S-9 CHAOS TAIL ASSEMBLY

1. From 1/4" x .035 aluminum tube bushing stock, cut (7) 1/2" long bushings.

2. Lay the horizontal stabilizers flat on the floor and tap the bushings into place with a hammer. Drill through with a 3/16" bit once they are installed. The holes in the welded on bushings may need reaming out to 1/4" for ease of installation. See **Figure 08-02.** If the bushings slide in without force, use J & B Weld to hold them in place, then drill out to #11.

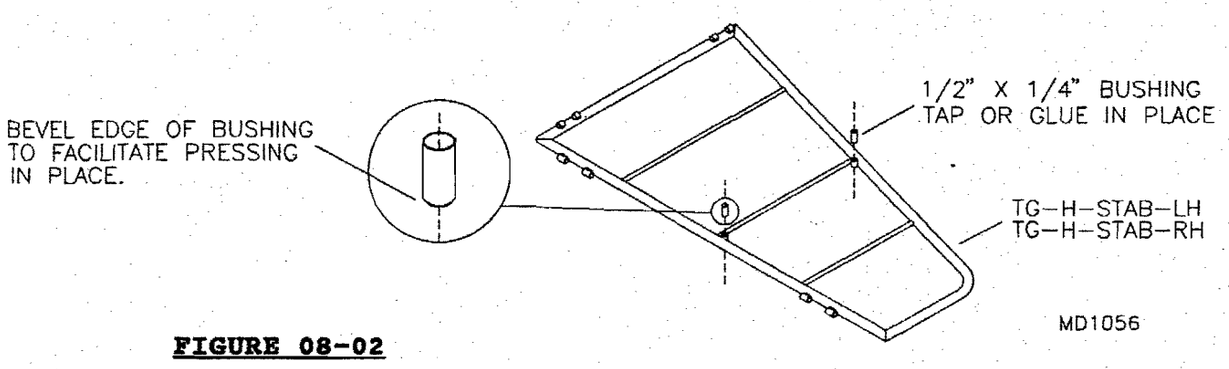


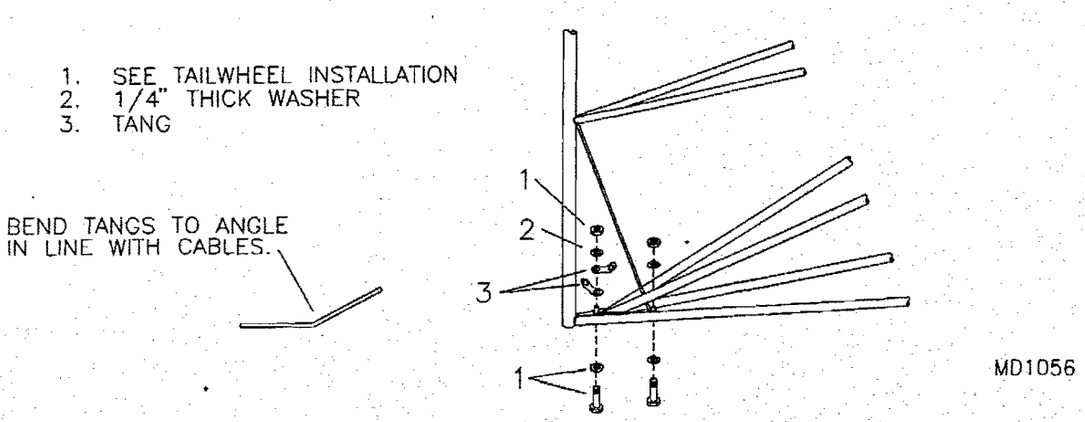
FIGURE 08-02

3. Repeat for the other three locations on the vertical fin, except use a backing bar, such as another hammer. **HINT:** A small C-clamp and a shot of lubricant can also be used to set the bushings in place.

4. Hinge stabilizers to the fuselage with 1/4" x 3 1/8" clevis pins. **DO NOT** install cotter pins until final assembly. Check for freedom of movement. It is necessary to ream all hinge points on the tail assembly. Use a 1/4" diameter drill bit 7" to 8" long. Reducing the pin diameter will also help the hinges work better.

5. Drill one hole in each stainless steel tang to 1/4" diameter and place on the rear tail wheel. Bolt as shown in **Figure 08-05.** Bend the tang to match the angle of the cables as they come off the stabilizer.

FIGURE 08-05



6. The S-9 tail cables use a custom made cable tang that has several holes in one end. These holes are used to adjust the set of the tail and tension the cables. Bolt the cables to their proper locations using the same washer stacking as shown in Figure 08-05. Before the tail cables can be set and tensioned you will need to bend the tangs so they line up with the cables. Do so by bolting them on using the inner most hole and bending to the exact angle with your hand. Avoid using a pliers this may cause stress risers. **IMPORTANT:** Attach the cables with the adjustor tangs bolted to the horizontal tail and **NOT** the fuselage or vertical fin. The reason is when you fold the tail the single hole tang is disconnected from the two lower attach points on each side. If the multi-hole tang was used you would have to remember which hole was used to set the rigging of the tail.

7. With the tangs bent to the proper angles loosely bolt the cables in place using the outer most hole on the adjustor tangs. The aft lower attach point uses a 3/16" bolt in the horizontal position. When this bolt is tightened it will tension the aft wires. The forward lower cable is tensioned by applying pressure at the cable attach point on the tail. About a hundred pounds of pressure can be applied by simply pressing down on the tail with your hand.

8. With cables under mild tension the horizontal stabilizer tips will be approximately 1/2" higher than the root. An acceptable setting is level to 1/2" dihedral. If more adjustment than what the tangs allows is required, try using more washers and the next length of bolt. See Figure 08-08. If your tail requires more than (3) thick washers under any top side cable tang return cables for longer ones. The cable tension should be enough they have a nice ring to them when strummed. If you are installing plastic cable fairing the tension is critical to insure the fairings will not flutter. The tail is in rig when the cables are tight and the tail is straight. It is best to check for straightness once the wings are installed.

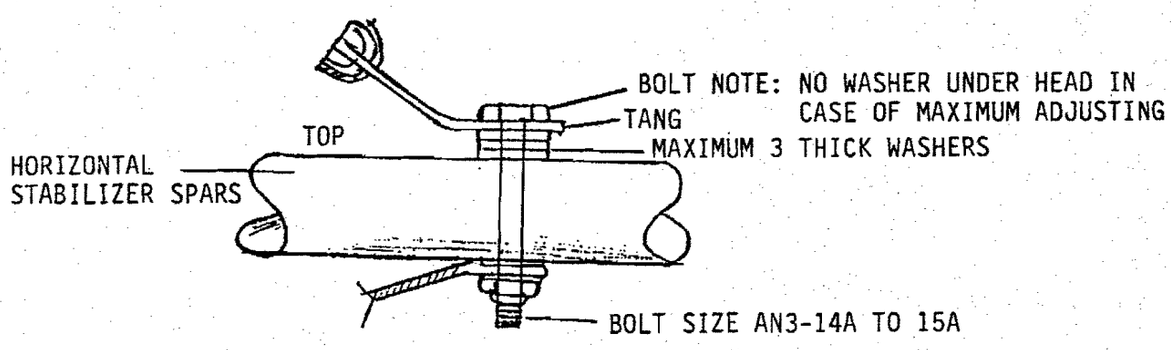


FIGURE 08-08

9. Drill and rivet the K-1000-3 nut plates to the inside of each elevator. Then attach an elevator horn to each side as shown in Figure 08-09.

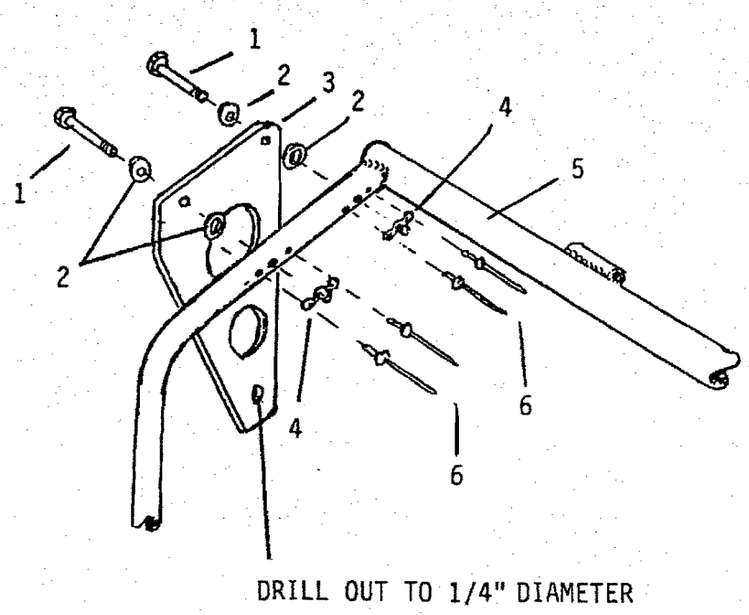


FIGURE 08-09

#	PART NAME	PART NO.	QTY
1.	3/16" BOLT	AN3-10A	4
2.	3/16" THIN WASHER	AN960-10L	8
3.	ELEVATOR HORN	TG-EH	2
4.	3/16" NUT PLATE	K-1000-3	4
5.	ELEVATOR FRAME	TG-EF(LH/RH)	2
6.	3/32" ALUMINUM POP RIVET	40 APR 1/8"	8

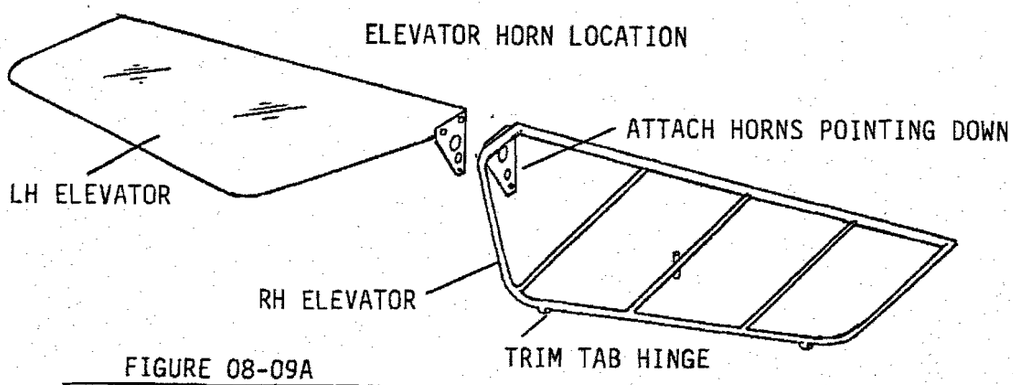


FIGURE 08-09A

10. Pin the elevator to the horizontal stabilizers using (4) 2 3/8" pins. Do not cotter pin until final assembly.

TRIM TAB AND TRIM WHEEL ASSEMBLY

11. Attach trim tab to the right elevator as shown in Figure 08-011. Insert small cotter pins. Drill out the trim cable stop tube to allow cable housing to insert. Please note the inside diameter of the trim tab spar is greater than the hinge pin. Make a shim to take out this gap from a soda pop can, or use brass shim stock. Wrap the shim around the pin after drilling the cotter pin hole, and insert into the trim tab spar. See Figure 08-011 and Figure 08-011A.

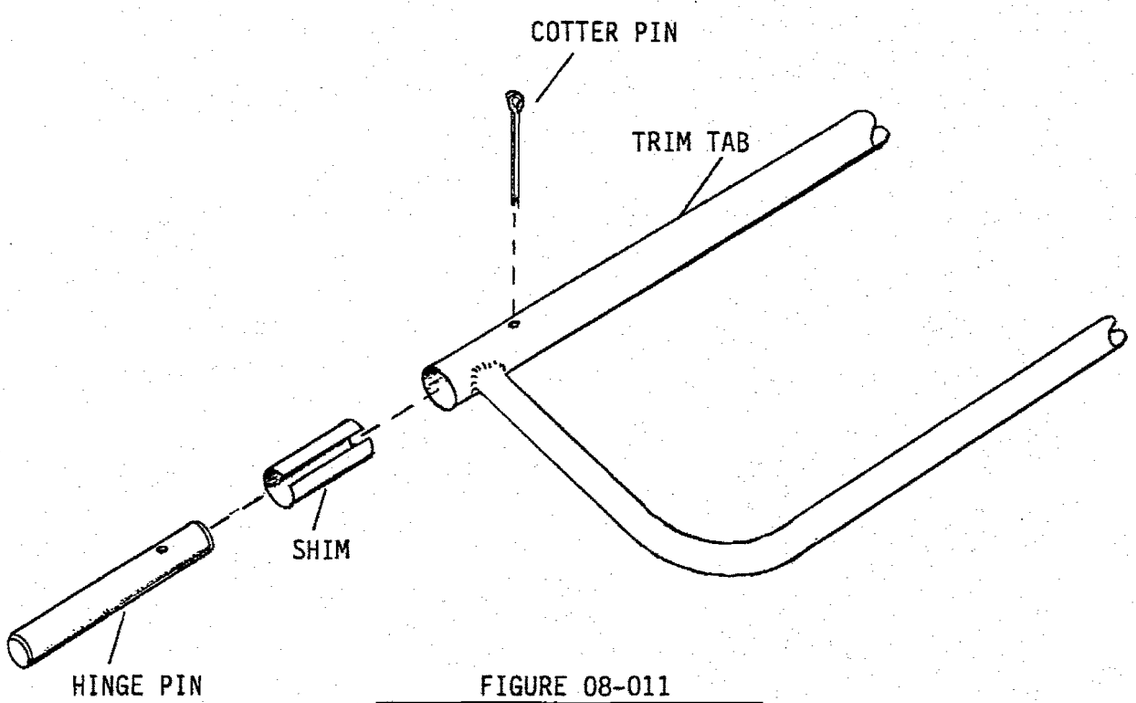
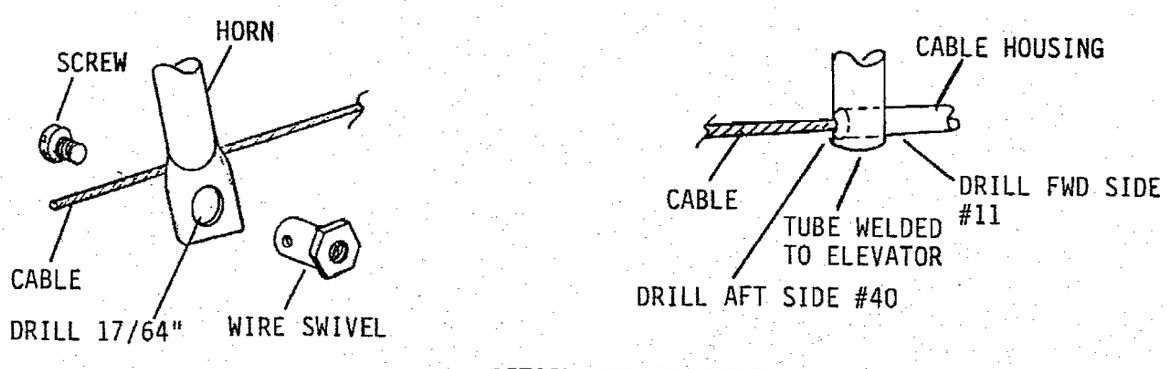


FIGURE 08-011



DETAIL FOR TRIM TAB CABLE ROUTING

FIGURE 08-011A

12. The trim tab is articulated by turning the trim wheel in the cockpit. On the trim wheel is a small plastic drum that a single strand of cable wraps around approximately 4 times. Bolt the trim wheel to the tab welded to the square tube on the left side of the cockpit just aft of the throttle. Use the parts drawing for assembly sequence. Tighten the bolt through the trim wheel so it has a fair amount of friction but is still easy to operate.

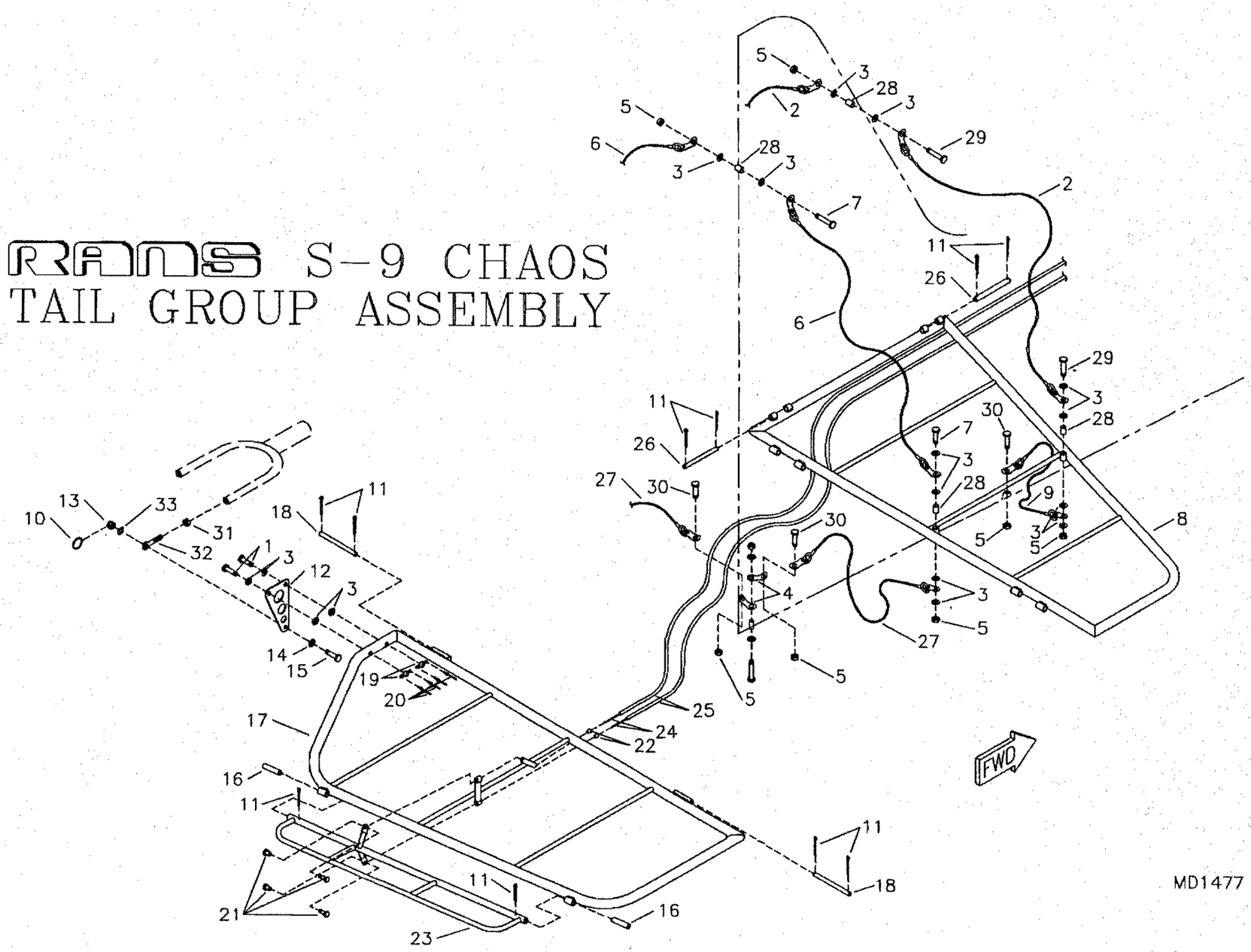
13. Drill out the horns on the trim tab to receive the wire swivels as shown in Figure 08-013. Insert the cable on the bottom horn and route to the trim wheel. **IMPORTANT:** To properly operate the trim tab the lower cable must wrap from the **BOTTOM** side of the drum. Wrap the cable tight around the drum without overlapping the other wraps and route back to the trim tabs top horn. Use the parts drawing for proper cable routing. Tension the system at the trim tab horns using the wire swivels. Test the operation of the tab by rotating the trim wheel. The tab should displace **DOWN** when the wheel is rotated **BACK.**

IMPORTANT

Before flying your S-9 for the first time make sure the trim system is ready to go. Check the cable housing to make sure they are seated in the stops. Check to make sure there is not slack or play in the system. A slack trim tab will flutter and may cause loss of pitch control. Trim tab flutter has occurred on the spring type trim systems when the spring tension was to light. Thank fully it is a low grade flutter and does not cause structural failure, however it can be very nerve racking! Check the cable tension on your trim system before every flight.

12. Refer to Control Stick Assembly for rigging elevator.

RANS S-9 CHAOS
TAIL GROUP ASSEMBLY



S-9 CHAOS - TAIL

#	DESCRIPTION	PART NUMBER	QUANTITY
1.	3/16" Bolt	AN3-10A	4
2.	Top Forward Cable	TG-TFC(9)	2
3.	3/16" Thin Washer	AN960-10L	28
4.	Hummertang	T12-HT6	2
5.	3/16" Tensile Nut	AN365-1032A	10
6.	Top AFT Cable	TG-TAC(9)	2
7.	3/16" Bolt	AN3-13A	3
8.	Horizontal Stabilizer, RH	TG-H-STAB-RH	1
8.	Horizontal Stabilizer, LH	TG-H-STAB-LH	1
9.	Lower Forward Cable	TG-LFC-IA	2
10.	Loc Ring	RL 27 1/4	2
11.	Small Cotter Pin	MS24665-134	18
12.	Elevator Horn	TG-EH	2
13.	1/4" Castle Nut	AN310-4	2
14.	1/4" Thin Washer	AN960-416L	2
15.	1/4" Bolt	AN4-7	2
16.	1 1/2" X 1/4" Pin (Steel Tube) **	TG-1 1/2X1/4 PIN	2
17.	Elevator, RH	TG-EL-RH	1
17.	Elevator, LH	TG-EL-LH	1
18.	2 3/8" X 1/4" Steel Rod Pin **	TG-2 3/8X1/4 PIN	4
19.	3/16" Nut Plate	K-1000-3	4
20.	3/32" Aluminum Pop Rivet	40APR1/8	8
21.	Wire Swivel/Screw Stop	2361	2
22.	Cable Ferrule Cap	ENDCAP-12000	2
23.	Trim Tab	TG-TRIM-TAB	1
24.	Trim Cable ***	TRIM-CAB(9)	0
25.	Trim Cable Housing ***	KSAC0008	0
26.	3" X 1/4" Steel Rod Pin **	TG-3X1/4 PIN	4
27.	Lower AFT Cable	TG-LAC-IA	2
28.	Spacer Bushing, 1/4" X 1/2" **	SB-1/4X1/2	6
29.	3/16" Bolt	AN3-11A	3
30.	3/16" Bolt	AN3-4A	4
31.	1/4" Plain Nut	AN345-416	2
32.	Male Rod End, 1/4" X 1/4"	NM-4	2
33.	1/4" Plastic Washer	PW-4	2

**Fabricate, see bushing sheet.
***For cable lengths, please see trim system.

S-9 CHAOS

ELEVATOR TRIM SYSTEM

S-9 CHAOS - ELEVATOR TRIM SYSTEM

#	DESCRIPTION	PART NUMBER	QUANTITY
1.	Trim Cable Housing	KSAC0008	120 in
2.	Trim Cable Wheel Type	TG-CAB-WT-300	300 in
3.	Cable Guide*	TG-GUIDE	2 in
4.	1/4" Large Wood Washer	AN970-4	1
5.	Trim Wheel	PT-WHEEL	1
6.	1/4" Thin Washer	AN960-416L	1
7.	1/4" Bolt	AN4-14A	1

*Cut 4" piece in half.