

Film-Tech

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1. CALIBRATION, ALIGNMENT, AND ADJUSTMENT PROCEDURES

The following paragraphs contain the necessary information to calibrate, align, and adjust the various components and assemblies. Always observe standard safety precautions and maintenance procedures when working on the projector.

1.1. LED SOUNDHEAD ALIGNMENT AND ADJUSTMENTS

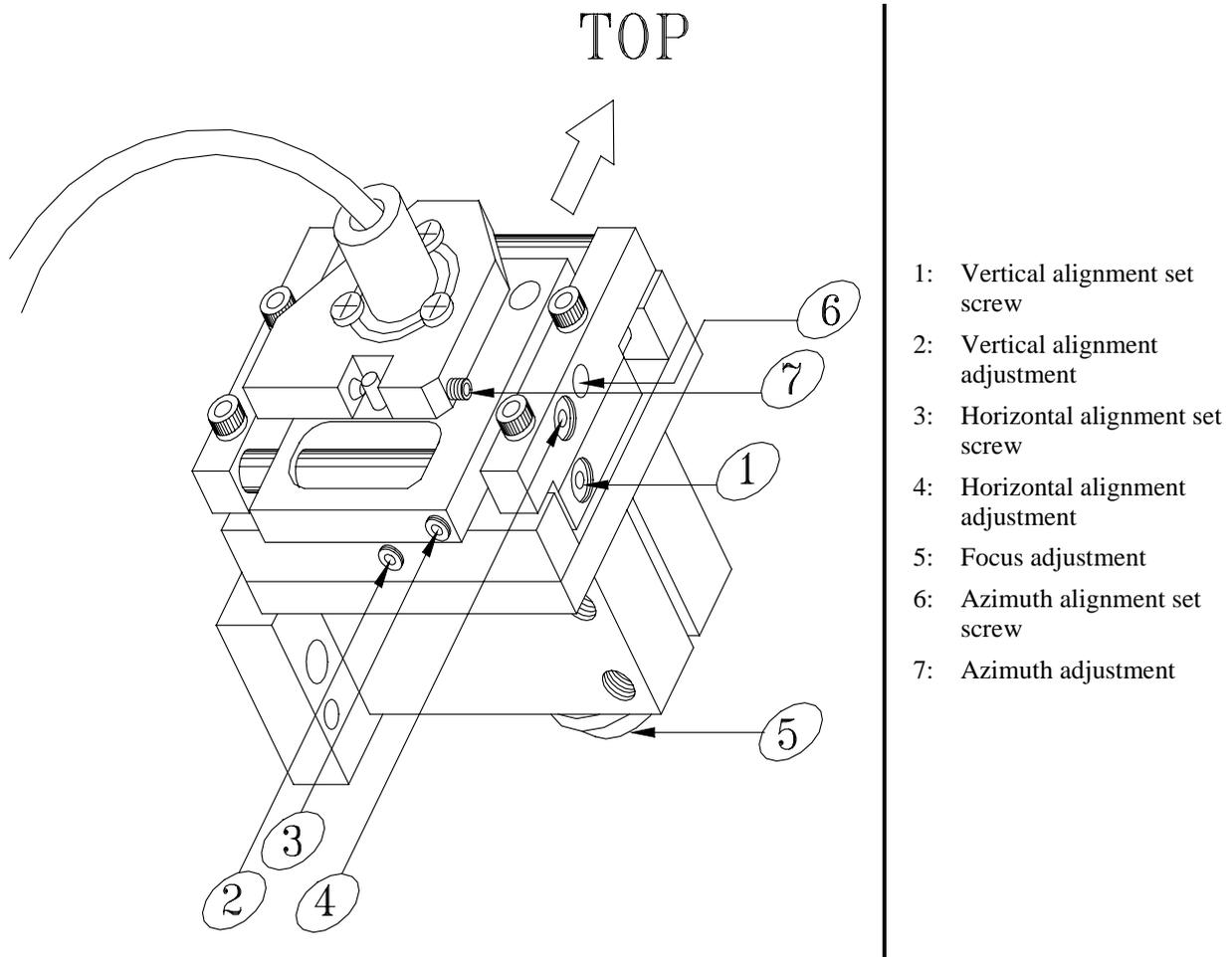


Figure 1-1: LED Soundhead Assembly

1.1.1. PRELIMINARY PROCEDURES

1. Verify that LED is operational and lens is clean.
2. Verify cell wiring for proper left/right wiring to cinema processor.

1.1.2. CELL POSITIONING: VERTICAL ALIGNMENT

1. Loosen 3/32-inch Allen set screw on side of cell adjustment assembly (item 1 in Figure 1-1).
2. Run Dolby Cat. 69T tone.
3. Adjust vertical position of cell (item 2 in Figure 6-1) for maximum output level.
4. Tighten set screw on side of cell adjustment assembly.
5. Adjust cinema processor's pre-amplifier gains for left and right tone reference levels.

1.1.3. HORIZONTAL ALIGNMENT

1. Loosen 3/32-inch Allen set screw on bottom of cell adjustment assembly (item 3 in Figure 1-1).
2. Run Buzz Track film.
3. Adjust lateral position of cell (item 4 in Figure 1-1) until there is no output at processor's test points. If output is present on both left and right test points, increase focal distance between lens and cell.
4. Tighten set screw on bottom of cell adjustment assembly.

1.1.4. FOCUS AND AZIMUTH

1. Loosen 3/32-inch Allen Azimuth set screw in hole on side of cell adjustment assembly (item 6 in Figure 1-1).
2. Turn cinema processor's pre-amplifier Hf adjustments counterclockwise to minimum settings.
3. Run Dolby Cat. 69P Pink Noise film (not older than 1992).
4. Adjust Focus (item 5 in Figure 1-1) and Azimuth (item 7 in Figure 1-1) for maximum high frequency response and phase coherence.
5. Carefully lock focus adjustment (5) and azimuth set screw (6).
6. Turn cinema processor's pre-amplifier Hf adjustments clockwise until real-time analyzer shows flat frequency response to 16 kHz.
7. Verify that both channels have identical frequency response.

1.1.5. ALIGNMENT VERIFICATION

1. Repeat vertical and horizontal alignment procedures described in Sections 1.1.2 and 1.1.3.
2. Recheck to verify that optimum alignment has been achieved.

1.1.6. PERFORMANCE CHECK: CROSSTALK

1. Run Dolby Cat. 97 cell alignment film.
2. Verify that there is no crosstalk between left and right processor test points.

1.1.7. ILLUMINATION UNIFORMITY

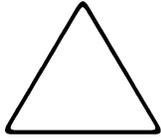
1. Run Dolby Cat. 566 illumination uniformity film.
2. Connect left and right processor test points.
3. Verify that illumination uniformity across cell is within ± 0.5 dB.

1.1.8. FINAL CHECK

1. Verify Dolby tone reference levels. (Note: Set LED current to minimum setting allowable while keeping processor pre-amp in the middle of its adjustment range.)
2. Run Buzz Track film.
3. Verify frequency response and azimuth.
4. Check that all locking adjustments are tight.

Repeat appropriate procedures from Sections 1.1.2 through 1.1.7 if adjustments are necessary.

1.2. DIGITAL SOUNDHEAD ALIGNMENT



The polarity of visible red LEDs may be opposite from that of infrared LEDs. If reversed, LED will not light.

1.2.1. PRELIMINARY STEPS

1. Turn LED power supply down to minimum setting.
2. Connect video cable to CCD assembly.
3. Turn on digital processor.
4. Apply AC power to projector and verify that LEDs are operational.

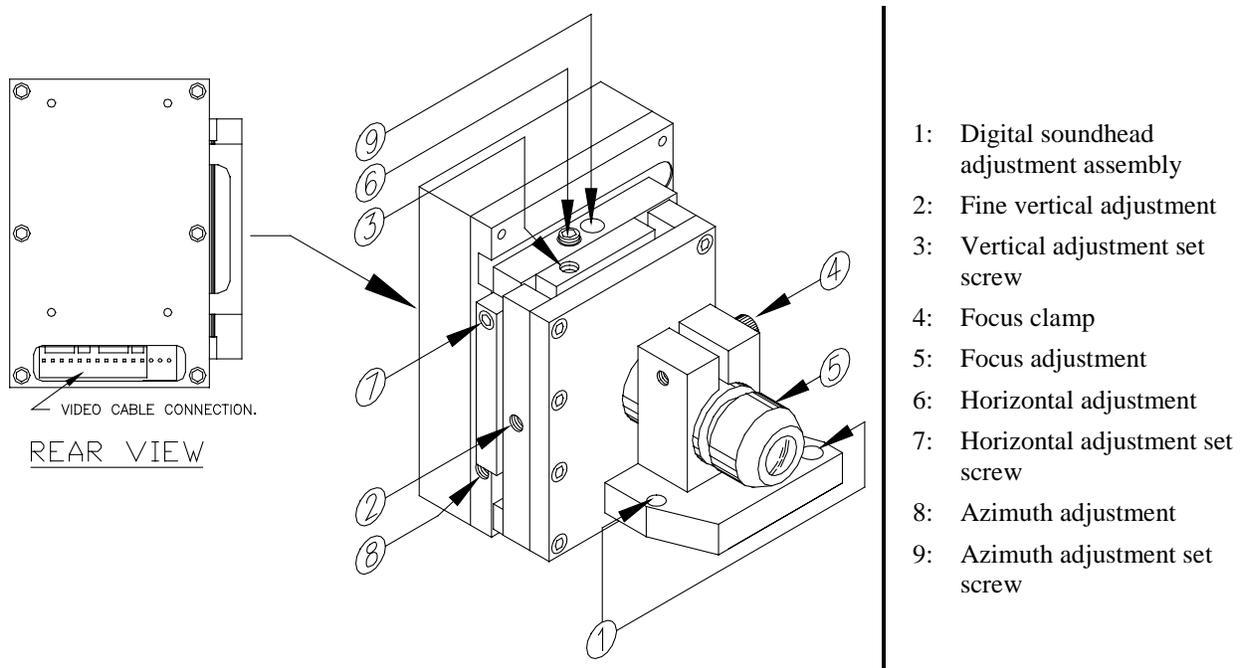


Figure 1-2: Digital Soundhead Assembly

1.2.2. ALIGNMENT PROCEDURE

1. Remove analog solar cell adjustment assembly, or rotate assembly downward, for easier access to CCD adjustments.
2. Set CCD adjustment assembly to center of travel path in both horizontal (item 6 in Figure 1-2) and vertical (item 2 in Figure 1-2) directions.
3. Run film loop with Dolby Digital track.
4. Adjust CCD vertical positioning by pivoting entire adjustments assembly (item 1 in Figure 1-2) and fine vertical adjustments (item 2 in Figure 1-2) to achieve maximum video signal on oscilloscope.

5. Adjust with threaded lens (item 5 in Figure 1-2) at front of CCD assembly to obtain highest possible focus reading on DRAS software.



**Digital reader has been factory-aligned to meet Dolby specifications.
Field adjustment requires oscilloscope and/or DRAS/QC software.**

6. Adjust azimuth (item 8 in Figure 1-2) to read zero ± 2 mils with DRAS software.
7. Adjust lateral positioning (item 6 in Figure 1-2) to center image on CCD. It should read zero ± 0.5 mils on DRAS software.
8. Magnification should be $100 \pm 2\%$; adjust focal distance if necessary.
9. Adjust LED power supply output for $4 \pm 0.5V$ of video amplitude if necessary, try to keep LED current to minimum possible setting.
10. Lock all adjustment set screws (items 3, 4, 7, and 9 in Figure 1-2).

1.3. DASHPOT ADJUSTMENT

1. Turn hex-slotted screw counter clockwise at bottom of dashpot assembly through access hole in projector bottom plate, until friction of dashpot is at lowest point.
2. Run wow and flutter test film and increase friction by turning hex slotted screw, at bottom of dashpot assembly, clockwise until best result is obtained.

B-13: CENTRAL PIVOT ANALOG SOUNDHEAD ASSEMBLY

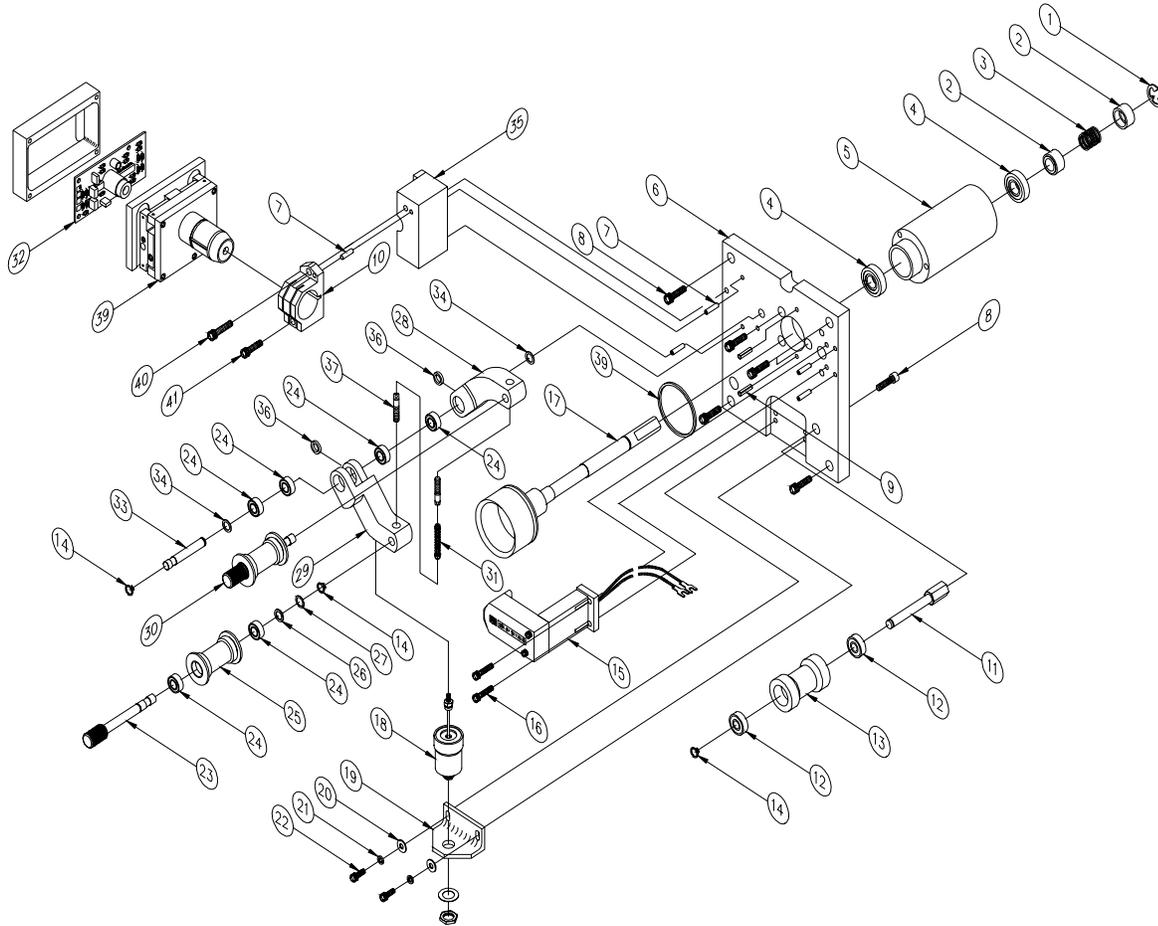


Figure B-13: Central Pivot Analog Soundhead Assembly (196260-001)

#	Item Description	Part Number
1	E Ring	598931-156
2	Spring Retainer, Sound Drum	119169-001
3	Compression Spring	598931-140
4	Ball Bearing, Flanged for Sound Head	598931-122
5	Bearing Housing	119158-001
6	Base Plate, Sound Head	196209-001
7	Dowel Pin 1/8Dia x 1/2	598931-017
8	Screw, SCH 8-32 x 5/8	598931-045
9	Spring Pin	598931-132

10	Clamp, Mount Analog Reader	196192-001
11	Shaft-35MM Film Roller	119159-001
12	Ball Bearing, By-Pass Roller Assembly	598931-119
13	Roller, Film By-Pass Sound Head	119168-001
14	External Retaining Ring	598931-154
15	Analog LED Assembly	196049-001
16	Screw, SHC 6-32 x 1/2	598931-042
17	Sound Drum-Shaft (DS, LED)	194798-001
18	Airpot - Snubber	598931-783
19	Dashpot Bracket, Sound Head	119160-001
20	Flat Washer #6	--
21	Flat Lock Washer #6	--
22	Screw, SHC 6-32 x 3/8	598931-041
23	Shaft, Lateral Guide Roller	119162-001
24	Bearing, Lateral Guide Roller	598931-124
25	Roller, Lateral Guide, Sound Head	119164-001
26	Shim Spacer	598931-438
27	Washer – Wave Spring	598931-439
28	Upper Arm, Block – Stabilizer	196183-001
29	Lower Arm, Block-Stabilizer	196183-002
30	Lateral Guide Roller Assembly	121312-001
31	Spring, Sound Head Sub Assembly	598931-145
32	LED Solar Cell Assy.	196212-002
33	Shaft, Arm Sound Head	196185-001
34	Shim Spacer, .020 THK.	598931-064
35	Mount, Bracket LED Reader	196224-001
36	Spacer, Bearing, Analog / Digital	196210-001
37	Spring Anchor	196205-001
38	Shim Spacer, .010 THK. (Optional)	598931-063
39	Analog Reader Assy.	196179-002
40	Screw, Hex Head 8-32 x 5/8”	--
41	Screw, Hex Head 8-32 x 1/2”	--

Table B-13: Central Pivot Analog Soundhead Assembly Parts List

B-14: CENTRAL PIVOT DIGITAL SOUNDHEAD ASSEMBLY

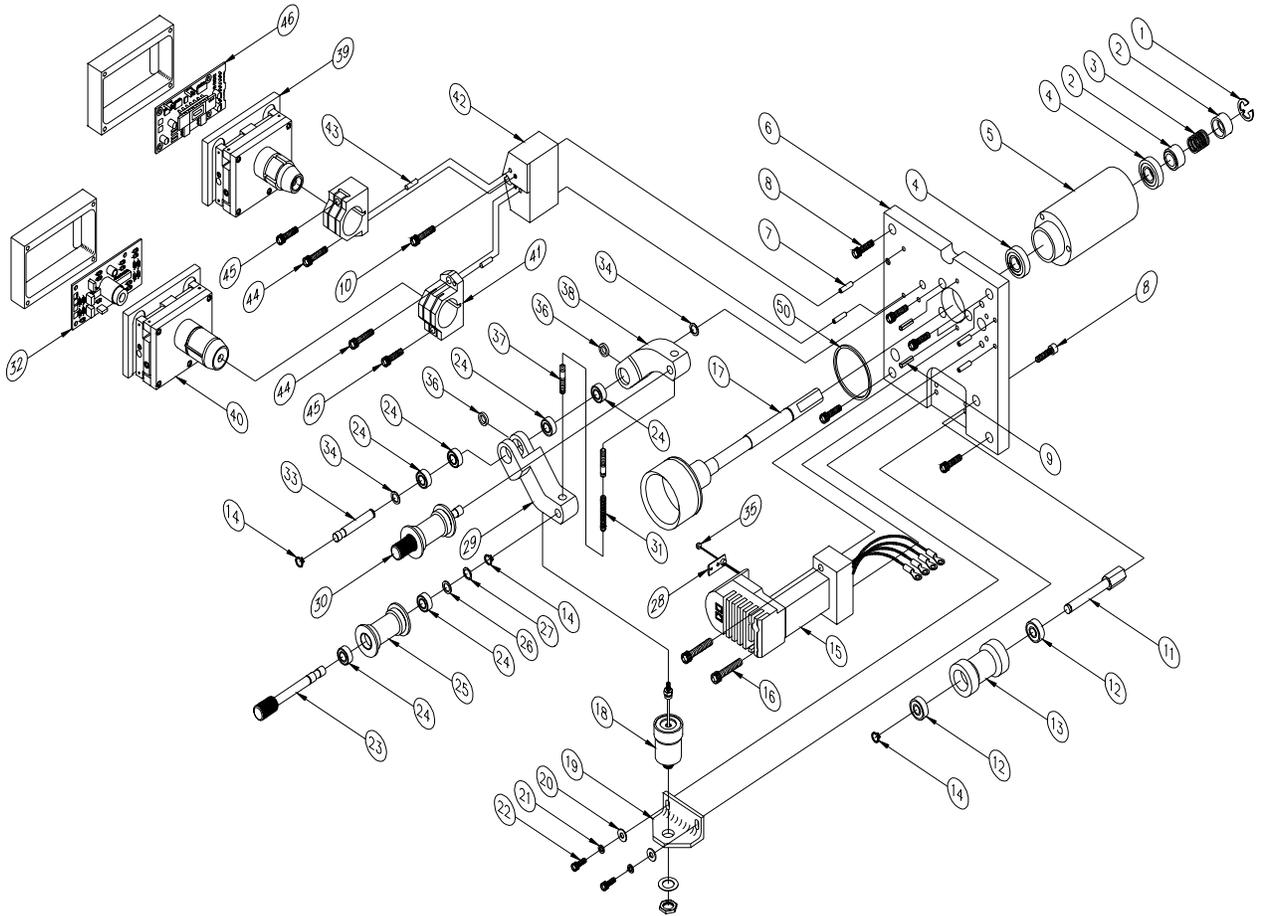


Figure B-14: Central Pivot Digital Soundhead Assembly (196220-002)

#	Item Description	Part Number
1	E Ring	598931-156
2	Spring Retainer, Sound Drum	119169-001
3	Compression Spring	598931-140
4	Ball Bearing, Flanged for Sound Head	598931-122
5	Bearing Housing	119158-001
6	Base Plate, Sound Head	196209-001
7	Dowel Pin 1/8Dia x 1/2	598931-017
8	Screw, SCH 8-32 x 5/8	598931-045

9	Spring Pin	598931-132
10	Screw, Hex Head 10-32 x 3/4	
11	Shaft-35MM Film Roller	119159-001
12	Ball Bearing, By-Pass Roller Assembly	598931-119
13	Roller, Film By-Pass Sound Head	119168-001
14	External Retaining Ring, By-Pass Roller Assembly	598931-154
15	Dual LED Mount Assembly	196184-001
16	Screw, SHC 10-32 x 1	598931-197
17	Sound Drum-Shaft (DS, LED)	194798-001
18	Airpot - Snubber	598931-783
19	Dashpot Bracket, Sound Head	119160-001
20	Flat Washer #6	
21	Flat Lock Washer #6	
22	Screw, SHC 6-32 x 3/8	598931-041
23	Shaft, Lateral Guide Roller	119162-001
24	Bearing, P35 Lateral Guide Roller Assembly	598931-124
25	Roller, Lateral Guide, Sound Head	119164-001
26	Shim Spacer	598931-438
27	Washer – Wave Spring	598931-439
28	LED Retainer Analog/Digital	196156-001
29	Lower Arm, Block-Stabilizer	196183-002
30	Lateral Guide Roller Assembly	121312-001
31	Spring, Sound Head Sub Assembly	598931-145
32	LED Solar Cell Assembly	196212-002
33	Shaft, Arm Sound Head	196185-001
34	Shim Spacer, .020 THK.	598931-064
35	LED, Visible Red	598931-704
36	Spacer, Bearing, Analog / Digital	196210-001
37	Spring Anchor	196205-001
38	Upper Arm, Block – Stabilizer	196183-001
39	Digital Reader Assembly	196182-001
40	Analog Reader Assembly	196179-002
41	Clamp Mount Analog / Digital Sound Head	196192-001
42	Mount Bracket Analog / Digital	196191-001
43	Dowel Pin 1/8Dia x 1/2	598931-017
44	Screw Hex Head 8-32 x 5/8	
45	Screw Hex Head 8-32 x 1/2	
46	CCD Assembly	196122-001
47	Digital Power Supply Assembly (Not Shown)	194834-001

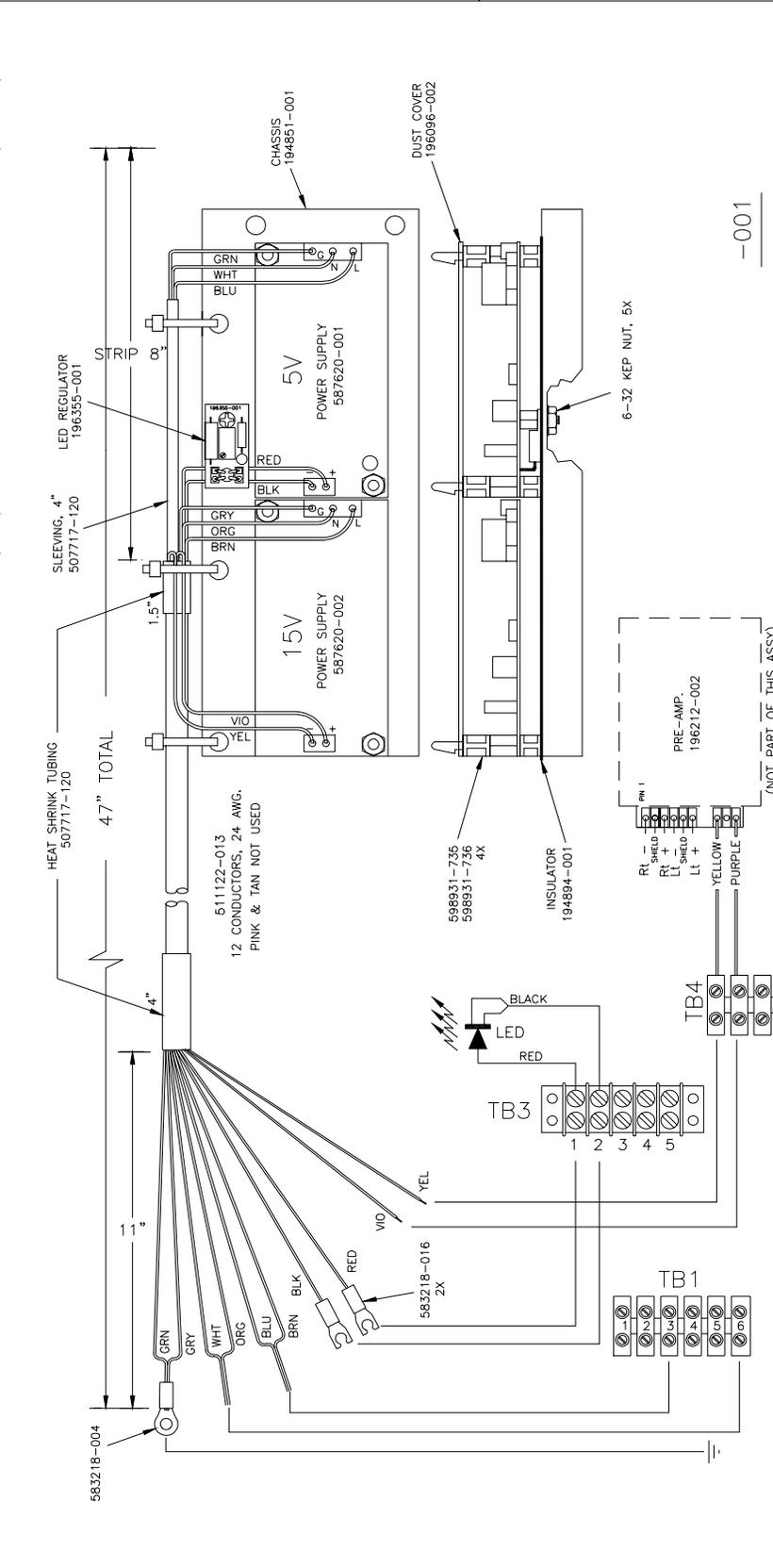
48	LED Power Supply Assembly (Not Shown)	194908-001
49	Shim Spacer .010 THK. (Optional) (Not Shown)	598931-063
50	O-ring, 1 1/2" ID x 1/16"	598931-097

Table B-14: Central Pivot Digital Soundhead Assembly Parts List

REV.	DESCRIPTION	DATE	APPROVED
C	NEW DRAWING (WAS P/L ONLY)	02.15.00	DSR

REVISIONS

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REV.	DESCRIPTION	DATE	APPROVED
C	NEW DRAWING (WAS P/L ONLY)	02.15.00	DSR

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES FRACTIONS .XXX ± .001 ANGLES ± .001		CONTRACT NO.	
MATERIAL N/A		APPROVALS	
FINISH P35		DRAWN DSR	
NEXT ASSY USED ON N/A		CHECKED	
APPLICATION		APPROVED	
DO NOT SCALE DRAWING		ISSUED	

CHRISTIE INCORPORATED		P/S ASSY, SOUND READER ANALOG	
SIZE	CAGE NO.	DWG. NO.	REV
B	194908	194908	C
SCALE	1	SHEET	1 of 1

CONNECTIONS SHOWN FOR REFERENCE

NOTES: UNLESS OTHERWISE SPECIFIED