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Teaberry Stalker One Service Manual

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STALKER ONE

SERVICE MANUALS



TEABERRY
ELECTRONICS CORP.
INDIANAPOLIS, INDIANA U.S.A.
40228

GENERAL INFORMATION OF MODEL: STALKER ONE (SSB/AM)

1. Type of Emission "D" Class
2. Frequency Range

<u>Channel</u>	<u>MHz</u>	<u>Channel</u>	<u>MHz</u>	<u>Channel</u>	<u>MHz</u>
1	26.965	9	27.065	17	27.165
2	26.975	10	27.075	18	27.175
3	26.985	11	27.085	19	27.185
4	27.005	12	27.105	20	27.205
5	27.015	13	27.115	21	27.215
6	27.025	14	27.125	22	27.225
7	27.085	15	27.185	23	27.255
8	27.055	16	27.155		

3. RF Output Power Rating4.watts (AM), 12 Watts PEP
4. Voltage and Current at Final Stage .. 5.5 volts and 740 mA at Channel 12.
5. Function of Transistor Per attached list of function of transistors/diodes.
6. Circuit Diagram Per attached Circuit Diagram.
7. Tune-up Procedure Per attached Alignment Instructions.
8. Automatic Modulation Control (AMC) (ALC).. Per attached Circuit Diagram.

CB SSB/AM TRANSCEIVER

SPECIFICATION FOR MODEL: STALKER ONE

Power Source	13.8 volts (DC)
Antenna Impedance	50 ohms
Test Temperature	25°C
AM Modulation Frequency	1 KHz
SSB Modulation Frequencies	500 Hz & 240 Hz
Standard Antenna Input Voltage	1000 uV
Standard Audio Output Power	0.5 W
SSG Modulation (AM)	1 KHz 30%
Audio Output Frequency (SSB)	1 KHz
Audio Output Load	8 ohms

<u>TRANSMITTER</u>	<u>UNIT</u>	<u>NOMINAL</u>		<u>LIMIT</u>	
		(AM)	(SSB)	(AM)	(SSB)
Frequency Tolerance (-30°C to +50°C).	%	0.002	0.002	0.005	0.005
RF Output at no mod (AM).	W	3.5	*	3.0	*
Rated Output Power (SSB).	Wpep	*	10	*	9
Maximum Output Power (SSB).	Wpep	*	12	*	11
Modulation Distortion at 80% Mod (AM)	%	3	*	10	*
Spurious Emission.	dB	-55	-55	-50	-50
Carrier Emission (SSB).	dB	*	-55	*	-40
Battery Drain at no Mod.	mA	1800	1500	2100	1800
Battery Drain at 80% Mod(AM), 10Wpep (SSB)	mA	2500	2200	2700	2700
AC Power Drain at no Mod.	W	*	*	*	*
AC Power Drain at 80% Mod. (AM), 10Wpep SSB	W	*	*	*	*
Microphone Amp Sensitivity at 50% Mod. AM, 4Wpep SSB	mV	4	4	1 to 7	1 to 7
Receiver (Noise Blanker - OFF)					
Sensitivity for 500 mW Output	uV	0.25	0.125	0.7	0.25
Sensitivity for 10 dB S/N.	uV	0.5	0.125	1.0	0.25
A.G.C. Figure of Merit 50 KuV for 10 dB change in Audio Output	dB	80	80	60	60
Selectivity at 6dB down	KHz	4.2	4.2	3.0	3.0
Cross Modulation. (E.I.A. standard)	dB	60	60	50	50

CB SSB/AM TRANSCEIVER

SPECIFICATION FOR MODEL: STALKER ONE

<u>Receiver (Noise Blanker -- OFF)</u>	<u>UNIT</u>	<u>NOMINAL</u>		<u>LIMIT</u>	
		(AM)	(SSB)	(AM)	(SSB)
Maximum Audio Output Power -8ohms Load	W	6.0	6.0	4.0	4.0
Audio Output Power at 10% Distortion. -8ohms Load	W	4.5	4.5	3.5	3.5
RF Gain Attenuation, 0.5 uV Standard.	dB	40	40	30 to 50	30 to 8
Fidelity at 450 Hz (1KHz OdB Reference).	dB	-3	-3	-6	-6
Fidelity at 2.2 KHz (1KHz OdB Reference).	dB	-10	-3	-18	-6
Squelch Sensitivity at Threshold	uV	0.3	0.3	1.0	1.0
Squelch Sensitivity at Tight.	uV	1000	1000	300 to 3000	← same
S Meter Sensitivity for S-9.	uV	100	100	30 to 300	30 to
Image rejection at 30.8 MHz	dB	50	50	45	45
Front end attenuation at IF Frequency of 7.8 MHz	dB	90	90	80	80
Hum & Noise Ratio Below Antenna input 1mV.	dB	50	*	40	*
Oscillator Dropout Voltage.	V	8.0	8.0	11.0	11.0
Battery Drain at no Signal (DC).	mA	600	600	750	750
AC Power Drain at no signal.	W	*	*	*	*
Clarifier Range (Receiver only)	Hz	1000	1000	600	600
Adjacent Channel Selectivity.	dB	60	70	50	60
PA Output Power at 10% Distortion -8ohms Load	W	4.5	*	3.5	*

TRANSISTOR COMPLEMENTMODEL STALKER ONE

TR1	2SC839	Noise Blanker Amplifier
TR2	2SC839	Noise Blanker Amplifier
TR3	2SA733	Noise Blanker Amplifier
TR4	2SC839	Noise Blanker Amplifier
TR5	2SC784/2SC460/2SC839	Receiver RF Amplifier
TR6	2SC839	Receiver 7.8 MHz IF Amplifier/ SSB Transmitter 7.8 MHz Amplifier
TR7	2SC839	AM Transmitter 7.8 MHz Amplifier
TR8	2SC839	Receiver 7.8 MHz Amplifier
TR9	2SC839	Receiver 7.8 MHz Amplifier
TR10	2SC945	AM Receiver AF Amplifier / SSB Product Detector
TR11	2SC839	19 MHz Band Local Amplifier
TR12	2SC839	TTL Driver Amplifier
TR13	2SC945	AGC Amplifier
TR14	2SC945	Squelch Amplifier
TR15	2SC945	Squelch Amplifier
TR16	2SC945	Mike Compression
TR17	2SA733	Mike Compression
TR18	2SC945	Mike Compression
TR19	2SC839	P.L.L. 13.1325 MHz Local Oscillator
TR20	2SC839	13.1325 MHz x2 (Doubler)
TR21	2SC839	P.L.L. Local Mixer
TR22	2SC839	P.L.L. 44.730 MHz AM Local Oscillator
TR23	2SC945	P.L.L. Active Filter
TR24	2SC945	P.L.L. Active Filter
TR25	2SC945	P.L.L. Active Filter
TR26	2SC839	7.7975 MHz/7.8025 MHz Carrier Oscillator
TR27	2SC945	SSB Transmitter Mike Amplifier
TR28	2SC1307	Transmitter Final
TR29	2SC1307	Transmitter Driver
TR30	2SC763	Transmitter Pre Driver
TR31	2SC1096	AM Transmitter Power Regulator
TR32	2SC945	AM Transmitter Power Regulator
TR33	2SC945	Receiver/PA AF Amplifier

FET COMPLEMENT

FET1	2SK30	Noise Blanker Amplifier
FET2	3SK40/3SK41	Receiver Mixer
FET3	2SK19	P.L.L. VCO
FET4	3SK40	P.L.L. Mixer
FET5	2SK19	AGC Amplifier

IC COMPLEMENT

IC1	MC4044P/upc1008C	P.L.L. Phase Detector
IC2	uPC143C08/MC7808UC	8V Voltage Regulator
IC3	LM1496H/MC1496G	Transmitter Balanced Modulator
IC4	uPC157A.LM301AN	Mike Compression'
IC5	LM3028BH/TA7045M	Transmitter Balanced Mixer
IC6	uPC56H2/uPC10001H	AF Power Amplifier
IC7	SN7490N/DM7490/N7490	1/10 Divider
IC8	SN7490N/DM7490/N7490	1/10 Divider
IC9	SN7490N/DM7490/N7490	1/10 Divider
IC10	SN7490N/DM7400/N7490	clock Oscillator/ Reset
IC11	SN7490N/DM7490/N7490	1/N Divider
IC12	SN7490N/DM7490/N7490	1/N Divider

DIODE COMPLEMENT

D1,2	1N60	Noise Blanker Detector
D3,54	1S1588	Protector
D4,5	1S1588	IF Signal Switching
D6	1S1588	Shortening
D7,8	1S1588	TR6 Bias Switching
D9,10	1S1588	Carrier Peak Shortening
D11,12	1N60	AM Detector
D13,14	1N60	S Meter Detector
D15	1N60P	A.N.L. Gate
D16,17	1S1588	Shortening
D18	1S2688	V.C.O.
D19,21	1N60	A.G.C. Detector
D20,22	1S1588	A.G.C. Detector

DIODE COMPLEMENT

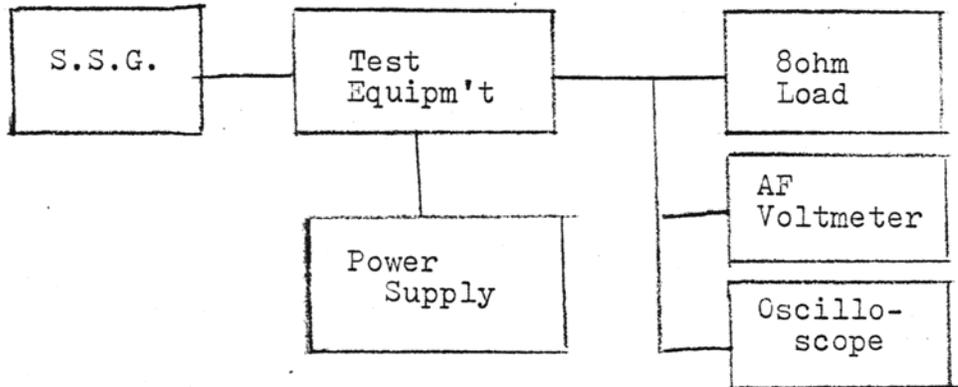
D23	1S1588	A.G.C. Detector
D24	1S1588	Shortening
D25	1S1588	Squelch Switching
D26,27, 28,29	1N60	A.M.C. Detector
D30	1S1588	Switching
D31,36	WZ061	Voltage Regulator
D32,33	1S1588	Switching
D34	1S2688	Clarifier
D35	KB262	Temperature Compensator
D37	BZ052	Voltage Regulator
D38,39,40	1S1588	Switching
D41	KB262	Temperature Compensator
D42	1S1588	Switching
D43	1N60	RF Power Meter Detector
D44,45	CZ092	Voltage Regulator
D46	SR1K2	Polarity Protector
D47	SR1K2	Mode Switching
D48	WZ061	AM Power Regulator
D49	WZ081	Voltage Regulator
D50	SR1K2	Decoupling
D52,53	1S1588	Switching

RECEIVER ALIGNMENT

TEST EQUIPMENT SETUP:

Audio Output Frequency 1KHz, 500 mW 2V (8ohms)
 Power Supply 13.8 V DC.

TEST EQUIPMENTS EMPLOYED AND THEIR CONNECTIONS



1. ALIGNMENT OF COILS AT EACH STAGE AND SENSITIVITY.

Mode Selector Switch to be set at USB position.

A. Connect SSG to Antenna terminal (Channel to be 12)

B. Set each controls as follows:

- * Volume control to be at the fully clockwise position.
- * Dx-Local Switch to be at Dx position.
- * Squelch Control to be at the fully counterclockwise position.
- * Clarifier Control to be at the center.
- * PA-CB Switch to at CB position.
- * Noise Blanker Switch to be at off position.

C. Adjust T-4,5,6,7,8, and 9 in this order, for maximum audio output.

D. Adjust VR-4 for 2.0V audio output on all channels within the SSG range of 0.125uV to 0.04uV.

2. S METER ALIGNMENT

Mode Selector Switch to be set at USB position.

A. Adjust VR-2 for S-9 with SSG set at 50uV. Loaded output.

3. SQUELCH ALIGNMENT

Mode Selector Switch to be set at USB position.

- A. Set SSG at 1mV, and Volume Control at 2.0 V.
Then turn Squelch Control fully clockwise.
- B. Adjust VR-5 till sound starts to be heard.
- C. Cut SSG signal, and turn Volume Control fully clockwise, and Squelch Control fully counterclockwise.
- D. Set Squelch Control at the point where noise barely ceases to be heard.
- E. Make sure that squelch will open when a signal of 0.25uV comes in from SSG, and that it will produce audio output of more than 2.0V.

4. RF GAIN ALIGNMENT

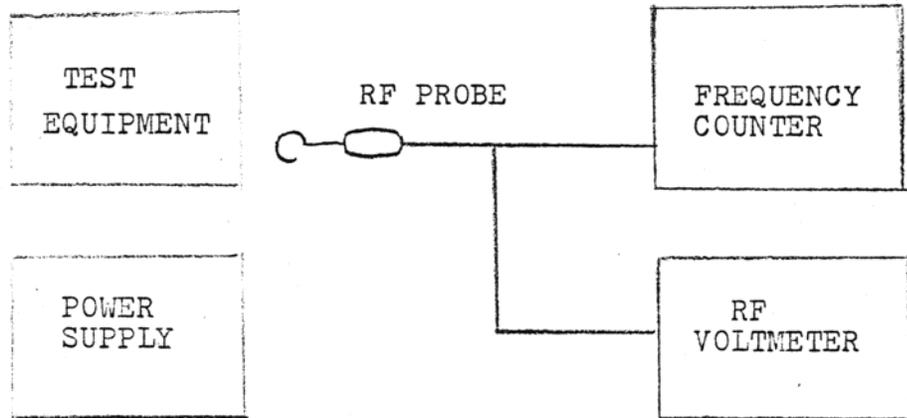
Mode Selector Switch to be set at USB position.

- A. Adjust Volume Control for audio output of 2.0 V, with 0.5uV of SSG output.
- B. Set Dx-Local Switch to be at Local position, and increase SSG output to 50uV.
- C. Adjust VR-1 for audio output of 2.0V.

ALIGNMENT OF PHASES LOCKED LOOP SYNTHESISER .

1. Keep the unit in receiving function.
2. Connect Frequency Counter and RF VTVM to TP-4.
3. Set mode switch to USB position and adjust T20 to get peak gain to be indicated on RF VTVM.
4. Adjust CT-3 to get frequency of 7.7985 MHz ± 5 Hz at mode switch of USB.
5. Adjust CT-2 to get frequency of 7.8025 MHz ± 5 Hz at mode switch of LSB.
6. Connect RF VTVM to TP-3.
7. Adjust T13 and T19 to get peak gain to be indicated on VTVM.
8. Connect DC Volt Meter (internal resistance must be more than 100k ohm/v) to TP-6.
9. Adjust T12 until DC Volt Meter indicates 4.0 V to 4.5 V.
10. Set Channel selector switch to CH-23 and connect frequency counter to TP-2.
11. Adjust the CT401 to get 990 kHz
12. Connect Frequency Counter and VTVM to TP-1 at channel selector switch of CH-13.
13. Adjust T10 and T11 to obtain peak to be indicated on VTVM.
14. Set clarifier to center position at channel selector switch of CH-1.
15. Adjust VR 8 to get frequency of 19.1675 MHz.
16. Adjust VR 9 and VR 11 and get clarifier range of ± 1.5 kHz.
17. Repeat item 15 and 16 at least two (2) times.
18. Set the unit in transmitting function.
19. Adjust VR 7 to get frequency of 19.1675 MHz.
20. Set the unit in receiving function and select AM mode.
21. Connect RF VTVM to TP-3, and adjust T-14 to get peak gain to be indicated on VTVM.
22. Adjust CT1 to obtain frequency of 19.1650 MHz.

TEST EQUIPMENTS EMPLOYED AND THEIR CONNECTIONS

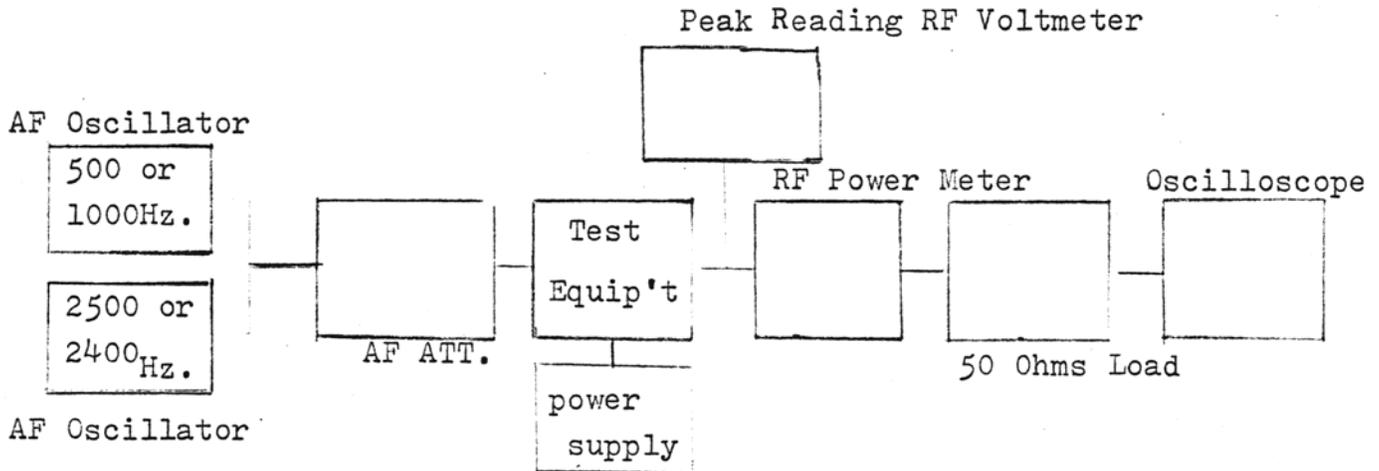


SSB TRANSMITTER ALIGNMENT

TEST EQUIPMENT SETUP:

Mike Input 500 Hz and 2400 Hz, two tones.
 Channel 12

TEST EQUIPMENTS EMPLOYED AND THEIR CONNECTIONS



1. ALIGNMENT OF COILS AT EACH STAGE.

Mode Selector Switch to be at USB position.

VR-6,12 to be set at maximum position.

- A. Set mike input at 1mV, and adjust T-16,17,18, and T-15, L-10 and L8, in the order, for maximum reading on RF VTVM.
- B. Set mike input at 0.2mV, and adjust T-16,17,18, and T-15 for maximum reading on VTVM.
- C. Increase mike input to 20mV, and adjust L-8 and L-10 for maximum reading on VTVM.
- D. Set mike input at 0.1mV, and adjust VR-15 for minimum crossover.
- E. Adjust VR-6,12 so that RF output power will increase to 10.5W to 11.5W when mike input is increased 10dB more than necessary to produce 10W PEP output.

2. CARRIER EMISSION CHECK

Mode Selector Switch to be set at USB position.

- A. Adjust mike input for 10W PEP output power.
- B. Cut mike input, and adjust VR 14 for minimum residual carrier.

- C. Carrier emission should be less than -40dB,
- D. Change Mode Selector Switch to LSB position and repeat the above alignment procedure.

AM TRANSMITTER ALIGNMENT

TEST EQUIPMENT SETUP:

Mode selector switch to be set at AM.
Mike input to be 1 KHz.
Channel to be 12.

TEST EQUIPMENTS EMPLOYED AND THEIR CONNECTIONS

Refer to the attached SSB transmitter alignment.

1. RF OUTPUT POWER ADJUSTMENT.
 - A. Adjust VR17 for 3.5W RF output power, non-modulated.
2. AMC ADJUSTMENT.
 - A. Adjust Mike input for 50% modulation.
 - B. Increase mike input by 16dB more than necessary to produce 50% modulation, and adjust VR-13 for 80% modulation.
 - C. Change mike input to 2.5 KHz, and repeat the above alignment procedure.
3. TVI TRAP ALIGNMENT
 - A. Adjust L-5, observing spectrum analyzer, so that the second harmonics (54 MHz) reaches the lowest maximum point.
 - B. Make sure that all spurious harmonics are attenuated more than 50 dB below fundamental.