAN FOR COMPUTER-AIDED DESIGN AND MFG OF ELECTRONIC SYSTEMS. USE AIR FORCE'S ICAM AND NASA'S IPAD PROGRAMS TO DEFINE CAD/CAM AND ELECTRONIC TECHNOLOGIES TO MAKE INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS, AND CABLES.	ARCHITECTURE

WORK STATUS

TECHNICAL REQUIREMENTS & EVALUATION CRITERIA WERE REVIEWED BY CAD-CAM-ELECTRONICS WORKING GROUP. COMMENTS WERE INCORPORATED. CONTRACT SERVICES REVIEW BOARD IS CHECKING THE PACKAGE. CONTRACTOR WILL DEVELOP ARCHITECTURE FOR ECAM USING ICAM DEFINITION.

PROJ NUMBER	TITLE	PROJ COST
S 80 6736	TECH READINESS ACCEL THRU COMPUTER INTEGRATED MFG (CAM)	315

PROBLEM	SOLUTION	TECHNOLOGY AREA
THE LEAD TIME REQUIRED TO BRING PRODUCTION LINES TO MOBILIZATION MAXIMUM IS INTOLERABLY EXCESSIVE. A CRITICAL DETERRENT IS THE EXTREME SHORTAGE OF TOOLMAKERS AND MACHINISTS.	THE DEVELOPMENT AND IMPLEMENTATION OF A COMPUTER INTEGRATED MANUFACTURING SYSTEM WILL SIGNIFICANTLY REDUCE THE REQUIREMENT FOR HIGHLY SKILLED CRAFTSMEN.	ARCHITECTURE

WORK STATUS

CONTRACT PACKAGES ARE BEING PROCESSED. PRELIMINARY PLANNING FOR TECHNOLOGY TRANSFER INTO AMMUNITION MFG OPERATIONS WAS INITIATED.

PROJ NUMBER	TITLE	PROJ COST
G 80 0001	VOICE CONTROLLED PROGRAMMING OF COMPUTERS	92

PROBLEM	SOLUTION	TECHNOLOGY AREA
PROGRAMMING COMPUTERS AND PROCESSING NC TAPES IS BEING DONE BY MANUAL INPUT WITH A KEYBOARD. THIS METHOD IS TIME CONSUMING AND SUBJECT TO ERRORS.	ESTABLISH A PROCESS OF INCORPORATING VOICE CONTROLLED PROGRAMMING EQUIPMENT IN THE PRESENT SYSTEMS AND DEVELOP PROGRAMS COMPATIBLE TO THE REQUIREMENTS OF THE EQUIPMENT.	FABRICATION CADCAM

WORK STATUS

THIS PROJECT WAS JUST FUNDED. NO STATUS REPORT IS REQUIRED.

PROJ NUMBER	TITLE	PROJ COST
R 80 1018	IMPROVED MFG. PROCESSES FOR DRY TUNED ACCELEROMETERS (CAM)	380

PROBLEM	SOLUTION	TECHNOLOGY AREA
THERE IS A NEED TO ESTABLISH MANUFACTURING METHODS NECESSARY TO INCREASE YIELD AND REDUCE COST OF DRY TUNED ACCELEROMETERS. THE PRESENT METHOD IS LABOR INTENSIVE AND PRONE TO ERROR.	ELECTRO-DISCHARGE MACHINING CAN BE ADAPTED TO AUTOMATED MACHINING OF THE COMPLEX DRY FLEXURE SUPPORTS. THIS APPROACH WILL PROVIDE THE FLEXIBILITY TO OPTIMIZE THE SUPPORT DESIGN FOR QUANTITY PRODUCTION	FABRICATION CADCAM

WORK STATUS

THE CONTRACT HAS BEEN AWARDED AND AN UPDATED MILESTONE PLAN PREPARED. THIS EFFORT WILL DEVELOP IMPROVED MMT FOR THE PRODUCTION OF DRY TUNED ACCELEROMETERS.

PROJ NUMBER	TITLE	PROJ COST
T 80 5082	FLEXIBLE MACHINING SYSTEM, PILOT LINE FOR TCV COMPONENTS	680

PROBLEM	SOLUTION	TECHNOLOGY AREA
PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY NOT MANUFACTURED IN LARGE QUANTITIES. BECAUSE OF THIS, MASS PDN TECHNOLOGIES THAT RESULT IN LOWER PDN COSTS ARE NOT USED.	THE ADVANTAGES OF MASS PDN CAN BE REALIZED IN PRODUCING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS, FLEXIPLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.	FABRICATION CADCAM

WORK STATUS

PHASE II IS CONTINUING THE ACTIVITIES INTIATED IN PHASE I TOWARDS PROVIDING GUIDANCE AND SOFTWARE SUPPORT IN SELECTING AND OPERATING A FMS. THE CONTRACTOR IS WORKING WITH HUGHES AIRCRAFT, AVCO, LYCOMING, G.E. PITTSFIELD AND ROCK ISLAND ARSENAL.

PROJ NUMBER	TITLE	PROJ COST
* 1 80 7183	SEMI-AUTO COMPOSITE MANUFAC SYSTEM HELICOPTER SECONDARY STRU	155

PROBLEM	SOLUTION	TECHNOLOGY AREA
* HELICOPTER FUSELAGE STRUCTURES HAVE HIGH MANUFACTURING COST DUE TO HIGH PART COUNT AND HIGH ASSEMBLY COSTS. METHODS OF COMPOSITE FABRICATION HAVE BEEN INVESTIGATED BUT HAND OPERATIONS RESULT IN HIGH LABOR COSTS.	USE EQUIPMENT AND TECHNIQUES DEVELOPED BY INDUSTRY IN SUPPORT OF AIR FORCE COMPOSITE COMPONENT PROGRAMS. THE SELECTED SYSTEM WILL BE UPDATED AND MODIFIED TO ACCOMODATE HELICOPTOR COMPONENTS WHICH ARE MORE COMPLEX AND HAVE MORE CURVATURE THAN AF COMP.	FABRICATION CADCAM

WORK STATUS

* A CONTRACT WAS AWARDED TO HUGHES HELICOPTER. WORK INITIATION IS WAITING ON THE COMPLETION OF PORTIONS OF THE FY79 PROJECT.

PROJ NUMBER	TITLE	PROJ COST
* 6 80 8051	APPLICATION AND CONTROL OF MACHINE TOOLS (CAM)	100

PROBLEM	SOLUTION	TECHNOLOGY AREA
* CURRENT PROCEDURES FOR THE JUSTIFICATION, SELECTION, APPLICATION, AND MAINTENANCE OF MACHINE TOOLS ARE INADEQUATE TO AVOID PROCUREMENT OF INEFFICIENT, UNRELIABLE MACHINE TOOLS.	ESTABLISH AN ACCURATE DEFINITION OF MACHINE TOOL REQUIREMENTS IN RELATION TO COMPONENT MACHINING REQUIREMENTS. DEVELOP PERFORMANCE ANALYSES AND COMPETITIVE PERFORMANCE EVALUATION CRITERIA.	DATA BASE/DATA AUTOMATION

WORK STATUS

* PROJECT REQUIREMENTS WERE DETAILED AND REVIEWED WITH PERSONNEL OF DIPEC, DRXIB AND ROCK ISLAND ARSENAL. VARIOUS PRIVATE COMPANY MAINTENANCE AND RELIABILITY EFFORTS WERE STUDIED. WRITING OF THE SOW BEGAN.

PROJ NUMBER	TITLE	PROJ COST
* F 80 3036	CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS	20

PROBLEM	SOLUTION	TECHNOLOGY AREA
* SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION. EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE. CONSIDERABLE ARTWORK IS REQUIRED.	DEVELOP COMPUTER AIDED MANUFACTURING TECHNIQUES THAT WILL REDUCE THE COST OF AND IMPROVE THE RELIABILITY OF SEMICONDUCTOR INTEGRATED CIRCUITS	CADCAM INTERACTION

WORK STATUS

* FUNDS WERE WITHDRAWN FROM THIS PROJECT AND APPLIED TO OTHER PROJECTS INCLUDING ECAM.

PROJ NUMBER	TITLE	PROJ COST
R 80 1021	COMPUTERIZED PROD PROCESS PLAN F/MACHINED CYLINDRICAL PARTS	240

PROBLEM	SOLUTION	TECHNOLOGY AREA
PRESENT MANUAL METHOD FOR PRODUCTION PROCESS PLANNING OF MACHINED CYLINDRICAL METAL COMPONENTS ARE INADEQUATE DUE TO HIGH PROCESS PLANNING COSTS AND A LACK OF STANDARDIZATION.	DEVELOP A COMPUTER SOFTWARE SYSTEM FOR PROCESS PLANNING OF MACHINED CYLINDRIC PARTS. THE SYSTEM WILL BE MANUFACTURER-INDEPENDENT AND WILL INCORPORATE PROCESS DECISION MODELING.	PLANNING/GROUP TECH

WORK STATUS

THE CONTRACT TO DEVELOP A COMPUTERIZED PROCESS PLANNING SYSTEM WAS AWARDED TO UTC. TECHNICAL MILESTONES HAVE BEEN FORMULATED.

PROJ NUMBER	TITLE	PROJ COST
6 80 7949	APPLICATION OF GROUP TECHNOLOGY TO RIA MFG (CAM)	155

PROBLEM	SOLUTION	TECHNOLOGY AREA
PRESENT PLANNING, SCHEDULING, AND MANUFACTURE OF WEAPON ASSEMBLIES AND COMPONENTS ARE BY SEPARATE LOTS AND PARTS WHICH REQUIRE MULTIPLE, MACHINING OPERATIONS, SET-UPS AND CHANGES OF TOOLING, AND CAUSE LOSS OF TIME AND MONEY.	APPLY GROUP TECHNOLOGY TO CLASSIFY, CODE AND MANUFACTURE WEAPON ASSEMBLIES AND COMPONENTS AS FAMILIES-OF-PARTS. MATCH PARTS BY CONTOUR AND SIZE FOR SIMULTANEOUS MACHINING- AND, SUB-GROUP FOR MORE EFFICIENT MACHINING AND ASSEMBLY.	PLANNING/GROUP TECH

WORK STATUS

THIS PROJECT IS A CONTINUATION OF 679 7949. THE MOST PROMISING GT APPLICATIONS AREAS WERE DEFINED AND SCHEDULED. INCLUDED ARE TASKS DIRECTED TOWARD PROCESS PLANNING AND EQUIPMENT REPLACEMENT. DEVELOPMENT OF A GROUP SCHEDULING SYSTEM IS UNDERWAY.

PROJ NUMBER	TITLE	PROJ COST
6 80 7963	GROUP TECHNOLOGY FOR FIRE CONTROL PARTS AND ASSEMBLIES	303

PROBLEM	SOLUTION	TECHNOLOGY AREA
FIRE CONTROL MANUFACTURING HAS RESULTED IN THE PROLIFERATION OF MANUFACTURING INFORMATION, LONG SET-UP TIMES OR MULTIPLE RESETTING OF MACHINES, UNDER-UTILIZATION OF MACHINES, LONG AND UNCERTAIN THROUGHPUT TIMES, AND HIGH WORK-IN PROGRESS.	THROUGH GROUP TECHNOLOGY PART FAMILIES, MACHINE GROUPS, TOOL GROUPS AND WORK GROUPS WILL BE ESTABLISHED TO REALIZE THE FOLLOWING - REDUCED PLANNING EFFORT, SET-UP TIME, WORK-IN PROGRESS, LEVEL OF SCRAP AND MORE EFFECTIVE MACHINE OPERATIONS.	PLANNING/GROUP TECH

WORK STATUS

UNDER PROJECT 6 79 7963 MICLASS VERSION 2.0 HAS BEEN IMPLEMENTED AND A PROCESS PLANNING MODULE IS BEING ACQUIRED. THIS PROJECT IS CONDUCTING ANALYSIS OF FIRE CONTROL SUB-ASSEMBLIES TO ESTABLISH GROUP TECHNOLOGY SYSTEM REQUIREMENTS.

PROJ NUMBER	TITLE	PROJ COST
* H 80 3010	MILLIMETER-WAVE SOURCES FOR 60, 94, AND 140 GHZ	892

PROBLEM	SOLUTION	TECHNOLOGY AREA
* TO ESTABLISH A MANUFACTURING CAPABILITY FOR PRODUCTION OF IMPATT DIODES WHICH ARE UNIFORM ENOUGH TO BE FIELD REPLACEABLE IN ARMY SYSTEMS.	ESTABLISH TECHNIGUES AND PROCESSES CAPABLE OF PRODUCING SILICON DOUBLE DRIFF IMPATT SOURCES. PRECISE AND RIGOROUS COMPUTER CONTROL OF ALL MATERIAL IS REQUIRED.	MANUFACTURING CONTROL

WORK STATUS

* PROJECT IS TO BE JOINTLY FUNDED WITH AIR FORCE. A CONTRACTOR WILL USE COMPUTER CONTROL OF EPITAXIAL GROWTH SYSTEM AND DEVICE PROCESSING TO MAKE SILICON IMPATT DIODE SOURCES FOR RADAR TARGET DETECTION AND HOMING. AF PORTION NOT YET FULLY FUNDED.

PROJ NUMBER	TITLE	PROJ COST
* R 80 3445	PRECISION MACHINING OF OPTICAL COMPONENTS	400

PROBLEM	SOLUTION	TECHNOLOGY AREA
* EXISTING PRECISION MACHINING FACILITIES CANNOT KEEP UP WITH THE DEMAND, MEET OPTICAL DESIGN REQUIREMENTS, MEET PRODUCTION SCHEDULES, AND STAY WITHIN REASONABLE COST BOUNDARIES.	INTEGRATE BOTH THE WELL PROVEN ERDA DEVELOPED SINGLE POINT DIAMOND MACHINING CAPABILITIES AND THE DEVELOPING INTERFEROMETRIC AIDED AND COMPUTER CONTROLLED TECHNOLOGY INTO A MANUFACTURING METHOD.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
* 5 80 4322	CHARACTERIZE DORMANCY EFFECT ON ELECTRONIC EQUIPMENT	515

PROBLEM	SOLUTION	TECHNOLOGY AREA
* UNCERTAINTY OF THE EFFECT OF LONG TERM STORAGE DURING PLANT LAYAWAY ON ELECTRONIC CONTROL SYSTEMS AND THE ASSOCIATED IMPACT ON PRODUCTION BASE LEAD TIME.	ANALYZE DATA CONCERNING DEGRADATION OF ELECTRONIC SYSTEMS DURING PERIODS OF DORMANCY AND DEVELOP CRITERIA FOR LAYAWAY PLANNING AND FUTURE SYSTEM DESIGN.	MANUFACTURING CONTROL

WORK STATUS

* AGREEMENT HAS BEEN REACHED WITH 5 ADDITIONAL OPERATING CONTRACTORS OF ARMY AMMO PLANTS TO PARTICIPATE IN THIS PMT. MAINTENANCE METHODOLOGY CONTRACTS FOR ARMY AMMO PLANTS WERE REVIEWED PRIOR TO AWARD.

PROJ NUMBER	TITLE	PROJ COST
* 6 80 7928	ROBOTIZED BENCHING OPERATIONS	113

PROBLEM	SOLUTION	TECHNOLOGY AREA
* BENCHING OPERATIONS ON BREECHBLOCKS AND RINGS ARE UNSAFE AND TIME CONSUMING.	DEVELOP INDUSTRIAL ROBOT TO PERFORM THESE OPERATIONS.	MAT HANDLING/STORAGE

WORK STATUS

* EVALUATIONS OF 14 DIFFERENT MANUFACTURERS ROBOTS HAS BEGUN. TO DATE MOST OF THESE COMPANIES ROBOTS DO NOT SEEM AMENABLE TO SOLVINGTHE PROBLEM

PROJ NUMBER	TITLE	PROJ COST
* R 80 3169	OPTICAL INSP OF PRINTED CIRCUIT BOARDS	90

PROBLEM	SOLUTION	TECHNOLOGY AREA
* OPERATOR FATIGUE ALLOWS MANY BAD PCBaS TO PASS VISUAL INSPECTION.	PROVIDE AN AUTOMATED OPTICAL COMPARATOR TO ELIMINATE THE NEED FOR HUMAN INSPECTOR.	TEST, INSP, EVAL

WORK STATUS

* AN OPERATING INSPECTION SYSTEM WAS DESIGNED AND ASSEMBLED, AND USED TO ESTABLISH OPERATING PARAMETERS, CAPABILITY, AND COST EFFECTIVITY ON A HIGH SPEED PRODUCTION LINE. CHYRSLER IS OPERATING THIS SYSTEM FOR AUTOMATIC OPTICAL INSPECTION OF PWB.

PROJ NUMBER	TITLE	PROJ COST
* 1 80 7371	INTEGRATED BLADE INSPECTION SYSTEM (IBIS)	100

PROBLEM	SOLUTION	TECHNOLOGY AREA
* INSPECTION OF TURBINE ENGINE BLADES AND VANES NECESSITATES HIGH ACCURACY. THE EFFORT IS TIME CONSUMING AND SUSCEPTABLE TO ERROR.	THIS PROJECT WILL IMPROVE THE INFRARED, X-RAY, AND INFRARED THERMOGRAPHY INSPECTION MODULES BY INCREASING RELIABILITY, REPEATABILITY AND SENSITIVITY. ALSO, INSPECTION COSTS WILL BE REDUCES.	TEST, INSP, EVAL

WORK STATUS

* THIS PROJECT WAS JUST FUNDED. NO STATUS REPORT IS REQUIRED.

ARMY CADCAM PROJECTS
08/29/80

PROJ NUMBER	TITLE	PROJ COST
* 5 80 3961	IMPR (3-D) VIB ACCEPT TSTNG F ART FUZES AND S/A MECHANISMS	352

PROBLEM	SOLUTION	TECHNOLOGY AREA
* CURRENT METHODS ARE COSTLY AND TIME CONSUMING, RA RELY EXPOSE THE TEST ITEM TO TRUE SERVICE ENVIRON MENTS, AND REQUIRE THREE TESTS TO ACCOUNT FOR ALL TEST AXES.	USE OF COMPUTERIZED 3-D VIBRATION / SHOCK TESTING AS AN ACCEPTANCE TOOL SOLVES TECHNICAL + ECONOMIC TEST DEFICIENCIES. TEST TIME IS REDUCED	TEST, INSP, EVAL

WORK STATUS

* SEE PROJECT 5 79 3961 FOR PHASE I WORK. A FUNDING DECREASE IS CAUSING SCHEDULING PROBLEMS. GOOD TECH NICAL PROGRESS IS BEING MADE.

FISCAL YEAR

81

CAM RELATED

MM&T

PROJECTS

ARMY CADCAM PROJECTS
08/29/80

PROJ NUMBER	TITLE	PROJ COST
3 81 1071	HYBRID INTEGRATED CAD AND MANUFACTURING (HICADAM)	1000

PROBLEM	SOLUTION	TECHNOLOGY AREA
HYBRID CIRCUIT DESIGN AND MANUFACTURE IS LABOR INTENSIVE. THE CAD DATA BASE HAS NOT BEEN EXTENDED TO MANUFACTURING PROCESS CONTROL.	ANALYZE FUNCTIONAL FLOW AND MANUFACTURING PROCESS CONTROLS AND MODIFY THE DESIGN DATA BASE TO MAKE IT CAPABLE OF DEFINING FUNCTIONS, INPUT, OUTPUT, CONTROLS AND INTERFACES. USE ICAM METHODOLOGY TO DEVELOP SYSTEM ARCHITECTURE.	ARCHITECTURE

PROJ NUMBER	TITLE	PROJ COST
3 81 1075	ELECTRONICS COMPUTER AIDED MANUFACTURING (ECAM)	2500

PROBLEM	SOLUTION	TECHNOLOGY AREA
ALTHOUGH INTEGRATED CIRCUITS, HYBRID CIRCUITS,PRINTED CIRCUITS AND CABLES ARE DESIGNED ON A COMPUTER, THERE IS LITTLE COMPUTERIZED CONTROL OF PROCESSES USED TO PRODUCE THESE ITEMS. A MASTER PLAN IS NEEDED TO DEFINE THE AREA AND REQUIREMENTS.	DEVELOP A DOD MASTER PLAN FOR COMPUTER-AIDED DESIGN AND MFG OF ELECTRONIC SYSTEMS. USE AIR FORCE'S ICAM AND NASA'S IPAD PROGRAMS TO DEFINE CAD/CAM AND ELECTRONIC TECHNOLOGIES TO MAKE INTEGRATED CIRCUITS,HYBRID CIRCUITS,PRINTED CIRCUITS, AND CABLES.	ARCHITECTURE

PROJ NUMBER	TITLE	PROJ COST
M 81 5006	LOW COST FABRICATION OF RF CAVITIES FOR TWTS	768

PROBLEM	SOLUTION	TECHNOLOGY AREA
HIGH COSTS OF COUPLED CAVITY TRAVELING WAVE TUBES IS DUE TO THE COST OF FABRICATING AND ASSEMBLING THE PRECISION RF CAVITIES. EW SYSTEMS REQUIRE LOW COST WIDE BAND JAMMER TUBES FOR AIRCRAFT SURVIVABILITY.	PROVIDE LOW COST MANUFACTURING TECHNIQUES FOR THE FABRICATION OF THE RF CAVITY STRUCTURE. APPLY COMPUTER CONTROL TECHNOLOGY WITH DIAMOND TOOLS IN LIEU OF CONVENTIONAL MACHINING.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
* H 81 9845	MMT COMPUTER-AIDED FLIR ASPHERIC LENS FABRICATION CAM	518

PROBLEM	SOLUTION	TECHNOLOGY AREA
* ASPHERIC LENSES REQUIRED BY FLIR SENSORS HAVE SEVERE WEIGHT AND SIZE LIMITIATIONS AND ARE DIFFICULT TO MFG. BECAUSE OF THE REPETITIVE PROCESS OF SURFACE SHAPING.	PROVIDE MANUFACTURING METHODS FOR PRODUCING ASPHERICAL FLIR LENSES USING A SINGLE POINT DIAMOND TURNING LATHE INTEGRATED WITH COMPUTER CONTROLS AND LASER INTEFERMETRIC FEEDBACK OF CUTTING TOOL POSITION.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
* T 81 5082	FLEXIBLE MACHINING SYS (FMS) PILOT LINE F/TCV COMPONENTS	880

PROBLEM	SOLUTION	TECHNOLOGY AREA
* PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY NOT MANUFACTURED IN LARGE QUANTITIES. BECAUSE OF THIS, MASS PDN TECHNOLOGIES THAT RESULT IN LOWER PON COSTS ARE NOT USED.	THE ADVANTAGES OF MASS PDN CAN BE REALIZED IN PRODUCING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS, FLEXIPLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
* T 81 5086	LASER HARDENING OF TRANSMISSION COMPONENTS CAM (PHASE I)	255

PROBLEM	SOLUTION	TECHNOLOGY AREA
* FLAME AND INDUCTION HARDENING IS EMPLOYED TO SURFACE HARDEN VEHICLE TRANSMISSION PARTS. THESE PROCESSES ARE INEFFICIENT.	ESTABLISH PARAMETERS AND CONTROLS NEEDED FOR LASER SURFACE HARDENING	FABRICATION CADCAM

ARMY CADCAM PROJECTS
08/29/80

PROJ NUMBER	TITLE	PROJ COST
T 81 5091	HEAVY ALUMINUM PLATE FABRICATION (PHASE I)	420

PROBLEM	SOLUTION	TECHNOLOGY AREA
MANY COMBAT AND TACTICAL VEHICLE HULLS AND THEIR COMPONENTS ARE FABRICATED FROM HEAVY ALUMINUM PLATE. CUTTING THIS HEAVY ALUMINUM PLATE TO SPECIFIED CONTOURS AND WELDING THE PIECES TOGEATER REQUIRES A GREAT DEAL OF MANUAL LABOR.	ESTABLISH THE CAPABILITY TO CUT HEAVY ALUMINUM PLATE RAPIDLY USING PLASMA ARC WITH NUMERICAL CONTROLS. PROCESS PARAMETERS WILL BE ESTABLISHED FOR GAS METAL ARC, GAS TUNGSTEN ARC, AND ELECTRON BEAM WELDING OF HEAVY ALUMINUM PLATE.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
1 81 7183	SEMI-AUTO COMP MANUF SYS F/HELI FUSELAGE SECONDARY STRUC	300

PROBLEM	SOLUTION	TECHNOLOGY AREA
HELICOPTER FUSELAGE STRUCTURES HAVE HIGH MANUFACTURING COST DUE TO HIGH PART COUNT AND HIGH ASSEMBLY COSTS. METHODS OF COMPOSITE FABRICATION HAVE BEEN INVESTIGATED BUT HAND OPERATIONS RESULT IN HIGH LABOR COSTS.	USE EQUIPMENT AND TECHNIQUES DEVELOPED BY INDUSTRY IN SUPPORT OF AIR FORCE COMPOSITE COMPONENT PROGRAMS. THE SELECTED SYSTEM WILL BE UPDATED AND MODIFIED TO ACCOMODATE HELICOPTOR COMPONENTS WHICH ARE MORE COMPLEX AND HAVE MORE CURVATURE THAN AF COMP.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
6 81 7307	PROGRAMMED OPTICAL SURFACING EQUIPMENT/METHODOLOGY	126

PROBLEM	SOLUTION	TECHNOLOGY AREA
CURRENT TECHNIQUES FOR PITCH BUTTONING AND BLOCKING PRECISION LENSES USE OLDER CONVENTIONAL EQUIP. ACCURACY DEPENDS ON THE SKILL AND EXPERIENCE OF WELL TRAINED MASTER OPTICIANS WHO ARE BECOMING SCARCE.	ADOPT COMPUTER TECHNIQUES AND INSTRUMENTATION WITH CONTROLS TO PITCH BUTTONING AND BLOCKING OPERATIONS. THE END PRODUCT WILL BE AN INTEGRATED SURFACING SYSTEM IMPLEMENTED IN THE FIRE CONTROL FABRICATION FACILITY AT ARRADCOM.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
* 6 81 8051	APPLICATION AND CONTROL OF MACHINE TOOLS	85

PROBLEM	SOLUTION	TECHNOLOGY AREA
* CURRENT PROCEDURES FOR THE JUSTIFICATION, SELECTION, APPLICATION, AND MAINTENANCE OF MACHINE TOOLS ARE INADEQUATE TO AVOID PROCUREMENT OF INEFFICIENT, UNRELIABLE MACHINE TOOLS.	ESTABLISH AN ACCURATE DEFINITION OF MACHINE TOOL REQUIREMENTS IN RELATION TO COMPONENT MACHINING REQUIREMENTS. DEVELOP PERFORMANCE ANALYSES AND COMPETITIVE PERFORMANCE EVALUATION CRITERIA.	DATA BASE/DATA AUTOMATION

PROJ NUMBER	TITLE	PROJ COST
* F 81 3005	GRAPHICAL PART PROGRAMMING EVALUATION (CAM)	125

PROBLEM	SOLUTION	TECHNOLOGY AREA
* POTENTIAL EXISTS TO EXTEND THE EXISTING COMPUTER-AIDED INTERACTIVE DESIGN SYSTEMS FOR THE CREATION OF NUMERICAL CONTROL TAPES AND THREE-DIMENSIONAL PARTS GEOMETRIES TO A BROAD RANGE OF DOD EQUIPMENT REQUIREMENTS.	THIS PROJECT WILL EVALUATE THE CAPABILITY OF EXISTING COMPUTER AIDED INTERACTIVE DESIGN SYSTEMS TO PRODUCE NUMERICAL CONTROL PART PROGRAMS AND PART GEOMETRIES FOR DOD PRODUCTION REQUIREMENTS.	CADCAM INTERACTION

PROJ NUMBER	TITLE	PROJ COST
* F 81 3036	CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS (CAM)	1000

PROBLEM	SOLUTION	TECHNOLOGY AREA
* SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION. EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE. CONSIDERABLE ARTWORK IS REQUIRED.	DEVELOP COMPUTER AIDED MANUFACTURING TECHNIQUES THAT WILL REDUCE THE COST OF AND IMPROVE THE RELIABILITY OF SEMICONDUCTOR INTEGRATED CIRCUITS	CADCAM INTERACTION

PROJ NUMBER	TITLE	PROJ COST
3 81 1021	CPPP MACHINED CYLINDRICAL PARTS (CAM)	250

PROBLEM	SOLUTION	TECHNOLOGY AREA
PRESENT MANUAL METHOD FOR PRODUCTION PROCESS PLANNING OF MACHINED CYLINDRICAL METAL COMPONENTS ARE INADEQUATE DUE TO HIGH PROCESS PLANNING COSTS AND A LACK OF STANDARDIZATION.	DEVELOP A COMPUTER SOFTWARE SYSTEM FOR PROCESS PLANNING OF MACHINED CYLINDRIC PARTS. THE SYSTEM WILL BE MANUFACTURER-INDEPENDENT AND WILL INCORPORATE PROCESS DECISION MODELING.	PLANNING/GROUP TECH

PROJ NUMBER	TITLE	PROJ COST
6 81 7724	GROUP TECHNOLOGY OF WEAPON SYSTEMS (CAM)	224

PROBLEM	SOLUTION	TECHNOLOGY AREA
THERE IS A NEED TO REDUCE AND CONTROL THE PROLIFERATION OF PARTS AND DESIGNS FORITEMS MANUFACTURED AT WATERVLIET ARSENAL.	THE ARMY HAS PURCHASED A GROUP CLASSIFICATION AND CODING SOFTWARE PACKAGE. ONCE THIS SYSTEM IS IMPLEMENTED, IT SHOULD BE POSSIBLE TO REDUCE THE NUMBER OF DIFFERENT PARTS THRU STANDARDIZATION.	PLANNING/GROUP TECH

PROJ NUMBER	TITLE	PROJ COST
T 81 6053	WELDING SYSTEMS INTEGRATION	350

PROBLEM	SOLUTION	TECHNOLOGY AREA
OF ALL METAL WORKING PROCESSES EMPLOYED IN TRACKED COMBAT VEHICLES MANUFACTURING, WELDING IS THE MOST LABOR INTENSIVE AND AFTER MACHINING, THE MOST COSTLY. AUTOMATION WHICH COULD REDUCE THESE COSTS IS AS YET AN UNACHIEVED GOAL.	UNDERTAKE A COORDINATED PROGRAM TO INTEGRATE EXISTING EXPERTISE AND TECHNOLOGY TO ADDRESS ONE APPLICATION (XM1 HULL). EXPERTISE WILL BE IN ARES OF WELDING PROCESS CONTROL, SENSORY TECHNOLOGY, STRESS ANALYSIS, AND COMPUTER CONTROL.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
3 81 3281	SILVER-ZINC GUIDANCE BATTERIES (CAM)	250

PROBLEM	SOLUTION	TECHNOLOGY AREA
ANODE AND CATHODE MANUFACTURING FOR SILVER ZINC BATTERIES IS BASED ON TWENTY YEAR OLD TECHNIQUES. REQUIREMENTS CALL FOR IN LINE PRODUCTION AND ACCEPTANCE TESTS.	DEVELOP A COMPUTER AIDED MANUFACTURING PROCESS FOR SILVER-ZINC BATTERIES WITH CONTROLLING SENSORS FOR ACCURATELY MEASURING MATERIALS AND ELECTROCHEMICAL COMBINATION.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
3 81 3445	PRECISION MACHINING OF OPTICAL COMPONENTS	625

PROBLEM	SOLUTION	TECHNOLOGY AREA
EXISTING PRECISION MACHINING FACILITIES CANNOT KEEP UP WITH THE DEMAND, MEET OPTICAL DESIGN REQUIREMENTS, MEET PRODUCTION SCHEDULES, AND STAY WITHIN REASONABLE COST BOUNDARIES.	INTEGRATE BOTH THE WELL PROVEN ERDA DEVELOPED SINGLE POINT DIAMOND MACHINING CAPABILITIES AND THE DEVELOPING INTERFEROMETRIC AIDED AND COMPUTER CONTROLLED TECHNOLOGY INTO A MANUFACTURING METHOD.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
6 81 8120	ADAPTIVE CONTROL TECHNOLOGY (CAM)	225

PROBLEM	SOLUTION	TECHNOLOGY AREA
INEFFICIENT USE OF NC MACHINE TOOLS DUE TO CONSERVATION PROGRAMMING IS UNECONOMICAL. ALSO THE INABILITY TO MONITOR A MULTIPLICITY OF TOOL FORMS CHARACTERISTIC OF NC MACHINE CAPABILITY, E.G. MANY DRILL SIZES WITH DIFFERENT LOADING, IS A LIMITER.	EXTEND THE CURRENT ADAPTIVE CONTROL TECHNOLOGY TO CONTROL THE TOOL LOADS IN SMALL MILLS AND DRILLS SO THEY CAN BE PERFORMED IN THE SAME SETUPS. THIS WOULD MAXIMIZE THE USE OF BOTH NC EQUIPMENT AND TOOL SYSTEMS.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
6 81 8135	IN-PROCESS CONTROL OF MACHINING	653

PROBLEM	SOLUTION	TECHNOLOGY AREA
DURING MFG. OF RECOIL CONTROL ORIFICES, ERRORS AR E INTRODUCED WHICH REQUIRE REWORK. CORRECTIVE ACT IONS INVOLVE COSTLY DETAILED INSPECTION AND REANA LYSIS WITH COMPUTERIZED DESIGN PROGRAMS TO DEFINE POSSIBLE REWORK ALTERNATIVES.	AN IMPROVED MANUFACTURING METHOD UTILIZING ADAPTIV E CONTROLS AND AUTOMATED INSPECTION EQUIPMENT WILL BE ESTABLISHED. MACHINE TOOLS WILL BE RETROFITTED	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
6 81 8154	COMPUTER INTEGRATION MFG (CIM),DDNC	337

PROBLEM	SOLUTION	TECHNOLOGY AREA
NUMERICAL CONTROL MACHINE TOOLS OFFER MANY ADVANT AGES OVER CONVENTIONAL MACHINE TOOLS BUT HAVE CER TAIN DISADVANTAGES. ONE PROBLEM AREA IS GETTING M ACHINE INSTRUCTIONS TO THE MACHINE TOOL AND COLLE CTING MANAGEMENT INFORMATION.	INTERFACE IN-HOUSE COMPUTER FACILITIES WITH CURREN T AND FUTURE NC MACHINE TOOLS TO FORM AN ADVANCED COMPUTER INTEGRATED MFG SYSTEM. UTILIZE DNC TECHNO LOGY.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
5 81 6716	DEV COMP-AID MODEL OF FORMING OPERATIONS FOR ARTILLERY PPTS	157

PROBLEM	SOLUTION	TECHNOLOGY AREA
TRIAL AND ERROR METHODS AND THE ABSENCE OF PROVEN AUTOMATED DESIGN TECHNIQUES FOR TOOLING CAUSE UN EXPECTED FAILURES IN FORMING OPERATIONS AND DELAY S IN STARTUP OF AMMUNITION PRODUCTION LINES.	DEVELOP ANALYTICAL MODELS AND AUTOMATED TOOL DESIG N METHODS OF CRITICAL METAL FORMING OPERATIONS. TO OL DESIGNS THUS GENERATED WILL BE TESTED IN A PROD UCTION SETTING TO VERIFY THE COMPUTER MODELS. PROV EN MODELS ARE APPLICABLE TO CURRENT AND FUTURE ITE	SIM, MODEL, OP RESCH

PROJ NUMBER	TITLE	PROJ COST
6 81 8136	IMPROVED IMPULSE PROGRAMMERS FOR HYDRAULIC SIMULATORS	80

PROBLEM	SOLUTION	TECHNOLOGY AREA
UNDESIRABLE SHOCK AND VIBRATION IN TESTS OF CERTA IN RECOIL MECHANISMS LIMIT THE EXTENT OF TESTING THAT CAN BE ACCOMODATED ON THE HYDRAULIC ARTILLER Y TEST SIMULATOR.	DESIGN AND MANUFACTURE IMPPOVED IMPULSE PROGRAMMER S TO GET BETTER SIMULATED FIRING THAT WILL BE MORE EFFECTIVE FOR A GREATER NUMBER OF WEAPONS.	SIM, MODEL, OP RESCH

PROJ NUMBER	TITLE	PROJ COST
6 81 7128	ROBOTIZED BENCHING OPERATIONS (CAM)	287

PROBLEM	SOLUTION	TECHNOLOGY AREA
BENCHING OPERATIONS ON BREECHBLOCKS AND RINGS ARE UNSAFE AND TIME CONSUMING.	DEVELOP INDUSTRIAL ROBOT TO PERFORM THESE OPERATIO NS.	MAT HANDLING/STORAGE

PROJ NUMBER	TITLE	PROJ COST
1 81 7371	INTEGRATED BLADE INSPECTION SYSTEM (IBIS)	357

PROBLEM	SOLUTION	TECHNOLOGY AREA
INSPECTION OF TURBINE ENGINE BLADES AND VANES NEC ESSITATES HIGH ACCURACY. THE EFFORT IS TIME CONSU MING AND SUSCEPTABLE TO ERROR.	THIS PROJECT WILL IMPROVE THE INFRARED, X-RAY, AND INFRARED THERMOGRAPHY INSPECTION MODULES BY INCRE ASING RELIABILITY, REPEATABILITY AND SENSITIVITY. ALSO, INSPECTION COSTS WILL BE REDUCES.	TEST, INSP, EVAL

PROJ NUMBER	TITLE	PROJ COST
3 81 1060	ELECTRICAL TEST AND SCREENING OF CHIPS	375

PROBLEM	SOLUTION	TECHNOLOGY AREA
ONE UNRELIABLE CHIP IN MILITARY ELECTRONIC ASSEMBLIES CAUSES REJECTION OR DESTRUCTION OF THE ENTIRE PACKAGE. PRESENT MEANS FOR DETERMINING CHIP RELIABILITY OR INTEGRITY IS A PROBE TESTING TECHNIQUE WHICH IS TIME CONSUMING AND DESTRUCTIVE.	PLACE A MONOLITHIC CHIP TESTING DEVICE AT THE POINT JUST BEFORE THE CHIP IS BONDED TO THE SUBSTRATE. INCLUDE ON THE PROBE A NON-DESTRUCTIVE POINT AND A METHOD FOR OXIDE REMOVAL.	TEST, INSP, EVAL

PROJ NUMBER	TITLE	PROJ COST
3 81 1073	REAL TIME ULTRASONIC IMAGING	200

PROBLEM	SOLUTION	TECHNOLOGY AREA
EXISTING ACOUSTICAL HOLOGRAPHY INSP. SYS PRODUCES UNSATISFACTORY VIDEO IMAGES DUE TO POOR RESOLUTION, SIGNAL NOISE AND LOW SPATIAL FREQ. ABERRATIONS.	A 3 CHANNEL PIPELINE PROCESSOR WITH ASSOCIATED 512X512X8 MEMORIES WITH A 30 FRAMES/SEC DISPLAY CAPABILITY. THIS SYS WOULD ELIMINATE ABERRATION, IMPROVE CONTRAST, AND REDUCE SIGNAL NOISE.	TEST, INSP, EVAL

PROJ NUMBER	TITLE	PROJ COST
3 81 1076	PATTERN RECOGNITION OF COMPONENTS F/HYBRID CIRCUIT SUBSTRATE	400

PROBLEM	SOLUTION	TECHNOLOGY AREA
OPTICAL INSPECTION OF HYBRIDS BY AN OPERATOR IS INEFFICIENT DUE TO HUMAN FATIGUE INTRODUCED BY REPETITIVE INSPECTION OF SMALL CIRCUITS. A COMPUTER CONTROLLED OPTICAL PATTERN RECOGNITION SYSTEM FOR COMPLEX HYBRID CIRCUITS IS NEEDED.	MODIFY EXISTING OPTICAL PATTERN RECOGNITION EQUIPMENT TO RECOGNIZE COMPONENT AND BOND PAD ALIGNMENT FOR LARGE NUMBERS OF ELECTRONIC DEVICES PER SUBSTRATE.	TEST, INSP, EVAL

FISCAL YEAR

82

CAM RELATED

MM&T

PROJECTS

PROJ NUMBER	TITLE	PROJ COST
T 82 1075	ELECTRONICS COMPUTER AIDED MANUFACTURING (ECAM)	1000

PROBLEM	SOLUTION	TECHNOLOGY AREA
ALTHOUGH INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS AND CABLES ARE DESIGNED ON A COMPUTER, THERE IS LITTLE COMPUTERIZED CONTROL OF PROCESSES USED TO PRODUCE THESE ITEMS. A MASTER PLAN IS NEEDED TO DEFINE THE AREA AND REQUIREMENTS.	DEVELOP A DOD MASTER PLAN FOR COMPUTER-AIDED DESIGN AND MFG OF ELECTRONIC SYSTEMS. USE AIR FORCE'S ICAM AND NASA'S IPAD PROGRAMS TO DEFINE CAD/CAM AND ELECTRONIC TECHNOLOGIES TO MAKE INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS, AND CABLES.	ARCHITECTURE

PROJ NUMBER	TITLE	PROJ COST
T 82 5092	FLEXIBLE MACHINING SYS (FMS) PILOT LINE F/TCV COMPONENTS	750

PROBLEM	SOLUTION	TECHNOLOGY AREA
PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY NOT MANUFACTURED IN LARGE QUANTITIES. BECAUSE OF THIS, MASS PDN TECHNOLOGIES THAT RESULT IN LOWER PDN COSTS ARE NOT USED.	THE ADVANTAGES OF MASS PDN CAN BE REALIZED IN PRODUCING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS, FLEXIBLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
T 82 5091	HEAVY ALUMINUM PLATE FABRICATION	180

PROBLEM	SOLUTION	TECHNOLOGY AREA
MANY COMBAT AND TACTICAL VEHICLE HULLS AND THEIR COMPONENTS ARE FABRICATED FROM HEAVY ALUMINUM PLATE. CUTTING THIS HEAVY ALUMINUM PLATE TO SPECIFIED CONTOURS AND WELDING THE PIECES TOGEATER REQUIRES A GREAT DEAL OF MANUAL LABOR.	ESTABLISH THE CAPABILITY TO CUT HEAVY ALUMINUM PLATE RAPIDLY USING PLASMA ARC WITH NUMERICAL CONTROLS. PROCESS PARAMETERS WILL BE ESTABLISHED FOR GAS METAL ARC, GAS TUNGSTEN ARC, AND ELECTRON BEAM WELDING OF HEAVY ALUMINUM PLATE.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
T 82 6008	LASER MACHINING (PHASE I)	250

PROBLEM	SOLUTION	TECHNOLOGY AREA
CONVENTIONAL MACHINING OF DIFFICULT TO MACHINE MATERIALS IS VERY EXPENSIVE. RAPID TOOL WEAR AND LOCALIZED HEATING OF THE WORKPIECE IMPACT REMOVAL RATES AND METALLURGICAL CHARACTERISTICS.	THIS PROGRAM WILL DEVELOP TECHNIQUES FOR LASER MACHINING BY NUMERICAL CONTROL.	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
3 82 1095	AUTOMATIC SEALING OF HYBRIDS	250

PROBLEM	SOLUTION	TECHNOLOGY AREA
SEALING OF SMALL METAL PACKAGES IS DONE BY HAND SOLDERING OR HAND-GUIDED ELECTRIC SEAM WELDING. BOTH REQUIRE AN OPERATOR.	DEVELOP A COMPUTER DIRECTED SOLDERING TECHNIQUE OR APPLY COMPUTER CONTROL TO THE SEAM WELDER. SET UP MEANS TO LOCATE THE PACKAGE AND LID IN A FIXTURE, TO CHECK ALIGNMENT, CONTROL THE CLOSURE OPERATION TEST THE SEAL WHILE STILL IN THE INERT ATMOSPHER	FABRICATION CADCAM

PROJ NUMBER	TITLE	PROJ COST
6 82 8226	COMPUTER AIDED WORK MEASUREMENT SYSTEM	205

PROBLEM	SOLUTION	TECHNOLOGY AREA
TIME STUDIES AND USE OF STANDARD DATA PRESENTLY REQUIRE TIME CONSUMING MANUAL CALCULATIONS TO DEVELOP PRODUCTION STANDARDS.	DEVELOP A COMPUTERIZED WORK MEASUREMENT SYSTEM THAT WILL VIRTUALLY ELIMINATE MANUAL CALCULATIONS IN THE DEVELOPMENT OF PRODUCTION STANDARDS. ROUTINES WILL INCLUDE PROGRAMS TO DEVELOP FINISHED STANDARDS FROM RAW TIME STUDIES OR STANDARD DATA.	DATA BASE/DATA AUTOMATION

ARMY CADCAM PROJECTS
08/29/80

PROJ NUMBER	TITLE	PROJ COST
F 82 3036	CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS	1000

PROBLEM	SOLUTION	TECHNOLOGY AREA
SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION. EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE. CONSIDERABLE ARTWORK IS REQUIRED.	DEVELOP COMPUTER AIDED MANUFACTURING TECHNIQUES THAT WILL REDUCE THE COST OF AND IMPROVE THE RELIABILITY OF SEMICONDUCTOR INTEGRATED CIRCUITS	CADCAM INTERACTION

PROJ NUMBER	TITLE	PROJ COST
T 82 5005	COMPUTER AIDED DESIGN FOR COLD FORGED GEARS (PHASE I)	300

PROBLEM	SOLUTION	TECHNOLOGY AREA
MACHINING AND OTHER PROCESSES ADD COST TO THE FINISHED COMPONENT.	ESTABLISH A MFG PROCESS TO RESULT IN A FINISHED GEAR TO DRAWING TOLERANCES FROM BAR STOCK AT AMBIENT TEMPERATURES.	CADCAM INTERACTION

PROJ NUMBER	TITLE	PROJ COST
T 82 5024	GEAR DIE DESIGN AND MFG UTILIZING COMPUTER TECHNOLOGY \CAM*	640

PROBLEM	SOLUTION	TECHNOLOGY AREA
THE CONTROL OF DIMENSIONAL TOLERANCES OF FORGED BEVEL GEARS PRESENTS A UNIQUE PROBLEM SINCE THESE GEARS ARE NOT MFG. TO THEOPETICAL EQUATIONS. THE BEVEL GEAR IS NOT CEFINED DIMENSIONALLY BUT IS PRESENTED AS REQUIREMENTS FOR TOOTH BEARING PATTER*	THIS PROGRAM WILL ELIMINATE THE CURRENT TRIAL AND ERROR METHODS BY UTILIZING CADCAM METHODS AND INTERACTIVE GRAPHICS TECHNIQUES. EXCESSIVE SCRAP, UNEXPECTED DIE WEAR AND BREAKAGE, AND THE HIGH COST OF FORGING DIES WILL BE ADDRESSED.	CADCAM INTERACTION

PROJ NUMBER	TITLE	PROJ COST
3 82 1072	MULTIPLE HI RELIABILITY/LOW VOLUME LSI MFG \CAP*	1200

PROBLEM	SOLUTION	TECHNOLOGY AREA
LOW VOLUME PURCHASE OF LSI CHIPS DOES NOT LEND IT SELF TO CIRCUIT VARIATIONS. LARGER THAN NEEDED NU MBERS OF CHIPS MUST BE ORDERED TO GET THE PRODUCE R'S ATTENTION. A LOW-VOLUME CHIP CAPABILITY IS NE EDED.	ANALYZE ALL LSI RESEARCH RESULTS AND SINGLE OUT NE W PROCESSING TECHNIQUES. ESTABLISH A MILITARY CAPT IVE DESIGN AND PRODUCTION LINE. DEVELOP SOFTWARE F OR CAD OF LSI CIRCUITS. PRODUCE VARIATIONS OF SEVE RAL CIRCUIT FAMILIES.	CADCAM INTERACTION

PROJ NUMBER	TITLE	PROJ COST
6 82 8231	IMPROVED CASTING TECHNOLOGY	200

PROBLEM	SOLUTION	TECHNOLOGY AREA
EXCESSIVE METAL MUST BE MELTED IN CASTING OPERATI ONS. THE YIELD RATIO OF SOME CASTS IS TOO LOW AND THE GATES AND RISERS TOO DIFFICULT TO CUT OFF. M ATERIAL PROPERTIES OFTEN VARY WITH CASTING PROCED URES.	USING COMPUTERIZED TECHNIQUES AND PRODUCTION CASTI NG FACILITIES, THE OPTIMUM SHAKE OUT TIMES, RISER SLEEVES AND GATING AND RISERING CONFIGURATIONS WOU LD BE DETERMINED. PROPERTIES OF CAST MATERIALS WIL L BE EVALUATED FOR DIFFERENT CAST DESIGNS.	CADCAM INTERACTION

PROJ NUMBER	TITLE	PROJ COST
T 82 6030	COMPUTER SIM OF TCV \MANUFACTURING PROCESS*	300

PROBLEM	SOLUTION	TECHNOLOGY AREA
THE LONG LEAD TIMES REQUIRED IN THE MATERIAL ACQU ISITION PROCESS OF TRACKED COMBAT VEHICLES (TCV) DO NOT ALLOW COMPONENTS TO REFLECT THE LATEST TEC HNOLOGIES. THIS LEADS TO DELAYS AND EXCESSIVE COS TS.	SIMULATING THE MANUFACTURING PROCESS DURING THE VE HICLE DEVELOPMENT PHASE WILL IDENTIFY TOOLING, OPT IMUM MANUFACTURING PROCESSES, OPTIMUM PRODUCTION L INE, AND POTENTIAL PRODUCTION PROBLEMS. IT WILL AS SIST INNOVATION AND PROVIDE FOR ACCURATE PLANNING.	PLANNING/GROUP TECH

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PROJ NUMBER	SUBTASK	TITLE	PROJ COST
T 82 6057	12	COMPUTER SIM OF TCV MANUFACTURING PROCESS	300

PROBLEM	SOLUTION	TECHNOLOGY AREA
THE FUEL EFFICIENCY OF THE XM1 NEEDS IMPROVEMENT.	THE FUEL EFFICIENCY CAN BE INCREASED BY RAISING TH E TURBINE INLET TEMPERATURE. THE ELEVATED TURBINE INLET TEMPERATURES WILL REQUIRE MATERIALS THAT CAN WITHSTAND HIGH TEMPERATURES AND PRESSURES. THIS P ROJECT WILL PROVIDE THE NECESSARY TECHNOLOGY.	PLANNING/GROUP TECH

PROJ NUMBER	TITLE	PROJ COST
T 82 6041	INTEGRATED APP OF ADAPTIVE CONTROL FOR MACH TOOLS AND ROBOTS	500

PROBLEM	SOLUTION	TECHNOLOGY AREA
SENSORS WHICH RECOGNIZE AND SIGNAL PHENOMENAL CHA NGES HAVE BEEN DEVELOPED AND DEMONSTRATED. APPLIC ATION OF THESE TO ADAPTIVE CONTROL CAN ADVANCE AU TOMATION TO THE LEVEL OF "PUSH BUTTON" FACTORIES, BUT LITTLE OR NOTHING HAS BEEN DONE IN THIS ARE*	STATE-OF-THE-ART SENSORS WILL BE ADAPTED TO A CNC MACHINING CENTER TO ADVANCE ITS PERFORMANCE BEYOND PRESENT LEVELS OF EFFICIENCY. THIS WILL PROVIDE A PROVEN CAPABILITY WHICH CAN BE EMPLOYED ON OTHER MACHINES.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
T 82 6053	WELDING SYSTEMS INTEGRATION	500

PROBLEM	SOLUTION	TECHNOLOGY AREA
OF ALL METAL WORKING PROCESSES EMPLOYED IN TRACKE D COMBAT VEHICLES MANUFACTURING, WELDING IS THE M OST LABOR INTENSIVE AND AFTER MACHINING, THE MOST COSTLY. AUTOMATION WHICH COULD REDUCE THESE COST S IS AS YET AN UNACHIEVED GOAL.	UNDERTAKE A COORDINATED PROGRAM TO INTEGRATE EXIST ING EXPERTISE AND TECHNOLOGY TO ADDRESS ONE APPLIC ATION (XM1 HULL). EXPERTISE WILL BE IN ARES OF WEL DING PROCESS CONTROL, SENSORY TECHNOLOGY, STRESS A NALYSIS, AND COMPUTER CONTROL.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
1 82 7345	IN-PROCESS CONTROL OF RESIN MATRIX CURE	200

PROBLEM	SOLUTION	TECHNOLOGY AREA
CONVENTIONAL CONTROL OF THE CURE STAGE DURING COMPOSITE HARDWARE MANUFACTURING IS ATTAINED THROUGH MANUAL OR AUTOMATIC CONTROL OF THE AUTOCLAVE/PRESS TEMPERATURE AS A FUNCTION OF TIME. THIS METHOD IGNORES THE CHEMICAL STATE OF THE RESIN DURING •	USE IN-PROCESS CONTROL TECHNIQUES CAPABLE OF MONITORING THE RESIN FLOW/CURE BEHAVIOR TO INSURE PRODUCTION OF COMPONENTS HAVING CONSISTENTLY HIGH QUALITY.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
3 82 1079	WIDE AREA MERCURY-CADMIUM-TELERIDE QUADRENT DETECTORS	350

PROBLEM	SOLUTION	TECHNOLOGY AREA
LARGE AREA MERCURY-CADMIUM-TELLURIDE QUANDRENT DETECTORS FOR IR SEEKERS ARE EXPENSIVE BECAUSE OF HIGH MATERIAL COST AND LOW YIELD. THE MATERIAL IS HARD TO GROW TO THE RIGHT CHEMICAL BALANCE. SLICING, ION IMPLANTATION AND/OR DIFFUSION ARE TOUCHY.	FIND THE EXACT CHEMISTRY FOR GOOD DETECTOR OUTPUT. LOOK AT CLOSED LOOP COMPUTER CONTROL OF CRYSTAL PULLING. OPTIMIZE X-RAY CHARACTERIZATION, SAWING, POLISHING, ION IMPLANTATION, AND TESTING.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
6 82 7707	AUTOMATED PROCESS CONTROL FOR MACHINING	133

PROBLEM	SOLUTION	TECHNOLOGY AREA
MACHINING OPERATIONS ARE SELECTED, PARAMETERS ARE SET, AND STANDARDS ARE ESTABLISHED EMPIRICALLY WITH LITTLE OR NO ENGINEERING ANALYSES, CONTROL OR FEEDBACK.	APPLY COMPUTERIZED CONTROLS FOR OVERALL SELECTION OF PROCESSES, OPERATIONS, PARAMETERS, FEEDBACK AND OPTIMATION, WITH AUTOMATED ESTIMATING AND DETERMINATION OF REAL TIME AND COSTS.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
* 6 82 8135	IN-PROCESS CONTROL OF MACHINING	557

PROBLEM	SOLUTION	TECHNOLOGY AREA
* DURING MFG. OF RECOIL CONTROL ORIFICES, ERRORS ARE INTRODUCED WHICH REQUIRE REWORK. CORRECTIVE ACTIONS INVOLVE COSTLY DETAILED INSPECTION AND REANALYSIS WITH COMPUTERIZED DESIGN PROGRAMS TO DEFINE POSSIBLE REWORK ALTERNATIVES.	AN IMPROVED MANUFACTURING METHOD UTILIZING ADAPTIVE CONTROLS AND AUTOMATED INSPECTION EQUIPMENT WILL BE ESTABLISHED. MACHINE TOOLS WILL BE RETROFITTED	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
* 6 82 8241	COMPUTER DIAGNOTSTICS + CONTROL FOR BORE GUIDANCE	303

PROBLEM	SOLUTION	TECHNOLOGY AREA
* THE BORE GUIDANCE SYSTEM CONSISTS OF MANY INTERDEPENDENT ELEMENTS MAKING IT DIFFICULT AND TIME CONSUMING TO DIAGNOSE PROBLEMS. ALSO, TUBES WITH LARGE WALL VARIATIONS GREATLY INCREASE THE DIFFICULTY IN MAINTAINING CONTROL.	COMPUTER CONTROL WILL MAKE POSSIBLE SUCH FEATURES AS SELF TESTING, CHCKING, MONITORING, AND CALIBRATION IN CONTROL, TEST, AND MEASUREMENT SYSTEMS.	MANUFACTURING CONTROL

PROJ NUMBER	TITLE	PROJ COST
* 6 82 8244	OPTIMIZE THE HEAT TREATMENT OF ROTARY FORGE TUBES	286

PROBLEM	SOLUTION	TECHNOLOGY AREA
* ROTARY FORGED TUBES ARE CUPRENTLY HEAT TREATED BASED ON HISTORICAL DATA. IF THE INITIAL CYCLE DOES NOT RESULT IN ADEQUATE PROPERTIES ADDITIONAL CYCLES ARE PERFORMED UNTIL ACCEPTABLE PROPERTIES ARE ATTAINED.	INFORMATION ON EACH PREFORM TOGETHER WITH HISTORICAL DATA WILL BE USED TO DEVELOP A COMPUTER PROGRAM TO GENERATE HEAT TREAT PARAMETERS. THIS WILL GREATLY INCREASE THE PROBABILITY THAT THE REQUIRED PROPERTIES WILL BE OBTAINED ON THE FIRST CYCLE.	SIM, MODEL, OP RESCH

PROJ NUMBER	TITLE	PROJ COST
F 82 3069	FUNCTIONAL SEGMENTATION OF THE AN/USM-410	120

PROBLEM	SOLUTION	TECHNOLOGY AREA
ARMY ELECTRONIC ITEMS MUST BE TESTED ON EXPENSIVE AUTOMATIC TESTERS THAT CONTAIN MORE CAPABILITY THAN NEEDED AND COST MORE THAN MOST FIRMS CAN AFFORD.	RECONFIGURE THE AN/USM-410 EQUATE TESTER TO PERMIT A MINIMUM OF MODULES TO DO SOME LOW ORDER TESTING AND PERMIT ADD-ONS TO BE ADDED TO UPGRADE THE GEAR TO HANDLE ADDITIONAL TESTS AS NEEDED. WORK ON SOFTWARE COMPATIBILITY.	TEST, INSP, EVAL

PROJ NUMBER	TITLE	PROJ COST
Q 82 8073	COMPUTERIZED COLOR MATCHING SYSTEM	218

PROBLEM	SOLUTION	TECHNOLOGY AREA
COLOR ACCEPTABILITY IS THE MOST TROUBLESOME PROBLEM IN CENTRAL DOD PROCUREMENT OF TEXTILE FOR CLOTHING THE MILITARY SERVICES.	AN INSTRUMENTAL COLOR INSPECTION SYSTEM ADAPTED TO VOLUME PRODUCTION OF TEXTILES, A SYSTEM WITH GREATER RELIABILITY, PRECISION AND CONSISTENCY.	TEST, INSP, EVAL

PROJ NUMBER	TITLE	PROJ COST
1 82 7371	INTEGRATED BLADE INSPECTION SYSTEM (IBIS)	654

PROBLEM	SOLUTION	TECHNOLOGY AREA
INSPECTION OF TURBINE ENGINE BLADES AND VANES NECESSITATES HIGH ACCURACY. THE EFFORT IS TIME CONSUMING AND SUSCEPTABLE TO ERROR.	THIS PROJECT WILL IMPROVE THE INFRARED, X-RAY, AND INFRARED THERMOGRAPHY INSPECTION MODULES BY INCREASING RELIABILITY, REPEATABILITY AND SENSITIVITY. ALSO, INSPECTION COSTS WILL BE REDUCES.	TEST, INSP, EVAL

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PROJ NUMBER	TITLE	PROJ COST
* 3 82 1076	AUTOMATIC RECOGNITION OF CHIPS	400

PROBLEM	SOLUTION	TECHNOLOGY AREA
* OPTICAL INSPECTION OF HYBRIDS BY AN OPERATOR IS INEFFICIENT DUE TO HUMAN FATIGUE INTRODUCED BY REPETITIVE INSPECTION OF SMALL CIRCUITS. A COMPUTER CONTROLLED OPTICAL PATTERN RECOGNITION SYSTEM FOR COMPLEX HYBRID CIRCUITS IS NEEDED.	MODIFY EXISTING OPTICAL PATTERN RECOGNITION EQUIPMENT TO RECOGNIZE COMPONENT AND BOND PAD ALIGNMENT FOR LARGE NUMBERS OF ELECTRONIC DEVICES PER SUBSTRATE.	TEST, INSP, EVAL

PROJ NUMBER	TITLE	PROJ COST
* 3 82 1092	AUTOMATIC TESTING OF SUBSTRATES	250

PROBLEM	SOLUTION	TECHNOLOGY AREA
* THICK FILM SUBSTRATES ARE HARD TO TEST BEFORE THE COMPONENTS ARE APPLIED FOR CONTINUITY. IF A BED OF NAILS OR PROBE IS USED IT COULD MAGE THE PADS OR CIRCUITRY. IF THE COMPONENTS ARE ATTACHED, THE SUBSTRATE COULD HAVE BEEN DEFECTIVE.	DEVELOP AN ELECTRON BEAM SCANNER THAT WILL INSPECT A THICK FILM SUBSTRATE BY CHARGING EACH THICK FILM CONDUCTOR AND LOOK FOR OPENS AND SHORTS. A COMPUTER WILL DRIVE THE BEAM AND LOOK AT DETECTORS FOR BACKSCATTER. A LIBRARY OF DEFECTS WILL BE DEVELOP	TEST, INSP, EVAL

PROJ NUMBER	TITLE	PROJ COST
* 5 82 4237	CONTINUOUS TNT PROCESS ENGINEERING	350

PROBLEM	SOLUTION	TECHNOLOGY AREA
* CURRENT CIL PROCESS REQUIRES PROCESS AND SAFETY IMPROVEMENTS.	DESIGN AND BUILD A CIL LINE TO TEST PROCESS IMPROVEMENTS.	CONTINUOUS FLOW PROCESS

APPENDICES

APPENDIX A - LATE SUBMITTALS

APPENDIX B - DISTRIBUTION LIST

LATE SUBMITTALS

The project information provided below was submitted late in the programming cycle and is not reflected elsewhere in the report. The US Army Depot System Command is the sponsoring organization.

Project G 81 2001: Provide Prototype Robots for Automated Blast Cleaning

Summary - This effort, programmed for $133.4K in FY81 and $283.1K in FY82, will develop technology to apply robots to blast cleaning operations.

Project G 80 4002: Robotized Welding of MM113A2 Suspension

Summary - This effort will be directed toward integrating robot technology into welding operations. Planned funding is FY80 - $316K and FY81 - $74K.

Project G 81 4003: Rubber Injection Molding of Double Pin Track

Summary - This effort will develop an automated robot injection molding process for fabrication of rubber track pads. Planned funding is FY81 - $345K and FY82 - $118K.

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