PHOTOFACT* Folder

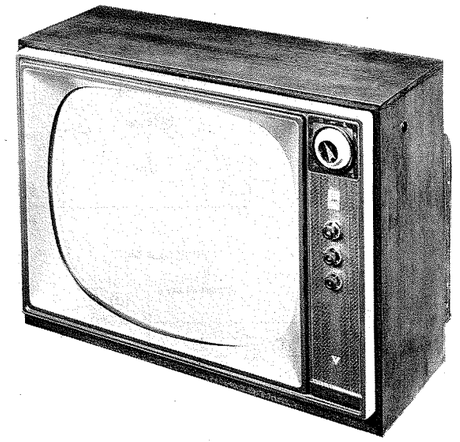
*TRADE MARK

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U,
821-K-910, U, 821-T-901, U, 821-T-905, U,
921-K-910, U, 921-T-901, U (Ch. 1051-19)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 821-T-901

1. Remove 11 wood screws holding rear cover. Remove antenna connections. Remove rear cover.
2. Remove 6 push-on type knobs from the front.
3. Remove speaker leads, yoke plug, picture tube socket, and Hi-Voltage lead.
4. Remove 4 metal screws holding front control panel. Remove front control panel from the cabinet.
5. Remove pilot light.
6. Remove 6 chassis bolts from the bottom of the cabinet.
7. Remove the chassis.



MODEL 821-T-901 (CH. 1051-19)

TRADE NAME	Trav-Ler	MODELS	CHASSIS
		821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U	1051-19
MANUFACTURER	Trav-Ler Radio & Tele. Corp., 571 West Jackson Blvd., Chicago 6, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF-Seventeen, UHF-Eighteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 195 Watts, 1.9 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube, and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)
One fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove the plug button located on the upper right side of the cabinet.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

SYNC STABILITY

Sync stability may be varied by means of a Range control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

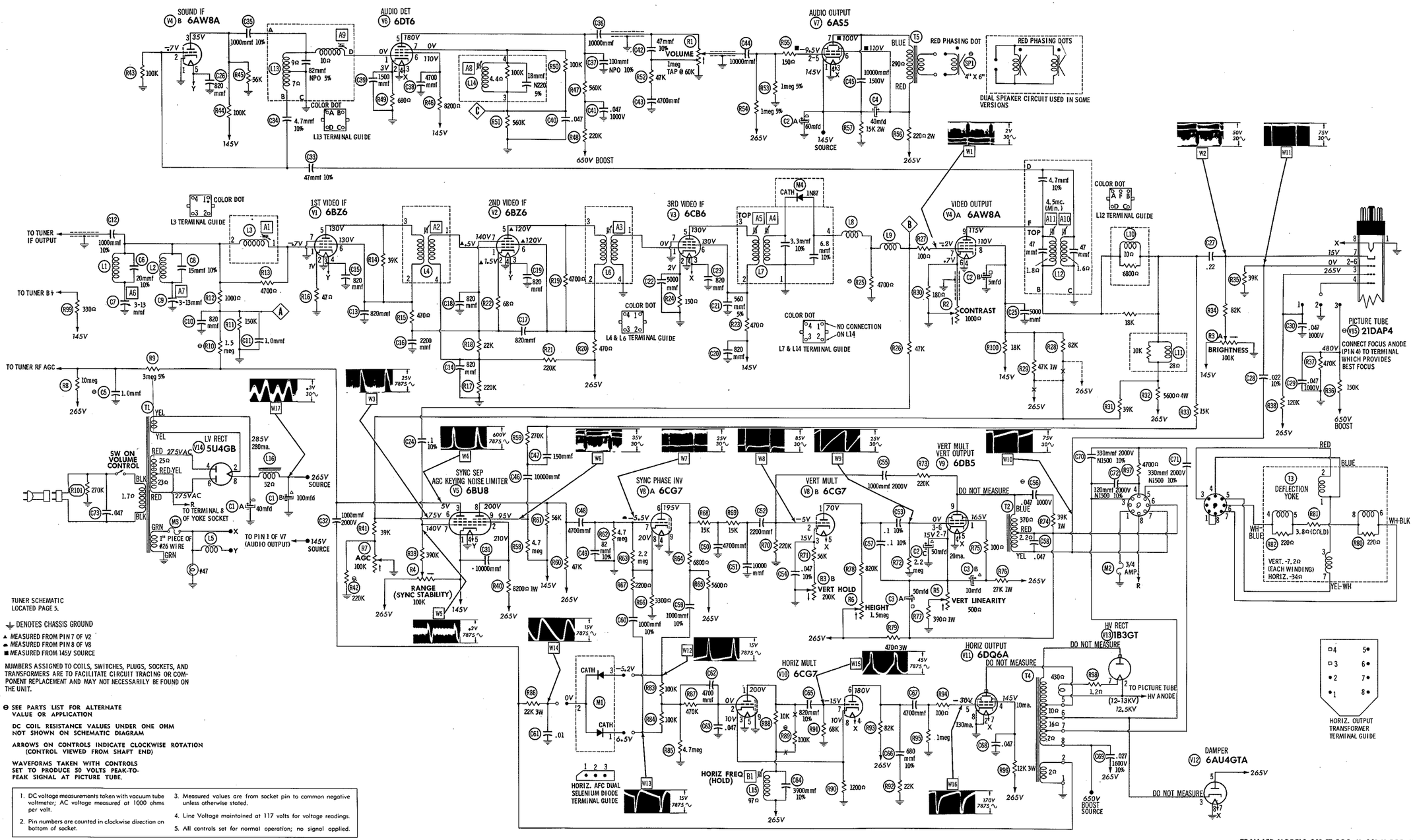
CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

JA417

SET 453 FOLDER 2



TUNER SCHEMATIC
LOCATED PAGE 5.

⏚ DENOTES CHASSIS GROUND

▲ MEASURED FROM PIN 7 OF V2
● MEASURED FROM PIN 8 OF V8
■ MEASURED FROM 145V SOURCE

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

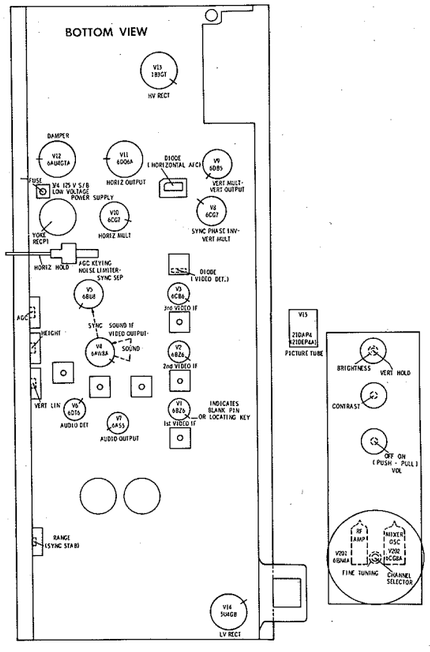
TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	150K	47Ω	0Ω	.1Ω	▲ 470Ω	▲ 470Ω	0Ω		
V2	6BZ6	▲ 22K	▲ 68Ω	.1Ω	0Ω	†470Ω	†470Ω	160K		
V3	6CB6	.1Ω	150Ω	.1Ω	0Ω	■ 470Ω	■ 470Ω	0Ω		
V4	6AW8A	0Ω	100K	■ 45K	0Ω	.1Ω	● 50Ω	4800Ω	15K	†5600Ω
V5	6BU8	■ 0Ω	†8200Ω	1.5meg	0Ω	.1Ω	†25K	●†410K	†30K	■ 4.7meg
V6	6DT6	19Ω	680Ω	.1Ω	0Ω	¶780K	■ 8200Ω	560K		
V7	6AS5	¶	550K	.1Ω	0Ω	550K	†220Ω	†510Ω		
V8	6CG7	● †1.5meg	220K	● 60K	0Ω	.1Ω	†12K	1.7meg	3300Ω	0Ω
V9	6DB5	†27K	● 500Ω	2.2meg	0Ω	.1Ω	2.2meg	●500Ω	NC	†840Ω
V10	6CG7	†10K	1meg	1200Ω	.1Ω	0Ω	†82K	68K	1200Ω	0Ω
V11	6DQ6A	NC	0Ω	NC	†12K	1meg	TP	.1Ω	0Ω	TOP CAP †10Ω
V12	6AU4GTA	NC	NC	¶700K	NC	†0Ω	NC	.1Ω	0Ω	
V13	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †440Ω
V14	5U4GB	NC	¶	NC	25Ω	NC	23Ω	NC	¶	
V15	21DAP4	0Ω	39K	†120K	0Ω	NC	39K	●■ 100K	.1Ω	
V201	6BN4A	0Ω	3.5meg	0Ω	.1Ω	■ 1300Ω	0Ω	3.5meg		
V202	6CG8A	10K	■ 5900Ω	0Ω	0Ω	.1Ω	■ 1300Ω	■ 10K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

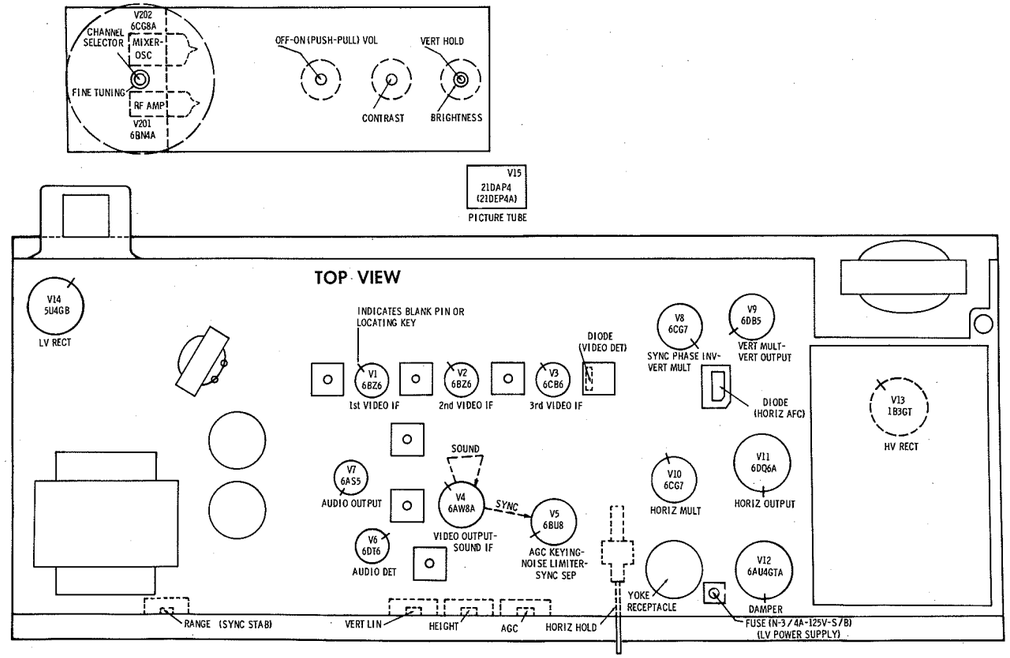
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
■ MEASURED FROM 145V SOURCE.
† MEASURED FROM 265V SOURCE.
‡ MEASURED FROM PIN 3 OF V12.
▲ MEASURED FROM PIN 7 OF V2.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (B+), V14, Fuse Wire (Fil.)

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14, V15, Diode (Horiz. AFC)
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V14, V10, V11, V12
Vert. off freq. V8, V9
Horiz. off freq. V10, Diode (Horiz. AFC)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V8
No horiz. sync V5, V8, Diode (Horiz. AFC), V10
No vert. or horiz. sync V5, V8

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A5, A8 thru All...GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A6, A7 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
Mixer Plate Coil .....GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Set Contrast fully clockwise and AGC fully counterclockwise.
Connect the negative lead of a 3 volt bias supply to point (A) . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.0MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B) . Low side to chassis. (Across Video Det. load)	A1, A2, A3, A4, A5, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust Mixer Plate Coil and A2 to place 45.75MC marker at 50% on curve, A1 and A3 to correct low frequency side of curve, A4 for MINIMUM dip and A5 for proper tilt.
2.	"	"	"	41.25MC 47.25MC	"	"	A6, A7	Adjust A6 to place 41.25MC marker in proper trap notch. Adjust A7 to place 47.25MC marker in other trap notch.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.05mfd	High side to point (B) . Low side to chassis.	4.5MC (15KC Swp)	Any non-interfering channel	Across voice coil. Connect DC probe of VTVM to point (C) . Common to chassis.	A8	Use high signal input. Set Volume for audible level. Adjust A8 for maximum audio on scope. If two peaks occur, select the one giving the highest meter readings.
4.	"	"	"	"	"	A9, A10	Reduce the signal level to the point where the audio on the scope starts to break up. Adjust A9 and A10 for cleanest maximum audio output on scope. Reduce the signal level still farther retouch A9 and A10 for cleanest maximum audio on scope.

SOUND IF ALIGNMENT USING AIR SIGNAL AND VTVM

Set the Contrast fully clockwise and tune in an air signal.
Connect the positive lead of the VTVM to point (C); negative lead to chassis.
Preset A8 fully counterclockwise. Next turn A8 clockwise until a peak is obtained on the meter. The point of maximum undistorted sound as judged by listening, will occur slightly past this peak and will be between 2.5 and 3.5 volts on the meter. Tune A8 for maximum undistorted sound and not peak voltage. Reduce the signal by disconnecting the antenna or detuning the Fine Tuning until the sound is distorted. Adjust A9 and A10 for maximum undistorted sound. Further reduce the sound and retouch A9 and A10. Continue reducing the signal and retouching A9 and A10 until optimum results are obtained. It may be necessary in some cases to retouch A8 for MINIMUM buzz at strong signal levels and A10 for cleanest sound at weak signal levels.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.05mfd	High side to point (B) . Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode det. (Fig. 2) to pin 7 (cathode) of picture tube. Common to chassis.	All	Adjust for MINIMUM deflection.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

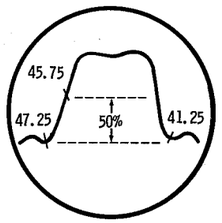


FIG.1

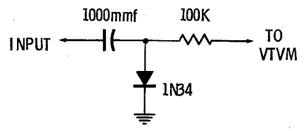
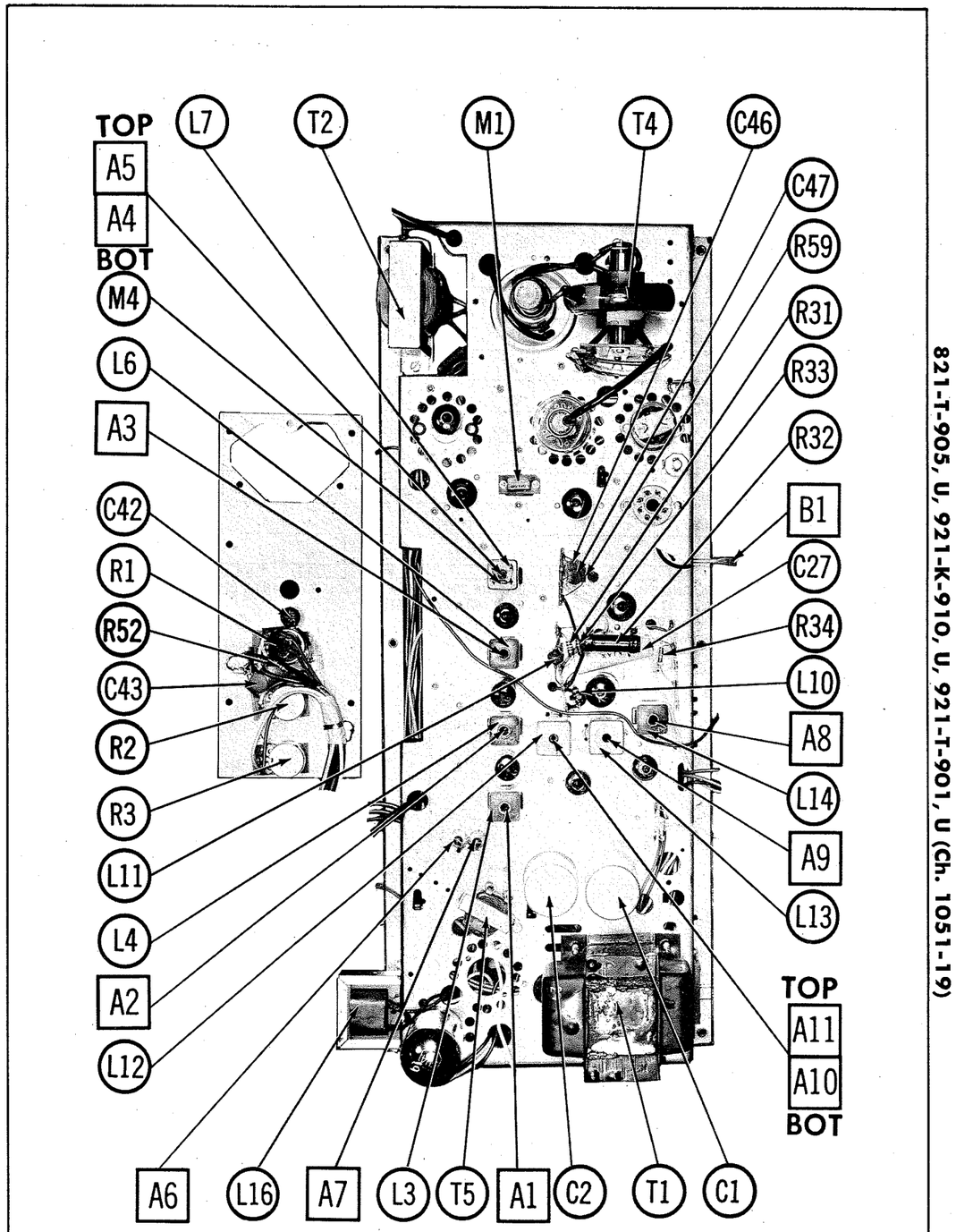


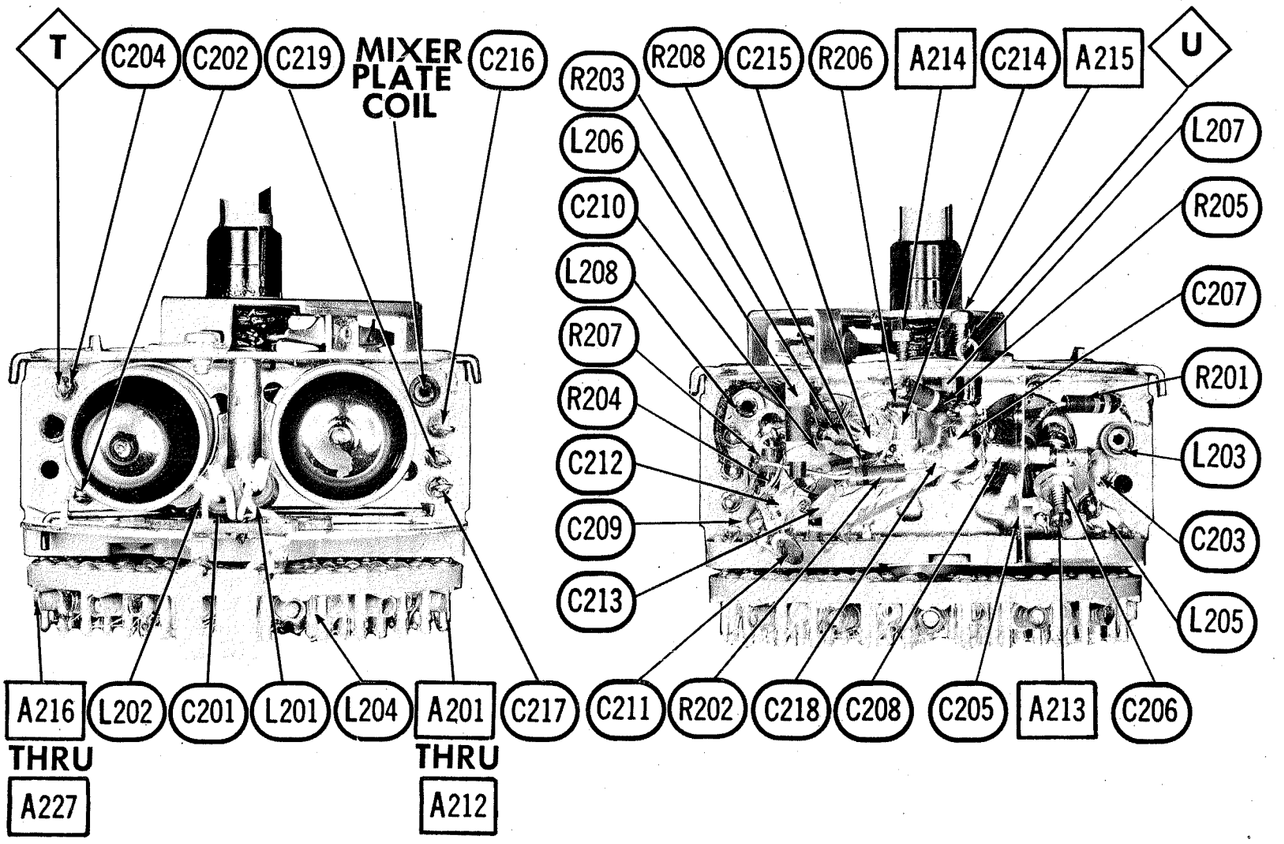
FIG.2



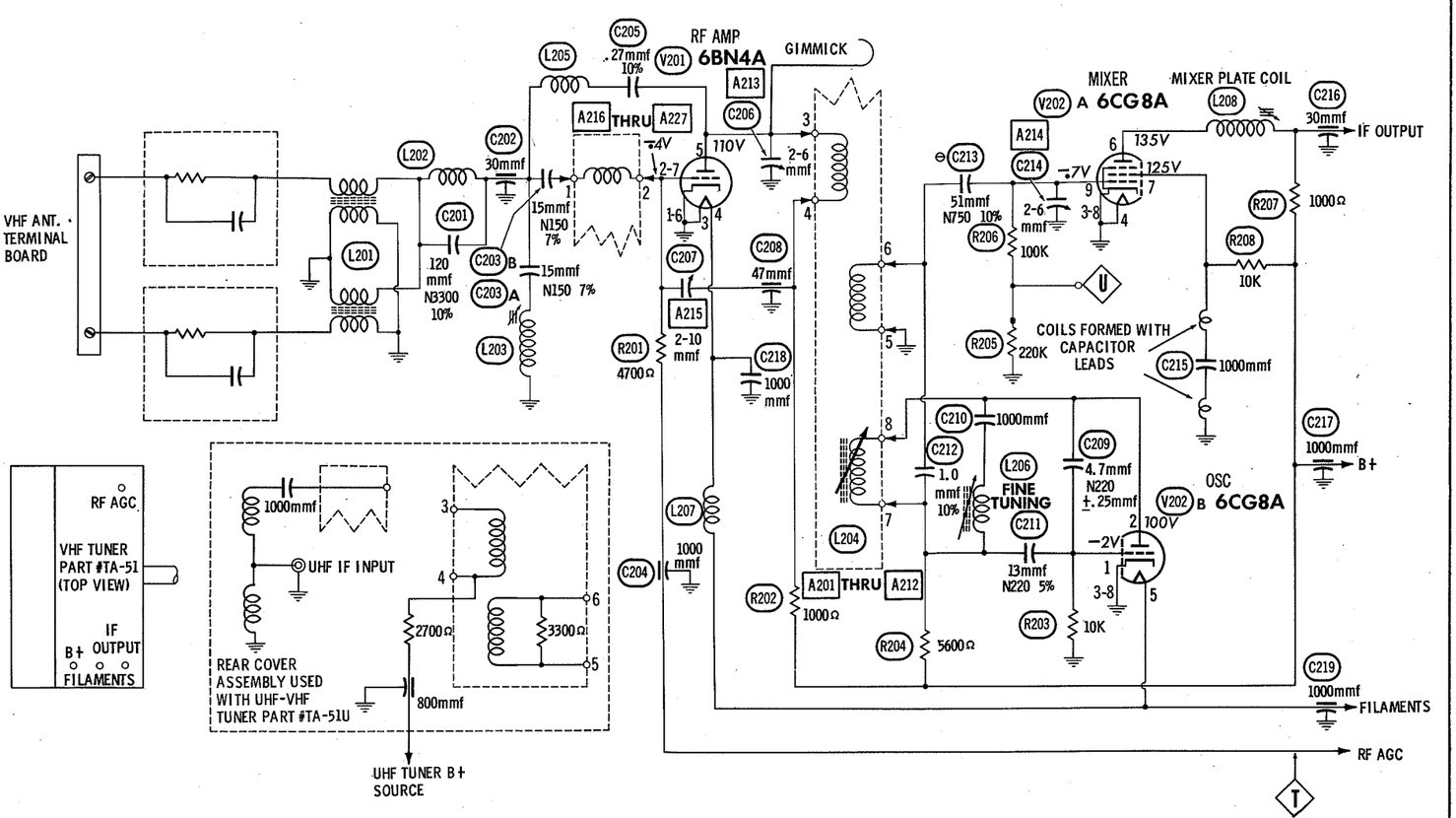
CHASSIS TOP VIEW

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)

FOLDER 2



TUNER TA-51



A PHOTOFACT STANDARD NOTATION SCHEMATIC

TUNER TA-51, U

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A213, A214, A215..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Set the Fine Tuning to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

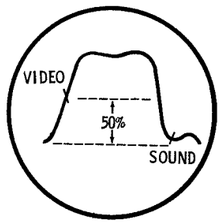


FIG. 201

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A213, A214, A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope. Restore bias.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by compressing or expanding coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

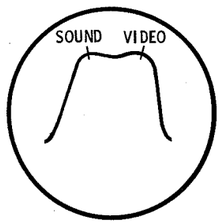


FIG. 202

TUNER PARTS LIST AND DESCRIPTIONS

TA-51,U

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BN4A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C201	120		N3300 10%	13L-031						
C202	30			13M350U300N-02						
C203A	15		N150 7½	13L8PG150N2						
B	15		N150 7½							
C204	1000			13M350EA102Z-01	EF-001	MFT-1000			503C-D1	
C205	.27		10%	13D-111-45						
C206	2-6			31B-902-01		829-6		CT552		
C207	2-10			31B-902-09		829-10				
C208	47			13M320U470J-09	EF-00005	MFT-50				
C209	4.7		N220 ±.25mmf	13L8R4R7C						
C210	1000			13LX102Z	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C211	13		N220 5%	13L8R13J						
C212	1.0		10%	13D-111-35	NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1S 10% *	
C213	51		N750 10%			TCN-51	C10Q51U		5TCU-Q51S 10% *	①
C214	2-6			31B-902-01		829-6		CT552		
C215	1000			31J-024	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C216	30			13M350U300N-02						
C217	1000			13M350EA102Z-01	EF-001	MFT-1000			503C-D1	
C218	1000			13LX102Z	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C219	1000			13M350EA102Z-01	EF-001	MFT-1000			503C-D1	

Note 1. Some versions may use 51mmf N470 10% in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
NOTE : Part numbers listed above are "Standard Coil" Part Numbers.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PART No.
R201	4700Ω		12TAE472M-01-02-03
R202	1000Ω		12TAE102M-01-02-03
R203	10K		12TAE103M-01-02-03
R204	5600Ω		12TAE562K-01-02-03

ITEM No.	RATING OHMS	RATING WATT	PART No.	NOTES
R205	220K		12TAE224M-01-02-03	
R206	100K		12TAE104M-01-02-03	
R207	1000Ω		12WAE102M-01	
R208	10K		12TAE103M-01	

NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T3398-01	Includes L202, L203
L202	RF Choke	34A-748	
L203	IF Trap Coil	34A-762	
L204	Ant., RF, Mixer Grid & Osc. Coils	31T-3361-06	Includes Rotor Disc Assy.

ITEM No.	USE	PART No.	NOTES
L205	RF Choke	34A-1005	
L206	Fine Tuning Coil	34A-787-03	
L207	Fil. Choke	31K-137-027	
L208	Mixer Plate Coil	31UA-580-017	

NOTE: Part Numbers listed above are "Standard Coil" Part Numbers.

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRAV-LER PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N87	SC-23	1N60	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M5	Tuner Tuner	TA-51 TA-51U	VHF VHF-UHF Provisions

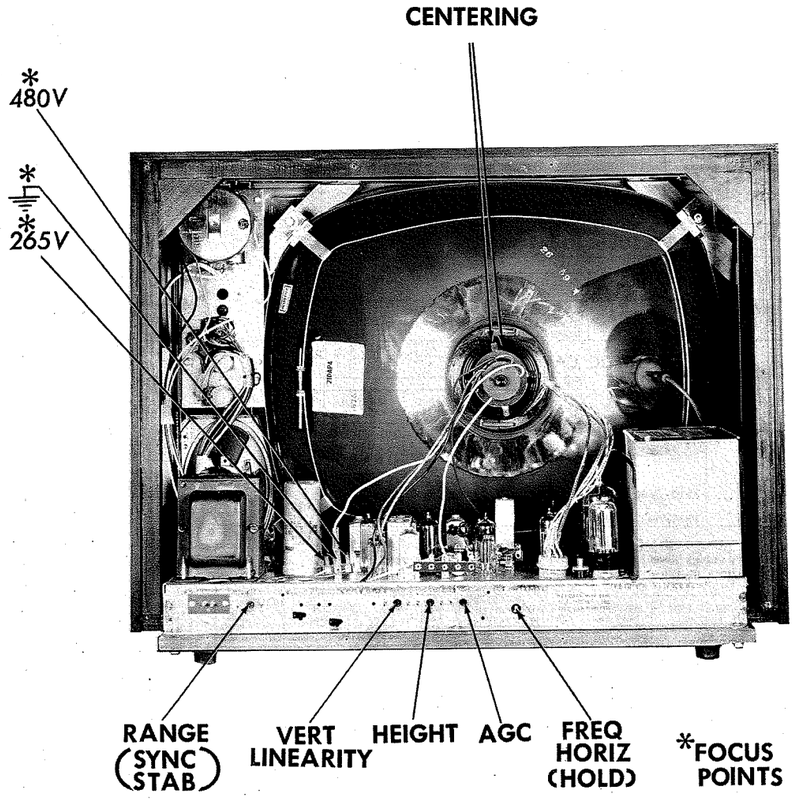
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	DW-96	
Mask	MP-135	
Knob	K-336	Channel Selector
Knob	K-337	Fine Tuning
Knob	K-340	Off-On-Volume, Contrast
Knob	K-338	Brightness
Knob	K-339	Vert. Hold
Cabinet	CA-332F	Fabric, Model 821-FT-900
Cabinet	CA-332M	Mahogany, Models 821-T-901, U, 821-T-905, U
Cabinet	CA-332B	Blond, Models 821-T-901, U, 821-T-905, U
Cabinet	CA-334M	Mahogany, Models 821-K-909, U, 821-K-910, U
Cabinet	CA-333B	Blond, Models 821-K-909, U, 821-K-910, U
Leg	CH-100M	Mahogany, Models 821-K-909, U, 821-K-910, U
Leg	CH-100B	Blond, Models 821-K-909, U, 821-K-910, U

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8685 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Frequency Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Frequency Hold slowly counterclockwise until the picture just falls into sync.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp.	6BZ6	
V2	2nd Video IF Amp.	6BZ6	
V3	3rd Video IF Amp.	6CB6	
V4	Video Output-Sound IF Amp.	6AW8A	
V5	AGC Keying-Noise Limiter-Sync Sep.	6BU8	
V6	Audio Det.	6DT6	
V7	Audio Output	6AS5	

ITEM No.	USE	TYPE	NOTES
V8	Sync Phase Inv. -Vert. Mult.	6CG7	
V9	Vert. Mult. -Vert. Output	6DB5	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	6DQ8A	
V12	Damper	6AU4GTA	
V13	HV Rect.	1B3GT	
V14	LV Rect.	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	TRAV-LER PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	21DAP4 21DEP4A	21DEP4 ① 21DEP4 ①	21DAP4 ① 21DEP4-A ①	21DAP4 ② 21DEP4 ② 21DEP4A ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▬40	350	EC-115	AFH2-64-25	B0483	FP247	TMD-91	TVL-2780	
B	▲100	350							
C2A	▬60	200	EC-114	AFH4-46-10	D0676	FP419.11	TMQ-161	TVL-4709	
B	▬5	200							
C	▲50	50							
C3A	▬50	350	EC-116	AFH3-28-30	C0225	FP330.7	TMT-18	TVL-3639.5	
B	▲10	350							
C4	40	200	EC-113	PRS250V40	BR4025	TC58	TD-40-350	TVA-1511	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	1.0	100		PC-89	P288N-1.0		CUB2W1	GEM-21	2TM-M1	①
C6	20		10%	CC-124	NPO-SI 20	TCZ-20	C10Q2C	ZT-542	MS-42	
C7	3-13			TC-25						
C8	15		10%	CC-125	NPO-SI 15	TCZ-15	C10Q15C	CNO-415	MS-15	
C9	3-13			TC-25						
C10	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C11	1.0	100		PC-89	P288N-1.0		CUB2W1	GEM-21	2TM-M1	
C12	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C13	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C14	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C15	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C16	2200			CC-123	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C17	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C18	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C19	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C20	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C21	560		5%	CC-126			1R5T56		MS-356	
C22	5000			CC-3	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C23	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C24	.1	600	10%	PC-78C	V84C6P1		PM6P1	GTM-601	6TM-P1	
C25	5000			CC-3	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C26	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C27	.22	400		PC-28C	P48N-22		CUB4P22	GEM-4022	4TM-P22	
C28	.022	600	10%	PC-45C	V84C6S22		PM6S22	GTM-6122	6TM-S22	
C29	.047	1000		PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	
C30	.047	1000		PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	
C31	10000			CC-81	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C32	1000	2000		CC-98	HVD-30-1000	DD30-102	HVB20D1	2HV-210	20GA-D1	
C33	47		10%	CC-12	DI-47	DD-470	C10Q47C	CNO-447	MS-447	
C34	4.7		10%	CC-15	NPO-SI 4.7	TCZ-4R7	C10V47C	ZT-5547	MS-55	
C35	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C36	10000			CC-81	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C37	100		NPO 10%	CC-73	NPO-SI 100	TCZ-100	C10T1C	ZT-531	5TCC-T1S 10% *	
C38	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C39	1500			CC-127	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C40	.047	200		PC-26C	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C41	.047	1000		PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	
C42	47		10%	CC-12	DI-47	DD-470	L10Q47	CNO-447	MS-447	
C43	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C44	10000			CC-81	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C45	10000	1500		CC-121	DAC-27	DD-103	HVE16SI	2HV-110	20HKB-SI	
C46	10000			CC-81	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C47	150			CC-122	DI-150	DD-151	L10T15	B-315	5GA-T15	
C48	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C49	82		10%	CC-130	DI-82	DD-820	L10Q82	CNO-482	MS-482	
C50	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C51	10000			CC-81	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C52	2200			CC-123	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C53	.1	600	10%	PC-78C	V84C6P1		PM6P1	GTM-601	6TM-P1	
C54	.047	600	10%	PC-46C	V84C6S47		PM6S47	GTM-6147	6TM-S47	
C55	1000	2000		CC-98	HVD-30-1000	DD30-102	HVB20D1	2HV-210	20GA-T1	②
C56	.047	1000		PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	
C57	.1	600	10%	PC-78C	V84C6P1		PM6P1	GTM-601	6TM-P1	
C58	.047	600		PC-46C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C59	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C60	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C61	.01	600		PC-15C	P688N-01	D6-103	CUB6SI	GEM-611	6TM-SI	
C62	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C63	.047	600		PC-40C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C64	3900		10%	MC-14	1464-0039		1R5D39	MCB463	MS-239	
C65	820		10%	MC-23	1469-00082		1R5T82	MCB251	MS-382	
C66	680		10%	MC-31	1469-00068	D6-681	1R5T68		MS-368	
C67	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C68	.047	600		PC-40C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C69	.027	1600	10%	PC-88C						
C70	330	2000	N1500 10%	CC-119						
C71	330	2000	N1500 10%	CC-119						
C72	120	2000	N1500 10%	CC-118						
C73	.047	600		PC-40C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use .22mfd ⓐ 200V in this application (Part #PC-25C).
② Some versions may use 1000mmf ⓐ 2000V in this application (Part #CC-98).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	VC-173				PP16A	Volume, Tap ⓐ 60K
B	Switch						Not Req.	Push-Pull Off-On
R2A	10000Ω	½	VC-178	B-505	A47-1000-S	Q17-108	U3	Contrast
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	100K	½	VC-174	F1-31		■ (QJ-1112	-(	Brightness
B	200K			R2-33				Vert. Hold
R4A	100K	½	VC-177	AB-40	B47-100K-S	B11-128	PTA15L	Range (Sync Stability)
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	
R5A	500Ω	½	VC-176	AB-4	B47-500-S	B11-103	PTA52L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	
R6A	1.5meg	½	VC-175	AB-742	B47-1.5meg-S	B11-138	TA15L	Height
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	
R7A	100K	½	VC-177	AB-40	B47-100K-S	B11-128	PTA15L	AGC
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	

■"Concentrikit" Equivalent: K-2 Kit with Base Elements & Shafts: B11-128, P1-204 (Panel) B11-129, R1-220 (Rear)
▲ "STA-LOC" Equivalent: FA15L, RU25L, OF2125, IK2625.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R8	10meg		IR-151	
R9	3meg 5%		IR-279	
R10	1.5meg			Note 1
R11	150K		IR-95	
R12	1000Ω		IR-112	
R13	4700Ω		IR-48	
R14	39K		IR-121	
R15	470Ω		IR-6	
R16	47Ω		IR-97	
R17	220K		IR-91	
R18	22K		IR-45	
R19	4700Ω		IR-48	
R20	470Ω		IR-6	
R21	220K		IR-91	
R22	68Ω		IR-59	
R23	4700Ω		IR-6	
R24	150Ω		IR-98	
R25	4700Ω		IR-48	Note 2
R26	47K		IR-46	
R27	100Ω		IR-104	
R28	82K		IR-31	
R29	47K	1	IR-120	
R30	180Ω		IR-133	
R31	39K		IR-121	
R32	5600Ω	4	IR-273	
R33	15K		IR-63	
R34	82K		IR-31	
R35	39K		IR-121	
R36	150K		IR-95	
R37	470K		IR-110	
R38	120K		IR-144	
R39	390K		IR-117	
R40	8200Ω	1	IR-255	
R41	39K		IR-121	
R42	220K		IR-91	Note 3
R43	100K		IR-43	
R44	100K		IR-43	
R45	56K		IR-100	
R46	8200Ω		IR-60	
R47	560K		IR-136	
R48	220K		IR-91	
R49	680Ω		IR-135	
R50	100K		IR-43	
R51	560K		IR-136	
R52	47K		IR-46	
R53	1meg 5%		IR-74	
R54	1meg 5%		IR-74	

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R55	150Ω		IR-98	
R56	220Ω	2	IR-272	
R57	15K	2	IR-68	
R58	4.7meg		IR-277	
R59	270K		IR-140	
R60	47K		IR-46	
R61	56K		IR-100	
R62	4.7meg		IR-277	
R63	2.2meg		IR-163	
R64	6800Ω		IR-78	
R65	5600Ω		IR-52	
R66	3300Ω		IR-108	
R67	2200Ω		IR-67	
R68	15K		IR-63	
R69	15K		IR-63	
R70	220K		IR-91	
R71	56K		IR-100	
R72	2.2meg		IR-163	
R73	220K		IR-91	
R74	39K	1	IR-77	
R75	100Ω		IR-104	
R76	27K	1	IR-193	
R77	390Ω	1	IR-55	
R78	820K		IR-116	
R79	470Ω	3	IR-271	
R80	220Ω		IR-5	
R81	3.8Ω Cold		IR-284	
R82	220Ω		IR-5	
R83	100K		IR-43	
R84	100K		IR-43	
R85	4.7meg		IR-277	
R86	22K	3	IR-276	
R87	470K		IR-110	
R88	10K		IR-64	
R89	100K		IR-43	Note 4
R90	1200Ω		IR-34	
R91	68K		IR-61	
R92	22K		IR-45	
R93	82K		IR-31	
R94	100Ω		IR-104	
R95	1meg		IR-105	
R96	12K	3	IR-275	
R97	4700Ω		IR-48	
R98	1.2Ω		IR-274	
R99	330Ω		IR-189	
R100	18K		IR-99	
R101	270K		IR-140	

Note 1. Some versions may use 2.2meg in this application (Part #IR-163).
Note 2. Some versions may use 6800Ω in this application (Part #IR-78).
Note 3. Some versions may use 56K in this application (Part #IR-100).
Note 4. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TRAV-LER PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	41.25MC Trap Coil	L-161-1						
L2	47.25MC Trap Coil	L-161						
L3	1st Video IF	L-150				6231 †		
L4	2nd Video IF	L-151	17-5004	17-5004	TV-126	6234		
L5	Fil. Choke	L-164	19-1001	19-1001	BC-562	4604		1.6uh
L6	3rd Video IF	L-151	17-5004	17-5004	TV-126	6234		
L7	4th Video IF	L-152						
L8	RF Choke	L-160	19-1005	19-1005	BC-566	4612		10.4uh
L9	RF Choke	L-158						27.5uh
L10	Series Peaking Coil	L-162						①
L11	Shunt Peaking Coil	L-163						②
L12	1st Sound IF	1-154						
L13	2nd Sound IF	L-155						③
L14	Quadrature Coil	L-110A	17-1031 *	17-1031 *		1481 *	SD-5*	

* Parallel with 100K resistor. ① Wound on 6800Ω resistor. ② Wound on 10K resistor. ③ Prl. tapped ⓐ 7Ω.
† Disregard secondary.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L15	97Ω		L-156	HS-5 *	TV-163 *	6210 *	H-102 *	HS-5	Horiz. Osc. * Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ^C.)	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	.280A	52Ω	1Hy.	FC-18	26C44	C-2996	F-801	C-2328	26C44	C-27X

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.9A	550VCT ⓐ .280A	5V ⓐ 3A	TR-52A						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⓐ 9.2A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	TR-50A	26S14		V319			26S14	A-113X ①
T3	Yoke-Horiz. (18.5MH) (110°)-Vert. (13.8MH)	L-149	Y-48 ②③		Y-110 ②③		DY-27A ②③	Y-48 ②③	Y-60 & NW-9 & YC-110 ③
	Rear Cover & Centering Device	MP-136							
	Yoke Clamp	ST-58							
T4	Horiz. Output	TR-51	FLY-137 *		X-162 *	EFR-172*	HO-304 *	FLY-137 *	D-151R*

① Connect as autoformer.
② Use original yoke damping networks. Require new rear cover, centering device, and yoke clamping device.
③ Connect same as original.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5	5		5	5	5	5	5
	6	6		6	4	6	6	6
	7	7		7	2	7	7	7
	8	8		8	1	8	8	8
	2	1		1	7	2	1	2
	1	2		2	8	1	2	1
Special Notes →		④		④	⑤		④	

④ If AGC does not function properly, reverse connections to terminals #1 and #2.
⑤ Filament requires one turn only.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	4700Ω	3-4Ω	AT-50	24S48	A-3026	AU-601	A-3877	24S48	S-6X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	SPK-84 ①	46A1	① Models 821-FT-900, U, 821-T-901, U, 821-T-905, U
	5"	PM	3-4Ω	SPK-36 ②	5A07	② Models 821-K-909, U, 821-K-910, U

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	TRAV-LER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1		SR-15 ①	K1615 ①	SD-91 ②			① Selenium Type. ② Silicon Type (2 used).

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRAV-LER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	N	3/4A 125V	F-13	F-14	333.750 (N-3/4A-125V)	346010	N 3/4	HN 1/2 to 3/4
M3	1" #26 Wire							

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)

FOLDER 2