INSTRUCTION MANUAL

Olson Audio-Visual

Spotter 2

042758

MODEL No. RA-530

DESCRIPTION

The Audio-Visual Spotter is a combination transmitter and receiver for use in the 11-Meter (Class D) Citizens Radio Service. This transceiver has been designed to meet the Federal Communication Commission (FCC) requirements which are applicable to equipment operating in this ser - vice.

The Receiver employs an extremely stable tuneable section providing reception on channels one (1) through twenty-two (22).

A Spot Switch rendering an audible tone and visual"S" meter indication is employed to assist the operator to tune the receiver to the same channel used to transmit.

The Squelch Control will silence the receiver in the absence of a signal on the channel the receiver is tuned to.

The Transmitter provides up to twelve crystal controlled positions by the means of a switch located on the front panel. For convenience, one transmit crystal socket is mounted on the front panel. The transmitter actuating switch is conveniently located on the microphone for push to talk operation. Television interference is suppressed to a minimum by use of a trap circuit.

The Meter located on the front panel indicates received signal strength and a relative transmitted modulation indication.

Auxiliary Speaker terminals located on the rear apron provides function of internal and/or external speakers.

The Power Supply provides operation on 110 and/or 12 volts and may be readily converted to 110/6 volt operation with minor circuit charges . (NOTE: This modification is explained in the operation section of this manual.)

Each unit is precision engineered and rigidly tested to give optimum performance and the ultimate in operating convenience.

SPECIFICATIONS

RECEIVER SECTION

General	Dual conversion tunable superhetrodyne
First IF frequency	3.5 MC Range
Second IF frequency.	595 KC
Sensitivity	Better than 3/10 microvolt for 6 db S/N ratio
Selectivity	3.5 KC at 6 db points
Noise Limiter	Dual series gated diode fully automatic

* * * * * * * * * * * * * * * * * * *

TRANSMITTER SECTION

General	3rd overtone crystal controlled .005% tolerance.
Maximum power input	5 watts
Modulation	Impedance type, high level plate AM with 100% capability.

* * * * * * * * * * * * * * * * * * *

POWER SUPPLY

Average total power requirements	50 watts
12 volt DC current requirements	4-1/2 amp.
6 volt DC current requirements	10 amp.
Type	Vibrator, with grain oriented silicon steel transformer and silicon diode rectifiers

INSTALLATION

Since there are so many applications where the Audio-Visual Spotter can be used, each with a different antenna and antenna mounting requirement, no antenna is supplied with the equipment. Several different antennas are available.

Each type of antenna is designed to give best performance for a particular type of installation.

For a Base station installation use either RG58 /U or RG8 /U co-axial cable to connect the antenna to the unit. For cable runs longer than 100 feet, RG8/U cable is preferred to minimize the power loss. The cable must be terminated in a PL -259 connector. If RG58/ U cable is used, a Type U-9 - 175/U adapter is also required. Your antenna must provide a 50 ohm impedance match and standing wave ratio of less than 1.5 to 1.

The microphone must be mounted for your convenience to either side of the cabinet by means of the clip and self tapping screws. Note: Holes have been placed on both sides of the cabinet for this purpose. The unit may be mounted in any convenient location with the use of the supplied mounting brackets.

For mobile or marine installations your unit will derive power from a storage battery. The unit is normally wired for 12V DC and 110V AC operation at the factory. If your particular mobile or marine installation must function on 6V DC it will be necessary to modify the circuit as outlined below. Refer to the schematic for identification of proper leads. The battery cable supplied with your unit is used in both 6 and 12 volt operations.

Conversion to 6 V. DC operation (Refer to schematic-- dotted lines).

1. Remove lead from (B) and connect to (A)
2. Remove lead from (E) and connect to (F)
3. Remove lead from (H) and connect to (G)
4. Install short jumper wire from (I) to (B)
5. Install short jumper wire from (D) to (C)

Cable end marked red is connected to the "hot" side of battery. The unmarked lead is bonded to the frame of the automobile to provide a good electrical ground.

A minimum length of RG58/ U co-axial cable terminating in a PL-259 connection is routed to the antenna.

A one quarter (1/4) wave length antenna providing a 50 ohm impedance match and low standing wave ratio is recommended for all mobile installations and metallic boats. For non-metallic boats a well designed citizen band antenna should be used.

An external speaker may be connected to the unit with-out the internal speaker by making appropriate connection to terminal strip located in rear of cabinet.

OPERATION

As you unpack the equipment examine it for any apparent damage that might have occurred in shipment. If any damage is found, file a claim with your carrier or any Olsen Electronics Store.

The following items are packed with the Audio-Visual Spotter

1 - AC Line Cord
1 - Microphone
1 - Microphone Holder
Instruction Book, License Application and Warranty Card

Study the page in this manual devoted to FCC Regulations so that you have a thorough under-standing of the general responsibilities when using this type of equipment.

1. Connect the proper power cable which is compatible to the type of operation you desire to the receptacle located in the rear apron of the chassis.

2. Connect the antenna feed line to the co-axial connection on the rear apron of chassis. Refer to installation.

3. Turn the unit on by rotating the Volume control knob clockwise.

4. Select one of the transmit channels by means of the Channel Selector. Notice that there are twelve positions on the illuminated dial marked A,B,C,D,E,F,G,H,I,J,K, and X. These markings correspond to channels marked on rear panel. The channel X transmit crystal socket is located on the front panel. Note: the use of any crystals other than those designed for the Olsen Audio-Visual Spotter may result in illegal off-frequency operation. Crystals are available from your local Olsen distributor.

5. Rotate the Squelch control knob fully counter clockwise.

6. Adjust Volume control to a desirable level.

7. When only noise is present (no signal) turn the Squelch control slowly clockwise to the point where no noise is heard. The receiver is now properly adjusted so that the transmitted signals will be heard but the receiver will be quiet between transmissions. Do not turn the Squelch control further than is necessary to just quiet the noise as this would result in loss of reception of weak signals.

8. The meter on the front panel will automatically indicate relative strength of a received signal as well as relative modulation indication.

9. Plug microphone in jack located on front panel.

10. To transmit, depress button on microphone and speak directly into the microphone. The equipment will not function as a receiver unless the button is released.

11. Should you desire to "SPOT" or locate your transmit channel, actuate the slide switch located on front panel marked "SPOT", and tune the receiver. When the receiver is tuned to the same channel as being transmitted both an audible tone and "S" meter deflection will be noted.

RECEIVER ALIGNMENT

Refer to the schematic in this manual. The equipment required is a VTVM, and two Signal Generators of which one is crystal controlled for the CB frequencies 26.965 and 27.225; ± .0025% tolerance. The other generator must be capable of output of 595 kc.

Prodedure:

1. Connect negative lead of VTVM set to DC operation to point on chassis referred to as (A)in schematic; plus lead is connected to chassis.

2. Set signal generator to 595 kc., clip high side of generator to body of capacitor (C),(no electrical connection). Low side is connected to chassis. Remove 24.100 MC crystal from socket.

3. Adjust top and bottom slugs of T5P,T6P and T7P for maximum indication on VTVM. Attenuate generator output so as not to exceed -2 volts during the alignment. If two peaks are noticed, use the peak with the adjusting slug most withdrawn. The crystal is then replaced prior to the next step of alignment. Disconnect leads from generator.

4. Clip the negative lead of the VTVM to pin(9)of V2 and plus lead to chassis. Back out the slug of coil L3 counter clockwise. The VTVM will indicate a gradual increase in reading until the point of a pronounced decreased in reading is noted. again rotate the slug of L3 counter clockwise until a sharp increased reading is denoted by the VTVM and continue rotation an additional one quarter (1/4) turn.

Tunable Oscillator and RF Alignment

Equipment needed -
Signal Generator with accuracy of .0025%
Vacuum Tube Volt Meter (VTVM)

Prodedure:

1. Adjust both trimmer capacitors on main tuning capacitor approximately 1/8 of a turn out from closed position.

2. Connect negative lead of VTVM to point on chassis referred to as (A) in schematic, plus lead to chassis.

3. Connect out-put of signal generator, set to channel 22 (27.225), to antenna input terminal on rear of chassis.

4. Set receiver main tuning dial to Channel 22.

5. Adjust slug of oscillator coil L2P until signal is heard.

6. Adjust slug of mixer coil L3P for maximum reading on VTVM. You will note two (2) peaks: use the peak evident with maximum insertion of slug.

Each time a maximum is obtained, reduce the generator output so that VTVM reading is no more than 2 volts. Failure to reduce the generator output may result in an overload condition and subsequent incorrect alignment.

7. Turn generator to Channel 2 and tune receiver dial until signal output is heard.

8. If receiver dial reads High:

Procedure:

A. Tune signal generator to Channel 22 (27.225) and tune receiver to generator.

B. Rotate the slug of oscillator coil L2P approximately 1/4 turn out (counter clockwise).

C. Adjust oscillator trimmer capacitor CO until signal is tuned in once more.

D. Set signal generator to channel 2 (26.975). Tune receiver dial to signal.

E. Determine whether dial tracks high or low at channel 2(26.975). Repeat procedure to obtain proper tracking.

9. If receiver dial reads Low:

Procedure:

A. Same as 8 (A)
B. Rotate slug of oscillator coil L2P approximately 1/4 turn clockwise.
C. Same as 8 (C)
D. Same as 8 (D)
E. Same as 8 (E)

After completing proper oscillator tracking, proceed to adjust gang tracking.

Procedure:

10. Set signal generator on Channel 2 and tune receiver dial for maximum deflection on VTVM. Peak mixer coil L3P for maximum reading on scale of VTVM. Note the proper peak will be indicated with maximum insertion of slug.

11. Set signal generator to channel 22(27.225).Tune receiver dial for maximum indication on VTVM. Proceed to adjust the mixer trimmer capacitor(CM)for maximum reading on VTVM scale.

12. Repeat in sequence procedure (10) followed by procedure (11). Peak should be obtained on both of these adjustments for a maximum deflection in the VTVM readings when switching from channel 2 and 22.

13. Set signal generator to Channel 2 and peak antenna coil L1. Peak both top and bottom slugs of mixer coil T3P keeping the out-put of signal generator just high enough for a work-able reading on VTVM.

TUBE VOLTAGE DATA

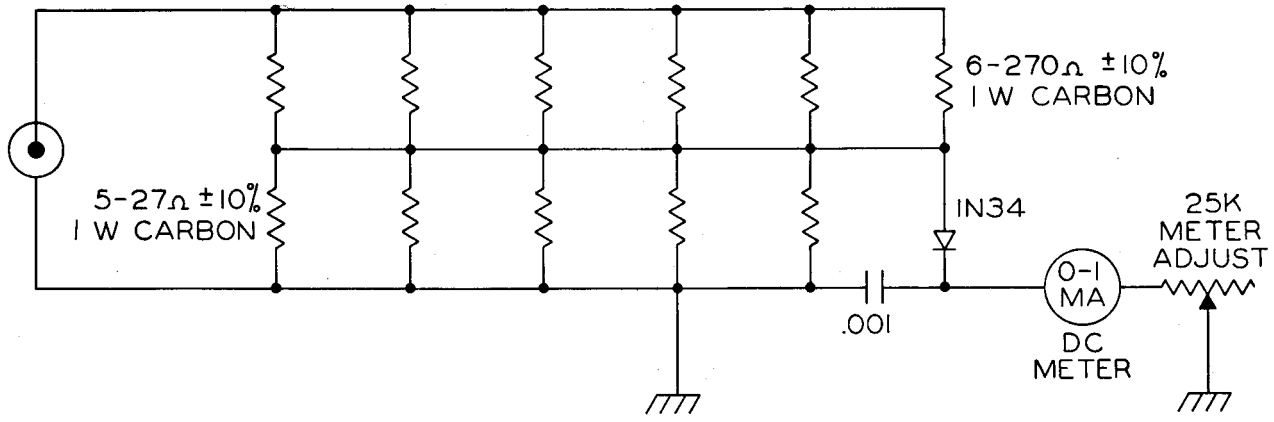
SYM & TYPE	MODE	PIN NUMBERS 1	2	3	4	5	6	7	8	9	FUNCTION
6BZ6	REC	-.82	0	0	•5.3	122	82	0			RF AMP
	XMIT										
6EA8	REC	19	-1.3	25	•5.3	•11	135	0	0	-1.2	1ST. MIXER & XTAL OSC.
	XMIT										
6EA8	REC	14.6	-3	35	•5.3	•11	145	0	0	-1.2	2ND. MIXER & OSC.
	XMIT										
6BJ6	REC	-.6	.8	•5.3	•11	135	70	0			595 IF AMP
	XMIT										
6BJ6	REC	-.7	.82	•5.3	•11	135	70	0			595 IF AMP
	XMIT										
12BR7	REC	145	60	73	•11	•1.5	-.1	-.18	.5	•5.3	ANL. SQUELCH
	XMIT										
6CX8	REC	0	-.6	-.65	0	•5.3	75	0	385	390	XMIT OSC.
	XMIT	0	-5	148	0	•5.3	0	4	105	270	+ POWER AMP.
6AQ5	REC	0	28	•5.3	•11	385	385	0			AUDIO OUTPUT
	XMIT	0	12.6	•5.3	•11	305	285	0			MODULATOR
6EA8	REC	0	0	42	0	•5.3	70	1.3	1.3	0	AUDIO DRIVER
	XMIT	105	0	92	0	•5.3	135	3.5	3.5	0	MIC. PRE-AMP
	REC										
	XMIT										
	REC										
	XMIT										

6U8 6BH6 6JE

READINGS TAKEN WITH V.T.V.M. FROM SOCKET PINS TO GND.
±20% OF SPECIFIED READINGS ARE ACCEPTABLE
• VOLTS A.C.

6AV5 = 6BA6 6AH6 6CB6 6AU5
6JT6 = 6AK5 6AU7
6CB6 = 6HQ6 6BZ6 6DE6 6DK6 6CB6

★ 6BZ6 = 6DT6 6DE6 6HQ6



DUMMY LOAD AND OUTPUT INDICATOR FOR TRANSMITTER TUNE-UP

TRANSMITTER ALIGNMENT PROCEDURE

1. Bottom must remain attached during alignment.

2. Connect 50 ohm dummy load to antenna output connector. (See schematic).

3. Turn selector switch to channel 11 or 9.

4. Energize transmitter by depressing microphone button.

5. Turn L5 (oscillator coil) OUT (counter-clockwise) until meter on load drops to zero.

6. Turn L5 IN (clockwise) very gradually until meter indicates sudden increase. Advance L5 another 1/2 turn clockwise beyond this point. NOTE: There are two peaks; use peak mostly inserted.

7. Insert tool through hole on chassis apron and adjust L4 (Tank coil) for maximum indication on dummy load.

8. Repeat steps #5 and #6.

9. Check all positions of selector switch which have crystals.

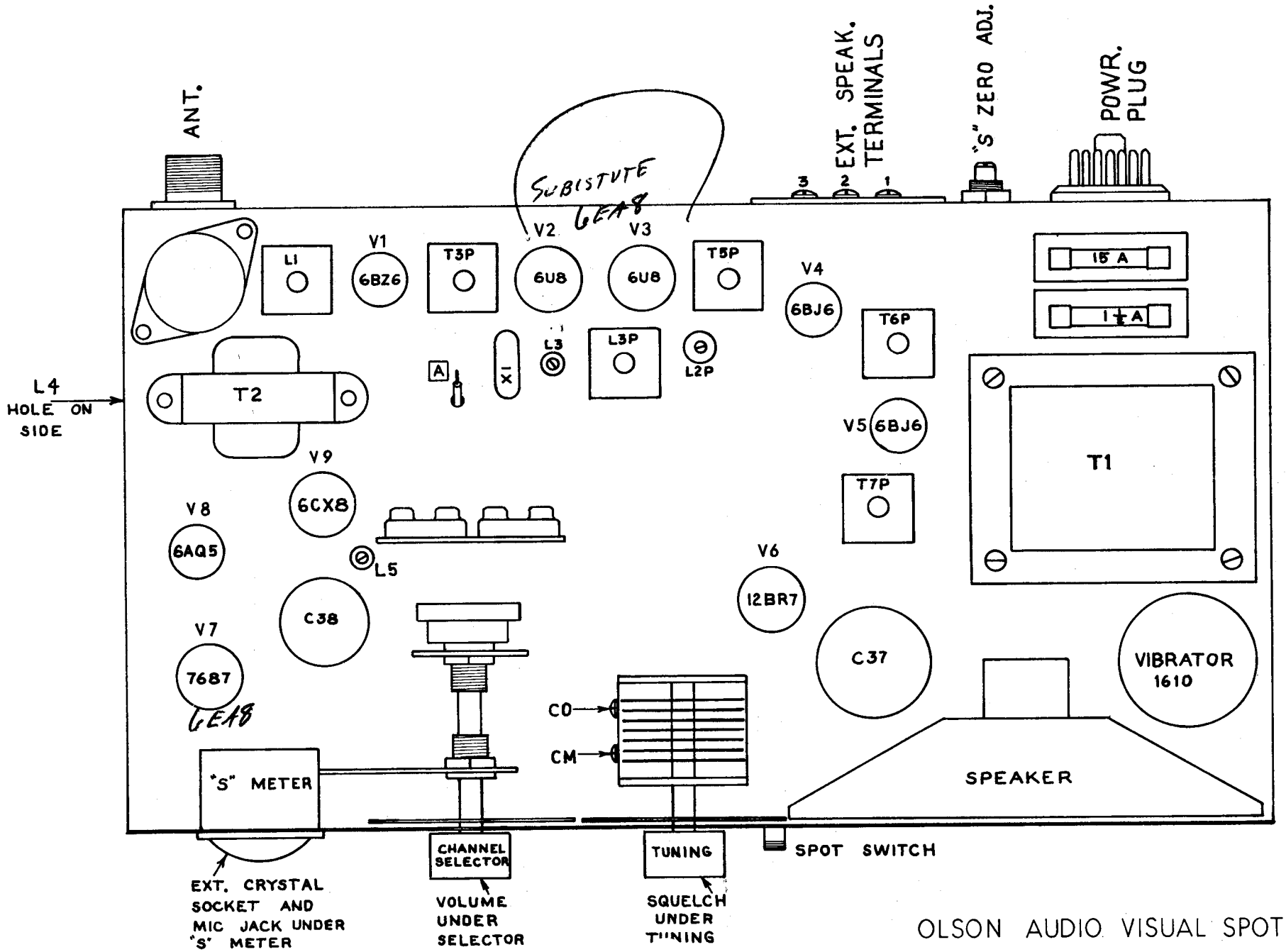
10. Repeat the foregoing procedure, using the normal antenna as the load. An RF power meter or field strength meter should be used for maximum power output adjustment.

TV INTERFERENCE:

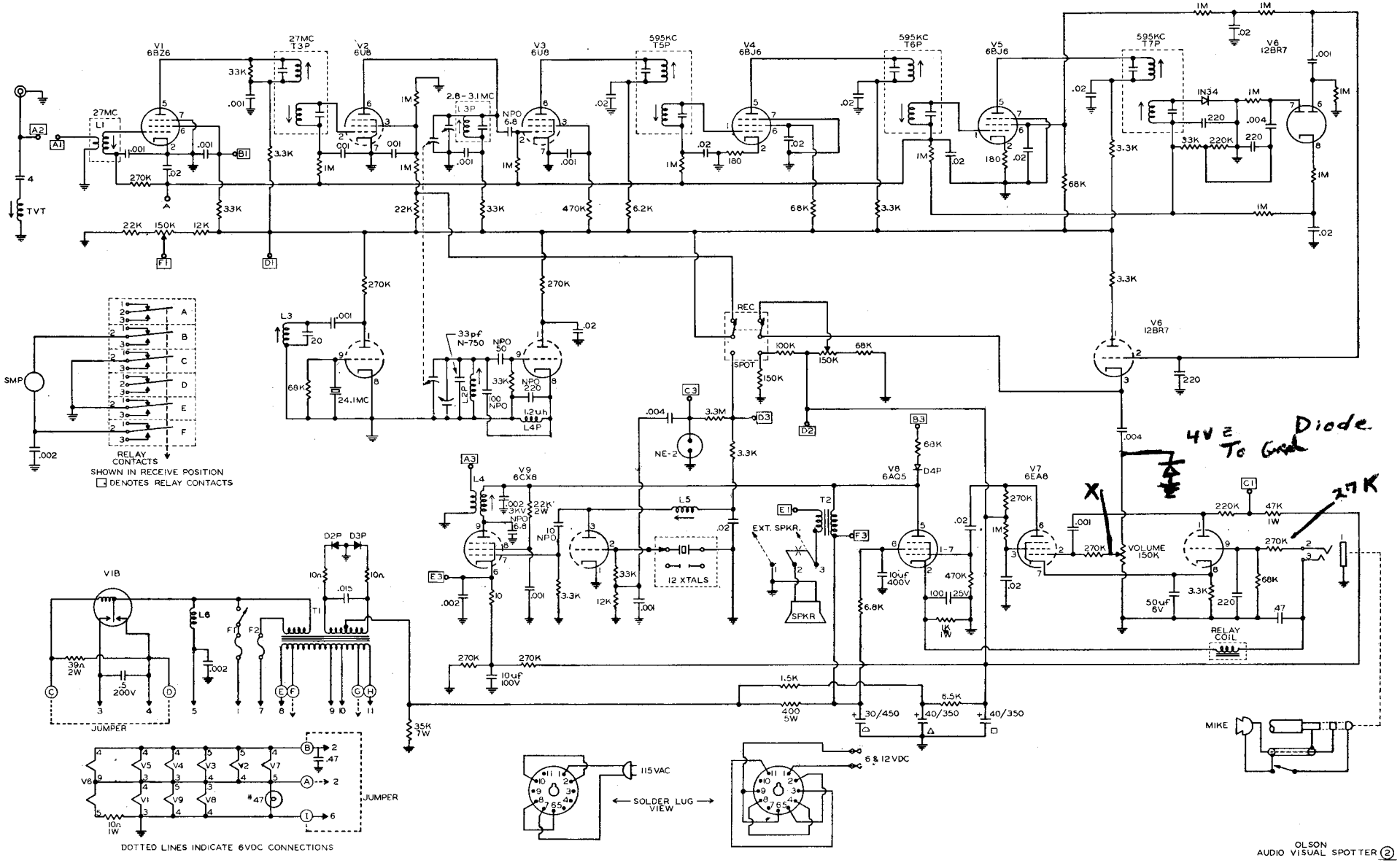
The Spotter is equipped with a built in low pass series resonant filter which has been pre-aligned at the factory to suppress interference on channels 2 to 6. In cases where the transmitting antenna is close to television receiving antennae, this filter may not be sufficiently effective. In some instances, the installation of a high pass filter between the antenna lead-in and TV chassis will prove effective. Specific interference on one TV channel may be eliminated by slight adjustment of the trap core in the chassis of the Spotter. (See schematic, TVT). This is required only in severe conditions.

MAINTENANCE NOTES:

A voltage chart is shown to provide reference values. Check tubes before attempting realignment. Voltage measurements will usually disclose where a defect may occur.



OLSON AUDIO VISUAL SPOTTER


V1 6BZ6
V2 6U8
V3 6U8
V4 6BJ6
V5 6BJ6
V6 12BR7
V7 6EA8
V8 6AQ5
V9 6CX8
V1B
27MC T3P
595KC T5P
595KC T6P
595KC T7P
2.8-3.1MC T3P
27MC L1
TVT
SMP
RELAY CONTACTS
SHOWN IN RECEIVE POSITION
DENOTES RELAY CONTACTS
24.1MC
33pf N-750
NPO 50
NPO 220
1.2uh L4P
REC
SPOT
NE-2
D2P D3P
D4P
12 XTALS
EXT. SPKR.
SPKR
VOLUME 150K
RELAY COIL
MIKE
JUMPER
DOTTED LINES INDICATE 6VDC CONNECTIONS
115VAC
SOLDER LUG VIEW
6 & 12VDC
4V p-p To Grid Diode
27K
OLSON
AUDIO VISUAL SPOTTER (2)

PARTS LIST

CAPACITORS

QUANTITY	PART NO.	DESCRIPTION		SYMBOL
1	1300-04	4 pf	Mica	
2	1300-11	6.8 pf	NPO Disc	
1	1300-14	10 pf	NPO Disc	
1	1300-18	20 pf	NPO Disc	
1	1300-28	33 pf	N750 Disc	
1	1300-33	50 pf	NPO Disc	
1	1300-43	100 pf	NPO Disc	
5	1300-47	220 pf	Disc	
16	1300-60	.001 mfd	Disc	
1	1300-62	.002 mfd	Disc	
3	1300-68	.004 mfd	Disc	
1	1300-74	.015 mfd 3Kv	Disc	
14	1300-75	.02 mfd	Disc	
3	1300-81	.47 mfd	Tubular Mylar	

ELECTROLYTICS

1	1301-04	10 MFD @ 450 VDC	
1	1303-01	10/100/50 MFD @ 100/25/6 VDC	C-38
1	1304-01	30/40/40/30 MFD @ 450/350/350/25	C-39

RESISTORS

3	1100-01	10 ohm 1/2W
2	1100-08	180 ohm 1/2W
7	1100-16	3.3K ohm 1/2W
1	1100-18	6.2K ohm 1/2W
2	1100-22	12K ohm 1/2W
2	1100-26	22K ohm 1/2W
6	1100-29	33K ohm 1/2W
6	1100-33	68K ohm 1/2W
1	1100-35	100K ohm 1/2W
1	1100-37	150K ohm 1/2W
2	1100-39	220K ohm 1/2W
8	1100-41	270K ohm 1/2W
2	1100-44	470K ohm 1/2W
13	1100-47	1M ohm 1/2W
1	1100-51	3.3 meg ohm 1/2W
1	1101-01	10 ohm 1W
1	1101-07	1K ohm 1W
1	1101-12	6.8K ohm 1W
1	1101-16	47K ohm 1W
1	1102-01	39 ohm 2W
1	1102-10	22K ohm 2W
1	1107-03	400 ohm 7W
1	1107-04	1.8K ohm 7W
1	1107-06	6.5K ohm 7W
1	1105-08	35K ohm 7W

CONTROLS

QUANTITY	PART NO.	DESCRIPTION	SYMBOL
1	1800-10	Main Tuning Capacitor	PL-1
1	1700-04	150K "S" Meter Control	
1	1700-07	150K Squelch Control	
1	1700-08	150K Volume Control W/SPST Switch	
1	1900-05	DPDT "Spot Switch"	
1	1900-09	Channel Selector Switch	PL
1	1900-15	6 PDT Relay	

COILS

1	1400-25	TVI Coil	TVT
1	1400-04	Plate Coil	L3
1	1400-06	2nd Conversion Oscillator	L-2P
1	1400-11	Crystal Oscillator, Plate	L-5
1	1400-08	Final, Tank	L-4
1	1500-07	Choke, RFC 50	L-6
1	1500-02	Choke, 1.2 uh	L-4-P

TRANSFORMERS

1	1600-14	Antenna Input Transformer	L-1
1	1600-13	Mixer, Transformer	L-3-P
1	1600-06	RF Transformer	T-3-P
1	1600-08	Input IF Transformer	T-5-P
1	1600-09	Interstage IF Transformer	T-6-P
1	1600-10	Output IF Transformer	T-7-P
1	3600-01	Power Transformer	T-1
1	3600-08	Audio Output Transformer	T-2

RECTIFIERS & DIODES

2	2400-03	Diode Rectifiers	D2P-D3P
1	2400-01	1N34 Diode	1N34
1	2400-02	1N34A Diode	D-4P

TUBES

1 - 6AQ5 2 - 6BJ6 3 - 6EA8
1 - 6CX8 1 - 6BZ6 1 - 12BR7

MISCELLANEOUS

1	4100-03	24.1mc Crystal	
1	2500-03	Vibrator (Special)	VIB
1	2600-01	"S" Meter, Horizontal Mounting	SMP
1	2300-02	1.5 Amp. Fuse 3AG-SB	F-2
1	2300-05	1.5 Amp. Fuse 3AG	F-1
1	2200-06	TS-51 Lamp	
1	2200-03	NE-2 Neon Lamp	NE2
1	2800-01	Number Dial W/hub	
1	2800-02	Letter Dial W/hub	
1	3300-32	Grill	
1	3100-01	Logo	
1	3300-11	Front Panel	
1	3400-01	Cabinet	
1	3300-42	Chassis	
1	3300-26	Chassis Bottom	
1	3300-23	Crystal Door	