

PRODUCTION PLAN

I.D.I. AVRO

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PRODUCTION PLAN

AVRO IDI

This manual is prepared for use by Electrical and Precision Assembly Departments for use on the AVRO IDI contract.

Heads of Departments other than Electrical and Precision Assembly were in agreement with it.

This should not, of course, be considered as a general policy to apply to all contracts.

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ELECTRICAL PROCESS DEPARTMENT

1. Master Process Sheet for Assembly will be made, it will call for Operation Sheets.
2. "Family Tree" drawing will be made by the Department.
3. M and A List will be made and distributed by Process Department.
4. It will be the responsibility of the Electrical Process Department to see that all copies of M and A list are up to date.
5. Process will design necessary jigs and fixtures required for assembly.
6. Process will provide specialized containers for transportation of finished parts from Machine Shop to the White Room.
7. Process will provide the necessary tote boxes, properly marked, to Assembly Area.
8. Process will analyze methods and timing of the assembly line.
9. Process will keep records of actual running time per sub-assembly, Shop Foreman will provide necessary information.
10. Process will look after all assembly line production queries.
11. Process will act as expeditor for any material shortages.
12. Process will assign and record all internal serial numbers.

PRODUCTION CONTROL

1. Production Control will be supplied with M and A List.
2. Issue of Shop Orders to manufacture CDG Parts should be started with operation 1. (consult "Family Tree" drawing).
3. Production Control will abide by Continuous Flow Method.
4. Production Control will provide a runner between Inspection Services and Assembly lines.
5. Production Control will expedite material as per assembly line requirement.
6. Production Control Dispatcher will advise Assembly line Foreman of delivery (date, time) of material that is on the Shortage List.

MATERIAL HANDLING

Authority: Material Control

1. Only Production Control will request Material from Stores.
2. Movement of material from one department to another will be via Material Control only.
3. Material Control will be responsible for the continuous flow of materials.
4. Material Control will provide a recording clerk close to the Inspection Area on a full time basis.
5. Material manufactured by CDC and designated for the AVRO contract will be re-routed by Material Control direct to Production area without physical movement into the Stores. Production Control will provide a runner.
6. M and A list will be used as a basic recording medium.
7. Help for physical movement of Material in Process will be provided by the Production Control.
8. Spare B.O. Components will be issued only when requested by the Production Control.
9. M and A list will be used as a Shortage List. Shortage list will indicate P.O. number and estimated delivery date.
10. Material expediting should follow ascending numbers on the M and A List.
11. Electrical Process Engineer will be personally responsible for the correction of M and A Lists in circulation.

INSPECTION

1. Where possible all CDC manufactured parts will carry an acceptance inspection stamp.
2. All CDC manufactured parts (not sub-assembly) will follow the procedure as set up by the Chief Inspector and in operation now, except for Para. 7.
3. All sub-assemblies made in the Electrical Manufacturing area will be inspected in the same location.
4. All sub-assemblies will carry identification numbers, starting with the letter "S".
5. Since there is no possibility of sub-assemblies being scrapped, units that require rework should be released immediately to the assembly line, and a tag attached to the sub-assembly will tell the nature of the rework. It will be left to the discretion of the Inspector whether or not an Inspection Report is necessary.
Inspection will stamp the sub-assembly only when it is accepted.
6. Shop Travellers used on this contract will be identified by the coloured sticker.
7. Inspector will advise the Material Control clerk when Inspection is completed. Material Control will provide the necessary packing material.
8. Benches will be provided in the White Room for the use by the Inspectors.
9. Process Sheets will indicate after which operation inspection is required (subject to change by the Chief Inspector).
10. After Final Line Inspection, units will be forwarded for Test and Calibration.

Inspection (cont'd)

11. Any rework after this stage will be made by the technician on loan from the Shop Foreman.
12. Units will be assembled using continuous flow process, Inspection should keep pace with Production.

ELECTRICAL MANUFACTURING

1. Production Control will provide the material required for assembly.
2. Assembly should use continuous flow method.
3. Any Production stoppages should be remedied immediately, consult Process Engineer if required.
4. Any rework should be attended to at once.
5. Any defective material should be reported to Process Engineer who will contact Inspection Services.
6. Inspection Services will contact Material Control for transportation of sub-assemblies to the White Room.

WHITE ROOM

1. This is Continuous Flow Operation. All queries or production difficulties should be reported to Process Engineering as soon as possible.
2. The I.D.I. Assembly area will be roped off. Unauthorized personnel should not be allowed into the assembly area.
3. Process and Operation Sheets will be provided by the Process Department.
4. Assembly fixtures and tote boxes will be supplied by the Process Department.
5. Each assembly section will carry all materials required for operation.
6. Only tools required for specific operation should be kept on the bench; personal tool boxes should be stored outside the assembly area.
7. Personnel should ask Shop Foreman for permission to leave the assembly area, at times other than normal breaks.
8. Shop Foreman will detail one person to start at 7:30 a.m. (overtime paid) to carry completed sub-assemblies to Inspection area and bring back accepted sub-assemblies for the next operation.
9. Sub-assembly returns for rework should be routed to the person who is responsible for the operation which requires rework.
10. After final visual inspection, if the Calibration Group asks for rework, the Shop Foreman will arrange to have a technician available for rework on a call basis. Completed units will not be returned to the assembly area.
11. Defective parts which cannot be reworked will be turned over to

White Room (cont'd)

Inspection Department for disposition.

12. Defective parts that can be reworked will be turned over to Process Engineer for investigation.
13. The Shop Foreman will keep records of time spent on the operations performed.

MATERIAL AND ASSEMBLY LIST

SHEET . 1 . of . 6 .
ISSUE NO. 1 . . .
DATE. . 12/6/57 . .

FROM . . . Material Control . . .

TO. . . Machine Shop

PROJECT AVRO S.O. NAME. I.D.I. Unit

DATE REQUIRED. DRAWING

S/A NAME No. 1 Frame OPERATION #1

QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.
1		A(STD)4 Clamp	1
2		Boston Gear G 461Y	1
3		D(MGPI)321 Casting	1

MATERIAL AND ASSEMBLY LIST

SHEET. 2 .of . 6 .
ISSUE NO. 1
DATE .12/.6/57 . .

FROM . . Material Control. . .

TO . . Electrical Manufacture. . .

PROJECT .AYROS.O.NAME . I.D.I. Unit

DATE REQUIRED

DRAWING.

S/A NAME .#1 Frame

OPERATION. .#1

QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.				
1		Plug Windhester #SMRE-14P-G	1				
2		Wire as specified					
3		Eyelet Fed. #1267	14				

MATERIAL AND ASSEMBLY LIST

SHEET . 3 . of . 6 .
 ISSUE NO . 1 . : :
 DATE . 12/6/57 . .

FROM . Material Control
 PROJECT . AVRO
 DATE REQUIRED
 S/A NAME . #1 Frame
 QUANTITY

TO White Room
 NAME I.D.I. Unit
 DRAWINGS
 OPERATION . #1

NO.	ITEM	DESCRIPTION	UNIT QTY.
1		Ball Bearing Min. Prec #5632G	1
2		" " Micro Prec #S1810	2
3		" " Min. Prec #SS5532FC	2
4		" " Min. Prec #SS6632C	1
5		Screw Fill HD #0-80 x 1/8	1
6		" Sock HD #4-40 x 1/8	1
7		" Sock HD #4-40 x 1/4	1
8		" Flat HD #2-56 x 1/2 L	1
9		Flat Washer #4	1
10		Lock Washer #4	1
11		Lamp Gen. Elec. #327 S.R.	9
12		Screw Flat HD #0.80 x 5/16	5

MATERIAL AND ASSEMBLY LIST

SHEET . 4 . of 6 .
ISSUE NO. . 1 .
DATE . . 12/ . 6/57 .

FROM. . MACHINE SHOP TO. . . Electrical Manufacture
PROJECT . AVRO S.O. NAME . I.D.I. Unit
DATE REQUIRED DRAWING
S/A NAME . #1 Frame OPERATION . . #1
QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.			
1		A(MGPI)2409 S/A Light Contact	1			
2		A(MGPI)2410 S/A "	2			
3		A(MGPI)2411 S/A "	4			
4		B(MGPI)273 Light Board	1			
5		B(MGPI)274 Insulation Strip	1			
6		D(MGPI)33 #1 Frame	1			
7		A(MGPI)1466a 1 Ring Light Contact	4			
		A(MGPI)1466b 1 Ring Light Contact	1			
9		A(MGPI)2048 1 Ring Light Contact	2			

MATERIAL AND ASSEMBLY LISTSHEET . 5 . of . 6 .
ISSUE NO. . 1 . :
DATE . 12/6/57 . .

FROM . Machine Shop TO . . White Room
PROJECT . AVRO S.O. NAME . I.D.I. Unit
DATE REQUIRED DRAWING
S/A NAME . #1 Frame OPERATION . . . #1
QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.
1		B(MGPI)1186 S/A Pointer Drift S/A	1
2		B(") 1188 S/A Card & Sleeve S/A	1
3		A(") 2860 S/A Counter Blind & Rod S/A	1
4		A(STD) 4 Clamp	1
5		A(MGPI)2270 S/A Pointer & Holder S/A	1
6		C(") 1756 S/A Counter S/A	1
7		A(") 132 Gear Azimuth Drive	1
8		A(") 137 Spacer, Drift Hub Bearing	1
		C(") 143 Disc, Indicating	1
10		A(") 257 Spacer, Counter Shaft	2
11		A(") 258 Button, Light	4
12		A(") 259 Button, Light	1
13		A(") 426 Ring, Dial Lighting	1
14		B(") 1003 Segment, Lighting	1
15		A(") 1211 Gear Mod. Boston	1
16		A(") 1528 Washer, Lamp	2
17		A(") 1529 Insert, Lamp	2
18		A(") 1530 Insulator	2
19		A(") 1531 Holder, Lamp	2
20		A(") 1532 Spring, Lamp Holder	2
21		A(") 2862 Spacer, Counter	1

SHEET . 6 . of 6 . .
ISSUE NO. . 1
DATE . . 12/6/57 . .

TO.Whiteroom

DATE REQUIRED DRAWING.

S/A NAME . . . #1 Frame . . . OPERATION . . . #1 . . .

QUANTITY.....

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NO.	ITEM	DESCRIPTION	UNIT QTY.
1		C(MGPI)3211 S/A Casting S/A	1
2		B(MGPI)3215 S/A Board Light & Cable	1

MATERIAL AND ASSEMBLY LIST

SHEET . 1 . of . 6 .
 ISSUE NO. . 1
 DATE . 13/ 6/57

FROM . . Material Control.

TO . . . Electrical Mfg.

PROJECT . ANTAC S.O. NAME . I.D.I.

DATE REQUIRED. DRAWING.

S/A NAME . #2 Frame OPERATION . #2

QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.				
1		Switch Micro 1SM22	4				
2		Ring Retaining Waldes Kohinoor #5133-6	4				
3		Screw Pan HD #2-56 x 1" long ST ST	4				
4		Nut Hex #2-56 AN340C-2	4				
5		Standoff USECO #1426	9				
6		Resistor RC20GF104K	1				
7							

MATERIAL AND ASSEMBLY LIST

SHEET. 2 . . of. . 6.
ISSUE NO . 1
DATE . . 13/6/57 . .

FROM . Material Control. TO . . . Machine Shop.
PROJECT . ANTAC: S.O. NAME . . I.D.I.
DATE REQUIRED DRAWING
S/A NAME . No. 2 Frame OPERATION
QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.				
1		B(STD)5b Clamp	8				
2		A(STD)3 Clamp	7				
3		RF Elec Rotary Type Switch #M12 .4P 4P D.D.	1				
4		Hardware for #M12 4P4PDD Switch	1	Supplied with Switch			
5		Switch Micro 15M22	2				
6		D(MGPI)324 Casting #2	1				
7		Screw Fill HD #2.64 x 9/64 Long	3	AN501C2-3			

MATERIAL AND ASSEMBLY LIST

SHEET . 3 . . of . 6 . .
 ISSUE NO. . 1 . .
 DATE. . . 13/ 6/ 57 . . .

FROM . Machine Shop TO . . Electrical Manufacturing . . .
 PROJECT . ANTAC S.O. . . . NAME . I.D.I:
 DATE REQUIRED DRAWING
 S/A NAME . #2 Frame OPERATION . #2
 QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.				
1		A(MGPI)1045 Mount "B" Micro Switch	1				
2	B	" 1289 " "A" " "	1				
3	A	" 1291 Roller " "	2				
4	B	" 1292 Actuator " "	2				
5	A	" 1464 Pivot Roller Mount	2				
6	A	" 1526 Pivot Micro Switch					
		Roller	2				
7	A	" 2865 Spacer	1				
8	D	" 34 Frame No. 2	1				

MATERIAL AND ASSEMBLY LIST

SHEET . . . 4 . of . 6 .
 ISSUE NO. 1
 DATE. . . 13/ 6/ 57 . .

FROM . . Material Control TO . . White Room.
 PROJECT . ANTAC S.O. NAME . I.D.I.
 DATE REQUIRED DRAWING
 S/A NAME . #2. Frame. OPERATION . #2
 QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.			
1		Switch Micro 15M22	3			
2		Potentiometer Comp. Inst. Corp to CDC Spec #28	1			
3		Potentiometer 500 ohms #300-00 Daystrom	1			
4		Trans-Synchro Eclipse Pioneer AY 503-3A1	2			
5		" " " " AY 502-35A1	2			
6		#4 Flat Washer (1/8 I.D. 5/16 O.D.)	1			
7		#4 L/S Lock Washer	1			
8		Bearing Min. Prec. #SS 518FC	1			
		Screw Fill Hd #2-56 x $\frac{3}{4}$ long	2			
		Screw Bdg HD #2-56 x $\frac{1}{4}$ "	2	AN50002-4		
11		Screw Fill HD #4-40 x $\frac{1}{4}$ "	8	AN50004-4		
12		Screw Fill HD #2-56 x 5/16"	2	AN50002-5		
13		Screw Flat HD #2-56 x $\frac{1}{2}$ long	4	ST ST		
14		Screw Pan HD #2-56 x 5/16 "	5	ST ST		
15		Screw Socket #4-40 x 1/12"	2			
16		Bearing Min Prec SS E 18FCE	4			
17		Ring Grip Waldes Mohinoor #5555-25	1			

MATERIAL AND ASSEMBLY LIST

SHEET . . . 5 . of . 6 .
 ISSUE NO. 1
 DATE . . 13/6/57 . . .

FROM . Machine Shop TO . . White Room
 PROJECT . ANTAC S.O. NAME . I.D.I.
 DATE REQUIRED DRAWING
 S/A NAME . #2 Frame OPERATION . #2
 QUANTITY

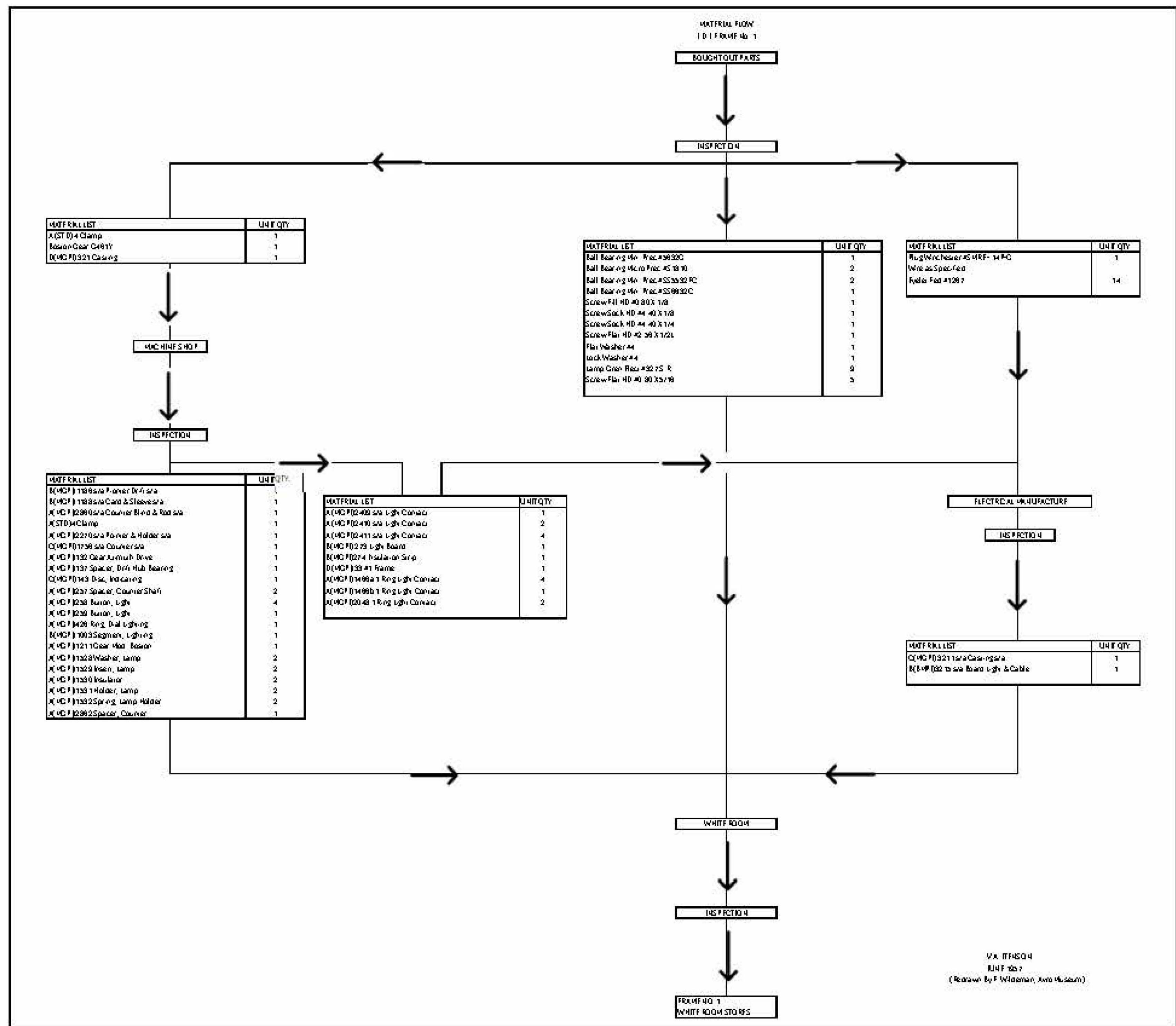
NO.	ITEM	DESCRIPTION	UNIT QTY.				
1		A(MGPI)250a Bracket Micro Switch	1				
2		A " 250b " " "	1				
3		A " 134 Gear Ap Synchro	1				
4		B " 231 Adapter Brg. Mtg.	1				
5		A " 244 Gear Synchro	1				
6		A " 246 Gear Synchro	2				
7		A " 260 Spring Synchro	2				
8		A " 1001 Gear Pot Drive	1				
		B " 1002 Adapter Pot	1				
		A " 1470 Actuator	1				
11		A " 3074 Screw Fill Hd (Mod)	3				
12		A " 3209b Micro Switch (Mod)	1				
13		A " 3209c Micro Switch (Mod)	1				
14		A " 1296 Switch	1				
15		Hardware supplied with switch	1				
16		B(STD)5b Clamp	8				
17		A(STD)3 Clamp	7				

MATERIAL AND ASSEMBLY LIST

SHEET . 6 . of . 6 .
 ISSUE NO. . 1 .
 DATE . 13/ 6/57 .

FROM . Electrical Manufacture . TO Whiteroom
 PROJECT . ANTAC S.O. NAME I.D.I.
 DATE REQUIRED DRAWING
 S/A NAME . No. 2 Frame OPERATION. . #2
 QUANTITY

NO.	ITEM	DESCRIPTION	UNIT QTY.
1		B(MGPI)1210S/A Switch X Mode S/A	1
2		Dwg. No. to include D(MGPI)34, Standoffs #1426 USECO and R8	1



MATERIAL FLOW
I.D.I. FRAME No. 2

BOUGHT OUT PARTS

INSPECTION

MATERIAL LIST	UNIT QTY.
B(STD) 5b Clamp	8
A (STD) 3 Clamp	7
RF Elec Rotary Type Switch	1
M12 4P4P DD	
Hardware for M12 4P4P DD Switch	1
Switch Micro 18M 22	2
D(MGPI) 324 Casting 2	1
Screw Fill HD 2-64 X 9/64 Long	3 AN501G2-3

MACHINE SHOP

INSPECTION

MATERIAL LIST	UNIT QTY.
A (MGPI) 1045 Mount "B" MicroSwitch	1
B (MGPI) 1289 Mount "A" MicroSwitch	1
A (MGPI) 1291 Roller MicroSwitch	2
B (MGPI) 1292 Actuator MicroSwitch	2
A (MGPI) 1464 Pivot Roller Mount	2
A (MGPI) 1526 Pivot MicroSwitch Roller	2
A (MGPI) 2885 Spacer	1
D (MGPI) 34 Frame No. 2	1

MATERIAL LIST	UNIT QTY.
A (MGPI) 250a Bracket Micro Switch	1
A (MGPI) 250b Bracket Micro Switch	1
A (MGPI) 134 Gear P Synchro	1
B (MGPI) 231 Adaptor Brg Mtg	1
A (MGPI) 244 Gear Synchro	1
A (MGPI) 246 Gear Synchro	2
A (MGPI) 260 Spring Synchro	2
A (MGPI) 1001 Gear Pot Drive	1
B (MGPI) 1002 Adaptor Pot	1
A (MGPI) 1470 Actuator	1
A (MGPI) 3074 Screw Fill HD (Mod.)	3
A (MGPI) 3209b Micro Switch (Mod.)	1
A (MGPI) 3209c Micro Switch (Mod.)	1
A (MGPI) 1296 Switch (Mod.)	1
Hardware supplied with switch	1
B(STD) 5b Clamp	8
A(STD) 3 Clamp	7

MATERIAL LIST	UNIT QTY.
Switch Micro lam22	3
Potentiometer Comp, Inst. Corp. to CDC Spec #28	1
Potentiometer 500Ω #300-00 Daystrom	1
Trans-synchro Eclipse Pioneer AY503-3A1	2
Trans-synchro Eclipse Pioneer AY502-35A1	2
#4 Flat Washer (1/8 ID 5/16 OD)	1
#4 L/S Lock Washer	1
Bearing Min. Prec #SS 518 FC	1
Screw Fill HD #2-56 X 3/4 Long	2 ST.ST.
Screw Bdg HD #2-56 X 1/4 Long	2 AN500c2-4 ST.ST.
Screw Fill HD #4-40 X 1/4 Long	8 AN500c4-4 ST.ST.
Screw Fill HD #2-56 X 5/16 Long	2 AN500c2-5 ST.ST.
Screw Flat HD #2-56 X 1/2 Long	4 ST.ST.
Screw Pan HD #2-56 X 5/16 Long	5 ST.ST.
Screw Sock HD CP #4-46 X 1/12 Long	2
Bearing Min. Prec SS E18FCE	4
Ring Grip Waldes Kohinoor #5555-25	1

MATERIAL LIST	UNIT QTY.
Switch Micro lam22	4
Ring Retaining Waldes Kohinoor 5133-6	4
Screw Pan HD #2-56 X 1" Long ST.ST.	4
Nut Hex 2-56 (AM340C-2)	4
Standoff Useco 1426	9
Resistor RC20GF104K	1

ELECTRICAL MANUFACTURE

INSPECTION

MATERIAL LIST	UNIT QTY.
B(MGPI) 1210s/a Switch X Mode s/a	1
Dwg No to Include D(MGPI) 34	
Standoffs 1426 Useco AND R8	1

WHITE ROOM

INSPECTION

FRAME NO. 2
WHITE ROOM STORES