INSTRUCTIONS FOR MAINTENANCE AND INSPECTION:
SERVO 7707 UPGRADE HOTBOX DETECTOR SYSTEM

I. Weekly Inspections and Tests performed by Signal Maintainer:

A. Clean lens and lens cap with tap water or soft cloth. Replace damaged, or perforated, lens caps. Extreme care must be used to avoid scratching the lens and positively do not use detergents or solvents for cleaning.

B. Inspect transducers, scanners, deflecting guards and track fittings to see if properly secured and no external damage visible.

C. Check track conditions: If track is "pumping" or "running" more than two inches, contact section gang for repair.

D. Run self-test on Integrity Test Unit (I T U) Logic No. 3 Card: Push Switch "S 1", and observe proper operation.

E. Change recorder tape (as required) and send tapes to Signal Inspectors' Office for their review.

F. Watch train and observe normal levels.

II. Monthly Inspections and Tests performed by Signal Maintainer:

A. Perform all Weekly Tests.

B. Using Model 260 Simpson, or Fluke 8024B meter, check supply voltages and enter on log sheet:

1. -12 Volts DC Unregulated: TB 1-4 and TB 1-1

2. -12 Volts DC Regulated: TB 1-3 and TB 1-1

3. +24 Volts DC Regulated: Main Power Supply Test: Jack and common.

4. +200 Volts DC: Main Power Supply Test: Jack and common.

5. +170 Volts DC B+: Main Power Supply Test: Jack and common

6. 120 Volts AC Unregulated: TB 1-5 and TB 1-7

II - B. (continued):

7. 1 1 5 Volts A C Regulated: T B 1 - 9 and T B 1 - 1 1

8. - 1 7 0 Volts D C: Reference Voltage Standard Test: Jack and common.

9. + 1 7 0 Volts D C: Reference Voltage Standard Test: Jack and common.

Note: Reference voltage Standard voltage will vary with ambient temperature. The important check is that the readings are balanced. They should not vary more than +/- 5 Volts.

10. Pulse processor input: Input jack on front of pulse processor and common.

11. Pulse processor output: Output jack on front of pulse processor and common.

C. Recorder calibration:

Push test button on front of Harmon W C O - 2 7 Recorder and check test pattern. Adjust gain of recorder to give level adjusted to on Item III-C.-11 (Page 4).

D. Record differential alarm setting.

E. Record absolute alarm setting.

F. Dragging equipment test:

1. Drop C T R

2. Turn on function simulator

3. Kick dragger.

4. Turn off function simulator

5. Pick C T R

6. Verify that Mars light came on, D S got indication and that radio transmitted.

G. Make Standard Cross and Grounds Test.

Note: Local Battery B B and N will show ground because of connection to Harmon Recorder.

III. Quarterly Inspections and Tests performed by Signal Inspector and Signal Maintainer:

A. All weekly and monthly tests should be performed before continuing with quarterly tests.

B. Check alignment:

1. Method:
Using new optical alignment fixture P N 2 0 0 0 9 9 - 8 1 - 5.

a. Install mirror cap on front of bolometer.

Note: Insure that cap fits securely and is flush to top of bolometer.

b. Install alignment fixture on rail and adjust to a point 14-1/2 inches from gage and 43-3/4ths inches from front of bolometer lens to back of alignment target, as shown on Page 7.

c. Site through alignment target hole and see if red dot appears inside circle of target?

d. If alignment is not correct, adjust for proper alignment.

e. Repeat Steps III - B - 1 - a through III - B - 1 - d for other scanner.

2. Method:
Using old-style alignment fixture:

a. Install pre-heated function simulator on alignment fixture.

b. Adjust alignment fixture so that heat source faces bolometer and is 14-1/2 inches from gage and 43-3/4ths inches from front of bolometer lens to back of heat source of function simulator, as shown on Page 7.

c. Drop C T R

d. Turn on function simulator

e. While observing recorder, have maintainer gently push on bolometer to determine where peak signal is seen.

f. If peak signal is not at the original position, adjust alignment until peak signal is seen for proper alignment.

g. Move function simulator and alignment fixture to other rail and check alignment as in Steps e. and f, above.

h. Turn off function simulator.

i. Pick C T R

III C. Check recorder calibration:

1. Set pre-heated function generator or function simulator on Rail 1 scanner. (The temperature should be set at 130° F. over ambient.)

2. Set tension on recorder pens to 2 grams.

3. Drop short track relay (C T R).

4. Turn on function simulator.

5. Using either scope or Fluke 8 0 2 4 B, "peak hold" meter, read output of Rail 1 pulse processor.

6. Adjust gain of pulse processor until 55 volts is seen on meter.

7. Adjust gain of Channel 1 Recorder to 10 m m (5.5 volts per m m).

8. Move function simulator to Rail 2 and repeat Steps 5 through 7, above, on Rail 2.

9. Turn off function simulator.

10. Pick C T R.

11. Push test button on recorder and record level seen.

D. Check alarm levels:

1. Differential alarm:

a. Set pre-heated function generator of function simulator on Rail 1 scanner. (The temperature should be set at 130° F. over ambient.)

b. Drop short track relay (C T R).

c. Turn on function simulator.

d. Adjust Rail 1 pulse processor to 9 m m (with 1 m m pedestal on Rail 2).

III D. 1. (continued):

e. Rail 1 should alarm. Move gain up and down to verify it is firing at 10 m m.

f. If level is not correct, adjust Rail 1 pot on A M D (Alarm Monitor - Differential).

g. Do Steps D - 1 - a through D - 1 - e for Rail 2.

h. If level is not correct, adjust Rail 2 pot on A M D.

2. Absolute alarm:

a. Set pre-heated function generator or function simulator on Rail 1 scanner.

b. Drop short track relay (C T R).

c. Turn on function simulator

d. Adjust Rail 1 pulse processor to 15 m m.

Note: If you cannot get enough gain out of pulse processor, set function simulator at focal point.

e. Remove fuse from A M D.

f. Rail 1 should alarm: Move gain up and down to verify it is firing at 15 m m.

g. If level is not correct, adjust Rail 1 pot in A M A (Alarm Monitor - Absolute).

h. Do Steps a through f, above, for Rail 2.

i. If level is not correct, adjust Rail 2 pot in A M A.

j. Turn off function simulator.

k. Pick C T R.

l. Replace fuse in A M D.

m. Run self-test to insure alarm monitors are working.

III E. Calibration of pulse processors:

1. Put pre-heated function generator of function simulator on alignment fixture and position at focal point for Rail 1. (The temperature should be set at 130° F. over ambient.)

2. Drop short track relay (C T R)

3. Turn on function simulator.

4. Adjust gain on Rail 1 pulse processor for 10 m m.

5. Remove function simulator from alignment fixture and set on scanner and record level seen.

6. Set function simulator off scanner and set pedestal for 1 m m.

7. Do Steps 1 through 6, above, for Rail 2.

8. Turn off function simulator.

9. Pick C T R

F. Alarm checkout:

1. Drop short track relay (C T R)

2. Turn on function simulator

3. Put heat in front of Rail 1 scanner (cigarette or soldering iron).

4. Leave heat source in front of scanner until more than four (4) alarms are seen.

5. Turn off function simulator.

6. Pick C T R

7. Listen to readout and verify that alarms are correct for left or right designation—and count is correct—and only four (4) alarms are given.

8. Do Steps 3 through 7, above, for Rail 2.

9. On one of the above tests, kick the dragger and verify alarm is given—and count is correct.

10. On one of the above tests, listen to readout on truck radio to verify radio is "keying" and audio quality is good.

Assistant Chief Engineer-Signals
Topeka, Kansas
Revised: 28 April 1986
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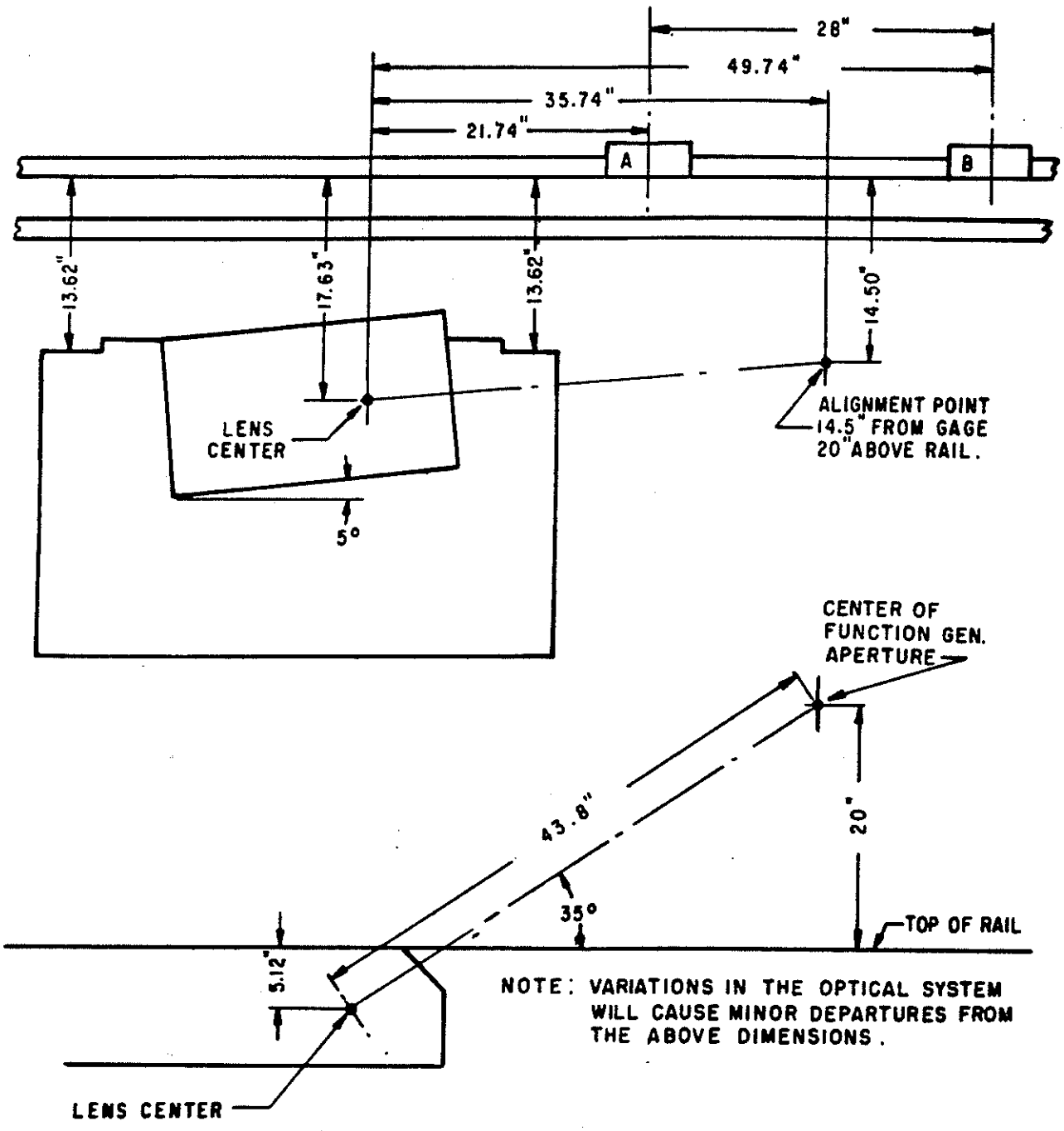
28"
49.74"
35.74"
21.74"
A
B
13.62"
17.63"
13.62"
14.50"
LENS CENTER
5°
ALIGNMENT POINT
14.5" FROM GAGE
20" ABOVE RAIL.
CENTER OF
FUNCTION GEN.
APERTURE
43.8"
20"
35°
TOP OF RAIL
5.12"
LENS CENTER
NOTE: VARIATIONS IN THE OPTICAL SYSTEM
WILL CAUSE MINOR DEPARTURES FROM
THE ABOVE DIMENSIONS.

"7707" Upgrade Hotbox Detector Inspection Record

(to be sent to Signal Supervisor's Office monthly)

Location: _____ Division: _____

District: _____ Milepost/s: _____

Month: _____ Name: _____

WEEKLY INSPECTIONS ("Yes" or "No")

	Week 1	Week 2	Week 3	Week 4	Week 5
Clean lens					
Inspect transducers and scanners					
Check track conditions					
Run self-test ("Pass" or "Fail")					
Watch train and observe normal levels					
Date and Initials					

MONTHLY INSPECTIONS

	Typical Levels	Found	Left
- 12 V UnReg	- 13.5		
- 12 V Reg	- 12.0		
+ 24 V DC	24		
200 V DC	190		
170 V B+	165		
120 V AC	120		
115 V Reg AC	114		
- 170 V DC	- 160		
+ 170 V DC	+ 160		
Rail 1: Pulse Processor Input	+ 12		
Rail 2: Pulse Processor Input	+ 12		
Rail 1: Pulse Processor Output	0		
Rail 2: Pulse Processor Output	0		
Recorder Calibration	OK		
Differential Alarm	9 mm		
Absolute Alarm	15 mm		
Dragging Equipment Test	OK		
Indication and Mars Light Test	OK		
Cross and Grounds Test	OK		

List repairs made during month (Note: Use other side of page):

Copy to Mr. B. B. Gaddis

1674U - 8 (Dated 21 October 1968)

10-16-85