

S E R V I C E M A N U A L

B I G " T "



TEABERRY
ELECTRONICS CORP.
INDIANAPOLIS, INDIANA U.S.A.
46226

GENERAL INFORMATION OF MODEL : BIG "T"

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	27.035	15	27.135	23	27.235
8	27.055	16	27.155		

3. RF Output Power Rating

: 4 - Watts (max.)

4. Voltage & Current at Final Stage

: Voltage: 12 V at 12 ch.
Current: 350 mA at 12 ch.

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. Description of Oscillator Circuit
and Devices for Frequency Stabilization

: Per attached OSC Circuit
description

9. Automatic Modulation Control (AMC)

: Per attached AMC Circuit
description

SPECIFICATIONS FOR MODEL: BIG "T" (UT - 95A)

GENERAL:

* Channels	:	23 Channels
* Frequency Range	:	26.965 MHz to 27.255 MHz
* Frequency Controlled	:	Crystal Controlled Synthesizer
* Semi Conductors	:	25 Transistors, 19 Diodes
* Microphone	:	600 ohm, Dynamic
* Speaker	:	8 ohm, 3 1/2"
* Antenna Impedance	:	50 ohm Coaxial
* Meter	:	Indicated Received Signal Strength and Relative Transmit Power Output
* Size	:	9 3/4" W x 8" D x 3 3/4" H
* Weight	:	
* Jacks	:	Phone (6P), Ext SP/PA (3.5P), Mike (4P)
* Controls	:	Channel Selector Switch Power ON-OFF Switch Volume Control Squelch Control PA ON-OFF Switch ANL ON-OFF Switch
* Power Supply	:	105 V to 129 V AC 60 Hz 12 V to 16 V DC
* Temperature	:	- 20° C to +50° C

ACCESSORIES:

Microphone
Microphone Hanger & Screw
Mounting Bracket & Screw
ID Card w/Envelope
FCC Application Form
Instruction Manual

MEASUREMENT CONDITION:

Audio output power 500 mW
Audio output load 8 ohm
Modulation frequency 1 KHz
Modulation 30%

ANT impedance 50 ohm
Power source 13.8 V DC
117 V 60 Hz
Test temperature 25° ± 5° C

A. TRANSMITTER SECTION		<u>Nominal</u>	<u>Limit</u>
Final Input Power	:		5 W
RF Output Power	:	3.2 W	2.7 ~ 4 W
Spurious Ratio	:	55 dB	50 dB
Frequency Tolerance	:		$\pm 0.005\%$
Microphone Input Sensitivity (1 KHz 50% Modulation)	:	4 mV	2 ~ 6 mV
Current Drain at No Modulation - AC	:	300 mA	400 mA
- DC	:	900 mA	1,000 mA
Current Drain at 80% Modulation - AC	:	400 mA	500 mA
- DC	:	1,500 mA	1,800 mA
B. RECEIVER SECTION (1 uV = 0 dB, ANL: OFF)			
Maximum Sensitivity	:	0.5 uV	0.25 ~ 1 uV
Sensitivity at 10 dB S/N	:	0.5 uV	1.0 uV
Image Rejection Ratio (f_o -910 KHz)	:	35 dB	25 dB
1st IF Rejection Ratio (11.275 MHz)	:	50 dB	40 dB
2nd IF Rejection Ratio (455 KHz)	:	100 dB	80 dB
Spurious Rejection Ratio	:	40 dB	25 dB
Squelch Sensitivity at Threshold	:	1 uV	2 uV
Squelch Sensitivity at Maximum	:	500 uV	125 ~ 2,000 uV
AGC (Input 50 mV, Output 10 dB Down)	:	90 dB	70 dB
IF Response at 6 dB Down Band Width	:	7 KHz	4 KHz
Adjacent Channel Selectivity	:	40 dB	30 dB
Cross Modulation	:	45 dB	35 dB
Audio Output Power (RF Input 1 mV)			
at Maximum Power	:	6 W	3 W
at 10% Distortion	:	3 W	2.5 W
Distortion at Input 1 mV	:	4.5%	7%
Distortion at Input 50 mV	:	6%	10%
Audio Fidelity (1 KHz, 0 dB Reference)			
(RF Input 1 mV) at 300 Hz	:	-6 dB	-10 dB
at 2.0 KHz	:	-6 dB	-10 dB
"S" Meter Sensitivity for "S-9"	:	50 uV	
Current Drain at No Signal - AC	:	250 mA	300 mA
- DC	:	350 mA	450 mA
Current Drain at Maximum Output Power			
- AC	:	400 mA	500 mA
- DC	:	1,100 mA	1,300 mA
Hum & Noise at 100 uV	:	45 dB	40 dB
C. PA SECTION			
Maximum Output Power	:	5 W	4 W
10% Distortion Output Power	:	4 W	3 W

ALIGNMENT OF VOLTAGE REGULATOR

Equipment required:

- a. Slide regulator
- b. AC voltage meter (150 v)
- c. DC voltage meter (30 v)

STEP	PRESET TO	CONNECTIONS	ADJUSTMENT	REMARKS
1	Receiving position	DC volt meter to J5	VR101	Adjust for 13.8 v

ALIGNMENT INSTRUCTION

A.. TRANSMITTER SECTION

1. Test equipment required:

- a. V.T.V.M. (Vacuum Tube Volt Meter)
- b. RF output power meter
- c. 50 ohm load (noninduction)
- d. RF attenuator
- e. Frequency counter
- f. DC amp meter (1 amp maximum)
- g. Field strength meter
- h. Oscilloscope
- i. Audio generator
- j. DC power supply (13.8 volt/2 amp) or AC power supply (117 v 60 Hz)

2. Alignment procedure

STEP	PRESET TO	CONNECTIONS	ADJUSTMENT	REMARKS
1	Tx mode, no modulation at channel 23	VTVM to secondary of T-8 (TP-2)	T-8	Adjust at the max point of OSC output; then turn the core to clockwise & fix at the point of 10% lower from the peak OSC (23 MHz OSC alignment)
2	Tx mode, no modulation at channel 13	VTVM to secondary of T-11 (TP-3)	T-9 T-10 T-11	Adjust for the max indication on VTVM (38 MHz mixer output alignment)
3	Same as Step 2	VTVM to secondary of T-14 (TP-4)	T-12 T-13 T-14	Adjust for the max indication on VTVM (27 MHz filter alignment)

4	Same as Step 2	RF output p power meter to Ant Jk. (J-4)	L-4 L-7 L-8	Adjust for the max indication on power meter
5	Same as Step 2	Same as Step 4	L-4	Adjust L-4 to obtain nominal 3.2W of RF output power
6	Same as item 2	Fieldstrength meter to ANT thru 50 ohm load and attenuator	L-3	Adjust to eliminate 54 MHz spurious radiation as small as possible (spurious alignment)
7	Tx mode, no modulation at all channels	Same as Step 2		Check frequency of all channels
8	Same as Step 2	Same as Step 2	VR-7	Adjust to obtain meter needle indication to the same power indication of RF power meter (meter adjust.)
9	Same as Step 2	Oscilloscope w/ 50 ohm load to ANT & AF generator to mic jk (J-3)	VR-8	Adjust to obtain 80% modulation at 10 mV, 1 KHz output of AF generator

B. RECEIVER SECTION

1. Test equipment required:

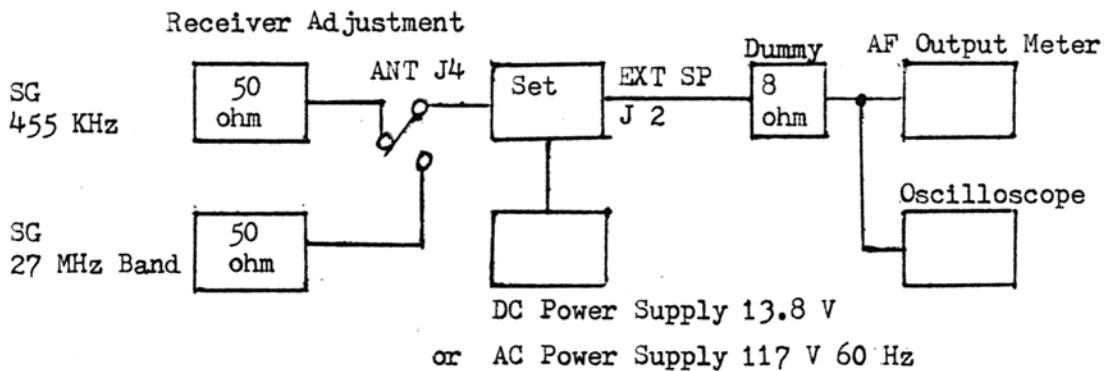
- a. Signal generator (455 KHz and 27 MHz band, 50 ohm output impedance, 1,000 OHZ, 30% modulation)
- b. AF output meter
- c. Oscilloscope
- d. 8 ohm dummy load (resistive)
- e. DC power supply (13.8 volt/2amp) or AC power supply (117 V 60 Hz)

2. Alignment procedure

STEP	SG CONNECTION FREQUENCY	PRESET TO	OUTPUT METER CONNECTION	ADJUSTMENT	REMARKS
1	to the base of TR-3 thru 0.01 uF cap. freq.: 455 KHz	ANL: OFF VOL: MAX SQL: MIN PA: OFF	to EXT SPK jk. (J-2)	T-5 T-6 T-7	Adjust for max indication on AF output meter
2	to ANT connector Freq: 27.115 MHz	SQL: MIN ANL: OFF VOL: MAX PA: OFF RX CH: 13	same as Step 1	T-1 T-2 T-3 T-4	Adjust for max indication on AF output meter
3	Same as Step 2	Same as Step 2	Same as Step 2	VR-3	Adjust to obtain proper sensitivity (0.5 uV)

4	Same as Step 2 ("S" meter adjustment)	Same as Step 2	Same as Step 2	VR-6	Adjust for S-9 position of meter needle indication at SG output level of 50 uV
5	Same as Step 2 (squelch adjustment)	Same as Step 2 SQL: MAX	Same as Step 2	VR-2	Adjust for 2 V AF output at SG input level of 500 uV and Squelch VR: Maximum

Remarks: Further reference of test equipments connection, see the following diagram



TX OSCILLATION CIRCUIT

1. 23 MHz Oscillator Circuit:

This oscillator circuit consists of the crystal controlled oscillator for the frequency synthesizer. The oscillator signal comes out from TR-6 2SC839 silicon transistor which is so called "Pierce B-E Oscillator Circuit." The collector tank circuit can be adjusted to obtain adequate frequency stability of oscillation. The voltage supplied to this circuit is also stabilized by a zener diode ZD-1,CZ-092.

2. 14 MHz Oscillator Circuit:

This oscillator circuit consists of the crystal controlled oscillator for the frequency synthesizer, of which signal comes out from TR-14 2SC839. The circuit is non-adjustable oscillator circuit and it well eliminates the undesirable spurious frequencies.

3. 11 HMz Oscillator Circuit:

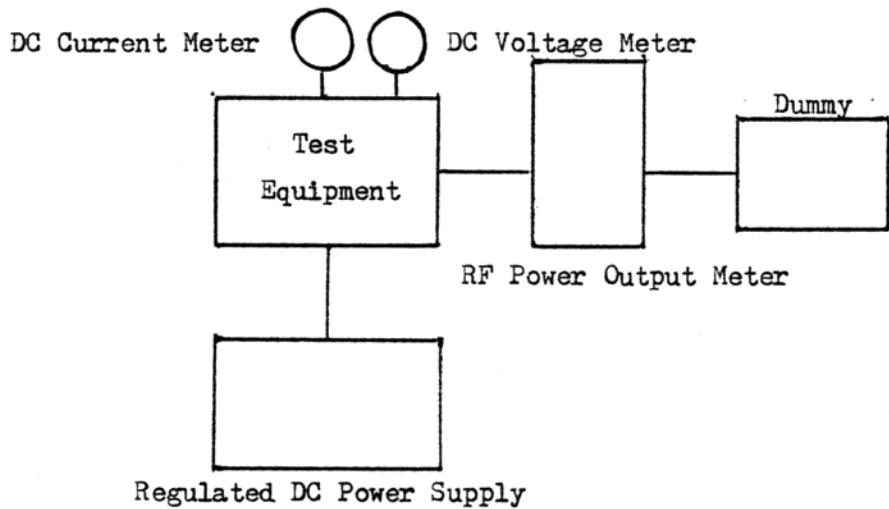
This oscillator circuit consists of the crystal controlled oscillator for the frequency synthesizer, of which signal comes out from TR-15 2SC839. The circuit is non-adjustable oscillator circuit, and it well eliminates the undesirable spurious frequencies.

AMC (AUTOMATIC MODULATION CONTROL) CIRCUIT

To protect overmodulation and to govern occupied band width when modulated, the percentage of modulation is automatically controlled. The modulation output signal is converted to DC signal by D-11, D-12, 1N60 and controlled by TR-17 2SC1364. The circuit works as the attenuator by TR-17 2SC1364 and R- 79 22K_o.

TEST CONNECTIONS

(Fig. 1)

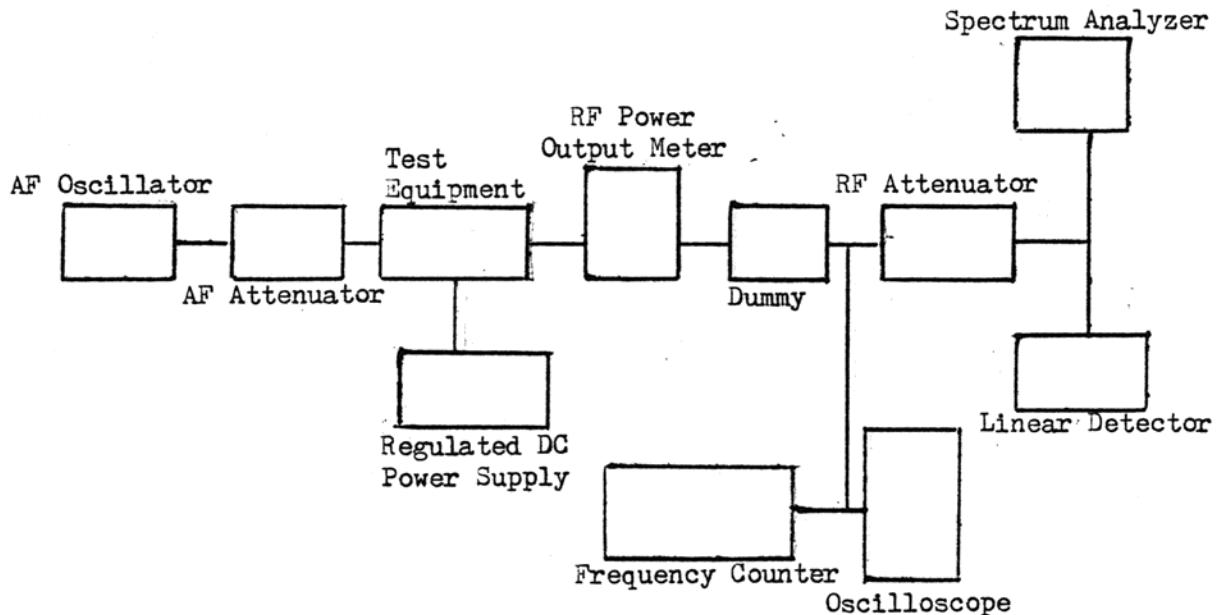


Meter used (Maker, Model):

RF Power Output Meter	Bird Electronics	Model -43
Dummy.	Iwatsu	AF-20N
DC Current Meter	Yokogawa Electronics	Class 0.5,
DC Voltage Meter	Yokogawa Electronics	Class 0.5
Regulated DC Power Supply	Kikusui Electronics	Model PAC20-5

TEST CONNECTIONS

(Fig. 2)



Meter used (Maker, Model):

AF Oscillator	Meguro Denpa Sokki	MCR-401
AF Attenuator	Kikusui Electronics	Model 984A
RF Power Output Meter	Bird Electronics	Model 43
Dummy.	Iwatsu	AF - 20 A
RF Attenuator.	Ando Electronics	AL - 512 N.
Linear Detector.	Meguro Denpa Sokki	Model MDA -450 A
Oscilloscope	Matsushita Communication	VP - 5405 A
Frequency Counter.	Takeda Riken	TR- 3976
Regulated DC Power Supply. . .	Kikusui Electronics	Model PAC 20-5
Spectrum Analyzer.	Hewlett Packard	Display 141 T RF 8554 L IF 8552 A

FUNCTION / TRANSISTOR / DIODE

Model: Big "T"

1. Transistor Complement:

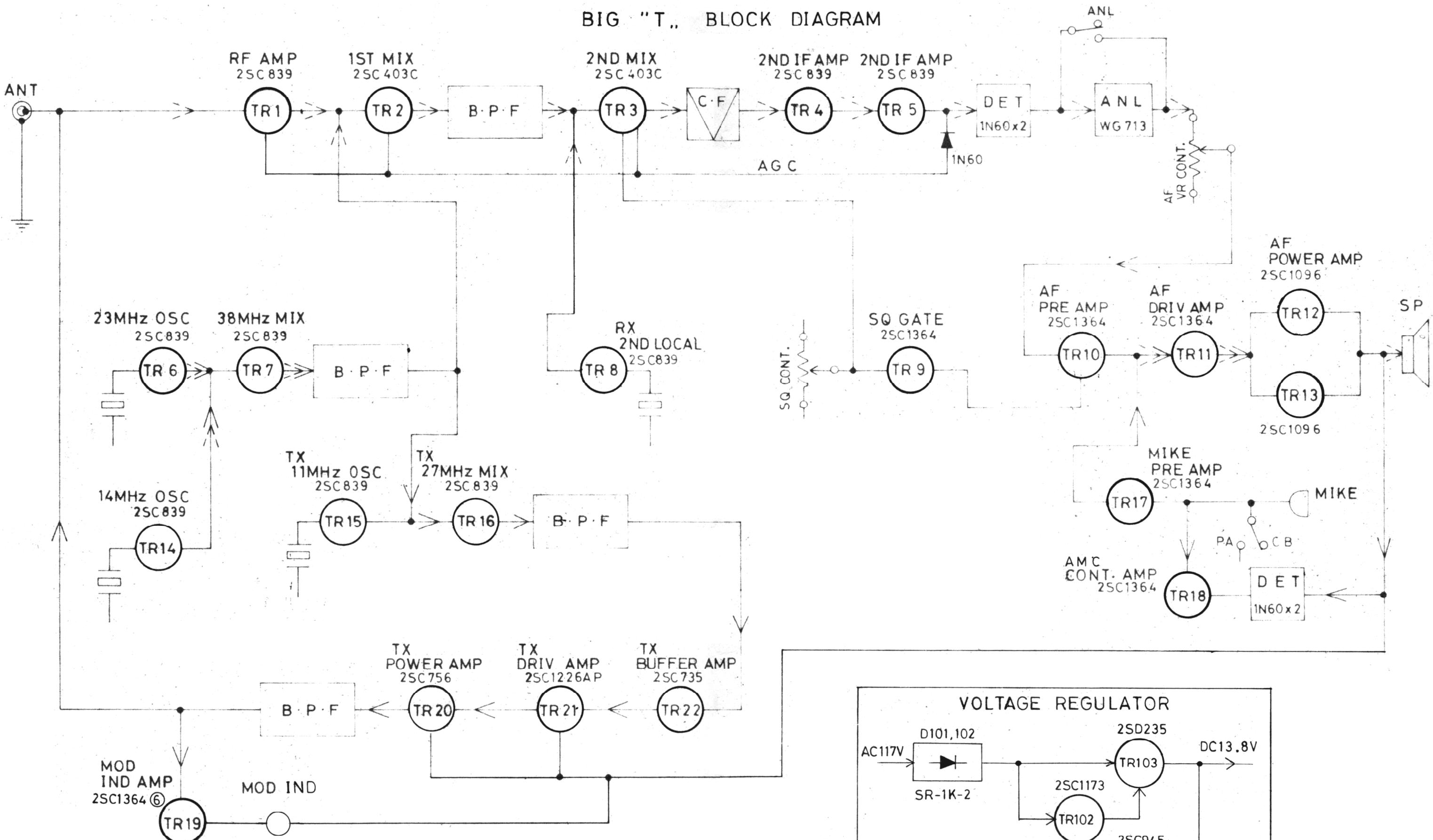
TR- 1	2SC839	RF Amplifier
TR- 2	2SC403C	Receiver 1st Mixer
TR- 3	2SC403C	Receiver 2nd Mixer
TR- 4	2SC839	2nd IF Amplifier (455 KHz)
TR- 5	2SC839	2nd IF Amplifier (455 KHz)
TR- 6	2SC839	23 MHz Oscillator
TR- 7	2SC839	38 MHz Band Mixer
TR- 8	2SC839	2nd Local Oscillator (11.730 MHz)
TR- 9	2SC1364	Squelch Gate
TR-10	2SC1364	Receiver AF Pre-Amplifier
TR-11	2SC1364	AF Driver Amplifier
TR-12	2SC1096	AF Power Amplifier
TR-13	2SC1096	AF Power Amplifier
TR-14	2SC839	14 MHz Band Oscillator
TR-15	2SC839	Tx Oscillator (11.275 MHz)
TR-16	2SC839	27 MHz Band Tx Mixer
TR-17	2SC1364	Mic. PA Pre-Amplifier
TR-18	2SC1364	AMC Control Amplifier
TR-19	2SC1364	Modulation Indicator Amplifier
TR-20	2SC756	Tx Power Amplifier
TR-21	2SC1226A	Tx Driver Amplifier
TR-22	2SC735	Tx Buffer Amplifier
TR-101	2SC945	Voltage Regulator
TR-102	2SC1173	Voltage Regulator
TR-103	2SD235	Voltage Regulator

2. Diode Complement:

D- 1	WG-713	Receiver Protector
D- 2	WG-713	Mode Switching
D- 3	WG-713	Receiver Protector
D- 4	1N60	AGC Detector
D- 5	1N60	Receiver "S" Meter Detector
D- 6	1N60	Receiver Detector
D- 7	1N60	Receiver Detector

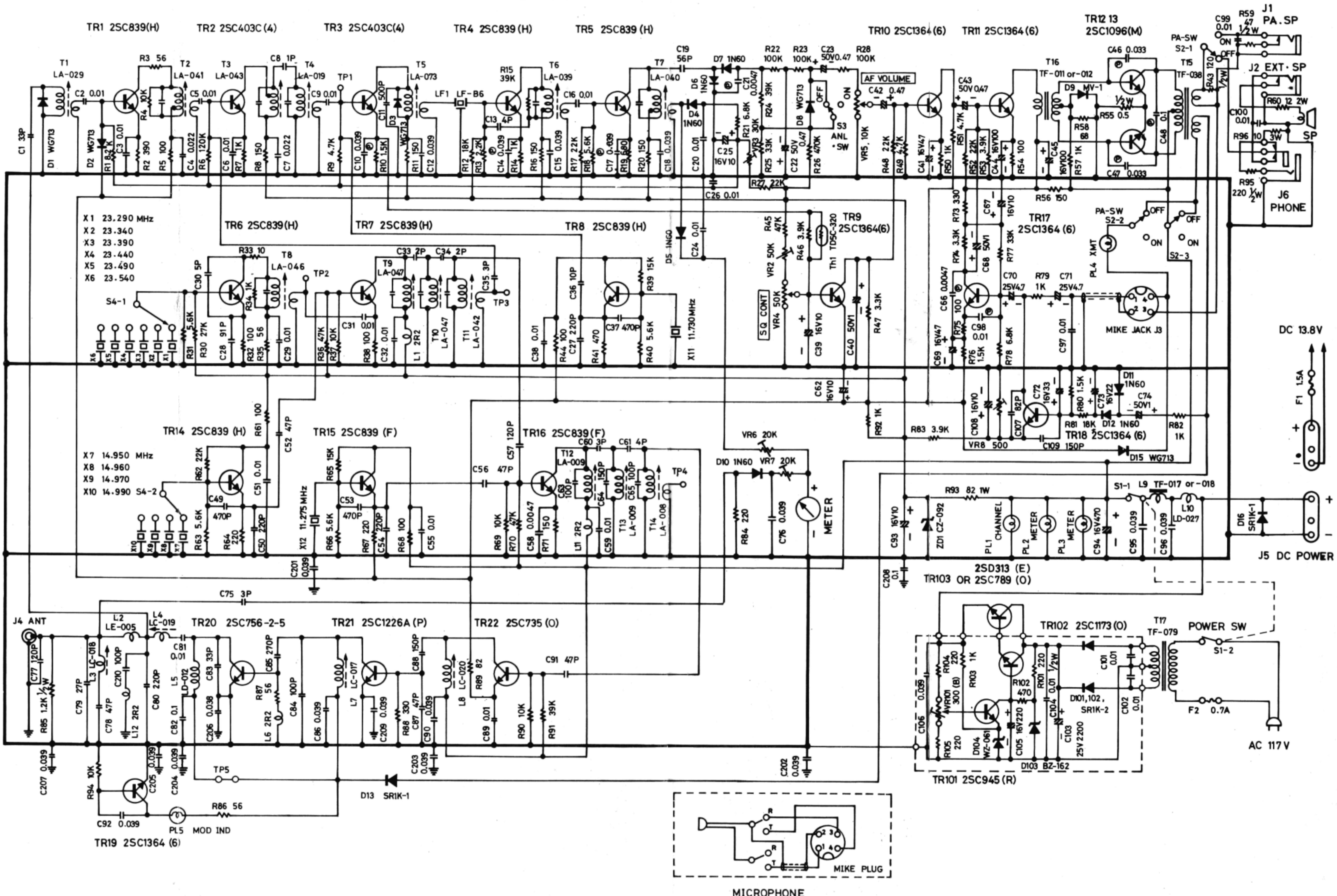
D- 8	WG-713	ANL Gate
D- 9	MV-1	Varistor
D-10	1N60	Tx Meter Detector
D-11	1N60	AMC Detector
D-12	1N60	AMC Detector
D-13	SR-1K-1	Modulation Stabilizer
D-14	WG-713	Mode Switching
D-101	SR-1K-2	Rectifier
D-103	BZ-162	Voltage Stabilizer
D-104	WZ-071	Voltage Stabilizer
ZD-1	CZ-092	Receiver Voltage Stabilizer

BIG "T" BLOCK DIAGRAM



名稱	UT-95A (BIG "T")
番号	E73-0011
当	49.10.6
当	49.9.21

CIRCUIT DIAGRAM FOR BIG "T"



BILLS OF MATERIAL FOR BIG "T"

CIRCUIT SYMBOL		DESCRIPTION		CIRCUIT SYMBOL	DESCRIPTION	PART NO.
CIRCUIT SYMBOL	DESCRIPTION	PART NO.			COILS & TRANSFORMERS (Continued)	
SEMI-CONDUCTORS						
TRANSISTORS						
TR-1,4,5,6,7,8,14	Transistor 2SC839 (H).....	DDBY222002	L-9		Choke Transformer TF-017	TTFY017001
TR-2,3	Transistor 2SC403C (4).....	DDBY204001	L-10		Coil LD-027	LLDY027001
TR-9,10,11,17,18, 19	Transistor 2SC1364 (6).....	DDBY233001				
TR-12,13	Transistor 2SC1096 (M).....	DDBY227001	C-8		Ceramic 1pF 50V	CCCB811091
TR-15,16	Transistor 2SC839 (F).....	DDBY222001	C-33,34		Ceramic 2pF 50V	CCCB812091
TR-20	Transistor 2SC756-2-5.....	DDBY215003	C-35,60		Ceramic 3pF 50V	CCCB813091
TR-21	Transistor 2SC1226A (P).....	DDBY229001	C-13,61		Ceramic 4pF 50V	CCCB814091
TR-22	Transistor 2SC735 (O).....	DDBY214001	C-36		Ceramic 10pF 50V	CCCB811005
TR-101	Transistor 2SC1096 (M).....	DDBY227001	C-1		Ceramic 33pF 50V	CCCB813305
TR-102	Transistor 2SC1173 (O).....	DDBY228001	C-56,78,91		Ceramic 47pF 50V	CCCB814705
TR-103	Transistor 2SC789 (O).....	DDBY220001	C-19		Ceramic 56pF 50V	CCCB815605
D-1	Diode CD37A.....	DDAY003002	C-63,65		Ceramic 100pF 50V	CCCB811015
D-2,3,8,15,17	Diode WG713.....	DDAY004001	C-57,77		Ceramic 120pF 50V	CCCB811215
D-4,5,6,7,10,11,12	Diode IN60.....	DDAY001004	C-64		Ceramic 150pF 50V	CCCB811515
D-9	Varistor MV-1.....	DDFY007001	C-75		Ceramic 3pF 50V SL	CCGB813091
D-13,16	Diode SR1K-1.....	DDAY002001	C-30		Ceramic 5pF 50V SL	CCGB815091
D-101,102	Diode SR1K-2.....	DDAY002002	C-79		Ceramic 27pF 50V SL	CCGB812705
D-103	Zenor Diode BZ-162.....	DDAY009003	C-83		Ceramic 33pF 50V SL	CCGB813305
D-104	Zenor Diode WZ-061.....	DDAY008001	C-52,87		Ceramic 47pF 50V SL	CCGB814705
ZD-1	Zenor Diode CZ-092.....	DDAY010002	C-107		Ceramic 82pF 50V SL	CCGB818205
TH-1	Thermistor TD5C-320.....	DDFY003003	C-28		Ceramic 91pF 50V SL	CCGB819105
			C-84,210		Ceramic 100pF 50V SL	CCGB811015
			C-88,109		Ceramic 150pF 50V SL	CCGB811515
			C-27,50,54,80		Ceramic 220pF 50V SL	CCGB812215
T-1	Coil LA-029	LLAY029001	C-85		Ceramic 270pF 50V SL	CCGB812715
T-2	Coil LA-041	LLAY041001	C-37,49,53		Ceramic 470pF 50V SL	CCGB814715
T-3	Coil LA-043	LLAY043001	C-110		Ceramic 22pF 50V SL	CCGB812205
T-4	Coil LA-019	LLAY019001	C-22,23,42,43		Electrolytic 0.47μF 50V	CEWF814780
T-5	Coil LA-073	LLAY073001	C-40,68,74		Electrolytic 1μF 50V	CEWF811090
T-6	Coil LA-039	LLAY039001	C-70,71		Electrolytic 4.7μF 25V	CEWF514790
T-7	Coil LA-040	LLAY040001	C-25,39,62,67,93,		Electrolytic 10μF 16V	CEWF311000
T-8	Coil LA-046	LLAY046001	108			
T-9,10	Coil LA-047	LLAY047001	C-73		Electrolytic 22μF 16V	CEWF312200
T-11	Coil LA-042	LLAY042001	C-72		Electrolytic 33μF 16V	CEWF313300
T-12,13	Coil LA-009	LLAY009001	C-41,69		Electrolytic 47μF 16V	CEWF314700
T-14	Coil LA-008	LLAY008001	C-44,45		Electrolytic 100μF 16V	CEWF311010
T-15	Output Transformer TF-038.....	TTFY038001	C-105		Electrolytic 220μF 16V	CEWF312210
T-16	Input Transformer TF-011.....	TTFY011001	C-94		Electrolytic 470μF 16V	CEWF314710
T-17	Power Transformer TF-079.....	TTFY079001	C-103		Electrolytic 2,200μF 25V	CCZY015001
L-1,6,11,12	Micro Inductor LF-4, 2R2.....	LLZY002005	C-58		Ceramic 0.0047μF 25V YG	CKFB514720
L-2	Coil LE-006.....	LLEY002005	C-2,3,5,6,9,16,20,		Ceramic 0.01μF 25V YG	CKFB511030
L-3	Coil LC-018.....	LLCY018001	24,26,29,31,32,			
L-4	Coil LC-019.....	LLCY019001	38,51,55,59,81,			
L-5	Coil LD-012.....	LLDY012001	89,97,99,100,			
L-7	Coil LC-017.....	LLCY017001	101,102,104			
L-8	Coil LC-020.....	LLCY020001	C-4,7			
					Ceramic 0.022μF 25V YG	CKFB512230

CIRCUIT SYMBOL	DESCRIPTION	PART NO.	CIRCUIT SYMBOL	DESCRIPTION	PART NO.
CAPACITORS (Continued)					
C-12,15,18,76,86, 90,92,95,96,106, 201,202,203,204, 205,206,207,209	Ceramic 0.039 μ F .25V YG	CKFB513930	R-39,65	Carbon 15k ohm 1/4W	RUBZ141534
C-82,208	Ceramic 0.1 μ F 25V YG.....	CKFB511040	R-12,81	Carbon 18k ohm 1/4W	RUBZ141834
C-11	Ceramic 500pF 50V N1200	CCEX815015	R-17,27,48,52,62	Carbon 22k ohm 1/4W	RUBZ142234
C-21,66	Mylar 0.0047 μ F 50V	CQME814725	R-30	Carbon 27k ohm 1/4W	RUBZ142734
C-98	Mylar 0.01 μ F 50V	CQME811035	R-25,77	Carbon 33k ohm 1/4W	RUBZ143334
C-46,47	Mylar 0.033 μ F 50V	CQME813335	R-36,70	Carbon 47k ohm 1/4W	RUBZ144734
C-10,14,17	Mylar 0.039 μ F 50V	CQME813935	R-22,23,28	Carbon 100k ohm 1/4W	RUBZ141044
C-48	Mylar 0.1 μ F 50V	CQME811045	R-6	Carbon 120k ohm 1/4W	RUBZ141244
			R-26	Carbon 470k ohm 1/4W	RUBZ144744
			R-15,24,91	Carbon 39k ohm 1/4W	RUBZ143934
			R-89	Carbon 82 ohm 1/4W	RUBZ148204
RESISTORS					
R-59	Solid 47 ohm 1/2W	RCEL124705	VR-4		
R-43	Solid 120 ohm 1/2W	RCEL121215	VR-5	RV-091, 50k ohm B	RRVY091001
R-95,101	Solid 220 ohm 1/2W	RCEL122215	VR-2	RV-090, 10k ohm A	RRVY090001
R-85	Solid 1.2k ohm 1/2W	RCEL121225	VR-3	Semi-fixed, RV-103, 50k ohm	RRVY103010
R-55	Metal 0.5 ohm 1/2W	RSJZ125085	VR-6,7	Semi-fixed, RV-103, 30k ohm	RRVY103009
R-96	Metal 10 ohm 3W	RSJZ301005	VR-8	Semi-fixed, RV-103, 20k ohm	RRVY103008
R-60	Metal 12 ohm 2W	RSJZ201205	VR-101	Semi-fixed, RV-103, 500 ohm	RRVY103003
R-93	Metal 82 ohm 1W	RSJZ108205		Semi-fixed, RV-102, 300 ohm	RRVY102002
R-104,105	Carbon 220 ohm 1/4W	RPBZ142214			
R-102	Carbon 470 ohm 1/4W	RPBZ144714			
R-103	Carbon 1k ohm 1/4W	RPBZ141024	X-1	Crystal 23,290 MHz	QQXY016001
R-83	Carbon 3.9k ohm 1/4W	RPBZ143924	X-2	Crystal 23,340 MHz	QQXY016002
R-45	Carbon 47k ohm 1/4W	RPBZ144734	X-3	Crystal 23,390 MHz	QQXY016003
R-97	Carbon 5.6k ohm 1/4W	RPBZ145624	X-4	Crystal 23,440 MHz	QQXY016004
R-15	Carbon 56k ohm 1/4W	RUBZ145634	X-5	Crystal 23,490 MHz	QQXY016005
R-33	Carbon 10 ohm 1/4W	RUBZ141004	X-6	Crystal 23,540 MHz	QQXY016006
R-3,35,86,87	Carbon 56 ohm 1/4W	RUBZ145604	X-7	Crystal 14,950 MHz	QQXY015001
R-58	Carbon 68 ohm 1/4W	RUBZ146804	X-8	Crystal 14,960 MHz	QQXY015002
R-5,32,38,44,54, 61,68,75	Carbon 100 ohm 1/4W	RUBZ141014	X-9	Crystal 14,970 MHz	QQXY015003
R-8,11,16,20,56,71	Carbon 150 ohm 1/4W	RUBZ141514	X-10	Crystal 14,990 MHz	QQXY015004
R-64,67,84	Carbon 220 ohm 1/4W	RUBZ142214	X-11	Crystal 11,730 MHz	QQXY014002
R-2,73,88	Carbon 330 ohm 1/4W	RUBZ143314	X-12	Crystal 11,275 MHz	QQXY014001
R-41	Carbon 470 ohm 1/4W	RUBZ144714			
R-19	Carbon 680 ohm 1/4W	RUBZ146814			
R-7,14,34,50,57, 82,92,79	Carbon 1k ohm 1/4W	RUBZ141024	S-1	Push Switch SW-010	SSWY010001
R-10,76,80	Carbon 1.5k ohm 1/4W	RUBZ141524	S-2	Push Switch SW-022	SSWY022001
R-13	Carbon 2.2k ohm 1/4W	RUBZ142224	S-3	See-saw Switch SW-026	SSWY026001
R-47,74	Carbon 3.3k ohm 1/4W	RUBZ143324	S-4	Rotary Switch SR-062	SSRY062001
R-46,53	Carbon 3.9k ohm 1/4W	RUBZ143924			
R-9,49,51	Carbon 4.7k ohm 1/4W	RUBZ144724	FL-1		
R-18,31,40,63,66	Carbon 5.6k ohm 1/4W	RUBZ145624	J-1,2	Ceramic Filter LF-B6	FFLY019001
R-21,78	Carbon 6.8k ohm 1/4W	RUBZ146824	J-4	Jack, SJ-296	JJKY010001
R-1	Carbon 8.2k ohm 1/4W	RUBZ148224	J-3	Antenna Connector JK-002	JJKY002001
R-4,37,69,90,94	Carbon 10k ohm 1/4W	RUBZ141034	J-5	Jack, N-7361, 3-P	JJKY004001
				Power Connector K-4004, 3F	JJKY011001
VARIABLE RESISTORS					
CRYSTALS					
				Crystal 23,290 MHz	QQXY016001
				Crystal 23,340 MHz	QQXY016002
				Crystal 23,390 MHz	QQXY016003
				Crystal 23,440 MHz	QQXY016004
				Crystal 23,490 MHz	QQXY016005
				Crystal 23,540 MHz	QQXY016006
				Crystal 14,950 MHz	QQXY015001
				Crystal 14,960 MHz	QQXY015002
				Crystal 14,970 MHz	QQXY015003
				Crystal 14,990 MHz	QQXY015004
				Crystal 11,730 MHz	QQXY014002
				Crystal 11,275 MHz	QQXY014001
SWITCHES					
				Push Switch SW-010	SSWY010001
				Push Switch SW-022	SSWY022001
				See-saw Switch SW-026	SSWY026001
				Rotary Switch SR-062	SSRY062001
MISCELLANEOUS					
				Ceramic Filter LF-B6	FFLY019001
				Jack, SJ-296	JJKY010001
				Antenna Connector JK-002	JJKY002001
				Jack, N-7361, 3-P	JJKY004001
				Power Connector K-4004, 3F	JJKY011001

**CIRCUIT
SYMBOL****DESCRIPTION****PART NO.****MISCELLANEOUS (Continued)**

J-6	Phone Jack, LJ-035-1A-5.....	JJKY005002
TP-1,2,3,4	Check Terminal TP-011	JTPY011001
	Crystal Socket SK-001	JSKY001001
	Microphone, MK-040	AMKY040001
	Speaker, SP-028.....	ASPY028001
	DC Power Cord, 1.5m	WZDZ070003
	AC Power Cord.....	WWZY001001
PL-1,4	Pilot Lamp, Clear, 14V 50mA.....	VPLY005004
PL-2,3	Pilot Lamp, Clear, 14V 50mA.....	VPLY005006
PL-5	Pilot Lamp, Clear, 4.5V 40mA.....	VPLY014012
F-2	Fuse, FS-001, 0.7 amp.....	ZFSY001002
F-1	Fuse, FS-001, 1.5 amp.....	ZFSY001004
F-2	Fuse Holder, S-N2050.....	ZFHY009001
	Meter, MT-018.....	ZMTY018001
	Mounting Bracket.....	MDBP400095
	Front Panel.....	MDMC200580
	Channel Knob.....	MDMP400581
	Channel Disc.....	MDMP400582
	Volume Knob.....	MDMP400583
	Push Switch Knob.....	MDMP400085
	Metal Cabinet.....	MDBC200584
	Bottom Cover.....	MDBP300586
	Control Plate.....	MDNP302878
	Microphone Plate.....	MDNP400286
	Brand Plate	MDNP400590
	FCC Plate.....	MDNP402862
	Knob Plate	MDNP400442
	Display Box.....	MDPP302861
	Styrofoam Box	MDPP302860
	Instruction Manual	MZPT095101
	FCC Application Form.....	MZPY000002
	Warranty Card.....	MZPT000004