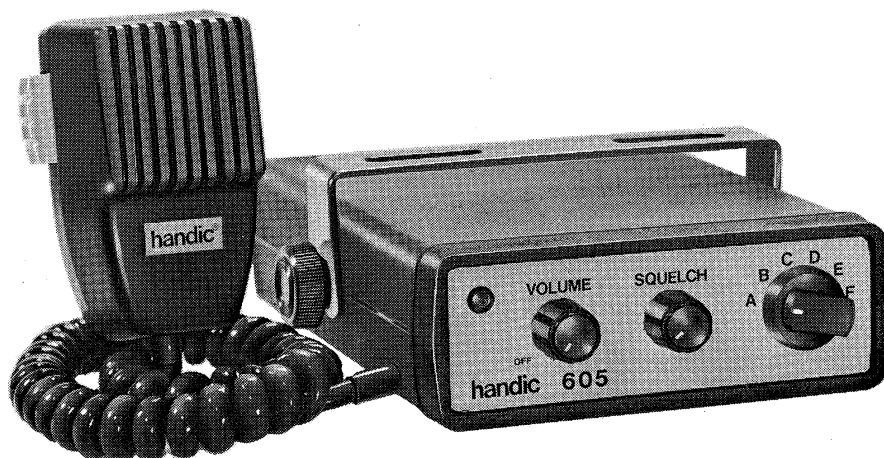


# handic<sup>®</sup>



SERVICE MANUAL  
FOR  
**handic 605**  
CITIZEN'S BAND TRANSCEIVER  
MOBILE TYPE  
6 CHANNELS 5 WATT



**handic**  
bolagen



Telex 2558 Telephone 031-45 0180  
Box 156 S-42122 V. Frölunda, Sweden

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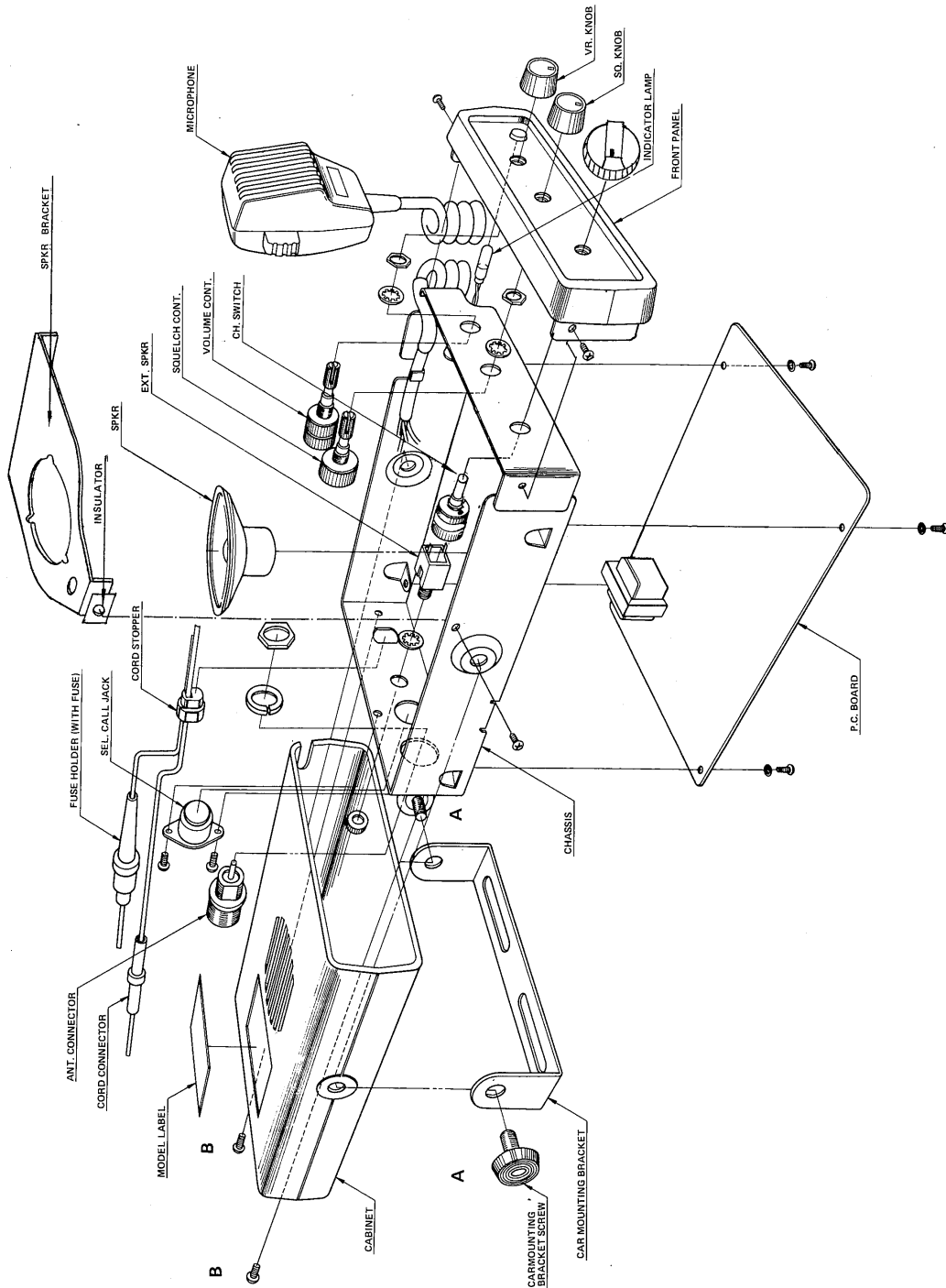
## SPECIFICATIONS

Description	Nominal spec.	Limit spec.
Frequency range	26.965 – 27.225 MHz	Adjustable to 31 MHz
Frequency tolerance	Less than $\pm 0.003\%$	Less than $\pm 0.005\%$
Operating voltage	13.8 V DC $\pm 15\%$	13.8 V DC $\pm 10\%$
DC power input	5 watts	
RF output (at 13.8 V DC)	3 watts	2.5 watts
Modulation	AM below 100 %	
Sensitivity	0.7 $\mu\text{V}$ at 10 dB(S+N)/N @ 50 mW	1.5 $\mu\text{V}$ at 10 dB(S+N)/N @ 50 mW
Selectivity	- 50 dB at $\pm 10$ kHz @ 1 $\mu\text{V}$ input	- 45 dB at $\pm 10$ kHz @ 1 $\mu\text{V}$ input
Intermediate frequency	455 kHz with ceramic filter	
Signal to noise ratio	45 dB at 1mV input	40 dB at 1mV input
Squelch sensitivity Threshold Tight	500 $\mu\text{V}$	Less than 1 $\mu\text{V}$ 50 $\mu\text{V}$ – 3 mV
Audio output (10 % distortion) (Max. power)	1.0 W 1.2 W	0.85 W 1.0 W
Semiconductors	15 transistors, 10 diodes and 2 thermistors	
Frequency control	Crystal control	
Microphone	Dynamic type with PTT switch (handic 44)	
Controls	Volume with power switch, squelch and channel selector	
Jacks	External speaker, selective call and antenna(S0-239)	
DC power cable length	More than 3 feet with in-line fuse	
Speaker	8 $\Omega$ , 57 mm, Dynamic type	
Size	42(H) x 116(W) x 166(D) mm.	

# DISASSEMBLY INSTALLATION

Removal of the cabinet:

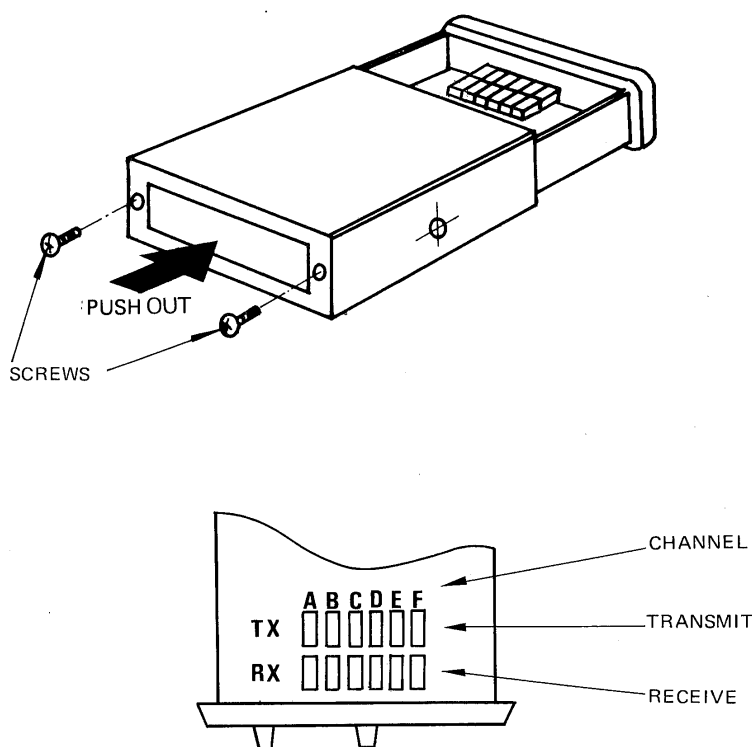
1. Remove the car mounting bracket screws A (one from each side of the unit) and remove the Mounting Bracket as shown.
2. Remove two screws B and pull out the chassis as shown.



## CRYSTAL INSTALLATION

Channel 15 (27.135 MHz) is supplied with the unit. Other channels can be operated by installing suitable crystals in the internal crystal sockets. Crystal sockets are located inside the case, on the printed circuit board. Push out the chassis as shown in the figure below. Plug crystals into the sockets on the printed circuit board. Plug Transmit(TX) crystals into TX sockets and Receiver(RX) crystals into RX sockets. Do NOT interchange or mix RX and TX crystals. Do always have a matched pair in the crystal sockets.

Order crystals from **h a n d i c**, stating channel number and frequency. **h a n d i c** is not responsible for poor operation when crystals of another manufacturer are used.



## SELECTIVE CALL

Selective call 6 P DIN jack is provided on the back of the cabinet.

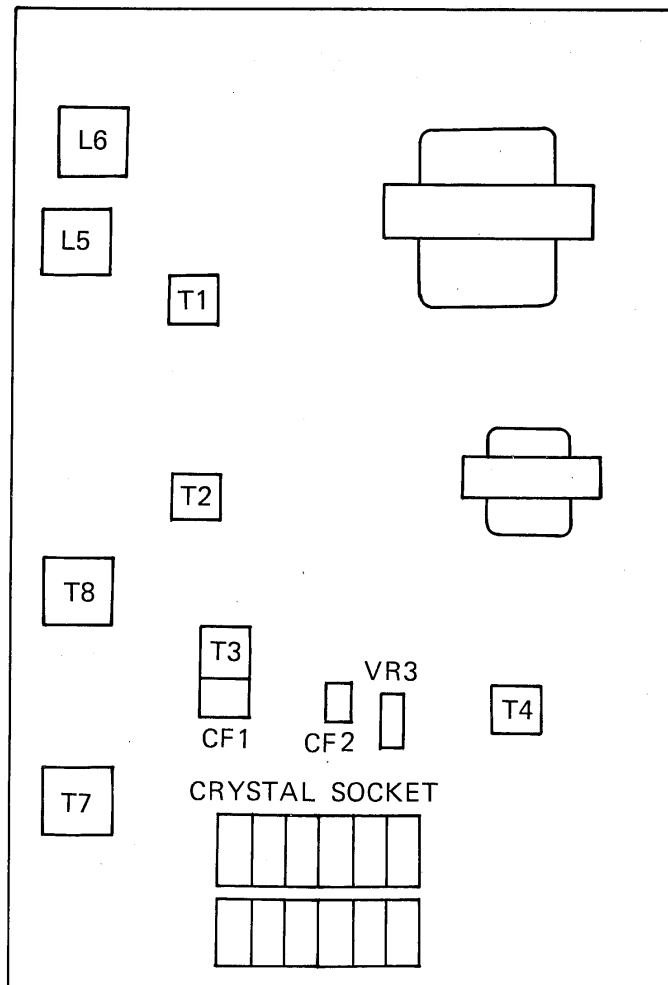
This jack is matched for **h a n d i c** S-10 and S-12 selective call units.

# GENERAL ALIGNMENT INSTRUCTIONS

## Test equipment required

- |  |                           |
|--|---------------------------|
| 1. RF standard signal generator (S.S.G.) | 6. Oscilloscope           |
| 2. AF signal generator                   | 7. Frequency counter      |
| 3. V.T.V.M. (AC)                         | 8. Monitor receiver       |
| 4. V.T.V.M. (DC)                         | 9. 1 A DC ammeter         |
| 5. RF power meter                        | 10. 8 $\Omega$ dummy load |

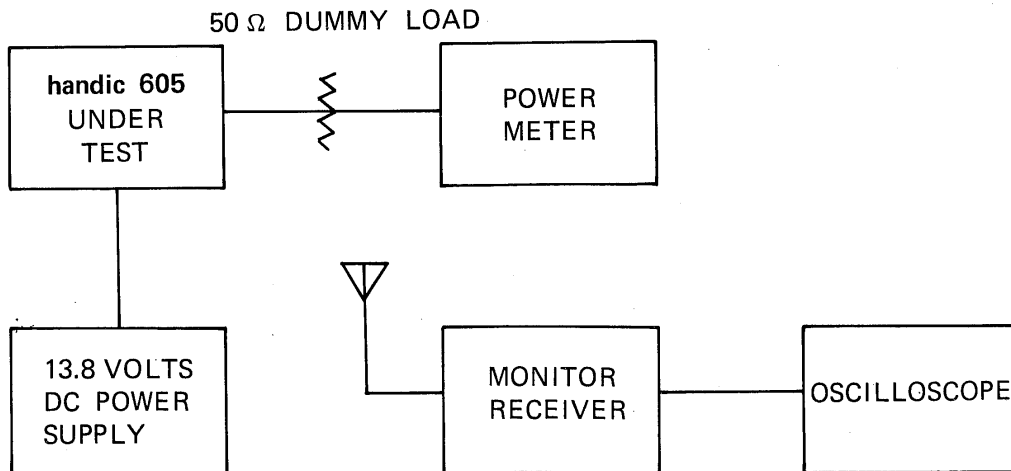
## ALIGNMENT POSITION



# TRANSMITTER SECTION ALIGNMENT CHART

STEP	CONTROL SETTING	TEST EQUIPMENT CONNECTION	POWER SUPPLY VOLTAGE	ADJUST	REMARKS
1	CH: A position 27.135 MHz	Power meter ( 50 Ω ): to ANT. Jack 1A ammeter: in series with lead between modulation winding of T6 and collector of Q15 Oscilloscope: to monitor receiver	Supply voltage: 13.8 volts		
2	Press the P.T.T. SW	"	"	T7, 8	Max. power output
3	"	"	"	L5, 6	Peak on the power meter and dip on the ammeter to get max. output at ANT. Jack
4	"	Power meter (50 Ω ): to ANT. Jack 1A ammeter: in series with lead between modulation winding of T6 and collector of Q15	Vary supply voltage from 15 to 12 volts	T7	If no output, adjust T7 to assure output at both voltage extremes.
5	"	Audio frequency generator: to C28(or talk into Microphone)	Reset the supply voltage to 13.8 volts		Check modula- tion
6	Repeat steps 2 to 4 if necessary				

TX

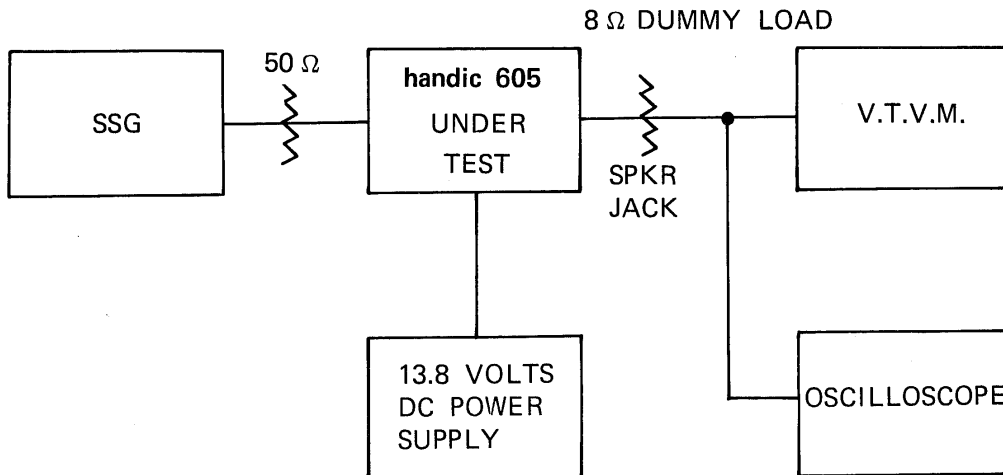


## RECEIVER SECTION ALIGNMENT CHART

STEP	CONTROL SETTING	TEST EQUIPMENT CONNECTION	SIGNAL GENERATOR SETTING	ADJUST	REMARKS
1	Volume control: Fully clockwise SQ. control: Max. counter-clockwise CH.: A position 27.135 MHz	V.T.V.M.: Parallel with 8 $\Omega$ dummy load connected to EXT. SPKR Jack Signal generator: through 100 pF to the base of Q2 2SC371	Freq.: 455 kHz Mod.: 1 kHz 30 %	T3 T4	Max. output on voltmeter
2	"	V.T.V.M.: Parallel with 8 $\Omega$ dummy load connected to EXT. SPKR Jack Signal generator: to ANT. Jack	Freq.: 27.135 MHz Mod.: 1 kHz	T1, 2	Max. S/N and max. output on voltmeter
3	Volume control: Adjust for desired audio level SQ. control: Fully clockwise	V.T.V.M.: Parallel with 8 $\Omega$ dummy load or across speaker to EXT. SPKR Jack Signal generator: to ANT. Jack	Freq.: 27.135 MHz Mod.: 1 kHz 30 % Output: 500 $\mu$ V	VR3	Adjust so squelch just opens

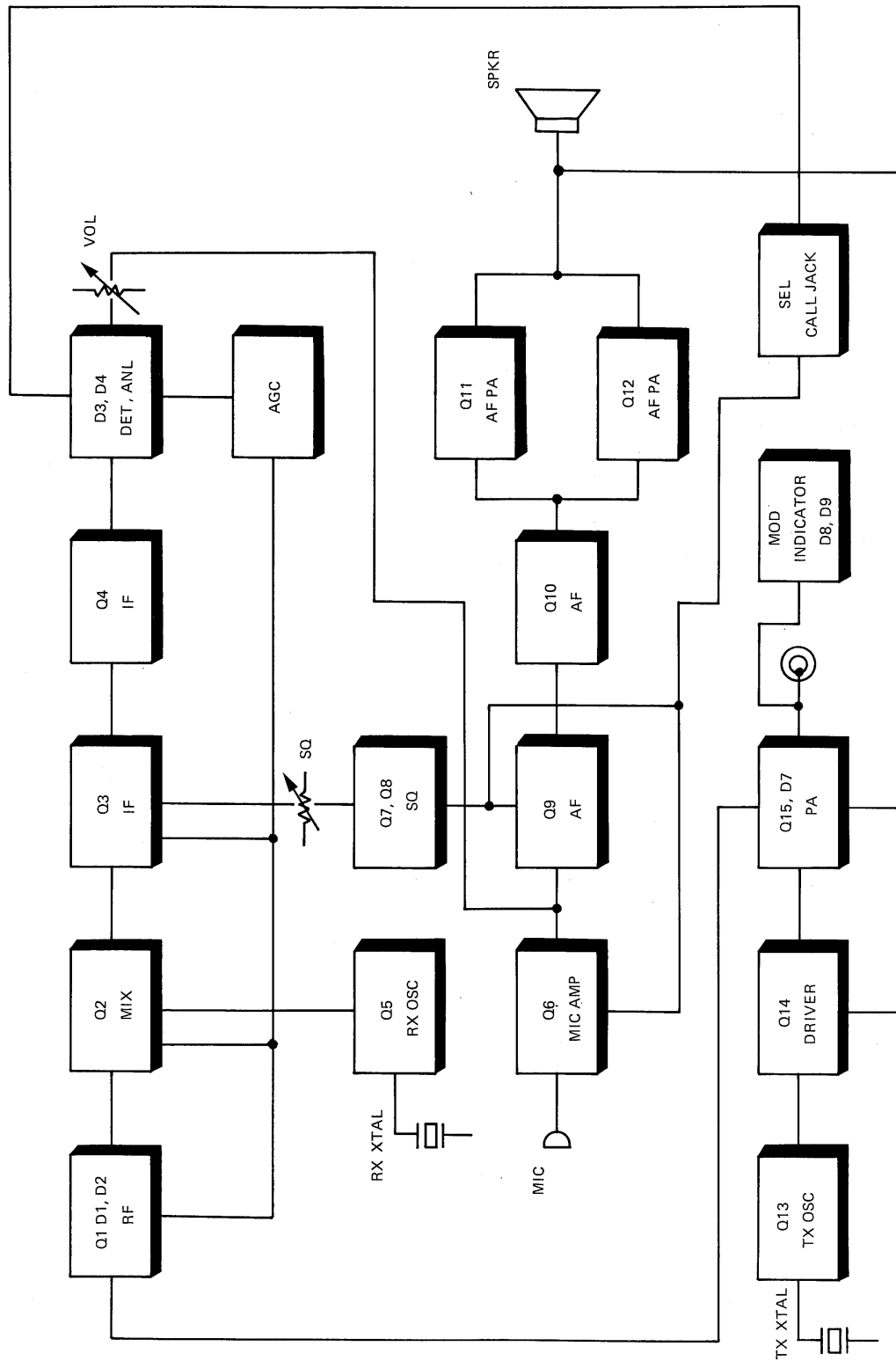
**Note:** Keep the input signal from S.S.G. as low as possible during all alignment.

RX

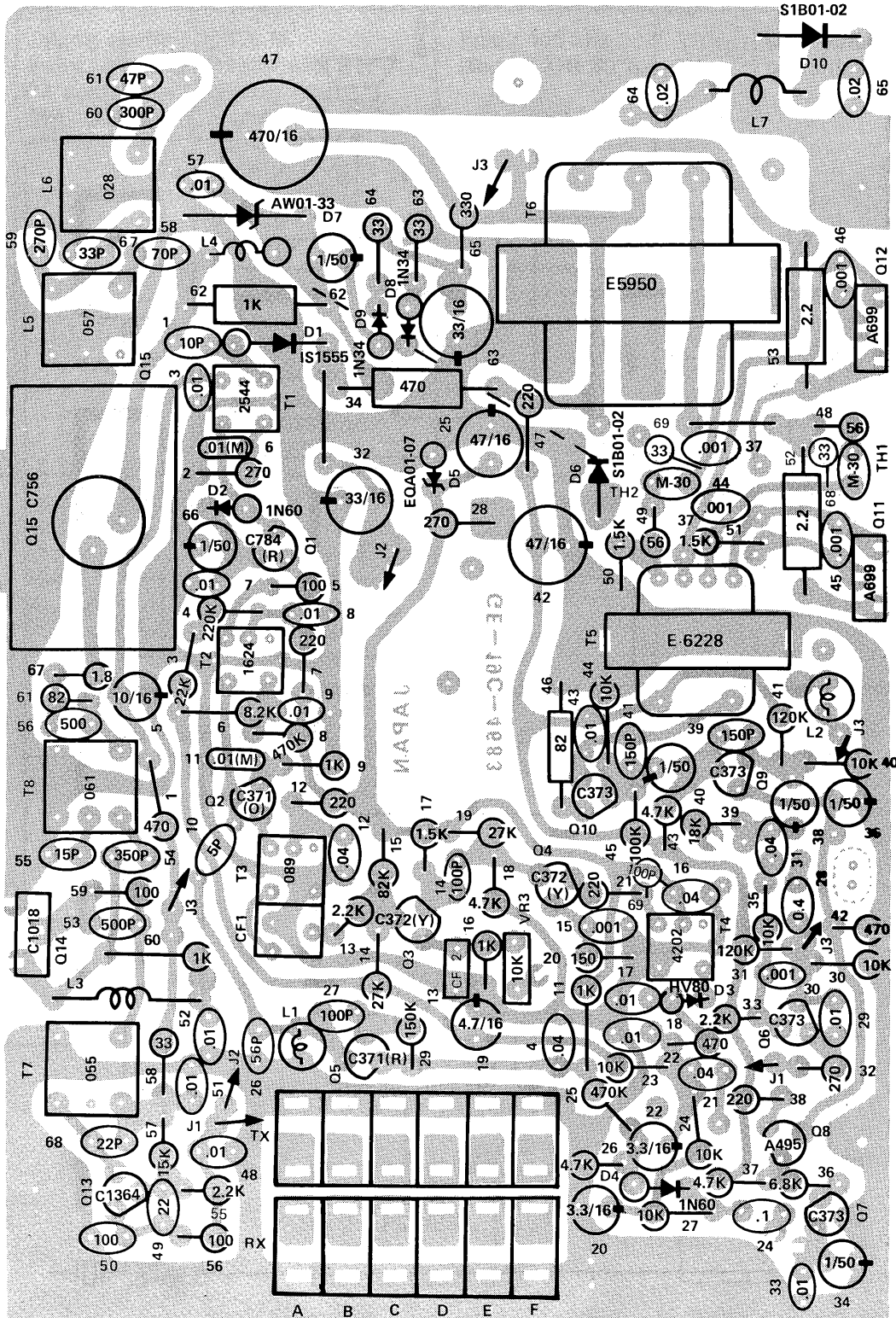




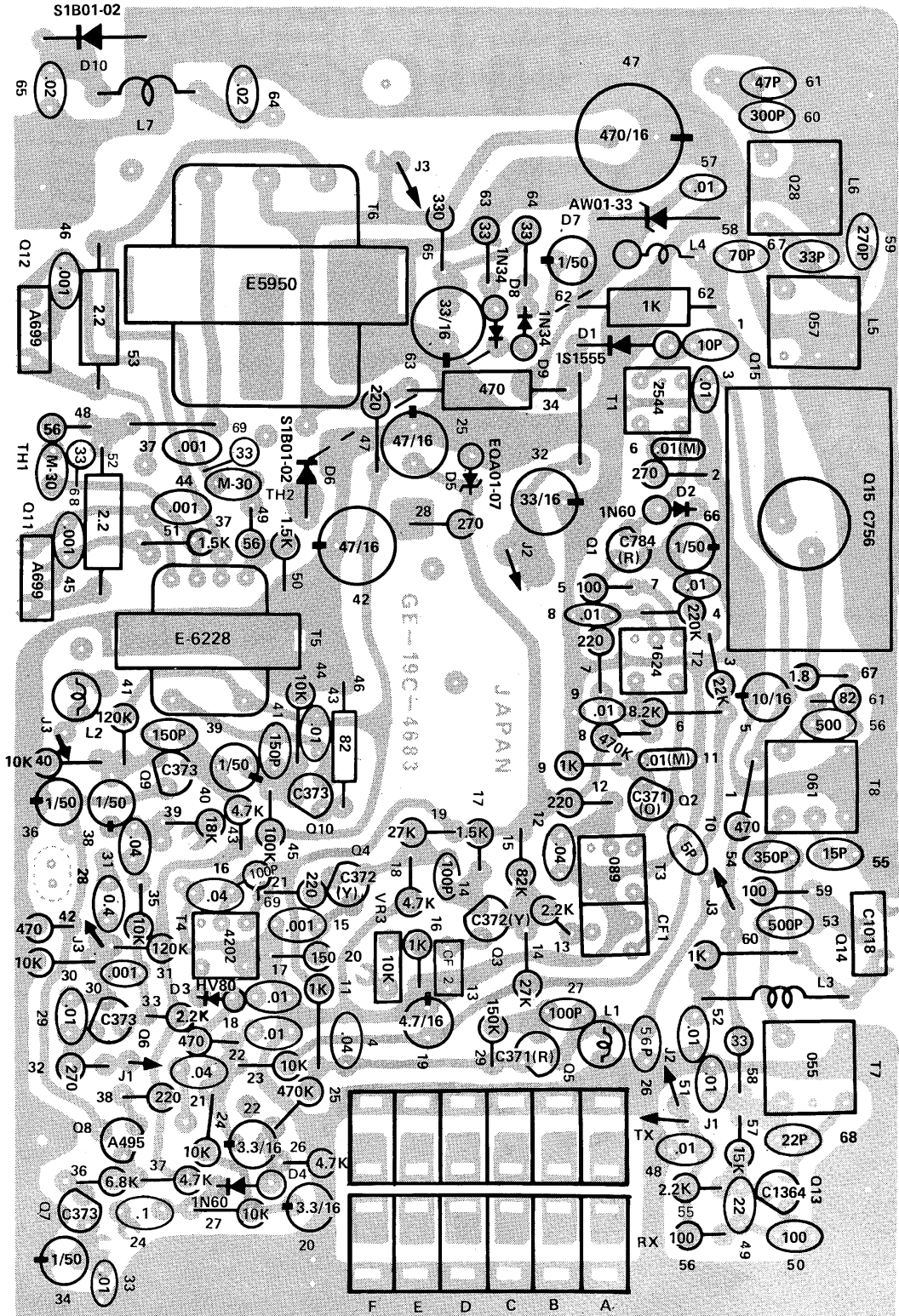
# BLOCK DIAGRAM



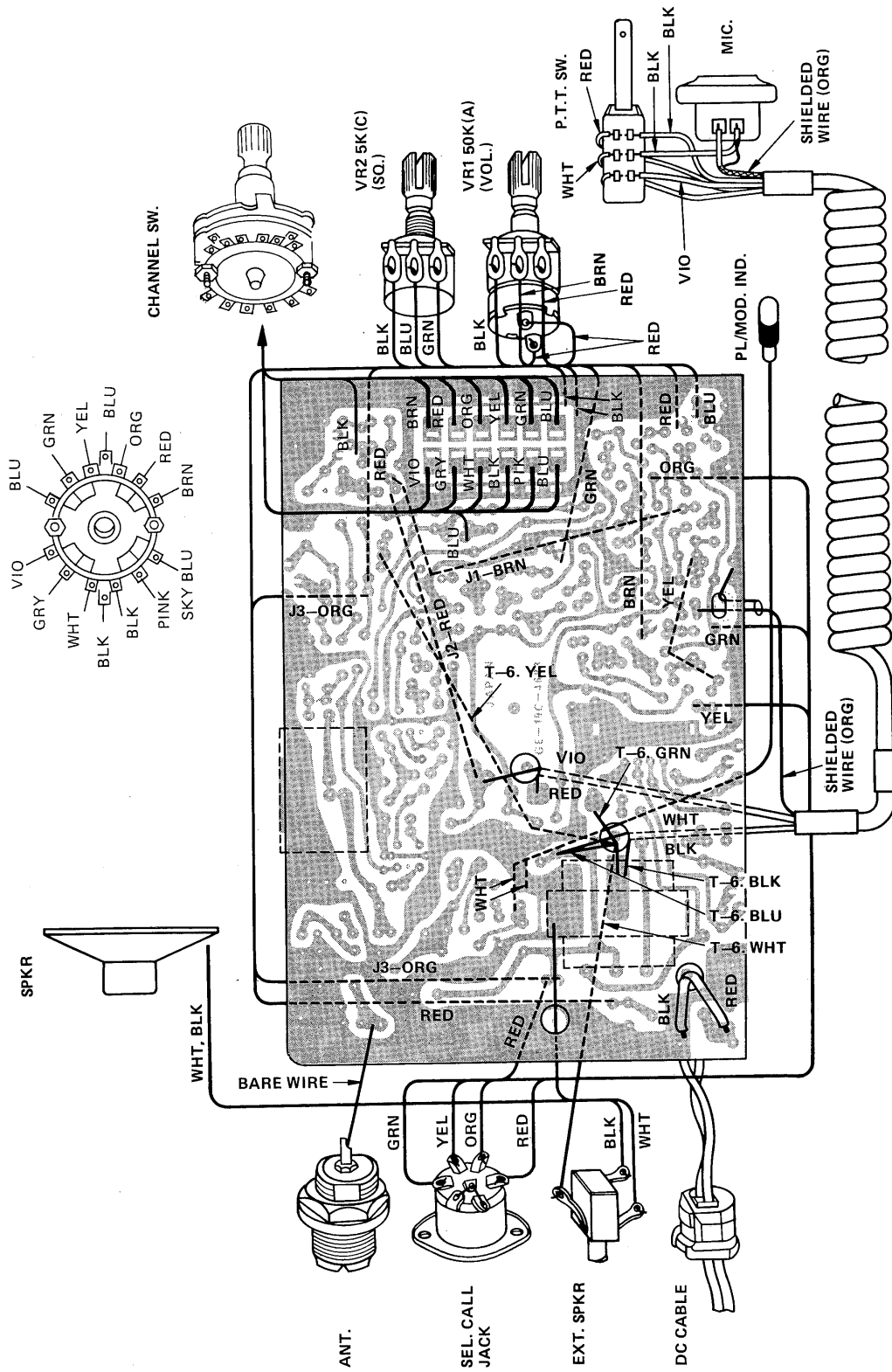
# PRINTED CIRCUIT BOARD TOP VIEW



# PRINTED CIRCUIT BOARD BOTTOM VIEW



# WIRING DIAGRAM



## TROUBLE SHOOTING

Symptom	Possible cause
1) Pilot lamp does not light and set does not operate when power is on.	A) Faulty power cord. B) Defective power switch SW3. C) Fuse blown.
2) Fuse blows when power switch is on.	A) Defective electrolytic capacitor. B) Defective audio power amplifier transistor Q11 or Q12. C) Defective TX final transistor Q14 or Q15. D) Defective zener diode D7.
3) Pilot lamp does not light.	A) Defective pilot lamp or resistor R65. B) Open circuit in the B+ Circuit.
4) Pilot lamp comes on but no sound on any channel.	A) Faulty EXT. speaker jack. B) Poor crystal socket contact or crystal loose in socket. C) Defective zener diode D5. D) Weak crystal.
5) Transmitter does not operate or no modulation.	A) Faulty P.T.T. switch. B) Defective microphone cartridge. C) Faulty transistor Q13, 14 or Q15. D) Faulty microphone cord. E) Defective T6 transformer modulation winding. F) Defective resistor R59, 61 or R67. G) Faulty transistor Q6.
6) Squelch control does not operate.	A) Defective transistor Q7 or Q8. B) Faulty VR2 or VR3.

# PARTS LIST

Ref. No.	Description				h a n d i c Stock Number	MFR'S Parts Number
<b>CAPACITORS</b>						
C1	Ceramic	10 pF	NPO	± 0.5 pF	990377	FCC-50
C2	Not used					
C3	Ceramic	0.01 μF		- 20 - + 80 %	990477	MC-70
C4	Ceramic	0.04 μF		- 20 - + 80 %	990491	MC-100
C5	Electrolytic	10 μF	16 WV	- 10 - + 50 %	990036	CE04W1C100
C6	Mylar	0.01 μF		± 20 %	990099	
C7-9	Ceramic	0.01 μF		- 20 - + 80 %	990477	MC-70
C10	Ceramic	5 pF	NPO	± 0.25 pF	990372	FCC-50
C11	Mylar	0.01 μF		± 20 %	990099	
C12-13	Ceramic	0.04 μF		- 20 - + 80 %	990491	MC-100
C14	Ceramic	100 pF		± 10 %	990295	FC-70
C15	Ceramic	0.001 μF		± 10 %	990519	SCP-60
C16	Ceramic	0.04 μF		- 20 - + 80 %	990491	MC-100
C17-18	Ceramic	0.01 μF		- 20 - + 80 %	990477	MC-70
C19	Electrolytic	4.7 μF	16 WV	- 10 - + 50 %	990561	CE04W1C4R7
C20	Electrolytic	3.3 μF	16 WV	- 10 - + 75 %	990554	CE04W1C3R3
C21	Ceramic	0.04 μF		- 20 - + 80 %	990491	MC-100
C22	Electrolytic	3.3 μF	16 WV	- 10 - + 75 %	990554	CE04W1C3R3
C23	Not used					
C24	Ceramic	0.1 μF		- 20 - + 80 %	990498	MC-135
C25	Electrolytic	47 μF	16 WV	- 10 - + 50 %	990043	CE04W1C470
C26	Ceramic	47 pF		± 10 %	990274	FC-60
C27	Ceramic	100 pF		± 10 %	990295	FC-70
C28	Ceramic	0.04 μF		- 20 - + 80 %	990491	MC-100
C29	Ceramic	0.01 μF		- 20 - + 80 %	990533	MC-70
C30	Ceramic	0.001 μF		± 10 %	990519	SCP-60
C31	Ceramic	0.04 μF		- 20 - + 80 %	990491	MC-100
C32	Electrolytic	33 μF	16 WV	- 10 - + 50 %	990568	CE04W1C330
C33	Ceramic	0.01 μF		- 10 - + 80 %	990477	MC-70
C34	Electrolytic	1 μF	50 WV	- 10 - + 75 %	990008	CE04W1H010
C35	Not used					
C36	Electrolytic	1 μF	50 WV	- 10 - + 75 %	990008	CE04W1H010
C37	Ceramic	0.001 μF		± 10 %	990519	SCP-60
C38	Electrolytic	1 μF	50 WV	- 20 - + 75 %	990008	CE04W1H010
C39	Ceramic	150 pF		± 20 %	990309	FC- 80
C40	Electrolytic	1 μF	50 WV	- 10 - + 75 %	990008	CE04W1H010
C41	Ceramic	150 pF		± 20 %	990309	FC-80
C42	Electrolytic	47 μF	16 WV	- 10 - + 50 %	990043	CE04W1C470
C43	Ceramic	0.01 μF		- 20 - + 80 %	990477	MC-70
C44-46	Ceramic	0.001 μF		± 10 %	990519	SCP-60
C47	Electrolytic	470 μF	16 WV	- 10 - + 50 %	990064	CE04W1C471
C48	Ceramic	0.01 μF		- 20 - + 80 %	990477	MC-70
C49	Ceramic	22 pF		± 5 %	990253	FC-50
C50	Ceramic	100 pF		± 10 %	990295	FC-70
C51-52	Ceramic	0.01 μF		- 20 - + 80 %	990477	MC-70
C53	Ceramic	500 pF		± 10 %	990365	FC-100
C54	Ceramic	350 pF		± 20 %	990358	FC-90
C55	Ceramic	15 pF	NPO	± 5 %	990386	FCC-60
C56	Ceramic	500 pF		± 10 %	990365	FC-100
C57	Ceramic	0.01 μF		- 20 - + 80 %	990477	MC-70

Ref. No.	Description			h a n d i c Stock Number	MFR'S Parts Number
C58	Ceramic	70 pF	± 10 %	990288	FC-70
C59	Ceramic	270 pF	± 20 %	990337	FC-90
C60	Ceramic	300 pF	± 20 %	990344	FC-90
C61	Ceramic	47 pF	± 10 %	990274	FC-60
C62	Electrolytic	1 μF	50 WV - 10 - + 75 %	990008	CE04W1H010
C63	Electrolytic	33 μF	16 WV - 10 - + 50 %	990568	CE04W1C330
C64	Ceramic	0.02 μF	- 20 - + 80 %	990484	MC-75
C65	Ceramic	0.02 μF	- 20 - + 80 %	990484	MC-75
C66	Electrolytic	1 μF	50 WV - 10 - + 75 %	990008	CE04W1H010
C67	Ceramic	33 pF	± 10 %	990267	FC-50
C68	Ceramic	22 pF	± 5 %	990253	FC-50
C69	Ceramic	100 pF	± 10 %	990295	FC-70
<b>RESISTORS</b>					
R1	Carbon film	470	1/2 W ± 10 %	954123	ELR-25K-471
R2	Carbon film	270	1/4 W ± 5 %	951435	ELR-25J-271
R3	Carbon film	22 K	1/4 W ± 5 %	951757	ELR-25J-223
R4	Carbon film	220 K	1/4 W ± 5 %	951925	ELR-25J-224
R5	Carbon film	100	1/4 W ± 5 %	951365	ELR-25J-101
R6	Carbon film	8.2 K	1/4 W ± 5 %	951687	ELR-25J-822
R7	Carbon film	220	1/4 W ± 5 %	951421	ELR-25J-221
R8	Carbon film	470 K	1/4 W ± 5 %	951981	ELR-25J-474
R9	Carbon film	1 K	1/4 W ± 5 %	951533	ELR-25J-102
R10	Not used				
R11	Carbon film	1 K	1/4 W ± 5 %	951533	ELR-25J-102
R12	Carbon film	220	1/4 W ± 5 %	951421	ELR-25J-221
R13	Carbon film	2.2 K	1/4 W ± 5 %	951589	ELR-25J-222
R14	Carbon film	27 K	1/4 W ± 5 %	951771	ELR-25J-273
R15	Carbon film	82 K	1/4 W ± 5 %	951855	ELR-25J-823
R16	Carbon film	1 K	1/4 W ± 5 %	951533	ELR-25J-102
R17	Carbon film	1.5 K	1/4 W ± 5 %	951561	ELR-25J-152
R18	Carbon film	4.7 K	1/4 W ± 5 %	951645	ELR-25J-472
R19	Carbon film	27 K	1/4 W ± 5 %	951771	ELR-25J-273
R20	Carbon film	150	1/4 W ± 5 %	951393	ELR-25J-151
R21	Carbon film	220	1/4 W ± 5 %	951421	ELR-25J-221
R22	Carbon film	470	1/4 W ± 5 %	951477	ELR-25J-471
R23-24	Carbon film	10 K	1/4 W ± 5 %	951701	ELR-25J-103
R25	Carbon film	470 K	1/4 W ± 5 %	951981	ELR-25J-474
R26	Carbon film	4.7 K	1/4 W ± 5 %	951645	ELR-25J-472
R27	Carbon film	10 K	1/4 W ± 5 %	951701	ELR-25J-103
R28	Carbon film	270	1/4 W ± 5 %	951435	ELR-25J-271
R29	Carbon film	150 K	1/4 W ± 5 %	951897	ELR-25J-154
R30	Carbon film	10 K	1/4 W ± 5 %	951701	ELR-25J-103
R31	Carbon film	120 K	1/4 W ± 5 %	951883	ELR-25J-124
R32	Carbon film	270	1/4 W ± 5 %	951435	ELR-25J-271
R33	Carbon film	2.2 K	1/4 W ± 5 %	951589	ELR-25J-222
R34	Carbon film	470	1/2 W ± 10 %	951477	ELR-25K-471
R35	Carbon film	10 K	1/4 W ± 5 %	951701	ELR-25J-103
R36	Carbon film	6.8 K	1/4 W ± 5 %	951673	ELR-26J-682
R37	Carbon film	4.7 K	1/4 W ± 5 %	951645	ELR-25J-472
R38	Carbon film	220	1/4 W ± 5 %	951652	ELR-25J-221

Ref. No.	Description			h a n d i c Stock Number	MFR'S Parts Number
R39	Carbon film	18 K	1/4 W ± 5 %	951743	ELR-25J-183
R40	Carbon film	10 K	1/4 W ± 5 %	951701	ELR-25J-103
R41	Carbon film	120 K	1/4 W ± 5 %	951883	ELR-25J-124
R42	Carbon film	470	1/4 W ± 5 %	951477	ELR-25J-471
R43	Carbon film	4.7 K	1/4 W ± 5 %	951645	ELR-25J-472
R44	Carbon film	10 K	1/4 W ± 5 %	951701	ELR-25J-103
R45	Carbon film	100 K	1/4 W ± 5 %	951869	ELR-25J-104
R46	Carbon film	82	1/4 W ± 5 %	951351	ELR-25J-820
R47	Carbon film	220	1/4 W ± 5 %	951421	ELR-25J-221
R48-49	Carbon film	56	1/4 W ± 5 %	951323	ELR-25J-560
R50-51	Carbon film	1.5 K	1/4 W ± 5 %	951561	ELR-25J-152
R52-53	Carbon film	2.2	1/2 W ± 10 %	954102	ELR-25K-2R2
R54	Not used				
R55	Carbon film	2.2 K	1/4 W ± 5 %	951589	ELR-25J-222
R56	Carbon film	100	1/4 W ± 5 %	951365	ELR-25J-101
R57	Carbon film	15 K	1/4 W ± 5 %	951729	ELR-25J-153
R58	Carbon film	33	1/4 W ± 5 %	951281	ELR-25J-330
R59	Carbon film	100	1/4 W ± 5 %	951365	ELR-25J-101
R60	Carbon film	1 K	1/2 W ± 10 %	951533	ELR-25K-102
R61	Carbon film	82	1/4 W ± 5 %	951351	ELR-25J-820
R62	Carbon film	1 K	1/2 W ± 10 %	951533	ELR-25K-102
R63-64	Carbon film	33	1/4 W ± 5 %	951281	ELR-25J-330
R65	Carbon film	330	1/4 W ± 5 %	951449	ELR-25J-331
R66	Not used				
R67	Carbon film	1.8	1/4 W ± 5 %	951071	ELR-25J-1R8
R68-69	Carbon film	33	1/4 W ± 5 %	951281	ELR-25J-330
<b>SEMICONDUCTORS</b>					
Q1	Transistor	silicon		992108	2SC784(R)
Q2	Transistor	silicon		992045	2SC371(R) or 2SC372(O)
Q3-4	Transistor	silicon		992059	2SC372(Y)
Q5	Transistor	silicon		992045	2SC371(R) or 2SC372(O)
Q6-7	Transistor	silicon		992066	2SC373
Q8	Transistor	silicon		992010	2SA495(O)
Q9-10	Transistor	silicon		992066	2SC373
Q11-12	Transistor	silicon		992017	2SA699(A)
Q13	Transistor	silicon		992129	2SC1364
Q14	Transistor	silicon		992122	2SC1018
Q15	Transistor	silicon		992094	2SC756
D1	Diode	silicon		992150	1S1555
D2	Diode	germanium		992143	1N60
D3	Diode	silicon		992164	HV-80
D4	Diode	germanium		992143	1N60
D5	Diode	zener		992199	EQA01-07(S)
D6	Diode	silicon		992171	SIB01-02
D7	Diode	zener		992185	AW01-33
D8-9	Diode	silicon		992136	1N34A
D10	Diode	silicon		992171	SIB01-02
TH1-2	Thermistor			992262	M-30

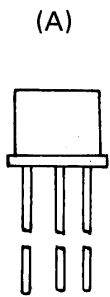


Ref. No.	Description	handic Stock Number	MFR'S Parts Number
<b>COILS / TRANSFORMERS / FILTERS</b>			
T1	ANT. coil	995101	113CN2544
T2	RF coil	995045	1624
T3	IF coil	995052	7SSI-089
T4	IF coil	995059	4202
T5	Input transformer	995381	E6228
T6	Output transformer	995395	E5950
T7	OSC coil	995122	8SNC-055
T8	Drive coil	995115	8SND-061
L1	RF choke coil      2.2 $\mu$ H	995129	LF1-2R2K
L2	RF choke coil      470 $\mu$ H	995136	LF1-471K
L3	RF choke coil      10 $\mu$ H	995073	4LNC-029
L4	RF choke coil      2.2 $\mu$ H	995220	4LNC-054
L5	T NET coil	995080	8SNF-057
L6	$\pi$ NET coil	995031	10PNP-028
L7	Choke coil	995143	6LNC-053
CF1	Ceramic filter	995318	LF-A6
CF2	Ceramic filter		EF-A8
<b>VOLUMES</b>			
VR1	Volume              50 K (A)	984046	VM11A-5M1111
VR2	Squelch              5 K (C)	984025	50KA
VR3	Potentiometer      10 K	984018	VM10A-5KC P6S2A
<b>SWITCHES</b>			
SW1-a-b	CH. switch	994025	S18-1-2-6-20L 2P-012
SW2	P.T.T. switch		
SW3	Power switch (on the VR1)		
<b>CRYSTAL</b>			
RX	Crystal 26.660 MHz		
TX	Crystal 27.115 MHz		
<b>MISCELLANEOUS</b>			
	Panel	599512	
	Escutcheon assembly	599519	GE-19B-4649
	Cabinet	599526	GE-19B-4647
	Chassis	599533	GE-17D-3405
	Heat sink	599540	GE-19D-4653
	Mounting bracket	599547	GE-16D-3166
	Mounting bracket screw	599554	GE-19D-4652
	Knob (VR-SQ)	599043	GE-19D-4631
	Knob (Channel)	599568	GE-19D-4662
	Cabinet saran net		

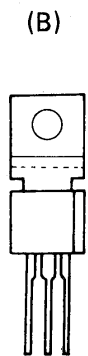
Ref. No.	Description	h a n d i c Stock Number	MFR'S Parts Number
	MIC. case	599575	GE-19C-4655
	MIC. holder	599582	GE-18D-4453
	MIC. element	599589	UD-11
	MIC. cord	599596	GE-17D-3521
	MIC. knob	599603	GE-19D-4657
	MIC. label A	599610	GE-19D-4785(A)
	MIC. label B	599617	GE-19D-4785(B)
	MIC. switch holder	599624	GE-19D-4661
	Rear label		
	PCB spacer	599638	GE-19D-4789
	Crystal socket	599099	S2-101P
	ANT. connector	599428	SO239
	DIN. Jack	599645	CS-260
	Speaker jack	599652	SJ-296-1-15
	Cord stopper	599659	SR-3P-4
	Speaker	599169	EAS-6P01S
	DC cord (w/Fuse) holder	599666	
	Pilot lamp 7V/50 mA L = 190 mm.	599673	
	Fuse 2A	599680	
	P.C. Board	599687	GE-19C-4683
	Screw 1 kit	599694	
	Wires 1 kit	599701	

# SEMICONDUCTORS LEAD IDENTIFICATIONS

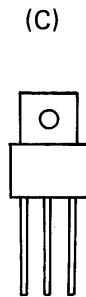
- (A): 2SA495(O), 2SC371(O), 2SC371(R), 2SC372(Y), 2SC373, 2SC784(R)
- (B): 2SA699
- (C): 2SC1728
- (D): 2SC756
- (E): 2SC1364



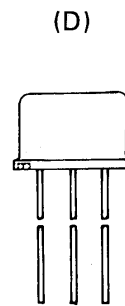
- 1. Emitter
- 2. Collector
- 3. Base



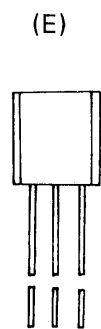
- 1. Base
- 2. Collector (Tab)
- 3. Emitter



- 1. Emitter
- 2. Base
- 3. Collector

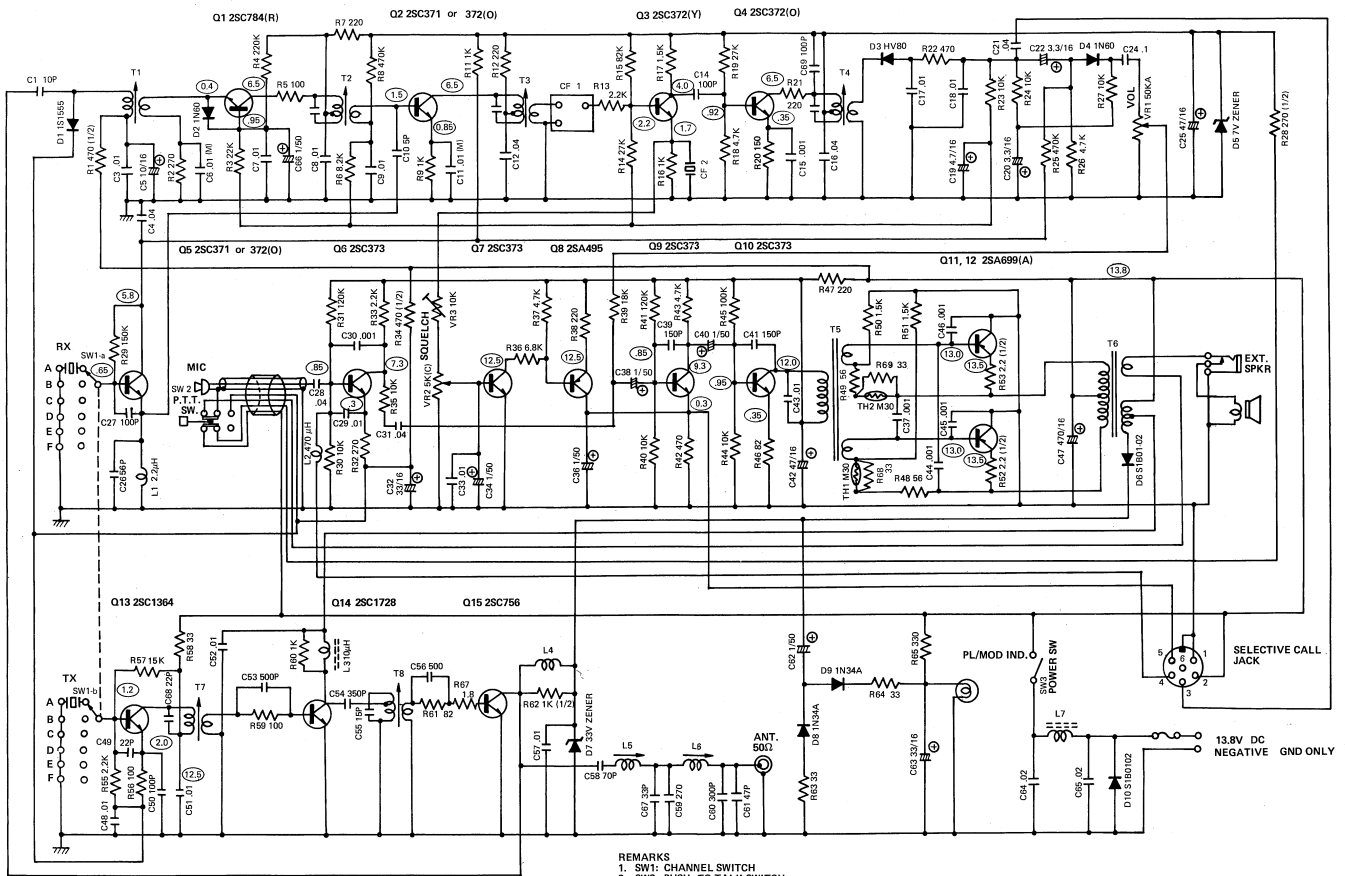


- 1. Emitter
- 2. Base
- 3. Collector



- 1. Emitter
- 2. Collector
- 3. Base

### SCHEMATIC DIAGRAM



- REMARKS**
1. SW1: CHANNEL SWITCH
  2. SW2: PUSH-TO TALK SWITCH
  3. SW3: POWER SWITCH
  4. VR1: VOLUME CONTROL
  5. VR2: SQUELCH CONTROL
  6. RESISTANCE VALUES IN OHMS, K = 1,000
  7. CAPACITANCE VALUES IN MF, P = PMF
  8. ○ MARKS DC VOLTAGE MEASURED BY V.T.V.M.