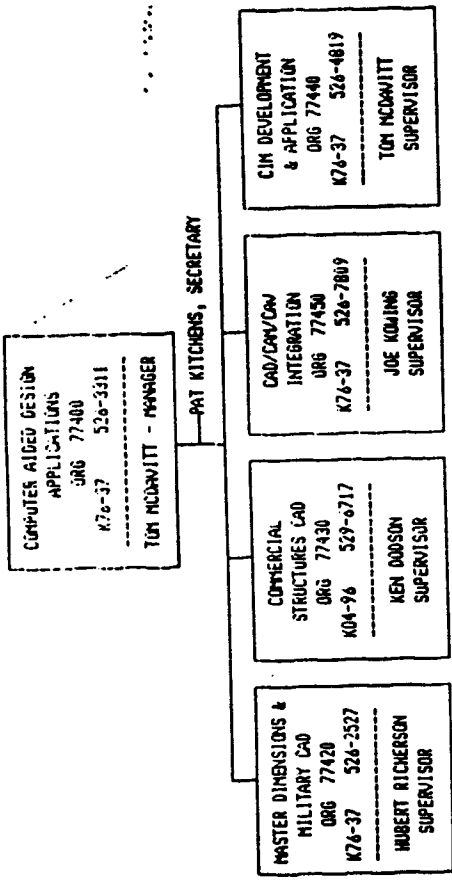


CAD - COMPUTER AIDED DESIGN

CAM - COMPUTER AIDED MANUFACTURING

CAV - COMPUTER AIDED VERIFICATION

KEN DODSON  
COMMERCIAL CAD GROUP  
77430/529-6717  
JUNE 1987

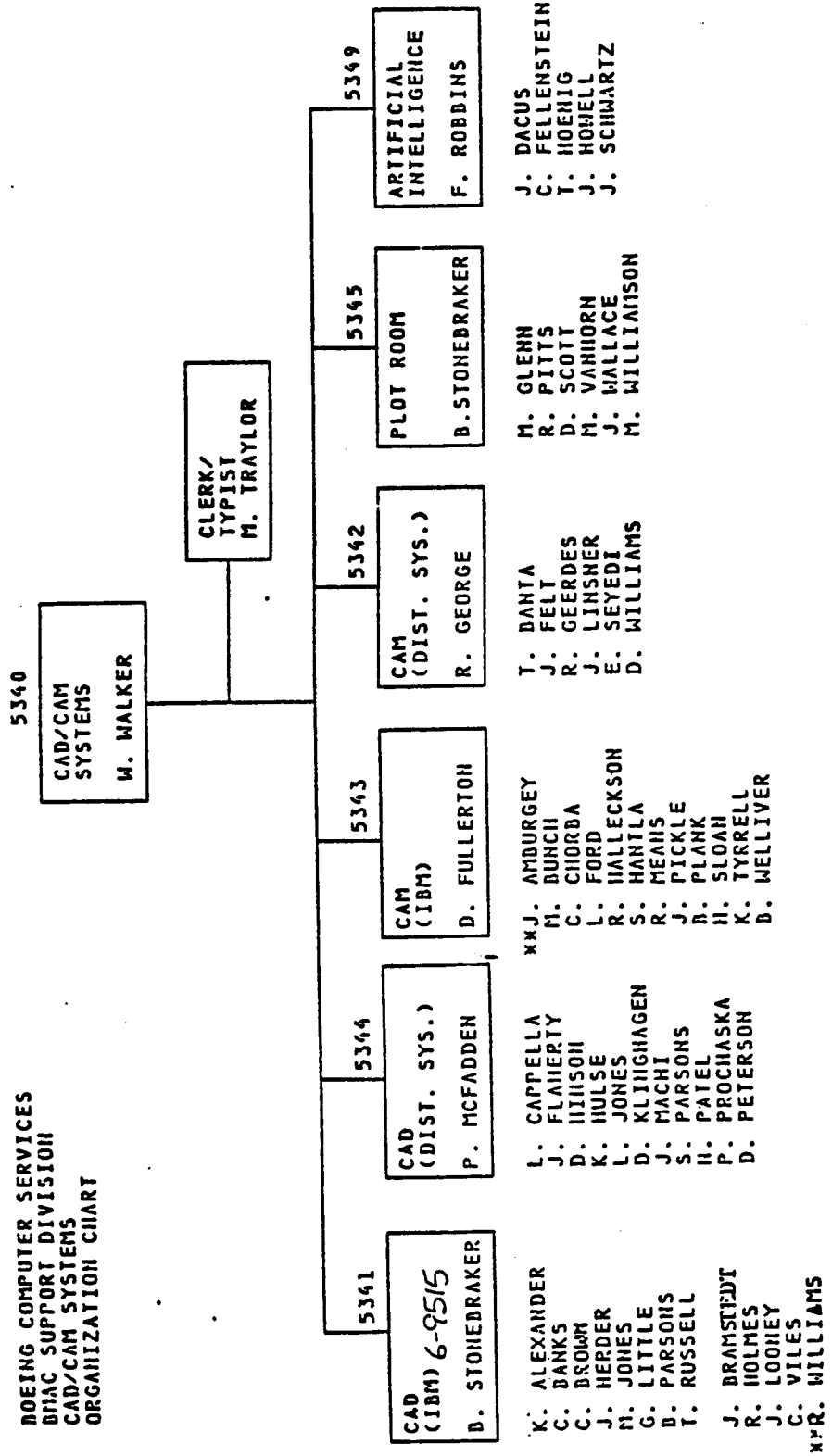


- ENGINEERS**
- DAVID DELLINGER
  - DAVID FULTON
  - DARRELL BLANTON
  - \* ROO JACKSON
  - MARY JAHNS
  - SHERRY MEERTENS
  - MIKE REED
  - LARRY ROBBINS
  - JACK SANDBERG
  - ROGER SHAWSON
  - JIM WATSON
  - LARRY WELKER
  - BRADLEY WELTY
  - GARY WOLFF
- ENGINEERS**
- ROBERT BROGAN
  - DIANE FILLIPI
  - TOM BLAVES
  - BARRY GRUBER
  - BRUCE KNUDSON
  - KEVIN LOONIS
  - LANE MYERS
- ENGINEERS**
- WES HENDERSON
  - RONDY WEST
- PEA**
- DICK PRICE
  - BOB STALCUP
- ON-SITE BRAC-SD SUPPORT**
- BCS PROG. MGR.
  - 5341 TERRY RUSSELL
  - 5341 MELODY JONES
  - 5336 LYNN JONES
  - 5400 DICK TITTERINGTON
- ON-SITE OPS SYSTEM SUPPORT**
- 2057 DENNIS MCBURNEY

- DRAFTERS**
- GALE ANSCHUTZ
  - KATHY HUGH
  - CONNIE KING
  - \* BOB LEHR
  - \* CLYDE MORRISON
  - WILLIS MUTH
  - LORAN REPP
- DRAFTERS**
- \* GARY ACKERMAN
  - ROY FISHER
  - RUSS GOJIN
  - PAN LEBLOND
  - LINDA SMITH
  - MARTHA WERRY-BAGWELL
- DRAFTERS**
- BETTY ARNOLD
  - DICK BEREMAN
  - KARL JONES
  - SONORA PFORTMILLER
- GENERAL OFFICE**
- WILMA POPCHONE
  - CATHY CURTINS
  - JENNIFER DRESSLER
- GENERAL OFFICE**
- GENERAL OFFICE
  - MARY JONES

CLASSIFICATION	TOTAL
SUPERVISORS	4
MEA	23
PROJECT LEADER	1
PWA	1
DRAFTERS	17
GENERAL OFFICE	5
<b>TOTAL</b>	<b>51</b>
ON LOW	4
<b>TOTAL ON BOARD</b>	<b>47</b>

BOEING COMPUTER SERVICES  
 B71AC SUPPORT DIVISION  
 CAD/CAM SYSTEMS  
 ORGANIZATION CHART

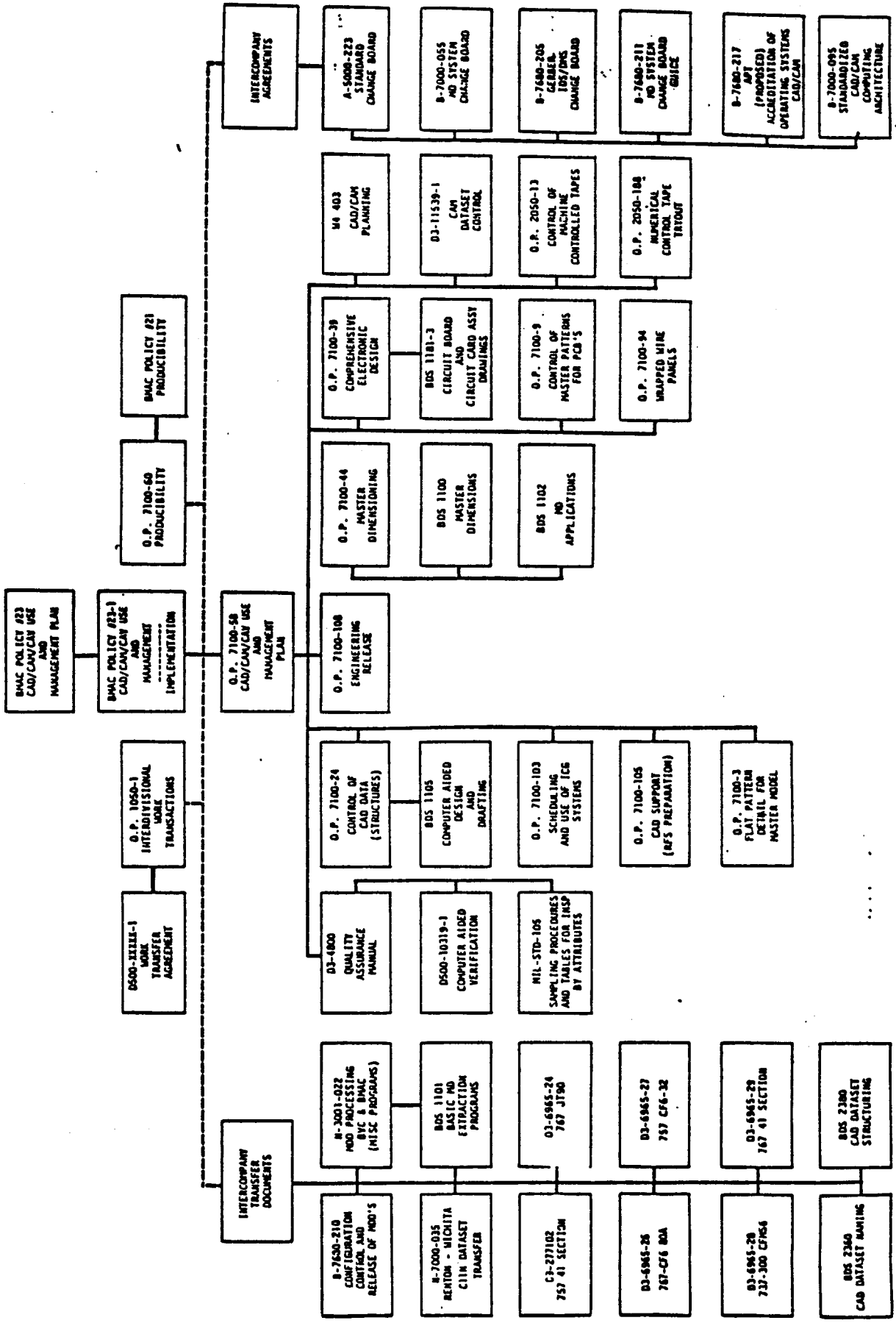


P/C	20	46	66	80	TOT
NO.	32	12	10	6	60

OCTOBER 1986

MFR. LOAN

# CAD/CAM/CAV PROCEDURES TREE



## BOEING ACRONYMS

MD MASTER DIMENSIONS  
CAD COMPUTER AIDED DESIGN  
MDD MASTER DIMENSIONS DEFINITION  
MDI MASTER DIMENSIONS IDENTIFIER  
ICG INTERACTIVE COMPUTER GRAPHICS  
IDS INTERACTIVE DESIGN SYSTEM  
APT AUTOMATICALLY PROGRAMMED TOOL  
TX95 BOEING MATH DEFINITION & EXTRACTION  
CV COMPUTER VISION  
CAM COMPUTER AIDED MANUFACTURING  
CAV COMPUTER AIDED VERIFICATION  
N/C NUMERICAL CONTROL  
DNC DIRECT NUMERICAL CONTROL  
CNC COMPUTER NUMERICALLY CONTROLLED

TX-95 - BOEING UNIQUE DEFINITION/EXTRACTION SYSTEM  
IBM MAINFRAME - REMOTE TERMINAL TSO ACCESSED  
BATCH PROCESS - 300K SIZE - 3000 SUBROUTINES - FORTRAN BASED  
SUBSET (FIGURE) INTERACTIVE - CPU INTENSIVE - EXPENSIVE  
COMPANY-WIDE COMPATIBLE UNDER CHANGEBOARD CONTROL

*each subroutine is 100 key lines*

## MDD'S

MASTER DIMENSION DEFINITIONS (MDD) IS A MATHEMATICAL SURFACE DEFINITION REPRESENTATION OF A PORTION OF A PRODUCT OR THE TOTAL PRODUCE I.E. PILOT AREA 41 SECTION, BODY CONSTANT SECTION, WING, BOX, L.E., FIN, STABILIZER AND ETC. EACH DEFINITION IS UNIQUELY IDENTIFIED BY NUMBER AND MODEL, AND IS APPROVED BY APPLICABLE ENGINEERING DESIGN GROUPS. THE APPROVED MDD RESIDES ON A RELEASED FILE CALLED USERS FILE.

THE MDD ENCOMPASSES THE LOFTING PHASE OF PRODUCT DEFINITION.

# MASTER DIMENSION DEFINITIONS

## MDD'S

**SIMPLE MDD'S 250-350 MH + \$3000 BCS**

**GENERAL MDD'S 350-500 MH + \$6000 BCS**

**COMPLEX MDD'S 500-800 MH + \$12000 BCS**



**AERO STRUT**

Q660 INBD STRUT-FWD INBD SIDE  
(STA 100 - STA 283)

Q661 INBD STRUT-FWD-OUTBD SIDE  
(STA 100 - STA 283)

Q662 INBD STRUT-MID-INBD SIDE  
(STA 283 - STA 387.2196)

Q663 INBD STRUT-MID-OUTBD SIDE  
(STA 283 - STA 387.2196)

Q664 INBD STRUT-AFT-INBD SIDE  
(STA 387.2196 - STA 595.4382)

Q665 INBD STRUT-AFT-OUTBD SIDE  
(STA 387.2196 - STA 595.4382)

Q666 OUTBD STRUT  
FWD-INBD SIDE  
(STA100-STA283)

Q667 OUTBD STRUT  
FWD-OUTBD SIDE  
(STA100-STA283)

Q668 OUTBD STRUT  
AFT-INBD SIDE  
(STA283-STA518.879)

Q669 OUTBD STRUT  
AFT-OUTBD SIDE  
(STA283-STA518.879)

**UPPER BIFURCATION AND  
CORE COWL HINGE FAIRING**

Q630 FWD-INBD & OUTBD NAC  
(STA 194.4 - STA 260.5)

Q631 AFT - INBD NAC  
(STA 250 - STA 419.397)

Q632 AFT - OUTBD NAC  
(STA 250 - STA 412.627)

Q628 PRIMARY NOZZLE - OUTER  
(STA 299.36 - STA 360.844)

Q627 FAN DUCT INNER WALL  
AND CORE COWL  
(STA 191.5 - STA 304.5)

Q645 T/R TRACK FAIRING  
(STA 195.5 - STA 260)

Q625 T/R COUL  
(STA 195.5 - STA 249.5)

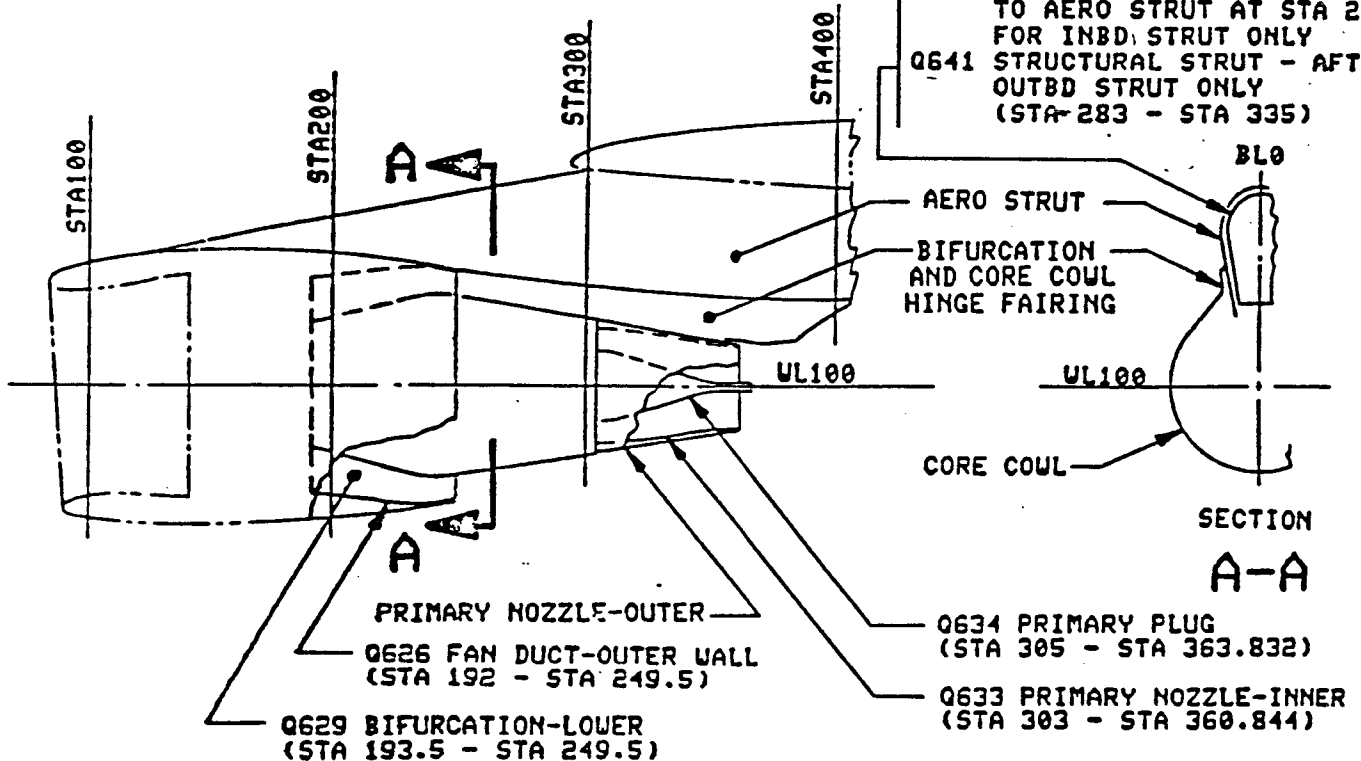
Q624 FAN COUL SUPPORT BEAM  
(STA 130 - STA 195.5)

Q622 INLET-OUTER  
(STA 90 - STA 141)  
(UPPER 66 DEGREES)

Q623 FAN COUL  
(STA 139 - STA 195.5)  
(UPPER 66 DEGREES)

Q640 STRUCTURAL STRUT - FWD  
INBD AND OUTBD  
(STA 202 - STA 283)  
NOTE: STRUCTURAL STRUT TANGENT  
TO AERO STRUT AT STA 283  
FOR INBD STRUT ONLY

Q641 STRUCTURAL STRUT - AFT  
OUTBD STRUT ONLY  
(STA 283 - STA 335)



**CF6-80C2 NACELLE MDD INDEX - 747**

- MDI'S

MASTER DIMENSION IDENTIFIERS (MDI'S) ARE EXTRACTIONS FROM MDD'S. THEY ARE USUALLY USED IN SUPPORT OF STRUCTURAL MEMBERS. THEY REPLACE THE OLD LOFT LINES CONCEPT FOR EACH INDIVIDUAL RIB OR FRAME CUT. DOOR OPENING PERIPHERY ARE ANOTHER MDI INCLUSION. FOR RIBS AND FRAMES, A CUT 1 INCH BOTH FORWARD AND AFT IS REQUIRED TO FORMULATE BEND ANGLES FOR FLANGES SO THEY WILL FIT THE SKIN CONTOUR.

REV  
LTR

PAGE 1 OF 6

MDR KC133-ME-203

DWG

MOD 130

NOV 03, 1980

MODEL KC133

KC133 MDI 710064

OUTSIDE SKIN SURFACE  
CPM-56 FAN DIAPHRAGM AND PRIMARY AFTERBODY (MACELLE A4)  
UNITS - IN  
TYPE - S

MSTA PLANE 236.0250  
COORDINATE SYSTEM IS INBD MACELLE RIGHT

MSTA	MHL	MHL
236.0250	100.0000	75.6741
236.0250	100.3195	75.6762
236.0250	100.7379	75.6853
236.0250	101.1561	75.7015
236.0250	101.5740	75.7250
236.0250	101.9914	75.7557
236.0250	102.4081	75.7935
236.0250	102.8242	75.8306
236.0250	103.2395	75.8907
236.0250	103.6537	75.9500
236.0250	104.0669	76.0166
236.0250	104.4789	76.0900
236.0250	104.8896	76.1705
236.0250	105.2988	76.2582
236.0250	105.7065	76.3529
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SCALE NONE

SM 100

SCALE NONE

SM 100

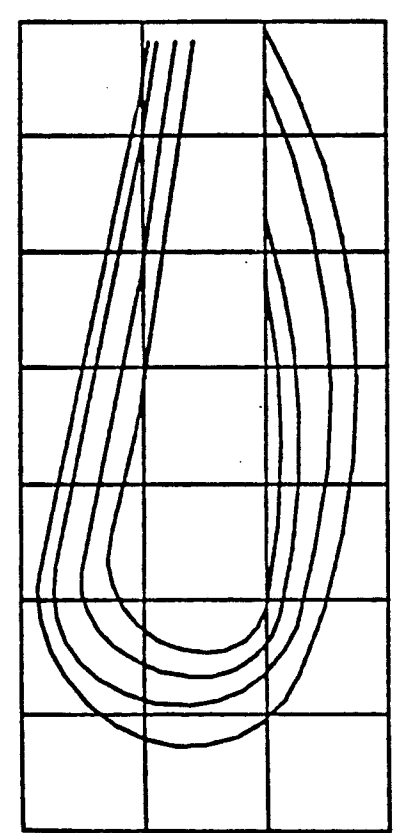
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96

'6

6

0 1 OF 1  
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 PNC                    MODEL 65110  
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 COMPUTER USER MANUAL  
 CHECK FOR REVISIONS - 1990 65110000 INCHES (0.1) UNIT - IN      CAT-00-001000  
 COMPUTER SYSTEMS GROUP      000-0000  
 UNIT      PLAN      000-0000  
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 000-0000      100-0000      000-0000  
 000-0000      100-0000      000-0000  
 000-0000      100-0000      000-0000  
 000-0000      100-0000      000-0000  
 000-0000      100-0000      000-0000  
 000-0000      100-0000      000-0000  
 000-0000      100-0000      000-0000



COMPUTER-DRAWN

***BOLING***

**MDI PLOTS**  
**&**  
**OFFICIAL MDI'S**

APT DRAWING DATA SETS ARE PRODUCED ON THE IBM MAINFRAME COMPUTER USING BATCH MODE. APT IS USUALLY APPLIED TO MACHINED PARTS OR LIKE FAMILY OF SHEET METAL DETAILS AND ASSEMBLY DRAWINGS. MDI'S CAN BE UTILIZED TO LOCATE OR MATE A SURFACE. THE APT CAD DRAWING IS DEVELOPED FROM LAYOUTS, SKETCHES, WORD OF MOUTH, ETC. THE MORE FORMALIZED THE INPUT THE FEWER ITERATIONS AND THE BETTER DRAWING IS PRODUCED IN A SHORT TIME SPAN.

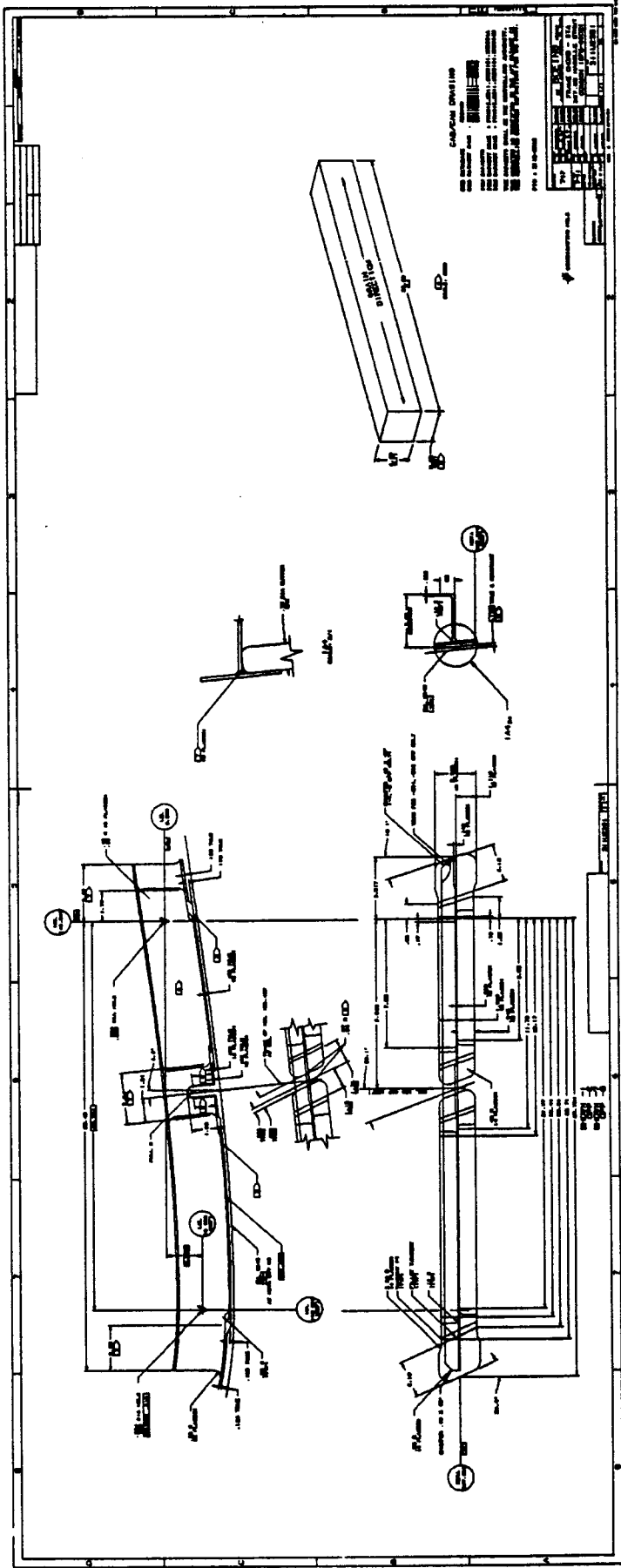
IBM INDUSTRY WIDE COMPATIBLE N/C LANGUAGE

IBM MAINFRAME - REMOTE TERMINAL TSO ACCESSED

BATCH PROCESS - 300K SIZE - FORTRAN BASED - APT LOFT -

NCT080 FLAT PATTERN - MDD INTERSECTION (MD/NC INTERFACE)

COMPANY-WIDE COMPATIBLE UNDER CHANGEBOARD CONTROL



IDS DRAWING DATA SETS ARE PRODUCED ON A GRAPHICS INTERACTIVE DESIGN SYSTEM, THE MDI'S ARE TRANSFERRED FROM THE MAINFRAME COMPUTER TO THE IDS SYSTEM WHERE THE TOTAL ENGINEERING DRAWING MAY BE CONSTRUCTED AND LETTERED. THE CAD DRAWING IS DEVELOPED FROM LAYOUTS, SKETCHES, WORD OF MOUTH, ETC. THE MORE FORMALIZED THE INPUT THE FEWER ITERATIONS AND THE BETTER DRAWING IS PRODUCED IN A SHORT TIME SPAN.

IDS IS USED IN ENGINEERING AS A DRAFTING TOOL ENABLING THE GEOMETRY TO BE PASSED ON TO THE MANUFACTURING SIDE. THERE THEY, MANUFACTURING, DEVELOP N/C "CHIP" TAPES THAT CUT THE INDIVIDUAL PARTS. IDS IS USUALLY APPLIED TO SHEET METAL DETAILS AND ASSEMBLY AND INSTALLATION DRAWINGS.

INTERACTIVE COMPUTER GRAPHICS  
TELECOMMUNICATION COMPATIBLE WITH TX95 & APT  
GERBER INTERACTIVE DESIGN SYSTEM (TURNKEY)  
APOLLO/GRAFTEK INTERACTIVE DESIGN SYSTEM (TURNKEY)  
COMPUTERVISION SYSTEM (CV) (TURNKEY)  
CIIM (IGES) COMPATIBLE

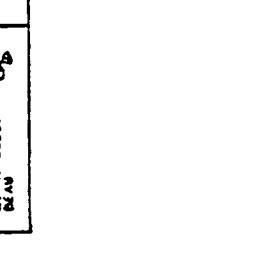
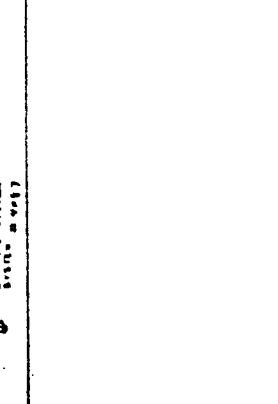
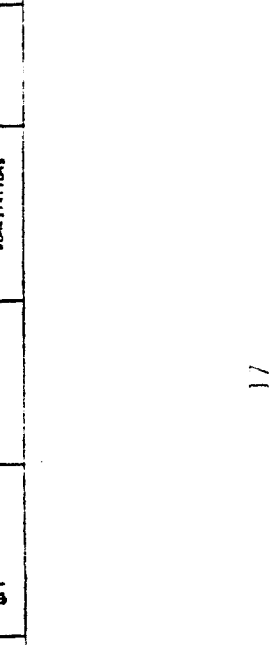
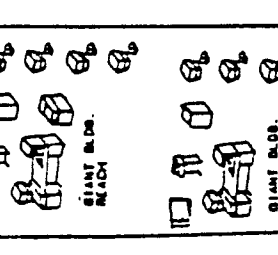
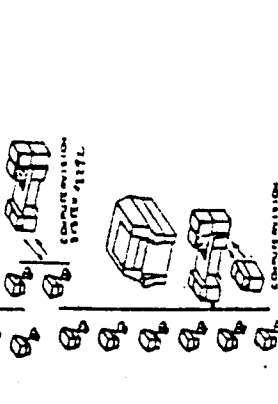
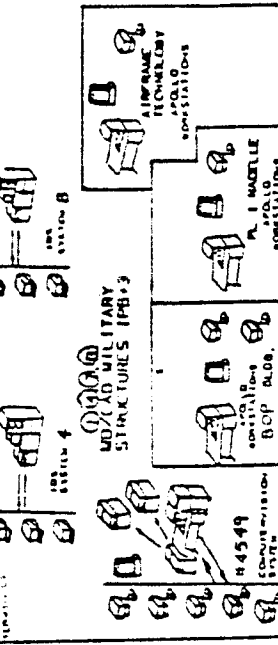
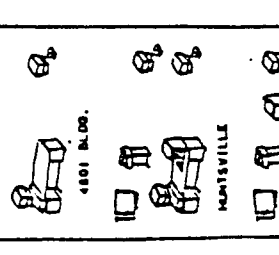
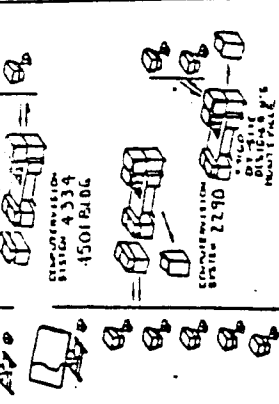
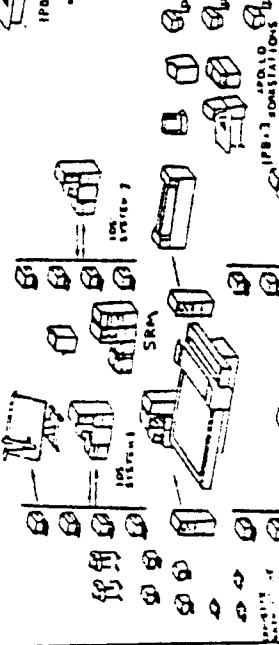
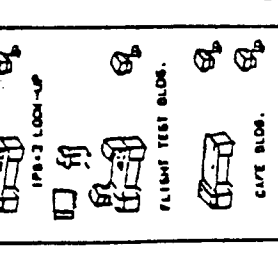
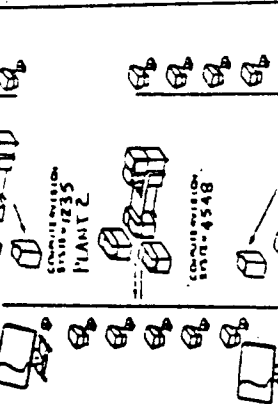
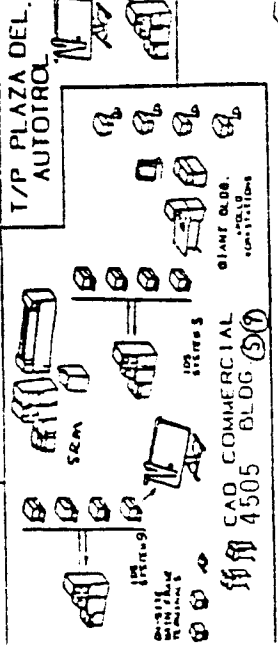
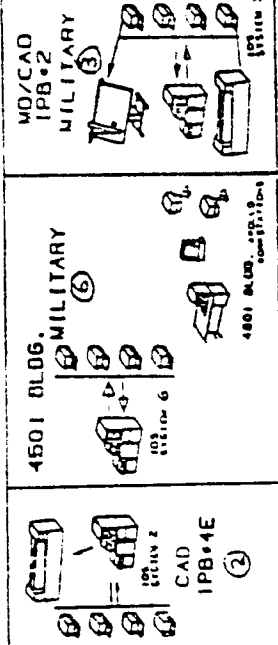
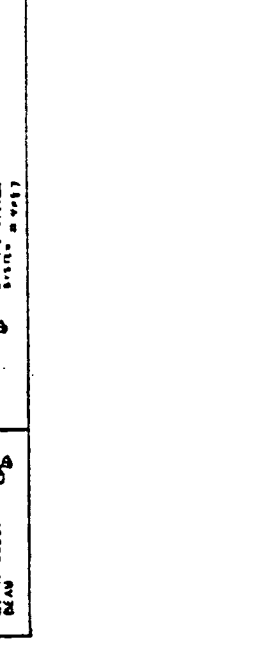
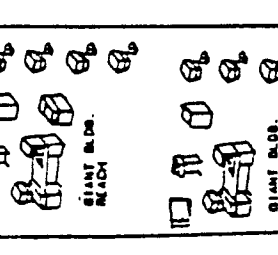
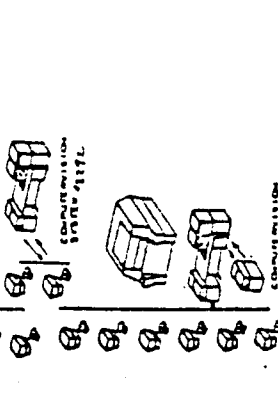
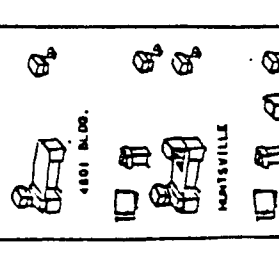
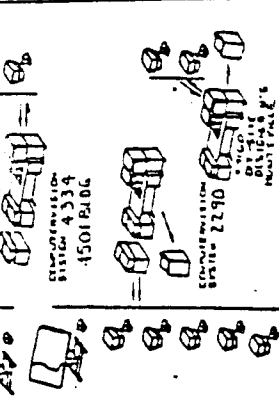
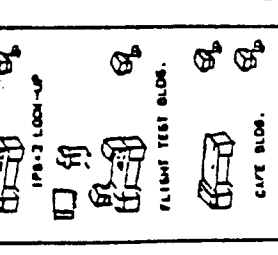
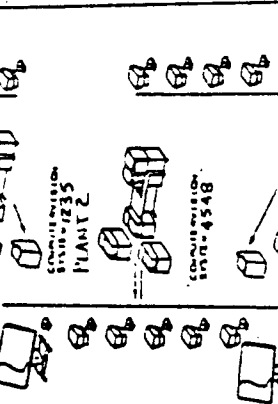
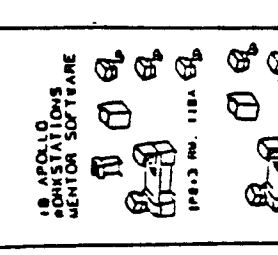
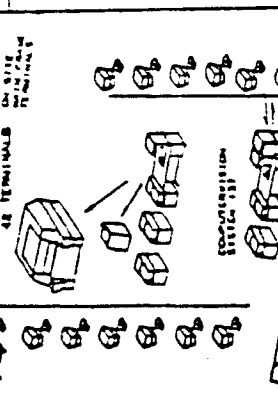
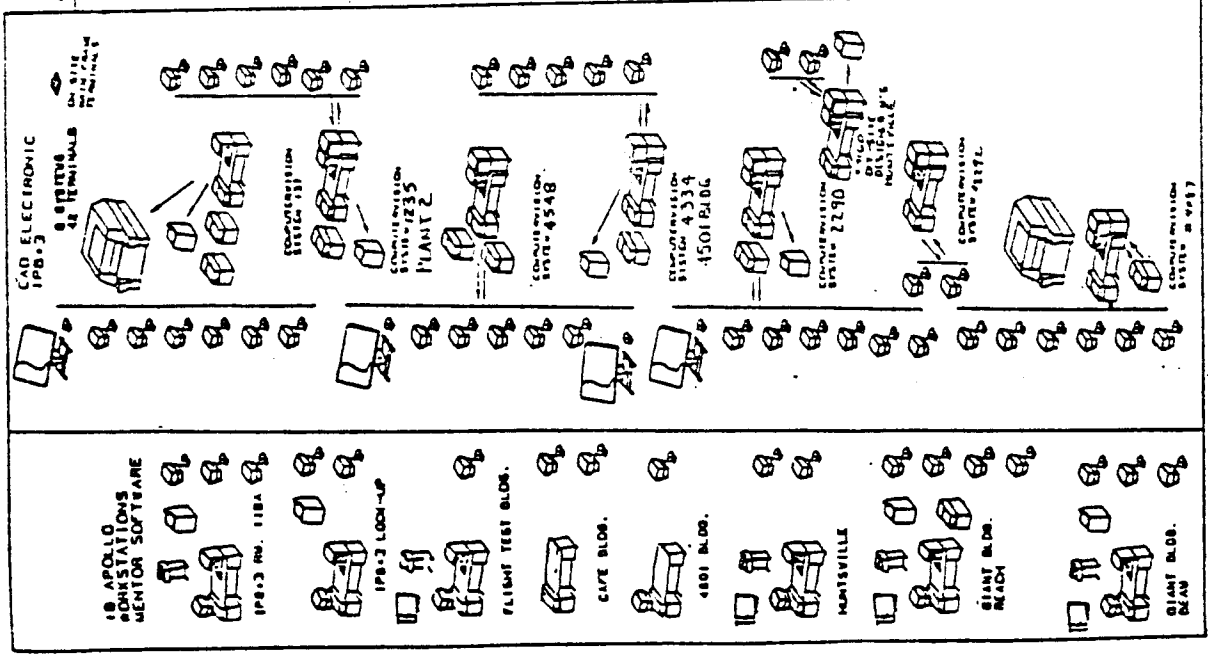
WICHITA CONTROLLED ICG WORK STATIONS

ENGINEERING		
ELECTRONIC CAD		
COMPUTER VISION WORKSTATIONS	36	
APOLLO/GRAFTEK WORKSTATIONS	60	
TOTAL	<u>96</u>	
MECHANICAL CAD		
GERBER IDS WORKSTATIONS	40	
COMPUTER VISION WORKSTATIONS	5	
APOLLO/GRAFTEK WORKSTATIONS	100	
CIMLINC WORKSTATIONS	4	
AUTOTROL WORKSTATIONS	4	
IBM CADAM WORKSTATIONS	15	
TOTAL	<u>168</u>	
OPERATIONS/MANUFACTURING		
GERBER IDS WORKSTATIONS	16	
CIMLINC WORKSTATIONS	46	
TOTAL	<u>62</u>	
BCS		
GERBER IDS WORKSTATIONS	1	
APOLLO/GRAFTEK WORKSTATIONS	2	
TOTAL	<u>3</u>	



2/14/6  
RFA

# GENERAL BUILDING METROPLEX



# CAD/CAM DRAWING

GDB DATABASE : R30000  
 GDB DATASET NAME : E311U2351S1--0000D  
 E311U2351S1--0001D  
 E311U2351S1--W002D  
 IBM DATASETS  
 IBM DATASET NAME : PR431E.E311.U2351S1.XX0001A  
 IBM DATASET NAME : PR431E.E311.U2351S1.XX0001M

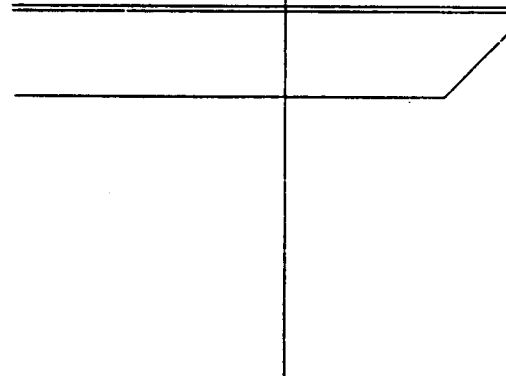
THE DATASETS SHALL BE THE CONTROLLING AUTHORITY.  
 THE GEOMETRY AS IDENTIFIED IN THE APT DATASET IS  
 THE CONTROLLING COMPUTER DEFINITION FOR THE PART.

PIN : 3113-2500

INATING HOLE

USED ON	DRAN D. FRANSEEN	5/22/74	THE BOEING COMPANY CORPORATE OFFICES SEATTLE, WA 98124
747	CHECKED F.A.P. W. HACKLER	L/1/74	
SECT NO.	DESIGNER P.A.H.	L/7/74	FRAME CHORD - STA 267.00 NACELLE STRUT COMMON (CFB-80C2)
7-11	DRW F. PARSONS	5/21/74	
Q-# NO.	STM B. GREEN	L/7/74	PRG NO.
17-3113Z5	GROUP		311U2351
GROUP ENG	PRDR P. MURPHY	L/12/74	
DRW # PLT	INFB G. KEITER	L/12/74	SCALE 1/1
TOLERANCES:			SH
AS 1/2 DECIMALS			

NTC. M. PARKS L/11/74



311U4170-28

COMPLETE DEFINITION BY DATASET

DATASET IS SOLE AUTHORITY. DIMENSIONALLY STABLE COPIES MUST BE OBTAINED FROM DATASET.

DATABASE: R30000A  
 DATASET: E311U4170S06--D

DATASET: E311U4170S06--D  
 DATA BASE: R30000A  
 RELEASE DATE: 08/01/86  
 EXECUTION DATE: 08/01/86  
 ALIAS: BYWT  
 LEVELS PLOTTED: 0-255

PIN 3111-4700

$\varnothing$  .250 ± .010 DIA TOOL HOLE  
 TOLERANCES ARE IN INCHES  
 UNLESS OTHERWISE SPECIFIED


TOLERANCES:  
 ANGLES: - DECIMALS: .03

3

PCM

FOR INFORMATION OF THE USER, THESE DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. DIMENSIONS SHOWN ARE THE DIMENSIONS OF THE PART AS MANUFACTURED. DIMENSIONS IN PARENTHESES ARE THE DIMENSIONS OF THE PART AS SHOWN ON THE DRAWING. DIMENSIONS IN PARENTHESES ARE THE DIMENSIONS OF THE PART AS SHOWN ON THE DRAWING. DIMENSIONS IN PARENTHESES ARE THE DIMENSIONS OF THE PART AS SHOWN ON THE DRAWING.

SEE PL FOR LIST OF MATERIAL, USAGE AND NOTES

USED ON	747	DRN	PATRICIA IKEDA	5/23/86	 CORPORATE OFFICES SEATTLE, WA 98124
		CHECKED	KWE	7/11/86	
			J. POLK		
			STRESS		
SECT NO.	7-11	ENGR	PATRICIA IKEDA	5/23/86	FAIRING INSTL-
		MFG ENGR	H. GYSNYT	7/23/86	LOWER STRUT,
ENG NO.	17-3111147	GROUP	M. VERMILITE	7/23/86	INBD NAC. PW4256
		PROJ			SIZE FSC NO. DRG NO.
GROUP DRG					E 81205 311U4170
PWR #PLT		NTC	M. W. WILLIAMS	7/25/86	SCALE 1/1
					SH 6

DRAWING RECORDS

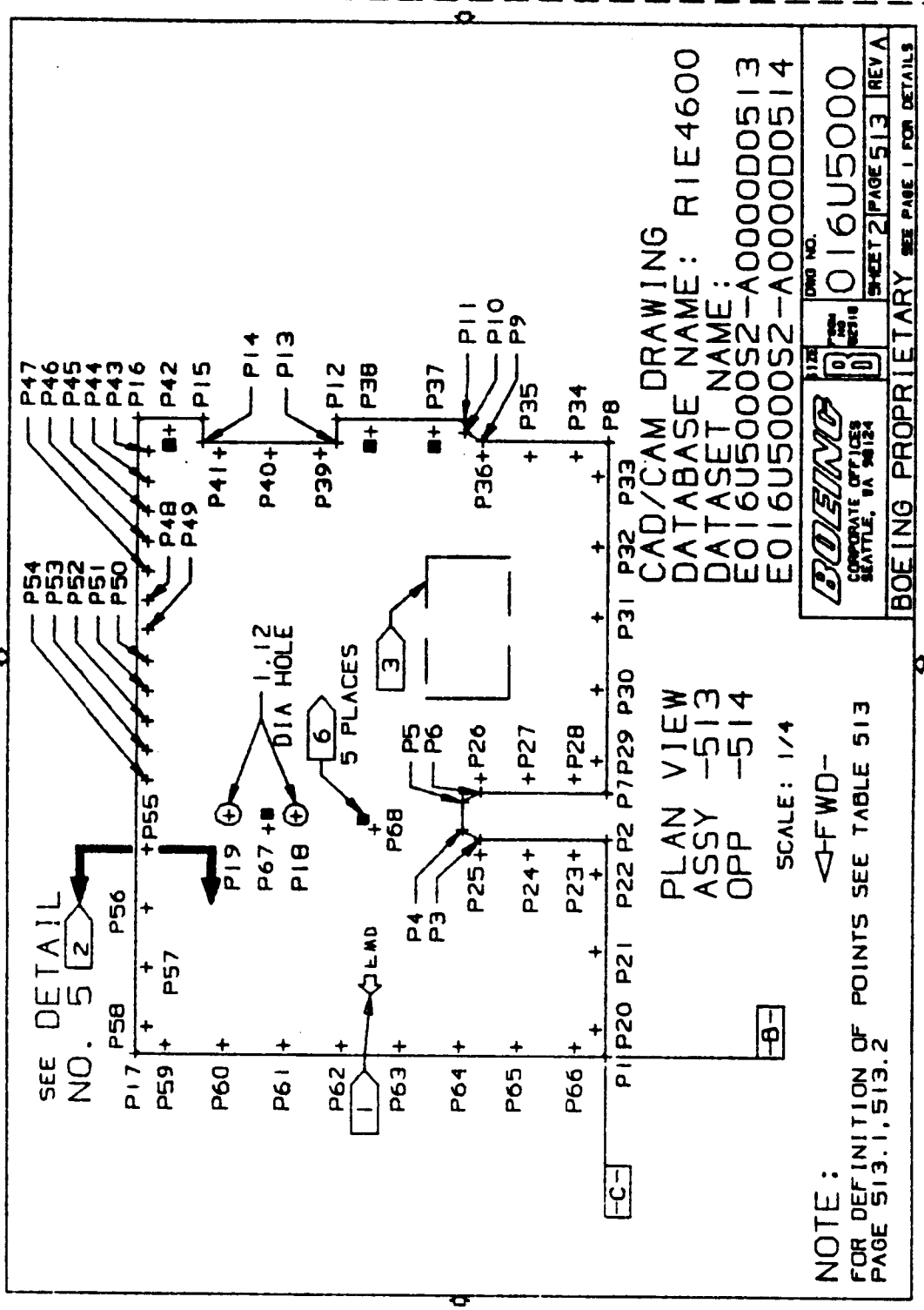
DRG NO.

311U4170

SHEET

REV

C



CAD/CAM DRAWING  
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 DATASET NAME:  
 E016U500052-A00000513  
 E016U500052-A00000514

 CORPORATE OFFICES SEATTLE, WA 98124	SIZE 0	DRW NO. 016U5000
	SHEET 2	PAGE 513
BOEING PROPRIETARY SEE PAGE 1 FOR DETAILS		

PLAN VIEW  
 ASSY -513  
 OPP -514  
 SCALE: 1/4

NOTE:  
 FOR DEFINITION OF POINTS SEE TABLE 513  
 PAGE 513.1, 513.2



# REQUEST FOR SERVICE

CAD Use Only

RFS No. \_\_\_\_\_  
Est. Manhours \_\_\_\_\_  
Charge No. \_\_\_\_\_  
AEMIS Milestone Reference No. \_\_\_\_\_

**Program Information:**

Requesting Organization \_\_\_\_\_ Org. No. \_\_\_\_\_ M/S \_\_\_\_\_  
Requestor \_\_\_\_\_ Phone \_\_\_\_\_  
Subject:  
Drawing No. \_\_\_\_\_ App. Supervisor \_\_\_\_\_  
EWI or WBS No. \_\_\_\_\_ Date \_\_\_\_\_

**Description of Service Required:**

⋮

**Brief Description of Input Data (Attach Detail Data):**

**Committed Schedule:**

Requesting Group Dates

CAD Group Dates

Change Board Date \_\_\_\_\_

**Milestone Approval**

**Milestone Explanation**

	Initial	Date
Requestor		
CAD		

▽	_____	▽	_____	▽	_____
▽	_____	▽	_____	▽	_____

**CAD Use Only**  
**Special Notes:**

**Job Completion:**

Date \_\_\_\_\_

Requestor's Signature \_\_\_\_\_

CAD Signature \_\_\_\_\_



SUBJECT: USE AND MANAGEMENT

## I. OBJECTIVE

To provide a method for assuring consideration of the use of Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), and Computer Aided Verification (CAV) capability in the early program planning and commitment activity of all Boeing Military Airplane Company (BMAC) Programs and to assure that proper planning takes place to provide coordination, equipment and manpower resources.

## II. GENERAL

- A. All CAD resources are controlled, assigned, and maintained by the BMAC Research and Engineering - CAD Applications Manager, (hereafter referred to as CAD Group). The CAD group is responsible for evaluating, developing, and installing new or additional CAD systems. The CAD group is also responsible for defining and managing storage and control of the database.
- B. Program CAD users will provide feedback to the CAD group to aid in assuring that CAD group activities are achieving the goal of improved productivity.
- C. The Operations Systems and Development group is responsible for functional coordination to establish requirements for evaluating, developing, and installing new CAM systems. This group is also responsible for defining and managing storage and control of the CAM database.
- D. All CAV resources are subject to approval by the Director of Quality Assurance.
- E. Each BMAC program (including manufacturing Interdivisional Work Authorization (IDWA) and Intracompany Work Authorization (ICWA) programs) which results in a manufactured product shall be reviewed for CAD/CAM/CAV data requirements. If it is determined that no CAD data requirement exists, a CAD/CAM/CAV plan shall be issued with the normal cover and signature pages and a single sheet stating, NO CAD DATA REQUIRED. If it is determined that a CAD data requirement does exist, a CAD/CAM/CAV plan shall be developed, documented and implemented by the program in the earliest stages of the program life, shall be approved by the Program Manager and the Program Chief Engineer/Program Engineering Manager, and shall be duly committed and recorded in the official documentation of the program's Change Management and Commitment activity (Change Board/Document of Industrial Engineering (D-IE)). The program shall call upon Research and Engineering - CAD, Manufacturing Engineering, Operations Systems and Development, and Quality Assurance to assist in establishing the plan.

Each CAD/CAM/CAV Plan shall include, but not be limited to, the following:

1. A description of the work to be accomplished on CAD, on CAM, on CAV or jointly on CAD, CAM, and CAV.

## MANUFACTURING INPUT TO CAD/CAM PLAN

Ref. O.P 7100-58

A formal agreement (CAD/CAM Matrix & CAD/CAM Plan) document is required for each project. The CAD data required by BMAC engineering formally released so Manufacturing side can utilize CAM.

### CAD/CAM Plan Overview

With the use of Interactive Design Systems and Batch-APT in both CAD and CAM organizational units, current proven cost-effective numerical control practices can now be extended to fabrication and assembly areas for machining, boring, routing, punch press, automated riveting and tube bending.

This plan will be to establish coordination between Engineering and Operations to define the areas of potential cost impact opportunities, the scope of CAD applications and the development of an over all CAD/CAM concept applicable to this program.

### CAD/CAM Matrix

The CAD/CAM matrix defines the "CAM Applications/Requested CAD Data" relating to each P.I.N. identifier, including priorities and type of data required.

The matrix is structured similar to the existing CAD/CAM Plans currently in use at Boeing Wichita Company, with the intention of providing a format which will be used to identify the negotiated CAD data to be supplied", from which engineering release dates can be established during subsequent DIE negotiations.

On matrix line item entries, where manufacturing priorities have been applied to both the assembly, and to each of its components, the intent is to relay to Engineering that there are CAD/CAM applications within the assembly, and that they are further identified to the specific component.

If Engineering chooses to supply CAD Data for the entire assembly, they can then determine specific request for CAD Data (I or A, etc.) from the detailed component breakout.

When CAD/CAM negotiations have been completed, this matrix will be completed to include the "CAD Data to be Supplied".

\* A CAD/CAM plan for each program is required.

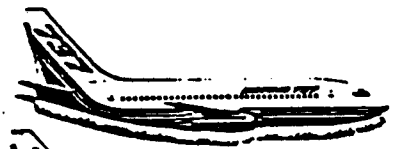
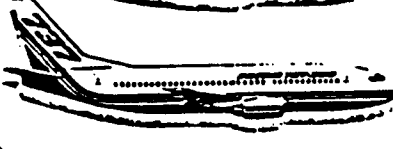
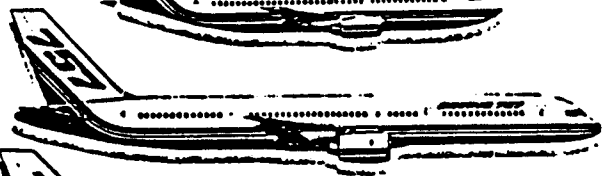
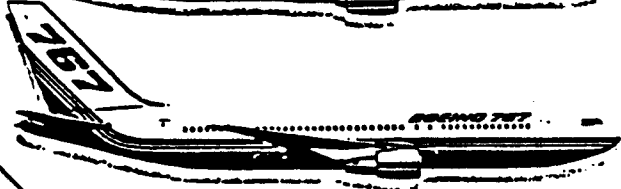

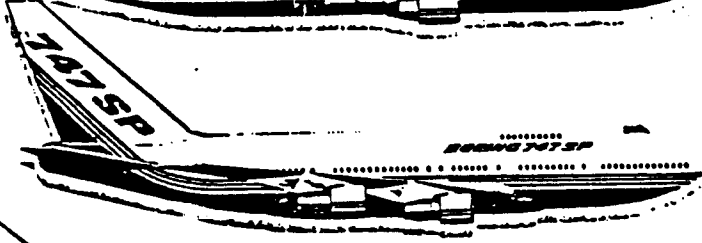
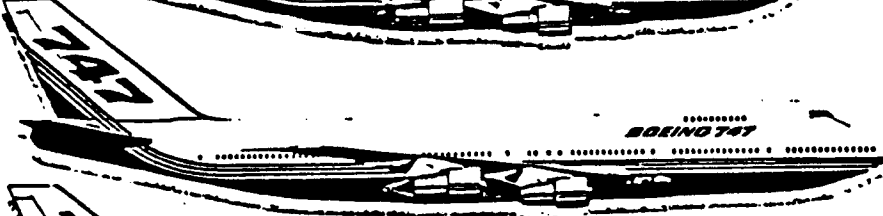
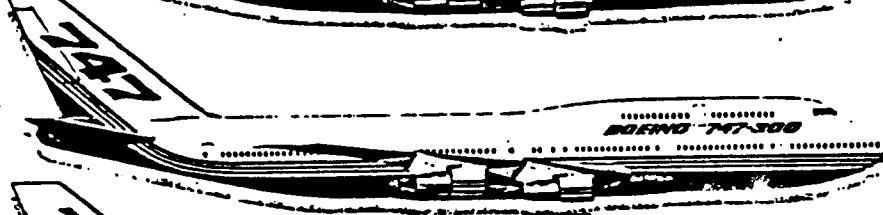
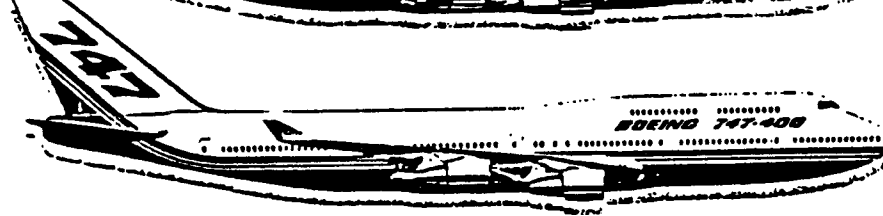


CAD/CAM MATRIX FOR 707/CFM56 PROGRAM

ESTIMATE RELATED TO ENGINEERING WORK STATEMENT		CAM APPLICATIONS/REQUESTED CAD DATA										NEGOTIATED CAD DATA TO BE SUPPLIED													
ITEM NUMBER	DRAWING TITLE	CLASS OF DWG. 1-V	PRIORITY	MD/NC INTERFACE	MDD SURFACE DEF.	FLAT PATTERN DEF.	FASTENER LOCATIONS	PERIPHERAL & CUTOUS	BEND/MOLD LINES	IDS(1) OR APT(A)	NO CAD DATA REQ.	REMARKS - CAM APPLICATIONS	CLASS OF DWG. 1-V	PRIORITY	MD/NC INTERFACE	MDD SURFACE DEF.	FLAT PATTERN DEF.	FASTENER LOCATIONS	PERIPHERAL & CUTOUS	BEND/MOLD LINES	IDS(1) OR APT(A)	NO CAD DATA			
																							V 1 XX	III	II
72401	INBD STRUT LINES (MDD'S)	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72402	INBD STRUT INSTL.	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72403	INBD STRUT - AERO-DYNAMIC SMOOTHNESS EXTERIOR SURFACE	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72406	SEALING PROVISIONS	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72408	INBD STRUT-DRAINAGE PROVISIONS	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72410	INBD STRUT CLOSURE BULKHEAD, NS270	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72411	INBD STRUT RIBS & STIFFENERS	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72412	INBD STRUT NS243 BULKHEAD	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72415	INBD STRUT-WING PANEL FAIRING	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I
72420	INBD-STRUT FRONT SPAR	V 1 XX	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I	IV	III	II	I

SEE COMPONENTS  
 SKETCH

**CURRENT  
FAMILY OF  
BOEING  
JETLINERS**

	<b>737-200</b>	<b>110 Seats</b> <b>2,500-mile Range</b> <b>In Service—1968</b>
	<b>737-300</b>	<b>128 Seats</b> <b>2,800-mile Range</b> <b>In Service—1984</b>
	<b>757-200</b>	<b>186 Seats</b> <b>4,000-mile Range</b> <b>In Service—1983</b>
	<b>767-200</b>	<b>216 Seats</b> <b>4,600-mile Range</b> <b>In Service—1982</b> Also, an Extended Range version, 216 seats, 6,100-mile range
	<b>767-300</b>	<b>261 Seats</b> <b>4,700-mile Range</b> <b>On Order</b> Also offered, an Extended Range version, 261 seats, 6,700-mile range
	<b>747SP</b>	<b>331 Seats</b> <b>6,900-mile Range</b> <b>In Service—1976</b>
	<b>747-200</b>	<b>452 Seats</b> <b>7,000-mile Range</b> <b>In Service—1971</b>
	<b>747-300</b>	<b>496 Seats</b> <b>6,450-mile Range</b> <b>In Service—1983</b>
	<b>747-400</b>	<b>509 Seats</b> <b>7,250-mile Range</b> <b>On Order</b>

- Notes:**
- All seating capacities are for a two-class configuration
  - All range figures are in statute miles with full passenger payload
  - Although out of production, about 1,750 727s continue to serve the world's airlines