

# **Rapid Air Operating Instructions**

## **CJ Servo Feed 104 & 108 Series**

6-01

4601 Kishwaukee Street, Rockford, IL 61109  
815-397-2578

## INTRODUCTION

The CJ servo has many features found in the more expensive models. Some of it's features are:

**Input:** 120 VAC, 50/60 HZ

**Amperage required at input:** 10 amps maximum.

**Accuracy:** .0025 per feed length at the rolls.

**Maximum feed length input:** 999.999 inches.

**Job storage:** 99 jobs

**Display:** 4 rows by 80 characters, backlit

**Fault type:** Displayed on the drive if a fault occurs otherwise an "8." is displayed.

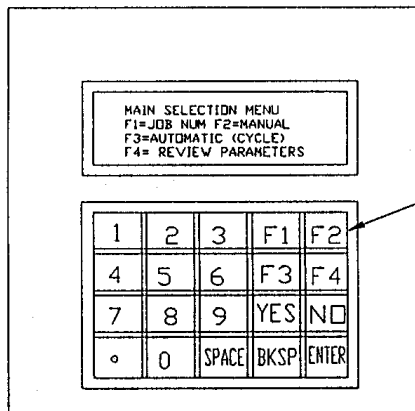
**Rolls:** Hardened and Ground

**Drive roll parallelism adjustment:** Used to tune the rolls to the material if needed.

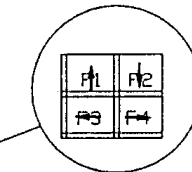
The Rapid Air CJ feed uses the same type of programming procedures as it has in it's more expensive models. Input a feed length, strokes per minute, and a feed arc and the program will adjust the servo acceleration/deceleration and maximum servo speed parameters to the requirement needed to keep up to the press strokes per minute.

The precision mechanical roll feed has been designed for compactness, ease of setup and installation. A 120 VAC. receptacle is all that is required of the customer. Two cables are supplied with the control and need to be connected to the proper locations of the motor. The electrical controls are housed in a small box that can be mounted on the press or if purchased, on a post that can be positioned close to the press.

**Note:**



KEYPAD



4 KEYS WERE CHOSEN TO HAVE A DOUBLE MEANING, ARROWS AND 'F' KEYS. THE ARROWS WERE BROUGHT OUT AS THE PRIMARY INSTEAD OF THE 'F' KEYS. IF YOU WOULD BEAR WITH US, WE ARE LOOKING AT A CORRECTION

## **INSTALLATION**

The Rapid Air servo was run and fully tested before being shipped from our plant. Carefully inspect all parts when uncrating them. If you find any damaged parts, please report it to the carrier that delivered the servo drive and at the same time, report the damage to your distributor.

The servo feed container should contain:

1 servo feed-- standard

1 console-- standard

1 console stand-- optional

1 servo mounting bracket-- optional

1 cascade roller assembly-- optional

Please contact someone at your facility to verify what options were purchased.

If a mounting bracket was purchased then it should be mounted first being careful that the center line of the bracket lines up with the centerline of the die area. The servo can then be mounted on the bracket. A print of the bracket can be found in the back of this manual.

If a bracket was not purchased then the servo will have to be mounted on the press bed or customer provided bracket. Line up the rolls to be centered and perpendicular to the center line of the die area. Included in the back of this manual is a hole pattern layout print for the CJ servo.

### **MECHANICAL PILOT RELEASE**

All CJ servo feeds are manufactured to accept an optional mechanical pilot release kit. If the mechanical pilot release is used, (we recommend it for press speeds of 250 or greater strokes per minute.) an adjustable actuator must be mounted to the press and timed to open the rolls when needed. Rapid Air offers such an actuator but only in one style and one length. If after inspecting the print dimensions and it is found that it would work for you then contact your distributor to purchase the actuating arm. If the arm doesn't seem like it will work then manufacturing your own arm is your only recourse. The only dimension that has to be closely watched is the travel of the mechanical actuating arm attached to the feed. The maximum travel of this arm is .800 before bottoming out.

### **ELECTRIC PILOT RELEASE**

The optional electric pilot release is mounted on top of the servo with 4 bolts which are included in the kit. The kit also includes the valve and the roll release stop for setting the maximum movement of the roll opening. It is the customer's responsibility to interface the pilot release valve with the customer supplied, press mounted, activating switch. The air requirements for the release to work correctly is 80 to 120 PSI, dry filtered and lightly lubricated air. There should be a minimum of 2 CFM available at all times.

## OPERATOR INPUT SECTION

The intent of this section is to familiarize the operator with the flow of the program and what to expect with each key press. Each program screen of the servo will be displayed and also comments to clarify possible questions. There are four sections that will be explained and they are as follows

### SECTION 1- JOB NUMBER

### SECTION 2 - MANUAL MODE

### SECTION 3 - AUTOMATIC MODE

### SECTION 4 - REVIEW PARAMETERS

When the servo is first started, and has performed it's startup procedure, the first screen displayed should look like this.

```
-----  
| MAIN SELECTION MENU: |  
| F1=JOB NUM F2=MANUAL |  
| F3=AUTOMATIC (CYCLE) |  
| F4=REVIEW PARAMETERS |  
-----  
* SELECT F1=JOB NUM
```

The first step in programming a job is to select a two digit job number which will be used to store the parameters that the operator inputs or to recall an existing job number that was previously loaded. When the operator presses F1 on the keypad, the screen will change to:

```
-----  
| JOB SELECTION MENU |  
| ENTER JOB NUMBER =__|  
| PRESS F4 KEY AFTER |  
| CORRECT # IS ENTERED |  
-----
```

The next screen lets you program parameters or exit with the existing parameters.

```
-----  
| JOB NUMBER =_____|  
| F1=PROG.PARAMETERS |  
| F4=DON'T ALTER VALUES |  
| |  
-----
```

Pressing the “F1 PROG. PARAMETERS” key initiates the following screen. Key in the required parameters.

```
-----  
| FEED LENGTH= _____ |  
| PRESS SPEED= _____ |  
| FEED ANGLE= _____ |  
| _____ |  
-----
```

\* ONCE THE PARAMETERS HAVE BEEN ENTERED, THE PROGRAM WILL COMPLETE THE MATH ROUTINE WHICH SELECTS THE PROPER ACCEL/DECELL AND MOTOR SPEED FOR THE PARAMETERS LISTED AND THEN THE MAIN MENU IS DISPLAYED AGAIN.

\*SELECT F2 MANUAL

If the operator elects to move the material from the feed to the die electrically, the manual mode has to be selected. Pressing the F2 key will bring up the manual mode screen.

```
-----  
| MANUAL LENGTH= _____ |  
| F1= SINGLE_FEED |  
| F2=GO TO INCH MODE |  
| F4= RETURN |  
-----
```

Each time the F1 key is pressed, the servo will move the material the feed length entered for the job number. The material will move at the speed required to keep up with the programmed press strokes per minute.

If the operator would like the material to move a slower rate then the inch mode should be selected. Press F2 now to display the inch mode screen.

```
-----  
| INCH MODE: |  
| F1= JOG FORWARD |  
| F2= JOG REVERSE |  
| F4= RETURN |  
-----
```

When the F1 key is pressed, the feed will advance the material at a slow rate of speed. When the F2 key is pressed, the feed will reverse the material and run at a slow rate of speed. Press F4 to return to the main screen.

With the main menu displayed and Pressing the “F3 AUTOMATIC (CYCLE)”, the following screen appears.

```
-----  
| AUTOMATIC JOB=01 |  
| FEED LENGTH= _____ |  
| PRESS SPEED= _____ |  
| F4= RETURN _____ |  
-----
```

In the automatic mode, the feed length and operator entered press speed will be displayed. Whenever the press mounted feed switch is activated, the servo will feed the feed length displayed on the screen. Because there is not an interface in the control for the pilot release it will be up to the customer to wire the pilot release switch to the solenoid that operates the raising of the rolls.

Press F4 button to return to the main menu and deactivate the automatic control.

Press F4 again and the final mode is review parameters, the parameters for the job number will then be displayed.

The last function on the keypad is the “RESET JOB PARAMETERS”. This function should be used with special caution as all the jobs being used will reset to the default parameters and cannot be restored without keying each job number’s parameters.

The following screen is displayed when the period is pressed while the “Main Selection menu” is displayed.

```
-----  
| RESET JOB PARAMETERS |  
| TO DEFAULT VALUE |  
| F1= RESET VALUES |  
| F4= RETURN -DONT RESET |  
-----
```

It is very important that the operator make a hard copy of the jobs on a sheet of paper so there is a permanent record.

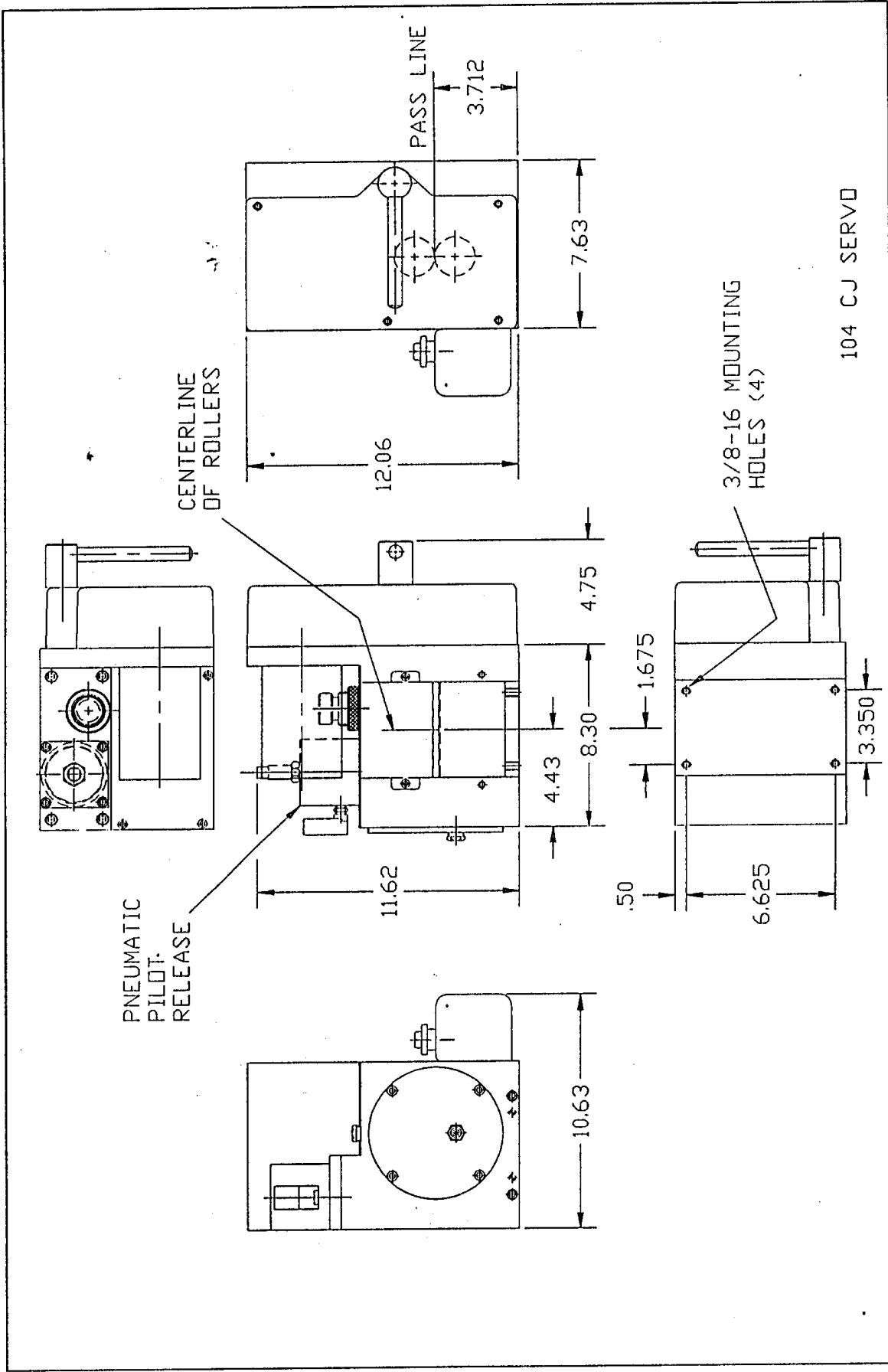
### 7.3.1 FATAL FAULT ERROR CODES

Err #	Status Display	Fault Message	Possible Cause
1	t	Power stage OverTemp	overload, fan malfunction, power stage failure
2	o	OverVoltage	excessive decel rate*
3	P	OverCurrent	power stage surge current*
4.0	r0	External feedback fault	Feedback signal through C8 not correctly detected
4.1	r1	Resolver line break	break in resolver feedback detected
4.2	r2	RDC error	fault in resolver-to-digital converted detected
4.3	r3	Sine Encoder init fail	sine encoder card has not initialized properly
4.4	r4	A/B line break	break in encoder A/B input lines detected
4.5	r5	Index line break	break in encoder index line
4.6	r6	Illegal halls	illegal hall combination detected
4.7	r7	C/D line break	break in sine encoder C/D line detected
4.8	r8	A/B out of range	sine encoder A/B level out of range
4.9	r9	Burst pulse overflow	sine encoder fault
5	u	Under voltage	bus voltage is too low
6	H	Motor over temperature	motor overload caused overheating
7.1	A1	Positive analog supply fail	Failure in +12V supply
7.2	A2	Negative analog supply fail	Failure in -12V supply
8	J	OverSpeed	velocity $\geq$ VOSPD
8.1	J1	OverSpeed	Velocity $\geq$ 1.8 x VLIM
9	E	EEPROM failure	Faulty EEPROM
10	e	EEPROM checksum fail	EEPROM checksum invalid on power up*
12	F	Foldback	System in FoldBack mode
14.1	d5	Positive over travel fault	PFB exceeded PMAX with PLIM=1
14.2	d6	Negative over travel fault	PFB exceeded PMIN with PLIM=1
15.1	d1	Numeric position deviation	Internal fault
15.2	d2	Excessive position deviation	PE > PEMAX
16	c	Communication interface	A communications fault has occurred

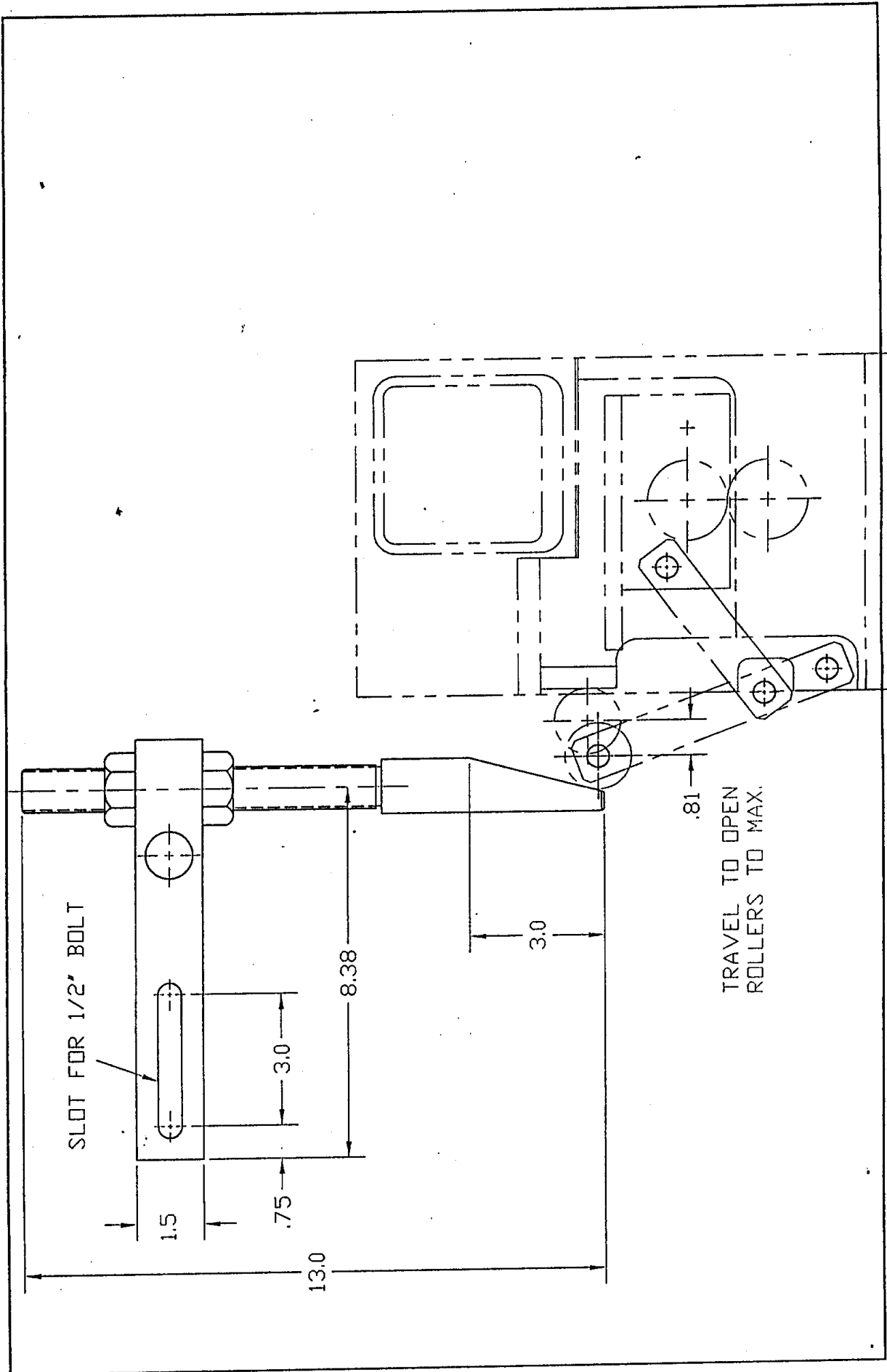
\*These faults can only be cleared by cycling power

### 7.3.3 NO MESSAGE FAULTS

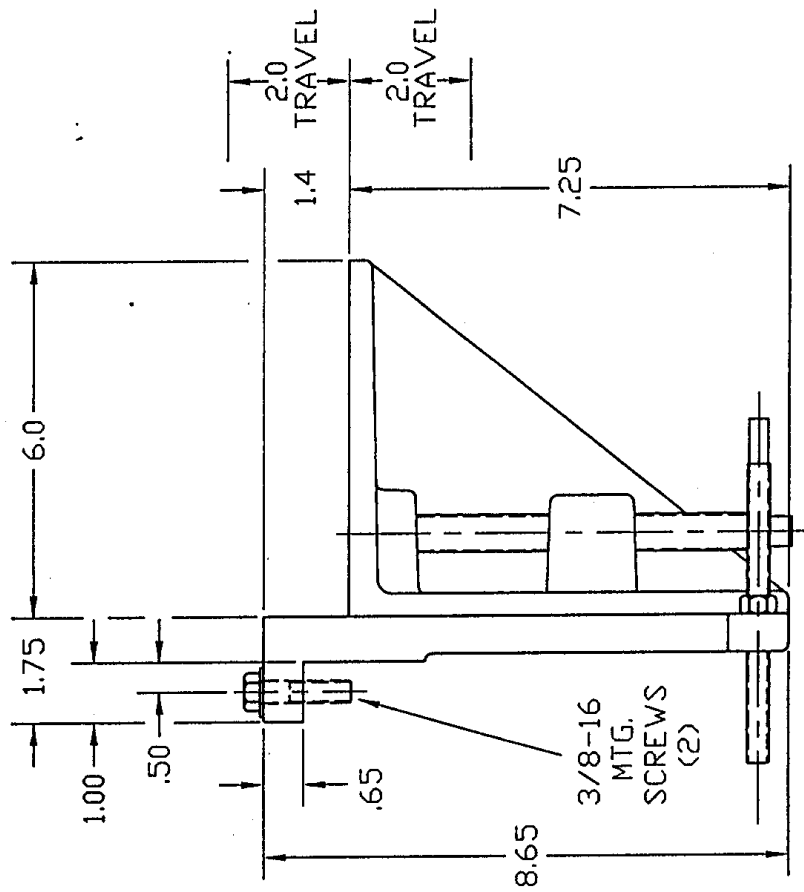
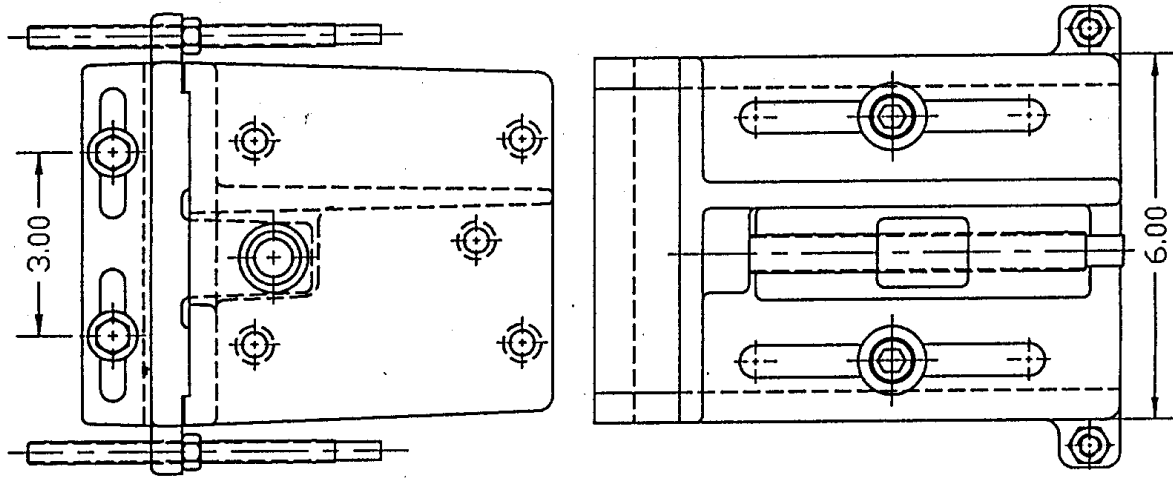
Fault Description	Fatal	Non-Fatal	Flashing Status Display	Steady Status Display
Watchdog (DSP)	X		■	
Watchdog (HPC)	X			■
No Compensation	X		-1	
Invalid Velocity Control	X		-2	
Encoder not Initialized on attempt to enable	X		-3	
Encoder Initialization failure	X		-4	
AutoConfig failure	X		-5	
Hardware CW limit switch open		X	L1	
Hardware CCW limit switch open		X	L2	
Hardware CW and CCW limit switches open		X	L3	
Software CW limit switch is tripped (PFB > PMAX & PLIM=2)		X	L4	
Software CCW limit switch is tripped (PFB < PMIN & PLIM=2)		X	L5	
Positive and negative analog supply fail	X		A3	
RAM failure (during init)	X			I
EPROM checksum (during init)	X			c
Altera load failure (during init)			E101	
Altera DPRAM failure (during init)			E102	

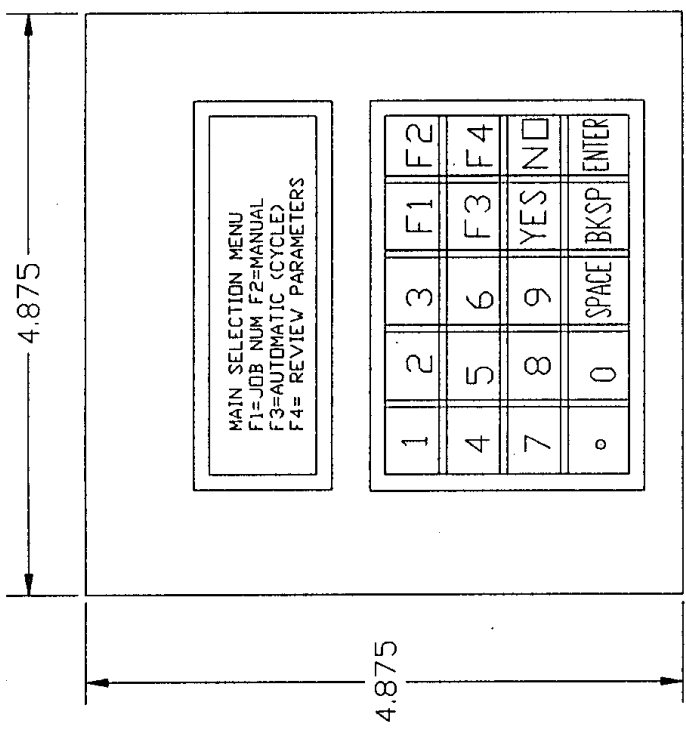


104 CJ SERVO



ADJUSTABLE MOUNTING BRACKET  
FOR CJ SERIES FEEDS





KEYPAD

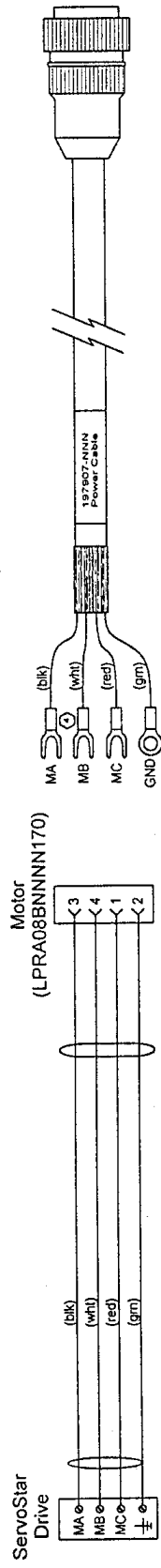
<b>RAPID-AIR CORPORATION</b> ROCKFORD, IL • MADISON, SD	
PART NAME KEYPAD	
MATERIAL	WEIGHT
HEAT TREAT	HARDNESS
DRAWN BY	CHECKED BY
DATE	DRAWING NUMBER
SCALE	FULL
DATE	B

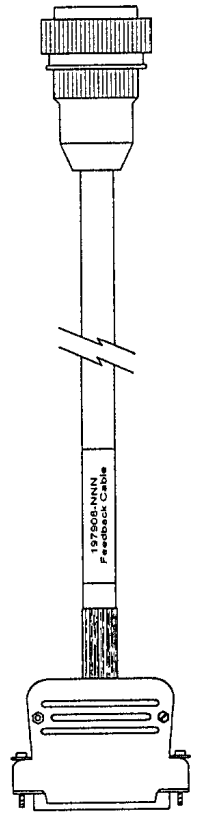
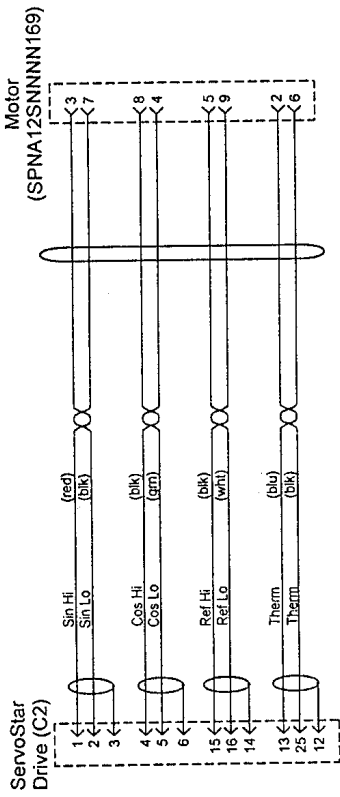
  

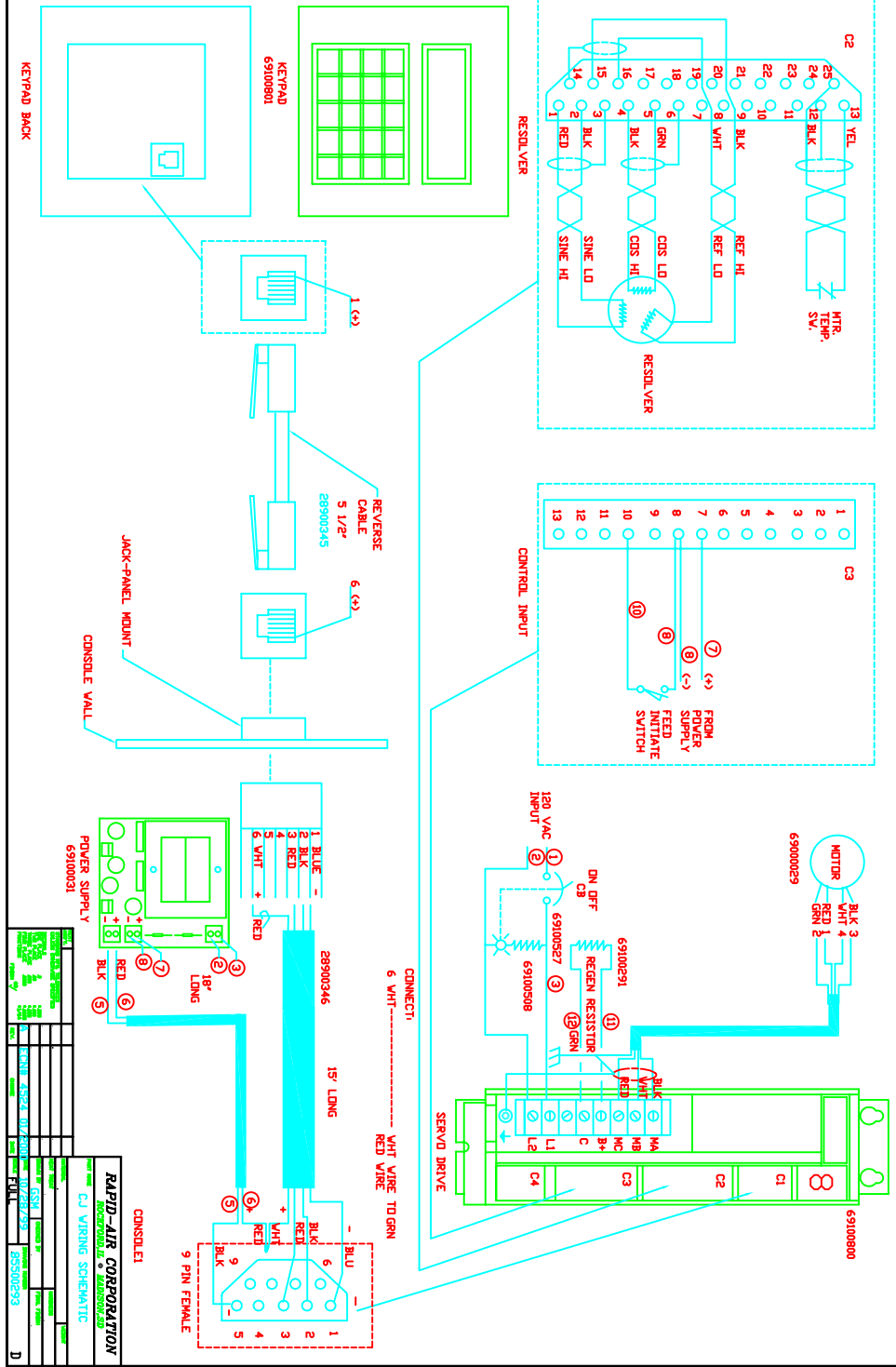
NEXT ASS'Y.	DATE
STANDARD MFG TOLERANCES UNLESS OTHERWISE SPECIFIED	CHANGE
DECIMALS .0 ±.030	REV.
ONE PLACE .00 ±.010	
TWO PLACE .000 ±.005	
THREE PLACE .0000 ±.0005	
FOUR PLACE .0000 ±.0005	
FRACTIONS 63/1764	
FINISH 63/√	











RAPID-AIR CORPORATION	
CJ WIRING SCHEMATIC	
REV	DATE
1	10/15/77
2	11/15/77
3	12/15/77
4	1/15/78
5	2/15/78
6	3/15/78
7	4/15/78
8	5/15/78
9	6/15/78
10	7/15/78
11	8/15/78
12	9/15/78
13	10/15/78
14	11/15/78
15	12/15/78
16	1/15/79
17	2/15/79
18	3/15/79
19	4/15/79
20	5/15/79
21	6/15/79
22	7/15/79
23	8/15/79
24	9/15/79
25	10/15/79
26	11/15/79
27	12/15/79
28	1/15/80
29	2/15/80
30	3/15/80
31	4/15/80
32	5/15/80
33	6/15/80
34	7/15/80
35	8/15/80
36	9/15/80
37	10/15/80
38	11/15/80
39	12/15/80
40	1/15/81
41	2/15/81
42	3/15/81
43	4/15/81
44	5/15/81
45	6/15/81
46	7/15/81
47	8/15/81
48	9/15/81
49	10/15/81
50	11/15/81
51	12/15/81
52	1/15/82
53	2/15/82
54	3/15/82
55	4/15/82
56	5/15/82
57	6/15/82
58	7/15/82
59	8/15/82
60	9/15/82
61	10/15/82
62	11/15/82
63	12/15/82
64	1/15/83
65	2/15/83
66	3/15/83
67	4/15/83
68	5/15/83
69	6/15/83
70	7/15/83
71	8/15/83
72	9/15/83
73	10/15/83
74	11/15/83
75	12/15/83
76	1/15/84
77	2/15/84
78	3/15/84
79	4/15/84
80	5/15/84
81	6/15/84
82	7/15/84
83	8/15/84
84	9/15/84
85	10/15/84
86	11/15/84
87	12/15/84
88	1/15/85
89	2/15/85
90	3/15/85
91	4/15/85
92	5/15/85
93	6/15/85
94	7/15/85
95	8/15/85
96	9/15/85
97	10/15/85
98	11/15/85
99	12/15/85
100	1/15/86
101	2/15/86
102	3/15/86
103	4/15/86
104	5/15/86
105	6/15/86
106	7/15/86
107	8/15/86
108	9/15/86
109	10/15/86
110	11/15/86
111	12/15/86
112	1/15/87
113	2/15/87
114	3/15/87
115	4/15/87
116	5/15/87
117	6/15/87
118	7/15/87
119	8/15/87
120	9/15/87
121	10/15/87
122	11/15/87
123	12/15/87
124	1/15/88
125	2/15/88
126	3/15/88
127	4/15/88
128	5/15/88
129	6/15/88
130	7/15/88
131	8/15/88
132	9/15/88
133	10/15/88
134	11/15/88
135	12/15/88
136	1/15/89
137	2/15/89
138	3/15/89
139	4/15/89
140	5/15/89
141	6/15/89
142	7/15/89
143	8/15/89
144	9/15/89
145	10/15/89
146	11/15/89
147	12/15/89
148	1/15/90
149	2/15/90
150	3/15/90
151	4/15/90
152	5/15/90
153	6/15/90
154	7/15/90
155	8/15/90
156	9/15/90
157	10/15/90
158	11/15/90
159	12/15/90
160	1/15/91
161	2/15/91
162	3/15/91
163	4/15/91
164	5/15/91
165	6/15/91
166	7/15/91
167	8/15/91
168	9/15/91
169	10/15/91
170	11/15/91
171	12/15/91
172	1/15/92
173	2/15/92
174	3/15/92
175	4/15/92
176	5/15/92
177	6/15/92
178	7/15/92
179	8/15/92
180	9/15/92
181	10/15/92
182	11/15/92
183	12/15/92
184	1/15/93
185	2/15/93
186	3/15/93
187	4/15/93
188	5/15/93
189	6/15/93
190	7/15/93
191	8/15/93
192	9/15/93
193	10/15/93
194	11/15/93
195	12/15/93
196	1/15/94
197	2/15/94
198	3/15/94
199	4/15/94
200	5/15/94
201	6/15/94
202	7/15/94
203	8/15/94
204	9/15/94
205	10/15/94
206	11/15/94
207	12/15/94
208	1/15/95
209	2/15/95
210	3/15/95
211	4/15/95
212	5/15/95
213	6/15/95
214	7/15/95
215	8/15/95
216	9/15/95
217	10/15/95
218	11/15/95
219	12/15/95
220	1/15/96
221	2/15/96
222	3/15/96
223	4/15/96
224	5/15/96
225	6/15/96
226	7/15/96
227	8/15/96
228	9/15/96
229	10/15/96
230	11/15/96
231	12/15/96
232	1/15/97
233	2/15/97
234	3/15/97
235	4/15/97
236	5/15/97
237	6/15/97
238	7/15/97
239	8/15/97
240	9/15/97
241	10/15/97
242	11/15/97
243	12/15/97
244	1/15/98
245	2/15/98
246	3/15/98
247	4/15/98
248	5/15/98
249	6/15/98
250	7/15/98
251	8/15/98
252	9/15/98
253	10/15/98
254	11/15/98
255	12/15/98
256	1/15/99
257	2/15/99
258	3/15/99
259	4/15/99
260	5/15/99
261	6/15/99
262	7/15/99
263	8/15/99
264	9/15/99
265	10/15/99
266	11/15/99
267	12/15/99
268	1/15/00
269	2/15/00
270	3/15/00
271	4/15/00
272	5/15/00
273	6/15/00
274	7/15/00
275	8/15/00
276	9/15/00
277	10/15/00
278	11/15/00
279	12/15/00
280	1/15/01
281	2/15/01
282	3/15/01
283	4/15/01
284	5/15/01
285	6/15/01
286	7/15/01
287	8/15/01
288	9/15/01
289	10/15/01
290	11/15/01
291	12/15/01
292	1/15/02
293	2/15/02
294	3/15/02
295	4/15/02
296	5/15/02
297	6/15/02
298	7/15/02
299	8/15/02
300	9/15/02
301	10/15/02
302	11/15/02
303	12/15/02
304	1/15/03
305	2/15/03
306	3/15/03
307	4/15/03
308	5/15/03
309	6/15/03
310	7/15/03
311	8/15/03
312	9/15/03
313	10/15/03
314	11/15/03
315	12/15/03
316	1/15/04
317	2/15/04
318	3/15/04
319	4/15/04
320	5/15/04
321	6/15/04
322	7/15/04
323	8/15/04
324	9/15/04
325	10/15/04
326	11/15/04
327	12/15/04
328	1/15/05
329	2/15/05
330	3/15/05
331	4/15/05
332	5/15/05
333	6/15/05
334	7/15/05
335	8/15/05
336	9/15/05
337	10/15/05
338	11/15/05
339	12/15/05
340	1/15/06
341	2/15/06
342	3/15/06
343	4/15/06
344	5/15/06
345	6/15/06
346	7/15/06
347	8/15/06
348	9/15/06
349	10/15/06
350	11/15/06
351	12/15/06
352	1/15/07
353	2/15/07
354	3/15/07
355	4/15/07
356	5/15/07
357	6/15/07
358	7/15/07
359	8/15/07
360	9/15/07
361	10/15/07
362	11/15/07
363	12/15/07
364	1/15/08
365	2/15/08
366	3/15/08
367	4/15/08
368	5/15/08
369	6/15/08
370	7/15/08
371	8/15/08
372	9/15/08
373	10/15/08
374	11/15/08
375	12/15/08
376	1/15/09
377	2/15/09
378	3/15/09
379	4/15/09
380	5/15/09
381	6/15/09
382	7/15/09
383	8/15/09
384	9/15/09
385	10/15/09
386	11/15/09
387	12/15/09
388	1/15/10
389	2/15/10
390	3/15/10
391	4/15/10
392	5/15/10
393	6/15/10
394	7/15/10
395	8/15/10
396	9/15/10
397	10/15/10
398	11/15/10
399	12/15/10
400	1/15/11
401	2/15/11
402	3/15/11
403	4/15/11
404	