

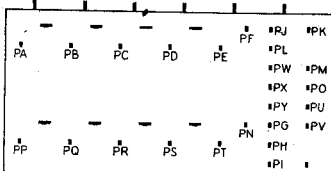
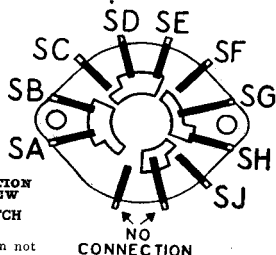


Firestone Tire & Rubber Co.

Firestone Tire & Rubber Co.			
	Model: 4A22	Chassis:	Year: Pre 1948
	Power:	Circuit:	IF:
	Tubes:		
	Bands:		
Resources			
Riders 15 (XV) FIRESTONE 15-7			
Riders 15 (XV) FIRESTONE 15-10			
Riders 15 (XV) FIRESTONE 15-11			
Riders 15 (XV) FIRESTONE 15-12			

PUSH-BUTTON RANGES:

Button No. 1 —540-1000 KC.
 Button No. 2 & 3—650-1300 KC.
 Button No. 4 & 5—975-1600 KC.

PUSH-BUTTON SWITCH
502177REAR SECTION
REAR VIEWBAND SWITCH
502147

(Front section not
used as switch)

DIA-
GRAM PART
NO. NO.

CONDENSERS

LIST
PRICE

DIA-GRAM NO.	PART NO.	DESC. (PTION)	LIST PRICE
3	502984	Condenser—mica 120 Mmfd. 500 volt.	\$0.24
4	502171	Condenser—trimmer; 5 to 35 Mmfd.	.24
6A to E	502910	Condenser—trimmer assembly for P-B tuner	3.00
12	502161	Condenser—mica 270 Mmfd. 500 volt.	.45
13	502165	Condenser—mica 1,000 Mmfd. 500 volt.	.45
16A, B, C	504086	Condenser—trimmer assembly	1.10
		A — 20 to 270 Mmfd.	
		B — 40 to 370 Mmfd.	
		C — 40 to 370 Mmfd.	
18	502153	Condenser—.05 Mfd. 200 volt.	.24
20	502155	Condenser—.1 Mfd. 200 volt.	.30
21	502157	Condenser—.05 Mfd. 400 volt.	.24
24	502271	Condenser—mica 250 Mmfd. 500 volt.	.24
25	502165	Condenser—mica 1,000 Mmfd. 500 volt.	.45
27	502159	Condenser—mica 50 Mmfd. 500 volt.	.24
30	502172	Condenser—trimmer; 25 to 100 Mmfd.	.36
31	502159	Condenser—mica 50 Mmfd. 500 volt.	.24
33	502151	Condenser—.01 Mfd. 400 volt.	.20
38	502157	Condenser—.05 Mfd. 400 volt.	.24
43	502271	Condenser—mica 250 Mmfd. 500 volt.	.24
44	502150	Condenser—.004 Mfd. 600 volt.	.20
45	502157	Condenser—.05 Mfd. 400 volt.	.24
49	502160	Condenser—mica 120 Mmfd. 500 volt.	.24
50	502152	Condenser—.02 Mfd. 400 volt.	.24
55	502410	Condenser—.1 Mfd. 400 volt.	.30
57	502405	Condenser—.25 Mfd. 400 volt.	.36
59A, B, C	502207	Condenser—electrolytic	2.20
		A — 20 Mfd. 400 volt	
		B — 10 Mfd. 400 volt	
		C — 20 Mfd. 25 volt	
60	502150	Condenser—.004 Mfd. 600 volt.	.20
61	502154	Condenser—.05 Mfd. 600 volt.	.24

RESISTORS

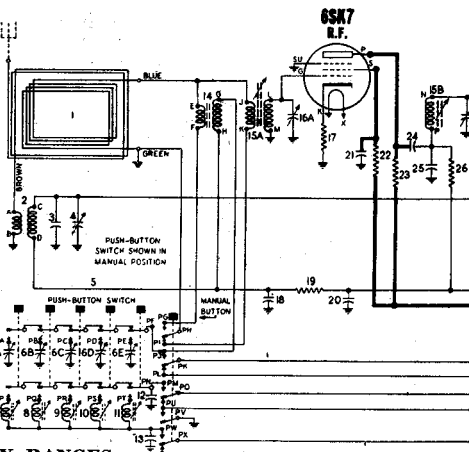
DIA-GRAM NO.	PART NO.	DESC. (PTION)	LIST PRICE
17	502127	Resistor—carbon 560 ohms 1/4 watt.	.12
19	502134	Resistor—carbon 470,000 ohms 1/4 watt.	.12
22	502128	Resistor—carbon 100,000 ohms 1/4 watt.	.12
23	502291	Resistor—carbon 4700 ohms 1/4 watt.	.12
26	502134	Resistor—carbon 470,000 ohms 1/4 watt.	.12
28	502130	Resistor—carbon 22,000 ohms 1/4 watt.	.12
34	502466	Resistor—carbon 33,000 ohms 1 watt.	.16
36	502135	Resistor—carbon 2.2 Meg. 1/4 watt.	.12
37	502284	Resistor—carbon 470 ohms 1/4 watt.	.12
38	502467	Resistor—carbon 68,000 ohms 1/4 watt.	.12
41	502131	Resistor—carbon 47,000 ohms 1/4 watt.	.12
42A, B	502148	Volume control 500,000 ohms (with switch)	1.25

FREQUENCY RANGES:

Standard
 Broadcast
 Band } 540-1600 KC.
 Short
 Wave
 Band } 9.35-9.88 MC.

The above circuit applies to chassis which have number. Early production chassis without the

If a broad tuning peak or a dead spot is encountered trimmer No. 5 at 1600 Kc. (in chassis without oscillation resulting from extraneous coupling be 69 at position shown in above circuit.



DIA-GRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
46	502468	Resistor—carbon 4.7 Meg. 1/4 watt.	\$.12
47	502128	Resistor—carbon 100,000 ohms 1/4 watt.	.12
51	502133	Resistor—carbon 220,000 ohms 1/4 watt.	.12
53	502132	Resistor—carbon 100,000 ohms 1/4 watt.	.12
54	502134	Resistor—carbon 470,000 ohms 1/4 watt.	.12
56	502135	Resistor—carbon 2.2 Meg. 1/4 watt.	.12
62	502291	Resistor—carbon 4700 ohms 1/4 watt.	.12
63	502127	Resistor—carbon 560 ohms 1/4 watt.	.12
65	502137	Resistor—wire wound 350 ohms 2 watt.	.25
69	502264	Resistor—carbon 47 ohms 1/4 watt.	.12
COILS & TRANSFORMERS			
1	502247	Loop antenna	4.15
2	504298	Coil—S. W. antenna	1.35
	502025	Complete coil and trimmer assembly for push-button tuner	8.80
7	502907	Coil less slug (540-1600 Kc.)	1.50
8, 9	502908	Coil less slug (650-1300 Kc.)	1.50
10, 11	502909	Coil less slug (975-1600 Kc.)	1.50
	502911	Slug for coils, 502907, 502908, 502909	.25
	501151	Clip for mtg. push-button coils	.08
14	502112	Coil—B.C. antenna (for push-button)	1.70
15 (A,B,C,D)	504294	Tuning unit—complete assembly	10.60
15A	504210	Coil—B.C. antenna coupling (less slug).	1.20
15B	504214	Coil—R.F. (less slug).	.85
15C	504295	Coil—B.C. antenna (less slug).	1.00
15D	504342	Coil—S.W. oscillator (less slug)	.75
	504211	Slug for B.C. antenna coupling or S.W. osc. coil (yellow end)	.45
	504213	Slug for B.C. oscillator coil (white end)	.45
	504215	Slug for R.F. coil (purple end)	.45
32	502111	Coil—S.W. oscillator (air core)	1.10
35	502102	Transformer—1st I.F.	2.30
40	502163	Transformer—2nd I.F.	2.30
48	502174	Transformer—power	7.50
	502170	Transformer—output for R-502168 speaker	2.00
66	504661	Transformer—output for M-502168 speaker	2.00
	504122	Transformer—output for R-502168 speaker	2.00

OTHER ELECTRICAL PARTS

DIA-GRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
5	502177	Switch—push button	4.10
29	502147	Switch—band	2.00
57, 58	110629	Wamp-dial (Model #44) V 0.25 Amps	2.30
24	502146	Switch—tone control	.70
66	502168	Speaker—Electro-Dynamic (8 inch)	8.50
	502169	Cone & voice coil for R-502168 speaker	2.75
	504062	Cone & voice coil for M-502168 speaker	2.75
	504123	Cone & voice coil for R-502168 speaker	2.75

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

John F. Rider

MODELS 4A21, 4A22

Adam

THE FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

1. Remove chassis and loop antenna from cabinet (do not remove loop of wire stapled to cabinet). After chassis has been removed, replace loop antenna in cabinet. Stand the chassis on one end and space it approximately same distance from loop as when installed in cabinet. Then reconnect all leads to loop antenna and to loop of wire stapled on cabinet.
2. Turn the tuning control knob clockwise as far as it will go (tuner mechanism is now in maximum open position with tuning slugs almost completely withdrawn from coils). Dial pointer should then point to 1600 KC mark on scale. If it is set incorrectly, release pointer clip on dial cord and reposition pointer.
3. Connect output meter across speaker voice coil or from 6K6GT plate to chassis through a .1 Mfd. condenser.
4. Connect the ground lead of the signal generator to the receiver chassis.
5. Set volume control at maximum volume position and use a weak signal from the signal generator.
6. Push in the manual button and leave it in that position throughout the alignment procedure.

IMPORTANT!—Align this receiver in exactly the order shown below.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO GENERATOR TC	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
Set tuner mechanism to maximum open position by turning the tuning control knob clockwise as far as it will go (Dial pointer at 1600 KC). Then check whether the positions of the tuning slugs correspond to the positions shown in Fig. 2. If settings are incorrect, rotate the individual core and threaded stem until desired position is reached. Note that threaded stem is prevented from moving by a dab of speaker cement at top and this seal must be removed before stem can be rotated.							
.1 MFD. Condenser	Terminal "T" on Tuner Unit (See Fig. 2).	455 KC	Broadcast (Clockwise)	Any point where it does not affect the signal.	1, 2 3, 4	2nd I.F. 1st I.F.	Adjust for maximum output. Then repeat adjustment.
500 MMFD. Mica Condenser	External Antenna Clip on Loop Frame	1600 KC	Broadcast (Clockwise)	1600 Kc.	5	Broadcast Oscillator	Adjust for maximum output.
				Tune to 1600 Kc. generator signal.	6	Broadcast R.F.	Adjust for maximum output.
					7	Broadcast Ant.	Adjust for maximum output.
500 MMFD. Mica Condenser	External Antenna Clip on Loop Frame	1400 KC	Broadcast (Clockwise)	Set pointer to 1400 Kc. mark on dial scale. Do not attempt to tune to generator signal.		BC. Osc. coil tuning slug	Adjust position of slug for maximum output.
						BC. R.F. coil tuning slug	Adjust position of slug for maximum output.
						BC. Ant. coil tuning slug	Adjust position of slug for maximum output.
500 MMFD. Mica Condenser	External Antenna Clip on Loop Frame	1600 KC	Broadcast (Clockwise)	Set pointer to 1600 Kc. mark on dial scale. Do not attempt to tune to generator signal.	5	Broadcast Oscillator	Adjust for maximum output.
				Tune to 1600 Kc. generator signal.	6	Broadcast R.F.	Adjust for maximum output.
					7	Broadcast Antenna	Adjust for maximum output.
500 MMFD. Mica Condenser	External Antenna Clip on Loop Frame	1400 KC	Broadcast (Clockwise)	Tune to 1400 Kc. generator signal.		BC. R.F. coil tuning slug	Adjust position of slug for maximum output.
						BC. Ant. coil tuning slug	Adjust position of slug for maximum output.
400 OHM Carbon Resistor	External Antenna Clip on Loop Frame	9.6 MC	Short wave (Counter-Clockwise)	9.6 Mc.	8	S.W. Oscillator	Adjust for maximum output. Check to see if proper peak was obtained by setting the signal generator to 10.5 Mc. and then tune radio in vicinity of 9.6 Mc. If image signal is not heard, realign at 9.6 Mc. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	External Antenna Clip on Loop Frame	9.6 MC	Short wave (Counter-Clockwise)	Tune to 9.6 Mc. generator signal.	9	S.W. Antenna	Adjust for maximum output. Try to increase output by de-tuning trimmer and retuning receiver dial until maximum output is obtained.

Apply a coating of speaker cement at top of each tuning core stem to prevent movement.

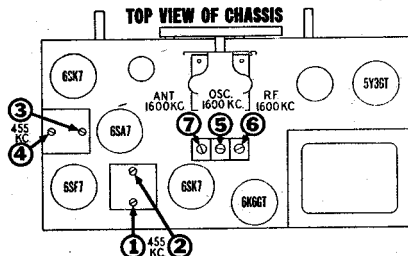
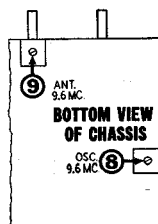


FIG. 1—TRIMMER LOCATIONS

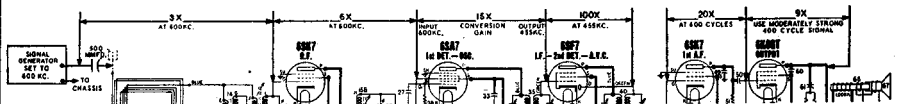
THE FIRESTONE TIRE & RUBBER CO. MODELS 4A21, 4A22 Adam

APPROXIMATE STAGE GAIN DATA

Be sure R.F. and I.F. stages are accurately aligned before measuring gain. R.F. gains can be measured with a "channel" type instrument containing a tuned and calibrated R.F. amplifier. A vacuum tube voltmeter may be used for audio gain measurements. Observe following precautions:

- For all gain measurements connect signal generator as shown. Use 600 KC. signal with 400 cycle modulation (use nearby frequency if local station interferes.)
- For R.F. and I.F. measurements connect negative terminal of a 3 volt battery (two 1½ volt cells in series) to A.V.C. lead at terminal "D" of S.W. Ant. coil. Then connect positive battery lead to receiver chassis. This provides a definite operating point. **IMPORTANT:** Disconnect battery when measuring audio stage gains.
- Be sure radio is carefully tuned to generator signal (use weak signal for sharp tuning.)
- When using a "channel" type instrument carefully tune it for maximum output at desired frequency before making measurements.

The R.F. and I.F. stage gains shown below are less than under normal operating conditions due to the use of 3 volts fixed bias in order to establish a definite operating point. Therefore, these values are not intended to indicate the full capability of a stage.



Differences in tube characteristics, tolerance of parts, adjustment of tuned circuits, and variations of line voltage will influence stage gain. Accuracy of measurements is dependent upon careful tuning of receiver to generator signal and experience in using your test equipment. These factors may create considerable variation in gain measurements.

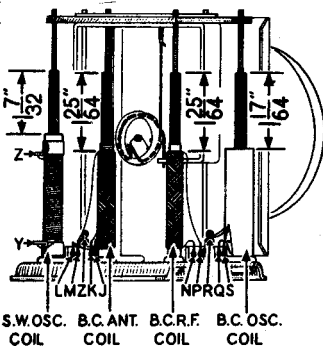


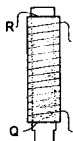
FIG. 2—SLUG TUNER ASSEMBLY (Rear View)

(Drive Parts)

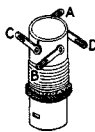
- 117057 Cord (8")
114955 Clip on cord
504012 Spring



B.C. R.F. COIL
504214



B.C. OSCILLATOR COIL
504295



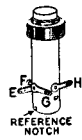
S.W. ANTENNA COUPLING COIL
504296



S.W. OSCILLATOR COIL
504342



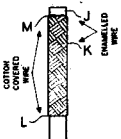
S.W. OSCILLATOR COIL
502111



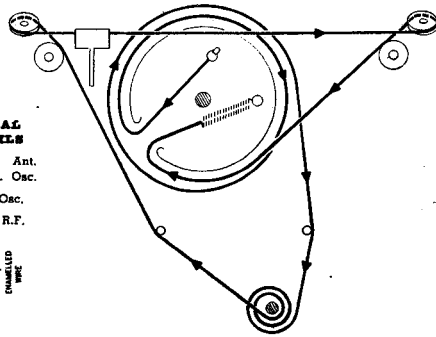
B.C. ANT. COUPLING COIL (PUSH-BUTTON)
502112

SLUGS FOR MANUAL TUNING COILS

- 504211—For B.C. Ant. and S.W. Osc.
504213—For B.C. Osc.
504215—For B.C. R.F.



B.C. ANTENNA COUPLING COIL
504210



DIAL AND POINTER DRIVE CORD ARRANGEMENT

To string dial cord, turn the main drive drum to maximum counter-clockwise position and use following parts:

- 114955 Clip on end of cord
117057 Cord (54 inches)
119087 Ring for dial cord
161384 Tension Spring

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

