Quality. Uncompromised.

®

# PUBLIC ADDRESS AMPLIFIER WITH AM/FM TUNER COLO 100

### INSTRUCTION MANUAL

WARNING
TO PREVENT FIRE OR SHOCK HAZARD
DO NOT EXPOSE THIS APPLIANCE TO
RAIN OR MOISTURE

Write your SERIAL NUMBER here.
The number is located near the name plate on the rear panel.

#### **PRECAUTIONS**

To ensure maximum safety, please carefully follow the instructions be-

#### 1. Check the power source

Plug the unit only into a power source whose voltage and frequency ratings match those given in the instruction manual.

#### 2. Power cord

The unit is provided with a 3-core type a.c. line cord with a grounding wire. Insert the plug only into a 3conductor outlet (containing grounding wire) of 120V/60Hz. Or if a 3conductor outlet is not available, use an adaptor, connecting the grounding wire to a grounding screw on a wall, etc. Insert or unplug the a.c. line cord only after making certain the unit's power switch is turned off. to prevent shock noise from damaging the speakers.

#### 3. Ventilation

To offset heat generated by the unit, it is necessary to provide ample ventilation around the unit. Avoid blocking or impeding the ventilation holes on the unit. To prevent unnecessary problems, install the unit on a place free from any vibrations, direct sunlight, humidity or dust circulation.

#### 4. Do not open the cabinet

The unit has been completely factory adjusted. To avoid electric shock or harm to the human body or to the unit, never open the cabi-

#### 5. If the unit gets wet or foreign matter enters

In case the unit gets wet or any water or foreign matter gets into the cabinet, immediately disconnect the a.c. line cord, and consult your dealer or qualified electrician.

#### 6. Instruction manual

Keep the instruction manual near the unit, and record the serial number (found on the rear panel) on the cover.

#### SWITCHES, CONTROLS AND **OPERATION**

#### (1) Power Button

Depress this button to turn on power. Pressing it a second time will turn off power.

#### (2) Power Indicator

Glows when the power is turned on, indicating that the unit is in operation.

#### (3) Microphone Jack (MIC 1)

An input terminal used to connect a high impedance microphone with standard type plug to the unit. On the rear panel of the unit are screwtype MIC 1 terminals. Since the MIC jack on the front panel takes priority over the rear MIC terminals, the MIC jack on the front panel should not be connected with a microphone plug when the MIC 1 terminals on the rear panel are in

#### (4) MIC 1, 2 Level Controls

These controls regulate the input levels from microphones connected to the respective MIC terminals, Rotate each knob clockwise to raise the input level, and counterclockwise to reduce it. Turning the knob fully counterclockwise (to position trols for MIC, AUX or PHONO/ "0") cuts all input from micro-

#### (5) AUX Level Control

This knob regulates the level of input from any equipment connected to the AUX jack on the rear panel. such as chimes, tape deck, rhythm box, synthesizer, etc. Rotate the knob clockwise to raise the level and counterclockwise to reduce it Turning the knob fully counterclockwise (to position "0") cuts all input from above equipment,

#### (6) PHONO/TUNER Level Control

This knob regulates the level of input from the tuner section of the unit, or connected record player. Rotate the knob clockwise to raise the level of input from the built-in tuner, and counterclockwise to raise the level of input from the record player. At midposition ("0"). input from either source is cut,

This control operates on either tuner or record player, not both at once: signals cannot be mixed.

#### (7) MASTER Volume Control

This knob controls at one time the combined signals coming from MICs 1, 2, AUX, and PHONO/TUNER. Rotate the knob clockwise to raise the overall level of those signals together, and rotate it counterclockwise to reduce it. Turning the knobfully counterclockwise (to "0") position) cuts all inputs.

Note that this control should be used at position "5" or higher. If the master volume control is set lower than "5", the separate conTUNER set higher may cause "clipping" of input signals and increased distortion in sound.

#### (8) BASS/TREBLE Tone Controls

These are rotary controls that regulate the balance of tone of input signals coming from MICs 1, 2, AUX, or PHONO/TUNER. BASS regulates the low frequency range and TREBLE the high frequency range. Rotate the respective knobs to the right to increase the response. and to the left to decrease it.

BASS is effective in reducing lowfrequency noise produced by record warpage, and TREBLE reduces the scratch noise on a record or the hiss on a tape. Also use these controls to compensate for acoustic. conditions.

#### (9) Tuning Dial

This knob tunes in the desired AM or FM broadcast station. Use the lower half of the knob for AM band, and the upper half for FM band reception. Rotate the knob to bring the pointer on the knob to the desired position on the frequency scale around the knob

#### (10) AM/FM Selector

For selecting receiving frequency bands. Set the selector to AM to receive AM stations, and to FM for FM stations. Set at FM AFC position to prevent tuning drift due to frequency deviation. Generally, when receiving FM stations, first set the selector to FM and tune in to the desired station; then set the selector to FM AFC. When not

using the tuner function, turn selector to OFF.

#### (11) Ferrite-bar Antenna

This is a built-in antenna for use in AM broadcast reception. Erect the bar towards you, and position it where the reception is optimal.

#### (12) Antenna Input Terminals

Use the terminals labeled  $300\Omega$ when parallel feeder is used, and the terminals labeled 75 $\Omega$  for coaxial cable. The AM terminal is used to connect external antenna when sufficient electric field strength cannot be obtained with the built-in ferrite bar antenna.

#### (13) TUNER Output Jack

This is a tuner output jack for RCA pin plug. It transmits signal from the built-in tuner independently. without mixing. To mute tuner, short-circuit the jack with shorting plug.

#### (14) PRE OUT Terminal

Output from the preamplifier section appears at this terminal. Use this terminal when operating, unit's preamplifier section separately, or when coupling the unit with separate power amplifier.

#### (15) MAIN IN Terminal

Terminal for feeding signal into the unit's main amplifier section. Use when operating main amplifier section, or when coupling the unit with separate preamplifier.

#### (16) Main Amplifier SEPA-RATE/UNITE Switch

This switch permits either separate use of main amplifier section or combined use of main amplifier section with preamplifier section. In SEPARATE position, the main amptifier section is disconnected from the preamplifier section so that you can used the main amplifier section separately. In the UNITE position. the preamplifier and the main amplifier sections are connected. In the UNITE position, the MAIN IN terminal cannot be used.

#### (17) PHONO Input Jack

This is a phonograph input terminal for RCA pin plug. When using stereo phonograph, use Y-adaptor for RCA plug connection.

Note: The PHONO input jack is for record player with MM type cartridge. Plug player with ceramic or crystal cartridge into the AUX jack.

#### (18) AUX Input Jack

This is an auxiliary input jack for RCA pin plug.

#### (19) GND Terminal

This terminal is the connection for grounding wire of record player, etc., to reduce inter-equipment hum noise or induction noise, or to prevent static electricity.

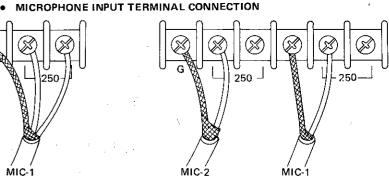
#### (20) Music Muting Terminals

Short-circuiting GND and S terminals will immediately cut input signals at AUX and PHONO/TUNER (and signal from built-in tuner). Remove the short-circuit to regain state already established by front panel controls. This function is effective in interrupting music signals to insert announcement, etc. by means of microphones.

(21) Microphone Input Terminals

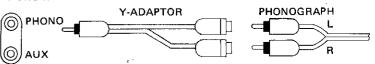
## -250 BALANCED TYPE, LOW IMPEDANCE (250Ω)

Length of shielded cord: 200 feet (60 meters) maximum



UNBALANCED TYPE, LOW IMPEDANCE (250Ω) Length of shielded cord: 60 feet (18 meters) maximum

#### PHONO INPUT JACK CONNECTION WHEN USING STEREO PHONOGRAPH



These are screw-type microphone input terminals. The 3 right-hand terminals are for MIC 1 connections, and the 3 left-hand terminals are for MIC 2 connections. Both MIC 1 and MIC 2 connections can be made simultaneously. These terminals have been already adjusted to accept low impedance (250 Ohms) batanced or unbalanced microphone. The stranded wire from the microphone should be hooked up to G terminal.

#### (22) Speaker Terminals

Unit is provided with 2 sets of speaker terminals; one for low impedance use, and the other for high impedance or constant voltage use. For low impedance use, 0, 4, 8, and 16 ohm terminals are available. For high impedance or constant voltage use, 0, 12.5, 25, and 70 volt terminals are available.

Terminals are screw-knob type. Loosen the knob, and the hole above it will open. Insert the bared end of speaker cable into the hole. and then tighten the knob so that the cable is securely fixed, (Refer to "CONSIDERATIONS FOR PA SPEAKER LAYOUT for details on use of these speaker terminals.)

#### (23) Overload Protection Reset Button

This button resets the built-in protection device, which would cut the output when main amplifier section is overloaded because of mismatching of speaker impedance. etc. If the protection device is activated to prevent the unit from being damaged, remove the cause of overload, and press the Overload Protection Reset button to start normal operation,

#### USING RACK MOUNTING BRACKETS

The unit is mountable into a 19inch rack. When rack-mounting the unit, remove screws near the front panel at both sides of the cabinet, and install the rack-mounting brackets supplied with the screws. The unit can also be placed in upright position for wall mounting. For that purpose, remove screws on the bottom plate of the unit, and install suitable brackets with the screws.

25V

AMPLIFIER 1

12.51/

12.5V

AMPLIFIER 2

#### **CONNECTING SPEAKERS IN** SERIES

If two PA music amplifier units are connected in series the same speaker system can be driven with double power output.

When using 2 units in series, for example, set the SEPARATE/UNITE switch on amplifier "1", which will be used for source control, to U-NITE position, and set the SEPAR-ATE/UNITE switch on amplifier "2", whose main amplifier section alone will be used, to SEPARATE

501/

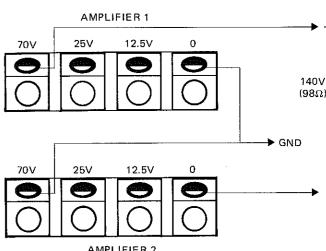
 $\{12.5\Omega\}$ 

GND

position. Connect PRE OUT terminal on amplifier "1" to MAIN IN terminal on amplifier "2" using RCA pin cord. (See figure for speaker cable connections in series combination of amplifiers.)

Note: When amplifiers are connected in series, the OV terminal on amplifier "2" cannot be used as grounding terminal. Never attempt to ground the terminal

## ROTEL PUBLIC ADDRESS AMPLIFIER HIGHER DA-100 JOHN BOND BONS -



AMPLIFIER 2

#### **CONSIDERATIONS FOR PA SPEAKER LAYOUT**

#### SPEAKER CONNECTIONS

In connecting speakers to a public address amplifier it is important to present the amplifier with the load impedance it is designed to handle. Failure to do this can cause overheating and component failure. In many cases problems can take months to appear in the form of reduced reliability and unnecessary service calls. A load impedance that is too low is especially bad. You should strive to have a load impedance of not less than 70% of the chosen amplifier output impedance. For example, do not connect a 4 Ohm speaker to the 8 Ohm output. Driving a load of higher impedance than rated amplifier output is not as serious, but results in a power loss proportional to the mismatch and should be avoided. For example, driving a 16 Ohm load through the 8 Ohm output will result in a 50% loss in power. The high impedance mismatch should be kept to less than 200%, especially if it is anticipated that more than 50% of the rated amplifier power will be re-

There are two methods of connecting groups of speakers to the amplifier. Firstly, using the low impedance (i.e. 4, 8, 16 Ohm) outputs. This is preferable where: -

- (a) Runs are short (less than 200 ft. [70 m]).
- (b) Few horns or speakers are to be used (i.e. typically 4-8)
- (c) Same sound levels are required at each speaker.
- (d) Low impedance also provides slightly better fidelity and frequency

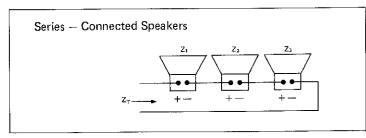
High impedance or constant voltage is the second method and is preferable where: -

- (a) The runs are long and line losses are to be avoided.
- (b) Many speakers are to be used.
- (c) Different sound levels are required at different locations, for example indoor speakers and outdoor horns.
- (d) Future expansion possibilities require flexibility in wiring layout.

The following is a more detailed discussion of these two methods.

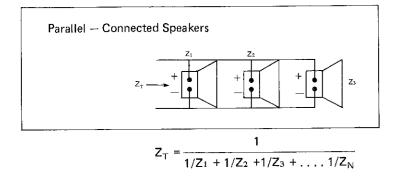
#### LOW IMPEDANCE CONNECTION

The speakers must be connected so as to present a combined impedance equal to the selected amplifier output impedance, i.e. 4, 8, 16 Ohms. The connections should be arranged in a series/parallel combination to achieve this according to the following formulae. The impedance should be between 70% and 200% of the output impedance selected. If the amplifier is to be driven anywhere near its full rated output the impedance should be well within these tolerances.



 $Z_T = Z_1 + Z_2 + Z_3 + Z_{s_1}$ where  $Z_T$  = total combined load impedance

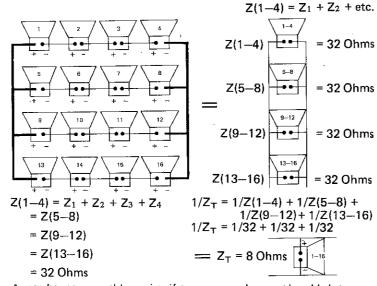
and Z<sub>N</sub> = individual speaker impedance



#### SERIES/PARALLEL COMBINATIONS

In larger systems it will be necessary to combine series and parallel connections to obtain the necessary impedance. The rules for calculating the total effective impedance is to divide the entire circuit into individual small series of parallel sub-circuits and apply the foregoing rules to them.

The following is an example using 16 x 8 Ohm speakers. Each schematic is an impedance equivalent to its predecessor but has been simplified.



As can be seen, a problem arises if one more speaker must be added at some future date, as all the connections must be changed. This is not much of a problem if only a few speakers are involved, but if the network is extensive, the problem is significant. In addition, failure of one speaker can take out a number of associated units.

#### HIGH IMPEDANCE OR CONSTANT VOLTAGE (25V & 70V) SYSTEMS

The high impedance or constant voltage method of impedance matching uses a high impedance amplifier output which is transformed down to 8 Ohms by an impedance matching transformer at each individual speaker. The big advantages of this approach as compared to low impedance are: -

- (1) Reduced line losses and ability to use smaller wire gauges. This is due to the higher voltage and reduced current in the speaker lines.
- (2) Much simpler impedance matching procedures and connections.

Constant voltage is a misnomer in that the amplifier does not always produce 70V. Rather, the amplifier output impedance is set at such a level that, irrespective of its rated power, it will produce 70.7 volts output at full power. Thus a 10 Watt amplifier optimum load would have an impedance of 500 Ohms ( $V^2/P = 70.7^2/10$ ), a 40 Watt amp would be 126 Ohms and 100 Watt amp, 50 Ohms:

Multiple transformer taps allow the impedance at each speaker to be adjusted individually to give a total matched load. Because of the high impedance arrangement, the system is easier to impedance match and is also inherently less susceptible to problems caused by mismatching.

The transformer taps are marked in Watts instead of Ohms (usually 4, 2, 1, 1/2}. Again, it should be borned in mind that these levels of power output are only achieved when the transformer is working at 70.7 volts. The transformers are connected in parallel. A good match is obtained by ensuring that the total of all tap settings fits into the range of 40-80% of rated amplifier output, 80% is chosen to allow for transformer insertion loss. It is also good practice not to drive the amplifier to 100% of its capacity.

Examples are shown below. For simplicity it is assumed that all tap settings are the same at each speaker.

For a 40 Watt amplifier the range 40-80% is equivalent to 16-32 Watts.

1110101010	
6 speakers x 4 Watt taps each = 24W	Good match
4 speakers x 1 Watt taps each = 4W	Poor match
20 speakers x 1 Watt taps each = 20W	. ,Good match
20 speakers x 4 Watt taps each = 80W	Very poor match— overload

30 speakers x 1 Watt taps each = 30W . . . . . . . . . . Good match

#### NOTE:

None of the above tap settings guarantee the actual sound levels through each speaker. This is as much a function of the master volume control as the tap setting. The setting simply defines the maximum power consumed by an 8 Ohm speaker if presented with 70.7 volt input. In the case of a small number of speakers, it is always preferable to use a higher tap setting and reduced the sound level by turning down the master volume control. In calculating the amplifier rating needed for a typical music/paging system using speakers distributed in an office environment, a good rule of thumb is to allow about 1W per speaker and space speakers at 1½ X ceiling height. For noisy areas, or where the volume level required is higher, more power is required.

#### **PHASING**

When using multiple speakers in a sound system installation, it is advisable to phase the speakers in order to reduce the cancellation effect caused by improper phasing. Speakers out of phase will lose up to one-half of their normal volume and will operate with poor tonal characteristics.

For speakers facing in the same general direction, the speakers are in phase when all speaker cones move in the same direction when an equal signal is applied. With two speakers facing each other, proper phasing is achieved when the cone of one speaker moves inward while the cone of the other speaker moves outwards.

If speakers are unmarked, or not the same model, the following procedure will allow fast and simple phasing.

- (1) Connect one side of a flashlight battery to one of the speaker terminals.
- (2) Momentarily contact the other speaker terminal to the other side of the
- (3) Note direction of cone movement (inward or outward).
- (4) Mark the speaker terminal that corresponds to the positive side of the
- (5) Repeat the same procedure for each successive speaker, making sure that the direction of cone movement is the same for each case.
- (6). If the speaker cones are all to move in the same direction, connect the marked terminals to each other and the unmarked terminals to each other. If the cones are to move in opposite directions, as is the case when two speakers are facing each other, connect the marked terminal of each speaker to the unmarked terminal of each speaker.

#### POWER LOSS IN LONG LINES

For long lines the power loss in the lines (I<sup>2</sup>R) becomes a significant factor. The power supplied by the amplifier is effectively reduced by the line loss. For a 0.5 db loss in sound pressure the total wire resistance must be limited to 6% of speaker impedance. The following table shows the calculated two wire cable lengths permissible for a number of wire sizes in feet. For a 1 db loss, the lengths may be doubled. For 2 db loss, multiply by 4.4.

	Resistance	Low	-Impedan	ice	High-Im	pedance Syst	ems
AWG Size	(Ohms/1000 Feet)	4Ω	8Ω	16Ω	100W/70.7V 12½W/25V (50Ω)	50W/70.7V 6¼W/25V (100Ω)	25W/7.0.7V 3%W/25V (200Ω)
14	2.50	48	96	190	600	1,200	2,400
16	4.02	30	60	90	370	740	1,500
18	6.39	19	38	76	230	460	920
20	10,1	12	24	48	150	300	600
22	16.2	7	14	28	93	190	380

#### **TECHNICAL SPECIFICATIONS**

#### AMPLIFIER SECTION

Tone Control Action

Power Output ,
Frequency Response
lum and Noise
MIC 1 Input (front: 50 k $\Omega$ )54 dB below rated output
MIC 1 Input (rear: 250Ω)50 dB below rated output
MIC 2 Input 50 dB below rated output
AUX Input 78 dB below rated output
PHONO Input65 dB below rated output
Sensitivity .
MIC Input
2.5 mV/50 kohms
AUX Input
PHONO Input 3 mV
Outputs
12.5V (1.56 ohms), 25V (6.25 ohms), 70V (49 ohms)
nputs
Controls

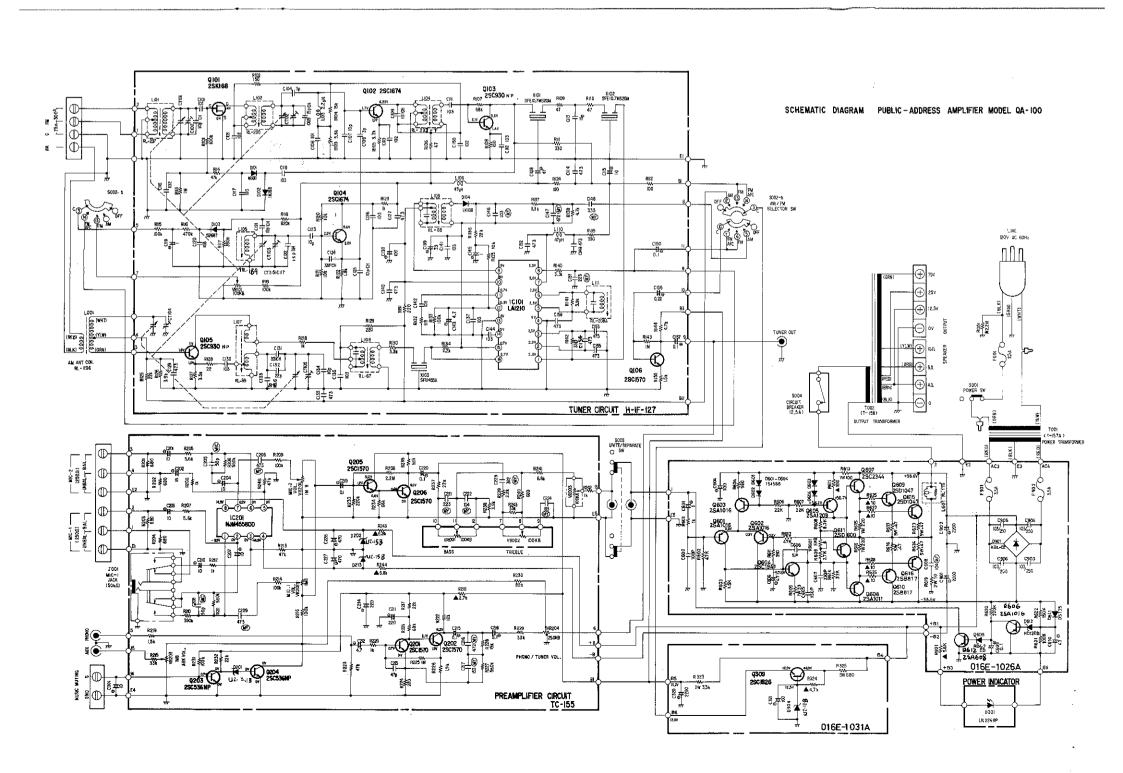
BASS.....+5 dB, -12 dB (100 Hz) TREBLE.....+5 dB, -12 dB (10 kHz)

TUNER SECTION (at TUNER C	OUTPUT)
Frequency Range	.AM: 535-1605 kHz
	FM: 87.4∸108.5 MHz
Sensitivity	.AM: 500 µV for 20 dB quieting
	FM: 4 $\mu$ V for 30 dB quieting
Distortion	.AM: 1.5%, MOD 30% 400 Hz
	FM: 0.8%, MOD 100% 400 Hz
Hum and Noise	.AM: 40 dB
	FM: 60 dB
Output	.AM: 220 mV, MOD 30% 400 Hz
(at TUNER OUT)	FM: 400 mV, MOD 100% 400 Hz
MISCELLANEOUS	
Power Requirement	.120V AC/60 Hz
Power Consumption	.270 VA
Dimensions	.430 (W) x 110 (H) x 290 (D) mm
(w/o rack mounting bracket)	16-15/16" x 4-5/16" x 11-13/32"
Weight	
<ul> <li>Specifications and features su</li> </ul>	bject to possible modification

without notice.

Contaction   Computer No.   Description																																													
TORS, DIODES AND I'CS TR50000139 25K1684-F TR300000131 25K1674/LC1674 (K, I TR300000327 25K1570/T1GH/2SC55 TR300000327 25K1570/T1GH/2SC55 TR30000023 25K1016 (G, H) TR10000023 25K1016 (G, H) TR10000021 25K1016 (G, H) TR10000021 25K1016 (G, H) TR100000032 25K1016 (G, H) TR100000032 25K1016 (G, H) TR100000032 25K1016 (G, H) TR100000032 25K1017 (E, D) TR40000045 25K1047 (D, E) TR20000045 25K1047 (D, E) TR20000045 25K1047 (D, E) TR20000045 25K1047 (D, E) TR200000045 25K1047 (D, E) TR200000046 25K1047 (D, E) TR200000047 25K1047 (D, E) TR200000048 25K1047 (D, E) TR200000049 25K1047 (D, E) TR200000040 25K1047 (D, E) TR200000040 25K1047 (D, E) TR200000040 25K1047 (D, E) TR200000040 25K1047 (D, E) TR2000000040 25K1047 (D, E) TR200000010 IN4148 DD10000011 1K188 DD10000010 IN4148 DD100000010 IN4148 DD1000000010 IN4148 DD1000000010 IN4148 DD1000000010 IN4148 DD100000010 IN4148 DD100000010 IN4148 DD1000000010 IN4148 DD10000000010 IN4148 DD10000000010 IN4148 DD10000000010 IN4148 DD10000000010 IN4148 DD100000000010 IN4148 DD100000000000000000000000000000000000	L601 T001 T002		L108	L107	L105	L104	L103	L101			VR003	VR002	VR001	VR601	VR203 VR204	VR202	VR201		IC201	IC101	D612	D611			-		D104	•		Ω616	0612	Q611	Q609	0608	Q606	0.605	Q604	0309		0105 0106	Ω104		Q102	I	Location
S AND I'CS S AND I'CS S SC 1674,LC1674 (K, I 2SC 1674,LC1677 (K, I 2SC 1674) (K, I 2SC 1674,LC16 (G, H) 2SC 1674 (K, I 2SC 1674,LC16 (K, I 2	LC01150002 PT21101049 PT00000163	LM000000024 LC22081005	LC10670000 LC10680004	LC10390002	LC21890003 LM000000024	LC02330000	LM00000073	100000000	AND LB02		RV10000833	RV10000895	RV10000895	RV20000272	RV10000871 RV10000901	RV10000871	RV10000871		IC00000019	IC00001358	DD 20000016	DD10000068	DD 20000200	DD 10000100	DD20000016	DD 20000200	DD10000111	DD5000080	DD 400000095	TR20000040	TR10000126	TR40000069	TR40000045	TR10000138	TR10000023	TR10000217	TR30000169	TR30000029	300003	TR30000327	TR30000133	TR30000339	TR30000133	TORS, DIODE	Computer No
	RL-115, Anti-Parasi T-157AF-T, Power T-158, Output Tran	47uH TRL-236, RL-208A-T	RL-671, RL-68, /	RL-39T, AM OSC Coil	TRL-189, FM OSC Coil 47UH TRL-236, Micro	RL-233T,	2.2uH TRL-239, Micro		BAR ANT.	Volume	051	C3826 100KB	051 C3826 Control		C3324 1MB, AUX C3827 250KB,	C3324 1MB, MIC-	1MB, MIC-	TORS 5BM	45	031 LA	UZ-12B (M,		UZ-5.1		UZ-12B (M,	UZ-5.1 (B)	1K188	034		2SB817 (D, E	F, C	m,	п,Υ	1011 (E,	1016 (G,	1209-ST	1941 (K,	1826 (0,	536G/2SC15	1570/	1674/LC1674 (K,	930 (E) S	C1674/LC1674 (K,	S AND	Description
																																							SO	So	SS	F9	<u>×</u> :	<b>.</b>	5 6

Computer No. Description
OTHERS
LF00000166 SFE10.7MS2GA (RED)
LF00000210 SFU455A
FU12000112 Fuse 250V 3.5A UL
SH40000120 Power Switch C-3600B-T
SH30000274 Function Switch 061C-3190
SH20000046 6P Slide Switch SS-13-8
LY00000101 Breaker With Support 063
C-4140A09
FS20000080 QA-100 Front Panel



#### OWNER'S WARRANTY

This warranty covers ROTEL QA-100 Tuner/amplifiers.

This equipment is warranted to be free from defects for one year with respect to material and labour from date of purchase by original purchaser under conditions of normal use and service. The warranty covers component parts and shop labour at authorised service stations only. Outside labour charges are not included.

This warranty does not apply to breakage of any kind if equipment, or any of the component parts have been damaged through accident or alteration, abuse or misuse or to any damage caused by fire, flood or other Act of God.

This warranty is in lieu of all warranties expressed or implied and of all obligations or liabilities on its part in connection with the sale of this machine.

In the event of equipment failure, contact your dealer who will advise you, or forward the unit prepaid to one of the service depots listed below. Include a description of the problems and a return address. Sales receipt must accompany the unit to validate the purchase date and hence warranty.

#### TITRE DE GARANTIE DU CLIENT

Cette garantie couvere ROTEL QA-100.

Cet équipement est garanti être libre de tous défauts, pour une année en ce qui concerne le metériel et le travail, à partir de la date d'achat pa l'acheteur original, et sous conditions normales d'utilisation et de service.

Cette garantie ne couvre pas le bris d'aucune façon, ni l'équipement ni aucune de ses parties endommagés par accident, modifications, abus ou mauvais emploi, ou tout autre dommage causé par le feu, l'inondation ou tout autre cas de force majeure. Cette garantie remplace toute autre garantie experimée ou impliquée, et toute obligation ou responsabilité liée à la vente de cet appareil.

Si des réparations ou des ajustemente s'avèrent nécessaires, consulter votre distributeur qui vous renseignera, ou retourner l'appareil défectueux à un des dépôts de service autorisés désignés ci-dessous. Joindre une not indiquant la nature du problème et votre addresse de retour. Inclure la facture pour confirmer la date d'achat et la validité de la garantie.

CANADIAN AGENT: BURTEK MARKETING INC., 3879 East 2nd Ave, Burnaby, B.C. V5C 3W7

Ontario Rep: VICOM ENTERPRISES, 3868 Chesswood Dr., Downsview, Ont, M3J 2W6

Quebec & Maritimes: S.GREENE AGENCIES INC., 8255 Mountain Sights, Ste, 405, Montreal, Quebec, H4P 2B5