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DOCUMENTATION PAGE

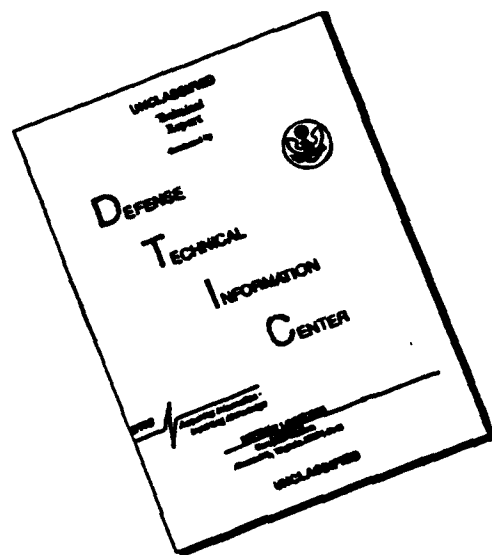
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**TECHNOLOGY INSERTION-ENGINEERING SERVICES
PROCESS CHARACTERIZATION
TASK ORDER NO. 1
(BLOCK 1)**

DATABASE DOCUMENTATION BOOK

WR-ALC

MANPSC

**CONTRACT SUMMARY REPORT
14 AUGUST 1989**

**CONTRACT NO. F33600-88-D-0567
CDRL SEQUENCE NO. B008**

1. Project No.	2. Date
3. Title	4. Author
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MCDONNELL DOUGLAS
McDonnell Douglas Missile Systems Company
St. Louis, Missouri 63166-0516 (314) 232-0232

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WR-ALC (MANPSC)

1.0 Identification of RCC

Resource Control Center (RCC) MANPSC has been identified by the Statement of Work (SOW) of Contract F33600-88-D-0567, Technology Insertion Engineering Services, Cure Notice Response for Task Order No. 1, for Process Characterization.

(Resource Central Center)

2.0 General Information

MANPSC is an RCC with MANPS section of the Industrial Products Division (MAN) at WR-ALC. MANPSC is located in Building 169.

The primary workload in MANPSC consists of MISTR work consisting of some adhesive bonding work and conventional sheet metal work, namely; C-141 AFT Cowling, C-141 Thrust Door, C-130 Cowl Scoop, C-130 Elevator, and C-130 Flaps.

MANPSC will be discussed in more detail in the following Section 2.1 through 2.8.

2.1 Facility Layout Drawing

The facility layout drawings of Building 169 represent the existing As-Is condition.

The drawings entitled Master Shop Layout File Building 169 were updated as of April 1989 and are of good quality.

2.2 Equipment

MANPSC is comprised mainly of conventional sheet metal and certain specialized composite material fabrication equipment. MANPSC has large assembly and check fixtures, rivet installation holding fixtures, fixed tables and dollies, overhead lifting cranes, transport dollies, drying ovens, autoclaves, necessary equipment for autoclave support, and other ordinary support equipment.

MANPSC also has the normal sheet metal equipment to support the MISTR workload such as hand brakes, hand formers, drill press, band saw, hole punch, bench grinder, as well as all the rivet driving and upsetting tools necessary to support the numerous type of fasteners used in repair/overhaul work.

The majority of the equipment within MANPSC varies in age between ten and twenty years old, with some forty years old or older. The majority of the equipment is in good working and usable condition.

New, replacement pieces of equipment are being planned for purchase within the next ten years.

A listing of all equipment for MANPSC can be found in the Equipment Profile List of Section 5.0.

2.3 Workforce

MANPSC has a less than adequate workforce. Other RCC areas such as the F-15 Wing Repair has priority over the MANPSC work and has drawn a few people from the MANPSC effort. The remaining workforce is well trained and well supervised. Personal interviews and the interviewees attendance at several "QP 4" meetings has indicated a sense of professionalism and pride among the workforce.

The workforce is comprised mainly of Aircraft Sheet metal Mechanics of three basic classifications; namely, metal bond, autoclave, and the general sheet metal type, two foreman classifications, one leader-in-training, a secretary, a tool and parts attendant, and worker trainee.

The following constitutes a listing of the available manpower within MANPSC.

<u>Skill Code</u>	<u>Skill Level</u>	<u>Quantity</u>	<u>Experience</u>
48127	WS-14	2	20 Foreman 14
47886	WS-10	2	15 Foreman 10
9A014	WS-10	38	Mechanic A/C
9A012	WS-08	50	Sheet metal worker
10860	WS-05	5	Mechanic helper
9A075	GS-05	2	Sheet metal worker
48913	GS-03	1	Secretary

2.4 Repair Process Technologies

The repair process technologies within MANPSC consists of major unit manufacturing and small sheet metal conventional, honeycomb bonded and composite repairs on HIGH-VALUE C-141 and C-130 major aircraft assemblies. These assemblies are critical to flight safety and the performance of the aircraft in their assigned mission.

All of the aircraft assemblies to be inspected and repaired are received in Building 169 and are disassembled as required per the applicable Technical Order for inspection/repair/modification. They are reworked to incorporate all the aircraft modifications and Technical Order changes to meet the required configuration for the aircraft.

The sheet metal and composite components are repaired to a serviceable condition, otherwise are replaced with new parts. The repairs may consist of removing local corrosion, replacing damaged sections and those sections with major corrosion, replacing angles, brackets, rivets, fabricating special repair plates, etc. to repair damaged members of the minor or major structural component of the unit.

2.5 Workload Volume and Mix

The workload within MANPSC consists entirely of Management of Item Subject to Repair (MISTR) items.

2.6 Material Handling

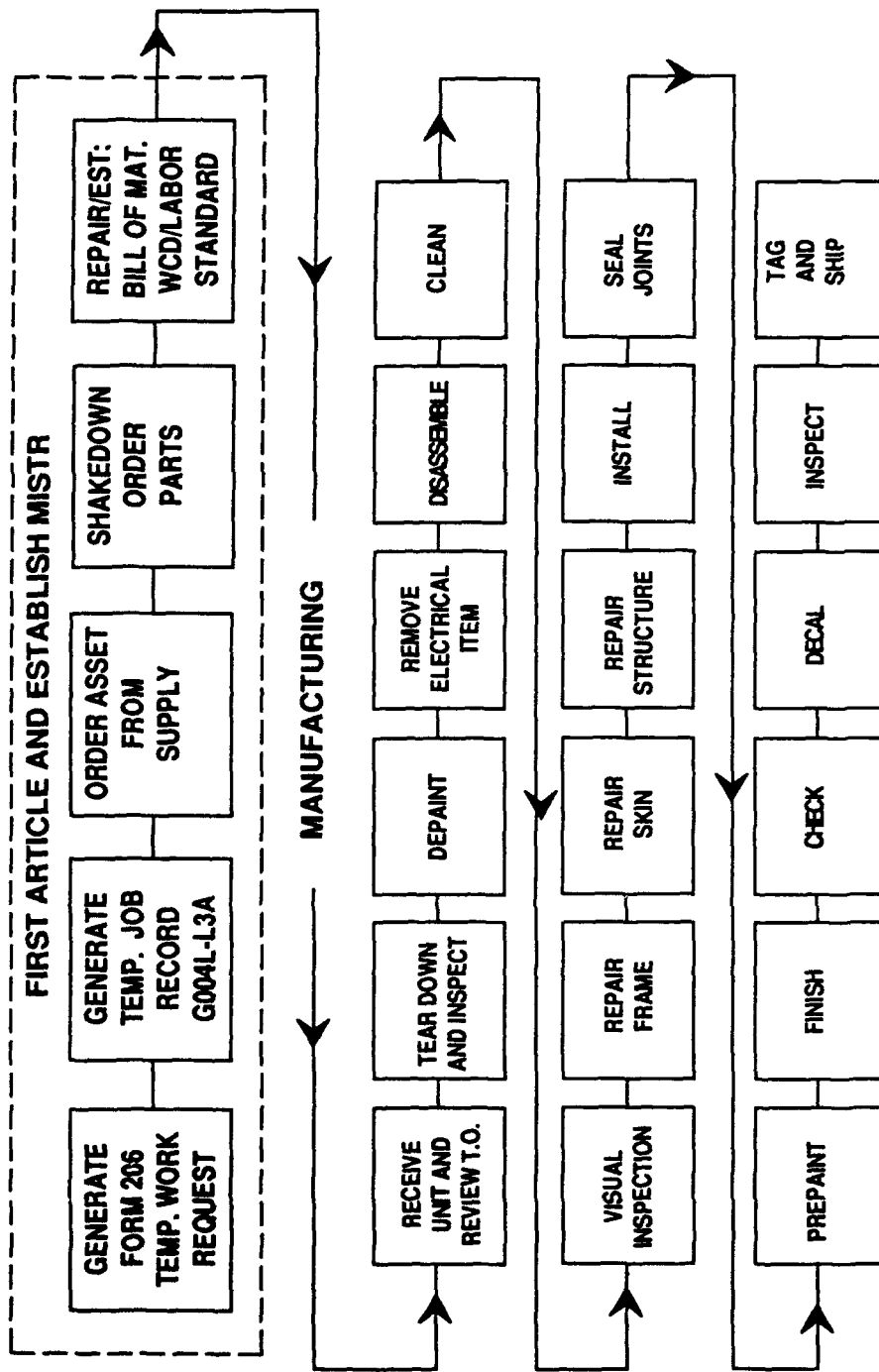
Material handling in MANPSC involves the use of overhead cranes, slings, manpower, holding and transport dollies and work carts.

All the large and heavy items such as the C-130 Elevator and the C-130 Flaps, etc. are loaded into and out of the check and assembly jigs and fixtures by the use of cranes and slings. Some of the assemblies over by "manpower" requiring several workers to accomplish the task. Some of the assemblies are moved and/or flip-flopped or taken in and out of the jig or fixture as much as six or seven times before completion.

All work is moved, as required, by the mechanic workforce. Some moves are made by the overhead crane and sling, but the majority of material handling is by manhandling or by work dollies with wheels.

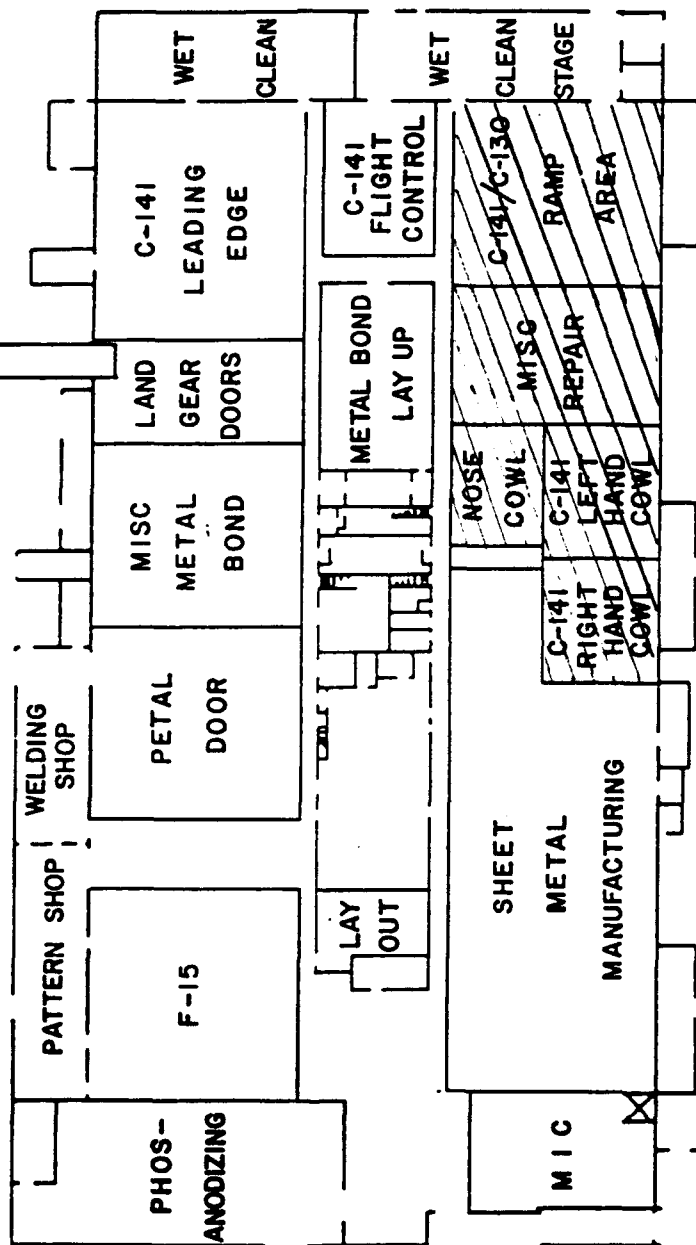
2.7 Storage

The only dedicated storage in the MANPSC area is several parts handling and storage bins in the general areas. Large assemblies are stored within the work area, making it difficult to work. The large items not being used should be returned to outside storage and not in Building 169. The flap assemblies and other large, bulky items are normally stored in wooden crates outside the MANPSC area.

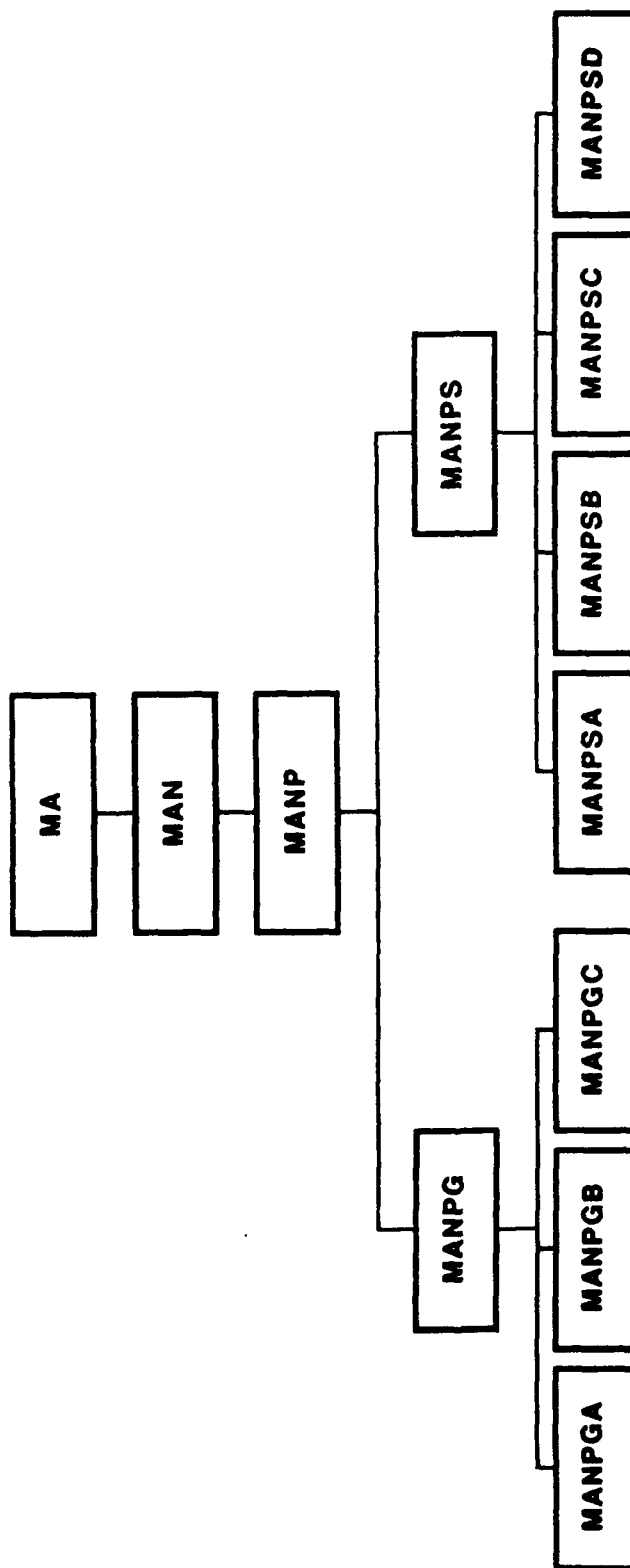


WR-ALC MANPSC PROCESS FLOW CHART
FIGURE

N



BLDG 169 MANPSC

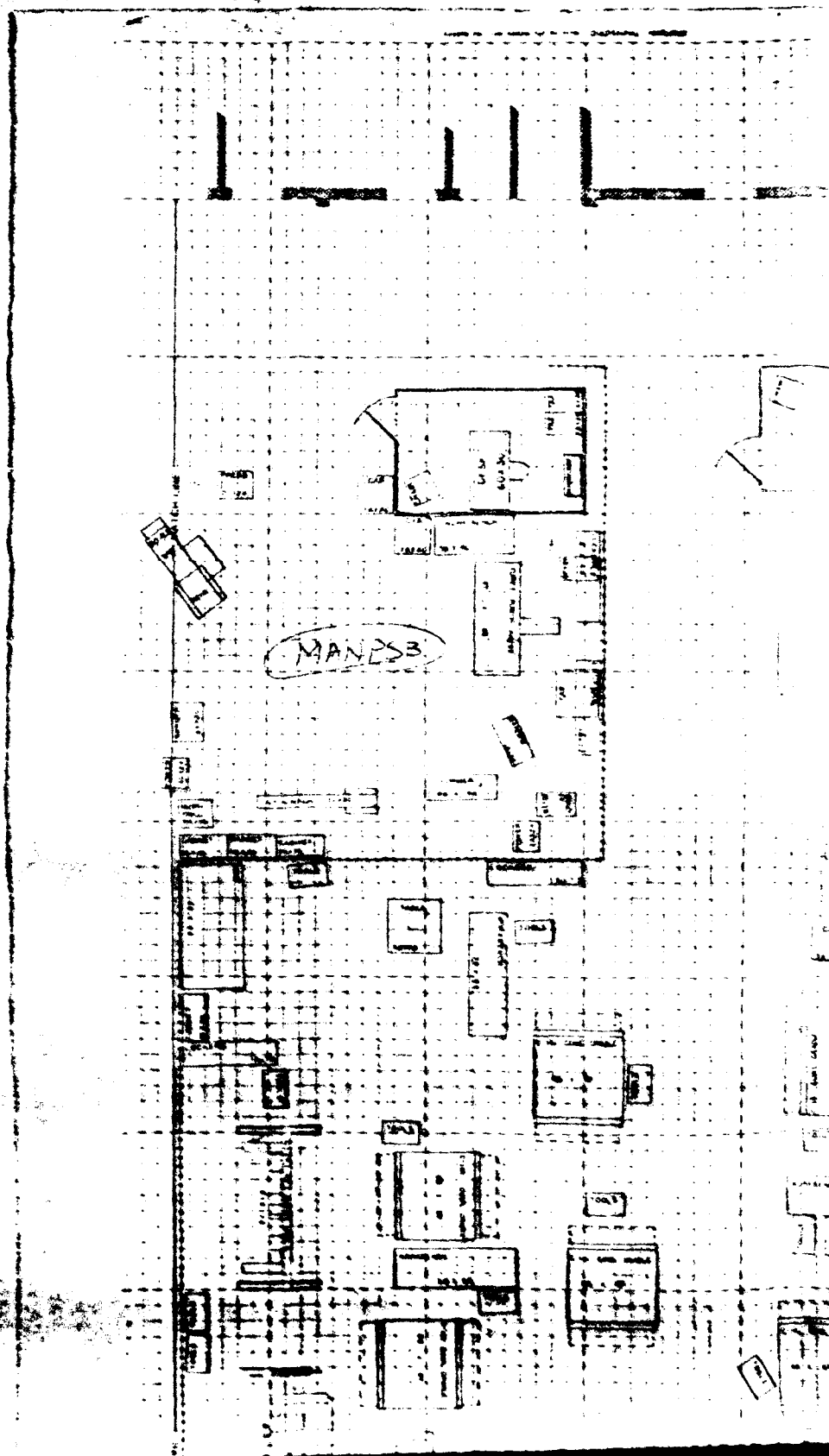


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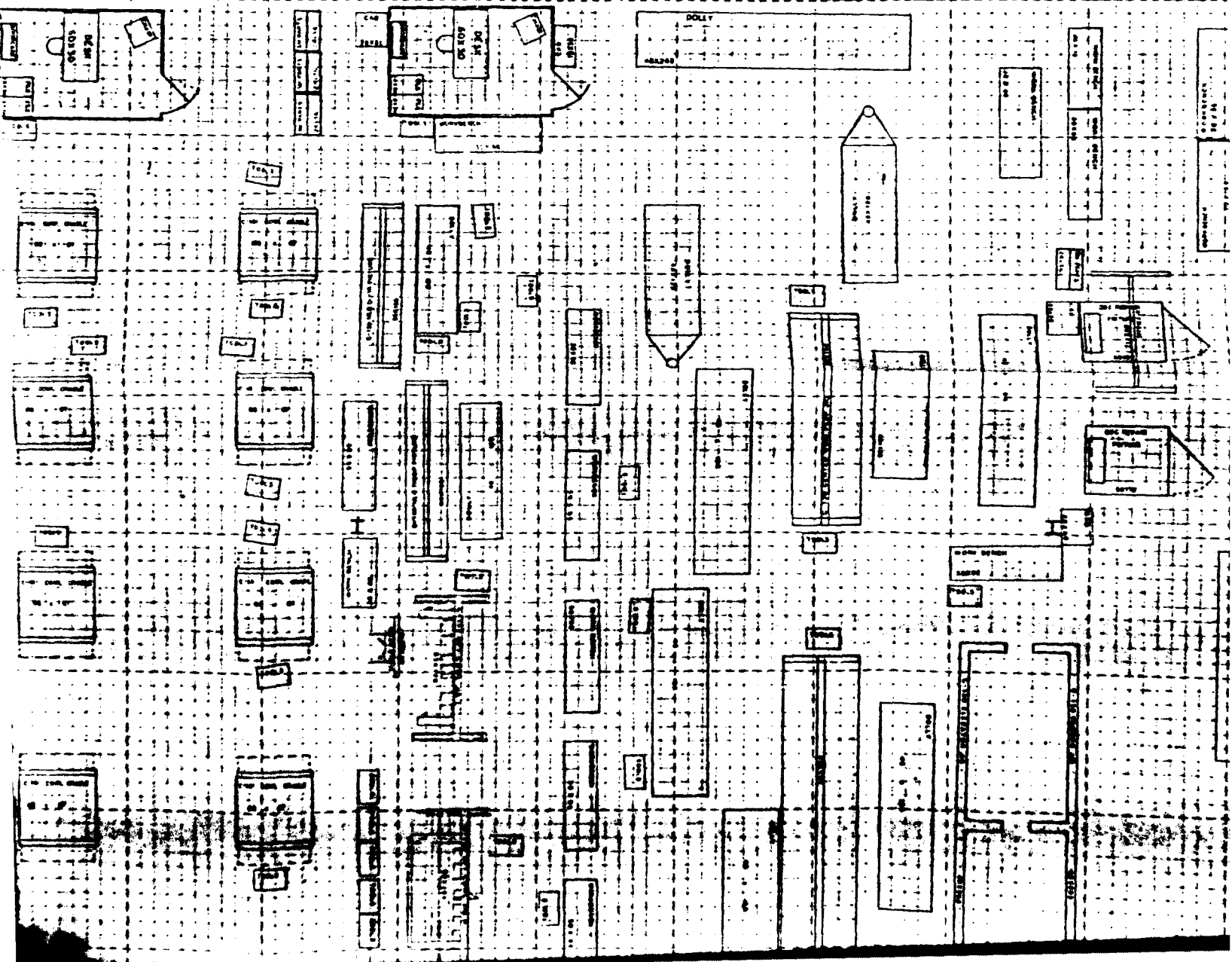
MA = DIR. OF MAINT.
 MAN = INDUSTRIAL PRODUCTS DIVISION
 MANP = PRODUCTION BRANCH
 MANPG = GYRO SECTION
 MANPGA = GYRO REPAIR UNIT NO. 1
 MANPGB = GYRO REPAIR UNIT NO. 2
 MANPGC = GYRO REPAIR UNIT NO. 3

MANPS = SHEET METAL SECTION
 MANPSA = ADHESIVE BONDING UNIT
 MANPSB = SHEET METAL MANUFACTURING UNIT
 MANPSC = SHEET METAL REPAIR UNIT
 MANPSD = PLASTIC & MISC. SHEET METAL UNIT

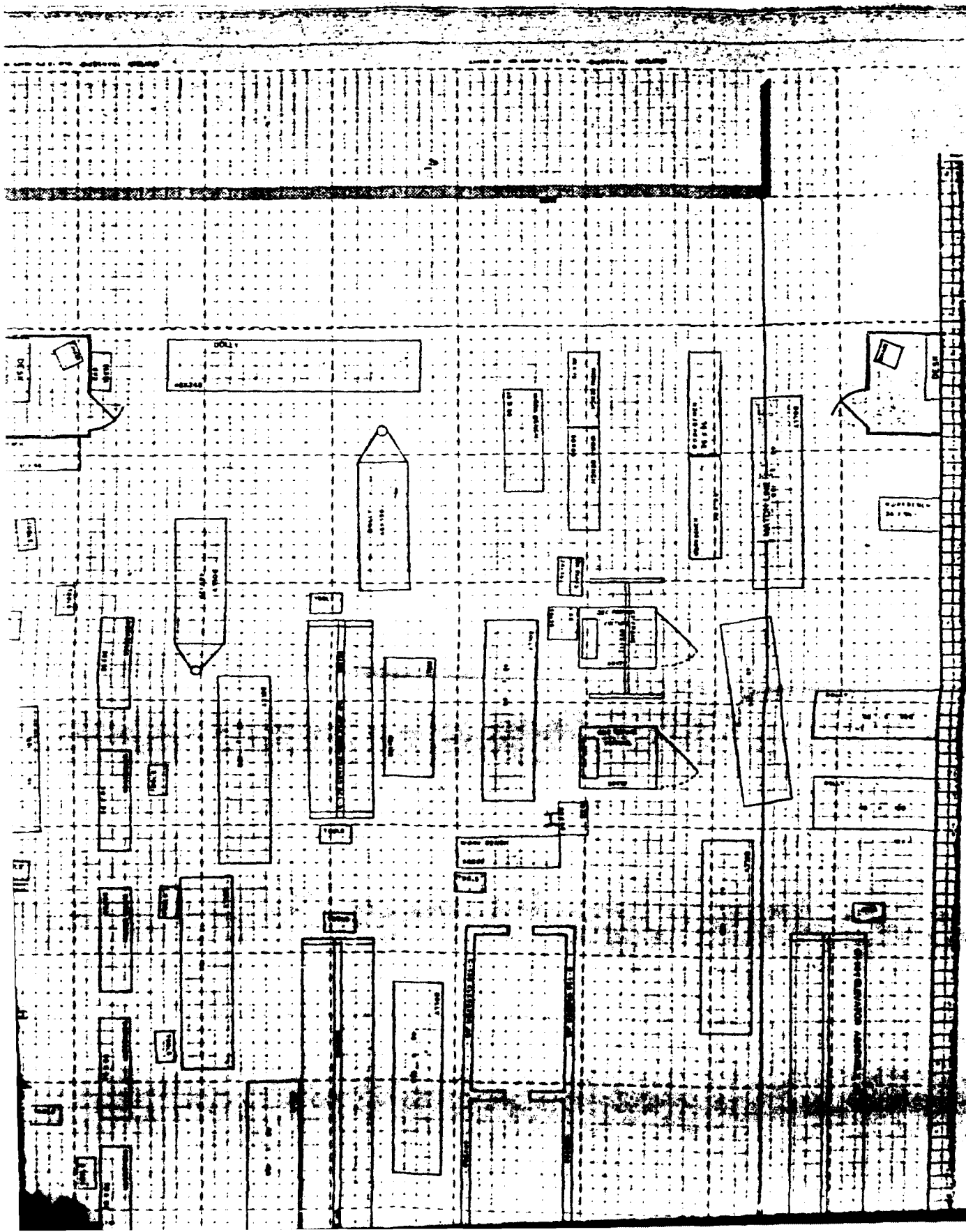
WR-ALC RCC PROCESS CHARACTERIZATION COVERAGE
FIGURE 9.0-1

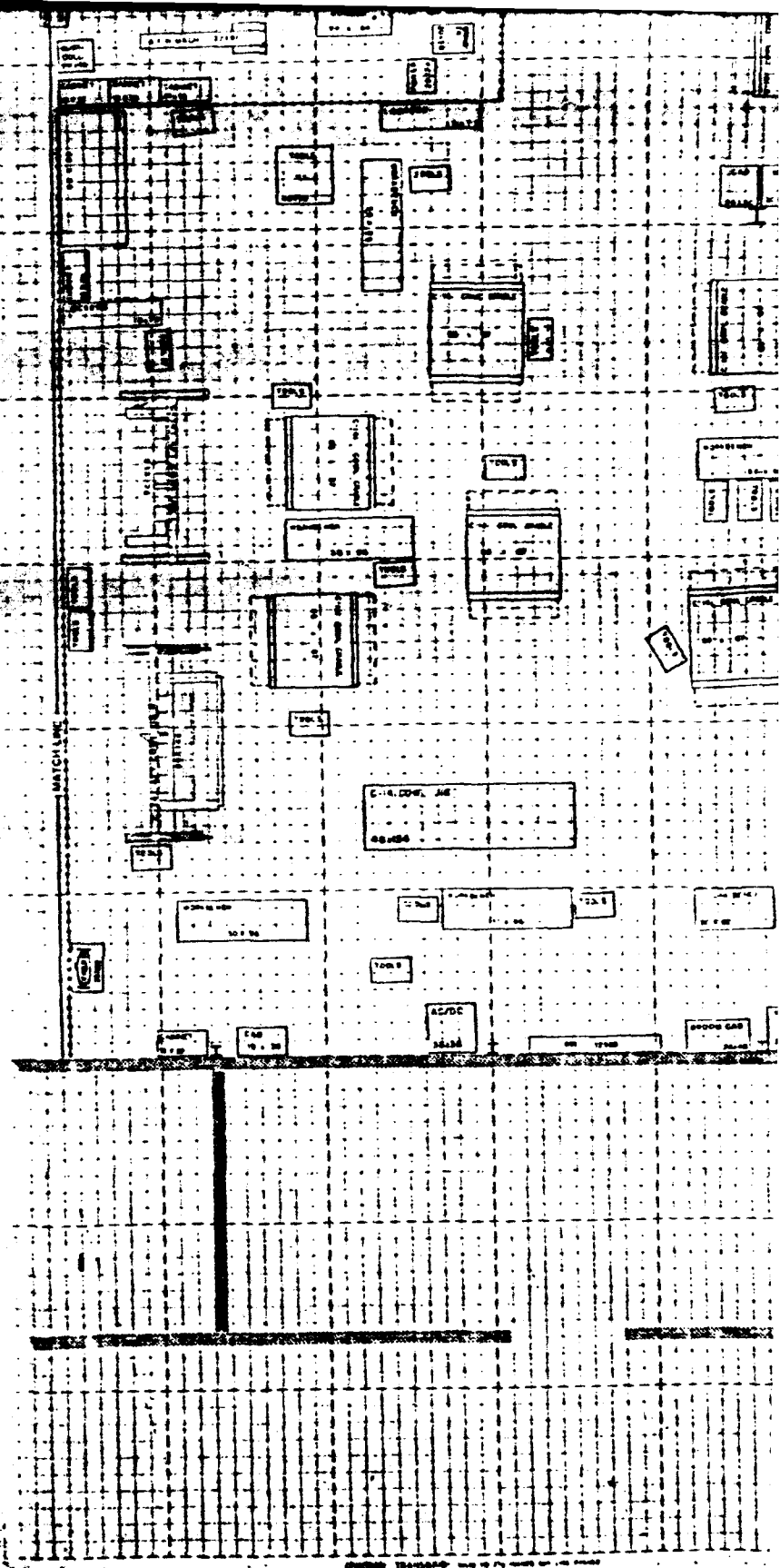


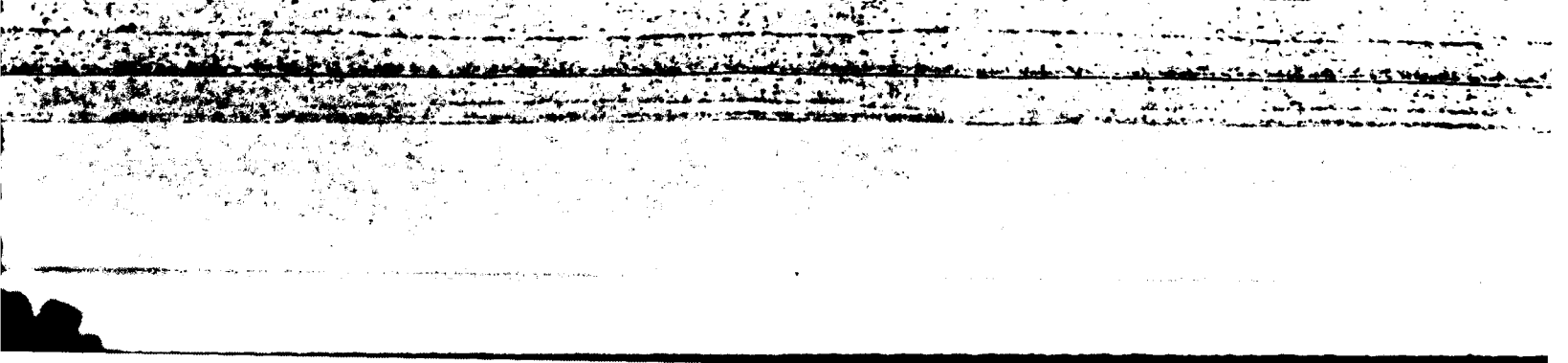
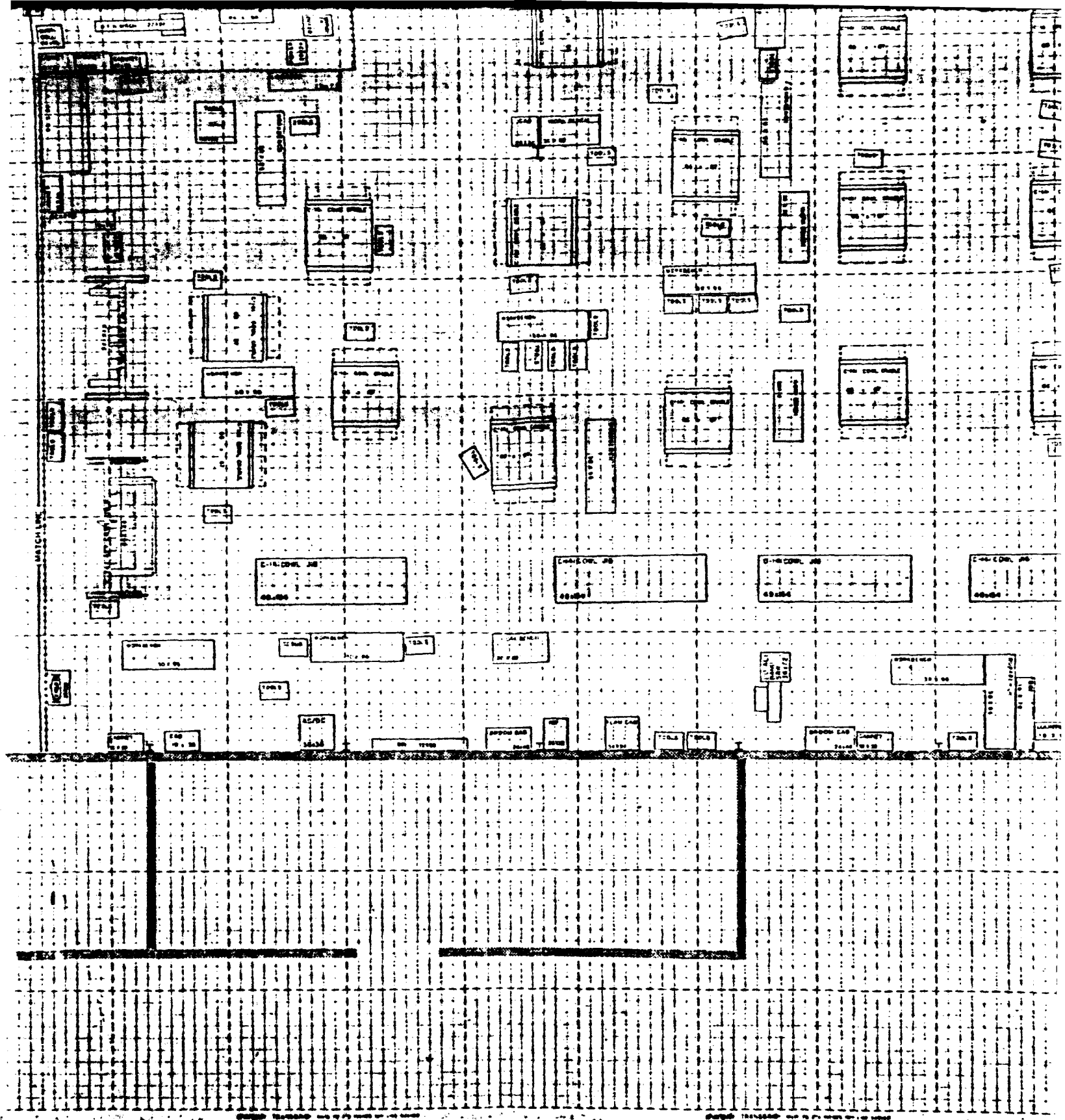
MANPSC

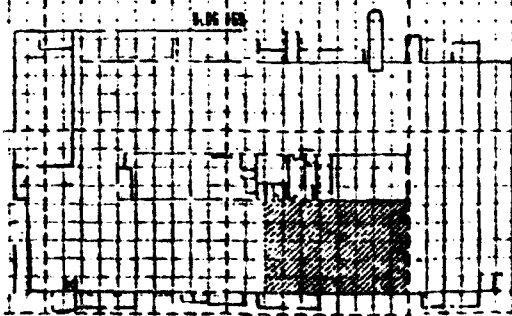
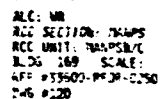


B-109 SOUTHEAST CENTER



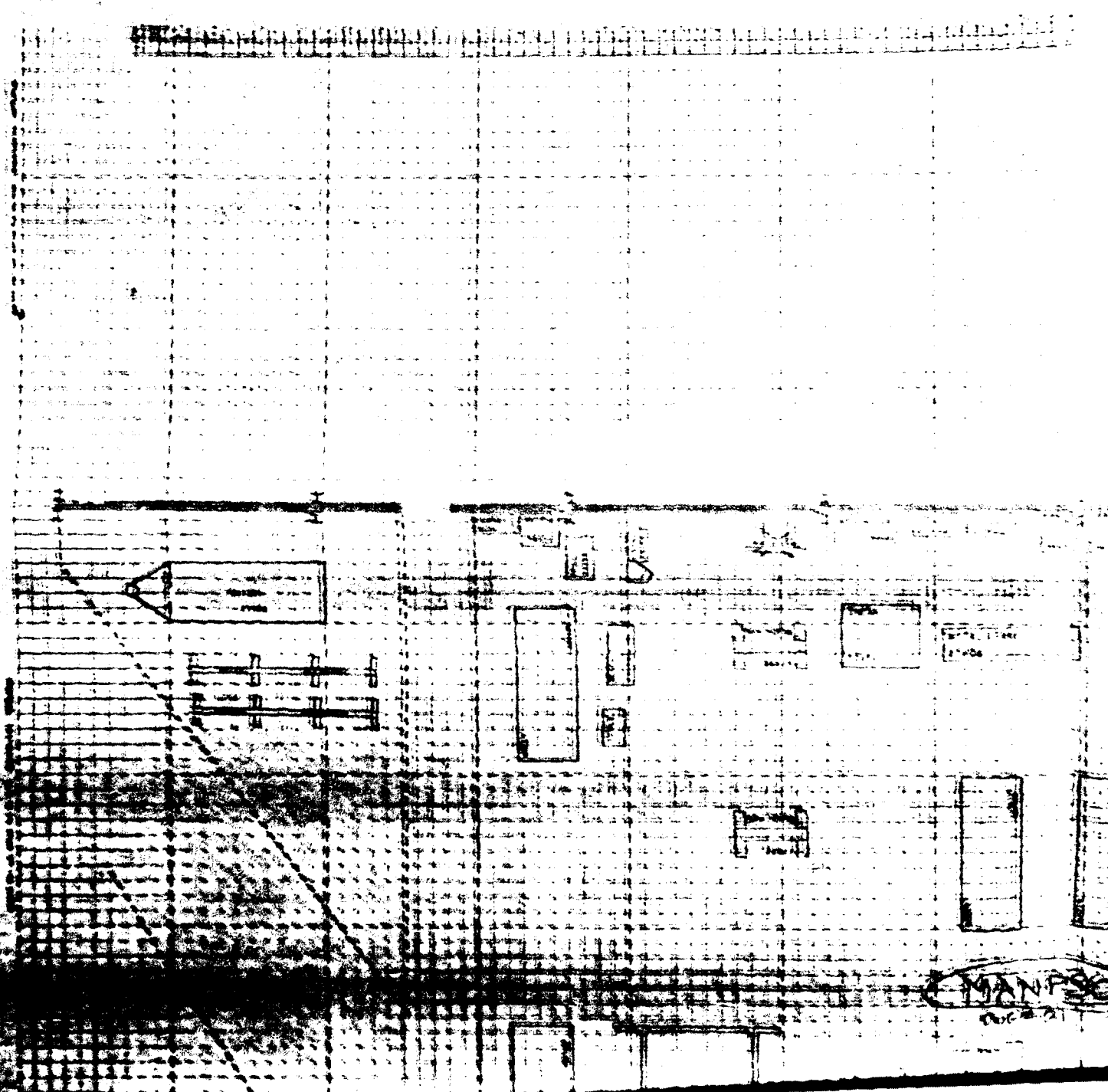




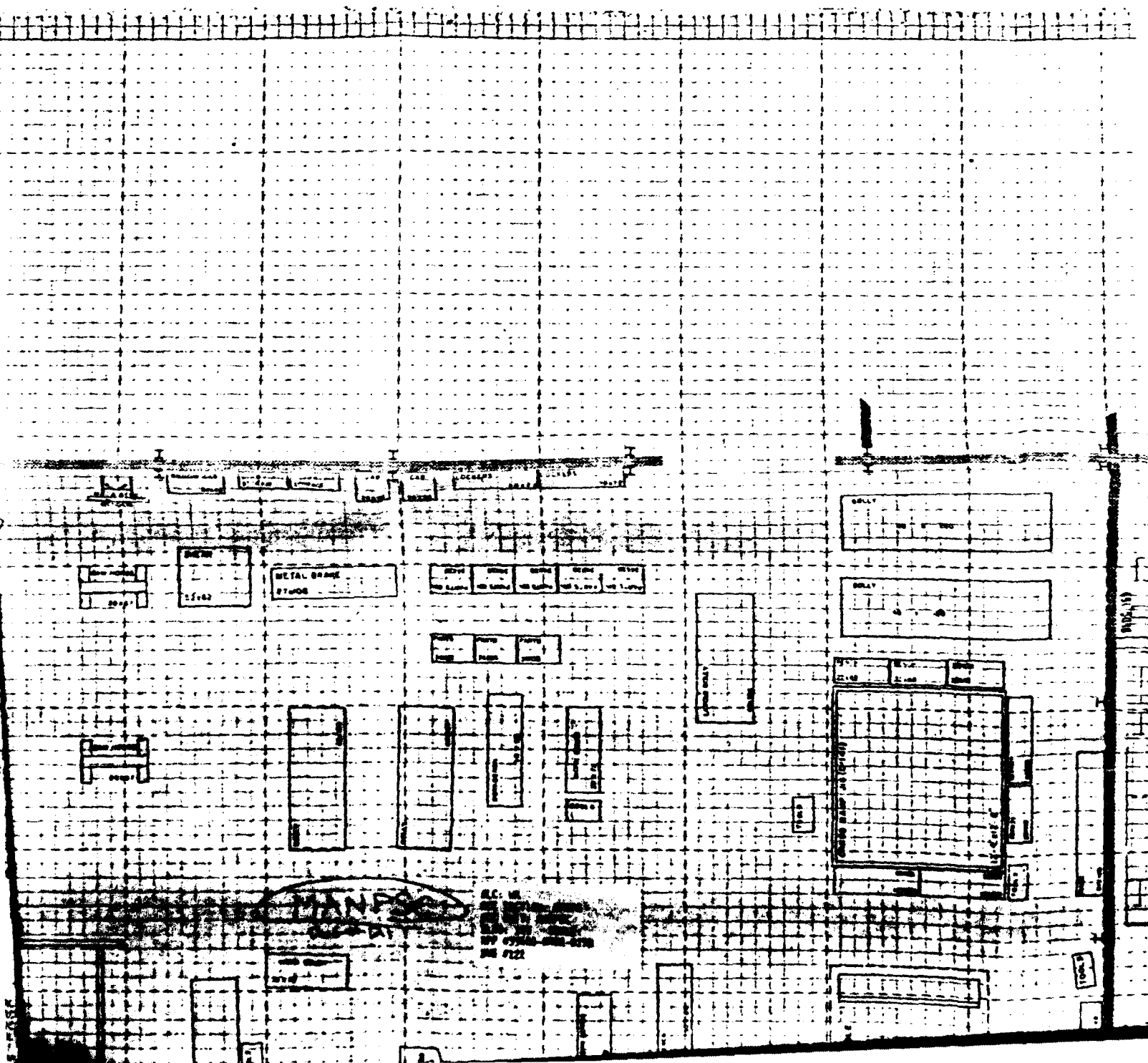


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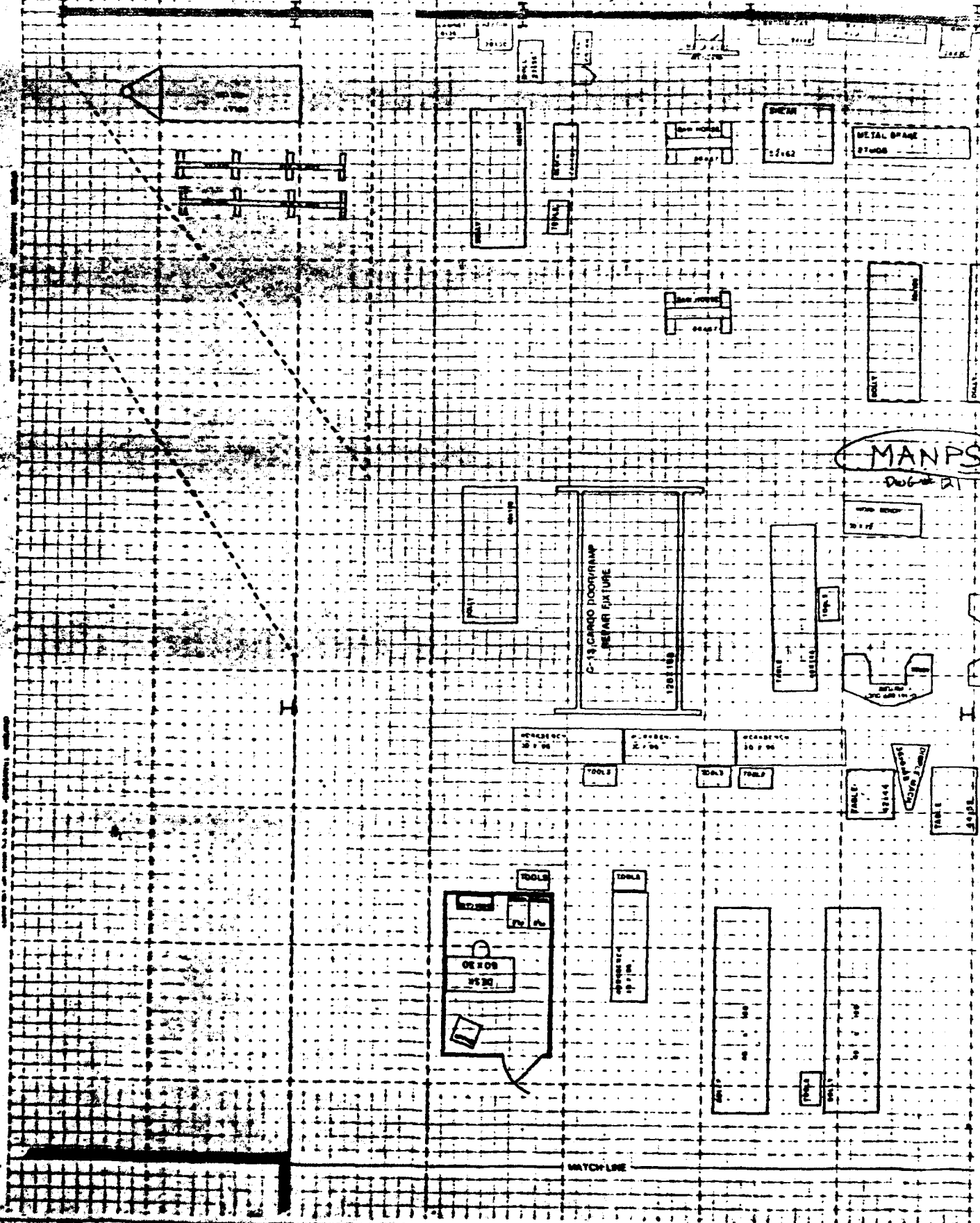
B-169 SOUTHERS



B-169 SOUTHEAST CORNER 3

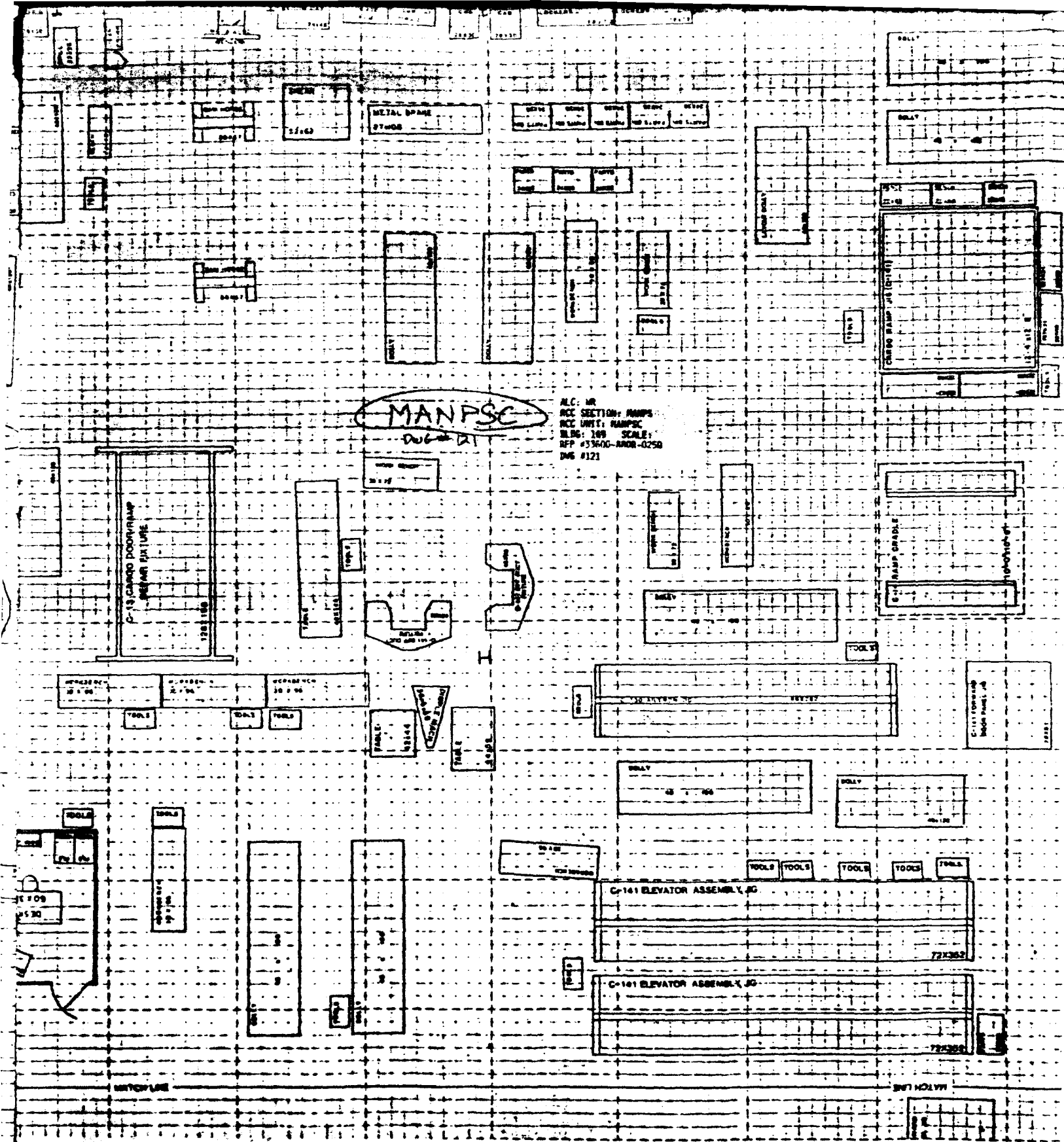


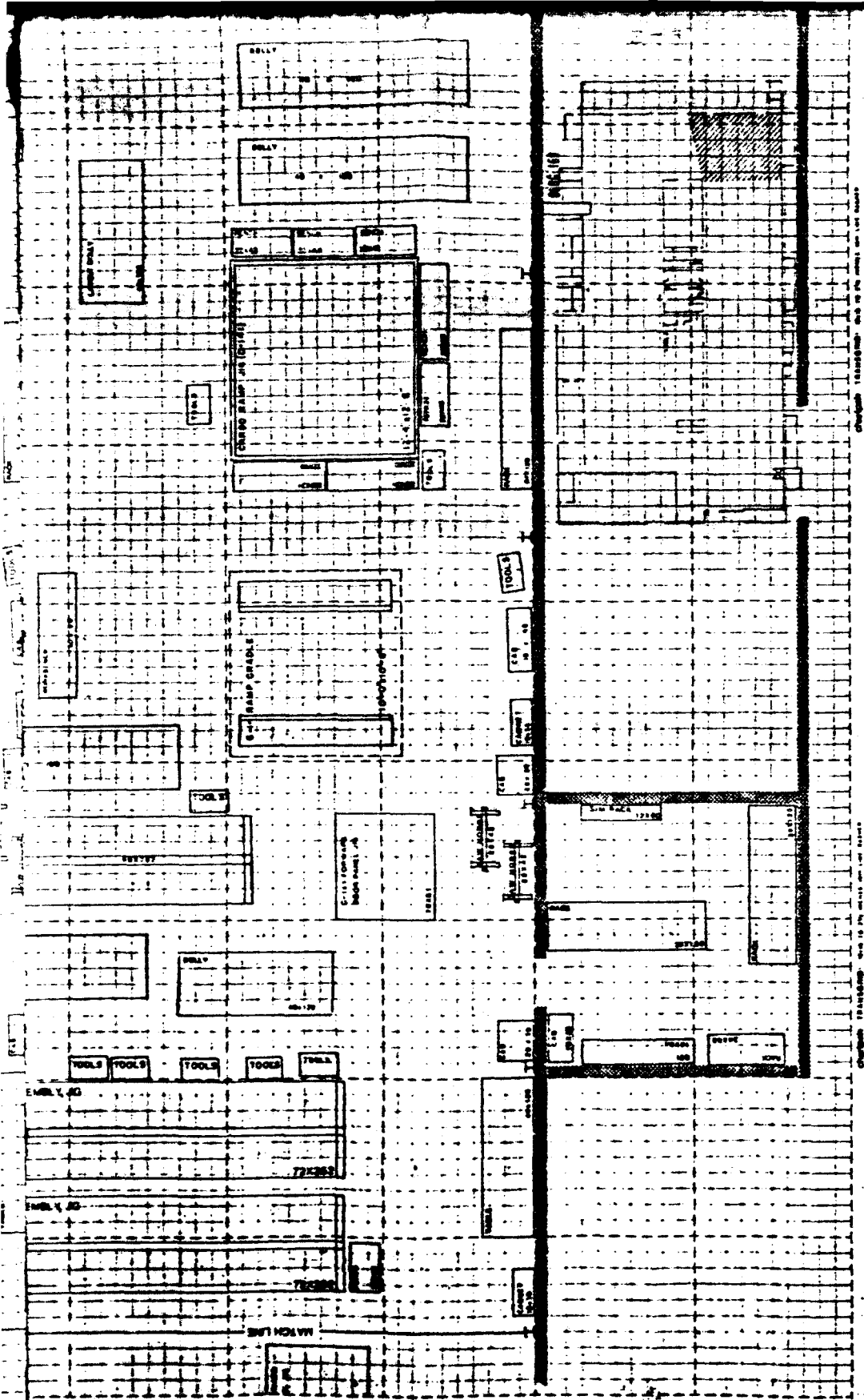
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MANPS
2-1-62

WATCH LINE





** ALC - WR	RCC - MANPSC	MODEL WORKLOAD FILE										7/ 5/1989		
06692A	MB014Y	0	4	55	27	49	49					186.80	297.20	OA
C-141	.0	.0		0		.0000		.0000				0	.870	B
06692ASUBA	MBA14Y	0	4	0	0	0	0					.00	.00	OA
C-141	.0	.0		0		.0000		.0000				0	.000	B
06692ASUBC	MBC14Y	0	4	0	0	0	0					.00	.10	OA
C-141	.0	.0		0		.0000		.0000				0	.000	B
50164A	MB024D	0	4	4	14	12	12					61.10	69.80	OA
C-130	.0	.0		0		.0000		.0000				0	.048	B
50266A	MB021D	0	4	0	0	3	1					197.80	205.60	OA
C-130	.0	.0		0		.0000		.0000				0	.013	B
50454A	MB053D	0	4	1	3	3	5					158.30	277.50	OA
C-130	.0	.0		0		.0000		.0000				0	.054	B
50454ASUBA	MBA53D	2	4	0	0	0	0					.00	8.50	OA
C-130	.0	.0		0		.0000		.0000				0	.002	B
50454ASUBB	MBB53D	0	4	0	0	0	0					.00	.00	OA
C-130	.0	.0		0		.0000		.0000				0	.000	B
51402A	MB019Y	0	4	5	3	2	5					69.10	54.60	OA
C-141	.0	.0		0		.0000		.0000				0	.013	B

CONTROL NUMBERS BY RCC

	RCC	C/N	NOUN	ORGHRS
	MNPSA	51454A 51455A	PETAL DOOR	19105
		01900A	BRAKEAER	9171
	(6) (4 ^{1/2})	51352A 51353A	DOOR	8342
		51418A 51419A	LEADING	6480 43098
11/23	ADD	05502A 05503A	AILERON	
		51334A	HORIZ. STABILIZER	
	MNPSA	06691A 06692A	COWLING R4L	97484
		50164A	SCOUP	4032
		51402A	DR THRUST	3110
	5	50266A	ELEVATOR	2770
		50242A 50244A	FLAP	3504 110900
		(50454A)		
	MNPSD	03172A	CANOPY	49719
		51344A	NOZZEL	34626
		09193A F15	RADOME	21107
	(7) (6 ^{1/2})	41059A C130	RADOME ASSY	9310
		03427A	CANOPY	6900
		40208A C141	RADOME	5495 127157
11/23	ADD	51420A	LEADING EDGE	281155

SHEET METAL SHOP

BB
10/14/88

RCC	ORG HRS	80%	NO. OF HRS SELECTED FOR STUDY
MNPSA	53450	42760	43098 (81%)
MNPSA	144209	115367	110900 (77%)
MNPSD	156501	125200	127157 (81%)

CALCULATED FROM DOC. GDFC AS OF 22 SEP 88 FOR RCC MNPS
AND ALLOCATED C/N'S FOR UNITS A, C & D.

10/15

4.0 DATA COLLECTION*

Eight different profile data sheets were made available to the working group for collection of data. The eight different profile sheets are:

- | | |
|---------------------|--------------------------------|
| - Operation Profile | - Disassembly/Assembly Profile |
| - Equipment Profile | - Parallel Process Profile |
| - Manpower Profile | - "IN" Dates Profile |
| - Workload Profile | - "OUT" Dates Profile |

The data collected for each RCC was from shop interviews with the shop foreman, workleaders, mechanics and from appropriate ALC personnel. Collected data were compiled in proper profile sheet for that RCC.

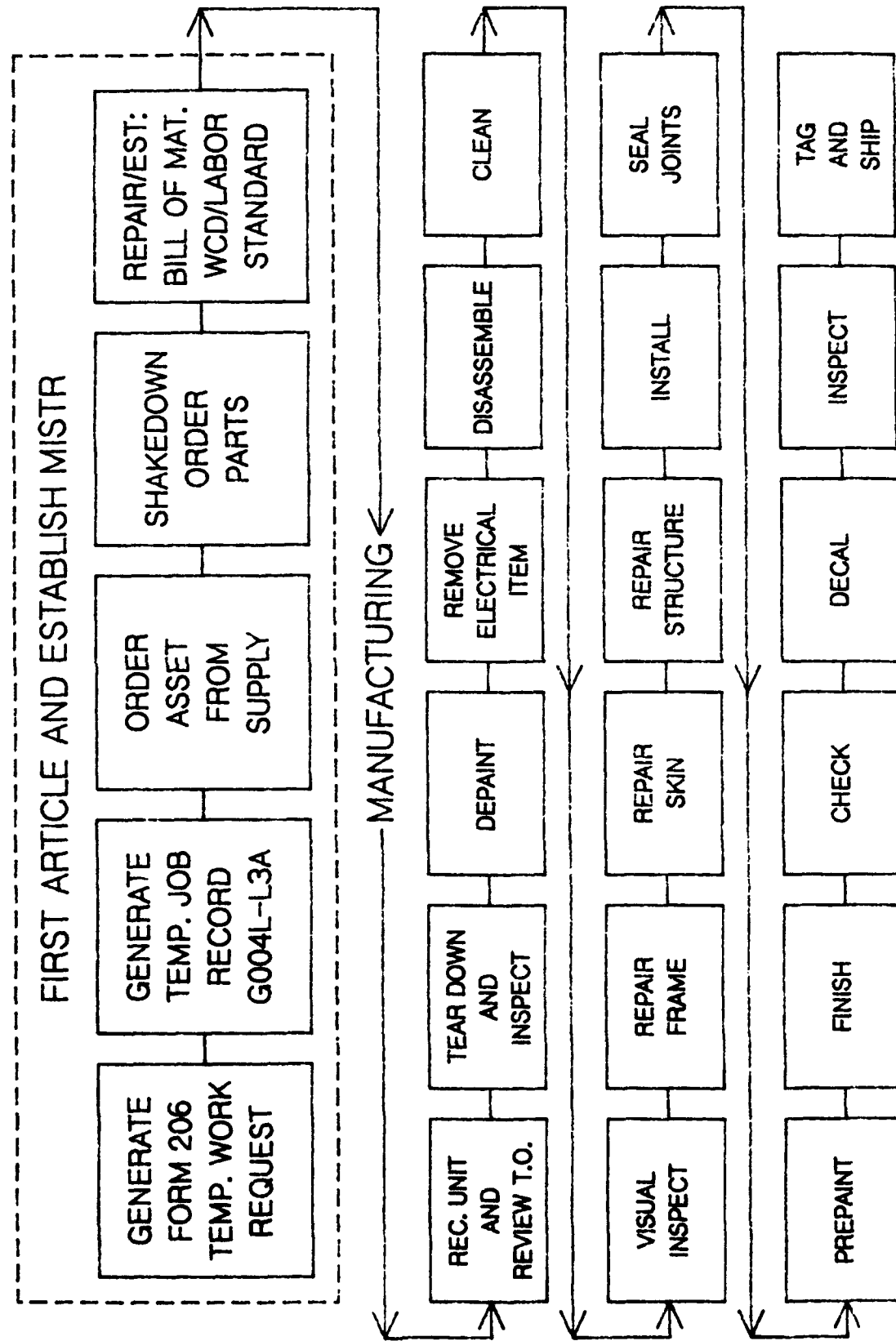
4.1 DATA COLLECTION PROCESS

- Data was collected for C/N or M number as identified by the 80/20 Analysis for a particular RCC.
- The shop foreman was requested to identify the person most familiar with each C/N of the 80/20 Analysis.
- The person identified by the shop foreman was interviewed by the Data Collector or Collectors transferred the data to the profile sheets.
- The profile for each C/N was compiled into a notebook for a particular RCC.
- The data was scrutinized by the working group members for completeness and correctness.
- The data collected will be used to generate the model input for each RCC.

*Note: This procedure will be revised and updated as required.

MANPSC

PROCESS FLOW CHART

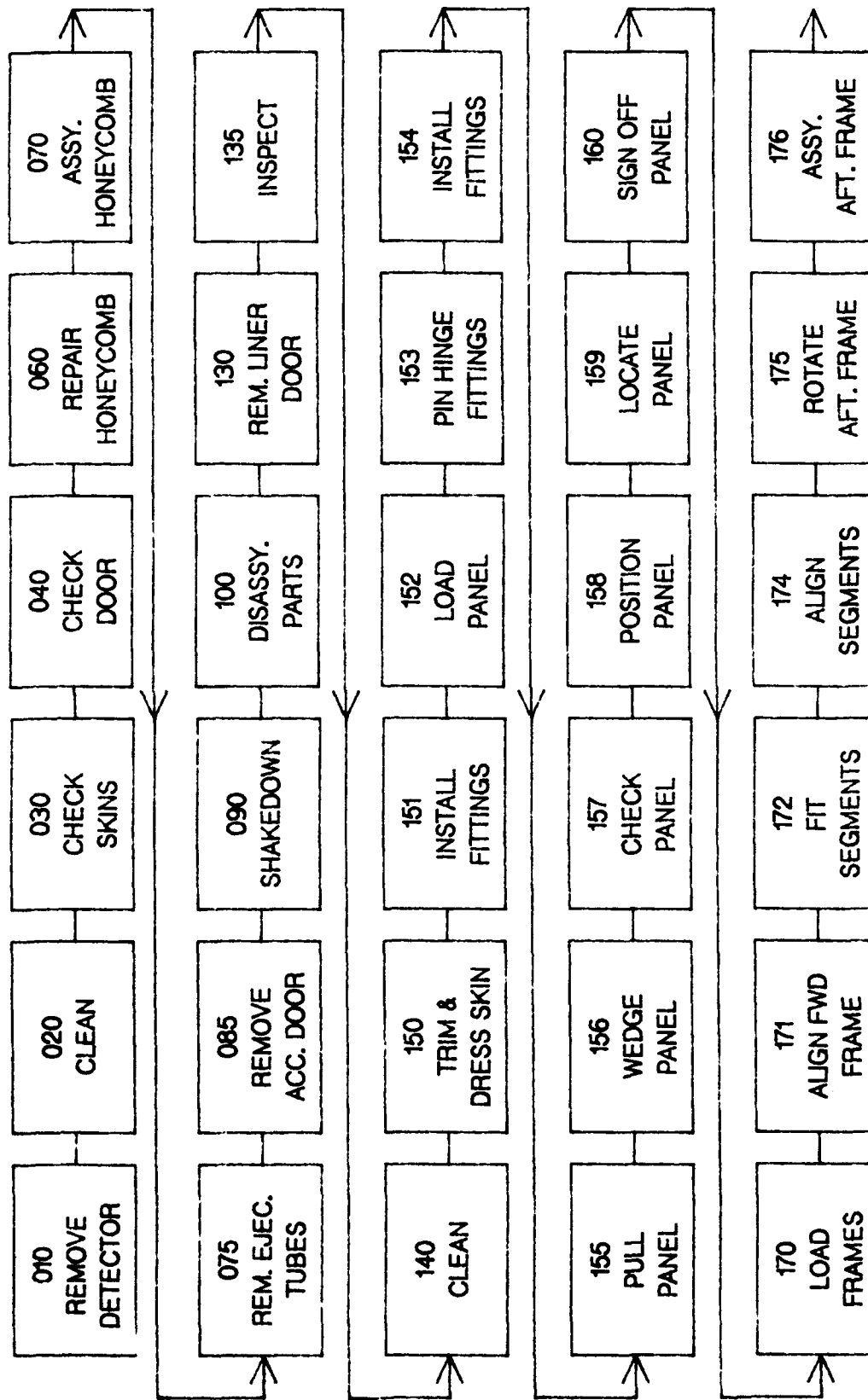


PROCESS FLOW CHART

WR-ALC
MANPSC

C/N 06692A
AFT. COWL

PAGE ONE

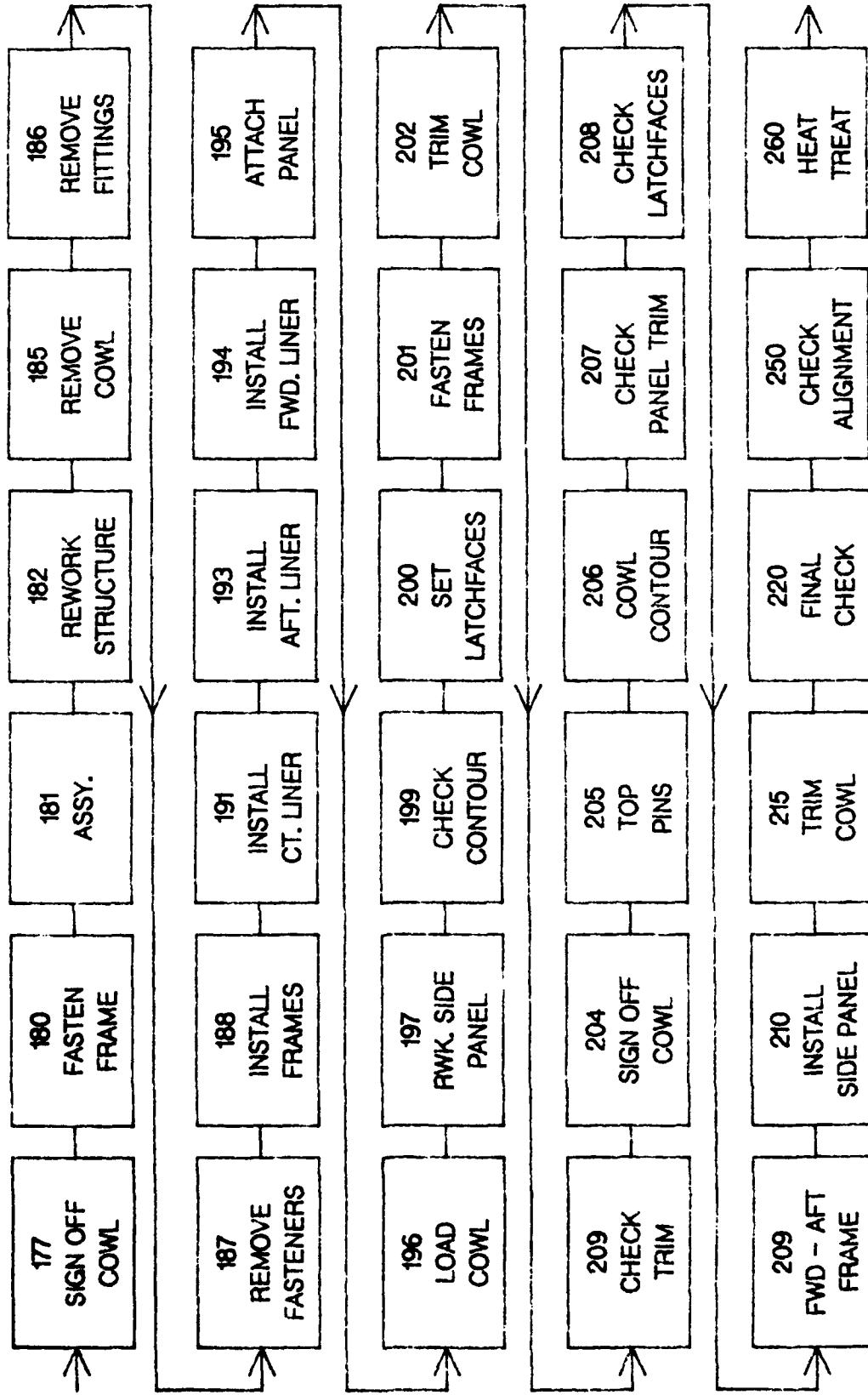


PROCESS FLOW CHART

WR-ALC
MANPSC

C/N 06692A
AFT. COWL

PAGE TWO

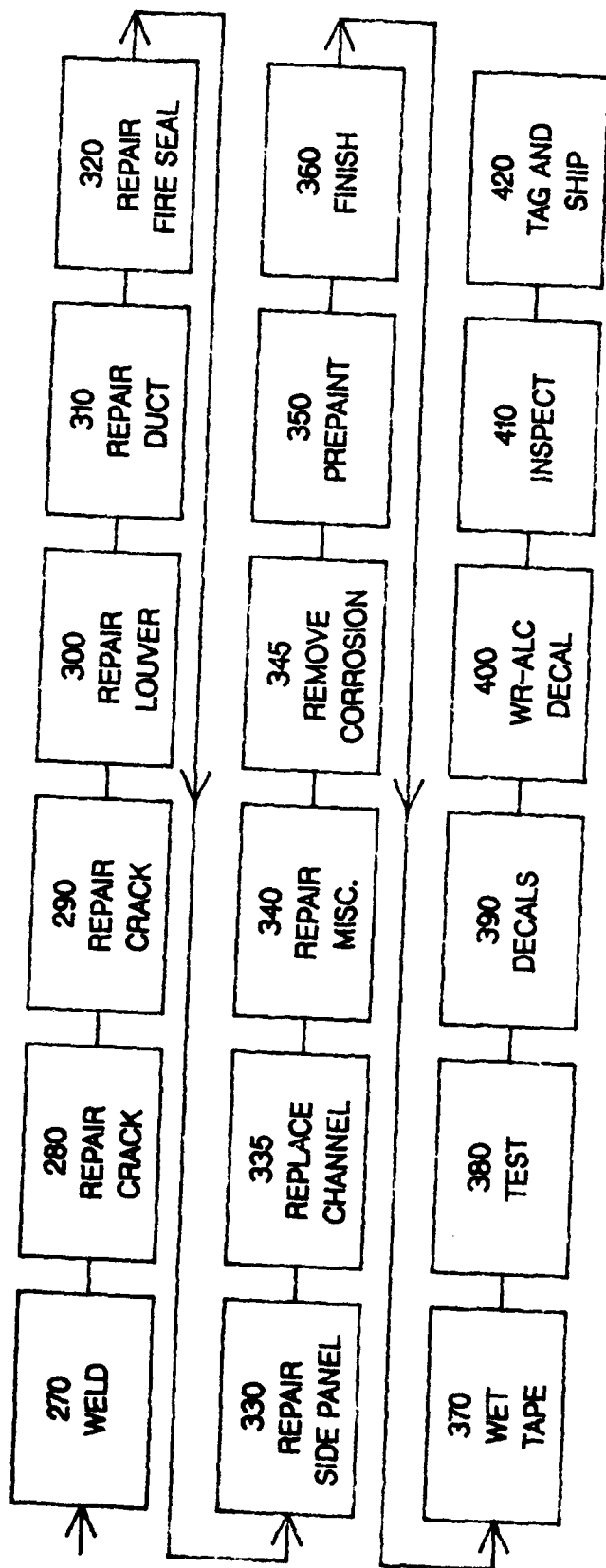


PROCESS FLOW CHART

WR-ALC
MANPSC

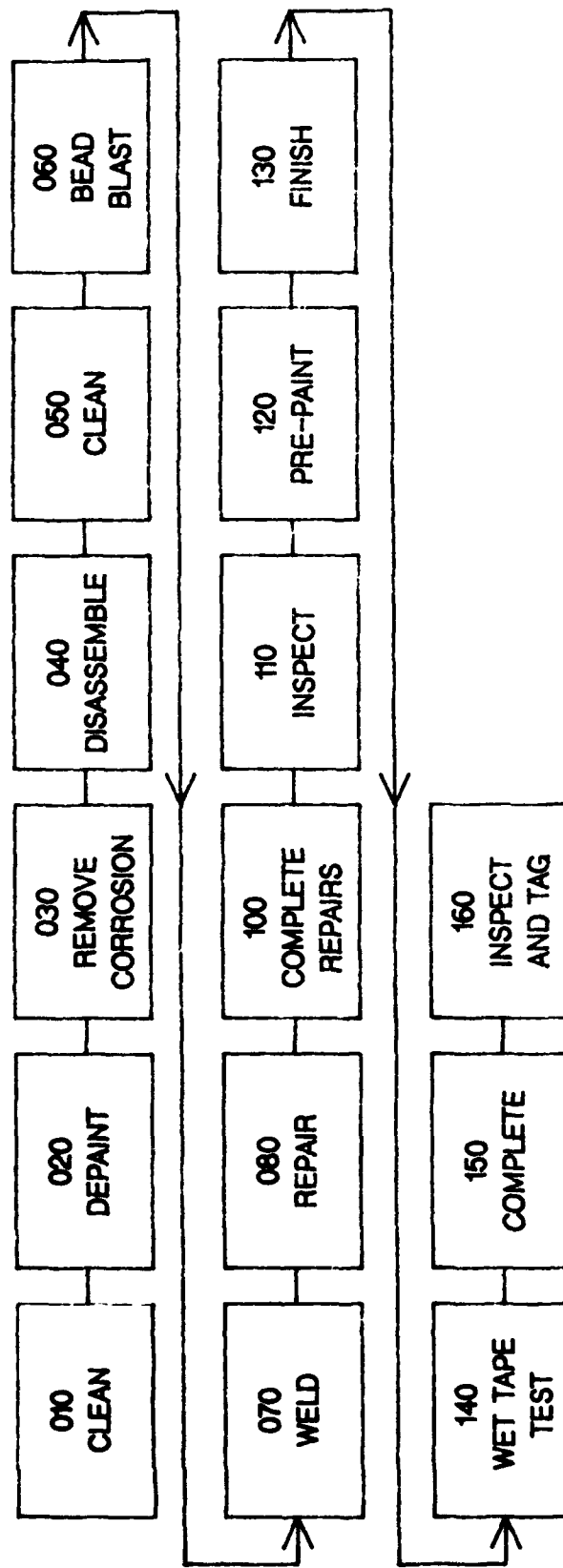
C/N 06692A
AFT. COWL

PAGE THREE



PROCESS FLOW CHART

WR-ALC
MANPSC

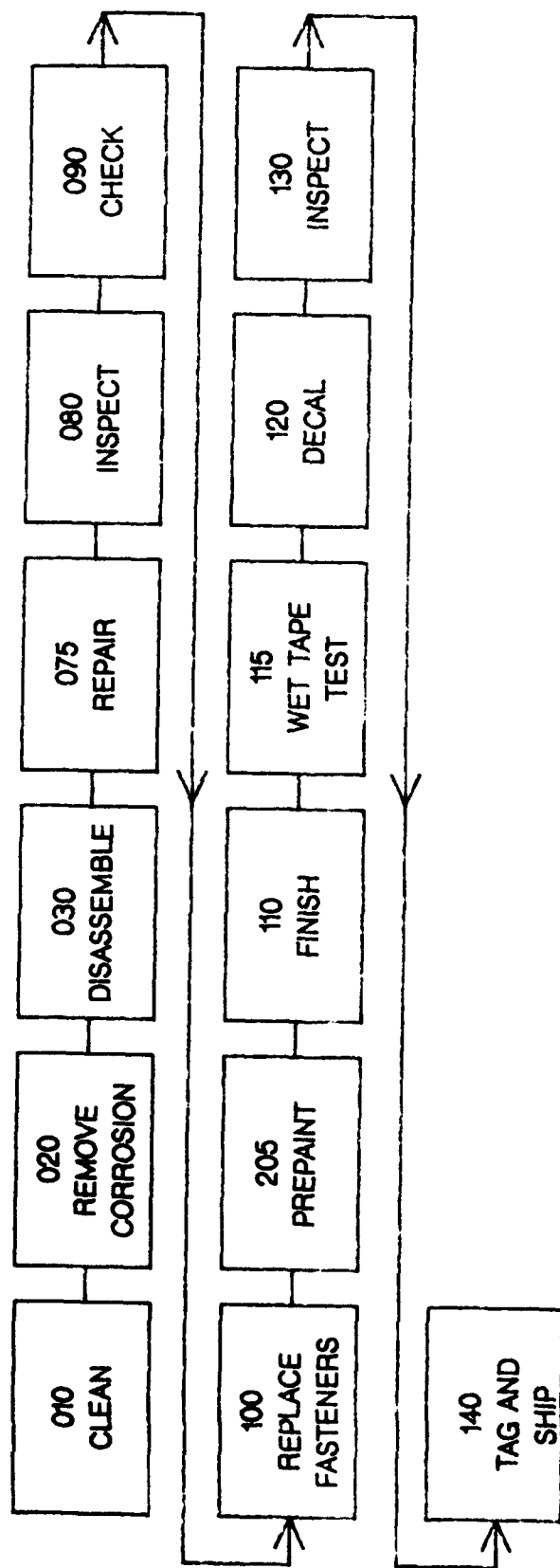
PCN #50164A
SCOOP

PROCESS FLOW CHART

WR-ALC
MANPSC

PCN #51402A

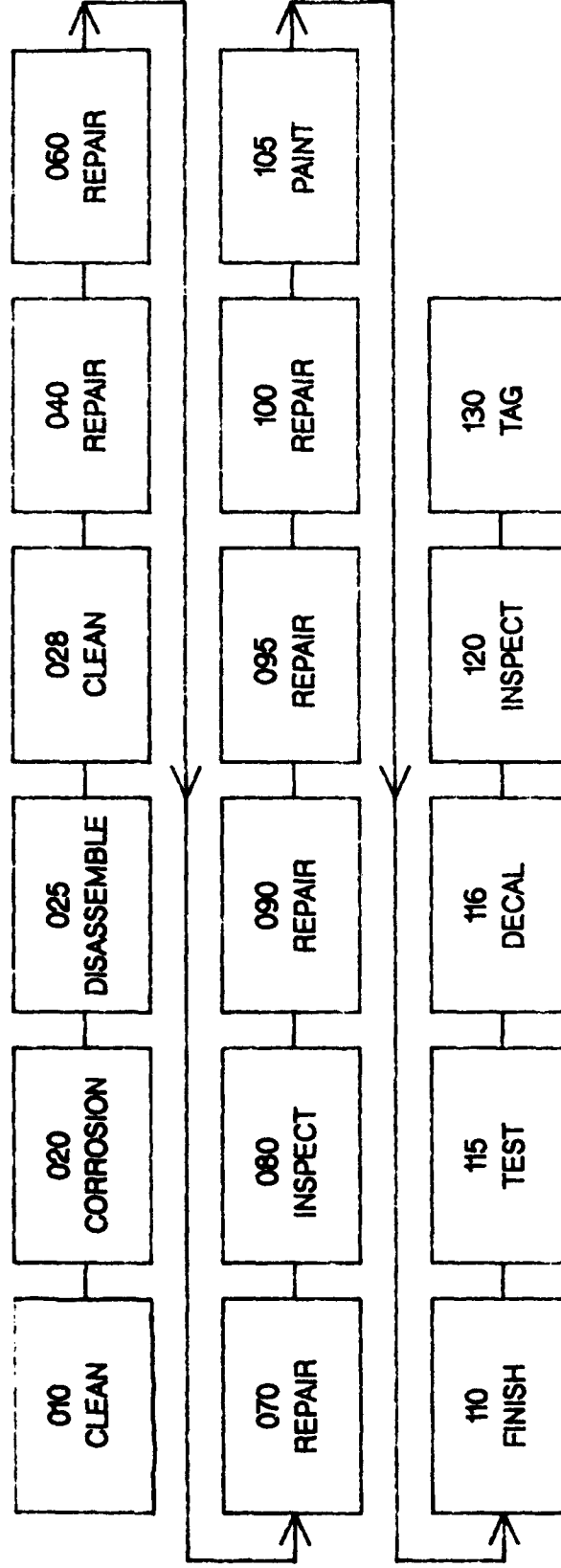
DOOR, THRUST REVERSER



PROCESS FLOW CHART

WR-ALC
MANPSC

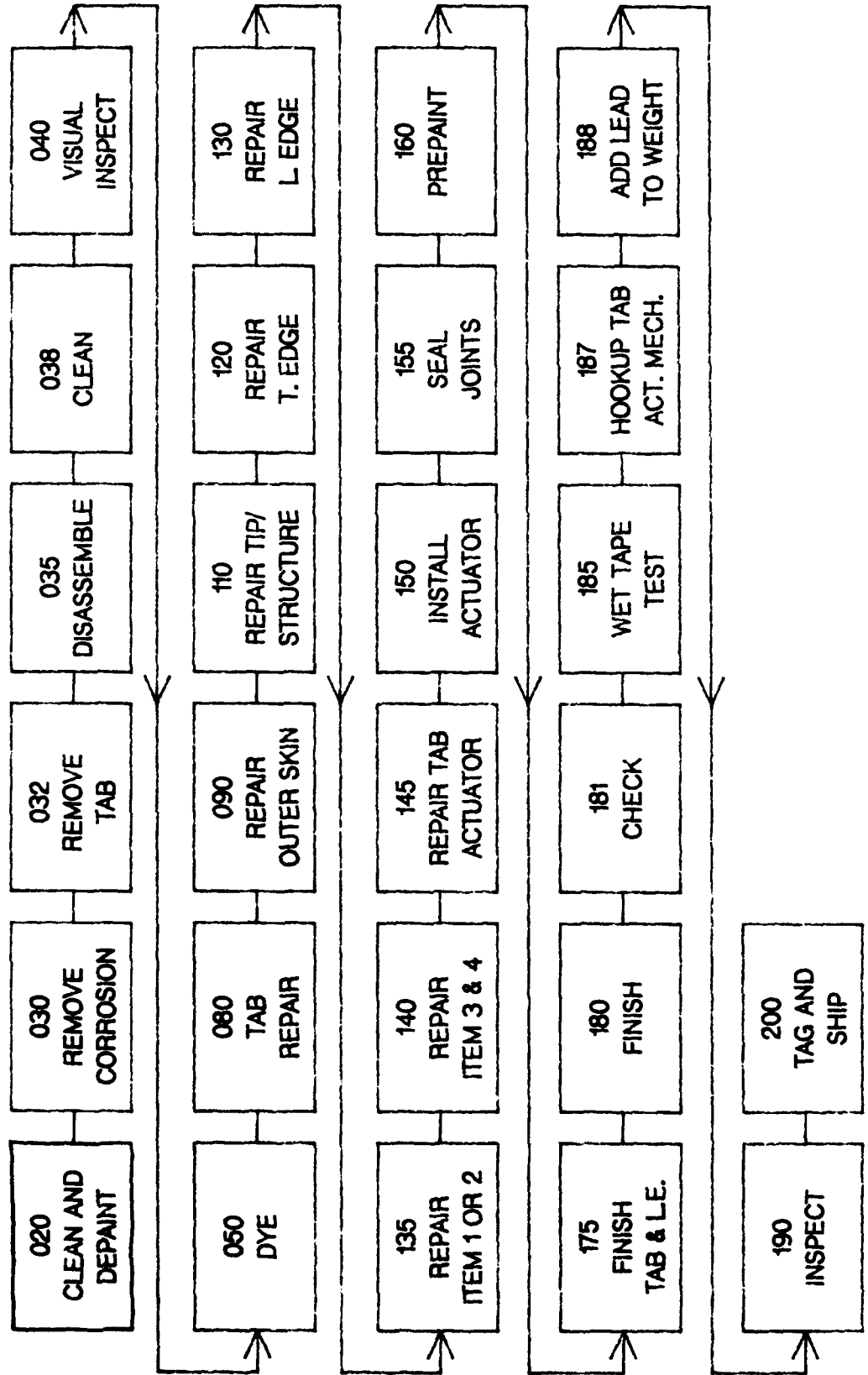
PCN #50454A
FLAP, CENTER WING



PROCESS FLOW CHART

WR-ALC
MANPSC

PCN #50266A
ELEVATOR



-----ADP-8094 953----- (CONTINUED) -----COMPUTER GENERATED

B. COMPLETE THE FOLLOWING TASKS				REMARKS	
168-29	155	INSPECT & MECHANICALLY ADJUST INTERFERRAL CORROSION ON ALL FWD & AFT IN COULING. ROUTE EXCESSIVE CORRODED COULING PARTS TO MNPCT. ATTACH SUPPLEMENT SHEET MNPCT. REEKNING ONLY			
168-29	156	CLEAN COUL PARTS. REMOVE PROTECTIVE COATING FROM NEW OUTER PANEL EXTERIOR. ROUTE TO MNPCT. REEKNING ONLY			
168-29	157	BEGIN PHASE I (PIL) CROSS BOW REEKNING ONLY			
168-29	158	INSTALL ALL FITTINGS INCLUDING CENTER HINGE FITTING ON THE PANEL WITH TWO SCREWS INTO THE PANELS THREADED INSERTS. NOTE: DO NOT DRILL ANY HOLES IN PANEL.			
168-29	159	LOAD PANEL ON TO TIE			
168-29	160	FINISH CENTER HINGE FITTING TO FITTURE. USE SHORT L-PIN 3/8" DIA. THE L-PIN ALLOWS "FEEL" OF THE PIN'S TIGHTNESS DURING BUILDUP.			
168-29	161	INSTALL A MODIFIED CENTER HINGE FITTING IN THE TOP FWD INSERT POSITION ON THE PANEL.			
168-29	162	PULL THE PANEL INTO CONTOUR USING A MINIMUM OF 5 CLAMPS FWD AND AFT, STARTING AT THE TOP OF THE PANEL AND WORKING DOWN.			
168-29	163	WEDGE THE PANEL IN PLACE FROM THE BOTTOM EDGE USING THE LOWER SLIDE LOCATOR FEATURE (X8526619), FWD AND AFT. IN ROHR FIXTURES USE C-CLAMPS ON BOTTOM TRIM BOARDS.			
168-29	164	CHECK THE FWD AND AFT TRIM EDGE OF THE PANEL FOR CORRECT STATION USING GAUGES X8526573 (FWD) AND X8526607 (AFT). ON ROHR FIXTURES USE X865653 (FWD) AND X865654 (AFT).			
168-29	165	RELEASE CLAMPS. AT THIS POINT PANEL SHOULD BE CORRECTLY POSITIONED WITH LITTLE OR NO DAYLIGHT BETWEEN THE			

		TOUCH CENTER AND THE FUTURE REATCH CLAMP. THE MINIMUM SPECIFIC	
167-10	175 MNP8CT	LIGHTLY FORCE THE OUTER SURFACE OF THE PANEL, END AND AFT WHERE THE PANEL MEETS THE TOP OF THE CLAMPING DETAILS OF THE FIXTURE. THESE MARKS WILL ALLOW PRECISION CHECKING OF THE LOCATION OF THE PANEL IN THE FIXTURE LATER IN THE BUILDUP PROCESS. ON THE ROHR FIXTURES THE BOTTOM AND TOP TRIM BOARDS MAY BE USED FOR THE SAME PURPOSE	
168-10	176 MNP8CT	THEIR AND SIGN OFF THE PANEL LOCAT- ION AT THIS POINT	
169-10	177 MNP8CT	LOAD THE END AND AFT FRAMES, DUCT SEGMENTS, LINERS BEGINNING WITH CENTER LINER AND VANES IN THE FIXTURE. TEMPORARILY ATTACH ALL COMPONENTS. DO NOT FORCE ANY COMPONENTS.	
169-10	178 MNP8CT	ALIGN THE END FRAME ASSEMBLY TEMPORARILY TO THE PANEL USING THE TOP END PIN-UP POINT. RELOCATE CLIPS AND TRIM OR REPLACE PINS AS NECESSARY TO ACHIEVE THIS FIT. SET THE END FACE OF THE FRAME ON CORRECT STATION. USE THE 150 SPACER PRO- VIDED AT THE PIN-POINT. CHECK ALL OF THE FRAME FACE WITH THE GAUGE TOOL (X85534573) TO INSURE IT IS NOT TWISTED OFF STATION. USE GAUGE TOOL X8553552 FOR ROHR FIXTURES.	
169-20	179 MNP8CT	SNUGLY FIT THE DUCT SEGMENTS AND LINERS WORKING FROM FRONT TO REAR USING PLENTY OF TEMPORARY FASTENERS. MARK ALL TEMPORARY FASTENER LOCA- TIONS FOR FUTURE REFERENCE. NOTE: THIS PROCESS WILL DETERMINE THE STATION OF THE INNER PORTION OF THE AFT FRAME ASSEMBLY (ZP21313) DUE TO THE CONNECTION OF THE DUCT SEGMENTS TO THE FRAME.	3
169-20	174 MNP8CT	DUCT SEGMENT FRAMES SHOULD BE BOLTED TO THEIR RESPECTIVE FITTINGS TO CORRECTLY POSITION THE DUCT SEGMENTS AND VANES. DO NOT FORCE OR ATTACH FRAMES WHICH REQUIRE EXCESSIVE FORCE TO ALIGN. USE FINGER PRESSURE ONLY (A MINIMUM OF TWO FRAMES SHOULD BE SECURED PER DUCT SEGMENT, SPACED AT	3

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169-17	104	PERMANENTLY INSTALL FWD AND AFT COUL		
	MNPSCOT	INSTALL FWD COUL		
169-18	105	PERMANENTLY INSTALL FWD AND AFT COUL		
	MNPSCOT	INSTALL FWD COUL		
169-19	106	TEMPORARILY ATTACH SIDE PANEL AND ACCESS DOOR - - DO NOT DRILL - - OR TRIM PANEL OR DOOR AT THIS TIME		
		NOTE		
		BEGIN PHASE 4 - OBSERVE NOTE IN PHASE		
169-20	107	LOAD COUL IN FIXTURE WITH BEST POSSIBLE FIT - ONLY IF NECESSARY, THE FIXTURE CONTOUR SCAPES MAY BE FLID BACK ONE AT A TIME TO PIN-UP THE COUL - ONLY IF NECESSARY THE AFT 30 H100 PIN MAY BE USED		
	MNPSCOT			
169-21	108	POSITION AND REMOVA SIDE PANEL AND DOOR TO TOOLING		
	MNPSCOT			
169-22	109	CHECK THE CONTOUR OF THE SIDE PANEL		
	MNPSCOT			
169-23	110	SET THE CORRECT BUTTLIN OF THE LATCHFACES - IT 375 SPACERS BETWEEN THE LATCHFACE AND TOOLING FACE OF THE LEFT HAND FIXTURE AND 1450 SPACERS BETWEEN THE LATCHFACE AND TOOLING FACE OF RIGHT HAND FIXTURES		
	MNPSCOT			
169-24	111	FASTEN ALL FRAMES AND "BRACES" BETWEEN THE MAIN COUL AND THE LOWER PANEL BEFORE REMOVING FROM FIXTURE		
	MNPSCOT			
169-25	112	POSITION AND TRIM COUL TO DOOR PAYING ATTENTION TO FWD AND AFT STATION TRIM OF THE DOOR AND CORRECT BUTTLIN OF THE DOOR LATCHFACES (SEE OPER 200 ABOVE)		
	MNPSCOT			
169-26	113	CHECK THE FWD AND AFT TRIM OF SIDE PANEL AND ACCESS DOOR FOR CORRECT STATION. MARK ANY AREA OF EXCESS FWD AND AFT COUL TRIM		
	MNPSCOT			
169-27	114	CHECK AND SIGN OFF COUL CONFIGURATION AT THIS POINT		
	MNPSCOT			
169-28	115	ARE THREE TOP PINS HAND FREE?		
	MNPSCOT			
169-29	116	IS COUL IN CONTOUR FWD AND AFT?		
	MNPSCOT			
169-30	117	ARE FWD AND AFT PANEL TRIMS WITHIN TOLERANCE		
	MNPSCOT			

150-10	200 MNPSCOT	ARE SATISFIED WITH THE CURRENT OUTLINE?		
150-11	207 MNPSCOT	ARE FWD AND AFT FRAMES ON SECTION PLANE?		
150-12	210 MNPSCOT	REMOVE COWL FROM FITTING AND PERMANENTLY INSTALL SIDE PANEL AND ACCESS DOOR.		
150-13	215 MNPSCOT	TRIM COWL FWD AND AFT INCLUDING PAIRING STRIP.		
150-14	220 MNPSCOT	FINAL CHECK IN FIXTURE (RESKINE ONLY). PHASE VI.		
150-28	250 MNPSCOT	INSTALL + 3 REPAIR COWLING IN ALIGN- MENT FIXTURE AND CHECK FOR PROPER ALIGNMENT FOLLOWING SAME PROCEDURES AS IN OPER #200. NOTE THESE TOLERANCES MAY BE ACHIEVED (+3 ONLY) BY MOVING MOVABLE CONTROL BOARD BACK 1/4" FROM NOMINAL IS ALLOWED TO ACHIEVE THESE TOLERANCES.		
150-29	260 MNPSCOT	ROUTE TO HEAT TREAT. HEAT TREAT MISCELLANEOUS PARTS IAW ATTACHED SUPPLEMENT SHEET M8E14Y.		
150-29	270 MNPSCOT	ROUTE CRACKED PARTS TO WELDING SHOP. WELD IAW ATTACHED SUPPLEMENT SHEET.		
150-29	280 MNPSCOT	REPAIR CRACKS IN AFT COWL SUPPORT VANES AND LOWER ANGLES.		E
150-29	290 MNPSCOT	REPAIR CRACKS IN UPPER VANE ANGLES.		
150-29	300 MNPSCOT	REPAIR SURGE BLEED LOUVER.		
150-29	310 MNPSCOT	REPAIR LOWER SURGE BLEED DUCT.		
150-29	320 MNPSCOT	INSPECT AND REPAIR OR REPLACE FIRE SEAL.		
150-29	330 MNPSCOT	REPAIR OR REPLACE SIDE PANEL.		E
150-29	335 MNPSCOT	IF HAT CHANNEL, P/N 7021786-106, IS REPLACED AND HAS TO BE MODIFIED, MODIFY IAW ECO NO 79C0021 AND 1C-141B-3, SEC VIII. IF NOT, N/A.		A

159-27	340 MNP3CT	REPAIR MODEL TEST CHEE FOR CUMBER REPLACE MISSING PARTS AND ALL EXP POINTS BALANCE AND TOLERS		
159-27	345 MNP3CT	REMOVE DISPOSITION AND MCH-1415-23 NIA		
159-27	350 MNP3CT	PREPAINT TREAT TIME _____ DATE _____ NOTE ITEM MUST BE PAINTED WITHIN 48 HOURS TIME _____ DATE _____		
159-27	360 MNP3CT	PAINT EXTERIOR AND INTERIOR 164 FINISH TIME _____ DATE _____		
159-27	370 MNP3CT	4. FORTY-EIGHT HOURS AFTER PAINT PERFORM WET TAPE TEST NIA IF NOT REQUIRED) 5. WET TAPE TEST STARTED TIME _____ DATE _____		
159-28	380 MNP3CT	REIN-INSTALL AND TEST DETECTOR SYSTEM IAW T.O. 10-1415-10 AND T.O. 10-1415-2-771-1		
159-28	385 MNP3CT	REINSTALL EJECTOR TUBE AND COUPLING PMD33597-10 WITH CLAMPS PER JAN7001-105 SEA		
159-29	390 MNP3CT	INSTALL WARNING DECALS. N40		
159-29	400 MNP3CT	INSTALL WR-410 DECAL IAW MAGI 66-40. COMPLETE AFIO FORM 1349 UPDATE DATA PLATE.		
159-29	410 MNP3CT	FINAL VISUAL INSPECT. CHECK FOR TOOLS AND FOREIGN OBJECTS.		
159-29	420 MNP3CT	TAG AND TURN-IN.		
		MANE/89062 MANP/89062 MANS/89062 MAQN/89062		

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (A), 10⁷ cells/ml (B), 10⁸ cells/ml (C), and 10⁹ cells/ml (D). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (A), 10⁷ cells/ml (B), 10⁸ cells/ml (C), and 10⁹ cells/ml (D). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (A), 10⁷ cells/ml (B), 10⁸ cells/ml (C), and 10⁹ cells/ml (D).

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1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

SEEKING QUALITY WITH YOUR EVALUATION

NAME 17363
NAME 17363
NAME 17363
NAME 17363

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

1. *Chlorophyll a* (Chl *a*)

457 2011

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

DATE	DESCRIPTION	AMOUNT	BALANCE
1960-01-01	OPENING BALANCE	100.00	100.00
1960-01-15	PAYROLL	50.00	50.00
1960-01-31	RENT	25.00	25.00
1960-02-15	UTILITIES	10.00	15.00
1960-02-28	SALES	75.00	90.00
1960-03-15	PAYROLL	50.00	40.00
1960-03-31	RENT	25.00	15.00
1960-04-15	UTILITIES	10.00	5.00
1960-04-30	CLOSING BALANCE	5.00	5.00

— 55 —

2014-01-23

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11-17-52

POSITIVE ACCOUNT DATA

22-23

532

1994 = 9.45

MINOR REPAIR DOOR JAW TECH ORDER
10-11-81 SECTION 11 PART 3
RETURN TO INJECT

1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 26

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Figure 5.2

17. IF NEW OUTER C.D. IS NEEDED FOR 10-1-19-2, RETURN TO THE OFFICE OF THE DIRECTOR, FBI, WASHINGTON, D.C. 20535.

MANE/88144
MANB/88144
MANP/88144
MAGN/88144

Table 1. *Salmonella* serotypes and their associated diseases

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Lichtenthaler and Whistler (1973). The total chlorophyll content was determined by the method of Arar and Cook (1980). The carotenoid content was determined by the method of Lichtenthaler and Whistler (1973). The total carotenoid content was determined by the method of Arar and Cook (1980). The total protein content was determined by the method of Lowry et al. (1951). The total lipid content was determined by the method of Bligh and Dyer (1959). The total carbohydrate content was determined by the method of Dubois and Gilles (1950). The total nucleic acid content was determined by the method of Burton (1956). The total ash content was determined by the method of AOAC (1990). The total moisture content was determined by the method of AOAC (1990). The total dry matter content was determined by the method of AOAC (1990). The total organic acid content was determined by the method of AOAC (1990). The total alkaloid content was determined by the method of AOAC (1990). The total flavonoid content was determined by the method of AOAC (1990). The total phenolic content was determined by the method of AOAC (1990). The total tannin content was determined by the method of AOAC (1990). The total saponin content was determined by the method of AOAC (1990). The total sterol content was determined by the method of AOAC (1990). The total glycoside content was determined by the method of AOAC (1990). The total alkaloid content was determined by the method of AOAC (1990). The total flavonoid content was determined by the method of AOAC (1990). The total phenolic content was determined by the method of AOAC (1990). The total tannin content was determined by the method of AOAC (1990). The total saponin content was determined by the method of AOAC (1990). The total sterol content was determined by the method of AOAC (1990). The total glycoside content was determined by the method of AOAC (1990).

6-2

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

11-15-2009

ROUTE TO IMPACT

---COMPUTER GENERATED---

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Arar and Collins (1971). The *Chlorophyll a* and *Chlorophyll b* contents were expressed as $\mu\text{g g}^{-1}$ of dry weight.

1. THE UNITED STATES OF AMERICA
 2. DEPARTMENT OF JUSTICE
 3. FEDERAL BUREAU OF INVESTIGATION
 4. WASHINGTON, D. C. 20535
 5.

1. The first group of people who are not in the labor force are those who are not in the labor force because they are not in the labor force.

DEPARTMENT OF THE ARMY
WASHINGTON, D.C.

140-181 (10) ROUTE TO MAFROT
UNRECORDED

MANE 1731
MANG 1731
MANP 1733
MANB 1731

AFLCR 66-11

SHOP FLOW DAY STANDARD

MISTR C/N 066921 REVIEW DATE 22 Nov '87

$$A((B / C) + D + E) / F$$

A = CONVERSION FACTOR, CHANGING WORKDAYS TO
CALENDAR DAYS

A = 1.46

A = 1.46

B = ITEM STANDARD HOURS / NUMBER OF WORKERS
TOTAL FOR ALL SHOPS 324.7 / 2 = B

B = 162.35

C = (a) Obtain the RCC yearly indirect time values
for duty codes (G037G - EH1 - M1 - MEH)

Duty Code

% Value

Duty Code

% Value

24

0.1

25

0

26

1.7

29

0

1.00 - 0.018 (a) = 0.982

(b) Obtain the RCC efficiency factor from the
G037G - FD1 - D2 - MFD (YR 87)

JAN

93.9

MAY

94.9

SEP

95.2

FEB

96.7

JUN

95.9

OCT

95.2

MAR

94.5

JUL

94.7

NOV

91.7

APR

91.9

AUG

84.5

DEC

91.8TOTAL 1125.9 - 12 = 93.8

Multiply (a) X (b) = C

(b) = 93.8 C = 92.1%

D = Process Support

244 Card input/output D033 System

12 Hours

Transportation time between RCC moves

2.0

Packing

0

Unpacking

16.0

Awaiting Maintenance

52.0

Inspection

0

Other

0

D = 72.0

E = Unique Process Support

Plating Process

1.5

Hrs

E = 72.4

Welding Process

.5

Heat Treat Process

0

Paint Process

4.9

Electrical

2.6

Wet Tape Test

24.0

Wet Cleaning

10.9

Other

28.0F = Shift Hours (8) X # of Shifts Working = 2

F = 16

A(((B / C) + D + E) / F)

Number of Flow Days

29

SAS

7:25 FRIDAY, FEBRUARY 24, 1989 1

PART OPERATION SUMMARY

ALC: WARNER ROBBINS RCC: MANPDB

PCN: 06692A WCD: M8A14Y WCD DATE: 88141

PN: 8325548-

NSN: 30

OPERATION: ZPRT

BACKSHOP OPERATION TYPE:

MATERIAL TYPE:

END ITEMS:

MISSING FLOWTIMES: 0

SAMPLE SIZE: 2

OUTLIERS DELETED: 0

----- MANPOWER REQUIRED -----

----- EQUIPMENT REQUIRED -----

SKILL	QTY	FRACTION	HOURS	CODE	CATEGORY	QTY	FRACTION	HOURS	BATCH	
									MIN	MAX

HISTORICAL DATA

ACTUAL FREQ	RELATIVE FREQUENCY											DISTRIBUTION	PARAMETERS	D VALUE	D ALPHA	
	0	10	20	30	40	50	60	70	80	90	100					
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>=10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

OCCURRENCE FACTOR: . OCCURRENCES: 2

DISTRIBUTION OF CHOICE: HISTORICAL DISCRETE

PART OPERATION SUMMARY

ALC: WARNER ROBBINS RCC: MANPDA

PN: 8325548-

NSN: 30

PCN: 06692A

VCD: MBD14Y WCD DATE: 87363

OPERATION: ZPRT

MISSING FLOWTIMES: BACKSHOP OPERATION TYPE: MATERIAL TYPE:

END ITEMS: OUTLIERS DELETED:

----- MANPOWER REQUIRED -----		----- EQUIPMENT REQUIRED -----	
SKILL	QTY	FRACTION	TIME
		CODE	CATEGORY
		QTY	FRACTION
		HOURS	HOURS
		MIN	MAX

HISTORICAL DATA

ACTUAL FREQ	RELATIVE FREQUENCY											DISTRIBUTION	PARAMETERS	D VALUE	D ALPHA
	0	10	20	30	40	50	60	70	80	90	100				
0												UNIFORM			
0												TRIANGULAR			
0												NORMAL			
0												LOGNORMAL			
0												EXPONENTIAL			
0															
0															
0															
0															
0															

OCCURRENCE FACTOR: OCCURRENCES:

DISTRIBUTION OF CHOICE:

>= 0

PART OPERATION SUMMARY

PN: 8325548-40
ALC: WARNER ROBBINS
RCC: MANPSC
SHEETMETAL, SHEETMETAL REPAIR
NSN:
PCN: 06692A
WCD: MB014Y
WCD DATE: 87363
OPERATION: 7PPT
MISSING FLOWTIMES: 0
PRIMARY OPERATION TYPE: INS
MATERIAL TYPE: AL
SAMPLE SIZE: 107
END ITEMS:
OUTLIERS DELETED: 0

[illegible]

HISTORICAL DATA

[illegible]

OCURRENCE FACTOR: . OCCURRENCES: 107
DISTRIBUTION OF CHOICE: HISTORICAL DISCRETE

2. PSSD/RCC 3. MATERIAL 4. MIC 5. ERRC 6. QTY 7. SCHED DT 8. COMP
MNPST

9. MODEL/DESIGN/SERIES 10. NOUN 11. ITEM SERIAL
C-130 B, E, & H SCOOP, ENGINE AIR INLET

12. BCN 12A. SER NO. 13. TECH DATA/OPTIONAL
1-1-4, 1-1-8, 1C-130A-23,
1C-130B-10, 1C-130A-3,

14. PART NUMBER 15. STOCK NR. 16. PDN 17. BCN
352863-501 1560006529677LG 50547A 806564
352863-9 1560000835312LG 50164A 806565
352863-9 1560000835312LG 10751A 915328

18. DISP-19 PDN/
STATION OP NO. 20. WORK TO BE ACCOMPLISHED 21. MECH 22. P' 23

18. DISP-19 PDN/ STATION OP NO.	20. WORK TO BE ACCOMPLISHED	21. MECH	22. P'	23
	SUPPLEMENTAL WCD'S: MBA24D: DEGREASE, HEAT TREAT AND CADIUM PLATE MISC PARTS. MBB24D: BEAD BLAST AND WELD MISC PARTS. MBG24G: QUALITY ASSIST.			
180 010 MNPDD7	CLEAN IAW T.O. 1-1-2, SECTION VI.			B
180 020 MNPDD7	DEPAINT IAW T.O. 1-1-2, SECTION VI.			B
180 030 MNPDD7	REMOVE CORROSION IAW T.O. 1-1-2, SECTION VI.			B
169 040 MNPST	DISASSEMBLE SCOOP ASSY AS REQUIRED. N/A OPERATIONS 070 AND 090 IF WELDING IS NOT REQUIRED.			
180 050 MNPDD7	CLEAN INTERIOR OF SCOOP AND/OR MISCELLANEOUS PARTS IAW T.O. 1-1-2, AS REQUIRED.			B
169 060 MNPST	REPAIR IAW T.O. 1C-130A-3, SECTION VI. NOTE: N/A NEXT TWO (2) OPERA- TIONS IF WELDING IS NOT REQUIRED.			B
142 070 MNPDAJ	IF REQUIRED, BEAD BLAST AREAS TO BE WELDED, IAW MIL-STD-1504			B
169 090 MNPST	WELD REPAIR AS REQUIRED IAW T.O. 1-1A-9.			B
169 100 MNPST	COMPLETE REPAIRS TO SCOOP IAW T.O. 1C-130A-3.			B
169 110 MNPST	INSPECT FOR TOOLS AND FOREIGN OBJECTS.			B

19. DISP-19. PDM

STATION OP NO.

20. WORK TO BE ACCOMPLISHED

21. MECH 22. P 23

180	120 MNPDD7	PREPAINT TREAT IAW T.O. 1-1-2 AND 1-1-8. RECORD TIME: _____ DATE: _____ NOTE: ITEM MUST BE PAINTED WITHIN 48 HOURS.			B
180	130 MNPDCF	FINISH IAW T.O. 1-1-4 AND 1-1-8. TIME: _____ DATE: _____			B
180	140 MNPDCF	A. FORTY-EIGHT HOURS AFTER PAINT, PERFORM WET TAPE TEST IAW T.O. 1-1-8 B. WET TAPE TEST STARTED: DATE: _____ TIME: _____			B
169	150 MNPSCT	COMPLETE AFTO FORM 349. WORK UNIT 22BAR. INSTALL WR/ALC DECAL.			
169	160 MNPSCT	FINAL VISUAL INSPECT. INSPECT FOR TOOLS AND FOREIGN OBJECTS. TAG AND TURN IN.			B
		MANE/89005 MANP/89005 MANS/89005 MAQN/89005			

SHOP FLOW DAY STANDARD

Reference AFLCR 66-11

CONTROL NO. 50164A

DATE 28 Dec 88

Shop Flow Days (standard calendar days) = $\frac{A((B / C) + D + E)}{F}$

Where :

A = CONVERSION FACTORS, Changing workdays to calendar days.

5 day week = 1.46

6 day week = 1.21

7 day week = 1.03

A = 1.46

B = END ITEM STANDARD HOURS, expressed in hours, to two decimal places.

Note 1. When an operation with a labor standard takes place concurrent to a process support or unique process support operation (factors D or E below), use only the longer time.

Note 2. If the same operation is performed on the same part at the same time by multiple workers, divide the total standard time by the number of workers.

B = 73.74

C = RCC CONSTANT, direct labor hours, expressed as a percentage of total hours available. Subtract indirect labor factors for duty codes .24, .25, .26, and .29 for 1.00. Reference G037G-EHI-MI-MEH. Round off answer to four decimal places.

C = 9850

D = PROCESS SUPPORT, expressed in hours, to two decimal places. An average time value for each end item, for transportation time between RCCs, packing, unpacking, and awaiting Maintenance time.

D = 4.94

E = UNIQUE PROCESS SUPPORT, expressed in hours, to two decimal places. An average time value for each end item, for processes, such as plating, heat treating, welding, painting, etc.

E = 12.74

F = SHIFT HOURS, expressed in whole hours. Normally 8 hours in peacetime. Peacetime process or test times that exceed 8 hours are an exception (e.g. plating, heat treating, etc.). If the number of shifts are temporarily changed (3 months or less), the number of flow days should not be modified.

F = 8

Flow Days = $\frac{A((B / C) + D + E)}{F}$

FD = 12

FLOW PROCESS CHART

NUMBER

PAGE NO.

NO OF PGS

4. PROCESS										5. SUMMARY									
Repair of C-130 Engine Exhaust Scoop										3. ACTIONS		b. PRESENT		c. PROPOSED		d. DIFFERENCE			
6. ☐ MAN OR ☐ MATERIAL											NO.	TIME	NO.	TIME	NO.	TIME			
7. CHART BEGINS										☐ OPERATIONS	10								
8. CHART ENDS										☐ TRANSPORTATIONS	9								
9. CHARTED BY										☐ INSPECTIONS	1								
10. DATE										☐ DELAYS									
11. ORGANIZATION										☐ STORAGE									
12. DETAILS OF ☐ PRESENT ☐ PROPOSED METHOD										DISTANCE TRAVELLED (Feet)									
										ANALYSIS		E. ANALYSIS		F. ANALYSIS					
										WHY?		NOTES		CH					
										WHAT?	WHERE?	WHEN?	HOW?	WHY?	HOW?				
										TIME	TIME	TIME	TIME	TIME	TIME				
1. Clean, repaint and remove corrosion	●	○	□	◇	▽														
2. Move to Bldg 169	○	●	□	◇	▽														
3. Disassemble scoop as required	●	○	□	◇	▽														
4. Move to Bldg 180	○	●	□	◇	▽														
5. Clean interior of scoop and for Misc. Parts	●	○	□	◇	▽														
6. Move to Bldg 169.	○	●	□	◇	▽														
7. Repair scoop as needed	●	○	□	◇	▽								Item is moved to welding is needed						
8. Move to Bldg 142	○	●	□	◇	▽														
9. Bead Blast areas to be welded.	●	○	□	◇	▽														
10. Move to Bldg 125	○	●	□	◇	▽														
11. Weld as required	●	○	□	◇	▽														
12. Move to Bldg 169	○	●	□	◇	▽														
13. Complete repairs	●	○	□	◇	▽														
14. Move to Bldg 180	○	●	□	◇	▽														
15. Prepaint treat	●	○	□	◇	▽														
16. Move to Paint shop in Bldg 180	○	●	□	◇	▽														
17. Paint scoop	●	○	□	◇	▽														
18. Move to Bldg 169	○	●	□	◇	▽														
19. Final Visual Inspection	○	●	□	◇	▽														
20. Tag and Turn IN	●	○	□	◇	▽														
21.	○	●	□	◇	▽														

SAS

PN: 352863-9 ALC: WARNER ROBBINS PART OPERATION SUMMARY 7:25 FRIDAY, FEBRUARY 24, 1989 4

NSN: RCC: MANPSC SHEETMETAL, SHEETMETAL REPAIR WCD: MB024D WCD DATE: 88147
 OPERATION: ZPRT PCN: 50164A
 SAMPLE SIZE: 45 MISSING FLOWTIMES: 0 PRIMARY OPERATION TYPE: INS MATERIAL TYPE: AL
 ----- MANPOWER REQUIRED ----- END ITEMS: OUTLIERS DELETED: 2

SKILL	QTY	TIME		CATEGORY	QTY	TIME		BATCH
		FRACTION	HOURS			FRACTION	HOURS	
EQUIPMENT REQUIRED								

HISTORICAL DATA

ACTUAL FREQ	RELATIVE FREQUENCY										D VALUE	D ALPHA
	0	10	20	30	40	50	60	70	80	90		
0	***											
20	***											
40	***											
60	***											
80	***											
100	***											
120	***											
140	***											
160	***											
180	***											
>=00	***											

UNIFORM 9.0 327.0 0.625
 TRIANGULAR 9.0 43.0327.0 0.543
 NORMAL 76.0 84.7 0.343
 LOGNORMAL 76.5 1.000
 EXPONENTIAL 0.212

OCCURRENCE FACTOR: OCCURRENCES: 47
 DISTRIBUTION OF CHOICE: HISTORICAL DISCRETE

2. PSSD/RCC		3. MATERIAL		4. MIC	5. ERPC	6. QTY	7. SCHED DT	8. COMP
MNPSC								
9. MODEL/DESIGN/SERIES				10. NOUN			11. ITEM SERIAL	
				DOOR, THRUST REVERSER				
12. BCN 12A. SER NO.				13. TECH DATA/OPTIONAL				
				1-1-1				
				1-1-2, 1-1-4, 1-1-8,				
				1-1A-9, 1C-141B-10				
				1C-141B-3, 1C-141B-36,				
14. PART NUMBER		15. STOCK NR.		16. PDN		17. BCN		
3P22002-362		1560009411377JH		51402A		806515		
3P22002-361		1560009411378JH		51404A		806516		
3P22002-359		1560009073121JH		05309A		806517		
3P22002-360		1560012304280JH		09276A		806518		
18. DISP-19. PDN/		20. WORK TO BE ACCOMPLISHED		21. MECH		22. P		23
STATION/OP NO.								
180-27 010		CLEAN.						
MNPDD7								
169-29 020		INSPECT FOR AND REMOVE CORROSION.						
MNPDD7								
169-29 030		INSPECT AND DISASSEMBLE AS						
MNPSC		NECESSARY FOR REPAIRS.						
169-29 075		REPAIR SHEET METAL STRUCTURAL DAMAGE						B
MNPSC		IAW T.O. 1C-141B-3.						
169-29 080		INSPECT FITTING FOR ELONGATED HOLES;						
MNPSC		LOOSE RIVETS AND FASTENERS IAW T.O. 1C-141B-3.						
169-29 090		VISUALLY CHECK CONTOUR AND ALIGNMENT						
MNPSC		IAW T.O. 1C-141B-3.						
169-29 100		REPLACE RIVETS AND FASTENERS IAW						B
MNPSC		T.O. 1C-141B-3.						
180-27 105		PREPAINT TREAT.						
MNPDD7		NOTE: ITEM MUST BE PAINTED						
		WITHIN 48 HOURS.						
		RECORD TIME: _____ DATE: _____						
180-27 110		FINISH AS PER PRINT 3P00006.						B
MNPDCF		TIME: _____ DATE: _____						
180-27 115		A. FORTY-EIGHT HOURS AFTER PAINT.						B
MNPDCF		PERFORM WET TAPE TEST.						
		B. WET TAPE TEST STARTED:						
		DATE: _____ TIME: _____						
169-29 120		COMPLETE AFTO FORM 349.						
MNPSC		INSTALL WR-ALC DECAL IAW MAOI 66-40.						
		WORK UNIT CODE 23TQA.						

13. DIBP-19. PBN

STATION OF NO

20. WORK TO BE ACCOMPLISHED

21. MECH 22. P 23

169-29 130
MNPSCTFINAL VISUAL INSPECT.
1. CHECK FOR TOOLS AND FOREIGN
OBJECTS.169-29 140
MNPSCT

TAG AND TURN IN.

MANE/88154
MANS/88154
MANP/88154
MAQN/88154

$$A((B / C) + D + E) / F$$

A = CONVERSION FACTOR, CHANGING WORKDAYS TO
CALENDAR DAYS A = 1.46

B = ITEM STANDARD HOURS / NUMBER OF WORKERS
TOTAL FOR ALL SHOPS 76.1 / 1 = B B = 76.1

C = (a) Obtain the RCC yearly indirect time values
for duty codes (G037G - EH1 - M1 - MEH)

Duty Code	% Value	Duty Code	% Value
24	<u>0.1</u>	25	<u>0</u>
26	<u>1.7</u>	29	<u>0</u>

1.00 - 0.018 (a) = 0.982

(b) Obtain the RCC efficiency factor from the
G037G - FD1 - D2 - MFD (YR 87)

JAN <u>93.9</u>	MAY <u>94.9</u>	SEP <u>95.2</u>
FEB <u>96.7</u>	JUN <u>95.9</u>	OCT <u>95.2</u>
MAR <u>94.5</u>	JUL <u>94.7</u>	NOV <u>91.7</u>
APR <u>91.9</u>	AUG <u>84.5</u>	DEC <u>96.8</u>

TOTAL 1125.9 - 12 = 93.8 (b) = 93.8 c = 92.1%
Multiply (a) X (b) = C

D = Process Support

244 Card input/output D033 System	12 Hours	
Transportation time between RCC moves	<u>3.5</u>	
Packing	<u>2.0</u>	
Unpacking	<u>0</u>	
Awaiting Maintenance	<u>52.0</u>	D = <u>69.5</u>
Inspection	<u>0</u>	
Other	<u>0</u>	

E = Unique Process Support

Plating Process	<u>1.0</u>	Hrs	E = <u>31.0</u>
Welding Process	<u>1.5</u>		
Heat Treat Process	<u>0</u>		
Paint Process	<u>1.5</u>		
Electrical	<u>0</u>		
Wet Tape Test	<u>64.0</u>		
Wet Cleaning	<u>3.5</u>		
Other	<u>1.5</u>		

F = Shift Hours (8) X # of Shifts Working = 1 F = 8

$$A(((B / C) + D + E) / F)$$

Number of Flow Days 33

SAS

7:25 FRIDAY, FEBRUARY 24, 1989 9

PART OPERATION SUMMARY

PN: 3P22002-362
 OPERATION: ZPRT
 SAMPLE SIZE: 9
 ALC: WARNER ROBBINS
 RCC: MANPSC
 SHEETMETAL, SHEETMETAL REPAIR
 NSN:
 PCN: 51402A
 WCD: MB019Y
 WCD DATE: 88154
 PRIMARY OPERATION TYPE: ASSY
 MATERIAL TYPE: SYN
 MISSING FLOWTIMES: 0
 END ITEMS: 0
 OUTLIERS DELETED: 0

----- MANPOWER REQUIRED -----
 SKILL QTY FRACTION HOURS
 ----- EQUIPMENT REQUIRED -----
 CATEGORY QTY FRACTION HOURS
 BATCH
 MIN MAX

HISTORICAL DATA

ACTUAL FREQ	0	10	20	30	40	50	60	70	80	90	100	DISTRIBUTION	PARAMETERS	D VALUE	D ALPHA	
0	0											UNIFORM	14.0	41.0	0.171	1.00
5	0											TRIANGULAR	14.0	28.0	0.109	1.00
10	11	****										NORMAL	29.7	8.7	0.220	1.00
15	0											LOGNORMAL			1.000	1.00
20	11	****										EXPONENTIAL	31.3		0.328	1.00
25	44	*****														
30	0															
35	22	*****														
40	11	****														
45	0															
>=50	0															

OCCURRENCE FACTOR: 9
 OCCURRENCES: 9
 DISTRIBUTION OF CHOICE: TRIANGULAR

2 PSSD/POC 3 MATERIAL 4 MIC 5 ERRC 6 QTY 7 SCHED DT 8 COMP
MNPST

9 MODEL/DESIGN/SERIES 10 NOUN 11 ITEM SERIAL
C-130 FLAP, CENTER WING

12 BCN 12A. SER NO. 13 TECH DATA/OPTIONAL
1C-130A-3, 1-1-2
1C-130A,B,E,H(H)2-2
1C-130B/H

14 PART NUMBER 15 STOCK NR. 16 PDN 17 BCN
375456-3 1560006031491LG 50454A 806668
375456-4 1560007323228LG 50455A 806669
375456-6 1560008132072LG 50195A 806670
375456-5 1560008182083LG 50143A 806671
375456-7 1560009121806LG 50242A 806672
375456-8 1560009121812LG 50244A 806673
342328-600R 1560005455166LG 01651A 806674

18 DISP-19 PDN/
STATION OP NO. 20 WORK TO BE ACCOMPLISHED 21 MECH 22 'P' 23

		SUPPLEMENTAL WCD'S MBA53D: FLAP CARRIAGES MBB53D: PREPAINT TREAT/PRIME L.E. AND FLAP SKINS, CLEAN AND PLATE MISC MBG53D: ASSIST QUALITY			
180-27	010 MNPDD7	CLEAN AND DEPAINT IAW T.O. 1-1-2.			B
180-27	020 MNPDD7	REMOVE CORROSION IAW T.O. 1-1-2.			B
169-29	025 MNPST	SHAKE DOWN FOR FOD PRIOR TO REWORK, DISASSEMBLE AS REQUIRED.			
180-27	028 MNPDD7	CLEAN INTERIOR OF FLAP IAW T.O. 1-1-2 AS REQUIRED.			B
169	030 MNPST	INSTALL IN FIXTURE AND CHECK FLAP ALIGNMENT, WEAR TOLERANCES AND CONDITION OF ACTUATOR PLATES. (REPLACE PLATES AS NECESSARY)			
169	040 MNPST	REPAIR STRUCTURE IAW T.O. 1C-130A-3.			B
169	060 MNPST	REPAIR/REPLACE LEADING EDGE SKINS.			B
169	070 MNPST	REPAIR/REPLACE BOTTOM SKINS IAW T.O. 1C-130A-3.			B
169	080 MNPST	RECHECK ALIGNMENT PRIOR TO REMOVING FROM FIXTURE.			B

13.D13P-12.PDN/

STATION OP NO. 20 WORK TO BE ACCOMPLISHED 21 MECH 22 P

169	090 MNP SCT	REPAIR OR REPLACE TOP SKINS IAW T.O. 1C-130A-3.
-----	----------------	--

169	095 MNP SCT	REPAIR TRAILING EDGE IAW T.O. 1C-130A-3.
-----	----------------	---

169	100 MNP SCT	REPAIR/SERVICE/REPLACE CARRIAGES AS REQUIRED IAW T.O. 1C-130A-3, 1C-130A,B,E,H(H)2-2.
-----	----------------	---

180-27	105 MNPDD7	PREPAINT TREAT IAW T.O. 1-1-2 AND 1-1-8. RECORD TIME: _____ DATE: _____ NOTE: ITEM MUST BE PAINTED WITHIN 48 HOURS.
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180-27	110 MNPDCF	FINISH IAW TO 1-1-4 AND 1-1-3. TIME: _____ DATE: _____
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180-27	115 MNPDCF	A. FORTY-EIGHT HOURS AFTER PAINT, PERFORM WET TAPE TEST IAW T.O. 1-1-8 B. WET TAPE TEST STARTED: DATE: _____ TIME: _____
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169-29	116 MNP SCT	COMPLETE AFTO FORM 349 AND INSTALL WR-ALC DECAL IAW MAOI 66-22.
--------	----------------	--

169-29	120 MNP SCT	INSPECT FOR TOOLS AND FOREIGN OBJECTS.
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169	130 MNP SCT	FINAL VISUAL INSPECT. TAG AND TURN IN.
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MANE/8147
MANP/8147
MANS/8147
MAQN/8147

 2. PSSD/RCC 3. MATERIAL 4. MIC 5. ERRC 6. QTY 7. SCHED DT 8. COMP
 MNPSCT

9. MODEL/DESIGN/SERIES 10. NOUN 11. ITEM SERIAL
 C-130 FLAP, CARRIAGE CENTER WING

12. BCN 12A. SER NO. 13. TECH DATA/OPTIONAL
 MIL-STD-1504, 44B-1-102
 1-1-2, 1-1-3, 1-1-4,
 1C-130A-3, 1C-130A-36

14. PART NUMBER 15. STOCK NR. 16. PDN 17. BCN
 342781-501 1560006316402LG 805547

18. DISP-19. PDN/
 STATION OP NO. 20. WORK TO BE ACCOMPLISHED 21. MECH 22. P' 23

169	010 MNPSCT	REMOVE CARRIAGES FROM FLAP.			
169	020 MNPSCT	TEAR DOWN CARRIAGES.			
142	030 MNPDAJ	HULL BLAST TO REMOVE PAINT AND CORROSION IAW MIL-STD-1504.			
142	040 MNPDAJ	NDI INSPECT CARRIAGE FRAMES IAW 1C-130A-36.	K		
180-27	050 MNPDD7	PREPAINT & TREAT IAW T.O. 1-1-2 & 1-1-8.			B
180-27	060 MNPDCF	FINISH IAW T.O. 1-1-4 & 1-1-8. TIME _____ DATE _____			B
169	070 MNPSCT	ASSEMBLE CARRIAGES. INSTALL NEW BEARINGS 100%.			B

MANE/8147
 MANP/8147
 MANS/8147
 MAQN/8147

2. PSSD/RCC 3. MATERIAL 4. MIC 5. ERRC 6. QTY 7. SCHED DT 8. COMP

9. MODEL/DESIGN/SERIES 10. NOUN 11. ITEM SERIAL
CENTER WING FLAP12. BCN 12A. SER NO. 13. TECH DATA/OPTIONAL
1-1-4, 1-1-2, 1-1-8

14. PART NUMBER	15. STOCK NR.	16. PDN	17. BCN
375456-3	1560006031491LG	50454A	805597
375456-4	1560007323228LG	50455A	805598
375456-6	1560008182072LG	50195A	805599
375456-5	1560008182083LG	50143A	805600
375456-7	1560009121806LG	50242A	805601
375456-8	1560009121812LG	50244A	805602
342328-600R	1560005455166LG	01651A	805603

18. DISP-19. PDN/
STATION OP NO. 20. WORK TO BE ACCOMPLISHED 21. MECH 22 'P' 23

180-27	010 MNPDD7	PREPAINT TREAT ITEMS AS REQUIRED IAW 1-1-2 AND 1-1-8.			B
--------	---------------	--	--	--	---

180-27	020 MNPDCF	PRIME INTERIOR SIDE OF LEADING EDGE SKINS AS REQUIRED IAW 1-1-4 AND 1-1-8.			B
--------	---------------	--	--	--	---

180-27	030 MNPDCF	PRIME INTERIOR SIDE OF FLAP SKINS AS REQUIRED IAW 1-1-4 AND 1-1-8.			B
--------	---------------	---	--	--	---

140	040	CLEAN & PLATE MISC PARTS AND HARDWARE AS REQUIRED.			
-----	-----	---	--	--	--

MANE/8034
MANP/8034
MANS/8034
MAQN/8034

1. NAME: [REDACTED] 2. GRADE: [REDACTED] 3. DATE: [REDACTED]

4. POSITION: [REDACTED] 5. DUTY: [REDACTED]

6. REPORT NO: [REDACTED] 7. REPORT DATE: [REDACTED]

14. PART NUMBER	15. STOCK NO	16. PDM	17. RCM
ITE451-7	150001111481L3	504513	505995
ITE451-8	1500007323229L3	504520	507131
ITE451-9	1500008123072L3	501933	507387
ITE451-10	1500008123072L3	501476	507387
ITE451-11	1500008123072L3	508-86	507387
ITE451-12	1500008123072L3	508-42	507387
ITE451-13	1500008123072L3	508-17	507387

18. DUTY: [REDACTED] 19. WORK TO BE ACCOMPLISHED: [REDACTED]

20. ASSIST QUALITY WITH JUMP EVALUATION: [REDACTED]

MADE 1 14
JANV 1974
JANV 1974
JANV 1974

AFLCR 66-11

SHOP FLOW DAY STANDARD

MISTR C/N 50454A REVIEW DATE 14 Oct 87

$$A((B / C) + D + E) / F$$

A = CONVERSION FACTOR, CHANGING WORKDAYS TO
CALENDAR DAYS

A = 1.46

A = 1.46

B = ITEM STANDARD HOURS / NUMBER OF WORKERS
TOTAL FOR ALL SHOPS 250.30 / 2 = BB = 125.15C = (a) Obtain the RCC yearly indirect time values
for duty codes (G037G - EH1 - M1 - MEH)

Duty Code % Value Duty Code % Value

24

0.1

25

0

26

1.7

29

0

1.00

0.018

(a) = 0.982(b) Obtain the RCC efficiency factor from the
G037G - FD1 - D2 - MFD (YR 87)JAN 93.9MAY 94.9SEP 95.2FEB 96.7JUN 95.9OCT 95.2MAR 94.5JUL 94.7NOV 91.7APR 91.9AUG 84.5DEC 96.8TOTAL 1125.9 - 12 = 93.8(b) = 93.8 C = 92.10

Multiply (a) X (b) = C

D = Process Support

244 Card input/output D033 System

12 Hours

Transportation time between RCC moves

2.0

Packing

Unpacking

Awaiting Maintenance

Inspection

Other

D = 14.00

Total Hrs

E = Unique Process Support

Plating Process

9.25 HrsE = 55.22

Welding Process

Heat Treat Process

Paint Process

5.47

Test Warmups

Wet Tape Test

24.0

Wet Cleaning

16.50

Other

Total Hrs

F = Shift Hours (8) X # of Shifts Working =

F = 8

$$A(((B / C) + D + E) / F)$$

Number of Flow Days

37

SHOP FLOW DAYS

REVIEW DATE 26 SEP 86 INSTR C/N 50454A

A	244 CARD INPUT/OUTPUT - DO33 SYS.	12.0
B	UNCRATE/PACKING	8.0
C	LABOR: D <u>ADIR. STD HRS</u> <u>158.29</u> E1 <u>LABOR EFF x NO. WORKERS</u> <u>.94 x 2 = 1.88</u>	84.19
	* TOTAL FOR ALL SHOPS	
D	MACHINE PROCESSING, (EG. DRYING, BAKING) IF WET TAPE TEST REQ. 24 HRS	24.0
E	PRODUCTION PROCESSING DELAY, <u>4</u> x 4 HRS =	16.0
F	INSPECTION, <u> </u> x 1.0 <u>N/A PAC PROGRAM</u>	0
G	TRANSPORTATION.	2.0
	TOTAL FLOW HOURS	146.19
I	WORK SHIFT ADJUSTMENT. <u>TOTAL FLOW HOURS</u> = <u>146.19</u> <u># SHIFTS</u> <u>1</u>	146.19
J	TOTAL FLOW DAYS <u>WORK SHIFT ADJ</u> = <u>146.19</u> <u>HRS SHIFT</u> <u>8</u>	18.27
K	CONVERSION TO CALENDAR DAYS <u>1.45 x 18.27</u> = <u>26.49</u> TOTAL FLOW DAYS	26
L	SUM FLOW DAYS	26

SAS

PN: 342781-501
 OPERATION: ZPRT
 SAMPLE SIZE: 2

ALC: WARNER ROBBINS
 NSN:

PCN: 50454A
 WCD: MBA53D
 WCD DATE: 88147

PRIMARY OPERATION TYPE: ASSY MATERIAL TYPE: AL
 MISSING FLOWTIMES: 0
 OUTLIERS DELETED: 0

MANPOWER REQUIRED
 SKILL QTY FRACTION TIME HOURS

EQUIPMENT REQUIRED
 CODE CATEGORY QTY FRACTION TIME HOURS BATCH MIN MAX

HISTORICAL DATA

ACTUAL FREQ	0	10	20	30	40	50	60	70	80	90	100	DISTRIBUTION	PARAMETERS	D VALUE	D ALPHA
0	0	0	0	0	0	0	0	0	0	0	0	UNIFORM	48.0	48.0	1.000
10	0	0	0	0	0	0	0	0	0	0	0	TRIANGULAR	48.0	48.0	1.000
20	0	0	0	0	0	0	0	0	0	0	0	NORMAL	48.0	48.0	1.000
30	0	0	0	0	0	0	0	0	0	0	0	LOGNORMAL	48.0	48.0	1.000
40	100	0	0	0	0	0	0	0	0	0	0	EXPONENTIAL	50.4	50.4	0.378
50	0	0	0	0	0	0	0	0	0	0	0				
60	0	0	0	0	0	0	0	0	0	0	0				
70	0	0	0	0	0	0	0	0	0	0	0				
80	0	0	0	0	0	0	0	0	0	0	0				
90	0	0	0	0	0	0	0	0	0	0	0				
>=100	0	0	0	0	0	0	0	0	0	0	0				

OCCURRENCE FACTOR: 2
 DISTRIBUTION OF CHOICE: HISTORICAL DISCRETE

SAS

7:25 FRIDAY, FEBRUARY 24, 1989 7

PART OPERATION SUMMARY

PN: 375456-3 ALC: WARNER ROBBINS RCC: MANPDC
 OPERATION: ZPRT NSN:
 SAMPLE SIZE: BACKSHOP OPERATION TYPE: WCD: MBB53D WCD DATE: 88034
 MISSING FLOWTIMES: END ITEMS: MATERIAL TYPE:
 ----- MANPOWER REQUIRED ----- OUTLIERS DELETED:

SKILL	QTY	MANPOWER REQUIRED	TIME	FRACTION	HOURS	CODE	CATEGORY	QTY	EQUIPMENT REQUIRED	TIME	FRACTION	HOURS	BATCH MIN	BATCH MAX
-------	-----	-------------------	------	----------	-------	------	----------	-----	--------------------	------	----------	-------	-----------	-----------

HISTORICAL DATA

ACTUAL FREQ	0	10	20	30	40	50	60	70	80	90	100	DISTRIBUTION	PARAMETERS	D VALUE	D ALPHA
0	0	0	0	0	0	0	0	0	0	0	0	UNIFORM			
0	0	0	0	0	0	0	0	0	0	0	0	TRIANGULAR			
0	0	0	0	0	0	0	0	0	0	0	0	NORMAL			
0	0	0	0	0	0	0	0	0	0	0	0	LOGNORMAL			
0	0	0	0	0	0	0	0	0	0	0	0	EXPONENTIAL			

OCCURRENCE FACTOR: . OCCURRENCES:
 DISTRIBUTION OF CHOICE:

SAS

PART OPERATION SUMMARY

7:25 FRIDAY, FEBRUARY 24, 1989 8

ALC: WARNER ROBBINS

NSN:

PN: 375458-3

OPERATION: ZPRT
SAMPLE SIZE: 30

RCC: MANPSC

SHEETMETAL, SHEETMETAL REPAIR

PCN: 50454A

WCD: MB053D WCD DATE: 88147

PRIMARY

OPERATION TYPE: INS

MATERIAL TYPE: AL

END ITEMS:

OUTLIERS DELETED: 0

MISSING FLOWTIMES: 0

MANPOWER REQUIRED

TIME FRACTION HOURS

QTY

SKILL

EQUIPMENT REQUIRED

TIME FRACTION HOURS

QTY

CATEGORY

CODE

RELATIVE FREQUENCY

TIME FRACTION HOURS

QTY

SKILL

HISTORICAL DATA

ACTUAL FREQ

RELATIVE FREQUENCY

TIME FRACTION HOURS

QTY

CATEGORY

CODE

RELATIVE FREQUENCY

TIME FRACTION HOURS

QTY

CATEGORY

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CATEGORY

CODE

RELATIVE FREQUENCY

TIME FRACTION HOURS

QTY

2 PSSD/RCC 3 MATERIAL 4 MIC 5 EPRC 6 QTY 7 SCHED DT 8 COMP
MNPST9 MODEL/DESIGN/SERIES 10 NOUN 11 ITEM SERIAL
C-130 ELEVATOR12 BCN 12A. SER NO. 13 TECH DATA/OPTIONAL
1-1-2, 1-1-4, 1-1-8
1C-130A-23
1C-130A-36, 1C-130A-3,
33B-1-1, 1C-130A/B/H-4,

14 PART NUMBER	15 STOCK NR.	16 PDN	17 BCN
370184-15	1560007381003LG	50464A	806537
370184-16	1560007381004LG	50465A	806538
370018-5	1560009283106LG	50266A	806539
370018-6	1560009283105LG	50250A	806540
370018-1R	1560006217838LG	50144A	806541
370018-1L	1560006217839LG	50502A	806542
353933-601R	1560005756166LG	03558A	806543
353933-601L	1560005710541LG	04154A	806544
353933-600L	1560005710537LG	04853A	806545

18 DISP-19 PDN/-
STATION OP NO. 20 WORK TO BE ACCOMPLISHED 21 MECH 22 'P' 23

169-29	010 MNPST	REMOVE TAB & LEADING EDGE ACCESS DOOR.			
180-27	020 MNPDD7	CLEAN AND DEPAINT IAW T.O. 1-1-2. CLEAN AND DEPAINT ITEM 2, 3, AND 4. REFERENCE T.O. 1C-130A-36. FOR POSSIBLE NDI INSPECTION.			B
180-27	030 MNPDD7	REMOVE CORROSION IAW T.O. 1-1-2.			B
169-29	035 MNPST	SHAKE DOWN FOR FOD PRIOR TO REWORK, DISASSEMBLE ELEVATOR AS REQUIRED.			
180-37	038 MNPDD7	CLEAN INTERIOR OF ELEVATOR IAW T.O. 1-1-2 AS REQUIRED.			B
169-29	040 MNPST	VISUAL INSPECT ITEM 1 AND 2 ON ELEV- ATOR AND ITEM 3 AND 4 ON TRIM TAB IAW TO 1C-130A-36. REF TO 1C-130A-3. RECORD FINDINGS BELOW: ITEM 1 _____ ITEM 2 _____ ITEM 3 _____ ITEM 4 _____ THE FOLLOWING SAFETY PRECAUTIONS SHALL BE OBSERVED WHEN PERFORMING PENETRANT INSPECTION. WARNING: PROLONGED OR REPEATED IN- HALATION OF VAPORS OR POWDERS MAY RESULT IN IRRITATION OF MUCOUS MEM- BRANE AREAS OF THE BODY. A. ADEQUATE VENTILATION SHALL BE			B

13. DISP-19. PDN/

STATION	OP NO.	20. WORK TO BE ACCOMPLISHED	21. MECH	22. P	23
		USED WHEN HANDLING CLEANER, EMULSIFIERS, PENETRANTS OR DEVELOPERS. WARNING: CONTINUAL EXPOSURE TO PENETRANT INSPECTION MATERIAL MAY CAUSE SKIN IRRITATION. B. THE FOLLOWING PRECAUTIONS SHALL BE USED WHEN HANDLING CLEANERS, EMULSIFIERS, PENETRANTS, OR DEVELOPERS. 1. AVOID CONTACT OF PENETRANT INSPECTION MATERIALS BY WEARING NEOPRENE GLOVES. 2. KEEP INSIDES OF NEOPRENE GLOVES CLEAN. 3. WASH EXPOSED AREAS OF BODY WITH SOAP AND WATER. 4. CHECK FOR TRACES OF FLUORESCENT PENETRANTS ON SKIN, CLOTHES, AND GLOVES USING BLACKLIGHT SOURCE. WARNING: INJURY TO EYES AND SKIN MAY OCCUR WHEN BLACKLIGHT IS NOT USED IAW MANUFACTURER'S INSTRUCTIONS. UNFILTERED LIGHT SOURCES (IF FILTER IS REQUIRED.) MAY POSSIBLY DAMAGE THE EYES. C. FOLLOW MANUFACTURER'S INSTRUCTIONS WHEN USING BLACKLIGHT SOURCES, AND FILTER ALL LIGHT SOURCES REQUIRING FILTERING. WARNING TEMPERATURES IN EXCESS OF 120 DEGREES F MAY CAUSE BURSTING OF THE PRESSURIZED CAN AND INJURY TO PERSONNEL. D. STORE ALL PRESSURIZED SPRAY CANS IN A COOL, DRY AREA PROTECTED FROM DIRECT SUNLIGHT. AVOID EXPOSURE OF PRESSURIZED SPRAY CANS TO OPEN FLAME. WARNING: VOLATILE FUMES MAY OCCUR, CREATING BOTH A FIRE AND HEALTH HAZARD. E. EXERCISE EXTREME CAUTION WHEN HANDLING PENETRANTS WHICH HAVE BEEN HEATED TO THE POINT WHERE SOME OF ITS LIGHTER CONSTITUENTS ARE DRIVEN OFF.			
169-29	050 MNPST	ITEMS THAT APPEAR TO HAVE CRACKS WILL BE DYE PENETRANT INSPECTED IAW TO 1C-130A-36. CHAPTER 6, PENETRANT INSPECTION KIT-FLUORESCENT TYPE 1, METHOD C, GROUP VII, MIL-I-25135. RECORD RESULTS BELOW: ITEM 1. _____ ITEM 2. _____ ITEM 3. _____ ITEM 4. _____			K

18. DISP-19. PDN/ STATION	OP NO.	20. WORK TO BE ACCOMPLISHED	21. MECH	22. P	23
169-29	080 MNPST	REPAIR RIVETED TAB IAW T.O. 1C-130A-3. IF REPAIR IS REQUIRED OTHER THAN BRACKET AND HINGES ON HONEYCOMB TAB. REPLACE.			
169-29	090 MNPST	REPAIR/REPLACE OUTER SKINS AND STRUCTURE DAMAGE IAW TO 1C-130A-3. INSPECT FOR TOOLS & FOD PRIOR TO CLOSING.			B
169-29	110 MNPST	REPAIR/REPLACE TIP AND STRUCTURE DAMAGE IAW T.O. 1C-130A-3. INSPECT FOR FOD.			B
169-29	120 MNPST	REPAIR/REPLACE TRAILING EDGE AND STRUCTURE DAMAGE IAW T.O. 1C-130A-3. INSPECT FOR FOD.			B
169-29	130 MNPST	REPAIR LEADING EDGE COVER AND STRUCTURE DAMAGE IAW T.O. 1C-130A-3.			B
169-29	135 MNPST	REPAIR/REPLACE ITEM 1 OR 2 AS REQUIRED IAW T.O. 1C-130A-3.			B
169-29	140 MNPST	REPAIR OR REPLACE ITEM 3 AND 4 ON TAB IAW T.O. 1C-130A-3.			B
169-29	145 MNPST	CHECK/REPAIR/REPLACE TAB ACTUATOR MECHANISM IAW T.O. 1C-130A-3.			B
169-29	150 MNPST	INSTALL TAB. DO NOT HOOK UP ACTUATOR.			
169-29	155 MNPST	SEAL ALL EXTERIOR JOINTS, SPLICES AND SEAMS IAW 1C-130A-3.			
180	160 MNPDD7	PREPAINT TREAT IAW T.O. 1-1-2 AND 1-1-8. RECORD TIME: _____ DATE: _____ NOTE: ITEM MUST BE PAINTED WITHIN 48 HOURS.			B
180-27	175 MNPDCF	FINISH ELEVATOR TAB COVE AND LEADING EDGE ON TAB IAW T.O. 1-1-4 AND 1-1-8.			B
180-27	180 MNPDCF	FINISH IAW T.O. 1C-130A-3, 1-1-4, AND 1-1-8. TIME: _____ DATE: _____			B
180-27	181 MNPDCF	CHECK BALANCE IAW T.O. 1C-130A-3 1-1-4.			B
180-27	185 MNPDCF	A. FORTY-EIGHT HOURS AFTER PAINT, WET TAPE TEST IAW T.O. 1-1-8. B. WET TAPE TEST STARTED: DATE: _____ TIME: _____			B

18. DISP-19. PDN/ STATION OP NO.		20. WORK TO BE ACCOMPLISHED	21. MECH	22. P	23.
169-29	187 MNPSCT	HOOE UP TAB ACTUATOR MECHANISM IAW T.O. 1C-130A/B/H-4.			
140	188 MNPDBS	ADD LEAD TO WEIGHT ASSY AS REQUIRED IAW 83C0004.			
169-29	190 MNPSCT	VISUAL INSPECT. INSPECT FOR TOOLS AND FOREIGN OBJECTS. TAG AND TURN IN.			E
169-29	200 MNPSCT	FILL OUT AFTO FORM 349. INSTALL WR-ALC DECAL.			
		MANE/8146 MANP/8146 MANS/8146 MAQN/8146			

AFICR 66-11

SHOP FLOW DAY STANDARD

MISTR C/N 50266A REVIEW DATE 7 Dec 87

$$A((B / C) + D + E) / F$$

A = CONVERSION FACTOR, CHANGING WORKDAYS TO
CALENDAR DAYS

A = 1.46

B = ITEM STANDARD HOURS / NUMBER OF WORKERS
TOTAL FOR ALL SHOPS 180.07 / 4 = B

B =

45.02

C = (a) Obtain the RCC yearly indirect time values
for duty codes (G037G - EH1 - M1 - MEH)

Duty Code	% Value	Duty Code	% Value
24	<u>0.1</u>	25	<u>0</u>
26	<u>1.7</u>	29	<u>0</u>

1.00 -

(a) = 0.0982

(b) Obtain the RCC efficiency factor from the
G037G - FD1 - D2 - MFD (YR 87)

JAN	<u>93.9</u>	MAY	<u>94.9</u>	SEP	<u>95.2</u>
FEB	<u>96.7</u>	JUN	<u>95.9</u>	OCT	<u>95.2</u>
MAR	<u>94.5</u>	JUL	<u>94.7</u>	NOV	<u>91.7</u>
APR	<u>91.9</u>	AUG	<u>84.5</u>	DEC	<u>96.8</u>

TOTAL 1125.9 - 12 =
Multiply (a) X (b) = C

(b) = 93.8 C = 92.10

D = Process Support

244 Card input/output D033 System
Transportation time between RCC moves
Packing
Unpacking
Waiting Maintenance
Inspection
Other

12 Hours

2.0

D = 14.0

E = Unique Process Support

Sealant

.75

Hrs

E =

4397

Plating Process

Welding Process

Heat Treat Process

Paint Process

Electrical

Wet Tape Test

Wet Cleaning

Other

4.2224.015.0

F = Shift Hours (8) X # of Shifts Working =

F = 8

$$A(((B / C) + D + E) / F)$$

Number of Flow Days

14

SHOP FLOW DAYS

REVIEW DATE 2 JAN 86 MISTR C/N 50266A

A	244 CARD INPUT/OUTPUT - DOZ. SYS.	12.0
B	UNCRATE/PACKING	8.0
C	LABOR: D - ADJ. STD HRS EM - LABOR EFF x NO. WORKERS A TOTAL FOR ALL SHOPS	$\frac{219.84}{.94 \times 2 = 1.88}$ 116.94
D	MACHINE PROCESSING, (EG. DRYING, BAKING) IF WET TAPE TEST REQ. 24 HRS	24.0
E	PRODUCTION PROCESSING DELAY. <u>16</u> x 4 HRS =	24.0
F	INSPECTION, <u> </u> x 1.0 <u>N/A</u>	0
	TRANSPORTATION.	2.5
H	TOTAL FLOW HOURS	187.44
I	WORK SHIFT ADJUSTMENT. $\frac{\text{TOTAL FLOW HOURS}}{\text{# SHIFTS}} = \frac{187.44}{1}$	187.44
J	TOTAL FLOW DAYS $\frac{\text{WORK SHIFT ADJ}}{\text{HRS SHIFT}} = \frac{187.44}{8}$	23.43
K	CONVERSION TO CALENDAR DAYS $1.45 \times 23.43 = 33.97$ TOTAL FLOW DAYS	33.97
L	SUM FLOW DAYS	34

FLOW PROCESS CHART						1. NUMBER 50464A	2. PAGE NO 1	3. NO OF P 2
4. PROCESS REPAIR ELEVATOR						SUMMARY		
6. L I MAN OR ☒ MATERIAL						B. ACTIONS		
						D. PRESENT		
						C. PROPOSED		
						E. DIFFEREN		
7. CHART BEGINS						HQ.		
8. CHART ENDS						TIME		
RECEIVE FROM SUPPLY						NO.		
TURN IN						TIME		
9. CHARTED BY						NO.		
C.G. Miller						TIME		
10. DATE						NO.		
21 APR. 78						TIME		
11. ORGANIZATION						DISTANCE TRAVELLED		
MANERR						(Feet)		
12a. DETAILS OF ☒ PRESENT ☐ PROPOSED METHOD						b. ANALYSIS		
						c. ANALYSIS		
						d. ANALYSIS		
						e. ANALYSIS		
						f. ANALYSIS		
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						br. ANALYSIS		
						bs. ANALYSIS		
						bt. ANALYSIS		
						bu. ANALYSIS		
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						bx. ANALYSIS		
						by. ANALYSIS		
						bz. ANALYSIS		
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						de. ANALYSIS </		

PART OPERATION SUMMARY

7:25 FRIDAY, FEBRUARY 24, 1989 5

PN: 370018-5 ALC: WARNER ROBBINS RCC: MANPSC SHEETMETAL, SHEETMETAL REPAIR
 OPERATION: ZPRT NSN: PCN: 50266A WCD: MB021D WCD DATE: 88146
 SAMPLE SIZE: 4 MISSING FLOWTIMES: 0 PRIMARY OPERATION TYPE: ASSY MATERIAL TYPE: AL
 END ITEMS: OUTLIERS DELETED: 0

----- MANPOWER REQUIRED ----- EQUIPMENT REQUIRED -----
 SKILL QTY FRACTION TIME FRACTION HOURS BATCH
 MIN MAX

HISTORICAL DATA

ACTUAL FREQ	0	10	20	30	40	50	60	70	80	90	100	DISTRIBUTION	PARAMETERS	VALUE	D ALPHA
0	0	0	0	0	0	0	0	0	0	0	0	UNIFORM	20.0	44.0	0.420
5	0	0	0	0	0	0	0	0	0	0	0	TRIANGULAR	32.3	13.6	1.000
10	0	0	0	0	0	0	0	0	0	0	0	NORMAL			0.286
15	0	0	0	0	0	0	0	0	0	0	0	LOGNORMAL			1.000
20	0	0	0	0	0	0	0	0	0	0	0	EXPONENTIAL	34.0		0.266
25	0	0	0	0	0	0	0	0	0	0	0				
30	0	0	0	0	0	0	0	0	0	0	0				
35	0	0	0	0	0	0	0	0	0	0	0				
40	0	0	0	0	0	0	0	0	0	0	0				
45	0	0	0	0	0	0	0	0	0	0	0				
50	0	0	0	0	0	0	0	0	0	0	0				

OCCURRENCE FACTOR: 4
 DISTRIBUTION OF CHOICE: HISTORICAL DISCRETE

MANPSC

06692A

50164A

51402A

50454A /

50266A

NAME B. M. Burdette ALC 244-26C DATE 4-22-54 ICC 12224V.DSC SHEET 1 OF 1

NAME BTM Consulting ALC 244-1260 DATE 4-22-84 ICC 1721V DSC SHEET 1 OF 1

PCN
NNN
NNN

061088

WCD -DRB CLAY

WCD DATE 8/23/63

[illegible]

[illegible][illegible]

OPERATION PROFILE

NAME <u>B M Bunday</u> ALC <u>NW-PLC</u> DATE <u>5-10-84</u> RCC <u>MANPSC</u> SHEET <u>1 OF 1</u>		WCD <u>MANPSC</u> WCD DATE <u>88144</u>												
OPERATION NUMBER	RCC	OPERATION DESCRIPTION	MANDATORY OCCURRENCE FACTOR	OPERATION TYPE	MANDATORY FLOW HOURS			MANPOWER			EQUIPMENT			DATA SOURCE COMMENTS
					%	HRS.	SKILL CODE/LEVEL	QTY.	%	HRS.	QTY.	%	HRS.	
010	MNO3AC	BREQ.	1.00	TRANSIT		4.0	9005	1						
				SETUP										
				PROCESS										
020	MNO3AC	BREQ.	1.00	TRANSIT		5.0								
				SETUP										
				PROCESS										
030	MNO3AC	BREQ.	1.00	TRANSIT		20.0								
				SETUP										
				PROCESS										
040	MNO3AC	BREQ.	1.00	TRANSIT		20.0								
				SETUP										
				PROCESS										
				TRANSIT										
				SETUP										
				PROCESS										
				TRANSIT										
				SETUP										
				PROCESS										

SHEET 3 OF 23

NAME		ALC WR										DATE		RCC MANPSC		SHEET 3	
ITEM CD PCN 06892A		WCD MB014Y		WCD DATE 87363		QTY		% HRS		EQUIP CODE		QTY		% HRS		NOTES	
OPER NUMB	RCC	OPER DESC	HIST MAND OCCR TYPE	MAND F	HRS	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	NOTES			
85	MANPSC	DIS	.	P	.	9A012	1	.	1.0	.	.	.	.	.	.	.	
90	MANPSC	INS	0.99	1.00	T	.	.	.	.	.	.	.	.	.	.	.	
90	MANPSC	INS	.	S	.	.	.	.	.	.	.	.	.	.	.	.	
90	MANPSC	INS	.	P	.	9A014	1	.	1.0	.	.	.	.	.	.	.	
90	MANPSC	INS	.	P	.	9A012	1	.	1.0	.	.	.	.	.	.	.	
100	MANPSC	PROC	0.97	1.00	T	.	.	.	.	.	.	.	.	.	.	.	
100	MANPSC	PROC	.	S	.	.	.	.	.	.	.	.	.	.	.	.	
100	MANPSC	PROC	.	P	.	9A014	1	.	16.0	.	.	.	.	.	.	.	
100	MANPSC	PROC	.	P	.	9A012	1	.	16.0	.	.	.	.	.	.	.	
130	MANPSC	DIS	0.99	1.00	T	.	.	.	.	.	.	.	.	.	.	.	
130	MANPSC	DIS	.	S	.	.	.	.	.	.	.	.	.	.	.	.	
130	MANPSC	DIS	.	P	.	9A014	1	.	24.0	.	.	.	.	.	.	.	
130	MANPSC	DIS	.	P	.	9A012	1	.	24.0	.	.	.	.	.	.	.	

[illegible]

SHEET 5 OF 23

OPERATION PROFILE										SAS
NAME	ITEM CD	PCN	08892A	ALC	WR	WCD	MB014Y	WCDDATE	87363	DATE
OPER	NUMB	RCC	MANPSC	ASSY	HIST	MAND	OPER	MAND	SKILL	EQUIP
					OCGR	TYPE	F	HRS	CD/LVL	CODE
151							S			
151					P				9A014	1
151					P				9A012	1
152					1.00	1.00T				
152					S					
152					P				9A014	1
152					P				9A012	1
153					1.00	1.00T				
153					S					
153					P				9A014	1
153					P				9A012	1
154					1.00	1.00T				
154					S					

NOTES

HRS

%

QTY

EQUIP

CODE

HRS

%

QTY

SKILL

CD/LVL

F

HRS

MAND

OPER

TYPE

S

1.00

1.00T

S

P

9A014

9A012

1

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[illegible]

NAME		OPERATION PROFILE										SAS		
		ALC WR						DATE						
ITEM CD PCN 08092A		WCD MBO14Y		WCDDATE 87363						RCC MANPSC				
OPER NUMB	RCC	OPER DESC	HIST MAND OCCR	OPER TYPE	MAND F	HRS	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS
157	MANPSC	INS	.	P	.		9A014	1	.	1.0		.	.	.
157	MANPSC	INS	.	P	.		9A012	1	.	1.0		.	.	.
158	MANPSC	PROC	1.00	1.00T	.			.	.	.		.	.	.
158	MANPSC	PROC	.	S	.			.	.	.		.	.	.
158	MANPSC	PROC	.	P	.		9A014	1	.	0.3		.	.	.
158	MANPSC	PROC	.	P	.		9A012	1	.	0.3		.	.	.
159	MANPSC	PROC	0.99	1.00T	.			.	.	.		.	.	.
159	MANPSC	PROC	.	S	.			.	.	.		.	.	.
159	MANPSC	PROC	.	P	.		9A014	1	.	0.2		.	.	.
159	MANPSC	PROC	.	P	.		9A012	1	.	0.2		.	.	.
160	MANPSC	NDI	0.98	1.00T	.			.	.	.		.	.	.
160	MANPSC	NDI	.	S	.			.	.	.		.	.	.
160	MANPSC	NDI	.	P	.		9A014	1	.	0.5		.	.	.

AD-A237 083

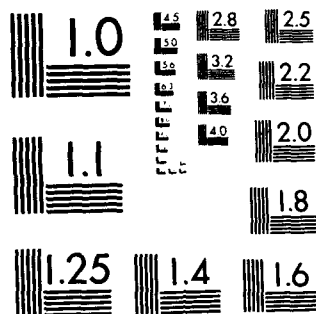
TECHNOLOGY INSERTION (TI)/INDUSTRIAL PROCESS
IMPROVEMENT (IPI) TASK ORDER... (U) MCDONNELL DOUGLAS
MISSILE SYSTEMS CO ST LOUIS MO 14 AUG 89 XF-AFLC

2/3

UNCLASSIFIED

F33600-88-D-0567

NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SAS
OPERATION PROFILE

SAS

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NAME _____
ITEM CD PCN 00002A

ALC WR
WCD MB014Y

DATE _____

ALC	WR	DATE
WCD	MB014Y	WCDDATE 87363

NAME	ITEM	CD	PCN	00802A					
	OPER				RCC	OPER	HIST	MAND	OP
	MEMO					DESC	OCGR	OCGR	TV
174						ASSY	0.98	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				RCC	OPER	HIST	MAND	OP
	MEMO					DESC	OCGR	OCGR	TV
	174					ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER			OPER					
	MEMO			DESC					
				RCC					
	174			MANPSC	ASSY	0.00	1.00	T	

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER	HIST	MAND	OP	
	MEMO				DESC	OCGR	OCGR	TV	
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				RCC	OPER	HIST	MAND	OP
	MEMO					DESC	OCGR	OCGR	TV
174						ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER				OPER		HIST	MAND	OP
	MEMO				DESC		OCGR	OCGR	TV
					RCC				
	174				MANPSC	ASSY	0.00	1.00	T

NAME	ITEM	CD	PCN	00002A					
	OPER			OPER					
	MEMO			DESC					
				RCC					
	174			MANPSC	ASSY	0.00	1.00	T	

[illegible]

NAME		OPERATION PROFILE										SAS	
ITEM CD PCN 08692A		ALC WR		WCD MB014Y		WCD DATE 87363		DATE		RCC MANPSC		SHEET 44	
OPER NUMB	RCC	MANPSC	PROC	HIST	MAND	OPER	MAND	SKILL	CD/LVL	QTY	%	HRS	EQUIP CODE
				OCCR	OCCR	TYPE	F	HRS					
182		MANPSC	PROC	.	.	P	.	9A014	1	.	3.0	.	
182		MANPSC	PROC	.	.	P	.	9A012	1	.	3.0	.	
185		MANPSC	PROC	0.93	1.00	T	.	.	.	.	.	.	
185		MANPSC	PROC	.	.	S	.	.	.	.	.	.	
185		MANPSC	PROC	.	.	P	.	9A014	1	.	0.3	.	
185		MANPSC	PROC	.	.	P	.	9A012	1	.	0.3	.	
186		MANPSC	PROC	0.99	1.00	T	.	.	.	.	.	.	
186		MANPSC	PROC	.	.	S	.	.	.	.	.	.	
186		MANPSC	PROC	.	.	P	.	9A012	1	.	0.1	.	
187		MANPSC	PROC	0.96	1.00	T	.	.	.	.	.	.	
187		MANPSC	PROC	.	.	S	.	.	.	.	.	.	
187		MANPSC	PROC	.	.	P	.	9A014	1	.	0.5	.	
187		MANPSC	PROC	.	.	P	.	9A012	1	.	0.5	.	

8:23 WEDNESDAY, APRIL 5, 1989 14

SHEET 12 OF 23

OPERATION PROFILE										SAS	
NAME										DATE	
ITEM CD PCN 08092A										ALC WR	
OPER NUMB										WCD MB014Y	
RCC										WCD DATE 87363	
OPER NUMB										HIST MAND	
RCC										OCCR TYPE	
OPER NUMB										MAND F HRS	
RCC										SKILL CD/LVL	
OPER NUMB										QTY	
RCC										% HRS	
OPER NUMB										EQUIP CODE	
RCC										QTY	
OPER NUMB										% HRS	
RCC										NOTES	
188	MANPSC	ASSY	0.99	1.00T							
188	MANPSC	ASSY		S							
188	MANPSC	ASSY		P	9A014	1	16.0				
188	MANPSC	ASSY		P	9A012	1	16.0				
191	MANPSC	ASSY	0.99	1.00T							
191	MANPSC	ASSY		S							
191	MANPSC	ASSY		P	9A014	1	8.0				
191	MANPSC	ASSY		P	9A012	1	8.0				
193	MANPSC	ASSY	0.98	1.00T							
193	MANPSC	ASSY		S							
193	MANPSC	ASSY		P	9A014	1	6.0				
193	MANPSC	ASSY		P	9A012	1	6.0				

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8:23 WEDNESDAY, APRIL 5, 1989 17

SHEET 15 OF 23

NAME										OPERATION PROFILE										SAS									
ITEM CD PCN 06892A										ALC WR										DATE									
OPER NUMB										WCD MB014Y										WCDDATE 87363									
201 MANPSC PROC										HIST MAND OPER MAND SKILL										F HRS CD/LVL									
201 MANPSC PROC										S										QTY % HRS									
201 MANPSC PROC										P										9A014 1 1.0									
201 MANPSC PROC										P										9A012 1 1.0									
202 MANPSC PROC 0.99 1.00T																													
202 MANPSC PROC										S																			
202 MANPSC PROC										P										9A014 1 2.0									
202 MANPSC PROC										P										9A012 1 2.0									
203 MANPSC INS 0.99 1.00T																													
203 MANPSC INS										S																			
203 MANPSC INS										P										9A014 1 0.3									
203 MANPSC INS										P										9A012 1 0.3									
204 MANPSC INS 0.98 1.00T																													
204 MANPSC INS										S																			

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SHEET 4 OF 23

NAME		OPERATION PROFILE										SAS	
		ALC WR		DATE		RCC MANPSC							
ITEM	CD	PCN	08692A	WCD	MB014Y	WCDDATE	87363						
OPER	NUMB	RCC	OPER	HIST	MAND	SKILL	EQUIP	QTY	%	HRS	CODE		
			DESC	OCCR	TYPE	F	HRS	CD/LVL					
204	MANPSC	INS	.	.	P	.	.	9A014	1	.	0.1		
205	MANPSC	INS	0.99	1.00	T	.	.	.	.	.	.		
205	MANPSC	INS	.	.	S	.	.	.	.	.	.		
205	MANPSC	INS	.	.	P	.	.	9A014	1	.	0.1		
205	MANPSC	INS	.	.	P	.	.	9A012	1	.	0.1		
206	MANPSC	INS	0.99	1.00	T	.	.	.	.	.	.		
206	MANPSC	INS	.	.	S	.	.	.	.	.	.		
206	MANPSC	INS	.	.	P	.	.	9A014	1	.	0.1		
206	MANPSC	INS	.	.	P	.	.	9A012	1	.	0.1		
207	MANPSC	INS	0.98	1.00	T	.	.	.	.	.	.		
207	MANPSC	INS	.	.	S	.	.	.	.	.	.		
207	MANPSC	INS	.	.	P	.	.	9A014	1	.	0.1		

OPERATION PROFILE

NAME

ALC WR

DATE _____

ITEM CD PCN 06692A

WCD MB014Y WCDDATE 87363

OPER OPER

	OPER	HIST	MAND	OPER	MAND
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HIST MAND OPER

HIST MA

MAND

SKILLS

FOOTNOTES

207	MANPSC	INS	P	9A012	1	0.1

208 MANPSC INS 1.00 1.00 T

208 MANPSC INS S

208 MANPSC INS . P . 9A014 1 01

208	MANPSC	INS	.	P	.	9A012	.	1	.	0.1
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209 MANPSC INS 1.00 1.00 Y

209 MANPSC INS S

209 MANPSC INS P 9A01A

209	MANPSC	INS	P	9A012	1	0

210 MANPSC ASSY 1.00 / 00T

210 MANPSC ASSY S

210	MANPSC	ASSY	P	9A014	1	0 3
210	MANPSC	ASSY	P	9A014	1	0 3

210	MANPSC	ASSY	P	9A012	1	03

SHEET 18 OF 23

OPERATION PROFILE

SAS

NAME

ALC WR

DATE

ITEM CD PCN 06692A

WCD MB014Y WCDDATE 87363

OPER
NUMBOPER
DESCHIST MAND OPER
OCCR OCCR TYPE F HRSMAND
CD/LVL

QTY % HRS

EQUIP
CODE

NOTES

RCC MANPSC

QTY % HRS

215 MANPSC ASSY 1.00 1.00 T

215 MANPSC ASSY . S

215 MANPSC ASSY . P 9A014 1 . 2.0

215 MANPSC ASSY . P 9A012 1 . 2.0

220 MANPSC INS 0.98 1.00 T

220 MANPSC INS . S

220 MANPSC INS . P 9A014 1 . 2.0

220 MANPSC INS . P 9A012 1 . 2.0

250 MANPSC PROC 0.96 1.00 T

250 MANPSC PROC . S

250 MANPSC PROC . P 9A014 1 . 8.0

250 MANPSC PROC . P 9A012 1 . 8.0

SAS

OPERATION PROFILE

NAME	ITEM CD	PCN	06692A	OPER	HIST	MAND	OPER	MAND	SKILL	WCD	MB014Y	ALC	WR	DATE	WCD	DATE	87363	RCC	MANPSC	QTY	%	HRS	NOTES
	260		MANPSC	MOVE	0.99	1.00T																	
	260		MANPSC	MOVE			S																
	260		MANPSC	MOVE			P			9A014					1		0.5						
	270		MANPSC	MOVE	0.97	1.00T																	
	270		MANPSC	MOVE			S																
	270		MANPSC	MOVE			P			9A014					1		0.5						
	280		MANPSC	REP	0.96	1.00T																	
	280		MANPSC	REP			S																
	280		MANPSC	REP			P			9A014					1		8.0						
	280		MANPSC	REP			P			9A012					1		8.0						
	290		MANPSC	REP	0.97	1.00T																	
	290		MANPSC	REP			S																
	290		MANPSC	REP			P			9A014					1		4.0						

[illegible]

OPERATION PROFILE

NAME	ITEM CD	PCN	08892A	ALC	WR	WCD	MB014Y	WCDDATE	87363	DATE	SAS	RCC	MANPSC	QTY	%	HRS	NOTES
OPER NUMB	RCC	MANPSC	OPER	HIST	MAND	OPER	MAND	SKILL	CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	
380	MANPSC				P												
390	MANPSC	ASSY	0.93	1.00T													
390	MANPSC	ASSY			S												
390	MANPSC	ASSY			P			9A012		1		0.3					
400	MANPSC	ASSY	0.93	1.00T													
400	MANPSC	ASSY			S												
400	MANPSC	ASSY			P			9A012		1		0.5					
420	MANPSC	INS	0.83	1.00T													
420	MANPSC	INS			S												
420	MANPSC	INS	1.00	P				9A014		1		0.1					

110 MANPSC INS . 1.00 P . 9A014 1 . . 50

SAS

OPERATION PROFILE

SHEET 1 OF 1

NAME *CMCuddy*

ITEM CD	PCN	08892A	OPER	HIST	MAND	OPER	MAND	WCD	MBALAY	ALC	WR	DATE	88141	WCD	DATE	88141	QTY	%	HRS	EQUIP	CODE	QTY	%	HRS	NOTES
10	MANPDA		1.00	1.00T		1.0	921-051																		
10	MANPDA				S																				
10	MANPDA				P	10.0																			
20	MANPDB			1.00T		1.0	921-051																		
20	MANPDB				S																				
20	MANPDB				P	40.0																			
30	MANPDB		1.00	1.00T																					
30	MANPDB				S																				
30	MANPDB				P	20.0																			
40	MANPDB			1.00T																					
40	MANPDB				S																				
40	MANPDB				P	20.0																			

SAS

OPERATION PROFILE

SHEET 1 OF 1

NAME *EMC Building*

ITEM CD PCN 08892A

ALC WR

DATE

5-10-84

RCC MANPSC

WCD MBD14Y WCDDATE 87313

NOTES

EQUIP CODE

% HRS

QTY

% HRS

QTY

SKILL CD/LVL

MAND F HRS

OPER OCCR TYPE

HIST MAND

OPER DESC

OPER NUMB

10 MANPDA

1.00T

1.0

911305

1

0.50

10 MANPDA

S

10 MANPDA

P

20.0

20 MANPDA

1.00T

1.0

911305

1

0.50

20 MANPDA

S

20 MANPDA

P

2.0

8:21 WEDNESDAY, APRIL 5, 1989 1

ASSEMBLY/DISASSEMBLY PROFILE

SAS

NAME QW31111111

ITEM CODE DATE 4-22-89 SHEET 1 OF 1

WCD DT DSOP ASOP REMOV ITEM CODE WCD DT WCD DT WCD DT

PCN 06991A 87363 130 194 PCN 3P21806-103

PCN 06991A 87363 130 193 PCN 3P21812-109

PCN 06991A 87363 130 191 PCN 3P21807-103

PCN 06991A 87363 130 193 PCN 3P21678-171

PCN 06991A 87363 130 188 PCN 3P21678-171

PCN 06991A 87363 130 188 PCN 3P21679-177

PCN 06991A 87363 130 188 PCN 3P21679-185

PCN 06991A 87363 130 193 PCN 3P21681-143

PCN 06991A 87363 330 330 PCN 3P21652-104

PCN 06991A 87363 75 380 PCN 3P21644-102

PCN 06991A 87363 85 380 PCN 31352A

PCN 50184A 88147 40 80 PCN 344758-3R

PCN 50184A 88147 40 80 PCN 344869

PCN 50184A 88147 40 80 PCN 388971-3

2015

SHEET 1 OF 11

SAS

OPERATION PROFILE

NAME CamQuincy

ITEM CD PCN 50184A

ALC WR

DATE

11-18-89

RCC MANPSC

WCD MB024D WCDDATE 88147

OPER NUMB

OPER DESC

HIST MAND OPER

OCCR TYPE

F

MAND

SKILL

CD/LVL

QTY

% HRS

EQUIP

CODE

QTY

% HRS

NOTES

10 MANPDD 0.94 1.00T 1.0 9AC05 1 0.50

10 MANPDD . . S

10 MANPDD . 1.00P 24.0

20 MANPDD 0.94 1.0T

20 MANPDD . . S

20 MANPDD . . P 24.0

30 MANPDD 0.94 1.0T

30 MANPDD . . S

30 MANPDD . . P 24.0

40 MANPSC DIS 1.00 . T 0.50 9AC014 1 0.50

40 MANPSC DIS . . S

40 MANPSC DIS . 1.00P . 9A014 1 4.0

50 MANPDD 0.96 1.00T 0.5 9AC014 1 0.5

SAS

OPERATION PROFILE

NAME *GmGmGmGm*

ALC WR

DATE

11-18-89

RCC MANPSC

ITEM CD PCN 50164A

WCD MB024D

WCD DATE 88147

OPER NUMB	RCC	OPER DESC	HIST OCCR	MAND TYPE	MAND F	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	NOTES
50		MANPDD	.	.	S	.	.	.	.	.	.	.	.	.
50		MANPDD	.	1.00	P	24.0	.	.	.	.	.	.	.	.
60		MANPDA	1.00	0.1	T	0.5	94014	1	0.5	.	.	.	.	.
60		MANPDA	.	.	S	.	.	.	.	.	.	.	.	.
60		MANPDA	.	.	P	24.0	.	.	.	.	.	.	.	.
70		MANPDB	1.00	0.1	T	1.0	94014	1	1.0	.	.	.	.	.
70		MANPDB	.	.	S	.	.	.	.	.	.	.	.	.
70		MANPDB	.	.	P	24.0	.	.	.	.	.	.	.	.
80		MANPSC REP	1.00	.	T	.	.	.	.	.	.	.	.	.
80		MANPSC REP	.	.	S	.	.	.	.	.	.	.	.	.
80		MANPSC REP	.	1.00	P	50.0	9A014	1	50.0	✓	.	.	.	.
90		MANPDB	1.00	.	T	24.0	.	.	.	.	.	.	.	.

24.0

1.00

50.0

24.0

1.00

50.0

24.0

SAS

OPERATION PROFILE

ALC WR

NAME GNIGWIDAY

ITEM CD PCN 50164A

WCD MB024D

DATE

44-18-89

WCDDATE 88147

OPER NUMB RCC OPER HIST MAND OPER MAND SKILL CD/LVL

90 MANPDB S

90 MANPDB

100 MANPSC REP 1.00 T

100 MANPSC REP S

100 MANPSC REP 1.00P 10.0 9A014 1 10.0 ✓

110 MANPSC INS 1.00 T

110 MANPSC INS S

110 MANPSC INS 1.00P 0.5 9A014 1 0.5 ✓

120 MANPDB 0.87 1.00T 1.0 9A014 1 1.0

120 MANPDB S

120 MANPDB P 32.0

130 MANPDC 1.00 T

130 MANPDC S

NOTES

QTY % HRS

RCC MANPSC

EQUIP CODE

% HRS

QTY

SAS
ASSEMBLY/DISASSEMBLY PROFILE

NAME *Bill G. Gentry* DATE *4-18-89* SHEET *1* OF *2*

ITEM CODE	WCD	WCD DT	DSOP	ASOP	REMOV	ITEM CODE	WCD	WCD DT	INSTALL	SAME	NOTES
PCN 06991A	MB014Y	87363	130	194	PCN 3P21806-103						
PCN 06991A	MB014Y	87363	130	193	PCN 3P21812-109						
PCN 06991A	MB014Y	87363	130	191	PCN 3P21807-103						
PCN 06991A	MB014Y	87363	130	193	PCN 3P21678-171						
PCN 06991A	MB014Y	87363	130	188	PCN 3P21678-171						
PCN 06991A	MB014Y	87363	130	188	PCN 3P21679-177						
PCN 06991A	MB014Y	87363	130	188	PCN 3P21679-185						
PCN 06991A	MB014Y	87363	130	193	PCN 3P21681-143						
PCN 06991A	MB014Y	87363	330	330	PCN 3P21652-104						
PCN 06991A	MB014Y	87363	75	380	PCN 3P21644-102						
PCN 06991A	MB014Y	87363	85	380	PCN S1352A						
PCN 50164A		88147	40✓	80✓	PCN 344758-3R						YES
PCN 50164A		88147	40	80	PCN 344869						YES
PCN 50164A		88147	40	80	PCN 388971-3						YES

8:21 WEDNESDAY, APRIL 5, 1989 2

ASSEMBLY/DISASSEMBLY PROFILE

SAS

NAME GINCARTNEY

ITEM CODE

ALC WR

DATE

11-18-89

WCD

WCD DT

DSOP

ASOP

REMOV

ITEM CODE

RCC MANPSC

WCD

WCD DT

INSTALL SAME

NOTES

PCN 50164A

88147 40 80 PCN 351576-01

PCN 50454A

88147 25 60 PCN 345208-31

PCN 50454A

88147 25 100 PCN 342781-501

PCN 50454A

88147 25 100 PCN 354760

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-326

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-327

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-335

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-336

PCN 52464A

88146 10 187 PCN 353972-1

YES

NAME <u>CM Gooding</u> ALC <u>Wg-ALC</u> DATE <u>4-25-84</u> RCC <u>MMMDSC</u> SHEET <u>1 OF 1</u>		PCN <u>514028</u>		WCD <u>MD30194</u>		WCD DATE <u>8/1/84</u>	
OPERATION NUMBER	RCC	OPERATION DESCRIPTION	MANDATORY OCCURRENCE FACTOR	OPERATION TYPE	MANDATORY FLOW HOURS		EQUIPMENT
					%	HRS.	
2000	M H N D S C	BEN	1.00	TRANSIT	-	-	
				SETUP			
				PROCESS			
010	M H N D S C	BEN	1.00	TRANSIT	-	-	
				SETUP			
				PROCESS			
WCB - OPERATIONS LATER RUN 010 THAN 140 OPERATED PER MILK - SUP COMPARTMENT COPD	M H N D S C	BEN	1.00	TRANSIT	-	-	
				SETUP			
				PROCESS			
9999	M H N D S C	BEN	1.00	TRANSIT	-	-	
				SETUP			
				PROCESS			

SAS

OPERATION PROFILE

NAME QWICBUTLEYSHEET 1 OF 44

RCC MANPSC

DATE 11-25-89

DATE 88154

ALC WR

WCD MB019Y WCDDATE 88154

NOTES

EQUIP
CODE

HRS

QTY

CD/LVL

MAND

OPER

HIST

OCCR

TYPE

F HRS

MANPDD

CLN

1.00

1.00T

9WB05

1

.50

10

MANPDD

CLN

1.00

1.00T

9WB05

1

.50

10

MANPDD

CLN

1.00

1.00T

9WB05

1

.50

10

MANPDD

CLN

1.00

1.00T

9WB05

1

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MANPDD

CLN

1.00

1.00T

9WB05

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MANPDD

CLN

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MANPDD

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9WB05

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MANPDD

CLN

SAS

OPERATION PROFILE

NAME *Cambridge*

ITEM CD PCN 51402A

WCD MBO18Y

WCDDATE 88154

ALC WR

DATE

4-25-89

RCC MANPSC

SHEET *2* OF *14*

NOTES

EQUIP
CODE

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

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QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPSC

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPDD

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPDD

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPDD

NDI

QTY % HRS

QTY % HRS

SKILL
CD/LVLMAND
F HRSOPER
TYPEHIST
OCCROPER
DESC

MANPDC

NDI

13

SAS

OPERATION PROFILE

SHEET 21 OF 44

NAME G.M. Gentry

ALC WR

DATE

4-21-89

RCC MANPSC

QTY

% HRS

NOTES

ITEM CD PCN 51402A WCD MB019Y WCD DATE 88154

OPER NUMB RCC HIST MAND OPER MAND SKILL CD/LVL QTY % HRS EQUIP CODE

110 MANPDC 0.0

110 MANPDC 24.0

115 MANPDC 1.00 1.00T 0.0

115 MANPDC 0.0

115 MANPDC 118.0

120 MANPSC PROC 1.00 1.00T 1.0 9WQ-05 1 .50

120 MANPSC PROC S

120 MANPSC PROC P 9A012 1 .0.3

130 MANPSC NDI 1.00 1.00T 0.0

130 MANPSC NDI S 0.0

130 MANPSC NDI P 9A012 1 ✓ .0.5 ✓

140 MANPSC ASSY 1.00 1.00T 0.0

140 MANPSC ASSY S 0.0

8:23 WEDNESDAY, APRIL 5, 1989 49

NAME GMCoverly

ITEM CD PCN 51402A

OPER NUMB

RCC OPER HIST MAND OPER MAND
DESC OCCR TYPE F HRS

WCD MB019Y WCDDATE 88154

ALC WR DATE

SAS 11-21-89

RCC MANPSC

SHEET 11 OF 17

NOTES

QTY % HRS

EQUIP CODE

% HRS

QTY

SKILL CD/LVL

9A012

P

1 ✓

0.1 ✓

140 MANPSC ASSY

9A012

1 ✓

0.1 ✓

8:21 WEDNESDAY, APRIL 5, 1989 2

ASSEMBLY/DISASSEMBLY PROFILE

SAS

NAME	DATE	ALC	WCD	DT	DSOP	ASOP	REMOV	ITEM	CODE	WCD	MANPSC	WCD	DT	INSTALL	SAME	NOTES
PCN 50164A	88147	40	80	PCN 351576-01												
PCN 50454A	88147	25	60	PCN 345208-3L												
PCN 50454A	88147	25	100	PCN 342781-501												
PCN 50454A	88147	25	100	PCN 354760												
PCN 51402A	88154	30	75	PCN 3P22002-326												YES
PCN 51402A	88154	30	75	PCN 3P22002-327												YES
PCN 51402A	88154	30	75	PCN 3P22002-335												YES
PCN 51402A	88154	30	75	PCN 3P22002-336												YES
PCN 52464A	88146	10	187	PCN 353972-1												

NAME *Chin...*

SHEET 2 OF 2

[illegible]

☎

OPERATIONAL PROFILE

[illegible]

NAME CMG Gentry

ITEM CD PCN 50454A

OPERATION PROFILE

ALC WR DATE 6-4-89

WCD MB053D WCD DATE 88147

RCC MANPSC

SHEET 1 OF 8

NOTES
*Thomas R'WZK
KXK (6) 4109*

QTY % HRS
EQUIP CODE
0.50

OPER NUMB
10
RCC
MANPDD
CLN
0.90
1.00T
HIST MAND
OCGR TYPE
0.90
1.00T
MAND F HRS
0.0
24.0
SKILL CD/LVL
9W305
1
QTY
1
% HRS
0.50

10 MANPDD CLN . S 0.0
10 MANPDD CLN . P 24.0

20 MANPDD 0.90 1.00T
20 MANPDD . S
20 MANPDD . P 24.0

25 MANPSC PROC 1.00 1.00T 1.00 9W305 1 .50

25 MANPSC PROC . S
25 MANPSC PROC . P 9A012 2 12.0

28 MANPDD 0.93 1.00T 1.00 9W305 1 .50

28 MANPDD . S
28 MANPDD . P 24.0

30 MANPSC INS 0.90 1.00T 1.00 9W305 1 .50

NAME Carl G. SundaySHEET 2 OF 8

OPERATION PROFILE

SAS

ITEM CD PCN 50454A
OPER NumbALC WR
WCD MB053DDATE 5-9-89
WCDDATE 88147

RCC

OPER

HIST MAND OPER

OCCR TYPE

MAND

F HRS

SKILL

CD/LVL

QTY

%

HRS

EQUIP

CODE

QTY

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NOTES

RCC

MANPSC

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MANPSC

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SHEET 17 OF 88

SAS

OPERATION PROFILE

NAME Jim Bradley

ALC WR

DATE _____

65-5-5

WCD MB053D WCDATE 88147

WCD MB053D W

3147

WCD MB053D WCDATE 88147

OPER NUMB	RCC	OPER DESC	HIST OCCR	MAND OCCR	OPER TYPE	MAND F	SKILL CD/LVL	QTY		EQUIP CODE	HRS		NOTES
								%	HRS		%	HRS	

100	MANPSC	REP	P	9A012	2	2.0

105	MANPDD	1.00	9WB05	1	.50
105	MANPDD	2.50	1.00	1	.50

105 MANPDD S

105	MANPDD	.	P	240
		.		

110 MANPDC 080 1.00T

110	MANPDC		.	S
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110 MANPDC . . . P 1211 0

115	MANPDC	0-53	1.00T
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115 MANPDC S

115	MANPDC	.	P	.	.	.	.

116	MANPSC	PROC	0.90	1.00T	1.00	9WB051	.53
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116	MANPSC	PROC	.	.	S	.	.	.	.
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SHEET 5 OF 8

OPERATION PROFILE

SAS

Em Gwady

ALC WR

DATE _____

5-8-89

RCC MANPSC

WCD MB053D WCDDATE 88147

ITEM CD PCN 50454A

OPER NUMB	RCC	OPER DESC	HIST OCCR	MAND OCCR	OPER TYPE	MAND F	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	NOTES
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116	MANPSC	PROC	P		1	5.0
				~~48127~~		

94C11

120 MANPSC INS 0.90 1.00 T

120 MANPSC INS . S

120 MANPSC INS . . P

CPA 11-1

130	MANPSC	INS	P	~~48127~~	1	0.3

9A014

Patent Shop. E.E.
operation - low - low
to pay price at

SHEET 6 OF 8

SAS

OPERATION PROFILE

NAME GMG/Indy

ALC WR

DATE

4-2-89

RCC MANPSC

ITEM CD PCN 50454A WCD MBA53D WCD DATE 88147

OPER NUMB	RCC	OPER DIS	HIST MAND OCCR TYPE	MAND F	HRS	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	NOTES
10	MANPSC	DIS	1.00	P	1.00T									
10	MANPSC	DIS		S										
10	MANPSC	DIS		P	2.0	9A012	2		0.5					
20	MANPSC	PROC	1.00		1.00T									
20	MANPSC	PROC		S										
20	MANPSC	PROC		P	2.0	9A012	2		0.5					
30	MANPDA		1.00		1.00T					1.00	9A012	1		.50
30	MANPDA			S										
30	MANPDA			P	2.0									
40	MANPDA		0.50		1.00T									
40	MANPDA			S										
40	MANPDA			P	8.0									
50	MANPDD				1.00T					1	9A012	1		.50

SAS

OPERATION PROFILE

SHEET 4 OF 8

NAME *B.M. Bradley*

ALC WR

DATE *5-2-89*

WCD MBAS3D WCD DATE 88147

ITEM CD PCN 50454A

OPER NUMB	RCC	OPER DESC	HIST OCCR	MAND OCCR	OPER TYPE	MAND F HRS	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	NOTES
50	MANPDD				S										
50	MANPDD				P	24.0									
60	MANPDC		1.00	1.00	T										
60	MANPDC				S										
60	MANPDC				P	118.0									
70	MANPSC	ASSY	1.00	1.00	T	1.00	9413-05	1		.50					
70	MANPSC	ASSY			S										
70	MANPSC	ASSY			P		9A012	2		3.0					

SHEET 8 OF 8

OPERATION PROFILE

NAME Cm Gurdley

SAS

ITEM CD PCN 50454A ALC WR DATE 2-2-89 WCD MBB53D WCD DATE 88034

NOTES

EQUIP
CODE

HRS

%

QTY

CD/LVL

SKILL

MAND

F HRS

OPER

HIST

OCCR

TYPE

DESC

OPER

RCC

MANPDD

MANPDC

MANPDC

MANPDC

MANPDC

1.00T .50 94012 2 .50

S

24.0

1.00T

S

20.0

1.00T

S

20.0

1.00T 1.00 94012 2 .50

S

20.0

P

(4)

NAME Bill C. Dwyer

ASSEMBLY/DISASSEMBLY PROFILE

8:21 WEDNESDAY, APRIL 5, 1989

ITEM CODE WCD WCD DT DSOP ASOP REMOV DATE DATE

PCN 50184A

88147 40 80 PCN 351576-01

PCN 50454A

88147 25 60 PCN 345208-3L

PCN 50454A

88147 25 100 PCN 342781-501

PCN 50454A

88147 25 100 PCN 354760

PCN 51402A

88154 30 75 PCN 3P22002-326

PCN 51402A

88154 30 75 PCN 3P22002-327

PCN 51402A

88154 30 75 PCN 3P22002-335

PCN 51402A

88154 30 75 PCN 3P22002-336

PCN 52484A

88146 10 187 PCN 353972-1

RCC MANPSC

WCD

WCD DT

SHEET

OF

INSTALL SAME

NOTES

55 4/10

ND

YES

MBAS3D 88034

ND

MBAS3D

OPERATION PROFILE

NAME CMC Building ALC 144-440 DATE 4-22-84 RCC 2224242 SHEET 1 OF 1

PCN		NSN		WCD		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE		WCD DATE			
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OPERATION PROFILE SAS

NAME GMG/IDay

DATE 11-22-89

ALC WR

WCDDATE 88146

WCD MB021D

ITEM CD	PCN	50208A	OPER NUMB	RCC	DESC	HIST	MAND	OPER	MAND	OCGR	TYPE	F	HRS	SKILL	CD/LVL	QTY	%	HRS	EQUIP	CODE	QTY	%	HRS	NOTES
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35	MANPSC	INS						0.0	P					9A014	1			20.0							
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38	MANPDD							1.00						1.0	9A014	1									
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38	MANPDD												0.0												
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38	MANPDD												0.0												
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40	MANPSC	INS						1.00					1.00	9A014	1										
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40	MANPSC	INS											0.0												
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40	MANPSC	INS											0.0												
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40	MANPSC	INS											0.0												
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50	MANPSC	INS						0.50					0.0												
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50	MANPSC	INS											0.0												
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50	MANPSC	INS											0.0												
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80	MANPSC	REP						1.00					0.0												
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→ only 1.0 hrs
Bldg. #180
MANPDD

→ 3.0, 4.0 hrs was 1.0 hr

→ 1.0 hr was 1.0 hr
MANPDD - 1.50 hr

NAME *CPB/Brady*

OPERATION PROFILE SAS

DATE *4-22-89*

SHEET *4* OF *8*

RCC MANPSC

WCD MB021D WCDDATE 88146

ITEM CD	PCN	50286A	OPER	HIST	MANO	OPER	MANO	SKILL	QTY	%	HRS	EQUIP	QTY	%	HRS	NOTES
NUMB	RCC	DESC	OCOR	TYPE	F	HRS	CD/LVL					CODE				

130	MANPSC	REP	1.00	1.00	T	0.0										
130	MANPSC	REP		0.0	S	0.0										
130	MANPSC	REP		0.0	P		13304		1	✓	40.0	✓				
130	MANPSC	REP		0.0	P		9A014		1	✓	40.0	✓				
135	MANPSC	REP	1.00	1.00	T	0.0										
135	MANPSC	REP			S											
135	MANPSC	REP			P		13304		1	✓	2.0					
135	MANPSC	REP			P		9A014		1	✓	2.0					
140	MANPSC	REP	1.00	1.00	T	0.0										
140	MANPSC	REP			S											
140	MANPSC	REP			P		13304		1	✓	2.0	✓				
140	MANPSC	REP			P		9A014		1	✓	2.0	✓				

245, no damage

SHEET 2 OF 8

OPERATION PROFILE

NAME *Cam Burdick*

ALC WR

DATE

11-22-89

RCC MANPSC

SHEET 2 OF 8

ITEM CD PCN 50286A WCD MB021D WCD DATE 88146

OPER NUMB	RCC	OPER DESC	HIST OCCR	MAND TYPE	MAND F	HRS	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	NOTES
145	MANPSC	REP	1.00	1.00T											
145	MANPSC	REP													
145	MANPSC	REP					13304	1	✓	12.0	✓				
145	MANPSC	REP					9A014	1	✓	12.0	✓				
150	MANPSC	ASSY	1.00	1.00T											
150	MANPSC	ASSY													
150	MANPSC	ASSY					13304	1	✓	1.0	✓				
150	MANPSC	ASSY					9A014	1	✓	1.0	✓				
155	MANPSC	REP	1.00	1.00T											
155	MANPSC	REP													
155	MANPSC	REP					13304	1	✓	8.0	✓				
155	MANPSC	REP					9A014	1	✓	8.0	✓				
160	MANPDD		1.00	1.00T			1.0 9A014	1							

→ 13.5g. #180
 MIN 12.5g

SAS

OPERATION PROFILE

SHEET 7 OF 8

NAME *Com Gaudrey*

ITEM CD PCN 50266A

WCD MB021D WCD DATE 88146

DATE 11-22-89

RCC MANPSC

QTY

% HRS

NOTES

EQUIP CODE

QTY

% HRS

SKILL CD/LVL

MAND F HRS

HIST MAND OPER

DESC

OCCR TYPE

S

48.0

.50

1.0 9113-05

0.75 1.00 T

MANPSC ASSY

S

1.0

13304

P

MANPSC ASSY

1.0

9A014

P

MANPSC ASSY

.50

1.0 9113-05

0.75 1.00 T

MANPDB

S

16.0

P

MANPDB

.50

1.0 9113-05

0.75 1.00 T

MANPSC INS

S

1.0

9A014

P

MANPSC INS

0.0

0.75 1.00 T

MANPSC ASSY

*Handwritten notes and signatures**Handwritten mark*

SHEET 8 OF 8

SAS

OPERATION PROFILE

NAME *Carroll*

ALC WR

DATE

11-22-89

RCC MANPSC

WCDDATE 88146

WCD MB021D

ITEM CD PCN 50286A

OPER NUMB	RCC	OPER DESC	HIST OCCR	MAND TYPE	MAND F	HRS	SKILL CD/LVL	QTY	%	HRS	EQUIP CODE	QTY	%	HRS	NOTES
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200	MANPSC	ASSY	.	.	S	.	.	.	.	.	.	.	.	.	.
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200	MANPSC	ASSY	.	.	P	.	9A014	1	1	.	1.04	.	.	.	.
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8:21 WEDNESDAY, APRIL 5, 1989

ASSEMBLY/DISASSEMBLY PROFILE

SAS

NAME *William Dwyer*

ITEM CODE

ALC WR

DATE

11-21-89

RCC MANPSC

SHEET *1* OF *1*

WCD

WCD DT

ASOP

REMOV ITEM CODE

WCD

WCD DT

INSTALL SAME

NOTES

PCN 50164A

88147 40 80 PCN 351576-01

PCN 50454A

88147 25 60 PCN 345208-3L

PCN 50454A

88147 25 100 PCN 342781-501

PCN 50454A

88147 25 100 PCN 354760

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-326

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-327

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-335

PCN 51402A

MB019Y 88154 30 75 PCN 3P22002-336

PCN 52464A

MB019Y 88146 10 187 PCN 353972-1

YCS

[illegible]

VS(XIX-257)

8:20 WEDNESDAY, APRIL 5, 1989 1

MANPOWER PROFILE SAS

NAME: GMG-114

ALC: WR DATE: 11-18-89

SHEET 1 OF 1

RCC: MANPSC

SK CODE	DESCRIPTN QTR	QUANTITY AVAILABLE			AVAILABLE HRS (PER SHIFT)			HOLIDAY	ALTERNATE SKILL CD/LVL	NOTES
		WEEK 1	WEEK 2	WEEK 3	WEEK 1	WEEK 2	WEEK 3			

13304	WG-5	1					5.7			
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13304	WG-5	4	1				5.4			
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48127	WG-114	1					5.7			
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48127	WG-114	4	1				5.4			
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9A012	WG-8	1					5.7	5.7		9A012/13304
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9A012	WG-8	4	50	10			5.4	5.4		9A012/13304
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9A014	WG-10	1					5.7	5.7		9A012
-------	-------	---	--	--	--	--	-----	-----	--	-------

9A014	WG-10	4	38	9			5.4	5.4		9A012
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9A005	WH-5	1	1							
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9A005	WH-5	4	1							
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8:20 WEDNESDAY, APRIL 5, 1989

SAS

MANPOWER PROFILE

NAME: Gina E. Dyer

ALC: WR

DATE: 11-18-89

RCC: MANPSC

SHEET 7 OF 7

SK CODE	DESCRIP	QTR	QUANTITY AVAILABLE			AVAILABLE HRS (PER SHIFT)			HOLIDAY	ALTERNATE SKILL CD/LVL	NOTES
			WORK WEEK 1	WORK WEEK 2	WORK WEEK 3	WORK WEEK 1	WORK WEEK 2	WORK WEEK 3			
13304	1110-5	1	1	2	3	1	2	3	1	2	3

13304 1212-5 1

5.7

13304 21G-5 4 1

5.4

48127 225-141

15.7

48127 711-572 1

4.

9A012 N.G-8 1

5.7 5.7

H0331/H10616

9A012 *MSD* 4 50 10

5.4.5.4

70331/71069

9A014 217-10 1

5.7 5.7

99012

9A014 20G-10 1 38 9

5.4 5 4

710612

1 1 5-PM 505MB

1 h 5-11M 500.116

SAS

EQUIPMENT PROFILE

SHEET 1 OF 1

NAME: G.M. Chazley

DATE: 4-18-89

RCC: MANPSC

SHEET 1 OF 1

EQUIP CODE	EQUIP DESCR	QUANT	AVAIL S1	AVAIL S2	PREV MAINT FRQ	MAINT S	TIME	UNSCHE MTR	% NOT AVAIL	FOOTPRINT MIN	FOOTPRINT MAX	ALT	EQP	SOURCE	NOTES
0577	H-Next	1	.	.	180	2	24.0	.	.	.	.	.	.	MANPSC	MANPSC
1176	OVEN	1	.	.	180	1	2.0	90	11.0	10	.	.	.	MANPSC	MANPSC
12119	H-Next	1	.	.	180	2	24.0	.	.	.	.	.	.	MANPSC	MANPSC
148010	PIP	1	.	.	180	2	8.0	.	.	.	.	.	.	MANPSC	MANPSC

SAS

EQUIPMENT PROFILE

NAME: GM2000000000 SHEET 1 OF 1

NAME: <u>G.M. Gossard</u>	ALC: <u>WR</u>	DATE: <u>4-18-89</u>	RCC: <u>MANPSC</u>	SOURCE	NOTES									
EQUIP CODE	EQUIP DESCR	QUANT	AVAIL	PREV MAINT	UNSCHE	% NOT	FOOTPRINT	ALT	EQP					
		S1	S2	S3	FRQ	S	TIME	MTBF	MTTR	AVAIL	MIN	MAX		
0577	H-IXT,	1	.	.	180	2	24.0	.	.	.	.	.	MIIXON	MIIXON
1176	OVEN	1	.	.	180	1	2.0	90	11.0	75	10	.	MIIXON	MIIXON
2119-	H-IXT	1	.	.	180	2	24.0	.	.	.	.	.	MIIXON	MIIXON
48010	PIG	1	.	.	180	2	8.0	.	.	.	.	.	MIIXON	MIIXON

EQUIPMENT PROFILE

[illegible]

EQUIPMENT PROFILE

[illegible]

EQUIPMENT PROFILE

[illegible]

PARALLEL PROCESS PROFILE

NAME <u>POASHAN</u> ALC <u>AR-ALC</u> DATE <u>5/18/89</u> RCC <u>MANP8</u> SHEET <u>1</u> OF <u>1</u>		CHILD PROCESS INFORMATION					
ITEM NUMBER	PARENT WCD	PARENT WCD DATE	BEGINNING OPERATION NUMBER	ENDING OPERATION NUMBER	ITEM NUMBER	CHILD WCD	CHILD WCD DATE
PCN NSN PIN 06692A	AB014Y	87363	83	220	PCN NSN PIN 06692A/P1	—	—
PCN NSN PIN					PCN NSN PIN		
PCN NSN PIN					PCN NSN PIN		
PCN NSN PIN					PCN NSN PIN		
PCN NSN PIN					PCN NSN PIN		
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PCN NSN PIN					PCN NSN PIN		
PCN NSN PIN					PCN NSN PIN		
PCN NSN PIN					PCN NSN PIN		
PCN NSN PIN					PCN NSN PIN		

8:24 WEDNESDAY, APRIL 5, 1989

SAS

WORKLOAD PROFILE

NAME	ITEM CODE	AIRCRAFT MODEL	WCD	ALC WR	WKL FLOAT TYP STOCK	DATE	INDUCTIONS PER QTR	QCC	MANPSC	NO OF FPS	MAX WIP	STD HRS	NOTES
						11-11-88	Q1 Q2 Q3 Q4						
PCN 08892A		C-141	MB014Y		4								
PCN 08892A		C-141	MB014Y		4								
PCN 08892A		C-141	MB014Y		4	55	24 49 49					180.43	
PCN 50164A		C-130	MB024D		4	4	14 12 12					61.1	
PCN 50266A		C-130	MB021D		4	0	0 3 1					194.84	
PCN 50454A		C-130	MB053D		4	2							
PCN 50454A		C-130	MB053D		4								
PCN 50454A		C-130	MB053D		4								
PCN 51402A		C-141	MB019Y		4	1	3 3 5					152.30	
					4	5	3 3 5					69.11	

ITEM 3.1 - MAR-

(For Internal Use, Not a Model Input)

[illegible]

NOTE: HISTORICAL FLOW TIME WILL BE GENERATED BY DATA PROCESSING. IF NO HISTORY IS COLLECTED ON WCD DATA COLLECTION SYSTEM, THIS INFORMATION MUST BE COLLECTED ON-SITE. EXPECTED HOURS WILL BE GENERATED FROM OPS. PROFILES. DATA PROCESSING.

NAME	ITEM CD	OPER	NUMB	R
	180	M		
	180	M		
	175	M		
	175	M		
	175	M		
	180	M		
	180	M		
	180	M		
	181	M		
	181	M		
	181	M		
	185	M		

(For Internal Use, Not a Model Input)

NOTE: HISTORICAL FLOW TIME WILL BE GENERATED BY DATA PROCESSING. IF NO HISTORY IS COLLECTED ON WCD DATA COLLECTION SYSTEM, THIS INFORMATION MUST BE GENERATED FROM OPS. PROFILE DATA PROCESSING.

(For Internal Use, Not a Model Input)

[illegible]

NOTE: HISTORICAL FLOW TIME WILL BE GENERATED BY DATA PROCESSING. IF NO HISTORY IS COLLECTED ON WCD DATA COLLECTION SYSTEM, THIS INFORMATION MUST BE OBTAINED ON-SITE. EXPECTED HOURS WILL BE GENERATED FROM OPS. PROFILES BY DATA PROCESSING.

(For Internal Use, Not a Model Input)

[illegible]

NOTE: HISTORICAL FLOW TIME WILL BE GENERATED BY DATA PROCESSING. IF NO HISTORY IS COLLECTED ON WCD DATA COLLECTION SYSTEM, THIS INFORMATION MUST BE OBTAINED ON-SITE. EXPECTED HOURS WILL BE GENERATED FROM OPS. PROFILES BY DATA PROCESSING.

(For Internal Use, Not a Model Input)

NAME	ALC	DATE	WCD	WORKLOAD TYPE	HISTORICAL FLOW TIME	STANDARD HOURS	EXPECTED HOURS
PCN							
NSN							
PN	#508668	11	MA0210	4		13.00	336
PCN							
NSN							
PN							
PCN							
NSN							
PN							
PCN							
NSN							
PN							
PCN							
NSN							
PN							
PCN							
NSN							
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PCN							
NSN							
PN							
PCN							
NSN							
PN							
PCN							
NSN							
PN							
PCN							
NSN							
PN							

NOTE: HISTORICAL FLOW TIME WILL BE GENERATED BY DATA PROCESSING. IF NO HISTORY IS COLLECTED ON WCD DATA COLLECTION SYSTEM, THIS INFORMATION MUST BE COLLECTED ON-SITE. EXPECTED HOURS WILL BE GENERATED FROM OPS. PROFILES DATA PROCESSING.

(For Internal Use, Not a Model Input)

Y86(X), 1991

(For Internal Use, Not a Model Input)

1. 1861

(For Internal Use, Not a Model Input)

V86(M)C, 21

(For Internal Use, Not a Model Input)

①

(For Internal Use, Not a Model Input)



5.1 PROFILE DATA FILES

The profile data files for RCC MANPSC were previously submitted under memo number NKE-E016-7603, dated July 6, 1989.

5.2 MODEL INPUT FILES

The model input files for RCC MANPSC were previously submitted under memo number NKE-E016-7603, dated July 6, 1989.

6.0 VALIDATION OF INPUT DATA

All profile data was validated in accordance with paragraph 7.2 and 7.3 of the Simulation Model Definition Document (SMDD). The profile data files included in this document were validated and accurately represent this RCC.

**MINUTES OF
MODEL VALIDATION MEETING
June 19 thru June 23, 1989**

WR-ALC/MDMSC

6-29-89

WR-ALC MODEL VALIDATION
MEETING MINUTES

19 June 89:

- . Jim Gillis started the meeting by introducing team members:

- . Jim Gillis
- . Gerald Peavy
- . Doug Keene
- . Lott Singletary

AFLC Representative:

- . Trixie Brown

MDMSC Representatives:

- . Bob Bashyam
- . Bill Rich
- . Roger VanderVoord
- . Scott Vroman

- . Jim pointed out that AFLC instructed them not to sign off the Model Validation Form.
- . Reviewed model output for RCC MANPSA. Evaluated throughput, historical flow hours vs. simulated flow hours, expected hours vs. standard hours.
- . This evaluation was performed for each item number. During this process list of major assumptions, action items and concerns were noted.

PCN 01900A: F-15 Speed Brake

- . Historical flow hours 933.5 vs. 466.70 of simulated flow hours.

Assumption:

Method of induction may be a problem. History does reflect 500 hours to complete first operation which is inspection.

Historical backshop hours were greater than simulated hours. We decided to input backshop hours back into the model.

6-29-89

WR-ALC
Model Validation Meeting Minutes
Page Two

PCN 01900A: F-15 Speed Brake (continued)

. Action items:

Doug to verify the manpower utilization.
Bill to review expected and standard hours.

PCN 05502A: C-141 Aileron

- . Simulated throughput 13.2% difference. The difference was due to sporadic induction method.

PCN 51334A: C-141 Leading Edge Horizontal Stabilizer

- . Bill to review expected hours.
- . Increase backshop hours by 180 hours based on historical report.

PCN 51352A: C-141 Access Door

- . Bill to review expected hours.
- . Increase backshop hours based on historical report.

PCN 51418A: C-141 Leading Edge Wing

- . Bill to verify expected hours.

PCN 51454A: C-141 Petal Door

- . Bill to review the subassembly process hours.
- . History had one sample of 698 days - adjusted for this odd occurrence and made hours from 2288 to 1334.

- . This completes the evaluation of model output for RCC MANPSA. At the end of this evaluation, Bob summarized the action items and assumptions. Jim commented that the model

WR-ALC
Model Validation Meeting Minutes
Page Three

seems to be doing what it is suppose to and asked MDMSC team to complete the action item and re-run the output. Jim also stated that either expected or standard hours can be used in establishing baseline of model based on IE's judgment. AFLC's representative, Trixie Brown, disagreed with Jim's comment. Validation team decided that during evaluation of difference between historical vs. simulation, 10% should be used only as a guideline not as a measurement.

Evaluation of RCC MANPGC:

- . Evaluated the model output for the following PCNs: 06121A, 74061A, 74063A, 74146A, 74148A and 74149A.
- . Review of throughput, historical vs. simulated flow hours and expected vs. standard hours revealed the following:
 - . Expected vs. standard hours were within acceptable range.
 - . Throughput was good.
 - . Flow hours showed lot of difference between simulation and history. Review of historical report revealed that an unique pattern of process is being followed in Gyro Shop. Gyros after inspection were stored/held for long period of time before the start of repair operation.
 - . Discussed about this problem. Doug and Jim wanted to have some methodology to show the unique holding process.

20 June 89:

- . Bruce Kirk of MDMSC joined us to facilitate our brainstorming effort.
- . Conducted brainstorming effort at Building 169. Morning session for Sheet Metal RCC's MANPSA, MANPSB, MANPSC, and MANPSD and afternoon for Gyro RCC's MANPGA, MANPGB, and MANPGC.

6-29-89

WR-ALC
Model Validation Meeting Minutes
Page Four

- . Due to the nature of process and similarity we decided to have one brainstorming effort for Sheet Metal (4 RCCs) and one for Gyro (3 RCCs).
- . Doug arranged both the sessions by bringing in representatives from manufacturing, scheduling, planning and quality.
- . Both the sessions went out very good with a lot of participation. Developed fish bone - details of fish bone and brainstorming activities are covered in minutes of model validation/brainstorming.

21 June 89:

- . Evaluated the model output for all the RCCs MANPSA, MANPSB, MANPSC, MANPSD, MANPGA, MANPGB, and MANPGC.
- . Redlined the backshop hours and added buffer operations as requested by ALC for Gyro RCCs.
- . Input all the changes and re-run the model.
- . Dick Donnelly and Lou Mavros joined us to support our model validation effort.
- . Dick, Lou, Bob and Gerald had an opportunity to meet Mr. Clinton Lewis. Discussed about the validity of model and about future task orders.
- . Jim Gillis will be on vacation for the rest of the week.

22 June 89:

- . Evaluated the re-run of model output after inputting the redlined corrections.

6-29-89

MANPSA

01900A: F-15 Speed Brake

- . Expected vs. standard hours is acceptable.
- . Historical vs. simulated flow hours - still have a problem. History shows operation 10 takes about 500 hours to complete. This is due to induction and priority problem. Operation 40 shows 68 hours to complete (waiting for engineer) whereas model shows 1 hour. One hours represents process hour whereas 68 hours includes waiting time also.

05502A: C-141 Aileron

- . This a PDM item. No historical data available. Evaluated the output and verified with mechanics and planners to validate the model output.

051334A: C-141 Leading Edge Horizontal Stabilizer

- . Standard vs. expected hours is within acceptable range.
- . Backshop hours were off. Redlined the output.

51454A: C-141 Petal Door

- . Model output does seem to represent as-is condition.

51352A: C-141 Access Door

- . Redlined backshop hours to represent historical data.

MANPSD

09193A: F-15 Radome

- . Expected vs. standard hours is within acceptable range.

WR-ALC
Model Validation Meeting Minutes
Page Six

- . Simulated flow hours are almost double the historical. Review showed us operation 190 takes about 550 hours to complete.
- . Operation 190 is repair operation performed by one mechanic for about 50 hours. Model shows the manpower availability as a problem.
- . Doug pointed out that the model exaggerates the problem.

41059A: C-130 Radome Assembly

- . Model output does seem to represent the as-is condition.
- . Needed to verify the historical data of 500 hours for operation 10.

51420A: C-141 Wing Leading Edge

- . Evaluated the output and redlined backshop hours.

40208A: C-130 Radome

- . Output does seem to represent the as-is condition except the historical hours for Operation 30.
- . History shows that it takes over 4000 hours to complete Operation 30.
- . Bob to check the historical input data at St. Louis, if available and respond to WR-ALC.

Q3172A: F-15A Canopy

- . Evaluated model output. History shows that it takes approximately 1180 hours to complete Operation 10.
- . Operation 10 is to inspect and determine what parts are required to perform the repair. It does wait for a long time in getting those required parts.

6-29-89

WR-ALC
Model Validation Meeting Minutes
Page Seven

MANPSB

- . This is a manufacturing RCC.
- . No historical data for analysis. Reviewed only the throughput.
- . Model output was validated based on it's performance on the other 6 RCCs.

MANPG

- . Evaluated the re-run of model out for RCCs MANPGA, MANPGB and MANPGC.
- . Output for these RCCs were reviewed earlier. Buffer operation were added where necessary to represent historical data.
- . Output for PCNs 74010A, 74074A, 74163A, 74126A, 74051A, 20012A, 06121A, 74061A, 74063A, 74146A, 74148A, and 74149A from all the three RCCs were individually evaluated.
- . Flow hours, process hours and throughput were within acceptable range. Model does represent the as-is condition.
- . Doug and Lott questioned the validity of historical data for PCNs 74074A and 20012A. Wanted to verify with manufacturing personnel.

23 June 89:

- . Doug and Lott verified and confirmed the flow hour information.
- . Reviewed the re-runs of model output.
- . Bob compiled the meeting of minutes and reviewed with team members.

6-29-89

WR-ALC
Model Validation Meeting Minutes
Page Eight

- . WR-ALC/AFLC/MDMSC validation team agrees that the model seems to represent the approximation of as-is condition of RCCs MANPSA, MANPSB, MANPSC, MANPSD, MANPGA, MANPGB and MANPGC; therefore, the model can be used as a baseline for experimentation.

Doug Keene, WR-ALC/MANEE

Lott Singletary, WR-ALC/MANEE

Jim Gillis, WR-ALC/MAWF

Gerald Peavy, WR-ALC/MAWF

Trixie Brown, AFLC/MAQF



Scott Vroman, MDMSC



Bill Rich, MDMSC



for Roger VanderVoord, MDMSC



Bob Bashyan, MDMSC

7.0 COMPUTER SIMULATION ANALYSIS OF RCC

The computer simulation analysis for RCC MANPSC was previously submitted under memo number NKE-E016-7603, dated July 6, 1989.

8.0 VALIDATION OF SIMULATION ANALYSIS

The validation of simulation analysis for RCC MANPSC was previously submitted under memo number NKE-E016-7603, dated July 6, 1989.

9.0 BRAINSTORMING

The minutes for RCC MANPSC brainstorming were previously submitted under memo number NKE-E016-7603, dated July 6, 1989.

**MINUTES OF
BRAINSTORMING SESSIONS**

June 20, 1989

WR-ALC/MDMSC

**MINUTES OF BRAINSTORMING
SESSION FOR FOUR SHEET METAL RCCs
- June 20, 1989 Morning Session -**

Jim Gillis started the brainstorming session by introducing the facilitator Bruce Kirk of MDMSC. The following were in attendance for this session:

Bashyam, Bob	MDMSC
Gillis, Jim	WR-ALC/MAWF
Jackson, John	WR-ALC/MANERS
Keene, Doug	WR-ALC/MANEE
Kirk, Bruce	MDMSC
Kittrell, Don	WR-ALC/MANSCA
Morrison, Michael	WR-ALC/MANERS
Nicholson, Richard	WR-ALC/MANERS
Powell, David	WR-ALC/MANPSA
Rich, Bill	MDMSC
Singletary, Lott	WR-ALC/MANEE
VanderVoord, Roger	MDMSC
Warnock, Kevin	WR-ALC/MANEE
Williams, Sam	WR-ALC/MANPSA

Bruce Kirk being the facilitator briefed to participant the process of brainstorming. Bruce emphasized flow time is the quality characteristic that we are trying to improve or minimize. With that round robin solution presentation process started. Following are the suggestions:

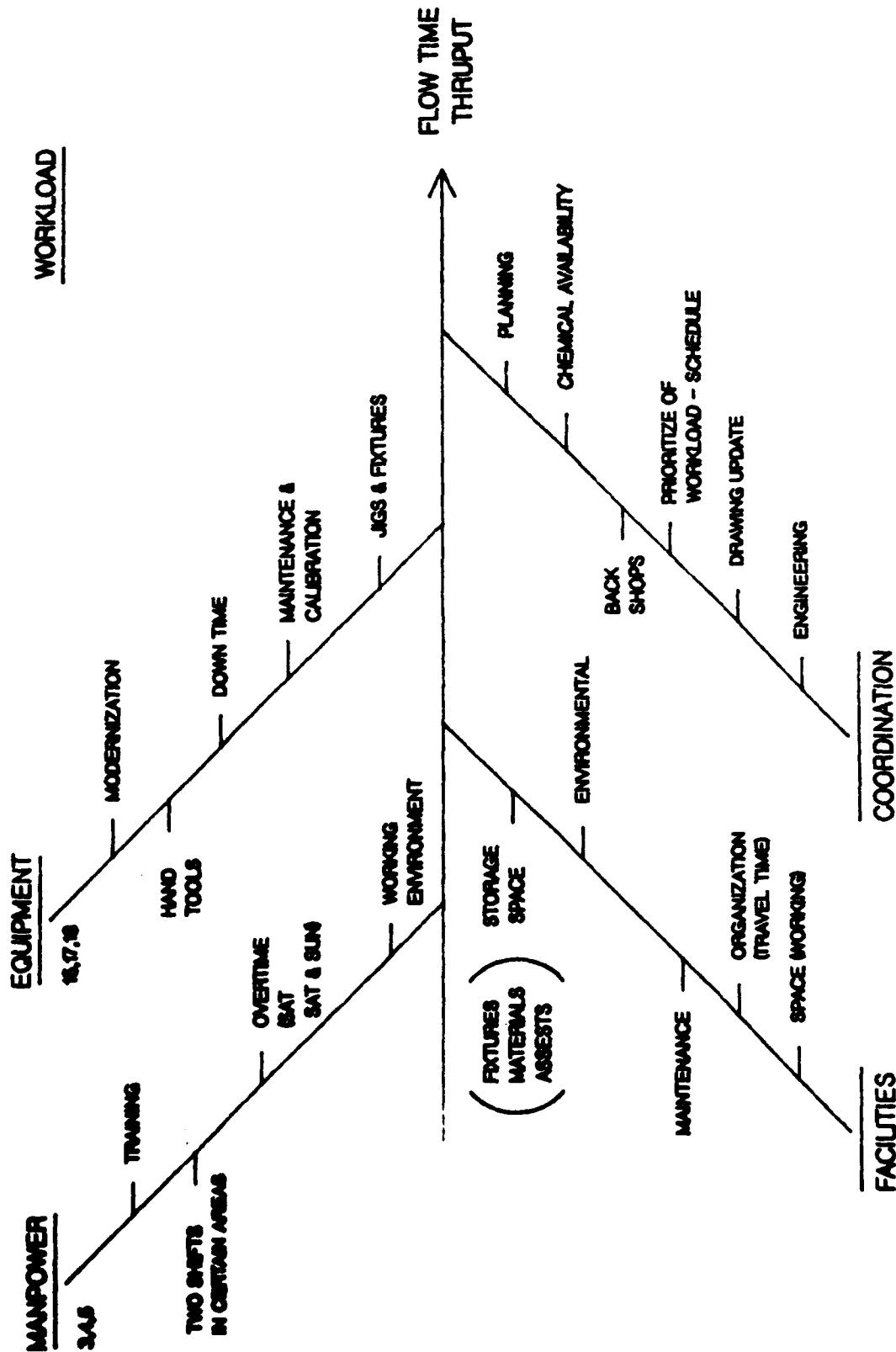
1. Time in Wet Clean (Back Shop).
2. Prioritize of workload (F-15 first).
 - a. May stop in middle of repair to respond.
 - b. Demand system.
3. Manpower.
4. Training shop - mechanics get transferred to F-15 Shop.

Minutes of Brainstorming Session
June 20, 1989 Morning Session
Page Two

5. Two shifts in certain shops.
6. Lack of space and environmental control.
7. No storage space for fixtures etc.
8. Chemical availability - anodize, etc.
9. Hand tools - proper matching to job. Prompt replacement of broken tools. Resizing the tool box may improve space.
10. Workload - need better forecasting.
11. RCC MANPSB completes then ships to storage - delay 10 to 15 days to get the same part back in finishing the repair.
12. Major repair coordination with Engineering - delays.
13. Update drawings requires 60 days.
14. Expedite travel of prioritize parts.
15. Space organization.
16. Equipment modernization.
17. Equipment preventive maintenance and calibration.
18. Jigs and fixtures - modify to ease use without removal.
Work stand - better accessibility.

DEVELOPED FISHBONE (CAUSE AND EFFECT) DIAGRAM.

SHEET METAL SHOP FISHBONE - CAUSE & EFFECT DIAGRAM



RCC: MAN PSC SUMMARY OF RE-EVALUATION

- Reformatted the results of L9 taguchi orthogonal array table.
- Evaluated throughput of each run for average throughput of RCC.
- Analyzed and tabulated results of best and worst PCN for each run including surge.
- This approach gives us a better understanding of the RCC's capability, process, and bottlenecks.

MANPSC CONTROL FACTORS
TABLE 10.6.2-1

BASE	BASE+	BASE++
• INCREASE FY 88 WORKLOAD BY 130%. • ALL OTHER FACTORS REMAIN IN THE AS-IS CONDITION.	• INCREASE FY 88 WORKLOAD BY 130%. • WRITE PSUEDO WCD FOR C-141 AFT COWL - PCN 05502A. • USE 8 SETS OF MODIFIED FIXTURES FOR C-141 AFT COWL	• INCREASE FY 88 WORKLOAD BY 130%. • WRITE PSUEDO WCD FOR C-141 AFT COWL - PCN 05502A. • USE 10 SETS OF MODIFIED FIXTURES FOR C-141 AFT COWL

LSC-20610

MANPSC SHEET METAL SHOP TAGUCHI ORTHOGONAL ARRAY

TABLE 10.6.2-2

RUN #	FACTORS & LEVELS						WORKLOAD (THROUGHPUT)		
	MANPOWER			OVERTIME		EQUIPMENT	AVG.	BEST	WORST
	1	2	3	SAT	SUN				
1	ALL					BASE	91.4 %	51402A 104.5 %	06692A 92.5 %
2	ALL			YES	YES	BASE +	36.6 %	51402A 96.0 %	06692A 23.0 %
3	ALL			YES	YES	BASE ++	44.0 %	51402A 96.0 %	06692A 35.0 %
4	50% 50%					BASE ++	60.5 %	51402A 96.0 %	06692A 53.0 %
5	50% 50%			YES	YES	BASE	98.7 %	51402A 104.0 %	50164A 92.0 %
6	50% 50%			YES	YES	BASE +	56.0 %	51402A 96.0 %	06692A 47.0 %
7	1/3 1/3 1/3	1/3	1/3			BASE +	68.4 %	51402A 96.0 %	06692A 63.0 %
8	1/3 1/3 1/3	1/3	1/3	YES	YES	BASE ++	91.4 %	51402A 96.0 %	06692A 92.0 %
9	1/3 1/3 1/3	1/3	1/3	YES	YES	BASE	98.5 %	51402A 104.0 %	50164A 94.0 %
SURGE*	50%**	50%**	50%**			BASE	60.0 %	51402A 110.0 %	06692A 53.0 %

NOTES:

- * INDUCTIONS = 579 (2 QTRS)
- ** TWO 12 HOUR SHIFTS.

LSC-20616

MANPSC SHEET METAL TAGUCHI ORTHOGONAL ARRAY
TABLE 10.---

RUN #	FACTORS & LEVELS					WORKLOAD (THROUGHPUT)					
	MANPOWER			OVERTIME		EQUIPMENT	130% OF FY 88			SURGE	
	1	2	3	SAT	SUN		QTY	%	QTY	%	
1	ALL					BASE	512	91	348	60	
2	ALL			YES	YES	BASE +	205	37			
3	ALL			YES	YES	BASE ++	248	44			
4	50%	50%				BASE ++	339	61			
5	50%	50%		YES	YES	BASE	553	99			
6	50%	50%		YES	YES	BASE +	314	56			
7	1/3	1/3	1/3			BASE +	383	68			
8	1/3	1/3	1/3	YES	YES	BASE ++	512	91			
9	1/3	1/3	1/3	YES	YES	BASE	552	98			

AD-A237 083

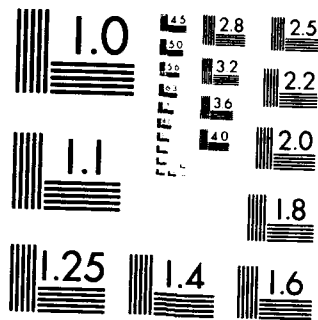
TECHNOLOGY INSERTION (TI)/INDUSTRIAL PROCESS
IMPROVEMENT (IPI) TASK ORDER (U) MCDONNELL DOUGLAS
MISSILE SYSTEMS CO ST LOUIS MO 14 AUG 89 XF-AFLC
F33600-88-D-0567

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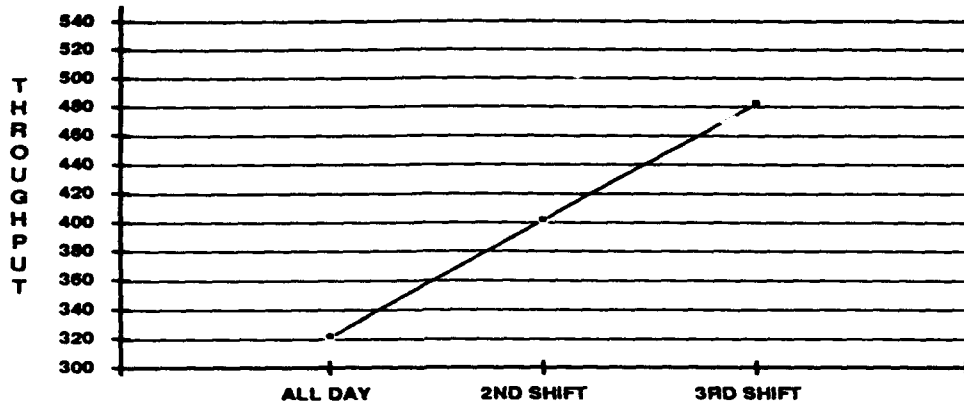
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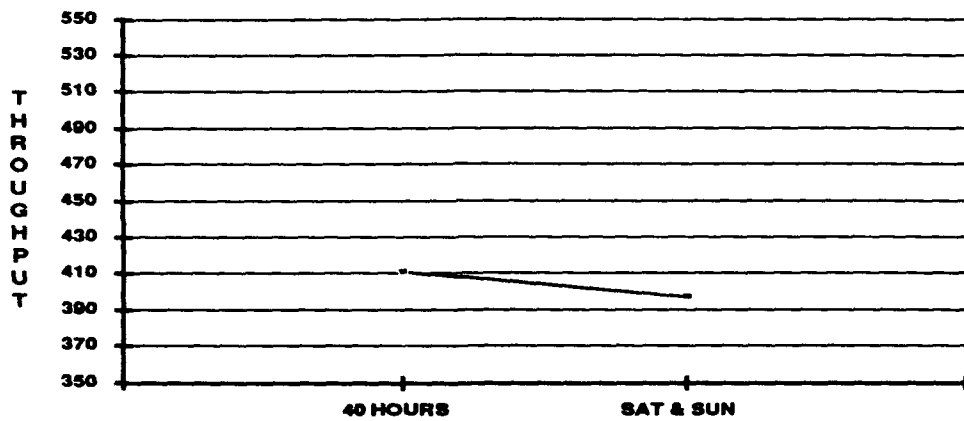


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

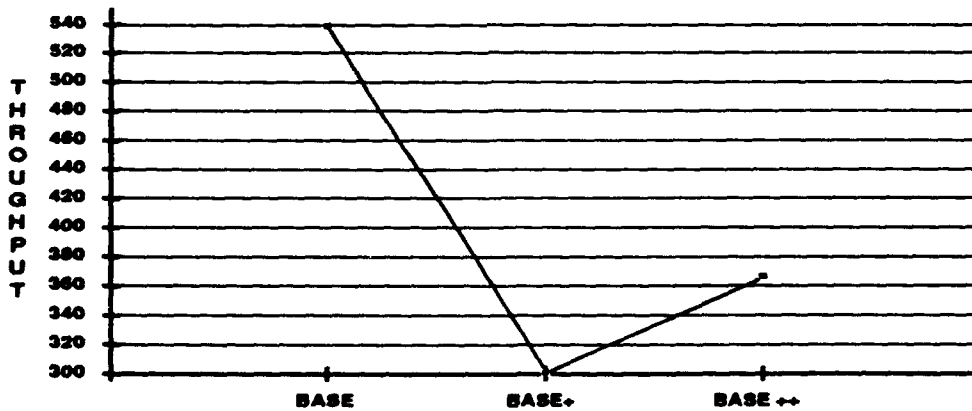
MANPOWER LOADING



OVERTIME



FIXTURES/EQUIPMENT



MANPSC EXPERIMENTATION RESULTS

LSC-20336

MANPSC - WRALC

MANPOWER

NKL: 560

$$1) \quad \frac{512 + 205 + 248}{3} = 322 \quad 58\%$$

$$2) \quad \frac{339 + 553 + 314}{3} = 402 \quad 72\%$$

$$3) \quad \frac{383 + 512 + 552}{3} = 482 \quad 86\%$$

OVERTIME:

$$1) \quad \frac{205 + 248 + 553 + 314 + 512 + 552}{6} = 397 = 71\%$$

$$40HRS \quad \frac{512 + 339 + 383}{3} = 411 = 73\%$$

FIXTURE / EQUIPMENT:

$$BASE : \quad \frac{512 + 553 + 552}{3} = 539 = 96\%$$

$$BASE + : \quad \frac{205 + 314 + 383}{3} = 301 = 54\%$$

$$BASE ++ : \quad \frac{248 + 339 + 512}{3} = 366 = 65\%$$

MANPSC - WRALC

FACTORS / ASSUMPTIONS

BASE : INCREASE FY88 WORKLOAD BY 130%..
MAINTAIN ALL OTHER RESOURCE FILES
AS IN AS-IS CONDITION.

BASE+ : INCREASE FY88 WORKLOAD BY 130%..
WRITE PSEUDO WCD FOR AFT COWL
PCN 06692A.
ADD 8 SETS (16 QTY) OF MODIFIED HOLDING
FIXTURE.

BASE++ : INCREASE FY88 WORKLOAD BY 130%..
WRITE PSEUDO WCD FOR AFT COWL
PCN 06692A.
ADD 10 SETS (20 QTY) OF MODIFIED
HOLDING FIXTURE.

SURGE : INCREASE 130% OF FY88 WORKLOAD
BY SURGE FACTOR.
F15 - 61%, C141 - 246% & C130 - 159%.
MAINTENANCE: SPREAD THEM TO (2) 12 HRS
SHIFT 5 DAYS A WEEK.

MANPSC - WRALC

SUMMARY:

REVIEWED THE RESULTS OF THE OUTPUT ANALYSIS OF THIS EXPERIMENTAL DESIGN FOR RLC MANPSC. THE RESULTS DOES IDENTIFY THE AREA OF POTENTIAL IMPROVEMENT AND PROBLEM.

SIMULATION OUTPUTS INDICATE THAT THE 130% OF FY88 WORKLOAD CAN BE ACCOMPLISHED WITH PRESENT MANPOWER AND FIXTURE. SPREADING OF MANPOWER MAKES LOT OF DIFFERENCE IN THROUGHPUT.

ANALYSIS OF OUTPUT DOES ALSO INDICATE THAT THE MODIFICATION OF HOLDING FIXTURE ALONE WILL NOT IMPROVE THROUGHPUT OR FLOW TIME. EVEN THOUGH THE MODIFIED HOLDING FIXTURE WILL PROVIDE QUALITY PRODUCT, MINIMIZE REWORK AND SCRAP AND BETTER CONTROL ON SCHEDULING THE JOB - PROCESS NEEDS TO BE FINE TUNED, ALLOCATION AND TRAINING OF MANPOWER IS ABSOLUTELY A MUST.

PROCESSED RUN #1 FOR 2872 WITH SURGE REQUIREMENT. SENSITIVITY OF THE SIMULATION RUN REVEALS THAT ON AN AVERAGE ONLY 60% CAN BE ACCOMPLISHED AT 85-100 (DIP 70%).

MANPSC C-141 AFT COUL ^I

I REVISE WCD MB014Y, (DATED 87363):

<u>BLDG.</u>	<u>OPER</u>	<u>WORK TO BE DONE</u>	<u>M/P</u>	<u>TOTAL - PROCESS HOURS</u>
169	010	(SAME)	—	—
180	020	↑	—	—
169	030	↓	—	—
↑	040	(SAME)	—	—
→	060	(ADD) "LOAD PANEL IN FIXTURE"	—	—
	070	(SAME)	—	—
	075	↑	—	—
	085	↑	—	—
	090	↑	—	—
	100	↑	—	(4.0)
↓	130	↑	2	40.0
169	135	↑	—	—
180	140	↑	—	—
169	150	↓	—	—
↑	151	(SAME)	—	—
→	152	(CHG) TO: "INSPECT ALL FITTINGS"	—	—
	153	(SAME)	—	—
	154	↑	—	—
	155	(SAME)	—	—
	156	(REM) "IN ROW ---- TRIM BOARDS"	—	—
	157	(REM) "USING ---- (AFT)"	—	—
	158	(SAME)	—	—
	159	(REM) "ON ---- PURPOSE"	—	—
	160	(SAME)	—	—
↓	170	(SAME)	—	(8.0)
169	171	(REM) "CHECK ---- FIXTURES"	2	4.0

<u>BUDG</u>	<u>OPER</u>	<u>WORK TO BE DONE</u>	<u>m/p</u>	<u>TOTAL PROCESS HOURS</u>
169	172	(SAME)	-	-
	174	(SAME)	-	-
	175	(SAME)	-	-
	176	(REM) "USE ----- FIXTURES"	-	-
	177	(SAME)	-	-
	180		-	-
	181		-	-
	182	(SAME)	-	-
→	185	(CHG) TO: "INSPECT ALL FASTENERS"	-	-
	186	(SAME)	-	-
	187		-	-
	188		-	-
	191		-	-
	193		-	-
	194		2	(12.0)
	195	(SAME)	2	8.0
→	196	(CHG) TO: "CHECK ALL CONTOURS"	-	(6.0)
	197	(SAME)	2	2.0
	199	(SAME)	-	-
	200	(SAME)	-	-
	201	(REM) "BEFORE ----- FIXTURE"	-	-
	202	(SAME)	-	-
	203		-	-
	204		-	-
	205		-	-
	206		-	-
	207		-	-
169	208	(SAME)	-	-

<u>BLOG</u>	<u>OPER</u>	<u>WORK TO BE DONE</u>	<u>M/P</u>	<u>TOTAL PROCESS HOURS</u>
169	209	(SAME)	-	-
↑	210	(REM) "REMOVE ----- AND"	-	-
	215	(SAME)	-	-
	220	(SAME)	-	(16.0)
	250	(SAME)	2	12.0
	260	(ADD) "REMOVE FROM FIXTURE"	-	-
	270	(SAME)	-	-
	280	↑	-	-
	290		-	-
	300		-	-
	310		-	-
	320		-	-
	330		-	-
	335		-	-
169	340		-	-
180	345		-	-
↑	350		-	-
↓	360		-	-
180	370		-	-
169	380		-	-
↑	390		-	-
↓	400		-	-
169	410		-	-
	420	(SAME)	-	-

TECHNOLOGY INSERTION PROGRAM

WR-ALC

MANPS - SHEET METAL SHOP

Bob Bashyan
Bill Rich

Possible Focus Study List

<u>Description</u>	<u>RCC</u>
1. Study to Improve Facilities Layout for Building 169	MANPSC MANPSA
2. Study to Improve Facilities Layout for Building 603	MANPSD
3. Study to Improve Facilities Layout for Building 670	MANPSD
4. Redesign/Modify Existing Jigs/Fixtures Such As Aileron Jig (Make Working Jig in lieu of Solely a Check Fixture)	MANPSA MANPSC
5. Redesign/Modify Existing Holding Fixtures so as to Rotate/Lock Part Being Repaired for Better Access and Less Worker Strain	All
6. Study to Design Holding Fixtures (Customized Shape/Size to be Used in lieu of Flat-Top Tables)	All
7. Study to Make a Fully Computerized "Work Book" (WCD) System in lieu of Current Unreadable "Paper-Mill"	All
8. Study for CADAM Data Storage and Retrieval MASTER Dimension Control System for General Tool Dimensional Control as well as for Part/Assembly Data Source	All
9. Study to Complement LIFT Plan and to Determine/Assign Priorities for New, More Modern/Diverse Sheet Metal Machinery, Facilities, and Equipment	All
10. Feasibility Study for WR-ALC to Manufacture C-141 Petal Door Outer/Inner Skin Assemblies In-House	All

TECHNOLOGY INSERTION PROGRAM

WR-ALC

MANPS - SHEET METAL SHOP

Bob Bashyam
Bill Rich

Possible Quick Fix List

Description

RCC

- | | |
|---|------------------|
| 1. Develop a Mechanic's "Hand Book" for Each Repaired Assembly | All |
| 2. Implement Mechanic "Buy-Maintain" (Buying Only Necessary Tools!) Tool-Set Program | All |
| 3. Provide Heavy Cardboard Shipping Boxes for Small/Medium Size Parts | All |
| 4. Move Bond Mechanics Closer to the Autoclaves | MANPSA
MANPSC |
| 5. Provide Level Aileron Support Tables Until a Better Holding Fixture Can Be Provided | MANPSA |
| 6. Provide Better Quality Drill Bits in lieu of the Current Re-Sharpended Ones | All |
| 7. Provide Certain Mechanics with a Needed 45-Degree Angle Drill Attachment and an Approximate "3X" Rivet Gun (For 1/8"/5/32" Rivets) | All |
| 8. Provide Pictorial - Drawings with the Existing "Work Books" (WCD's) | All |
| 9. Review and Allocate Sufficient and Dedicated Work Space for Each Work Station | All |
| 10. In Conjunction with 2 Above, Reduce Size of Mechanics Tool Box to Approximately 1/2 the Current Size (Thereby Saving Much Valuable Space) | All |
| 11. Put More Emphasis on QP4! | All |

for 5 of 9

Possible Quick Fix List (continued)

MANPS
Bob Bashyam
Bill Rich

<u>Description</u>	<u>RCC</u>
12. Include the Manufacturing Supervisor in <u>ALL</u> Task Force Formations When Quality/Production Would Be Discussed or/and Decisions Made to Affect Same	All
13. Design/Build Aileron Tab Hinge Locator	MANPSA
14. Design/Build a "Newspaper Clipping Cutter" to Cut the Thin Skins on the C-141 Horizontal Stabilizer Leading Edges	MANPSA
15. Evaluate Cleanliness Condition in Work/Staging Area Near the Autoclaves in Building 169	MANPSA
16. Review Safety Precautions in the Use of Methel-Ethel-Ketone (MEK), Depleted Uranium Counter-Balance Weights and Asbestos Clamps Used in Building 603 on the C-141 Wing Leading Edge	All
17. Senior Mechanics/Supervisors/Alternates should Outline the Repair Processes for the Repaired Assemblies (to be Used in Conjunction with 1 Above)	All
18. Implement Methodology to Eliminate Missing Petal Door Strake Parts	MANPSA
19. Use "T" Material (Form in "W" Temper) in lieu of "O"	All
20. Use Lockheed "Status" to Determine Latest Drawing/Effectivity	All
21. Certify Mechanic Doing Repair Work on the Horizontal Stabilizer Leading Edges for "Ohmmeter" and "Brazing" Use	MANPSA
22. Need "Window Area" Plot for F-15 Radome Repair Use	MANPSD

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Possible Quick Fix List (continued)

MANPS
Bob Bashyan
Bill Rich

Description

RCC

23. Need Holding/Support Fixtures for ALL Radomes
24. Move F-15 Canopy Repair Effort Out of Building 670
25. Provide Capability to Brush Alodine for Building 603
26. Remove C-130 Leading Edge (Unused) Jigs From Building 603
27. Need Better/Larger/Cleaner Toilet Facility for the Women Mechanics in Building 603
28. Need More Space for the C-141 Nozzles in Building 603
29. Need More Space for the Radomes in Building 670
30. Combine Repair Operations for the C-141 AFT Cowl Door to Use One (1) Mechanic in lieu of the Present Two (2)
31. Make Available to ALL ALC's Paul C. Bevan "Patch-Puller-Ring" for Fiberglass Repair
32. Encourage Suggestions Like Wendell Pittman's Investigation and Persistence in His Investigation of Missing Petal Door Strake Parts
33. Make Use of and Assign More Manufacturing Responsibility to the Planning Section for ALL Manufacturing/Engineering Coordination
34. Make Available Cobalt-Tipped Drill Bits, or Equipment, for Mechanic's Use for Drilling Out Fasteners

MANPSD

MANPSD

MANPSD

MANPSD

MANPSD

MANPSD

MANPSD

MANPSD

MANPSA

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Following are the Potential Improvements for Quick Fix.

10.0 WARNER ROBINS AIR LOGISTIC CENTER (WR-ALC)

10.1 QUICK FIX OPPORTUNITY TO DEVELOP A MECHANIC'S "HAND BOOK" FOR EACH REPAIRED ASSEMBLY. THE MECHANICS WOULD OUTLINE THE REPAIR PROCESSES FOR THE ASSEMBLIES BEING REPAIRED (MANPS).

10.1.1 Description of Current Operations

Most of the mechanic's training is received by actual "on-the-job" experience working with someone more experienced on the particular unit being repaired. Most experienced mechanics have made written notes to help guide them in the repair effort.

10.1.2 Description of Current Process Problems

The mechanic's sequence of tear-down, inspection and repair may vary compared with the WCD operation numbering. Certain peculiarities in the rework process may require a knowledge far in excess of the T.O. and the WCD instructions.

10.1.3 Description of New Process

Compile and publish a mechanic's training handbook written for each assembly being repaired in MANPS. The manual would compliment and supplement the Technical Orders and be compiled by training specialists using the experiences and input of the top mechanics currently doing the repair work as a guide. The training manual would be initiated to recognize the subtleties of the repair process and would document all major steps and techniques of each repaired assembly unit. The Manual would be coordinated through the Training Monitor and the cognizent Process Engineer, Manufacturing Engineer, Planner, Production Supervisor and Quality People.

10.1.4 Rationale Leading to Change

The "Hand-Books" would help train new people in a rapid build-up such as a "Surge" or "War-Time" situation or in any crisis such as the present mechanics "turn-around" due to the F-15 wing effort or where a production rate increase would be necessary. Additional training and motivational courses would also be beneficial in conjunction with the "Hand-Books".

10.1.5 Estimated Cost Savings

Observations and interviews have indicated a potential average increase in efficiency for each new/old mechanic of 20% for the first 30 day period and a 10% increase thereafter.

10.1.6 Implementation Cost/Schedule

Cost of an existing training specialist to coordinate the inputs is estimated to be \$10,000 per annum (pro-rated).

Cost of preparing and reproducing each manual is estimated to \$10 per copy.

Implementation could be realized in about 60 days from "Go-Ahead".

10.2 QUICK FIX OPPORTUNITY TO IMPLEMENT MECHANIC "BUY - MAINTAIN" TOOL-SET PROGRAM (BUYING ONLY NECESSARY TOOLS, THEREBY REDUCING THE SIZE OF THE TOOL BOX) (MANPS).

10.2.1 Description of Current Operations

All sheet metal mechanics are issued a standard set of tools, a tool box and a tool stand with drawers. Some of the tools have an everyday use, some have a limited use and some of the tools issued are never used: For example, the rivet guns issued have limited use while the most widely used gun, (3X type for 1/8" and 5/32" ad rivets) is not included - neither has a 45 degree pneumatic angle drill attachment been included. There are other instances.

10.2.2 Description of Current Process Problems

In some instances the replacement of a broken tool takes up to several weeks for replacement. In the interim, the mechanic either uses a "loaner" from the tool crib or borrows/shares a tool with a team member. These large tool box/tool stand occupy much valuable space and to reduce the number of tools would save much space, by requiring much smaller box/tool stands.

10.2.3 Description of New Process

Other repair facilities require the mechanics to buy and maintain their own set of necessary tools. These companies establish the requirements for the tool set and assist the mechanics in selecting the manufacturers of the tools. Inferior quality items that do not hold up and which constantly require replacement are eliminated. The tool manufacturers most often offer a life-time guarantee and a substantial discount to the mechanic because of the volume purchases. This has proven to be cost effective in many instances, for maintenance facilities such as Eastern, Delta, Hayes and Lockheed Air Service, etc.

One or two sets of "Limited-Use Tools" could be issued to a RCC repair area for general use.

10.2.4 Rationale Leading to Change

- . The reduction of the number of tools/tool box/tool box stand by 50% would save much space.
- . Eliminate/reduce tool crib manpower and storage area.
- . Eliminate/reduce buying activity and expense.
- . Provide the mechanic with the necessary tools to work with!
- . Provide the mechanic with an expeditious way to replace broken tools.
- . Make the mechanic responsible for the tools that he uses to do his assigned tasks.

10.2.5 Estimated Cost Savings

Interviews have indicated a possible savings of 10 man hours per week for each mechanic if he/she had a proper "Tool Set".

Observations have shown that a reduction in size due to the mechanic having only necessary tools from 6.50 square feet to 3.25 square feet would also save approximately 3 square feet per mechanic. This would be a significant amount of space to be gained in Building 670, for example.

10.2.6 Implementation Cost/Schedule

The schedule and implementation cost would require further study and selection of tool needs, which would vary with each RCC, and tool suppliers.

10.4³ QUICK FIX OPPORTUNITY TO MOVE BOND MECHANICS CLOSER TO THE AUTOCLAVES OR ALLOW THE REPAIR GROUP CLOSE TO THE AUTOCLAVE TO DO THE BOND WORK (MANPSA).

10.4³.1 Description of Current Operations

In addition to other miscellaneous small bonded assembly units, there are approximately fourteen (14) frame and longeron assemblies for the C-141 Petal and seven (7) Leading Edge Sections for the C-141, Aileron which require the units to be rebonded when they undergo repair.

10.4³.2 Description of Current Process Problems

The Aileron parts are rebuilt in W. Blackmon's area adjacent to the autoclave area and returned to S. Williams' control after completion, but the Petal Door parts are rebuilt in T. Cherry's area and then sent to rebond by the Petal Door mechanic and returned to him after completion. This is not an efficient flow of work effort.

10.4³.3 Description of New Process

(Need to "certify" all mechanics in Bond Shop.)

Move those workers closer to the autoclave who work/repair small bonded assemblies such as the frame assemblies for the C-141 Petal Doors and the C-141 Aileron Leading Edges, thereby reducing time lost by going back and to. (Always make the transit worker responsible to the Supervisor who is responsible for the final inspection and buy-off of the unit being repaired).

An alternate way to eliminate to and fro travel by the mechanics would be to allow the repair group close to the autoclave to do all the bond work.

10.4³.4 Rationale Leading to Change

Centralizing the bonding of small rebuilt assemblies would tend to:

- . Eliminate wasted time and steps.
- . Produce consistently better quality work.
- . Have the bonding operation in a cleaner and better controlled environment.
- . "Free" the "Home" mechanic to do more specialized work for which he is more qualified than others.

10.³.5 Estimated Cost Savings

It is estimated that a savings of 10 man hours per week could be realized.

10.³.6 Implementation Cost/Schedule

Cost of moving would be negligible and the schedule-to-move would be very flexible.

4
10.5 QUICK FIX OPPORTUNITY TO PROVIDE LEVEL AILERON SUPPORT
TABLES UNTIL A BETTER HOLDING FIXTURE CAN BE PROVIDED
(MANPSA).

4
10.5.1 Description of Current Operations

The support tables for the C-141 Ailerons are not all the same height requiring time and effort to level, per WCD instructions, before the Aileron can be worked. The Aileron must be level while skin work, hinge work, tab removal work or the leading edges are removed.

4
10.5.2 Description of Current Process Problems

(The effort to level the tables has been in the planning stage for about a year or so, according to some interviewees in the area.)

4
10.5.3 Description of New Process

Provide tables the same height to support the Ailerons (until customized cradle-type support holding fixtures are available).

4
10.5.4 Rationale Leading to Change

The customized cradles will support the Ailerons and eliminate the "Man-handling" and "Flip-flopping" from side to side and also allow both sides and the beam/tab area to be worked simultaneously.

4
10.5.5 Estimated Cost Savings

The level tables will save leveling time (usually 15-20 minutes) for 2 -3 mechanics and eliminate overhanging of the Aileron when tables are not available.

4
10.5.6 Implementation Cost/Schedule

The cost and schedule of leveling the existing tables should be available through Kevin Warnock (926-4446).

10.5
10.5 QUICK FIX OPPORTUNITY TO PROVIDE PICTORIAL - DRAWINGS
WITH THE EXISTING "WORK BOOKS" (WCD'S) (MANPS).

10.5
10.5.1 Description of Current Operations

The current copies of the WCD's (Work Books) are difficult to read and hard to understand. (This is true industry-wide.)

10.5
10.5.2 Description of Current Process Problems

Mechanic personnel do not adequately use the WCD's for repair instructions! They do not make proper use of the T.O.'s either!

10.5
10.5.3 Description of New Process

The Production Planner, with assistance from the Art Department, should provide a pictorial drawing, (exploded step-by-step drawing or otherwise), to accompany the "Work Book" (Work Control Document) to assist the worker to better understand the task and to help train others in a Surge or War-Time emergency situation.

10.5
10.5.4 Rationale Leading to Change

New mechanics (and old mechanics, also) would be more productive and understand what they are doing if better work instructions were given them.

Most other repair facilities are using pictorial drawings to supplement the T.O.'s and the planning sheets, and quality has in most cases, improved considerably because the mechanic better understood what they were supposed to do.

10.5
10.5.5 Estimated Cost Savings

It is estimated that the mechanic's efficiency would increase from 10% to 20% (but would vary with the individual) if he/she had a more comprehensive and understandable set of repair instructions to follow.

10.5
10.5.6 Implementation Cost/Schedule

A full time illustrator to make the drawings would cost approximately \$20,000 per year and could reduce the planning staff by a like number due to a reduction in contacts from manufacturing. An estimate of about 30 - 90 days to hire the necessary people and organize the effort would be required.

10.10⁶ QUICK FIX OPPORTUNITY TO DESIGN/BUILD AILERON TAB HINGE LOCATOR (MANPSA).

10.10.1⁶ Description of Current Operations

The current method, when a tab hinge bracket has to be replaced, is to use the tab assembly as a tool and locate the bracket being replaced by using the tab. This is rather difficult to do because the tab leading edge is in the way which makes it hard to position and locate the required shims behind the new fittings.

10.10.2⁶ Description of Current Process Problems

A hinge locator and alignment tool is sorely needed to assist the replacement of an aileron tab hinge fitting on the C-141 Aileron rear beam.

10.10.3⁶ Description of New Process

A simple bar type locator tool would be sufficient and speed up the task.

10.10.4⁶ Rationale Leading to Change

Observation and interviews with the supervisor and several mechanics indicated the hinges replacement was a problem.

10.10.5⁶ Estimated Cost Savings

The hinge replacement requires an average of 10 man hours per Aileron to replace the bad tab hinge fittings. This time would be reduced to approximately 1/2 of this or about 5 man hours with a bar-type locator tool.

10.10.6⁶ Implementation Cost/Schedule

The cost of a simple bar-type tool would be the primary cost involved:

- . Material Cost = \$500 (Steel tube and bar)
- . Welding = 100 (4 man hours)
- . Machining = 300 (10 man hours)
- . Engineering = 500 (8 man hours)

10.11.7 QUICK FIX OPPORTUNITY TO DESIGN/BUILD A "NEWSPAPER CLIPPING CUTTER" TO CUT THE THIN SKINS ON THE C-141 HORIZONTAL STABILIZER LEADING EDGES (MANPSA).

10.11.1⁷ Description of Current Operations

The thin .005 thick stainless steel cover skins for the C-141 Horizontal Stabilizer de-icer leading edge assemblies (8 per aircraft) must be removed in order to inspect and repair the embedded direct current wires and the heating elements.

10.11.2⁷ Description of Current Process Problems

The current way of skin removal is to cut and peel the cover skins using a wood chisel, tin snips, pliers, etc. to remove the skin without damaging the wires or the heating elements.

10.11.3⁷ Description of New Process

Design and make a depth cutter similar to the type cutter used to cut out newspaper clippings. This type cutter may be set to cut at a predetermined depth so as to cut the (.005) stainless steel thin skin cover and not cut the wires.

10.11.4⁷ Rationale Leading to Change

(Observation led to believing that a better way should be found.)

This new method of skin removal would allow the old skins to be removed in an easier manner thereby saving time and producing a neater and a more professional repair job.

10.11.5⁷ Estimated Cost Savings

A possible savings of two (2) man hours per leading edge section should be realized; for a total of eight (8) sections times two (2) equals sixteen (16) man hours saved per A/C.

10.11.6⁷ Implementation Cost/Schedule

The only cost would be the "Clipping-Cutter" design and machine costs which should not exceed \$200. Machine time for the cutter should be under \$100.

10.15⁶ QUICK FIX OPPORTUNITY TO USE "T" MATERIAL (FORM IN "W" TEMPER) IN LIEU OF "O" (MANPS).

10.15.1⁴ Description of Current Operations

Most all forming of aluminum for aircraft requires that the material be in soft condition, either in "O" condition or in "W" temper condition. Both conditions, "O" and "W" are of the same softness.

Most engineering drawings and/or material specifications call for the two material conditions to be used interchangeably.

10.15.2⁴ Description of Current Process Problems

It is hard to store "O" condition material, easy to damage, and handle because of it's softness therefore it is better to buy and store aluminum in the "T" condition. There is also the possibility of a part made out of the "O" material getting on the structural airframe of an air vehicle, inadvertently.

10.15.3⁴ Description of New Process

The "O" material requires a heat treat operation after forming to bring the part to a hardened state or "T" condition. The "W" condition is produced by a heat treat operation from the "T" condition, formed into the desired state, then the material returns to a hardened "T" condition at room temperature without any further heat treat.

In the event that "W" condition aluminum alloy sheet is used in lieu of "O", the material must be stored in cold storage while it is awaiting it's time to be worked. It has a shorter work time when it removed from the "ice-box" due to the materials ability to return to a hardened state at room temperature.

It is suggested that certain selected parts such as reinforcement doublers and formed parts be looked at and made from "W" condition rather than "O" condition thereby reducing the inventory of "O" material and conceivably reducing material costs, by eliminating excess scrapage.

10.15.4⁴ Rationale Leading to Change

Other production and repair facilities do not use and stock aluminum sheet stock in the "O" Temper in the thickness of .064 or less because of it's softness.

10.15.5 ⁸ Estimated Cost Savings

The cost savings would be indicated on the present scrappage cost which would be eliminated.

Scheduling is not available at this time.

10.15.6 ⁸ Implementation Cost/Schedule

Implementation of this suggestion requires selection of ^{parts} ~~parts~~ and procedure change. Estimated implementation time approximately 2 months.

10.12⁹ QUICK FIX OPPORTUNITY TO CERTIFY MECHANIC DOING REPAIR WORK ON THE HORIZONTAL STABILIZER LEADING EDGES FOR "OHMMETER" AND "BRAZING" USE (MANPSA).

10.17.1⁹ Description of Current Operations

The mechanic (Amanda Knight) has to use an Ohmmeter to check the continuity of the wiring on the C-141 Horizontal Stabilizer leading edge sections. These sections form an electrically de-iced section of the horizontal stabilizer. All sections are repaired either by repairing the wires and welding breaks in the mesh.

10.17.2⁹ Description of Current Process Problems

The mechanic has to use the back shop on four (4) occasions for the use of the "Ohmmeter" or the "Welding Unit," usually making the trips herself, to verify the repair.

10.17.3⁹ Description of New Process

In repairing the leading edge sections, the mechanic has to use an Ohmmeter to determine the repair so why not make it official by certifying the mechanic in it's use as well as the welding required to make the repairs to the mesh heating element.

10.17.4⁹ Rationale Leading to Change

Discussed with Sonny Heard, Training, the possibility of training/certification of Amanda Knight and others, if necessary, to the use of the Ohmmeter and the Welding/Brazing unit which would eliminate the back shop work and the related expense of the mechanic hand carrying the parts to and from the electrical building.

10.17.5⁹ Estimated Cost Savings

The elimination of four (4) back shop operations would save 4 times 2 man hours = 8 manhours per part; 8 parts times 8 man hours equals 64 man hours saved per aircraft.

10.17.6⁹ Implementation Cost/Schedule

The mechanic has checked out an Ohmmeter for repair use. Kevin Warnock (926-4446) has moved a "welder" to Building 169 for the mechanic's use.

10
10.19 QUICK FIX OPPORTUNITY TO NEED HOLDING/SUPPORT FIXTURES
FOR ALL RADOMES (MANPSD).

10
10.19.1 Description of Current Operations

The primary method of support for the radome repair in Building 670 is to place them directly on the floor. Some are elevated off the floor by the mechanics with 2 X 4's or other makeshift timbers.

Holding stands were made sometime back but are not being used and their whereabouts are now unknown.

10
10.19.2 Description of Current Process Problems

Some workers have expressed a desire to have the radomes elevated for better access and comfort.

10
10.19.3 Description of New Process

Holding stands/fixtures should be made to hold the radome on it's side and to allow the radome to be rotated. This method would be similar to the holding fixture currently being used with the C-141 nozzle repair effort.

10.19.4 Rationale Leading to Change

- . The radome would be accessible from one side thereby making better use of space.
- . Less worker fatigue.
- . Work efficiency increased.
- . Production rate increased.

10
10.19.5 Estimated Cost Savings

An increase of work efficiency from 10% to 15% is predicted which should increase throughput by a like amount for all radomes being worked in Building 670.

10
10.19.6 Implementation Cost/Schedule

The schedule and implementation costs will require further study based on an austere-type stand design.

10.21¹¹ QUICK FIX OPPORTUNITY TO PROVIDE CAPABILITY TO BRUSH
ALODINE FOR BUILDING 603 (MANPSD).

10.21¹¹.1 Description of Current Operations

Parts requiring alodine treatment have to be taken to Building 180, which is about two (2) miles distance from 603.

10.21¹¹.2 Description of Current Process Problems

No alodine treatment is currently available because of the lack of waste treatment/disposal.

10.21.3 Description of New Process

Either one of the following:

- (1) Step up the existing "Fast-Flow" pick-up and delivery system for the parts.
- (2) Temporarily provide five (5) collection drums with adequate exhaust/vent system at Building 603 and transfer the toxic waste to a tank truck for disposal.
- (3) Tie in to an existing waste disposal line at Building 645.

10.21¹¹.4 Rationale Leading to Change

- . Flow time will be reduced.
- . Throughput will be increased.
- . Cost will be reduced.

10.21¹¹.5 Estimated Cost Savings

The estimated cost would be contingent on the decision as to the selection of (1), (2) or (3).

The (1) is estimated to be the least expensive and (3) the most expensive with (2) somewhere in between but only as a temporary measure. Number (3) would be the ideal method to provide treatment.

10.21¹¹.6 Implementation Cost/Schedule

Implementation cost and schedule is contingent on the process selected:

- (1) Shortest time to implement.
- (2) Somewhere in between (1) and (3).
- (3) Longest time.

¹²
10.24 QUICK FIX OPPORTUNITY TO COMBINE REPAIR OPERATIONS FOR THE C-141 AFT COWL DOOR TO USE ONE (1) MECHANIC IN LIEU OF THE PRESENT TWO (2) (MANPSA).

¹²
10.24.1 Description of Current Operations

The current way of reworking the C-141, AFT Cowl Door, is to have one mechanic to tear down the old assembly and salvage the salvagable hardware and miscellaneous parts and another mechanic in another area to repair/rebuild the bonded honeycomb section of the door. (A third mechanic is also involved by removing the door from the cowl - in another area.)

After the bonded section is completed, it is transported back to the "Tear-Down" area and reassembled by the first mechanic (who is not bond certified).

¹²
10.24.2 Description of Current Process Problems

The current way of repairing the doors has no obvious problems with the exception of completion responsibility, and the excessive amount of flow time required between workers.

¹²
10.24.3 Description of New Process

The entire operation for repairing the door should be done in one area and the part not moved back and forth from one area to another. The "Tear-Down" mechanic should be trained and certified for bond operations.

¹²
10.24.4 Rationale Leading to Change

- . Eliminate duplicity of effort.
- . Decrease "Flow-Time".
- . Provide more trained workers.
- . Provide more versatile worker.

¹²
10.24.5 Estimated Cost Savings

At least one (1) full time mechanic will be released for other work.

Flow time will be increased at least by the time required for the part to flow between the areas which is usually 4-6 hours per door.

By certifying ALL workers for bonding, a more versatile utilization of the worker is possible who in turn is more capable of training others.

10.2¹²~~4~~.6 Implementation Cost/Schedule

This may be done immediately with a very little cost effect to implement.

10.28¹³ QUICK FIX OPPORTUNITY TO MAKE AVAILABLE COBALT-TIPPED DRILL BITS, OR EQUIVALENT, FOR MECHANIC'S USE FOR DRILLING OUT FASTENERS (MANPS).

10.28.1¹³ Description of Current Operations

The present lot of resharpened drill bits, especially the sizes normally used to drill out rivets and other type fasteners are not properly ground on center and the tips are softer than the normal quality of new drill bits.

10.28.2¹³ Description of Current Process Problems

These off-center and soft bits wander off-center when the fastener is drilled out sometimes enlarging the hole and requiring a backing strip, or making necessary the next size larger salvage rivet in the enlarged hole.

These drill bits are soft and consequently do not last - only a few holes - and they are dull.

10.28.3¹³ Description of New Process

Provide the Sheet Metal Mechanic with a better quality drill bit such as a Cobalt tipped bit, or equivalent, to be used on High-Value assemblies when drilling out rivets, other type fasteners such as lock bolts or blind rivets and bolts.

10.28.4¹³ Rationale Leading to Change

The current quality of resharpened drill bits is extremely poor, contributing to oversize and nonconforming holes, causing unnecessary work and much time lost.

Making available better quality drill bits for the mechanic's use, especially the sizes used to drill out fasteners will save time, money and provide a better quality product.

10.28.5¹³ Estimated Cost Savings

It is estimated that around 20 man hours are lost per unit every week trying to make quality work with these inferior quality drill bits.

Observation and interviews have indicated that most mechanics are not using the resharpened bits but are obtaining better quality drill bits from other areas such as the F-15 wing effort which is supplied with better quality bits.

10.28.6¹³ Implementation Cost/Schedule

Not available at this time.

Following are the Potential Improvements for Focus Studies.

10.A
~~10.3~~ DB

QUICK FIX OPPORTUNITY TO PROVIDE HEAVY CARDBOARD
RE-USABLE SHIPPING BOXES FOR SMALL/MEDIUM SIZE PARTS
(MANPS).

10.3.1 Description of Current Operations

Parts are currently being moved from one area to another by hand-carrying or by laying loose on a rolling hand cart while they are being transported.

10.3.2 Description of Current Process Problems

10.3.3 Description of New Process

Heavy cardboard, reusable boxes should be used to protect the smaller parts when they are transported from one area or backshop to another area. These are sometimes called "Banana Boxes" because they are about the same shape and construction as the boxes used to ship bananas. These boxes would be similar to the ones used in the tubing/cable shop to contain and transport parts.

10.3.4 Rationale Leading to Change

10.3.5 Estimated Cost Savings

Using these boxes with styrofoam and/or "bubble wrap" will minimize damage to parts being transported.

10.3.6 Implementation Cost/Schedule

10.B
of
~~10.7~~

QUICK FIX OPPORTUNITY TO REVIEW AND ALLOCATE SUFFICIENT AND DEDICATED WORK SPACE FOR EACH WORK STATION (HANPS).

10.7.1 Description of Current Operations

Much confusion exists now in certain areas because of the lack of dedicated and sufficient space for the mechanic and the work he/she is required to do. Traffic cross-flow is bad and in some instances there is no assigned or dedicated work space for the mechanic to do his/her assigned task.

10.7.2 Description of Current Process Problems

The work space for a given repair task must be adequate to allow the work to be performed in the most timely and cost effective manner.

10.7.3 Description of New Process

Each work station must be designed and space allotted to allow the mechanic to do his/her assigned task without interruption from people passing by, cross-flow traffic from fellow workers, insufficient space and confusion.

As a stop-gap measure, (before an in-depth facilities layout can be made), each work station must be identified and permanently marked so that the mechanic assigned to that work station may work with a minimum of interruptions. Rails or fences should be considered to outline the stations.

10.7.4 Rationale Leading to Change

Observation of several areas in Building 169, such as the areas for the petal doors and ailerons for the C-141, led to this present condition.

10.7.5 Estimated Cost Savings

Time will be saved and/or work efficiency will be increased along with the production rate.

10.7.6 Implementation Cost/Schedule

Implementation cost would involve about 16 man hours to lay-out and mark that stations. Equipment needed such as rails are assumed to be available. The time to implement would approximate two (2) weeks for each area from go-ahead.

10.C
10.8.1
OB

QUICK FIX OPPORTUNITY TO PUT MORE EMPHASIS ON QP4!
(MANPS).

10.8.1 Description of Current Operations

Some RCC repair units do not have an active QP4 team. Those that do are not allotted the necessary time to be effective - manpower seems to be the problem.

NOTE: QP4 is currently being revised and restructured. It is suggested that more recognition and prestige be given the group.

10.8.2 Description of Current Process Problems

10.8.3 Description of New Process

More emphasis should be placed on the "QP 4" team effort and to use these groups with greater visibility and recognition as problem solvers.

Long standing complicated problems have a greater chance of being solved when a QP4 team is active in the area.

10.8.4 Rationale Leading to Change

10.8.5 Estimated Cost Savings

- . More employee awareness and concern.
- . Better quality realized.
- . Better worker recognition and efficiency.
- . Money saved.

10.8.6 Implementation Cost/Schedule

10.9

QUICK FIX OPPORTUNITY TO INCLUDE THE MANUFACTURING SUPERVISOR IN ALL TASK FORMATIONS WHEN QUALITY/ PRODUCTION WOULD BE DISCUSSED OR/AND DECISIONS MADE TO AFFECT SAME (MANPS).

10.9.1 Description of Current Operations

Decisions are sometimes made that affect the production effort or the quality of a repair unit without the Supervisor being told or asked to participate in the decision making process.

10.9.2 Description of Current Process Problems

10.9.3 Description of New Process

Better solutions to MANPS problems may be realized so that when a task force is formed, it is formed from individuals most knowledgeable and intimately concerned with a solution to the problem, such as the Production Supervisor if the problem involves the production effort; or the Tooling expert if the problem involves a tool change; and the Planner if ANY change is contemplated in the work sequence or planning. The task force should always be headed up by the Production Supervisor if the problem involves production or quality.

10.9.4 Rationale Leading to Change

10.9.5 Estimated Cost Savings

- . Better utilization of the Supervisors.
- . Better quality.
- . More Supervisor awareness.
- . More cooperation from all concerned.

10.9.6 Implementation Cost/Schedule

10.E
10.12 QUICK FIX OPPORTUNITY TO EVALUATE CLEANLINESS CONDITION
IN WORK/STAGING AREA NEAR THE AUTOCLAVES IN BUILDING
169 (MANPSA).

10.12.1 Description of Current Operations

Most lay-up is done in the Lay-Up Room in Building 169 which is a controlled and compatible environment for the use of adhesives and bonding materials used in the manufacturing of MANPSA work.

Some small patches and repair work is done in the teardown areas and in the staging area of the autoclave. There is not as much concern or attention given to bonding conditions and cleanliness in this as there should be.

10.12.2 Description of Current Process Problems

10.12.3 Description of New Process

A study should be conducted to determine if the conditions are adverse and if a plastic curtain dropped from the ceiling would help the situation. The sanding, drilling and working of metals/composites should be moved further away from the area where adhesive bonding is being done.

10.12.4 Rationale Leading to Change

10.12.5 Estimated Cost Savings

The major benefit to isolating the bonding from the fabrication will be to create a somewhat controlled environment which a requirement to the use of structural adhesives.

10.12.6 Implementation Cost/Schedule

10.13

QUICK FIX OPPORTUNITY TO REVIEW SAFETY PRECAUTIONS IN THE USE OF METHYL-ETHYL-KETONE (MEK), DEPLETED URANIUM COUNTER-BALANCE WEIGHTS AND ASBESTOS CLAMPS USED IN BUILDING 603 ON THE C-141 WING LEADING EDGE (MANPS).

10.13.1 Description of Current Operations

Two safety situations are prevalent in the aileron repair and adjacent areas concerning: (1) The use of Methyl-Ethyl-Ketone, which should not be used. "Safety Solvents" are available and are not as toxic and just as effective as MEK; and (2) Inadequate marking and warning to the mechanics and handlers of the Depleted Uranium counterbalance weight used as the balance material for the weight.

The planners have addressed the problem of the depleted uranium with a vinyl cover but it is not used effectively.

10.13.2 Description of Current Process Problems

10.13.3 Description of New Process

The applicable T.O. lists all the precautions that must be taken to prevent undue exposure to the radioactivity of the material and the mechanics are aware of this. There is no awareness of the "heavy-metal" effects of ingesting ground depleted uranium powder or the fact that grinding or drilling causes sparking which would cause ignition. The Base Safety Engineer should address this problem.

10.13.4 Rationale Leading to Change

10.13.5 Estimated Cost Savings

Employee safety.

10.13.6 Implementation Cost/Schedule

P. 9
10.14 QUICK FIX OPPORTUNITY TO IMPLEMENT METHODOLOGY TO
ELIMINATE MISSING PETAL DOOR STRAKE PARTS (MANPSA).

10.14.1 Description of Current Operations

The Petal Doors arrive at WR-ALC to be inspected and repaired consistently missing the Strake which should accompany the door. This is an expensive group of parts! This is an expensive operation for every C-141 Petal Door to come in for repairs a NEW Strake has to be manufactured and shipped back out to stores!

Where are the missing strake parts? Who removes them from the Petal Door Assembly? By what authority are they removed? Records show that some of these parts have a value of \$20 to \$30 each and in many cases as many as twenty (20) parts are missing!

10.14.2 Description of Current Process Problems

10.14.3 Description of New Process

An investigation into this matter has been made and an employee was given a cash award for bringing this matter to the attention of his managers but no resolution to the problem has been effected as of this date.

10.14.4 Rationale Leading to Change

10.14.5 Estimated Cost Savings

(See Attachments.)

10.14.6 Implementation Cost/Schedule

10.16

QUICK FIX OPPORTUNITY TO USE LOCKHEAD "STATUS" TO
DETERMINE LATEST DRAWING/EFFECTIVITY (MANPS).

10.16.1 Description of Current Operations

There seems to be a bit of confusion at WR-ALC as to how to determine the effectivity of a part or of a drawing revision. This is especially pertinent to the drawings and parts for the Lockheed C-130 and C-141 aircraft. When the Air Force bought these airplanes from Lockheed, they also bought the drawings and the drawing submittal system, which would be in accordance with the applicable MIL Specification for the drawing requirements.

10.16.2 Description of Current Process Problems

10.16.3 Description of New Process

It is possible that a phone call to "Status" at Lockheed each time could get an answer to a problem involving a part as to whether it is required on a particular Model or not.

"Status" could also be used to verify the latest drawing revision or Engineering Order (EO) change to a drawing.

10.16.4 Rationale Leading to Change

10.16.5 Estimated Cost Savings

- . Time saved.
- . Money saved.
- . More confidence in working with Lockheed drawings.

10.16.6 Implementation Cost/Schedule

P.I.
DB.
~~10.18~~

QUICK FIX OPPORTUNITY TO NEED "WINDOW AREA" PLOT FOR F-15 RADOME REPAIR USE (MANPSD).

10.18.1 Description of Current Operations

There are approximately 150 F-15 Radomes in an "X" condition (a condition of maximum damage) which will require a maximum effort to repair in the near future for MANPSD, (Building 670).

10.18.2 Description of Current Process Problems

The F-15 repair T.O.'s do not give a "stay-out" or "window" area for the Radome to help guide the repair. Other T.O.'s such as for the C-130 Radomes give this information to establish repair limitations and help guide the mechanic making the repair.

10.18.3 Description of New Process

There is a need to establish the repair limitations for the F-15 Radomes. Hugh Darsey, (6)5374, MMFRB, Cognizent Engineer is working with the test range, (Building 675), people to derive information to define the repair limitations.

10.18.4 Rationale Leading to Change

In the event the repair limits are not defined it is probable that Radomes will be repaired and not be usable thereby wasting time, money, and effort.

10.18.5 Estimated Cost Savings

Cost savings not determinable, at this time.

10.18.6 Implementation Cost/Schedule

Not determinable at this time.

10.5
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10.20
Comment

QUICK FIX OPPORTUNITY TO MOVE F-15 CANOPY REPAIR EFFORT
OUT OF BUILDING 670 (MANPSD).

10.20.1 Description of Current Operations

The F-15 Canopy repair effort occupies only a small portion of Building 670 and the repair effort does not have sufficient space.

10.20.2 Description of Current Process Problems

10.20.3 Description of New Process

Additional space is currently needed and by moving the canopy effort out of the building more space will be available for the radomes.

The F-15 Canopy should be moved to an area closer to the sheet metal repair, Building 169.

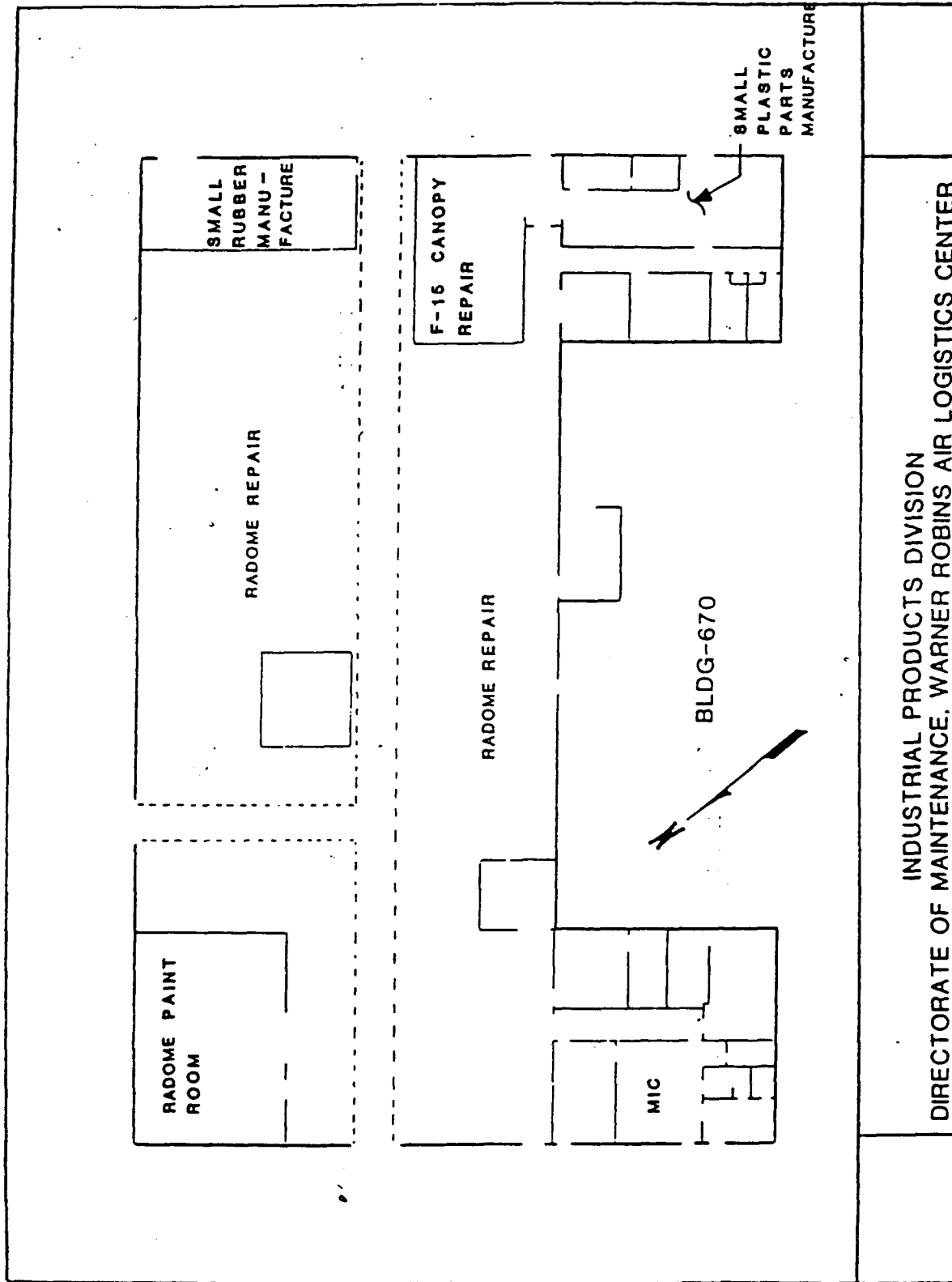
There is no GRID BOARD available to check the optical qualities of the transparencies when scratches are buffed out and the surface distorted.

10.20.4 Rationale Leading to Change

10.20.5 Estimated Cost Savings

Time will be saved and/or work efficiency will be increased and consequently the production rate increased. (See attached sketch.)

10.20.6 Implementation Cost/Schedule



INDUSTRIAL PRODUCTS DIVISION
DIRECTORATE OF MAINTENANCE, WARNER ROBINS AIR LOGISTICS CENTER

Good
Layout
Observations
10.22
10.K

QUICK FIX OPPORTUNITY TO REMOVE C-130 LEADING EDGE
(UNUSED) JIGS FROM BUILDING 603 (MANPSD).

10.22.1 Description of Current Operations

There are several unused C-130 Leading Edge jigs stored in Building 603 that are occupying much needed space needed for 4 - 6 additional nozzle stations.

10.22.2 Description of Current Process Problems

10.22.3 Description of New Process

Remove these jigs from the building thereby allowing the C-141 Nozzle effort to be expanded, as planned.

10.22.4 Rationale Leading to Change

10.22.5 Estimated Cost Savings

Space is at a premium in Building 603 and this space will be used to increase production rate for the C-141 Nozzle effort.

10.22.6 Implementation Cost/Schedule

10.23

QUICK FIX OPPORTUNITY TO NEED BETTER/LARGER/CLEANER
TOILET FACILITY FOR THE WOMEN MECHANICS IN BUILDING
603 (MANPSD).

10.23.1 Description of Current Operations

The women's toilet in Building 603 has only one (1) commode for 6-8 women to use. Water stands in the general area of the toilet when it rains. The women have to go to adjacent buildings or either wait!

10.23.2 Description of Current Process Problems

10.23.3 Description of New Process

Provide better toilet facilities.

10.23.4 Rationale Leading to Change

10.23.5 Estimated Cost Savings

Increased worker comfort station and sanitary conditions.

10.23.6 Implementation Cost/Schedule

7007
O
RESERVATION
10.25
10.M

QUICK FIX OPPORTUNITY TO MAKE AVAILABLE TO ALL ALC'S
PAUL C. BEVAN'S "PATCH-PULLER-RING" FOR FIBERGLASS
REPAIR (MANPS).

10.25.1 Description of Current Operations

(See Attachment.)

10.25.2 Description of Current Process Problems

10.25.3 Description of New Process

(See Attachment.)

10.25.4 Rationale Leading to Change

10.25.5 Estimated Cost Savings

(See Attachment.)

10.25.6 Implementation Cost/Schedule

1 um - copy
PAUL C. BEVAN'S COPY

NOTE*** THIS IS A CONFIRMATORY SUGGESTION.

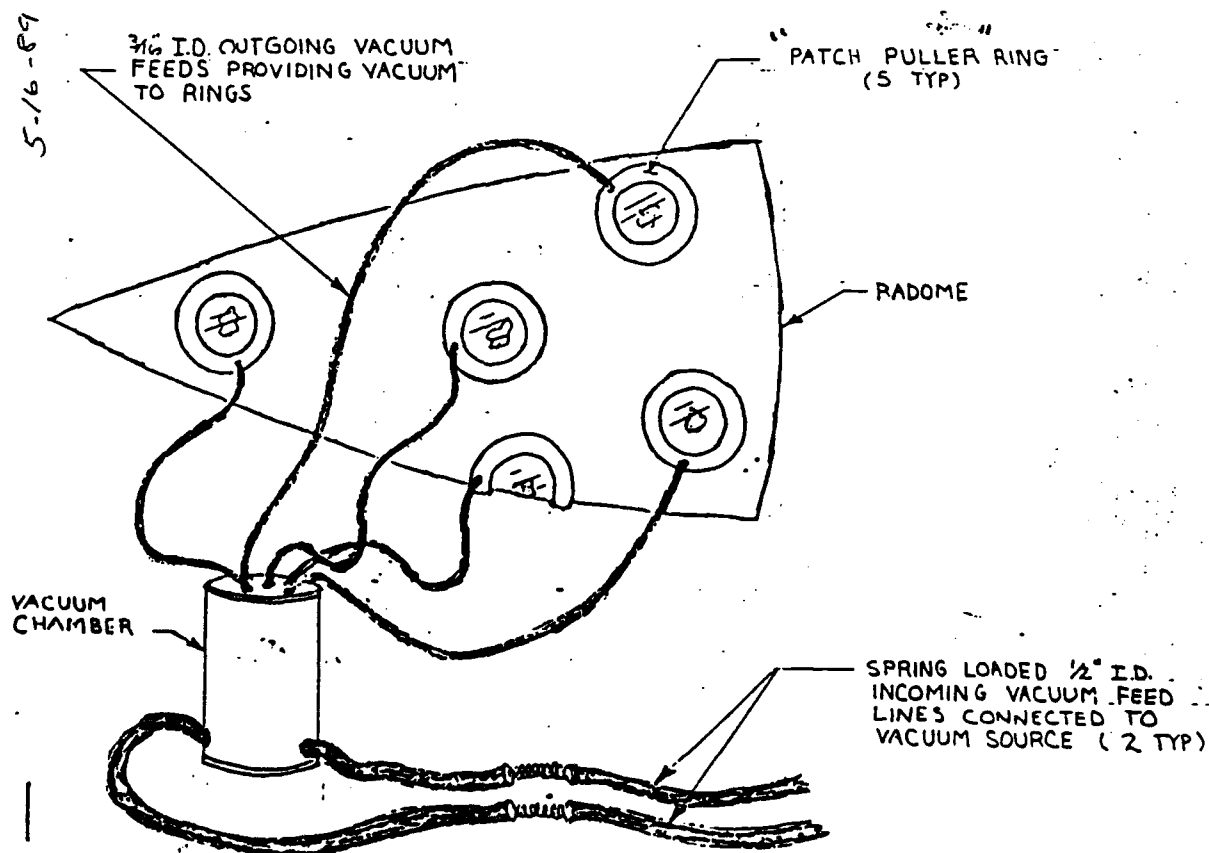
On 11-17-88, I discussed and demonstrated this concept in the presence of Jack Hambrick, David Turner, and Hugh Darsey. They were responding to an AFLC For 103 submitted by myself on 11-15-98. The 103 number is MANERS-8-558. I have attached a copy.

Problem: Present vacuum bag patching techniques are costly, both in labor and material. The government can reduce these costs.

Solution: I have prototyped and developed two systems that greatly reduce material costs and labor costs on the repair of fiberglass items. One system was designed and developed to be used on the F-15 radome. It will work on an aircraft that has a radome of the same configuration as the F-15 radome. After implementation of the system, 98% of labor cost and 98% of material costs will be saved in the patch set-up procedure. Approximately seven labor hours per F-15 radome will be saved. This system is also effective in spot patching on all types of fiberglass and on many fiberglass items DoD-wide. Some examples are the C-130 radome, C-141 radome, C-141 tail cone, C-130 hat dome, and C-141 hat dome.

Some benefits of the F-15 patch puller follow:

PAGE 1 OF 3 PAGES



1. Eliminates 98% of material used for patch set-up (tapes, spring, tacky tape)
2. Eliminates 98% of patch set-up material handling, application, and removal
3. Eliminates any possibility of pulling up circs by eliminating adhesive tape presently used.
4. Functions effectively over grid wires, copper foil tape, radar balancing tape, and oil- or fluid-contaminated surfaces where adhesive tapes now used encounter problems.
5. Works effectively on interior and exterior surfaces
6. I have prototyped and developed the part and mold; no additional tooling is needed.
7. Would be effective for field use in the form of an inexpensive kit. The kit would consist of cloth, resin, Mylar film, and patch puller ring. The system could be operated by a portable vacuum pump.
8. The system could be used throughout the Air Force on any aircraft having a radome with a similar configuration.
9. The system could be used DoD-wide (Navy, Army, ANG, etc).
10. The system is effective in spot patching
11. All components of the system are durable and reusable.

The second system I have developed operates off the same vacuum concept. I have developed a 2-inch-wide band of urethane that vacuums to the radome surface. The system incorporates the vacuum band, a dual vacuum feed, 1-inch masking tape, zinc chromate, and spring. One vacuum source will have a trap built into the line to allow for bleed-outs. Set up and operation is as follows:

1. Vacuum band down to face of radome operating off a straight line vacuum source (no trap). The band will surround the repair area.

2. Once in place, apply the zinc chromate to the outside face of the band.

NOTE: After the chromate has been applied to the vacuum band on the band's first use, the chromate will stay in place and require very little handling for the next several patches. Periodic reapplication of the chromate may be required to insure effectiveness of the device. The zinc chromate serves as an adhesive for alcohol sheet or Mylar film.

3. Next apply the spring with 2-inch pieces of 1-inch-wide masking tape just outside the repair area and within the vacuum band.

4. Attach the vacuum feed with the trap to this spring. This will allow for excess air resin to be bled from the patch. The system will now be ready for use.

5. Apply patch material to repair area (per TO 1-1-24).

6. Activate bleed-out vacuum and stretch Mylar sheet over the repair, adhering the sheet to the chromate. The patch is complete.

This method will reduce tape use by 90%. Labor required for patch set up and break down will be reduced by 70%. This will equate to an average of 6 labor hours saved per dome on the C-130 and C-141. I am in the process of making different sizes and shapes to accommodate different size and shape repairs. 1-1-24, pg 4-19, para 4-86 suggests that mechanics keep their repairs between 144 sq in and 324 sq in for best results. This is not always practical. I have developed a vacuum band that will allow patches of 500 sq in to be pulled. Based on the prototypes and the success of the system, pulling patches with areas of 1000 square inches and greater is realistic. The pullers are already applicable to 90% of the interior and exterior of the C-130 and C-141 radomes.

Some benefits of the vacuumized band follow:

1. Eliminates 70% of material handling in patch set-up on C-130 and C-141 radomes (approximately 6 hours per radome will be saved).
2. Eliminates 90% of tape used during patch set-up.
3. Functions effectively over contaminated surfaces where tape may lose its adhesion.
4. Works effectively on interior and exterior surfaces.
5. Would be applicable DoD-wide.
6. The vacuumized band is reusable and very durable.
7. Can be applied to numerous fiberglass items.

10.26

QUICK FIX OPPORTUNITY TO ENCOURAGE SUGGESTIONS LIKE WENDELL PITTMAN'S INVESTIGATION AND PERSISTENCE IN HIS INVESTIGATION OF MISSING PETAL DOOR STRAKE PARTS. CONTINUE INVESTIGATION TO ELIMINATE MISSING PETAL DOOR STRAKE PARTS (MANPSA).

10.26.1 Description of Current Operations

The Petal Doors arrive at WR-ALC to be inspected and repaired consistently missing the strake which should accompany the door. This is an expensive group of parts! This is an expensive operation for every C-141 Petal Door to come in for repairs a NEW strake has to be manufactured and shipped back out to stores!

Where are the missing strake parts? Who removes them from the Petal Door Assembly? By what authority are they removed? Records show that some of these parts have a value of \$20 to \$30 each and in many cases as many as twenty (20) parts are missing!

10.26.2 Description of Current Process Problems

10.26.3 Description of New Process

An investigation into this matter has been made and an employee was given a cash award for bringing this matter to the attention of his managers but no resolution to the problem has been effected as of this date. (See Attachment.)

10.26.4 Rationale Leading to Change

10.26.5 Estimated Cost Savings

(See Attachment.)

10.26.6 Implementation Cost/Schedule

THIS IS A COPY FROM THE "ORIGINAL"

TO: ALC/DPF/Donna Layfield
FROM: Wendell T. Pittman (926-4812)
DATE:
REF.: Reopen and Reevaluate Suggestion #863055

Ms. Layfield:

I would like to have this suggestion re-opened and re-evaluated.

I have been trying to get someone to realize that the Government could have been saving money since 1984. Nothing has seemed to have any effect.

The latter part of 1987 I contacted the Fraud Waste and Abuse Division and they checked into the matter. After an inquiry and finding that on a lot that Petal Doors coming to Depot Maintenance are stored on over half the doors. Out of 22 doors, 12 were minus strakes. If I remember right they had the suggestion re-submitted and it was further implemented by on through the General.

Some time around the first of the year I was instructed that a \$250.00 settlement could be made on the suggestion or a \$100.00 award would be paid and the suggestion would be further evaluated. After a period of time I was told that the implementation process had been completed and that the personnel in the field could not or would not comply with the directives so therefore my suggestion warranted no further compensation.

On the 11th of December, 1980, the doors were numbered and logged coming into the shop. From then until 17 August 1984 some of the doors were marked with or without strakes. I wasn't there all this period of time so I can't verify that everything was logged. But I can authenticate the validity of these facts. From Door #819 thru Door #1131 there were 96 doors sent to Depot Maintenance minus strake assemblies. At approximately 3,000.00 per strake this was a loss of 288 thousand dollars. From 17 August 1984 through January 1, 1988 I have no accurate count as to missing strakes except for the fact that out of even 20 doors 12 were missing strakes. Since my suggestion was implemented, there has been a drastic change from January 1988. July 15, 1988 the Petal Door shop has been delivers 34 doors for repair.

Page Two

Out of these 34 doors only 3 have been minus strake. So as you can see this has been a tremendous reduction in lost strakes since my suggestion was put in force. Since 1981 my guess would be that over one half million dollars have been lost due careless and unattention. From 12 out of 20 doors missing strakes in the latter part of 1987 to 3 out of 34 door missing strakes should warrant a monetary re-evaluation. If you would please look into this matter for me.

Thanking you in advance,

Wendell T. Pittman
MANPSA/WR-ALC WRAFB/926-4812

cc: Shirley L. Wade, Manager
Air Force Management
Engineering Agency
Randolph AFB, Texas

Honorable Sam Nunn
U. S. Senate
Washington, D.C.

51454A

Left Hand Strake Assembly

1560009466505	3F40353	279	\$132.49
1560009466503	"	281	78.92
1560009466501	"	283	148.21
1560004656499	"	285	204.99
1560004653971JH	"	141	34.51
1560001823974JH	"	143	24.07
1560004605362JH	"	145	37.07
1560004653418JH	"	147	46.16
1560004653969JH	"	243	23.71
1560004600716JH	"	149	91.00
1560004603420JH	"	151	98.68
1560004660743JH	"	153	90.10
1560004653977JH	"	269	49.18
1560004907654JH	"	199	92.53
1560004907656JH	"	201	92.61
1560004907657JH	"	203	49.75
1560004907667JH	"	257	60.77
1560004907670JH	"	271	17.63

51455A

Right Hand Strake Assembly

1560009466504	3F40353	280	\$ 94.36
1560009466502	"	282	109.15
1560009466500	"	284	86.70
1560009466508	"	286	189.30
1560001825369JH	"	146	59.13
1560004653973JH	"	142	35.11
1560002243239JH	"	148	51.91
1560004653975JH	"	144	29.81
1560004653968JH	"	244	25.68
1560P0775322065	"	258	57.78
1560004603419JH	"	150	77.39
1560P0949672065	"	152	175.93
1560004603421JH	"	154	78.92
1560004653981JH	"	270	32.69
1560004657655JH	"	200	25.77
1560004907658JH	"	204	46.40
1560004907669JH	"	258	57.36
1560004907671JH	"	272	82.09
1560P077532F	3F40352	228	83.62

10.27

10:00
DB

QUICK FIX OPPORTUNITY TO MAKE USE OF AND ASSIGN MORE MANUFACTURING RESPONSIBILITY TO THE PLANNING SECTION FOR ALL MANUFACTURING/ENGINEERING COORDINATION (MANPS).

10.27.1 Description of Current Operations

When the manufacturing people (mechanics) have problems pertaining to the engineering and other data requirements for a particular unit being repaired they most often contact the technical support people, such as the manufacturing, tooling, facilities, or materials engineer in a DIRECT contact manner.

Usually the mechanics are not as well-versed as the planner as to the overall part requirement and design intent and consequently should take the problem through the planner for him to make the contact.

10.27.2 Description of Current Process Problems

10.27.3 Description of New Process

Make better use of the Planning Section to help solve ALL problems involving the technical implementation of the Work Control Document (WCD).

10.27.4 Rationale Leading to Change

10.27.5 Estimated Cost Savings

When the planner is contacted he will be in a better position to:

- . Assist the mechanic to prevent work stoppages.
- . Revise the WCD, when required.
- . Coordinate the production effort.
- . Influence the standard hour requirement.
- . Help solve tooling problems and requirements.
- . Etc.

10.27.6 Implementation Cost/Schedule

10.29

QUICK FIX OPPORTUNITY TO STUDY TO OBTAIN BETTER QUALITY/DELIVERY FOR THE PETAL DOOR INNER/OUTER SKIN ASSEMBLIES FROM THE NEW SUBCONTRACTOR (MANPSA).

10.29.1 Description of Current Operations

The new inner skin and outer skin bonded assemblies for the Petal Door, which are made off-site at a Sub-Contractor, require inspection and repair work on the new assemblies before they are acceptable to be used. These new skins are sometime dented, scratched, have voids, have delaminations, etc. that require time and effort to fix before they can be used as acceptable parts. Also, the potted location for the attachment fasteners require re-potting in the honeycomb skin area due to not falling within the potted area. A cursory investigation shows that an increase in the potting area diameter from about one-half inch to about one inch could possibly eliminate the problem of re-potting. Most of the damage problems aforementioned are the fault of WR-ALC but the voids, delaminations, or core damage are most likely the fault of the Sub-Contractor.

10.29.2 Description of Current Process Problems

10.29.3 Description of New Process

Redesign the Petal Door Assembly jig to allow a greater amount of work to be performed in the jig without having to remove the parts so often. At the present time the skin assemblies and the frame parts require removal and replacement approximately six (6) times for each door. This could be reduced by adding a "Box-Jig" adaptation that would allow the skins to be folded back out of the way rather than removing the skins and the frame from the jig each time. More jigs are required for the current workload of Petal Doors.

10.29.4 Rationale Leading to Change

10.29.5 Estimated Cost Savings

An investigation team should be formed to ascertain how much time and money is being spent to rework these "New" Inner Skin and Outer Skin Assemblies and visit the new Subcontractor, if necessary.

A cursory investigation has also discovered that these skin assemblies frequently are not made to the correct contour! After reviewing the bonding capabilities and the autoclave facilities MDMSC has concluded that both of these skin assemblies should be made at WR-ALC!

10.29.6 Implementation Cost/Schedule

10-30-93
~~10-30~~ QUICK FIX OPPORTUNITY TO MAKE BETTER USE OF QUALITY PEOPLE TO HELP SOLVE PROBLEMS RELATED TO THE REPAIR EFFORTS (MANPS).

10.30.1 Description of Current Operations

The Supervisors and their Designees often do not call the Quality Assurance Specialist to help solve problems arising from the repair effort.

10.30.2 Description of Current Process Problems

10.30.3 Description of New Process

The Quality Assurance Specialist should be used by issuing a Request for Quality Assistance (RQA) (AFLC Form 354).

The Quality Assurance Specialist will use the skills and facilities available to develop valid solutions or recommendations on all RQAs. Examples include: Quality Engineering, Methods Improvement Laboratory, chemical or materials laboratories, and subject matter specialists from other divisions or directorates. All corrective actions will be thoroughly coordinated with all activities having a primary or collateral responsibility.

10.30.4 Rationale Leading to Change

10.30.5 Estimated Cost Savings

Time will be reduced and/or work efficiency will be increased and as a result the production rate increased. (See attached copy of MAOI 74-2.)

10.30.6 Implementation Cost/Schedule

23 June 1988

Quality and Reliability Assurance

REQUEST FOR QUALITY ASSISTANCE (RQA)

This MAOI outlines procedures for submitting a Request for Quality Assistance (RQA). This instruction applies to all employees and organizations in the Directorate of Maintenance (MA).

1. **GENERAL.** The purpose of the RQA program is to provide all employees with a medium to seek solutions for a known or suspected problem on any product, process, system, or procedure that may adversely impact the quality of products or services produced by this activity.

*2. **REQUIREMENTS.** AFLC Form 354, Request for Quality Assistance (RQA), is a means of initiating requests to the Product Quality and Reliability Division (MAQ) when initial investigative actions have failed to remedy the problem. Anyone who recognizes or suspects a problem may initiate an RQA. The RQA will not be used for resolution of personal grievances, subjects covered by the Master Labor Agreement, matters under the jurisdiction of 40-series regulations, or items covered by other programs (component failures-use QDR, tech data errors-use AFTO Form 22, etc).

3. **PROCEDURES:**

a. Individuals requesting Quality Assistance will:

(1) Prepare AFLC Form 354 when a suspected or known deficiency is compromising the quality of a product produced by MA.

*(2) Complete all blanks of Part I of AFLC Form 354 and forward to the applicable Quality Branch (MAQ). Routing through section and/or branch office is at the option of the applicable division. The form may be handscribed.

(3) State the deficient condition in sufficient detail to aid investigation; that is, include attachments, national stock numbers (NSNs), technical orders (TOs), etc.

(4) Assist Quality Assurance Specialist during problem review.

b. Applicable Quality Branch (MAQ) will:

(1) Maintain an RQA log book reflecting the RQA control number, date request received, subject, initiator's name, office symbol, suspense date, and date project closed.

(a) The control number will be comprised of the Quality Branch symbol, the last two digits of the year, and the numerical sequence of the project (for example, MAQB-86-1).

(b) A suspense date of not more than 25 workdays will be established.

(2) Contact the originator of the RQA to obtain additional information as required.

(3) Perform a comprehensive evaluation concerning the problem identified through the RQA.

Supersedes MAOI 74-2, 18 Apr 86.

OPR: MAQSS (Sue Pierce)

Editor: Wanda B. Wood

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23 June 1988

(4) Coordinate all findings/recommendations with responsible supervisors.

(5) Provide the initiator a thorough report, with recommendations, if applicable, within established suspense date. Also, provide copies to other organizations with an interest in or collateral responsibility for the problem or for actions associated with the solutions or recommendations. If evaluation cannot be completed within required suspense date, provide initiator with an interim status report.

(6) Initiate requests to effect changes to technical orders, regulations, or other directives when needed.

(7) Provide all recipients of the initial report with copies of all follow-on correspondence.

(8) Maintain a file on completed RQA actions in accordance with MAQOI 74-1.

c. The Quality Assurance Specialist will use the skills and facilities available to develop valid solutions or recommendations on all RQAs. Examples include: Quality Engineering, Methods Improvement Laboratory, chemical or materials laboratories, and subject matter specialists from other divisions or directorates. All corrective actions will be thoroughly coordinated with all activities having a primary or collateral responsibility.

d. Applicable personnel shall assist the Quality Assurance Specialist during evaluation process and assure corrective actions are taken when a problem is identified to their particular area.

FOR THE DIRECTOR

Walter R. Peacock, Jr.
WALTER R. PEACOCK, Jr., Col. USAF
Chief, Resources Management Division
Directorate of Maintenance

1 Attachment
AFLC Form 354 (Sample)

REQUEST FOR QUALITY ASSISTANCE (RQA)			
TO MAQ_N	FROM (Name, Organization, Extension) Jane Doe/MANPM/3491		DATE 4 Apr 86
SUBJECT (System/Item/Process)			
PROBLEM/CONDITION/RECOMMENDATION (If needed, continue on reverse. Do not write below this block.) (Define problem in sufficient detail, state previous actions taken to resolve problem, attach all pertinent information - drawings, previous correspondence, etc.)			
SIGNATURE (Signature of Initiator)			
REPORT			
TO MANPM	FROM MAQ_NM	CONTROL NUMBER MAQN-86-3	DATE 14 Apr 86
BENEFITS DERIVED/EXPECTED (If applicable) (Provide findings, recommendations, action taken, and benefits derived.)			
CORRECTIVE ACTION ON THIS REPORT IS ☒ COMPLETE ☐ PENDING ☐ NOT REQUIRED			MAQ MANHOURS 14 hrs
SIGNATURE (Section Level)		ORGANIZATION MANPM	EXTENSION 2441