This Manual is provided by

CBTricks.com

Someone who wanted to help you repair your equipment scanned this manual.

If you would like to help us put more manuals online support us.

Supporters of CBTricks.com paid for the hosting so you would have this file.

CBTricks.com is a non-commercial personal website was created to help promote the exchange of service, modification, technically oriented information, and historical information aimed at the Citizens Band, GMRS (CB "A" Band), MURS, Amateur Radios and RF Amps.

CBTricks.com is not sponsored by or connected to any Retailer, Radio, Antenna Manufacturer or Amp Manufacturer, or affiliated with any site links shown in the links database. The use of product or company names on my web site is not endorsement of that product or company.

If your company would like to provide technical information to be featured on this site I will put up on the site as long as I can do it in a non-commercial way.

The site is supported with donation from users, friends and selling of the Galaxy Service Manual CD to cover some of the costs of having this website on the Internet instead of relying on banner ads, pop-up ads, commercial links, etc. to pay my costs. Thus I do not accept advertising banners or pop-up/pop-under advertising or other marketing/sales links or gimmicks on my website.

ALL the money from donations is used for CBTricks.com I didn't do all the work to make money (I have a day job).
I all didn't do all this work for someone else to make money also, for example the ebay CD sellers.

Thank you for any support you can give.

SERVICE INSTRUCTIONS

for

MODEL 673-PR

23 Channel CB Radio

Printed April 20, 1974

TABLE OF CONTENTS

SECTION I

GENERAL INFORMATION

GENERAL DESCRIPTION

The Hy-Range Model 673 is a full 23-channel transceiver designed and licensed for Class "D" operation as designated by the F.C.C.

This transceiver is completely solid state, and provides you with a compact unit of high reliability and low power consumption. This transceiver utilizes a highly advanced, unique system of frequency synthesization enabling immediate operation on all 23 channels without the need of additional crystals or adjustments. Additional features include a built-in factory tuned TVI trap and jack for external VFO "Slider" (optional) Model 675 and an ANL switch to reduce undesirable noises.

The Hy-Range 673 transceiver is designed to operate from 105/120 AC to 50/60Hz. To obtain the best results from your transciver, it is suggested that you read all the instructions contained in your manual.

NOTE

It is illegal to transmit with this transceiver until you obtain your citizens band Class "D" license. You are also required to read and understand Part 95 of the F.C.C. rules and regulations before operation of this unit. License Form 505 and Part 95 regulations may be available from your dealer; if not, you may obtain copies from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

It is also prohibited by the F.C.C. to adjust the transmitter circuit of this unit unless you hold a current First or Second Class Radiotelephone License.

SPECIFICATIONS

CB Receiver Section

Circuit Type	Dual conversion superheterodyne with RF stage and 455 kHz mechanical filter
Frequency	23 crystal-controlled channels in the 27 mHz Citizens Band
Sensitivity	0.7 uV for 10 db S+ N/N ratio
IF Frequency	1st IF: 11.275 mHz 2nd IF: 455 kHz
Audio Output	3 watts maximum
Receiving Current Drain	About 14 VA on standby (no signal)

CB Transmitter Section

Frequency	23 crystal-controlled channels in 27 mHz Citizens Band
Power Input	5 watts

Emission	8A3
Spurious Response Rejection	All harmonic & spurious suppression better than FCC and D.O.T. requirements
Modulation	AM, 90% typical
Range Boost	Yields high average modulation at average voice levels
Transmitting Current Drain	Less than 30 VA
Antenna	Nominal 50 ohms impedance
Power Source	105/120 VAC 50/60 Hz

SECTION II

OPERATING INFORMATION

FRONT PANEL

Power/Volume Switch - To turn the power on, rotate the knob clockwise. Further rotation will increase the sound output from the speaker. To turn the power off, rotate the knob counter-clockwise until the click which indicates that the power is cut off from the power supply is heard.

Squelch Control - This control is used to eliminate annoying background noise at no signal. To adjust the squelch control properly, first, turn the knob counter-clockwise until background noise is heard. Then, rotate the knob slowly clockwise until the background noise just disappears. At this point, the receiver will be relatively quiet under no signal conditions, but an incoming signal will overcome the squelch action and be heard. Since this control is variable, it can be used to provide varying degrees of sensitivity to incoming signals. As the control is advanced from the extreme counter-clockwise position the squelch action is progressively increased and stronger signals are needed to overcome it. To receive extremely weak signals or to disable the squelch circuit, simply turn the control fully counter-clockwise.

Channel Selector - Continuously rotating switch, selects any one of 23 channels for transmit and receive operation.

Signal Strength/RF Power Meter - During reception, the built-in meter provides a relative indication of signal strength in "S" unit on the lower scale and thus offers basis for comparison between one incoming signal and another.

During transmit, this will provide an indication of antenna RF power on the upper scale. As you speak, the pointer should "flicker" slightly, indicating that you are modulating the RF carrier.

INSTALLATION

Location - Before installing the transceiver, choose the location which is protected from moisture and excessive heat, and is convenient to operate.

Power Connection - This transceiver is designed to operate from 105/120 V, 50/60 Hz AC. Connect the power cord to the AC outlet supplying 105-120 VAC.

Antenna Cable Connection - The antenna should be connected to the transceiver by means of coaxial cable. Either RF-58/U or RF-8/U coaxial cable is ideal for this purpose. The antenna lead-in cable should be terminated with a PL-259 type male coaxial connector which should be attached to the matching ANT connector at the rear of the transceiver.

Fine Tuning - This will be used for clear reception of stations that are slightly off frequency. Rotate the knob for clearer reception.

ANL (Automatic Noise Limiter) Switch - This switch, when placed in ON position, reduces undesirable noises. Place the switch in "ON" position when the unit is used in noisy areas.

MIC Jack - Connect the push-to-talk microphone to this jack.

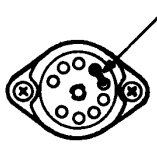
Phone Jack - Use a headphone for private listening. Inserting the headphone plug silences the internal speaker automatically.

REAR PANEL

AC Power Cord - Connect the power cord plug to the AC outlet supplying 105-120V, 50/60 Hz AC.

AC Power Fuse - When replacing the fuse, always use the same type of fuse, 125 V 3/4 A.

VFO Connector - This is provided for future connection of an external VFO (optional). When the VFO is not used, the two pin terminals must be connected to each other as illustrated. If they are not connected, your transceiver will not operate.



Connect two (of nine) pin terminals to each other, when the VFO is not used.

TVI Trap - Adjustable coil for minimizing TV interference. Preset at factory and does not usually require readjustment.

Ant Load - To obtain the best matching to your antenna system used, this will be adjusted for the minimum antenna reflection. However, this control is preset at the factory and should not be adjusted unless you have not precision test equipments.

CB Transmitter Operation -

IMPORTANT

Do not try to transmit without a CB antenna connected to the antenna connector on the rear panel.

1. Connect the microphone to the Microphone Socket.

2. Turn the power on.

3. Turn CB channel selector to a desired channel.

4. Depress the push-to-talk button on the microphone. Hold the microphone 4 to 6 inches from the mouth. Speak at a normal level. During periods of transmission, the receiver is silenced and reception is therefore impossible. In the same way, your signal can not be heard by another station when he is transmitting, each must take turns.

5. To receive, simply release the microphone push-to-talk button.

SECTION III

CIRCUIT DESCRIPTION

SCOPE

Q101, 23 mHz oscillator circuit, Q102, 15 mHz oscillator circuit and Q103, mixer are always operated regardless of transmit and receive mode of operation, when the channel selector switch is placed in the position other than between 22 and 23 channel. The channel selector, rotary switch S2a and S2b, has such mechanism that S2a moves one step at every four steps of S2b. The channel selector switch also has a neutral position between 22 and 23 channel and at that position common terminals are open circuited, making Q101 and Q102 oscillation stop, resulting in no transmit and receive operation.

Q104 is a 11.275 mHz oscillator circuit for transmit and Q110 is a 11.730 mHz oscillator circuit for receive operation. The power supply to both circuits will be closed or opened by the relay which in turn is controlled by the push-to-talk switch on the microphone. Thus one of two circuits is always being operated.

TRANSMISSION

The power line to the Q104, Q106, Q107 and Q1 will be closed by the relay when the push-to-talk switch is depressed and the transmitter circuits will operate. When the channel selector switch (S2abc) is placed in CH1 position, 23.290 mHz and 14.950 mHz crystals will be connected to the base of Q101 and Q102 respectively. These two frequency voltages are fed to the first mixer Q103 through C161 and C156 respectively, and converted into 38.240 mHz as follows:

1st Mixer: 23.290 + 14.950 = 38.240 mHz
(L101 is a 23 mHz nand oscillator coil.)

This obtained, the 38.240 mHz voltage is then added to the 2nd Mixer Q105 through a 38 mHz tuned-circuit consisting of C164, L102, C168, L103, C167 and L104 and a coupling capacitor C170. While Q104 is being oscillated, as previously stated, at a frequency of 11.275 mHz, this is also fed to the 2nd Mixer, thus two frequencies are converted into the 26.965 mHz transmitting frequency.

2nd Mixer: 38.240 − 11.275 = 26.965 mHz

This 26.965 mHz signal is then amplified by Q106, Q107, and Q1 to the required level for transmission. (L105, L106, L107, L108/C183, L109/C186 and C187 are 27 mHz band filter coils. L110, L111, C190 and VC-2 constitute a pi-type filter for antenna impedance matching.)

When the channel selector switch is placed in the CH2, CH3 or CH4 position, Q102 will oscillate at 14.960 mHz, 14.970 mHz or 14.990 mHz respectively, while Q101 will continuously oscillate at the same frequency, 23.290 mHz, during above four switch positions.

When the channel selector switch is placed in the CH5 position, Q102 oscillates at a frequency of 14.950 mHz due to the previously stated switching mechanism of S2a and S2b. On the other hand, Q101 changes its oscillating frequency from 23.290 mHz to 23.340 mHz. Then both frequencies are fed to the first Mixer and converted into the following frequency.

1st Mixer: 23.340 + 14.950 = 38.290 mHz

The resulting 38.290 mHz output is fed to the 2nd Mixer as previously described and converted into the CH5 transmitting frequency.

2nd Mixer: 38.290 - 11.275 = 27.015 mHz
(CH5 transmitting frequency)

In a similar manner, each channel frequency will be made as follows:

CH 5 23.340 + 14.950 - 11.275 = 27.015 mHz
CH 6 23.340 + 14.960 - 11.275 = 27.025 mHz
CH 7 23.340 + 14.970 - 11.275 = 27.035 mHz
CH 8 23.340 + 14.990 - 11.275 = 27.055 mHz
CH 9 23.290 + 14.950 - 11.275 = 27.065 mHz

CH 22 23.540 + 14.960 - 11.275 = 27.225 mHz
CH 23 23.540 + 14.990 - 11.275 = 27.255 mHz

NOTE

Capacitors C171 and C197 are inserted to compensate the spread of crystal frequency and they may not be used in some models.

RECEPTION

In receive mode, the power supply to transistors, Q104 through Q107 and Q1, is cut off by the relay circuit and the transmitter stops its operation. On the other hand, the power is supplied to transistors, Q108 through Q112, making the receiv circuit ready to operate.

When there is an input signal of 26.965 mHz (CH1) on the antenna circuit with the channel selector switch in CH1 position, the signal will be fed to the Q1 collector through the pi-type filter circuit consisting of L11, L110, C190 and VC2 (antenna impedance matching circuit). Q1 collector signal is then fed to the Q108 base-grounded amplifier through series-tuned 27 mHz circuit C101 and L112) and amplified. This output is finally fed to the Q109 Mixer base through L113 27 mHz tuned circuit.

Q109 is a mixer and 38.240 mHz signal is also added to the base of this transistor. Thus the first IF frequency, 11.275 mHz, will be made as below:

1st IF frequency: 38.240 - 26.965 = 11.275 mHz

This 11.275 mHz signal is then applied to the mixer diode, D109 through L114, and L115 IF tuned-circuit. At the same time 11.730 mHz signal from Q110 is applied to D109 through C127, R187 and L116 and the two signals are converted into 455 kHz 2nd IF frequency.

2nd IF frequency: 11.730 - 11.275 = 0.455 mHz

This 455 kHz IF signal is then fed to the L117, L118 455 kHz IF coil, mechanical filter, Q111, Q112, L119 detector coil and finally D106 detector. In this way audible sound will be obtained.

D101 is a switching diode which shorts the receiver input circuit during transmission operation.

D102 is a signal overload protector. R121, R122, R120, D108, R118, R119, D103 and C119 constitute automatic noise limiter.

D104 and D107 are rectifiers to obtain DC voltages for meter drive in both transmit and receive operation. In a similar way, input signals on other channels will be detected into audible signals as follows:

CH 1 23.290 + 14.950 = 38.240 mHz – 26.965 mHz = 11.275 – 11.730 mHz = 455kHz
CH 2 23.290 + 14.960 = 38.250 mHz – 26.975 mHz = 11.275 – 11.730 mHz = 455kHz
CH 3 23.290 + 14.970 = 38.260 mHz – 26.985 mHz = 11.275 – 11.730 mHz = 455kHz
CH 4 23.290 + 14.990 = 38.280 mHz – 27.005 mHz = 11.275 – 11.730 mHz = 455kHz

CH22 23.540 + 14.960 = 38.500 mHz – 27.225 mHz = 11.275 – 11.730 mHz = 455kHz
CH23 23.540 + 14.990 = 38.530 mHz – 27.255 mHz = 11.275 – 11.730 mHz = 455kHz

AUDIO CIRCUIT

The audio circuits consist of a microphone amplifier Q115, preamplifier (for receive) Q114, driver Q116, "B" Class power amplifier Q2/Q3 and squelch transistors: Q115 is powered only in transmit operation and Q114/Q113 in receive operation.

In transmit operation, the audio signals from microphone will be amplified through the following path: C132→Q115→C138, R143→Q116→T101→Q2/Q3→T2. The amplified signal obtained from the secondary coil of T2 is then fed to the Q107 and Q1 collector circuit through the relay circuit. At the same time, the power source will also be applied to these transistors, during transmit operation, thus the audio signal will modulate the RF carrier.

RANGE BOOST CIRCUIT

A part of the output is rectified by D105 and its DC output is applied to the emitter of Q115; decreasing the gain of Q115. Thus overmodulation due to excessive high signal input will be avoided.

In reception, the audio signal is fed to the following circuits: Volume -- C142 -- R154 -- Q114 -- R142/C137 -- Q116 -- T101 -- Q2/Q3 -- T2 -- C143 -- and finally drives the loud speaker.

VOLTAGE CHART

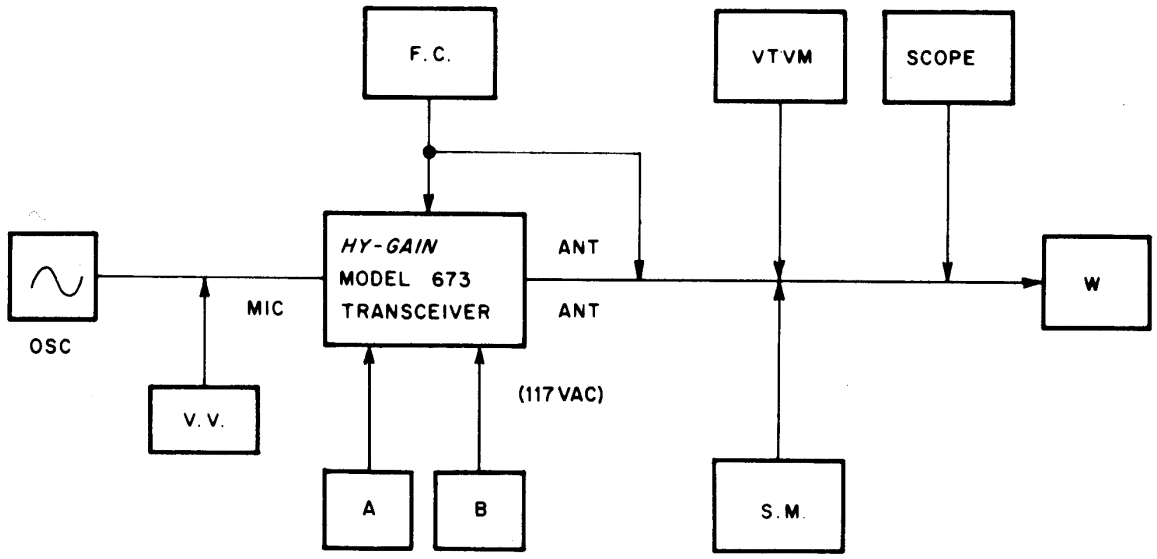
Transistor	Emitter (V)	Base (V)	Collector (V)
Q 1	0	-0.4 *	11.0 *
Q 2,3	0.07	0.6	12.8
Q 4	0	-0.22	5.0
Q101	3.8	4.6	10.0
Q102	2.3	2.9	10.5
Q103	2.7	3.5	10.1
Q104	2.8 *	3.4 *	12.0 *
Q105	0.8 *	1.3 *	12.5 *
Q106	0.6 *	1.2 *	12.5 *
Q107	0	-0.1 *	10.0 *
Q108	0.9	1.5	11.5
Q109	0.8	1.4	10.5
Q110	2.8	3.4	11.8
Q111	0.8	1.4	12.0
Q112	0.9	1.5	11.0
Q113	0	-0.1 (0.6)	9.0 (0.1)
Q114	2.5	3.1	6.7
Q115	2.3 *	2.9 *	7.0 *
Q116	1.6	2.2	11.0
Q301	-0.22	-0.35	-5.0

* Volts at transmit condition
( ) Squelch on

SECTION IV

ALIGNMENT PROCEDURES

TRANSMITTER ALIGNMENT TEST SET- UP



OSC	Audio Signal Generator
V.V.	Audio Level Meter, 1 mV measurable
A	DC Ampere-Meter
B	AC 117V, 50/60 Hz
F.C.	Frequency Counter, 0 - 40 mHz
VTVM	RF Volt Meter
SCOPE	Oscilloscope, 30 mHz
SM	Spurious Meter, 27 mHz band, built-in B.E.F. 1 mV measurable
W	Power Meter, 50 ohm, 50W, thermo-couple type

NOTE

When connecting DC ampere-meter, cut a jumper wire (RFC-102) and connect the meter between the both ends of jumper wire. After removing the meter, solder the jumper wire as is. It is recommendable to connect a RF coil/by-pass capacitor in series with the meter.

23 mHz OSCILLATOR CIRCUIT ALIGNMENT

Place the channel selector in 13CH position. Slowly rotate L101 core in direction from top to bottom until the oscillator just begin to oscillate. This oscillation starting point will be indicated by a rapid increase of Q101 emitter voltage (A DC voltmeter should be connected between Q101 emitter and chassis ground during this alignment). Further rotate the L1 core 1/2 turn in the same direction (clockwise) from that oscillation starting point. Finally make sure the oscillating frequency is within ± 300 Hz from the standard oscillating frequency (crystal frequency).

15 mHz OSCILLATOR CIRCUIT CHECK

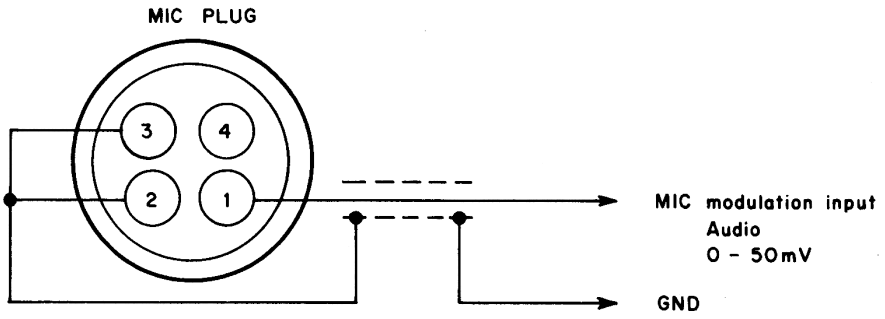
Make sure oscillating frequency of Q102 is within ± 300 Hz of the specific frequency.

FIRST MIXER, 38 mHz ALIGNMENT

Connect an oscilloscope to the No. 24 terminal on the printed circuit board and adjust L102, L103 & L104 for maximum amplitude. (It is recommendable that this alignment will be performed in receive mode.)

SECOND MIXER, 27 mHz ALIGNMENT

Set the unit in transmit mode and adjust L105, L106, L107, L108 & L109 for maximum reading on the watt meter. Moreover check for no abnormal oscillation using oscilloscope. To set the unit in transmit mode, the following pad will be used.



FINAL STAGE ALIGNMENT

Adjust L110, L111 and VC2 for maximum power output but the collector current of Q1 does not exceed 380 mA. Next, apply 1 kHz modulating signal to the microphone input terminal and check for normal modulation characteristics, using a oscilloscope.

MODULATION SENSITIVITY ALIGNMENT

Modulate the transceiver as in previous paragraph, feeding 10 mV audio signal and adjust RV103 for 100% modulation.

FREQUENCY CHECK

Set the unit in transmit condition and check transmitting frequency accuracy. Each channel frequency should be within ± 800 Hz from respective channel center frequency. When every channel has a same tendency of rising or falling frequency, they will be corrected within ± 300 or 400 Hz by removing or shorting the one of two capacitors connected to the crystal 101, in series. When the channel frequency of a given channel does not fall within ± 800 Hz, check crystal units according to the following table.

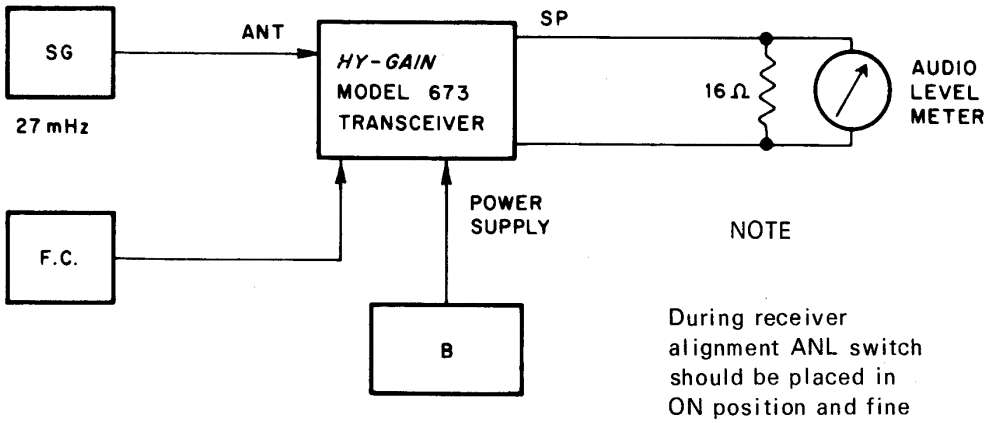
Defective Channel	Check
CH 1 - 4	Crystal 201 23.290 mHz
CH 5 - 8	Crystal 202 23.340 mHz
CH 9 - 12	Crystal 203 23.390 mHz
CH 13 - 16	Crystal 204 23.440 mHz
CH 17 - 20	Crystal 205 23.490 mHz
CH 21 - 23	Crystal 206 23.540 mHz
CH 1,5,9,13,17,21	Crystal 207 14.950 mHz
CH 2,6,10,14,18,22	Crystal 208 14.960 mHz
CH 3,7,11,15,19	Crystal 209 14.970 mHz
CH 4,8,12,16,20,23	Crystal 210 14.990 mHz

Connect a spurious meter to the antenna connector and adjust L1 (T.V.I.) for minimum 2nd harmonics (54 mHz) at no modulation.

P-RF METER ADJUSTMENT

Adjust RV104 so that the P-RF meter pointer indicates the same level as the reading of the watt meter connected to the unit.

RECEIVER ALIGNMENT TEST SET-UP



NOTE

During receiver alignment ANL switch should be placed in ON position and fine tune control in 12 o'clock position.

RECEIVER SENSITIVITY ADJUSTMENT

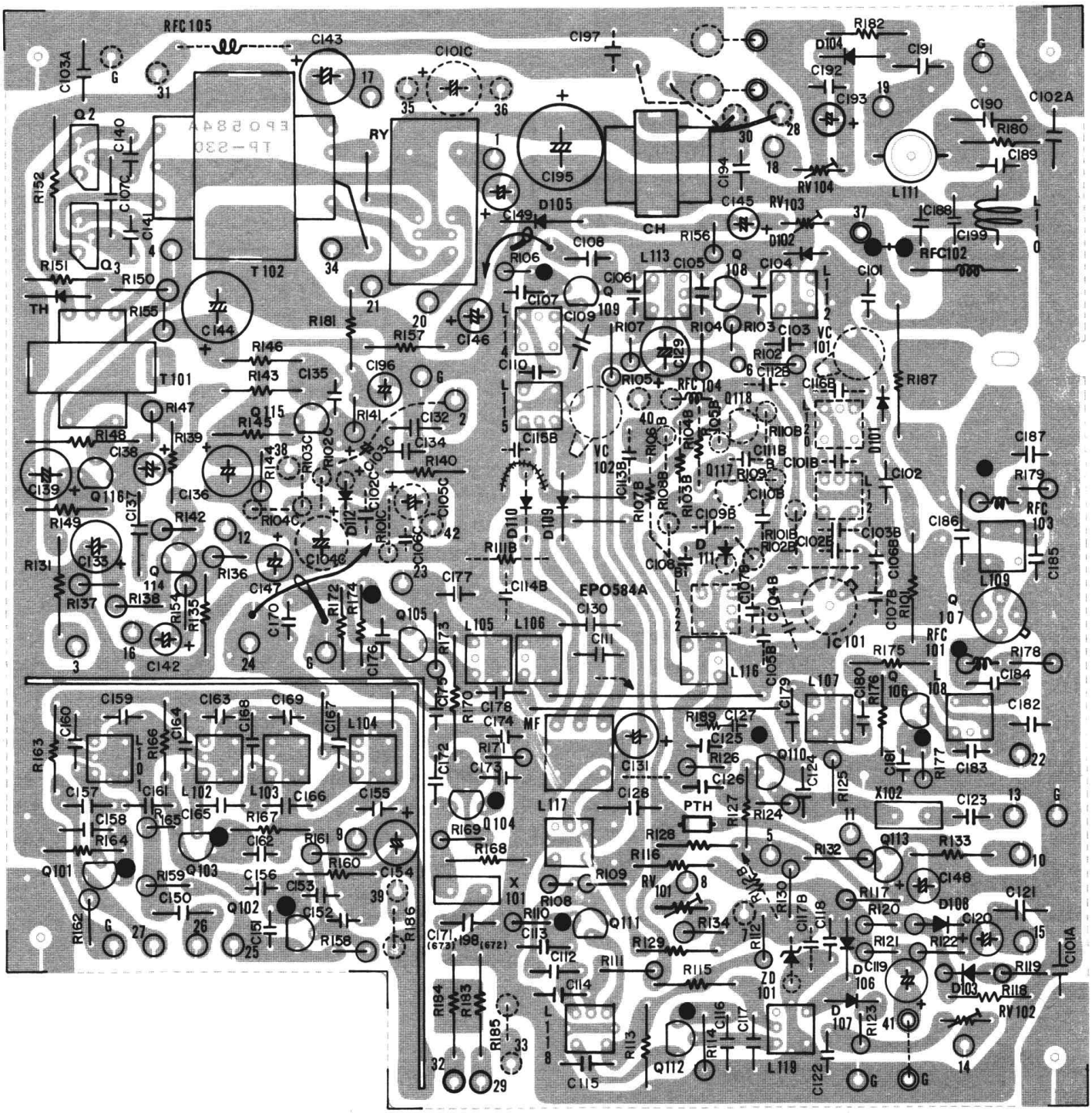
Connect a signal generator output, 27.115 mHz, 1 kHz 30% mod, to the receiver with the selector switch placed in 13CH position. Adjust L112, L113, L114, L115, MR, L117, L118 and L119 for mximum audio output.

SQUELCH ADJUSTMENT

Connect a level meter across the speaker terminal. Set signal generator attenuator to provide 74 db, 1 kHz, 30% mod. output and receive this signal. Set the squelch volume on the transceiver to minimum and note the level meter reading. adjust RV101 so that the level meter reading is decreased by 6 db.

S-METER ADJUSTMENT

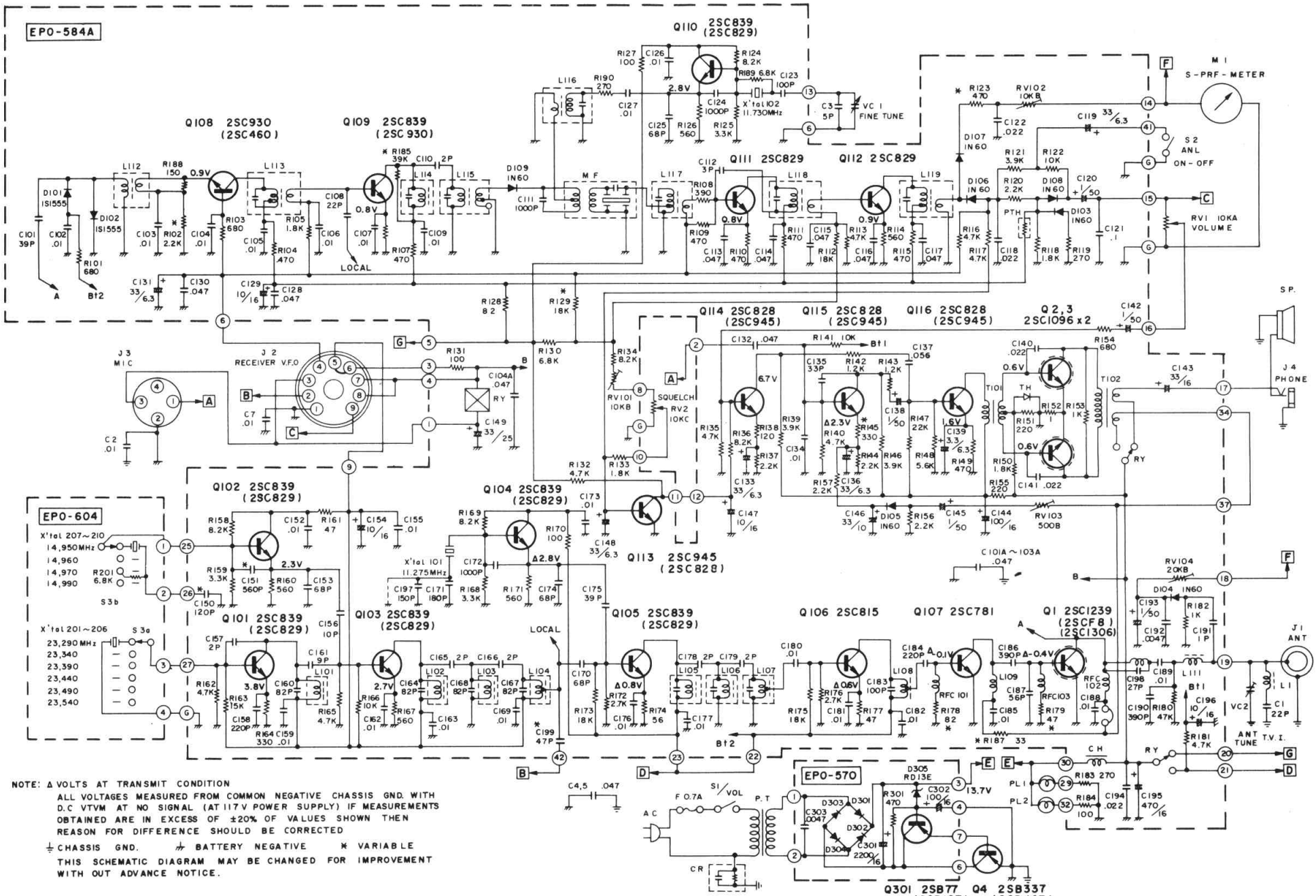
Adjust RV102 so that the meter pointer indicates "9" at the RF input signal of 40 db.



HY GAIN 672, 673

NOTE: 1. ALL PARTS INDICATED BY DOTTED LINE BE USED FOR ONLY MODEL 672 AND NOT USED FOR MODEL 673.

2. JUMPER WIRES INDICATED BY ++++ LINE WILL BE USED FOR ONLY MODEL 673.



NOTE: Δ VOLTS AT TRANSMIT CONDITION
ALL VOLTAGES MEASURED FROM COMMON NEGATIVE CHASSIS GND. WITH D.C VTVM AT NO SIGNAL (AT 117 V POWER SUPPLY) IF MEASUREMENTS OBTAINED ARE IN EXCESS OF ±20% OF VALUES SHOWN THEN REASON FOR DIFFERENCE SHOULD BE CORRECTED

⏚ CHASSIS GND. ⏚ BATTERY NEGATIVE * VARIABLE

THIS SCHEMATIC DIAGRAM MAY BE CHANGED FOR IMPROVEMENT WITH OUT ADVANCE NOTICE.

SCHEMATIC DIAGRAM HY-GAIN 673

SECTION V

PARTS LIST

Parts Name	Description	Part No.	Symbol
Transistor	2SC-1239	EQS-86	Q1
Transistor	2SC-1096	EQS-89	Q2,3
Transistor	2SB-337(B)	EQG-8	Q4
Volume Control	EVC-B85K30A14	ERV-134	RV1/s1
Volume Control	EVH-A8AK30C14	ERV-135	RV2
Variable Condenser		ECV-30	
Toggle Switch		EST-4	S2
Speaker	EAS-9D75S	EAS-14	SP
Microphone		EAM-14	MIC
Meter		EMM-48	MI
Pilot Lamp		EZP-6	PL1
Pilot Lamp		EZP-21	PL2
Fuse Holder		EZS-1	F
Fuse 0.7A		EZF-4	
ANT Jack		EZS-66	J1
V.F.O. Jack		EZS-89	J2
MIC Jack		EZS-60	J3
PHONE Jack		EZS-79	J4
Power Transformer		ETP-66	P.T
Power Cable		EZZ-1U	
Cord Stopper		EZZ-25	
CR Module		ECR-12	CR
Lug		EZL-L3B	LG
Trimmer Capacitor		ECV-5	VC2
T.V.I. Trap Coil		ETR-18	L1
Ceramic Capacitor	ECC-D05220K		C1
Ceramic Capacitor	RD208YZ103P50		C2
Ceramic Capacitor	ECC-D05473ZV		C4,5
Ceramic Capacitor	ECC-D05070C		C3
FCC Card		EBP-26	
FCC Label		EBP-40	
FCC Application Sheet		EBP-98	
Instruction Manual		EBP-244	
P.C. Board Complete		EC52-L3	
P.C. Board		EPO-584	
Transistor	2SC-829(B)	EQS-5	Q111,112
Transistor	2SC-839(H)	EQS-100	Q101-105,110
Transistor	2SC-838(S)	EQS-9	Q114-116
Transistor	2SC-934(P)	EQS-131	Q113
Transistor	2SC-815(K)	EQS-22	Q106
Transistor	2SC-781	EQS-57	Q107
Transistor	2SC-930(B)	EQS-139	Q108,109
Diode	1N60	EDG-3	D104-110
Diode	1S-1555	EDS-1	D101-102
Crystal	11.275MHZ	EXT-2	X'tal-101
Crystal	11.730MHZ	EXT-2	X'tal-102
Relay		EZR-6	
Input Transformer		ETA-41	T101

Parts Name	Description	Part No.	Symbol
Output Transformer		ETA-42	T102
Audio Choke Coil		ELA-2	CH
Posistor		EDP-1	PTH
Thermistor	23D25F	EDT-15	TH
Heat Sink for 2SC-781		MYO-8	
Shield Plate		MC45P6	
Mechanical Filter		EFC-3	
Test Pin		MYO-128	
Tie Point		MYO-9	
RF Choke Coil		ELR-4	RFC101-103
Potentiometer 100kB 2-leg	EVL-T5AA00B14		RV101,102
Potentiometer 500 B 2-leg	EVL-T5AA00B52		RV103
Potentiometer 200kB 2-leg	EVL-T5AA00B24		RV104
O.S.C. Coil		ETR-247	L101
RF Coil		ETR-248	L102,103
RF Coil		ETR-249	L104
RF Coil		ETR-30	L105,106
RF Coil		ETR-31	L107
RF Coil		ETR-22	L108
RF Coil		ETR-197	L109
RF Coil		ETR-17	L110
RF Coil		ETR-232	L111
ANT. Coil		ETR-194	L112
RF Coil		ETR-104	L113
RF Coil		ETR-255	L114
RF Coil		ETR-256	L115
RF Coil		ETR-255	L116
I.F. Coil		ETI-16	L117
I.F. Coil		ETI-17	L118
I.F. Coil		ETI-18	L119
Carbon Resistor ¼W 680 ohm	ERD-14TJ681		R101,103,104,
Carbon Resistor ¼W 2.2Kohm	ERD-14TJ222		R102,120,137, 156,157
Carbon Resistor ¼W 470 ohm	ERD-14TJ271		R104,107,109, 110,111,115, 123,149
Carbon Resistor ¼W 1.8Kohm	ERD-14TJ182		R105,118,133, 150
Carbon Resistor ¼W 330 ohm	ERD-14TJ331		R106,145,164
Carbon Resistor ¼W 390 ohm	ERD-14TJ391		R108
Carbon Resistor ¼W 18Kohm	ERD-14TJ183		R112,129,173, 175
Carbon Resistor ¼W 4.7Kohm	ERD-14TJ472		R113,116,117, 132,135,140, 162,165,181
Carbon Resistor ¼W 560 ohm	ERD-14TJ561		R114,126,160, 169,171
Carbon Resistor ¼W 270 ohm	ERD-14TJ271		R119
Carbon Resistor ¼W 3.9Kohm	ERD-14TJ392		R121,139,146
Carbon Resistor ¼W 10Kohm	ERD-14TJ103		R122,141,166
Carbon Resistor ¼W 8.2Kohm	ERD-14TJ822		R124,134,136, 158,169
Carbon Resistor ¼W 3.3Kohm	ERD-14TJ332		R125,159,168

Parts Name	Description	Part No.	Symbol
Carbon Resistor ¼W 100 ohm	ERD-14TJ101		R129,170
Carbon Resistor ¼W 82 ohm	ERD-14TJ820		R128
Carbon Resistor ¼W 6.8Kohm	ERD-14TJ682		R130
Solid Resistor ½W 100 ohm	ERC-12GK101		R131
Carbon Resistor ¼W 120 ohm	ERD-14TJ121		R138
Carbon Resistor ¼W 1.2Kohm	ERD-14TJ122		R142,143,144
Carbon Resistor ¼W 22Kohm	ERD-14TJ223		R147
Carbon Resistor ¼W 5.6Kohm	ERD-14TJ562		R148
Carbon Resistor ¼W 220 ohm	ERD-14TJ221		R159,155
Metal Oxide Resistor 1W, 0.3 ohm	ERX-IANJOR3		R152
Carbon Resistor ¼W 1Kohm	ERD-14TJ102		R153,182
Carbon Resistor ¼W 47 ohm	ERD-14TJ470		R161,177,179
Carbon Resistor ¼W 15Kohm	ERD-14TJ153		R163
Carbon Resistor ¼W 2.7Kohm	ERD-14TJ272		R172,176
Carbon Resistor ¼W 56 ohm	ERD-14TJ560		R174
Carbon Resistor ¼W 82 ohm	ERD-14TJ820		R178
Carbon Resistor ¼W 47Kohm	ERD-14TJ473		R180
Solid Resistor ½W 270 ohm	ERC-12GK271		R183
Solid Resistor ½W 100 ohm	ERC-12GK101		R184
Ceramic Capacitor 39pF 50V	ECC-D05390K		C101,175
Ceramic Capacitor.01uF 50V	RD208YZ103P50		C102-107,109, 121,134,152, 155,159,162, 164,169,173, 176,177,180, 181,182,185, 188,198
Ceramic Capacitor 22pF 50V	ECC-D0522OK		C108
Ceramic Capacitor 2pF 50V	ECC-D05020C		C110
Styroflex Capacitor.001uF	ECQ-S1102KX		C111
Ceramic Capacitor 3pF500V	ECC-D5030C		C112
Ceramic Capacitor.047uF25V	DD624BC473M25		C113-117,121, 128,130,132
Ceramic Capacitor.022uF50V	RD209YZ223P50		C118,122,144
Elyt. Capacitor 33/6V	ECE-A6V33N		C119,131,133, 136,139,148
Elyt. Capacitor 1/50V	ECE-A50V1N		C120,138,142, 145,193
Ceramic Capacitor 82pF 50V	ECC-D05820K		C123
Mylar Capacitor .001uF 50V	ECQ-M05102KZ		C124,151,172
Ceramic Capacitor 68pF 50V	ECC-D05680K		C125,153,170, 174
Ceramic Capacitor 56pF 50V	ECC-D05560K		C127,187
Elyt. Capacitor 10/16V	ECE-A16V10N		C129,147,154, 196
Ceramic Capacitor 33pF 50V	ECC-D05330K		C135
Mylar Capacitor.056uF 50V	ECQ-M05563KZ		C137
Ceramic Capacitor.022uF 25V	DD610BC223M25		C140,141
Elyt. Capacitor 33/16V	ECE-A16V33N		C143
Elyt. Capacitor 100/16V	ECE-A16V100N		C144

Parts Name	Description	Part No.	Symbol
Elyt. Capacitor 33/10V	ECE-A10V33N		C146
Elyt. Capacitor 3.3/25V	ECE-A25V3R3N		C149
Ceramic Capacitor 150pF 50V	ECC-D05151K		C150
Ceramic Capacitor 10pF 50V	ECC-D05100K		C156
Ceramic Capacitor 2pF500V	ECC-D5020C		C157,165,166, 178,179
Ceramic Capacitor 220pF 50V	ECC-D05221K		C158,184
Ceramic Capacitor 82pF 50V	ECC-D05820KR		C160,164,168, 167
Ceramic Capacitor 9pF500V	ECC-D5090D		C161
Ceramic Capacitor 330pF 50V	ECC-D05331K		C171
Ceramic Capacitor 100pF 50V	ECC-D05101K		C183
Ceramic Capacitor 390pF 50V	ECC-D05391K		C186,190
Ceramic Capacitor 1pF500V	ECC-D5010C		C191
Ceramic Capacitor.0047uF50V	RD204YZ472P50		C192
Elyt. Capacitor 470/16V	ECE-A16V470N		C195
Ceramic Capacitor.047uF 50V	RD209YM73P50		C101A,102A, 103A
Front Panel Assembly		MC52A1	
Chassis		MC52P4	
Rear Plate		MC52P5	
Bottom Plate		MC52P6	
Bracket (Front Panel)		MC52P7	
Cage		MC52A2	
Bracket (Front Panel)R.		MC52P10A	
Bracket (Front Panel)L.		MC52P10B	
Channel Plate		MC52P11	
Net		MC52P12	
Cap (Rubber)		MWO-277	
Lamp Holder		MWO-345	
Bracket (Meter Hold)		MC09P12	
Bush (CH Knob)		MHO-89	
Stiffner for Trans.		MYO-22	
Heat Sink		MYO-26	
Heat Sink		MM15P6	
Foot		EZZ-3	
Bracket (Trimmer Mount)		MM012P9	
Plastic Bush		MMO-2	
CH Knob		MNO-133	
VR Knob		MNO-134	
Knob		MNO-117	
Bracket (Vari-con Mount)		MC52P13	
Felt Sheet (Sw. Masking)		MWO-359	