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Report No. P/Systems/8R
Load Analysis and Power System
AVRO ARROW II
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ELECTRICAL POWER SUPPLY

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1.0 SUMMARY

An A.C. power generating system utilizing static transformer rectifier units to supply D.C. requirements, similar the the MK I A/C system, has been chosen for the CF-105 MK II

The A.C. generator capacity has been increased to cater for increased electrical loading, due to missile requirements, fire control and AFCS.

For this reason two 40 KVA, 120/208 volt, three phase, 400 cycle alternators have been chosen, each being driven independently by its respective A/C engine through a mechanical-hydraulic constant speed drive unit.

D.C. (27.5 volts) is provided by two 4.5 KW transformer rectifier units, each of which is supplied independently from its respective 40 KVA alternator. The D.C. output from the two transformer rectifier units is parallelled similar to the MK I system.

POWER SYSTEM - ELECTRICS CF-105

INTRODUCTION

2.0 Purpose

The purpose of this report is to establish a load analysis for the CF-105 A/C armed with either Sparrow II or Sparrow III missiles, and from the load analysis select a power system consisting of two alternators and two transformer rectifier units, of minimum weight, but of a capacity that will handle the many varied conditions that will be examined in the following sections.

3.0 General

The Electrical load Analysis has been drawn up on the basis of existing information for the MK II A/C and the Astra system with Sparrow II and Sparrow III missiles.

As full information on the PS13 engine was not available, the loading requirements of the J75 engine plus additional known requirements for the PS13, were used in determining the load analysis of the MK II A/C.

With the incorporation of the Astra system, the Air Conditioning System will be altered; however it is not anticipated that the electrical load on the overall system will alter, therefore information on the existing system has been utilized in determining the load for the MK II A/C.

Graphs #1 - "A.C. load Sparrow II missiles" and #2 - "D.C. load Sparrow II missiles" were drawn up from the load analysis charts.

Graph #4 - "D.C. load Sparrow III missiles" is identical to Sparrow II (Graph #2) with the addition of 102 amps in the Take Off, Cruise and Cruise Combat conditions required for Sparrow III missiles.

Graph #3 - "A.C. load Sparrow III missiles" caters for revised T.R.U. loads due to additional D.C., (sheet 2 of the A.C. load analysis) and for the substitution of the Sparrow III Armament Missile loads, for the Sparrow II Armament missile loads as shown on sheet 4 of the A.C. load analysis.

4.0 Choice of Power System

4.1 A.C. Two 40 KVA alternators have been chosen on the basis of graphs #1 and #3.

4.2 D.C. Two 4.5 KW transformer rectifier units have been chosen on the basis of graphs #2 and #4.

From these four graphs it is evident that the two 40 KVA alternators and two 4.5 KW transformer rectifier units, will handle the electrical loads on the A/C under normal conditions with a good reserve factor.

Power System - Electrics CF-105 Cont'd

4.3 Loss of one alternator or transformer rectifier unit.

4.3.1 A switch will be installed in the cockpit to allow the intake de-icing loads to be shed for the A/C to carry on an attack mission. The switch will be a two position switch labelled "Missiles" in one position and "De-Ice" in the other. The switch will normally be set in the "Missiles" position and a failure of one alternator will automatically shed the de-icing load. Should de-icing be required the selection of the switch to "De-Ice" position will pick up the de-icing loads and shed missile loads.

4.3.2 De-Ice Selection. Graph #6 - A.C. load Sparrow II or III is the A.C. load on the A/C when the switch is selected to "De-Ice" position, and it is evident that the 40 KVA alternator will handle this load without overload.

On selecting "De-Ice" approximately 30 amps are dropped from the "Landing" condition, which will bring the load within the rating of one T.R.U. (4.5 KW = 164 amps, see graphs #2 and #4). Graph #2 shows no D.C. problem with one alternator out. Graph #4 shows no problem with "De-Ice" selected as approximately 30 amps dropped from "Landing" condition and 115 amps dropped from cruise, cruise-combat and 132 amps from "Take Off" condition.

4.3.3 "Missiles" selection - With "Missiles" selected on the switch and considering one alternator failure (1 alternator and 1 T.R.U. 'out.)

4.3.3.1 Sparrow II Missiles - Graph #2 shows no problem on D.C. for cruise-combat condition.

Graph #5 indicates that one 40 KVA alternator will handle the load without overload.

These graphs are drawn to the MIL-Specification load analysis and are not truly representative of a combat envelope from the CF-105.

Graph no. 7, corresponding to graph #1, was drawn up to show the combat mission #1 where the combat period is for five minutes maximum.

Of the 40 KVA shown for the combat condition 5¼ KVA is for anti-icing of the W/S and canopy which has been considered as a continuous load. With a speed of M 1.5 for combat the K.H. temperature on the outside of the W/S and canopy will be approx. 110°F on a NACA standard day where the ambient at 50,000' is -67°F, and as the W/S and canopy are thermostatically controlled to 110°F this 5¼ KVA anti-icing load will not in fact be a continuous load, and therefore the average A.C. load for this condition will be somewhat smaller than shown.

Power System - Electrics CF-105 Cont'd

4.3.3.2 Sparrow III missiles - Graph #3 shows no A.C. problem with the failure of an alternator.

The average D.C. load shown on graph #4 for the combat condition is approximately 210 amps, however 30 amps of this load will be automatically shed with one T.R.U. out, thus the D.C. load will be 180 amps. or 110 % of rated capacity. The combat period is for 5 minutes and after firing the missiles the D.C. load drops well below rated value of the T.R.U.

4.4 Graphs #8 and #9 were drawn to show the loading on each alternator when both alternators and T.R.U.s are operating under normal conditions.

Graph #10 corresponds to graph #9 showing the typical A/C combat mission #1.

4.4.1 Loads on each alternator (Sparrow II)

			Average WATTS for time intervals on chart			Average VARS for time intervals on chart		
Start & Warm Up		Alt.#1	25256	24861	24766	3995	3700	3570
	VA		25600	25150	2500			
		Alt.#2	16540	15362	14353	9019	8610	8021
	VA		18800	17600	16420			
Taxi		Alt. #1	25421	25131	25096	4120	3870	3865
	VA		25800	25400	25400			
		Alt.#2	14751	14458	14423	8426	8177	8172
	VA		17000	16600	16570			
Take Off		Alt.1	25861	25546	25261	4550	4280	3995
	VA		26300	25800	25600			
		Alt.2	29477	26134	25244	8545	7391	6731
	VA		30700	27100	26150			
Cruise		Alt.1	7978	7826	7771	3470	3355	3300
	VA		8700	8510	8450			
		Alt.2	24602	24438	24374	6162	6040	5979
	VA		25400	25200	25050			
Combat		Alt.1	7921	7771	7683	3445	3300	3235
	VA		8640	8450	8340			
		Alt.2	30204	30043	29947	9644	9492	9421
	VA		31650	31500	31400			
Land		Alt.1	26096	25691	25606	4745	4425	4360
	VA		26500	26000	26000			
		Alt.2	12426	12021	11934	9051	8731	8667
	VA		15400	14850	14750			

APPENDIX I

Determination of Sparrow II Missile Loads:

1.0 Switch selected to "De-Ice" - One Alternator (or T.R.U.) out.

1.1 Sheddable D.C. loads for Take off and landing Conditions.

Land & Taxi Lts.	-	17.8
Land & Taxi Relays	-	.4
Fire Control Coupler	-	3.1
Weapons Control	-	3.0
Antenna Servo	-	1.1
Optical Sight	-	.1
AN/APX26 Interrogator	-	1.9
Computer-Ballistics	-	2.4
Infra Red	-	1.0
	Total-	30.8 AMPS

1.2 Sheddable D.C. loads for Cruise Condition
As per 1.1 less Land & Taxi Lts. & relays
Sheddable load 30.8 - 18.2 = 12.6 AMPS.

1.3 Take Off Loads

	.5 min.	2 min.	15 min.
From D.C. load chart - Take off loads	216.2	193.2	172.8
Less Sheddable loads (1.1)	30.8	30.8	30.8
	185.4	162.4	142.0
A.C. input to 1 T.R.U. required	7850 VA	7000 VA	6300

1.4 Cruise Loads

	.5 min.	2 min	30 min.
From D.C. load chart - Cruise loads	131.0	119.9	115.9
Less Sheddable loads (1.2)	12.6	12.6	12.6
	118.4	107.3	103.3
A.C. input to 1 T.R.U. required	5400 VA	5000 VA	4850 VA

1.5 Landing Loads

	.5 min.	2 min.	5 min.
From D.C. load chart - Landing loads	233.4	203.9	197.8
Less Sheddable loads (1.1)	30.8	30.8	30.8
	202.6	173.1	167.0
A.C. input to T.R.U. required	8450 VA	7400 VA	7200 VA

1.6 Sheddable Electronic A.C. loads:-
Displays, RX-TX, Compressor, Signal Data Converter, Liquid Cooling.
Gyro heaters, Antenna Servo, A.M.T.I., Synch., Optical Sight. Computer, Nadar II, APX/26, Fire Control Coupler, Infra-red and cooling, AN/ARD 501, Missile Anxiliaries, Missile Heaters and Missile loads.

1.7 Calculations to obtain revised A.C. load of Sht. 2 of load charts for switch in "De-Ice" position:-
Watts obtained by multiplying amps by 27.5 volts.
Vars obtained from watts and V.A. for the T.R.U.

TAKE OFF

	Watts			Vars		
	½ min.	5 min.	15 min.	1/12 min.	5 min.	15 min
A.C. Total Sht.2 (chart)	7187	6539	5964	8738	8188	7615
Normal T.R.U. loads Sht.2	5950	5320	4750	8160	7620	7050
Difference	1237	1219	1214	578	568	565
T.R.U. load (1.3)	5100	4465	3905	5965	5390	4940
A.C. loads Sht.2	6337	5684	5119	6543	5958	5505

CRUISE

	½ min.	5 min.	30 min	1/12 min	5 min	30 min
A.C. Totals Sht.2 (chart)	4839	4523	4404	6578	6341	6225
Normal T.R.U. load Sht.2	3605	3300	3190	6000	5770	5660
Difference	1234	1223	1214	578	571	565
T.R.U. load (1.4)	3255	2950	2840	4300	4030	3930
A.C. load Sht.2	4489	4173	4054	4878	4601	4495

LAND

	½ min.	2 min	5 min.	1/12 min	2 min	5 min
A.C. Totals Sht.2 (chart)	7636	6826	6654	9114	8474	8345
Normal T.R.U. load Sht.2	6420	5610	5440	8550	7910	7780
Difference	1216	1216	1214	564	564	565
T.R.U. load (1.5)	5575	4760	4590	6350	5660	5545
	6791	5976	5804	6914	6224	6110

1.8 Calculations for graph #6
Totalling A.C. loads; Shts. 1,2,3 & 4 of A.C. charts - Shts. revised as necessary.

TAKE OFF

Chart	½ min.	5 min.	15 min.		½ min.	5 min.	15 min.
Sht.1	23500	23500	23500		1014	1014	1014
Sht.2	6337	5684	5119	Revised(1.7)	6543	5958	5505
Sht.3	776	776	776	Revised(1.6)	481	481	481
Sht.4	1500	1500	1500	Revised(1.6)	758	758	758
	32113	31460	30895		8796	8211	7758
V.A.	33250	32450	31850				

CRUISE

	½ min.	5 min.	30 min.		½ min.	5 min.	30 min.
Sht. 1	6790	6790	6790		1014	1014	1014
Sht.2	4489	4173	4054	Revised(1.7)	4878	4601	4495
Sht.3	776	776	776	Revised(1.6)	481	481	481
Sht.4	1500	1500	1500	Revised(1.6)	758	758	758
	13555	13239	13120		7131	6854	6748
V.A.	15300	14900	14750				

LANDING

	Watts				Vars		
	½ min.	2 min.	5 min.		½ min.	2 min.	5 min.
Sht.1	23500	23500	23500		1014	1014	1014
Sht.2	6791	5976	5804	Revised(1.7)	6914	6224	6110
Sht.3	776	776	776	Revised(1.6)	481	481	481
Sht.4	1500	1500	1500	Revised(1.6)	758	758	758
	32567	31752	31580		9167	8477	8363
V.A.	33800	32850	32650				

APPENDIX II

Calculations for Sparrow III Missiles

1.0 D.C. loads - as per Sparrow II load charts with the addition of 102 amps in the Take Off, Cruise, and Cruise-Combat conditions.

	START & WARM UP			TAXI		
	½ min.	2 min.	15 min.	½ min.	2 min.	15 min
Sparrow II D.C. loads(amps)	172.1	143.7	136.7	184.0	163.1	160.5
Additional for Sparrow III	0	0	0	0	0	0
Sparrow III D.C. loads	172.1	143.7	136.7	184.0	163.1	160.5
A.C. input to T.R.U.S.(V.A.)	Same as Sparrow II			Same as Sparrow II		

	TAKE OFF & CLIMB			CRUISE		
	½ min.	2 min.	15 min.	½ min.	2 min.	30min.
Sparrow II D.C. loads(amps)	216.2	193.2	172.8	131.0	119.9	115.9
Additional for Sparrow III	102	102	102	102	102	102
Sparrow III D.C. loads(amps)	318.2	295.2	274.8	233.0	221.9	217.9
A.C. input to T.R.U's (V.A.)	13800	13000	12200	10700	10300	10200

	CRUISE COMBAT			LANDING		
	½ min.	2 min.	30 min.	½ min.	2 min.	5min.
Sparrow II D.C. loads (amps)	126.8	115.9	109.6	233.4	203.9	197.8
Additional for Sparrow III	102	102	102	0	0	0
Sparrow III D.C. loads (amps)	228.8	217.9	211.6	233.4	203.9	197.8
A.C. input to T.R.U's (V.A.)	10500	10200	9900	Same as Sparrow II		

2.0 A.C. Loads.

2.1 Calculations for Sparrow III A.C. loads Sht.2 of A.C. load charts. Start & Warm Up, Taxi and Landing identical to Sparrow II.

TAKE OFF

	Watts.			Vars.		
	½ min.	5 min.	15 min.	½ min.	5 min.	15min.
Sparrow II load Sht.2	7187	6539	5964	8728	8188	7615
Less Sparrow II T.R.U. load	5950	5320	4750	8160	7620	7050
	1237	1219	1214	578	568	565
Plus Sparrow III TRU load(1.0)	8750	8110	7560	10650	10150	9570
Sparrow III load Sht.2	9987	9329	8774	11228	10718	10135

CRUISE

	Watts			Vars		
	½ min.	5 min.	30 min.	½ min.	5 min.	30min.
Sparrow II load Sht.2	4839	4523	4404	6578	6341	6225
Less Sparrow II T.R.U. load	3605	3300	3190	6000	5770	5660
	1234	1223	1214	578	571	565
Plus Sparrow III load (1.0)	6400	6100	5980	8570	8300	8250
Sparrow III load Sht.2	7634	7323	7194	9148	8871	8815

CRUISE COMBAT

	½ min.	5 min.	30 min.	½ min.	5 min.	30 min.
Sparrow II load Sht.2	4724	4413	4229	6528	6231	6095
Less Sparrow II T.R.U. load	3490	3190	3015	5950	5660	5530
	1234	1223	1214	578	571	565
Plus Sparrow III TRU load(1.0)	6290	5985	5815	8410	8250	8010
Sparrow III load Sht.2	7524	7208	7029	8988	8821	8575

2.2 Calculations for Sparrow III A.C. loads Sht.4 of load charts.
Sparrow III loads Sht.4 - Low volt power supply - same as Sparrow II

Oxygen Capacitance - Same As Sparrow II
Power Failure Detector - Same As Sparrow II
Missile Auxiliaries - 553 watts 348 vars
CW Transmitter - 825 watts 520 vars
Weapons Control - 170 watts 105 vars

Start & Warm up - All loads except Weapons Control
Taxi - All loads except Weapons Control
Take off & Climb - All loads except Weapons Control
Cruise - All loads except Weapons Control
Cruise Combat - All loads.
Landing - Low Voltage power supply, Oxygen Cap., & Power Failure Detector.

2.3 Calculations for Sparrow III A.C. load total - Graph #3.

START & WARM UP

	Watts				Vars		
Chart	½ min.	5 min.	15 min.		½ min.	5 min.	15 min.
Sht.1	24427	24427	23723		1588	1588	1142
Sht.2	5974	5168	4974		7628	7028	6765
Sht.3	5875	5108	4902		2408	2304	2284
Sht.4	2878	2878	2878	Revised(2.2)	1626	1626	1626
	39154	37581	36477		13250	12546	11817
V.A.	41300	39550	38350				

TAXI

Sht.1	23500	23500	23500		1014	1014	1014
Sht.2	6286	5703	5633		7864	7365	7355
Sht.3	4866	4866	4866		2278	2278	2278
Sht.4	2878	2878	2878	Revised(2.2)	1626	1626	1626
	37530	36947	36877		12782	12283	12273
V.A.	39650	38900	38800				

TAKE OFF & CLIMB

	Watts ½ min.	Watts 5 min.	Watts 30 min.		Vars ½ min.	Vars 5 min.	Vars 30 min.
Sht.1	23500	23500	23500		1014	1014	1014
Sht.2	9987	9329	8774	Revised(2.1)	11228	10718	10135
Sht.3	11811	11811	11811		-1097	-1097	-1097
Sht.4	2878	2878	2878	Revised(2.2)	1626	1626	1626
	48176	47518	46963		12771	12261	11678
V.A.	49800	49050	48400				

CRUISE

	½ min.	5 min.	30 min.		½ min.	5 min.	30 min.
Sht.1	6790	6790	6790		1014	1014	1014
Sht.2	7634	7323	7194	Revised(2.1)	9148	8871	8815
Sht.3	11811	11811	11811		-1097	-1097	-1097
Sht.4	2878	2878	2878	Revised(2.2)	1626	1626	1626
	29113	28802	28673		10691	10414	10358
V.A.	31000	30600	30500				

CRUISE COMBAT

	Watts ½ min.	Watts 5 min.	Watts 30 min.		Vars. ½ min.	Vars. 5 min.	Vars. 30 min.
Sht.1	6790	6790	6790		1014	1014	1014
Sht.2	7524	7208	7029	Revised(2.1)	8988	8821	8575
Sht.3	11811	11811	11811		-1097	-1097	-1097
Sht.4	3048	3048	3048	Revised(2.2)	1731	1731	1731
	29173	28857	28678		10636	10469	10223
V.A.	31000	30700	30450				

LANDING

	½ min.	2 min.	5 min.		½ min.	2 min.	5 min.
Sht.1	23500	23500	23500		1014	1014	1014
Sht.2	7636	6826	6654		9114	8474	8345
Sht.3	4866	4866	4866		2278	2278	2278
Sht.4	1500	1500	1500	Revised(2.2)	758	758	758
	37502	36692	36520		13164	12524	12395
V.A.	39800	38800	38600				

SHT. 1

EQUIPMENT	PART DESIGNATION	TOTAL NO OF UNITS	OPERATING TIME MINS	ELECTRICAL REQ 200 V				
				TOTAL VA	WATTS Ø1	Ø2	Ø3	TOTAL
A.C. GENERATOR		2		40000				
C. CONTROL SURFACE								
DAMPING		1		110.0	78.5	7.5	7.5	93.5
STABLE PLATFORM		1		500.0	141.5	141.5	141.5	424.5
DISPLAY (A.F.C.S.)		1		212.0				180.0
D. INSTRUMENT								
SKIN TEMP. INDICATOR		1		5.7	4.0	—	—	4.0
E. ENGINE INSTRUMENTS								
FUEL CAPACITANCE		2		13.3	8.0	—	—	8.0
TURBINE DISCHARGE TEMP.		2		10.0	6.0	—	—	6.0
PRESSURE RATIO INDICATOR		2		90.0	60.0	—	—	60.0
F. FLIGHT INSTRUMENTS								
ARTIFICIAL HORIZON (TRANSFORMER)		1		67.0	20.0	20.0	20.0	60.0
DOPPLER		1		600.0	170.0	170.0	170.0	510.0
D.R. COMPUTER		1		115.0				98.0
H. HEATING & DE-ICING								
TEMP. CONTROL UNITS (W/S & CANOPY)		2		.3	.3	—	—	.3
TEMP. CONTROL UNITS (W/S & CANOPY)		2		.3	—	.3	—	.3
TEMP. CONTROL - COCKPIT		1		10.0	10.0	—	—	10.0
TEMP. CONTROL - RADAR		1		10.0	10.0	—	—	10.0
L/H RAMP DE-ICING		1		8355.0	2723.0	2714.0	2918.0	8355.0
R/H RAMP DE-ICING		1		8355.0	2723.0	2714.0	2918.0	8355.0
W/S & CANOPY ANTI-ICING		1		5250.0	1750.0	1750.0	1750.0	5250.0

AVERAGE VARS			EMERGENCY								
			WATTS	AVERAGE WATTS			VARS	AVERAGE VARS		
1/2 MIN	2 MIN	5 MIN		1/2 MIN.	5 MIN	30 MIN		1/2 MIN.	5 MIN	30 MIN.
57.9	57.9	57.9	9.5	9.5	9.5	9.5	5.9	5.9	5.9	5.9
264.0	264.0	264.0	425.0	425.0	425.0	425.0	264.0	264.0	264.0	264.0
111.0	111.0	111.0	180.0	180.0	180.0	180.0	111.0	111.0	111.0	111.0
4.0	4.0	4.0								
21.2	21.2	21.2								
16.0	16.0	16.0								
133.6	133.6	133.6								
28.8	28.8	28.8	60.0	60.0	60.0	60.0	28.8	28.8	28.8	28.8
317.0	317.0	317.0								
60.5	60.5	60.5								
.2	.2	.2								
.2	.2	.2								
—	—	—								
—	—	—								
—	—	—								
—	—	—								
—	—	—								
1014.4	1014.4	1014.4		674.5	674.5	674.5		409.7	409.7	409.7

CTRICAL REQUIREMENTS PER UNIT														
200 V 3PHASE							115 V 1 PHASE			PF	VOLT REG	FREQ. RANGE	CONNECTED LOAD	
WATTS			VARS											
2	Ø3	TOTAL	Ø1	Ø2	Ø3	TOTAL	VA	WATTS	VARS				WATTS	VARS
—	—	38.5	12.5	—	—	12.5				.95	± 10	380 - 420	38.5	12.5
—	—	37.4	12.2	—	—	12.2				.95	± 10	380 - 420	37.4	12.2
—	—	45.0	14.7	—	—	14.7				.95	± 10	380 - 420	45.0	14.7
—	—	45.0	14.7	—	—	14.7				.95	± 10	380 - 420	45.0	14.7
—	—	25.0	8.1	—	—	8.1				.95	± 10	380 - 420	25.0	8.1
00.0	1500.0	4500.0	1810.0	1810.0	1810.0	5430.0				.64	± 4	380 - 420	9000.0	10860.0
—	—	233.0	77.5	—	—	77.5				.95	± 10	380 - 420	476.0	155.0
—	—	8.0	10.6	—	—	10.6				.60	± 10	380 - 420	8.0	10.6
36.0	36.0	108.0	23.2	23.2	23.2	69.6				.84			108.0	69.6
		21.0				13.2				.85			21.0	13.2
		5.1				3.2				.85		380 - 420	5.1	3.2
		425.0				264.0				.85			425.0	264.0

	PF	VOLT REG	FREQ. RANGE	CONNECTED LOAD		ITEM NO.	LOADING & ANCHOR								
								AVERAGE WATTS.					AVERAGE VARS		
RS				WATTS	VARS		WATTS	1/2 MIN	5 MIN	15 MIN	VARS	1/2 MIN	5 MIN	15 MIN	
	.95	± 10	380 - 420	38.5	12.5		38.5	38.5	38.5	38.5	12.5	12.5	12.5	12.5	
	.95	± 10	380 - 420	37.4	12.2		37.4	37.4	37.4	37.4	12.2	12.2	12.2	12.2	
	.95	± 10	380 - 420	45.0	14.7		45.0	45.0	45.0	45.0	14.7	14.7	14.7	14.7	
	.95	± 10	380 - 420	45.0	14.7		45.0	45.0	45.0	45.0	14.7	14.7	14.7	14.7	
	.95	± 10	380 - 420	25.0	8.1		25.0	25.0	25.0	25.0	8.1	8.1	8.1	8.1	
	.64	± 4	380 - 420	9000.0	10368.0										
	.95	± 10	380 - 420	476.0	155.0										
	.60	± 10	380 - 420	8.0	10.6		8.0	8.0	8.0	8.0	10.6	10.6	10.6	10.6	
	.84			108.0	69.6										
	.85			21.0	13.2										
	.85		380 - 420	5.1	3.2										
	.85			425.0	264.0										

START & WARM-UP

AGE VARS 15 MIN		WATTS	AVERAGE WATTS 1/12 MIN	5 MIN	15 MIN	VARS	AVERAGE VARS 1/12 MIN	5 MIN	15 MIN	WATTS	AVERAGE 1/12 MIN	5 MIN
.5	12.5	38.5	38.5	38.5	38.5	12.5	12.5	12.5	12.5	38.5	38.5	38.5
.2	12.2	37.4	37.4	37.4	37.4	12.2	12.2	12.2	12.2	37.4	37.4	37.4
.7	14.7	45.0	45.0	45.0	45.0	14.7	14.7	14.7	14.7	45.0	45.0	45.0
.7	14.7	45.0	45.0	45.0	45.0	14.7	14.7	14.7	14.7	45.0	45.0	45.0
.1	8.1	25.0	25.0	25.0	25.0	8.1	8.1	8.1	8.1	25.0	25.0	25.0
		4620.0	4790.0	3950.0	3760.0	7010.0	7050.0	6460.0	6200.0	5210.0	5070.0	4490.0
		476.0	476.0	476.0	476.0	155.0	155.0	155.0	155.0	476.0	476.0	476.0
0.6	10.6	8.0	8.0	8.0	8.0	10.6	10.6	10.6	10.6	8.0	8.0	8.0
		108.0	108.0	108.0	108.0	69.6	69.6	69.6	69.6	108.0	111.0	108.3
		21.0	21.0	5.2	.7	13.2	13.2	3.2	.4	—	—	—
		5.1	5.1	5.1	5.1	3.2	3.2	3.2	3.2	5.1	5.1	5.1
		425.0	425.0	425.0	425.0	264.0	264.0	264.0	264.0	425.0	425.0	425.0
			5974.0	5168.2	4973.7		7627.8	7027.8	6765.0		6286.0	5703.3

MBAT				LANDING							
	AVERAGE VARS				AVERAGE WATTS				AVERAGE VARS			
ARS	½ MIN	3 MIN	30 MIN	WATTS	½ MIN	2 MIN	5 MIN	VARS	½ MIN	2 MIN	5 MIN	WA
12.5	12.5	12.5	12.5	38.5	38.5	38.5	38.5	12.5	12.5	12.5	12.5	
12.2	12.2	12.2	12.2	37.4	37.4	37.4	37.4	12.2	12.2	12.2	12.2	
14.7	14.7	14.7	14.7	45.0	45.0	45.0	45.0	14.7	14.7	14.7	14.7	
14.7	14.7	14.7	14.7	45.0	45.0	45.0	45.0	14.7	14.7	14.7	14.7	
8.1	8.1	8.1	8.1	25.0	25.0	25.0	25.0	8.1	8.1	8.1	8.1	
40.0	5950.0	5660.0	5530.0	6570.0	6420.0	5610.0	5440.0	8700.0	8550.0	7910.0	7780.0	
55.0	155.0	155.0	155.0	476.0	476.0	476.0	476.0	155.0	155.0	155.0	155.0	
10.6	10.6	10.6	10.6	8.0	8.0	8.0	8.0	10.6	10.6	10.6	10.6	
69.6	69.6	69.6	69.6	108.0	111.0	111.0	109.0	69.6	69.4	69.4	70.1	
13.2	13.2	6.4	0.4	—	—	—	—	—	—	—	—	
3.2	3.2	3.2	3.2	5.1	5.1	5.1	5.1	3.2	3.2	3.2	3.2	
264.0	264.0	264.0	264.0	425.0	425.0	425.0	425.0	264.0	264.0	264.0	264.0	
	6527.8	6231.0	6095.0		7636.0	6826.0	6654.0		9114.4	8474.4	8345.1	

REQUIREMENTS PER UNIT											CONNECTED LOAD		ITEM NO.	
200 V 3PHASE					115 V 1 PHASE			PF	VOLT REG.	FREQ. RANGE				
	VARS													
OTAL	Ø1	Ø2	Ø3	TOTAL	VA	WATTS	VARS				WATTS	VARS		WATTS
127.5				79.0				.85			128.0	79.0		
500.0	1215.0	1215.0	1215.0	3645.0				.90						
306.0				190.0				.85						
110.0				68.5				.85						
381.0				236.0				.85			381.0	236.0		
200.0								1.0			200.0	—		
212.0				132.0				.85			212.0	132.0		
128.0				79.0				.85			128.0	79.0		
85.0				52.6				.85			85.0	52.6		
42.5				26.3				.85			42.5	26.3		
38.2				23.5				.85			38.2	23.5		
51.0				31.6				.85	I 4	380-420	51.0	31.6		
162.0				100.0				.85			162.0	100.0		
362.0				224.0				.85		380-1000	362.0	224.0		
255.0				158.0				.85		380-1000	255.0	158.0		
127.0				79.0				.85			127.0	79.0		
127.0				79.0				.85			127.0	79.0		
85.0				53.0				.85			85.0	53.0		
147.0				91.0				.85			147.0	91.0		
600.0				372.0				.85			600.0	372.0		
425.0				263.4				.85			425.0	263.4		
340.0				210.0				.85			340.0	210.0		

* LEADING P.F.

START & WARM-UP

WATTS.			VARS.	AVERAGE VARS		
MIN.	15 MIN.			1/2 MIN	5 MIN	15 MIN
7.5	127.5		79.0	79.0	79.0	79.0
.0	555.0		-3645.0	-270.0	-270.0	-270.0
.0	306.0		190.0	190.0	190.0	190.0
.0	110.0		68.5	68.5	68.5	68.5
.0	390.0		236.0	366.0	262.0	242.0
.0	227.0		—	—	—	—
.0	212.0		132.0	132.0	132.0	132.0
8.0	128.8		79.0	79.0	79.0	79.0
5.0	85.0		52.6	52.6	52.6	52.6
2.5	42.5		26.3	26.3	26.3	26.3
8.2	38.2		23.5	23.5	23.5	23.5
.0	51.0		31.6	31.6	31.6	31.6
.0	162.0		100.0	100.0	100.0	100.0
.0	362.0		224.0	224.0	224.0	224.0
.0	255.0		158.0	158.0	158.0	158.0
.0	127.0		79.0	79.0	79.0	79.0
.0	127.0		79.0	79.0	79.0	79.0
5.0	85.0		53.0	53.0	53.0	53.0
.0	147.0		91.0	91.0	91.0	91.0
.0	600.0		372.0	372.0	372.0	372.0
.0	425.0		263.4	263.4	263.4	263.4
.0	340.0		210.0	210.0	210.0	210.0
2	4302.2			2407.9	2303.9	2283.9

TAXI

WATTS	AVERAGE WATTS.				VARS	AVERAGE	
	1/2 MIN.	5 MIN.	15 MIN.			1/2 MIN	5 MIN.
127.5	127.5	127.5	127.5		79.0	79.0	79.0
7305.0	555.0	555.0	555.0		-3645.0	-270.0	-270.0
306.0	306.0	306.0	306.0		190.0	190.0	190.0
110.0	110.0	110.0	110.0		68.5	68.5	68.5
381.0	381.0	381.0	381.0		236.0	236.0	236.0
200.0	200.0	200.0	200.0		—	—	—
212.0	212.0	212.0	212.0		132.0	132.0	132.0
128.0	128.0	128.0	128.0		79.0	79.0	79.0
85.0	85.0	85.0	85.0		52.5	52.5	52.5
42.5	42.5	42.5	42.5		26.3	26.3	26.3
38.2	38.2	38.2	38.2		23.5	23.5	23.5
51.0	51.0	51.0	51.0		31.6	31.6	31.6
162.0	162.0	162.0	162.0		100.0	100.0	100.0
362.0	362.0	362.0	362.0		224.0	224.0	224.0
255.0	255.0	255.0	255.0		158.0	158.0	158.0
127.0	127.0	127.0	127.0		79.0	79.0	79.0
127.0	127.0	127.0	127.0		79.0	79.0	79.0
85.0	85.0	85.0	85.0		53.0	53.0	53.0
147.0	147.0	147.0	147.0		91.0	91.0	91.0
600.0	600.0	600.0	600.0		372.0	372.0	372.0
425.0	425.0	425.0	425.0		263.4	263.4	263.4
340.0	340.0	340.0	340.0		210.0	210.0	210.0
	4806.2	4856.2	4856.2			2277.9	2277.9

CRUISE - COMBAT

WATTS	AVERAGE WATTS 1/2 MIN	5 MIN	30 MIN	VARS	AVERAGE VARS 1/2 MIN	5 MIN	30 MIN
127.5	127.5	127.5	127.5	79.0	79.0	79.0	79.0
7500.0	7500.0	7500.0	7500.0	-3645.0	-3645.0	-3645.0	-3645.0
306.0	306.0	306.0	306.0	190.0	190.0	190.0	190.0
110.0	110.0	110.0	110.0	68.5	68.5	68.5	68.5
381.0	381.0	381.0	381.0	236.0	236.0	236.0	236.0
200.0	200.0	200.0	200.0	—	—	—	—
212.0	212.0	212.0	212.0	132.0	132.0	132.0	132.0
128.0	128.0	128.0	128.0	79.0	79.0	79.0	79.0
85.0	85.0	85.0	85.0	52.6	52.6	52.6	52.6
42.5	42.5	42.5	42.5	26.3	26.3	26.3	26.3
38.2	38.2	38.2	38.2	23.5	23.5	23.5	23.5
51.0	51.0	51.0	51.0	31.6	31.6	31.6	31.6
162.0	162.0	162.0	162.0	100.0	100.0	100.0	100.0
362.0	362.0	362.0	362.0	224.0	224.0	224.0	224.0
255.0	255.0	255.0	255.0	158.0	158.0	158.0	158.0
127.0	127.0	127.0	127.0	79.0	79.0	79.0	79.0
127.0	127.0	127.0	127.0	79.0	79.0	79.0	79.0
85.0	85.0	85.0	85.0	53.0	53.0	53.0	53.0
147.0	147.0	147.0	147.0	91.0	91.0	91.0	91.0
600.0	600.0	600.0	600.0	372.0	372.0	372.0	372.0
425.0	425.0	425.0	425.0	263.4	263.4	263.4	263.4
340.0	340.0	340.0	340.0	210.0	210.0	210.0	210.0
11811.2	11811.2	11811.2		-1097.1	-1097.1	-1097.1	

LANDIN

WATTS	AVERAGE WATTS 1/2 MIN	2 MIN	5 MIN	VA
127.5	127.5	127.5	127.5	
7500.0	550.0	550.0	550.0	-3
306.0	306.0	306.0	306.0	
110.0	110.0	110.0	110.0	
381.0	381.0	381.0	381.0	2
200.0	200.0	200.0	200.0	
212.0	212.0	212.0	212.0	
128.0	128.0	128.0	128.0	
85.0	85.0	85.0	85.0	
42.5	42.5	42.5	42.5	
38.2	38.2	38.2	38.2	
51.0	51.0	51.0	51.0	
162.0	162.0	162.0	162.0	
362.0	362.0	362.0	362.0	2
255.0	255.0	255.0	255.0	
127.0	127.0	127.0	127.0	
127.0	127.0	127.0	127.0	
85.0	85.0	85.0	85.0	
147.0	147.0	147.0	147.0	
600.0	600.0	600.0	600.0	
425.0	425.0	425.0	425.0	
340.0	340.0	340.0	340.0	
4866.2	4866.2	4866.2		

AVERAGE VARS			EMERGENCY							
			WATTS	AVERAGE WATTS			VARS	AVERAGE VARS		
1/2 MIN	2 MIN	5 MIN		1/2 MIN	5 MIN	30 MIN		1/2 MIN	5 MIN	30 MIN
79.0	79.0	79.0	—	—	—	—	—	—	—	—
-270.0	-270.0	-270.0	—	—	—	—	—	—	—	—
190.0	190.0	190.0	—	—	—	—	—	—	—	—
68.5	68.5	68.5	—	—	—	—	—	—	—	—
236.0	236.0	236.0	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
132.0	132.0	132.0	—	—	—	—	—	—	—	—
79.0	79.0	79.0	—	—	—	—	—	—	—	—
52.6	52.6	52.6	—	—	—	—	—	—	—	—
26.3	26.3	26.3	—	—	—	—	—	—	—	—
23.5	23.5	23.5	—	—	—	—	—	—	—	—
31.6	31.6	31.6	—	—	—	—	—	—	—	—
100.0	100.0	100.0	162.0	162.0	162.0	162.0	100.0	100.0	100.0	100.0
224.0	224.0	224.0	—	—	—	—	—	—	—	—
158.0	158.0	158.0	—	—	—	—	—	—	—	—
79.0	79.0	79.0	—	—	—	—	—	—	—	—
79.0	79.0	79.0	—	—	—	—	—	—	—	—
53.0	53.0	53.0	85.0	85.0	85.0	85.0	53.0	53.0	53.0	53.0
91.0	91.0	91.0	—	—	—	—	—	—	—	—
372.0	372.0	372.0	—	—	—	—	—	—	—	—
263.4	263.4	263.4	—	—	—	—	—	—	—	—
210.0	210.0	210.0	—	—	—	—	—	—	—	—
2277.9	2277.9	2277.9		247.0	247.0	247.0		153.0	153.0	153.0

ELECTRICAL REQUIREMENTS PER UNIT															CONNE LO
	200 V 3PHASE								115 V. 1 PHASE			PF	VOLT REG.	FREQ. RANGE	
	WATTS				VARS				VA	WATTS	VARS				WATTS
	Ø1	Ø2	Ø3	TOTAL	Ø1	Ø2	Ø3	TOTAL							
0	494.0	494.0	494.0	1482.0	240.0	240.0	240.0	720.0				.90			1482.0
	-	4.0	-	4.0	-	5.4	-	5.4				.60		380-420	4.0
	2.4	2.4	2.4	7.2	5.5	5.5	5.5	16.5				.40		380-420	14.4
0	-	-	-	1020.0	-	-	-	632.1				.85	± 10	380-420	1020.0
0	400.0	350.0	-	750.0	-	-	-	-				1.0	± 10	380-420	750.0
0	350.0	-	400.0	750.0	-	-	-	-				1.0	± 10	380-420	750.0
0	-	400.0	350.0	750.0	-	-	-	-				1.0	± 10	380-420	750.0
0	400.0	350.0	-	750.0	-	-	-	-				1.0	± 10	380-420	750.0
0	-	-	-	170.0	-	-	-	105.3				.85	± 10	380-420	170.0
0	235.0	235.0	235.0	705.0	144.2	144.2	144.2	436.7				.85	± 5.0	380-420	2820.0
0	-	-	-	200.0	-	-	-	-				1.0	± 5.0	380-420	800.0

F	VOLT REG.	FREQ. RANGE	CONNECTED LOAD		ITEM NO.	LOADING & ANCHOR									
						AVERAGE WATTS.					AVERAGE VARS				
			WATTS	VARS		WATTS	1/2 MIN	5 MIN.	15 MIN		VARS	1/2 MIN	5 MIN.	15 MIN	
90			1482.0	720.0		—	—	—	—		—	—	—	—	
60		380-420	4.0	5.4		4.0	4.0	4.0	4.0		5.4	5.4	5.4	5.4	
40		380-420	14.4	33.0		14.4	14.4	14.4	14.4		33.0	33.0	33.0	33.0	
35	± 10	380-420	1020.0	632.1		—	—	—	—		—	—	—	—	
0	± 10	380-420	750.0	—		—	—	—	—		—	—	—	—	
0	± 10	380-420	750.0	—		—	—	—	—		—	—	—	—	
0	± 10	380-420	750.0	—		—	—	—	—		—	—	—	—	
0	± 10	380-420	750.0	—		—	—	—	—		—	—	—	—	
35	± 10	380-420	170.0	105.3		—	—	—	—		—	—	—	—	
35	± 5.0	380-420	2820.0	1746.8		—	—	—	—		—	—	—	—	
0	± 5.0	380-420	800.0	—		—	—	—	—		—	—	—	—	
															SHT 4
															SHT 3
															SHT 2
															SHT 1
														TOTAL	

OPERATING CONDITIONS

CRL

TAKE OFF & CLIMB									CRUISE			
WATTS	AVERAGE WATTS			VARS	AVERAGE VARS			WATTS	AVERAGE WATTS			
	1/2 MIN	5 MIN	15 MIN		1/2 MIN	5 MIN	15 MIN		1/2 MIN	5 MIN	30 MIN	
1482.0	1482.0	1482.0	1482.0	720.0	720.0	720.0	720.0	1482.0	1482.0	1482.0	1482.0	
4.0	4.0	4.0	4.0	5.4	5.4	5.4	5.4	4.0	4.0	4.0	4.0	
14.4	14.4	14.4	14.4	33.0	33.0	33.0	33.0	14.4	14.4	14.4	14.4	
1020.0	1020.0	1020.0	1020.0	632.1	632.1	632.1	632.1	1020.0	1020.0	1020.0	1020.0	
750.0	750.0	750.0	750.0	—	—	—	—	750.0	750.0	750.0	750.0	
750.0	750.0	750.0	750.0	—	—	—	—	750.0	750.0	750.0	750.0	
750.0	750.0	750.0	750.0	—	—	—	—	750.0	750.0	750.0	750.0	
750.0	750.0	750.0	750.0	—	—	—	—	750.0	750.0	750.0	750.0	
—	—	—	—	—	—	—	—					
2820.0	4920.0	3510.0	2910.0	1748.0	3049.2	2175.3	1803.5	2820.0	2820.0	2820.0	2820.0	
800.0	2400.0	800.0	800.0	—	—	—	—	800.0	800.0	800.0	800.0	
	12840.0	9830.0	9230.0		4440.0	3566.0	3194.0		9140.0	9140.0	9140.0	
	11811.0	11811.1	11811.0		-1097.0	-1097.0	-1097.0		11811.0	11811.0	11811.0	
	7187.0	6539.0	5964.0		8738.0	8188.0	7615.0		4839.0	4523.0	4404.0	
	23500.0	23500.0	23500.0		1014.0	1014.0	1014.0		6790.0	6790.0	6790.0	
	55338.0	51680.0	50505.0		13095.0	11671.0	10726.0		32580.0	32264.0	32145.0	
	56800.0	53000.0	51600.0						33900.0	33600.0	33450.0	

CRUISE - COMBAT

VARS	AVERAGE VARS ½ MIN	3 MIN	30 MIN	WATTS	AVERAGE WATTS ½ MIN	3 MIN	30 MIN	VARS	AVERAGE VARS ½ MIN	3 MIN	30 MIN
720.0	720.0	720.0	720.0	1482.0	1482.0	1482.0	1482.0	720.0	720.0	720.0	720.0
5.4	5.4	5.4	5.4	4.0	4.0	4.0	4.0	5.4	5.4	5.4	5.4
33.0	33.0	33.0	33.0	14.4	14.4	14.4	14.4	33.0	33.0	33.0	33.0
632.1	632.1	632.1	632.1	1020.0	1020.0	1020.0	1020.0	632.1	632.1	632.1	632.1
—	—	—	—	750.0	750.0	750.0	750.0	—	—	—	—
—	—	—	—	750.0	750.0	750.0	750.0	—	—	—	—
—	—	—	—	750.0	750.0	750.0	750.0	—	—	—	—
—	—	—	—	750.0	750.0	750.0	750.0	—	—	—	—
				170.0	170.0	170.0	170.0	105.3	105.3	105.3	105.3
1748.0	1746.9	1746.9	1746.9	2820.0	8310.0	8310.0	8310.0	1748.0	5147.8	5147.8	5147.8
—	—	—	—	800.0	800.0	800.0	800.0	—	—	—	—
	3137.0	3137.0	3137.0		14800.0	14800.0	14800.0		6644.0	6644.0	6644.0
	-1097.0	-1097.0	-1097.0		11811.0	11811.0	11811.0		-1097.0	-1097.0	-1097.0
	6578.0	6341.0	6225.0		4724.0	4413.0	4229.0		6528.0	6231.0	6095.0
	1014.0	1014.0	1014.0		6790.0	6790.0	6790.0		1014.0	1014.0	1014.0
	9632.0	9395.0	9279.0		38125.0	37814.0	37630.0		13089.0	12792.0	12656.0
					40300.0	39950.0	39750.0				

CRUISE - COMBAT					LANDING							
ATTS	AVERAGE VARS				AVERAGE WATTS				AVERAGE VARS			
MIN	VARS	1/2 MIN	3 MIN	30 MIN	WATTS	1/2 MIN	2 MIN	5 MIN	VARS	1/2 MIN	2 MIN	5 MIN
2.0	720.0	720.0	720.0	720.0	1482.0	1482.0	1482.0	1482.0	720.0	720.0	720.0	720.
.0	5.4	5.4	5.4	5.4	4.0	4.0	4.0	4.0	5.4	5.4	5.4	5.4
.4	33.0	33.0	33.0	33.0	14.4	14.4	14.4	14.4	33.0	33.0	33.0	33.
0.0	632.1	632.1	632.1	632.1	1020.0	1020.0	1020.0	1020.0	632.1	632.1	632.1	632.
0.0	—	—	—	—	—	—	—	—	—	—	—	—
0.0	—	—	—	—	—	—	—	—	—	—	—	—
0.0	—	—	—	—	—	—	—	—	—	—	—	—
0.0	—	—	—	—	—	—	—	—	—	—	—	—
0.0	105.3	105.3	105.3	105.3	—	—	—	—	—	—	—	—
0.0	1748.0	5147.8	5147.8	5147.8	—	—	—	—	—	—	—	—
0.0	—	—	—	—	—	—	—	—	—	—	—	—
0.0	6644.0	6644.0	6644.0		2520.0	2520.0	2520.0		1390.0	1390.0	1390.	
0.0	-1097.0	-1097.0	-1097.0		4866.0	4866.0	4866.0		2278.0	2278.0	2278.	
0.0	6528.0	6231.0	6095.0		7630.0	6826.0	6654.0		9114.0	8474.0	8345.	
0.0	1014.0	1014.0	1014.0		23500.0	23500.0	23500.0		1014.0	1014.0	1014.	
0.0	13089.0	12792.0	12656.0		38522.0	37712.0	37540.0		13796.0	13156.0	13027	
0.0					40850.0	39900.0	39100.0					

AVERAGE VARS			
RS	1/2 MIN	2 MIN	5 MIN
.0	720.0	720.0	720.0
4	5.4	5.4	5.4
3.0	33.0	33.0	33.0
2.1	632.1	632.1	632.1
—	—	—	
—	—	—	
—	—	—	
—	—	—	
—	—	—	
—	—	—	
—	—	—	
—	—	—	
1390.0	1390.0	1390.0	
2278.0	2278.0	2278.0	
9114.0	8474.0	8345.0	
1014.0	1014.0	1014.0	
13796.0	13156.0	13027.0	

EMERGENCY

AVERAGE WATTS.				AVERAGE VARS			
WATTS	1/2 MIN	5 MIN	30 MIN	VARS	1/2 MIN	5 MINS	30 MINS
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	247.0	247.0	247.0		153.0	153.0	153.0
	111.0	111.0	111.0		69.4	69.4	69.4
	674.5	674.5	674.5		409.7	409.7	409.7
	1032.5	1032.5	1032.5		632.1	632.1	632.1
	1210.0	1210.0	1210.0				

CUT 4

CRUISE COMBAT AVERAGE AMPS					LANDING AVERAGE AMPS.					EMERGENCY AVERAGE AMPS				
MIN	AMPS	5 MIN	2 MIN	30 MIN	AMPS	5 MIN	2 MIN	5 MIN	MIN	AMPS	5 MIN	2 MIN	30 MIN	
	.7	.7	.7	.7	.7	.7	.7	.7		.7	.7	.7	.7	
	.2	.2	.2	.2	.2	.2	.2	.2		–	–	–	–	
	–	–	–	–	–	–	–	–		–	–	–	–	
	.2	.2	.2	.2	.2	.2	.2	.2		–	–	–	–	
	.2	.2	.2	.2	.2	.2	.2	.2		–	–	–	–	
	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5		1.5	1.5	1.5	1.5	
	–	–	–	–	–	–	–	–		–	–	–	–	
	–	–	–	–	.2	.2	–	–		–	–	–	–	
	–	–	–	–	.5	.5	.5	.5		–	–	–	–	
	.3	.3	.3	.3	.3	.3	.3	.3		–	–	–	–	
	.4	.4	.4	.4	.4	.4	.4	.4		–	–	–	–	
	.4	.4	.4	.4	.4	.4	.4	.4		–	–	–	–	
	.2	.2	.2	.2	.2	.2	.2	.2		.2	.2	.2	.2	
	.4	.4	.4	.4	.4	.4	.4	.4		–	–	–	–	
	.6	.6	.6	.6	.6	.6	.6	.6		–	–	–	–	
	13.1	13.1	13.1	13.1	13.8	13.8	13.6	13.6		2.4	2.4	2.4	2.4	

TIONS

CRUISE AVERAGE AMPS				CRUISE COMBAT AVERAGE AMPS				LANDING AVERAGE AMPS.						
MIN	2 MIN	30 MIN	MIN	AMPS	5 MIN	2 MIN	30 MIN	AMPS	5 MIN	2 MIN	5 MIN	MIN	AMPS	5
.2	.2	.2		.2	.2	.2	.2	.2	.2	.2	.2		.2	
1.0	11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		–	
9.0	19.0	19.0		19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0		–	
–	–	–		–	–	–	–	.7	.7	.7	.7		–	
.4	.4	.4		.4	.4	.4	.4	.4	.4	.4	.4		–	
.2	.2	.2		.2	.2	.2	.2	.2	.2	.2	.2		–	
–	–	–		–	–	–	–	–	–	–	–		–	
–	–	–		–	–	–	–							
–	–			–	–	–	–	5.1	5.1	5.1	5.1		–	
–	–			–	–	–	–	1.0	1.0	1.0	1.0		–	
–	–	–		6.2	6.2	6.2	3.0	3.0	3.0	3.0	3.0		NEG	
.8	30.8	30.8		37.0	37.0	37.0	33.8	40.6	40.6	40.6	40.6		.2	

CRUISE COMBAT AVERAGE AMPS				LANDING AVERAGE AMPS.					EMERGENCY AVERAGE AMPS				
5 MIN	2 MIN	30 MIN		AMPS	5 MIN	2 MIN	5 MIN	MIN	AMPS	5 MIN	2 MIN	30 MIN	MIN
1.2	–	–		1.2	1.2	–	–		–	–	–	–	
.6	–	–		.6	.6	–	–		–	–	–	–	
1.0	–	–		1.0	1.0	–	–		–	–	–	–	
									–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
.2	.2	.2		.2	.2	.2	.2		–	–	–	–	
–	–	–		1.0	1.0	–	–		–	–	–	–	
–	–	–		.4	.4	–	–		–	–	–	–	
–	–	–		NEG	–	–	–						
.4	.4	.4		.4	.4	.4	.4		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
.8	.8	.8		.8	.8	.8	.8		–	–	–	–	
.2	.2	.2		.2	.2	.2	.2		–	–	–	–	
–	–	–		.2	.2	–	–		–	–	–	–	
3.0	3.0	3.0		3.0	3.0	3.0	3.0		–	–	–	–	
.6	.6	.6		.6	.6	.6	.6		–	–	–	–	
–	–	–		.3	.3	.3	.3		–	–	–	–	
–	–	–		1.0	1.0	1.0	1.0		–	–	–	–	
–	–	–		2.0	2.0	2.0	2.0		–	–	–	–	
–	–	–		45.0	45.0	33.0	33.0		–	–	–	–	
–	–	–		10.0	10.0	10.0	10.0		–	–	–	–	
–	–	–		12.0	12.0	12.0	12.0		–	–	–	–	
–	–	–		1.0	1.0	1.0	1.0		–	–	–	–	
–	–	–		.4	.4	.4	.4		–	–	–	–	
–	–	–		NEG									
8.0	5.2	5.2		81.3	81.3	64.9	64.9						

OPE

CHOR MPS		START & WARM-UP AVERAGE AMPS					TAXI AVERAGE AMPS					TAKE OFF & AVERAGE		
15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN
–		20.0	20.0	5.0	.7		–	–	–	–		–	–	–
–		.4	.4	.1	–		–	–	–	–		–	–	–
–		–	–	–	–		–	–	–	–		–	–	–
–		–	–	–	–		–	–	–	–		NEG.	–	–
–		NEG.	–	–	–		–	–	–	–		NEG.	–	–
–		.4	.4	.4	.4		.4	.4	.4	.4		.4	.4	.4
–		–	–	–	–		–	–	–	–		.4	.4	–
–		–	–	–	–		–	–	–	–		NEG.	–	–
–		.7	.7	.2	–		–	–	–	–		–	–	–
–		–	–	–	–		–	–	–	–		–	–	–
–		.3	.3	.3	.3		–	–	–	–		–	–	–
–		.4	.4	.1	–		–	–	–	–		–	–	–
–		–	–	–	–		–	–	–	–		–	–	–
–		–	–	–	–		–	–	–	–		–	–	–
–		–	–	–	–		8.9	8.9	8.9	8.9		8.9	8.9	8.9
–		–	–	–	–		–	–	–	–		8.9	8.9	8.9
–		–	–	–	–		1.6	1.6	1.6	1.6		1.6	1.6	1.6
–		–	–	–	–		2.2	2.2	2.2	2.2		2.2	2.2	2.2
–		–	–	–	–		–	–	–	–		.2	.2	.2
–		–	–	–	–		.2	.2	.2	.2		.2	.2	.2
–		–	–	–	–		.5	.5	.5	.5		.5	.5	.5
		22.2	22.2	6.1	1.4		13.8	13.8	13.8	13.8		23.3	23.3	22.9

CRUISE COMBAT AVERAGE AMPS				LANDING AVERAGE AMPS.					EMERGENCY AVERAGE AMPS				
MIN	2 MIN	30 MIN		AMPS	.5 MIN	2 MIN	5 MIN	MIN	AMPS	.5 MIN	2 MIN	30 MIN	MIN
10.0	2.5	.2		10.0	10.0	2.5	1.0		10.0	10.0	2.5	.2	
.2	–	–		.2	.2	–	–		.2	.2	–	–	
1.6	1.6	1.6		1.6	1.6	1.6	1.6		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
–	–	–		NEG.	–	–	–		–	–	–	–	
.4	.4	.4		.4	.4	.4	.4		–	–	–	–	
.4	–	–		–	–	–	–		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
–	–	–		–	–	–	–		–	–	–	–	
–	–	–		–	–	–	–		.6	.6	.6	.6	
–	–	–		8.9	8.9	8.9	8.9		–	–	–	–	
–	–	–		8.9	8.9	8.9	8.9		–	–	–	–	
–	–	–		1.6	1.6	1.6	1.6		–	–	–	–	
–	–	–		2.2	2.2	2.2	2.2		–	–	–	–	
–	–	–		.2	.2	.2	.2		–	–	–	–	
–	–	–		.2	.2	.2	.2		–	–	–	–	
–	–	–		.5	.5	.5	.5		–	–	–	–	
2.6	4.5	2.2		34.7	34.7	27.0	25.5		10.8	10.8	3.1	.8	

EQUIPMENT	PART DESIGNATION	Nº OF UNITS	AMPS PER UNIT	OPERATING TIME MINS	LOADING & ANCHOR AVERAGE AMPS			
					AMPS	5 MIN	2 MIN	15 MIN
M - MISCELLANEOUS								
CANOPY ACTUATOR		2	8.0		16.0	5.1	.1	—
PILOTS RELAY	CS-R-122	1	.2		—	—	—	—
SERVICE RELAY	CS-R-122	1	.2		.2	.1	—	—
REAR C/P RELAY	CS-R-122	1	.2		—	—	—	—
REAR SERVICE RELAY	CS-R-122	1	.2		.2	.1	—	—
CANOPY SEAL VALVE		1	1.0		—	—	—	—
P - D.C. POWER								
D.C. SHEDDING CONT. RELAY	MS-24141-1	1	.5		.5	.5	.5	.5
D.C. SHEDDING C/O RELAY	CS-R-122	1	.2		.2	.2	.2	.2
MAIN D.C. SUPPLY RELAY	MS-24140-1	1	.4		.4	.4	.4	.4
T.R.U. SIGNAL RELAY	CS-R-122	2	.2		.4	.4	.4	.4
EMERG'Y BUS RELAY	MS-24140-2	1	.2		.2	.2	.2	.2
					15.1	7.0	1.8	1.7

ANCHOR E AMPS			START & WARM-UP AVERAGE AMPS					TAXI AVERAGE AMPS					TAKE OFF AVERAG		
MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 M
1	—		—	—	—	—		16.0	5.1	.1	—		—	—	—
—	—		—	—	—	—		.2	.1	—	—		—	—	—
—	—		—	—	—	—		—	—	—	—		—	—	—
—	—		—	—	—	—		.2	.1	—	—		—	—	—
—	—		—	—	—	—		—	—	—	—		—	—	—
—	—		—	—	—	—		1.0	1.0	1.0	1.0		1.0	1.0	1.
.5	.5		.5	.5	.5	.5		.5	.5	.5	.5		.5	.5	.5
.2	.2		.2	.2	.2	.2		.2	.2	.2	.2		.2	.2	.2
.4	.4		.4	.4	.4	.4		.4	.4	.4	.4		.4	.4	.4
.4	.4		.4	.4	.4	.4		.4	.4	.4	.4		.4	.4	.4
.2	.2		.2	.2	.2	.2		.2	.2	.2	.2		.2	.2	.2
.8	1.7		1.7	1.7	1.7	1.7		19.1	8.0	2.8	2.7		2.7	2.7	2.

OPERATING CONDITIONS

E OFF & CLIMB AVERAGE AMPS				CRUISE AVERAGE AMPS					CRUISE COMBAT AVERAGE AMPS						
MIN	2 MIN	15 MIN	MIN	AMPS	.5 MIN	2 MIN	30 MIN	MIN	AMPS	.5 MIN	2 MIN	30 MIN		AMPS	.5
—	—	—		—	—	—	—		—	—	—	—		16.0	5
—	—	—		—	—	—	—		—	—	—	—		.2	
—	—	—		—	—	—	—		—	—	—	—		—	
—	—	—		—	—	—	—		—	—	—	—		.2	
—	—	—		—	—	—	—		—	—	—	—		—	
1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1
.5	.5	.5		.5	.5	.5	.5		.5	.5	.5	.5		.5	
.2	.2	.2		.2	.2	.2	.2		.2	.2	.2	.2		.2	.2
.4	.4	.4		.4	.4	.4	.4		.4	.4	.4	.4		.4	
.4	.4	.4		.4	.4	.4	.4		.4	.4	.4	.4		.4	
.2	.2	.2		.2	.2	.2	.2		.2	.2	.2	.2		.2	.2
2.7	2.7	2.7		2.7	2.7	2.7	2.7		2.7	2.7	2.7	2.7		19.1	8

	CRUISE COMBAT AVERAGE AMPS					LANDING AVERAGE AMPS.					EMERGENCY AVERAGE AMPS				
MIN	AMPS	.5 MIN	2 MIN	30 MIN		AMPS	.5 MIN	2 MIN	5 MIN	MIN	AMPS	.5 MIN	2 MIN	30 MIN	MI
	—	—	—	—		16.0	5.1	.1	—		—	—	—	—	
	—	—	—	—		.2	.1	—	—		—	—	—	—	
	—	—	—	—		—	—	—	—		—	—	—	—	
	—	—	—	—		.2	.1	—	—		—	—	—	—	
	—	—	—	—		—	—	—	—		—	—	—	—	
	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	
	.5	.5	.5	.5		.5	.5	.5	.5		—	—	—	—	
	.2	.2	.2	.2		.2	.2	.2	.2		—	—	—	—	
	.4	.4	.4	.4		.4	.4	.4	.4		—	—	—	—	
	.4	.4	.4	.4		.4	.4	.4	.4		—	—	—	—	
	.2	.2	.2	.2		.2	.2	.2	.2		.2	.2	.2	.2	
	2.7	2.7	2.7	2.7		19.1	8.0	2.8	2.7		1.2	1.2	1.2	1.2	

EQUIPMENT	PART DESIGNATION	Nº OF UNITS	AMPS PER UNIT	OPERATING TIME MINS	LOADING & ANCHO AVERAGE AMP AMPS	5 MIN	2 MIN	15 M
Q. FUEL & OIL								
TANK LEVEL SENSING VALVE		14	.5		7.0	7.0	7.0	
AIR PRESS REG. O/R VALVE		3	1.0		3.0	3.0	3.0	
AIR PRESS RELIEF O/R VALVE		3	1.0		3.0	3.0	3.0	
SERVICE CHECK IND. LIGHT	CS-I-107	2	.04		.1	.1	—	
FULL & PARTIAL REFUEL RELAY	M.S. 25024-1	1	.4		.4	.4	.4	
REFUELLING INDIC. LIGHTS	CS-I-107	14	.04		.6	.6	.6	
L/P COCK VALVE		2	5.0		NEG	—	—	
ATTITUDE SENSOR		1						
RT. C.G. CONTROL UNIT		1			6.6	6.6	6.6	
LEFT C.G. CONTROL UNIT		1			6.6	6.6	6.6	
PUMP S/O CONTROL RELAY		2	.2		—	—	—	
LOW LEVEL WARNG LIGHTS	CS-I-108	2	.17		—	—	—	
PILOTS FUEL PROP. WARNG LT	CS-I-108	1	.17		—	—	—	
TANK Nº1 RELAY	M.S. 25024-1	1	.35		.4	.4	.4	
TANK Nº2 RELAY	M.S. 25024-1	1	.35		.4	.4	.4	
FUEL S/O RELAY	CS-R-122	2	.2		—	—	—	
CROSS FEED VALVE		1	5.0		—	—	—	
RIGHT FUEL SYS ISOL VALVE		1	5.0		—	—	—	
LEFT FUEL SYS ISOL VALVE		1	5.0		—	—	—	
EXT TANK JETT VALVE		1	1.0		—	—	—	
EXT TANK JETT RELAY	M.S. 25024-1	1	.35		—	—	—	
EXT TANK AIR S/O VALVE		1	1.0		—	—	—	
					28.1	28.1	28.0	28

ANCHOR E AMPS			START & WARM-UP AVERAGE AMPS					TAXI AVERAGE AMPS					TAKE OFF AVERAG		
IN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 M
1.0	7.0		–	–	–	–		–	–	–	–		–	–	–
3.0	3.0		–	–	–	–		–	–	–	–		–	–	–
3.0	3.0		–	–	–	–		–	–	–	–		–	–	–
–	–		–	–	–	–		–	–	–	–		–	–	–
.4	.4		–	–	–	–		–	–	–	–		–	–	–
.6	.6		–	–	–	–		–	–	–	–		–	–	–
–	–		NEG	–	–	–		NEG	–	–	–		NEG	–	–
6.6	6.6		6.6	6.6	6.6	6.6		6.6	6.6	6.6	6.6		6.6	6.6	6
6.6	6.6		6.6	6.6	6.6	6.6		6.6	6.6	6.6	6.6		6.6	6.6	6
–	–		–	–	–	–		–	–	–	–		–	–	–
–	–		–	–	–	–		–	–	–	–		–	–	–
–	–		–	–	–	–		–	–	–	–		–	–	–
4	.4		.4	.4	4	.4		.4	.4	.4	.4		–	–	–
4	.4		.4	.4	4	.4		.4	.4	.4	.4		–	–	–
–	–		–	–	–	–		–	–	–	–		–	–	–
–	–		NEG	–	–	–		NEG	–	–	–		NEG	–	–
–	–		NEG	–	–	–		NEG	–	–	–		NEG	–	–
–	–		–	–	–	–		–	–	–	–		–	–	–
–	–		–	–	–	–		–	–	–	–		–	–	–
–	–		–	–	–	–		–	–	–	–		–	–	–
–	–		–	–	–	–		–	–	–	–		1.0	1.0	1
28.0	28.0		14.0	14.0	14.0	14.0		14.0	14.0	14.0	14.0		14.2	14.2	14

OPERATING CONDITIONS

TAKE OFF & CLIMB AVERAGE AMPS					CRUISE AVERAGE AMPS					CRUISE COMBAT AVERAGE AMPS				
AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	30 MIN	MIN	AMPS	5 MIN	2 MIN	30MIN	A
–	–	–	–		–	–	–	–		–	–	–	–	–
–	–	–	–		–	–	–	–		–	–	–	–	–
–	–	–	–		–	–	–	–		–	–	–	–	–
–	–	–	–		–	–	–	–		–	–	–	–	–
–	–	–	–		–	–	–	–		–	–	–	–	–
–	–	–	–		–	–	–	–		–	–	–	–	–
NEG	–	–	–		NEG	–	–	–		NEG	–	–	–	NE
6.6	6.6	6.6	6.6		6.6	6.6	6.6	6.6		4.9	4.9	4.9	4.9	2
6.6	6.6	6.6	6.6		6.6	6.6	6.6	6.6		4.9	4.9	4.9	4.9	2
–	–	–	–		–	–	–	–		.4	.4	.4	.4	
–	–	–	–		–	–	–	–		.3	.3	.3	.3	
–	–	–	–		–	–	–	–		.2	.2	.2	.2	
–	–	–	–		–	–	–	–		.4	.4	.4	.4	
–	–	–	–		–	–	–	–		.4	.4	.4	.4	
–	–	–	–		.2	.2	.2	.2		.2	.2	.2	.2	
NEG	–	–	–		NEG	–	–	–		NEG	–	–	–	NE
NEG	–	–	–		–	–	–	–		–	–	–	–	–
–	–	–	–		NEG	–	–	–		NEG	–	–	–	NE
–	–	–	–		–	–	–	–		1.0	1.0	1.0	1.0	1.
–	–	–	–		–	–	–	–		.4	.4	.4	9	
1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		–	–	–	–	–
14.2	14.2	14.2	14.2		14.4	14.4	14.4	13.5		13.1	13.1	13.1	13.1	8.5

NG CONDITIONS

MIN	CRUISE AVERAGE AMPS AMPS	.5 MIN	2 MIN	30 MIN	MIN	CRUISE COMBAT AVERAGE AMPS AMPS	.5 MIN	2 MIN	30MIN		LANDING AVERAGE AMPS. AMPS	.5 MIN	2 MIN	5 MIN
	–	–	–	–		–	–	–	–		–	–	–	–
	–	–	–	–		–	–	–	–		–	–	–	–
	–	–	–	–		–	–	–	–		–	–	–	–
	–	–	–	–		–	–	–	–		–	–	–	–
	–	–	–	–		–	–	–	–		–	–	–	–
	–	–	–	–		–	–	–	–		–	–	–	–
	NEG	–	–	–		NEG	–	–	–		NEG	–	–	–
	6.6	6.6	6.6	6.6		4.9	4.9	4.9	4.9		2.6	2.6	2.6	2.6
	6.6	6.6	6.6	6.6		4.9	4.9	4.9	4.9		2.6	2.6	2.6	2.6
	–	–	–	–		.4	.4	.4	.4		.4	.4	.4	.4
	–	–	–	–		.3	.3	.3	.3		.3	.3	.3	.3
	–	–	–	–		.2	.2	.2	.2		.2	.2	.2	.2
	–	–	–	–		.4	.4	.4	.4		.4	.4	.4	.4
	–	–	–	–		.4	.4	.4	.4		.4	.4	.4	.4
	.2	.2	.2	.2		.2	.2	.2	.2		.2	.2	.2	.2
	NEG	–	–	–		NEG	–	–	–		NEG	–	–	–
	–	–	–	–		–	–	–	–		–	–	–	–
	NEG	–	–	–		NEG	–	–	–		NEG	–	–	–
	–	–	–	–		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
	–	–	–	–		.4	.4	.4	9		.4	.4	.4	.4
	1.0	1.0	1.0	1.0		–	–	–	–		–	–	–	–
	14.4	14.4	14.4	13.5		13.1	13.1	13.1	13.1		8.5	8.5	8.5	8.5

		CRUISE COMBAT AVERAGE AMPS				LANDING AVERAGE AMPS.					EMERGENCY AVERAGE AMP			
PS MIN	MIN	AMPS	.5 MIN	2 MIN	30MIN	AMPS	.5 MIN	2 MIN	5 MIN	MIN	AMPS	.5 MIN	2 MIN	30
–		–	–	–	–	–	–	–	–		–	–	–	–
–		–	–	–	–	–	–	–	–		–	–	–	–
–		–	–	–	–	–	–	–	–		–	–	–	–
–		–	–	–	–	–	–	–	–		–	–	–	–
–		–	–	–	–	–	–	–	–		–	–	–	–
–		–	–	–	–	–	–	–	–		–	–	–	–
–		NEG	–	–	–	NEG	–	–	–		–	–	–	–
											–	–	–	–
6.6		4.9	4.9	4.9	4.9	2.6	2.6	2.6	2.6		–	–	–	–
6.6		4.9	4.9	4.9	4.9	2.6	2.6	2.6	2.6		–	–	–	–
–		.4	.4	.4	.4	.4	.4	.4	.4		–	–	–	–
–		.3	.3	.3	.3	.3	.3	.3	.3		–	–	–	–
–		.2	.2	.2	.2	.2	.2	.2	.2		–	–	–	–
–		.4	.4	.4	.4	.4	.4	.4	.4		–	–	–	–
–		.4	.4	.4	.4	.4	.4	.4	.4		–	–	–	–
.2		.2	.2	.2	.2	.2	.2	.2	.2		–	–	–	–
–		NEG	–	–	–	NEG	–	–	–		–	–	–	–
–		–	–	–	–	–	–	–	–		–	–	–	–
–		NEG	–	–	–	NEG	–	–	–		–	–	–	–
–		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.
–		.4	.4	.4	4	.4	.4	.4	.4		.4	.4	.4	
.0		–	–	–	–	–	–	–	–		–	–	–	–
3.5		13.1	13.1	13.1	13.1	8.5	8.5	8.5	8.5		1.4	1.4	1.4	1.

SHEE

SHEET 7

EQUIPMENT	PART DESIGNATION	Nº OF UNITS	AMPS PER UNIT	OPERATING TIME MINS	LOADING & ANCHOR AVERAGE AMPS			
					AMPS	5 MIN	2 MIN	15 MI
R - RADIO (NAV. & COMM'N)								
U.H.F. COMMAND	AN/ARC 52	1	5.6		—	—	—	—
INTERCOMM	AN/AIC 10	1	.875		.9	.9	.9	.9
U.H.F. HOMER	ARA 25	1	3.16		—	—	—	—
DATA LINK	AN/ARR 44	1	3.64		—	—	—	—
RADIO COMPASS	AN/ARN 6	1	4.2		—	—	—	—
S - RADAR								
DISPLAYS (APPS)		1	1.02		—	—	—	—
FIRE CONTROL COUPLER		1	3.06		—	—	—	—
ERECTION COMPUTER		1	.73		—	—	—	—
WEAPONS CONTROL		1	2.38		—	—	—	—
ANTENNA SERVO		1	1.09		—	—	—	—
OPTICAL SIGHT		1	.08		—	—	—	—
AIR-TO-GND. IFF	AN/APX 19	1	1.84		—	—	—	—
INTERROGATER IFF	AN/APX 26	1	1.93		—	—	—	—
TRANSPONDER IFF	AN/APX 27	1	1.78		—	—	—	—
COMPUTER - BALLISTICS		1	2.36		—	—	—	—
					.9	.9	.9	.9

ANCHOR AVERAGE AMPS			START & WARM-UP AVERAGE AMPS					TAXI AVERAGE AMPS					TAKE OFF & AVERAG		
IN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MI
—	—		5.6	5.6	5.3	5.2		5.6	11.4	6.7	5.4		5.6	11.4	8.
.9	.9		.9	.9	.9	.9		.9	.9	.9	.9		.9	.9	
—	—		3.2	3.2	3.2	3.2		3.2	3.2	3.2	3.2		3.2	3.2	3.2
—	—		3.6	6.6	4.4	3.8		3.6	3.6	3.6	3.6		3.6	3.6	3.6
—	—		4.2	4.2	4.2	4.2		4.2	4.2	4.2	4.2		4.2	4.2	4.2
—	—		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0
—	—		3.1	3.1	3.1	3.1		3.1	3.1	3.1	3.1		3.1	3.1	3.1
—	—		.7	.7	.7	.7		.7	.7	.7	.7		.7	.7	.7
—	—		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
—	—		1.1	2.2	1.4	1.2		1.1	1.1	1.1	1.1		1.1	1.1	1.1
—	—		.1	.1	.1	.1		.1	.1	.1	.1		.1	.1	.1
—	—		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8
—	—		1.9	1.9	1.9	1.9		1.9	1.9	1.9	1.9		1.9	1.9	1.9
—	—		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8
—	—		2.4	2.4	2.4	2.4		2.4	2.4	2.4	2.4		2.4	2.4	2.4
.9	.9		34.4	38.6	35.2	34.8		34.4	40.2	35.5	34.2		34.4	40.2	37

OPERATING CONDITIONS

TAKE OFF & CLIMB AVERAGE AMPS				CRUISE AVERAGE AMPS					CRUISE COMBAT AVERAGE AMPS					
5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	30 MIN	MIN	AMPS	5 MIN	2 MIN	30MIN		AMPS
11.4	8.5	5.6		5.6	5.2	5.2	5.2		5.6	5.2	5.2	5.2		5.6
.9	.9	.9		.9	.9	.9	.9		.9	.9	.9	.9		.9
3.2	3.2	3.2		3.2	3.2	3.2	3.2		3.2	3.2	3.2	3.2		3.2
3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6
4.2	4.2	4.2		4.2	4.2	4.2	4.2		4.2	4.2	4.2	4.2		4.2
1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0
3.1	3.1	3.1		3.1	3.1	3.1	3.1		3.1	3.1	3.1	3.1		3.1
.7	.7	.7		.7	.7	.7	.7		.7	.7	.7	.7		.7
3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0
1.1	1.1	1.1		1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1		1.1
.1	.1	.1		.1	.1	.1	.1		.1	.1	.1	.1		.1
1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8
1.9	1.9	1.9		1.9	1.9	1.9	1.9		1.9	1.9	1.9	1.9		1.9
1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8
2.4	2.4	2.4		2.4	2.4	2.4	2.4		2.4	2.4	2.4	2.4		2.4
40.2	37.1	34.4		34.4	34.0	34.0	34.0		34.4	34.0	34.0	34.0		34.4

G CONDITIONS

MIN	CRUISE AVERAGE AMPS				MIN	CRUISE COMBAT AVERAGE AMPS					LANDING AVERAGE AMPS.				
	AMPS	.5 MIN	2 MIN	30 MIN		AMPS	.5 MIN	2 MIN	30MIN		AMPS	.5 MIN	2 MIN	5 MIN	
	5.6	5.2	5.2	5.2		5.6	5.2	5.2	5.2		5.6	11.4	11.4	7.7	
	.9	.9	.9	.9		.9	.9	.9	.9		.9	.9	.9	.9	
	3.2	3.2	3.2	3.2		3.2	3.2	3.2	3.2		3.2	3.2	3.2	3.2	
	3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6	
	4.2	4.2	4.2	4.2		4.2	4.2	4.2	4.2		4.2	4.2	4.2	4.2	
	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	
	3.1	3.1	3.1	3.1		3.1	3.1	3.1	3.1		3.1	3.1	3.1	3.1	
	.7	.7	.7	.7		.7	.7	.7	.7		.7	.7	.7	.7	
	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	
	.1	.1	.1	.1		.1	.1	.1	.1		.1	.1	.1	.1	
	1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8	
	1.9	1.9	1.9	1.9		1.9	1.9	1.9	1.9		1.9	1.9	1.9	1.9	
	1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8	
	2.4	2.4	2.4	2.4		2.4	2.4	2.4	2.4		2.4	2.4	2.4	2.4	
	34.4	34.0	34.0	34.0		34.4	34.0	34.0	34.0		34.4	40.2	40.2	36.5	

SE AMPS			CRUISE COMBAT AVERAGE AMPS					LANDING AVERAGE AMPS.					EMERGEN AVERAGE		
N	30 MIN	MIN	AMPS	.5 MIN	2 MIN	30MIN		AMPS	.5 MIN	2 MIN	5 MIN	MIN	AMPS	.5 MIN	2 MIN
2	5.2		5.6	5.2	5.2	5.2		5.6	11.4	11.4	7.7		11.4	11.4	11.4
	.9		.9	.9	.9	.9		.9	.9	.9	.9		.9	.9	.9
2	3.2		3.2	3.2	3.2	3.2		3.2	3.2	3.2	3.2		—	—	—
	3.6		3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6		—	—	—
	4.2		4.2	4.2	4.2	4.2		4.2	4.2	4.2	4.2		—	—	—
0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		—	—	—
	3.1		3.1	3.1	3.1	3.1		3.1	3.1	3.1	3.1		—	—	—
	.7		.7	.7	.7	.7		.7	.7	.7	.7		.7	.7	.7
	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0		—	—	—
	1.1		1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1		—	—	—
	.1		.1	.1	.1	.1		.1	.1	.1	.1		—	—	—
8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8
9	1.9		1.9	1.9	1.9	1.9		1.9	1.9	1.9	1.9		—	—	—
8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8		—	—	—
4	2.4		2.4	2.4	2.4	2.4		2.4	2.4	2.4	2.4		—	—	—
0	34.9		34.4	34.0	34.0	34.0		34.4	40.2	40.2	36.5		14.8	14.8	14.8

CRUISE COMBAT AVERAGE AMPS				LANDING AVERAGE AMPS.					EMERGENCY AVERAGE AMPS				
.5 MIN	2 MIN	30MIN		AMPS	.5 MIN	2 MIN	5 MIN	MIN	AMPS	.5 MIN	2 MIN	30MIN	MIN
5.2	5.2	5.2		5.6	11.4	11.4	7.7		11.4	11.4	11.4	11.4	
.9	.9	.9		.9	.9	.9	.9		.9	.9	.9	.9	
3.2	3.2	3.2		3.2	3.2	3.2	3.2		—	—	—	—	
3.6	3.6	3.6		3.6	3.6	3.6	3.6		—	—	—	—	
4.2	4.2	4.2		4.2	4.2	4.2	4.2		—	—	—	—	
1.0	1.0	1.0		1.0	1.0	1.0	1.0		—	—	—	—	
3.1	3.1	3.1		3.1	3.1	3.1	3.1		—	—	—	—	
.7	.7	.7		.7	.7	.7	.7		.7	.7	.7	.7	
3.0	3.0	3.0		3.0	3.0	3.0	3.0		—	—	—	—	
1.1	1.1	1.1		1.1	1.1	1.1	1.1		—	—	—	—	
.1	.1	.1		.1	.1	.1	.1		—	—	—	—	
1.8	1.8	1.8		1.8	1.8	1.8	1.8		1.8	1.8	1.8	1.8	
1.9	1.9	1.9		1.9	1.9	1.9	1.9		—	—	—	—	
1.8	1.8	1.8		1.8	1.8	1.8	1.8		—	—	—	—	
2.4	2.4	2.4		2.4	2.4	2.4	2.4		—	—	—	—	
34.0	34.0	34.0		34.4	40.2	40.2	36.5		14.8	14.8	14.8	14.8	

SHEET 8

EQUIPMENT	PART DESIGNATION	Nº OF UNITS	AMPS PER UNIT	OPERATING TIME MINS	LOADING & ANCHOR AVERAGE AMPS			
					AMPS	5 MIN	2 MIN	15 MIN
T. SPECIAL ELECTRONICS								
INFRARED.		1	1.02		—	—	—	—
V. POWER & CONTROL FOR A.C. SYS								
EXTERNAL SUPPLY LINE RELAY		2	.6		1.2	1.2	1.2	1.2
A.C. LINE RELAY		2	.6		—	—	—	—
EXT LINE SHEDDING RELAY		1	.2		.2	.2	.2	.2
A.C. SHEDDING RELAY		1	.55		.6	.6	.6	.6
TRANSFER RELAY		2	.55		.6	.6	.6	.6
TRANSFER CONTROL RELAY		1	.2		.2	.2	.2	.2
					2.8	2.8	2.8	2.8

NCHOR AMPS		START & WARM-UP AVERAGE AMPS					TAXI AVERAGE AMPS					TAKE OFF & AVERAGE		
15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN	15 MIN	MIN	AMPS	5 MIN	2 MIN
–		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0
1.2		–	–	–	–		–	–	–	–		–	–	–
–		1.2	1.2	1.2	1.2		1.2	1.2	1.2	1.2		1.2	1.2	1.2
.2		–	–	–	–		–	–	–	–		–	–	–
.6		.6	.6	.6	.6		.6	.6	.6	.6		.6	.6	.6
.6		.6	.6	.6	.6		.6	.6	.6	.6		.6	.6	.6
.2		.2	.2	.2	.2		.2	.2	.2	.2		.2	.2	.2
2.8		3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6	3.6	3.6

OPERATING CONDITIONS

AKE OFF & CLIMB AVERAGE AMPS				CRUISE AVERAGE AMPS					CRUISE COMBAT AVERAGE AMPS					
·5 MIN	2 MIN	15 MIN	MIN	AMPS	·5 MIN	2 MIN	30 MIN	MIN	AMPS	·5 MIN	2 MIN	30MIN		AMPS
1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0
–	–	–		–	–	–	–		–	–	–	–		–
1.2	1.2	1.2		1.2	1.2	1.2	1.2		1.2	1.2	1.2	1.2		1.2
–	–	–		–	–	–	–		–	–	–	–		–
.6	.6	.6		.6	.6	.6	.6		.6	.6	.6	.6		.6
.6	.6	.6		.6	.6	.6	.6		.6	.6	.6	.6		.6
.2	.2	.2		.2	.2	.2	.2		.2	.2	.2	.2		.2
3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6

NDITIONS

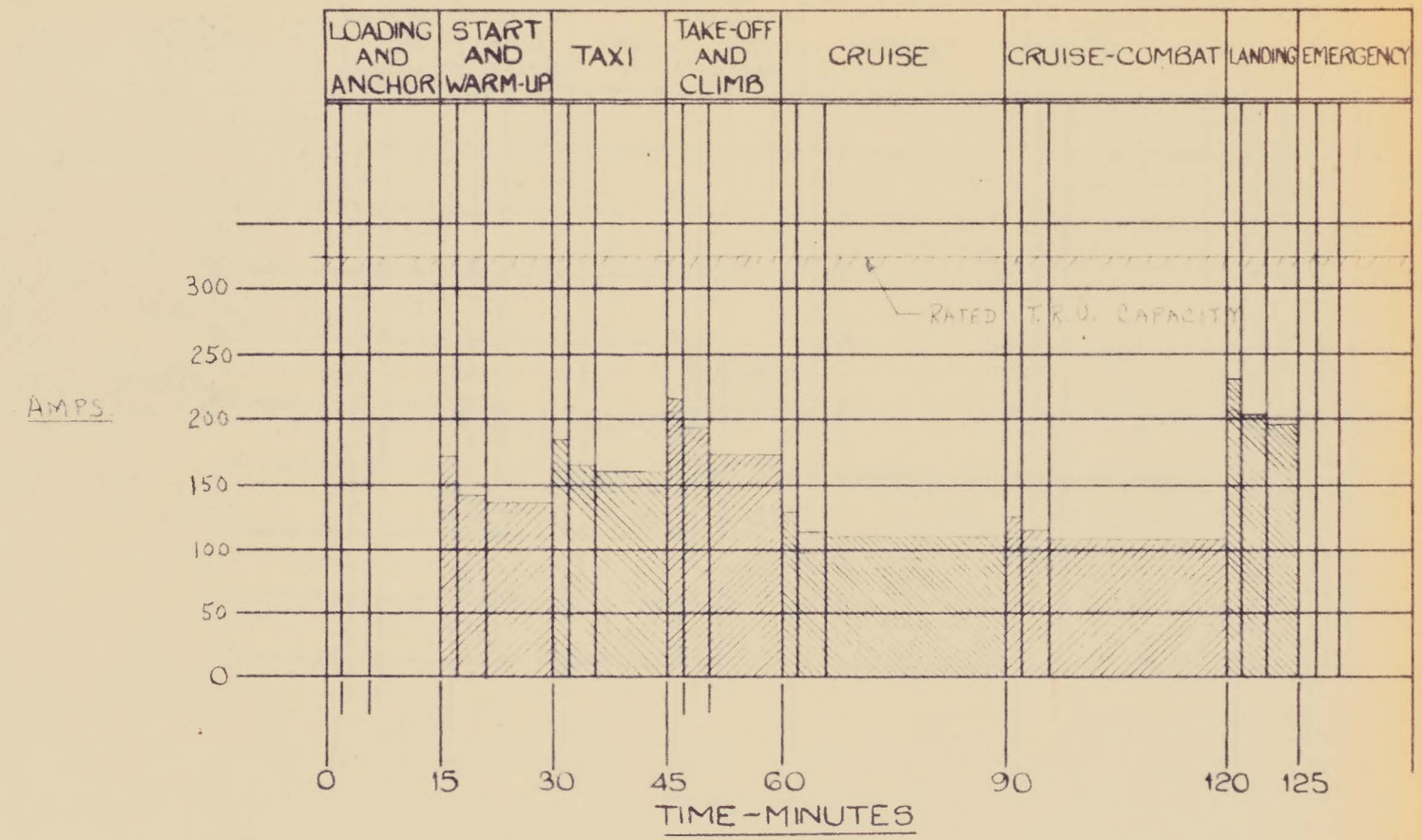
CRUISE					CRUISE COMBAT					LANDING					
AVERAGE AMPS					AVERAGE AMPS					AVERAGE AMPS.					
S	·5 MIN	2 MIN	30 MIN	MIN	AMPS	·5 MIN	2 MIN	30MIN		AMPS	·5 MIN	2 MIN	5 MIN	MIN	AMPS
	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		—
	—	—	—		—	—	—	—		—	—	—	—		—
	1.2	1.2	1.2		1.2	1.2	1.2	1.2		1.2	1.2	1.2	1.2		—
	—	—	—		—	—	—	—		—	—	—	—		—
	.6	.6	.6		.6	.6	.6	.6		.6	.6	.6	.6		—
	.6	.6	.6		.6	.6	.6	.6		.6	.6	.6	.6		—
	.2	.2	.2		.2	.2	.2	.2		.2	.2	.2	.2		—
	3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6		—

DITIONS

CRUISE				CRUISE COMBAT					LANDING					
AVERAGE AMPS					AVERAGE AMPS					AVERAGE AMPS.				
·5 MIN	2 MIN	30 MIN	MIN	AMPS	·5 MIN	2 MIN	30 MIN		AMPS	·5 MIN	2 MIN	5 MIN	MIN	AMPS
1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		—
—	—	—		—	—	—	—		—	—	—	—		—
1.2	1.2	1.2		1.2	1.2	1.2	1.2		1.2	1.2	1.2	1.2		—
—	—	—		—	—	—	—		—	—	—	—		—
.6	.6	.6		6	.6	.6	.6		.6	.6	.6	.6		—
.6	.6	.6		5	.6	.6	.6		6	.6	.6	.6		—
.2	.2	.2		.2	.2	.2	.2		.2	2	.2	2		—
3.6	3.6	3.6		3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6		—

CRUISE COMBAT AVERAGE AMPS				LANDING AVERAGE AMPS.					EMERGENCY AVERAGE AMPS				
5 MIN	2 MIN	30 MIN		AMPS	.5 MIN	2 MIN	5 MIN	MIN	AMPS	.5 MIN	2 MIN	30 MIN	MIN
1.0	1.0	1.0		1.0	1.0	1.0	1.0		—	—	—	—	
—	—	—		—	—	—	—		—	—	—	—	
1.2	1.2	1.2		1.2	1.2	1.2	1.2		-	-	-	-	
—	—	—		—	—	—	—		-	-	-	-	
.6	.6	.6		.6	.6	.6	.6		-	-	-	-	
.6	.6	.6		.6	.6	.6	.6		-	+	-	-	
.2	.2	.2		.2	.2	.2	.2		-	-	-	-	
3.6	3.6	3.6		3.6	3.6	3.6	3.6		-	-	—	—	

EQUIPMENT	PART DESIGNATION	Nº OF UNITS	AMPS PER UNIT	OPERATING TIME MINS	LOADING & ANCHOR AVERAGE AMPS				
					AMPS	5 MIN	2 MIN	15 MIN	MI
W. WARNING & EMERGENCY									
FIRE EXTINGUISHER		2	.75		NEG	–	–	–	
TIME DELAY		2	.1		NEG	–	–	–	
HYD BAY LOCK ON RELAY	M.S 25024-1	1	.35		–	–	–	–	
2ND SHOT RELAY	M.S 25024-1	1	.35		NEG	–	–	–	
CONTROL UNIT		3	.014						
FIRE WARNING LIGHT		3	.04						
FIRE PROTECTION RELAY	M.S 25024-1	2	.35		.4	.4	.4	–	
CRASH RELAY	M.S 25024-1	1	.35		–	–	–	–	
KEARFOTT BAILOUT WARN HORN		1	4.0						
BAIL OUT INDICATOR LIGHT	CS-C-109-3	2	.35						
MASTER WARNING CONTROL		1	.34		.3	.3	.3	.3	
MASTER WARNG LIGHT (RED)		1	.35		.4	.4	.4	.4	
MASTER WARNG LIGHT (AMBER)		1	.35		.4	.4	.4	.4	
ANNUNCIATOR BOX		1			.2	.2	.2	.2	
OXYGEN CAPACITANCE IND		1	.4		.4	.4	.4	.4	
CABIN PRESS WARNG LIGHT	CS-1-108-24	1	.2		–	–	–	–	
					2.1	2.1	2.1	1.7	
		TOTAL	SHT 8		2.8	2.8	2.8	2.8	
			7		.9	.9	.9	.9	
			6		28.1	28.1	28.0	28.0	
			5		18.1	7.0	1.8	1.7	
			4		1.6	1.6	.4	–	
			3		2.4	2.4	2.4	2.4	
			2		30.9	30.9	30.9	30.9	
			1		3.9	3.9	3.9	3.9	
					90.8	79.1	73.2	72.3	



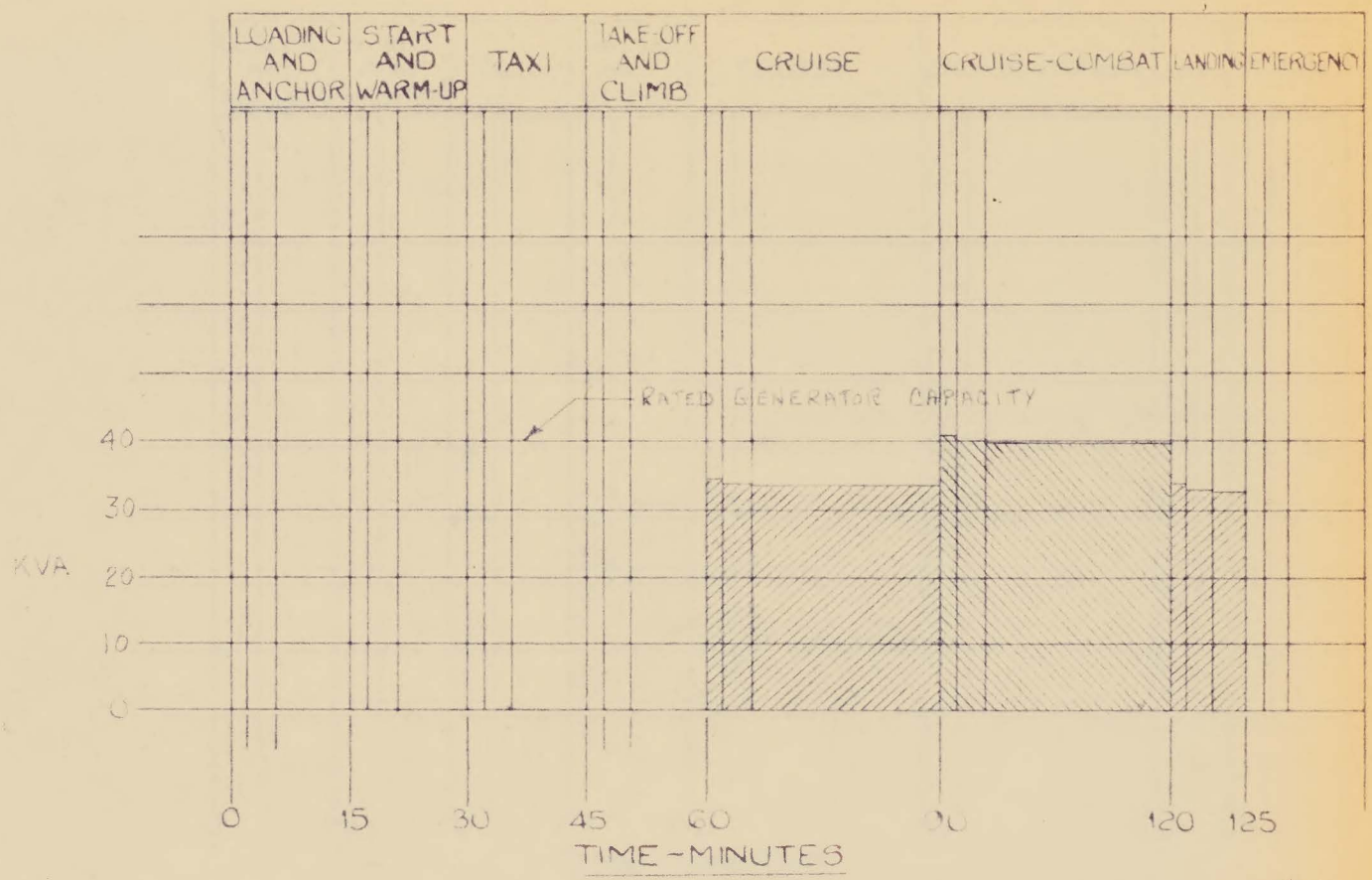
#2

CF105 MK II
SPARROW II MISSILES

D.C. LOAD

AVRO AIRCRAFT LIMITED.

GRAPH-ELECTRICAL LOAD ANALYSIS



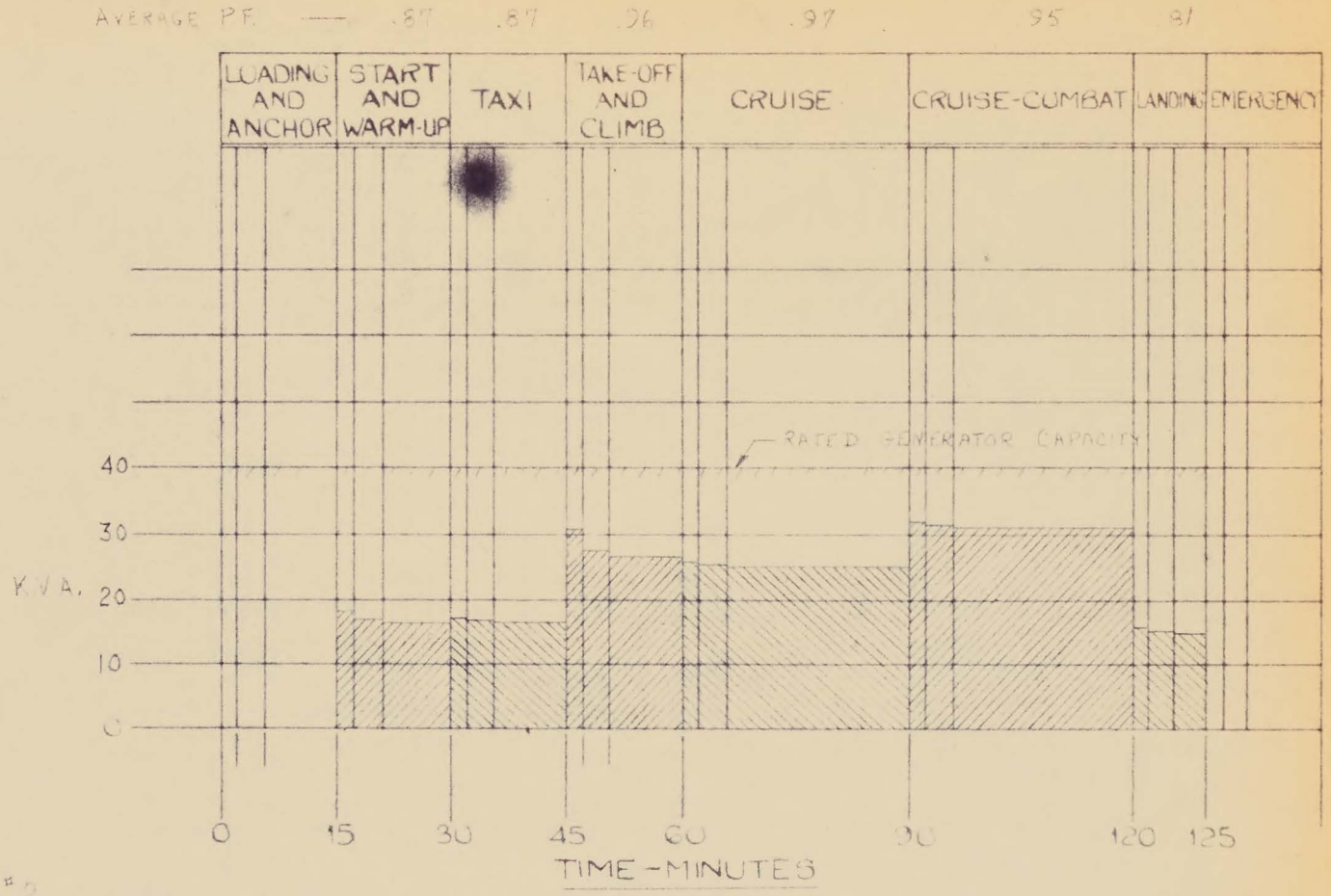
CASE 1

ONE ALTERNATOR OUT
SWITCH SELECTED TO "MISSILES" FOR CRUISE & COMBAT
& TO "DE-ICE" FOR LANDING

GRAPH #5

AVRO AIRCRAFT LIMITED.

GRAPH-ELECTRICAL LOAD ANALYSIS



ALTERNATOR #2

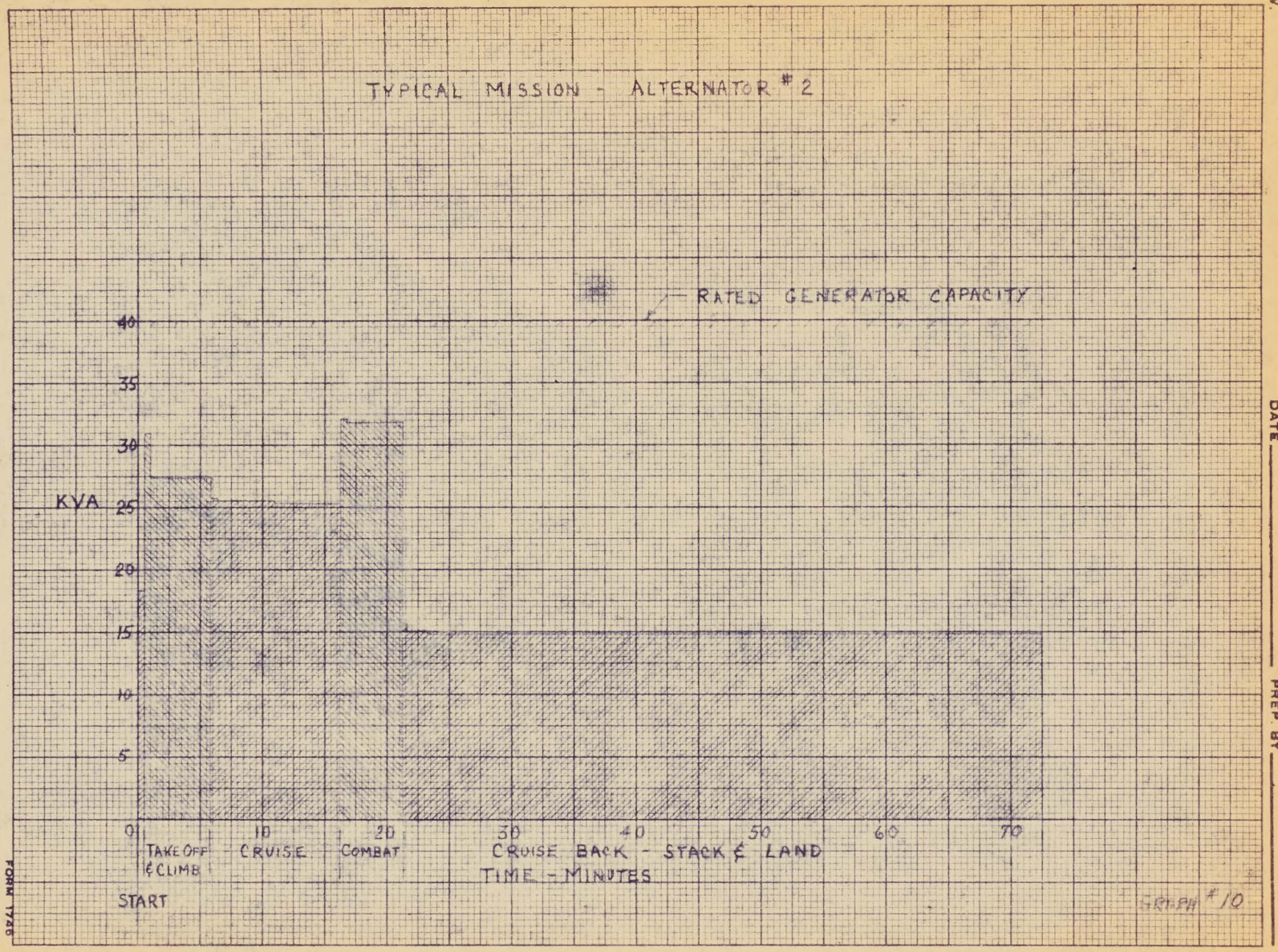
GRAPH #9

AVRO AIRCRAFT LIMITED.

GRAPH-ELECTRICAL LOAD ANALYSIS

AIRCRAFT
A.U.W.
COMPONENT
SHEET NO.
REPORT NO.
DATE
PREP BY

TYPICAL MISSION - ALTERNATOR # 2



GRAPH # 10

FORM 1726