

# SERVICE MANUAL

MODEL IM-3103 RADIO-INTERCOM SYSTEM



**NuTone**

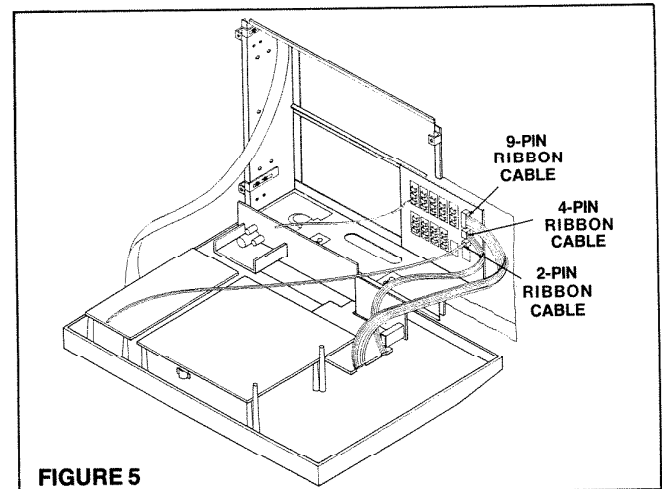
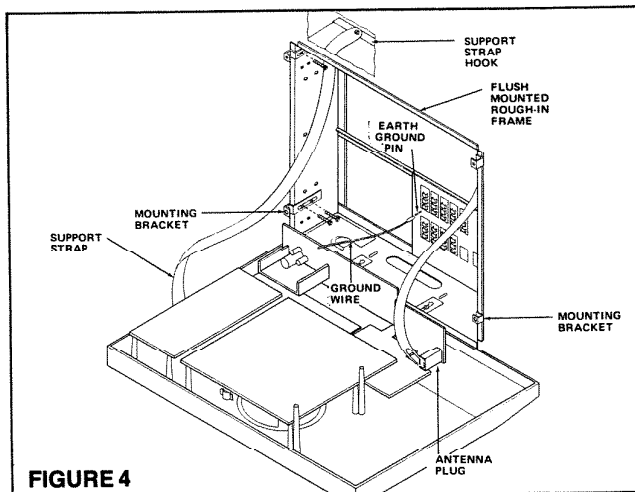
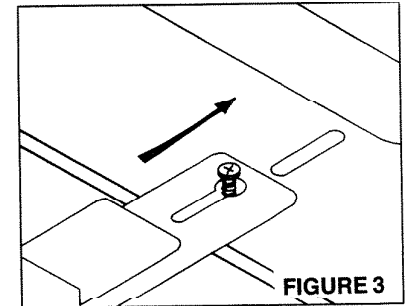
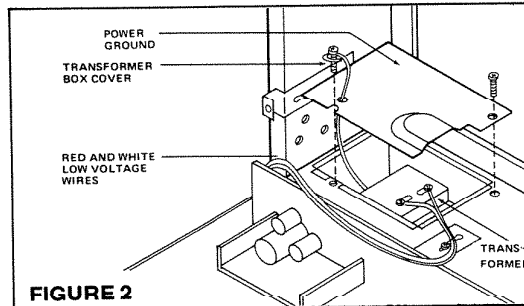
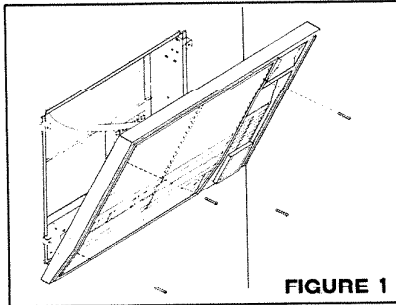
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## REMOVING THE MASTER STATION FROM MODEL IR-103 ROUGH-IN FRAME

1. Remove four (4) screws from front of master panel (See Figure 1).
2. Remove two (2) screws and ground wire from transformer box cover. Remove cover and disconnect the white and red/white low voltage wires from the transformer. (See Figure 2)
3. Remove the antenna connection from the tuner board. (See Figure 4)
4. Unplug the 2-pin, 4-pin and 9-pin ribbon cables and disconnect the black ground wire from the terminal board. (See Figure 5)
5. Remove screws that secure the hinges to the rough-in frame. (See Figure 3)
6. While supporting the master station, unhook the support strap from the rough-in frame. (See Figure 4)



## SERVICING THE MASTER STATION

1. A standard 20,000 ohm/volt multi-meter will suffice for most voltage and resistance measurements in this system. It is suggested that when a VTVM (or other high-impedance input meter) is available, it be used.
  2. A VTVM with a DC scale of 0 to 1.5 volts will be especially useful when measuring base and emitter voltages.
  3. The voltages included with the schematic diagram are for reference. Actual voltages may vary  $\pm 10\%$  to  $20\%$ . THE RELATIONSHIP BETWEEN THE VOLTAGES ON THE DIFFERENT ELEMENTS SHOULD REMAIN FAIRLY CONSTANT TO ACHIEVE DESIGN PERFORMANCE.
  4. To prevent leakage paths when measuring resistance of some components, it may be necessary to disconnect one side of the component under measurement.
  5. OBSERVE POLARITY WHEN MAKING RESISTANCE MEASUREMENTS IN TRANSISTOR CIRCUITS. IMPROPER POLARITY MAY RESULT IN FAI SF READINGS AND IN SOME CASES REVERSE POLARITY MAY EXCEED THE REVERSE BREAKDOWN RATINGS OF THE DEVICE.
  6. Make certain that power is OFF when making resistance measurements and when replacing components.
  7. Treat all printed circuit boards with care. Do not burn nor mutilate when making or breaking solder connections. Be careful of the foil paths.
- NOTE: Hum and/or squeal may result if circuit grounds or commons are tied together. Be cautious not to produce this condition when connecting grounds of test instruments to master station.**

# SERVICE TROUBLESHOOTING GUIDE: RADIO INTERCOM

## PROBLEM AREA: RADIO/INTERCOM

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
Entire system dead.	Primary of 301, Power Transformer.	Measure 120vAC.	Check wiring between transformer and circuit breaker.
	Secondary of 301, Power Transformer.	Measure 16 to 20vAC.	301N Power Transformer.
	Wiring between Power Transformer and IM-3103.	Be sure correct wires are connected to transformer. Correct wires are labeled with red "low voltage only" label.	
	Positive (+) end of capacitor C901.	Measure 22 to 28vDC.	Power Supply P.C. Board (7644A).
	2 pin connector, connecting Power Supply to Control & Amp P.C. Board.	Check that cable is plugged in and ribbon cable is not broken.	Power Supply P.C. Board (7644A).
	Emitter of Q108.	Measure approximately 14.5vDC.	Control and Amp P.C. Board (7667A).
	Radio Power Switch 5104	Switch should short when pressed in.	Control & Amp P.C. Board (7667A).
Clock/Frequency display does not light—all other features operate correctly.	2-pin connector connecting Digital Display P.C. Board to Control Amp P.C. Board.	Check that cable is plugged in and ribbon cable is not broken.	Digital Display P.C. Board (7665A).
	Pin 11 of IC203.	Measure approximately 14.5vDC.	Digital Display P.C. Board (7665A).
	Pin 12 of IC203.	Measure approximately 9vDC.	Digital Display P.C. Board (7665A).
Radio Power LED off—all other features operate normally.	Resistor R138 and LED D501.		Power LED P.C. Board (7670A) and/or Control & Amp P.C. Board (7667A).
No Radio-Intercom operates correctly.	Selector switch S311.	Check contacts in both AM & FM position.	Switch P.C. Board (7666A).
	Intercom I/P and Door Talk Switches.	Check that switches are not stuck in.	
	Audio at volume control.	Position selector switch to phono, slide program volume control to maximum. Input a 100MV, 1K hz audio signal into phono jack. Measure at wiper of program volume control VR101 approximately 20MV.	Switch P.C. Board (7666A).
	Audio at speaker.	Position selector switch to phono, slide program volume and master volume controls to maximum. Input a 100 MV, 1K hz audio signal into phono jack. Measure across speaker terminal approximately 3.5 V.	Control & Amp P.C. Board (7667A).
	Antenna connection.	Antenna must be installed.	
No FM Radio—all other operations normal.	Antenna connection.	Antenna must be connected to tuner.	
	Program selector switch (S311).	Check contacts in both audio path and DC voltage path.	Switch P.C. Board (7666A).
	6 pin connector, connecting switch P.C. Board to tuner P.C. Board.	Check that cable is plugged in and ribbon cable is not broken.	Switch P.C. Board (7660A).
	Q1, Q2, Q3 and IC1.	See voltage chart.	Tuner P.C. Board (7676A).

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
No AM Radio—all other operations normal.	Antenna connection.	Antenna must be connected to tuner.	
	Program selector switch S311.	Check contacts in both audio path and DC voltage path.	Switch P.C. Board (7666A).
	6 pin connector connecting switch P.C. Board to tuner P.C. Board.	Check that cable is plugged in and ribbon cable is not broken.	Switch P.C. Board (7666A).
	Q6 and IC1.	See voltage chart.	Tuner P.C. Board (7676A).
No FM frequency display—all other operations normal.	3 pin connector connecting tuner P.C. Board to Display P.C. Board.	Check that cable is plugged in and ribbon cable is not broken.	Tuner P.C. Board (7676A).
	Transistor Q4.	See voltage chart.	Tuner P.C. Board (7676A).
	Q201, Q202, Q203, IC202, IC201	See voltage chart.	Digital Display P.C. Board (7665A).
	Switch S312 and S311.	Check for 12.2 volts DC on base of Q301 when S311 is in FM. Check for 12.6 volts DC on emitter of Q301 when S312 is in frequency position.	Switch P.C. Board (7666A).
No AM frequency display—all other operations normal.	3 pin connector connecting tuner P.C. Board to Display P.C. Board.	Check that cable is plugged in and ribbon cable is not broken.	Tuner P.C. Board (7676A).
	Transistor Q5.	See voltage chart.	Tuner P.C. Board (7676A).
	Q201, Q202, Q203, IC201.	See voltage chart.	Digital Display P.C. Board (7665A).
	Switch S312 and S311.	Check for 12.2 volts DC on base of Q301 when S311 is in AM. Check for 12.6 volts DC on emitter of Q301 when S312 is in frequency position.	Switch P.C. Board (7666A).
No sound from master speaker—all remotes operate normally.	Setting of master volume control.	Master volume control must be turned up to get audio at Master.	
	VR102 Master Volume Control.	Measure approximately 200 ohms across control. Check for proper operation of wiper.	Control and Amp P.C. Board (7667A).
	Switches S101, S102, S103.	Check audio path through switches, be sure buttons are not stuck in.	Control and Amp P.C. Board (7667A).
	Switch S310 (master speaker).	Check audio path through switch, be sure switch is in the Radio Intercom position.	Switch P.C. Board (7666A).
	Speaker and ribbon cable connecting speaker to Control and Amp P.C. Board.	Speaker should measure approximately 24 r DC resistance. Check for broken ribbon cable.	Speaker or Control and Amp P.C. Board (7667A).
No sound from remote speakers master unit speaker operates normally.	Station selector switches S301–S309.	Switches must be in Radio-Intercom position.	
	9 Pin and 4 Pin Ribbon cable as well as black ground wire connecting Master Unit to terminal board.	Be sure cables are plugged in and not broken.	Switch P.C. Board (7666A) or Control and Amp P.C. Board (7667A).
	Collector of transistor Q103.	Voltage should measure approximately 14.5.	Control and Amp P.C. Board (7667A).
	Silver and Contor terminals on terminal P.C. Board.	Tune radio to a station, measure approximately 1v P—P Audio between Silver and Center terminal with Audio set at normal level.	Control and Amp P.C. Board (7667A).
Distortion at all speakers.	Program volume control.	Set program volume control just below point of distortion, adjust master volume and remote volume control for desired level.	
	IC-101.	See voltage chart.	
Master unit on—no sound from any speaker.	Program Selector Switch S311.	Check operation of switch to be sure switch is selected to proper mode.	Switch P.C. Board (7666A).
	9 Pin, 4 Pin and Black ground wires connecting master unit to terminal board.	Be sure cables are plugged in and not broken.	Switch P.C. Board (7666A) or Control Amp P.C. Board (7667A).
	Plus (+) of capacitor C116.	Measure approximately 21 volts DC.	Amp P.C. Board (7667A).
	Emitter of transistor Q108.	Measure approximately 15.5 volts DC.	Amp P.C. Board (7667A).

# SERVICE TROUBLE-SHOOTING GUIDE: RADIO/INTERCOM

## PROBLEM AREA: RADIO/INTERCOM

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
Master unit on—no sound from any speaker.	Transistor Q103 and Q109.	See voltage chart.	Amp P.C. Board (7667A).
	Transistor Q303.	See voltage chart.	Switch P.C. Board (7666A).
	Volume Control at Master and Remotes	Be sure controls are set at normal levels.	
	Program volume control.	Control must be set above minimum in order to send audio to all speakers.	
	Q101, IC101.	See voltage chart.	Amp P.C. Board (7667A).
	Q302.	See voltage chart.	Switch P.C. Board (7666A).
Record player and/or tape player silent—all other operations normal.	Program selector switch S311.	Check operation of switch, be sure switch is in either Phono or Tape.	Switch P.C. Board (7666A).
	Shielded Audio Cables between record player and/or tape player and master.	Touch center pin of phono connector, hum should be heard from Master Speaker.	Switch P.C. Board (7666A).
	Output of Record Player/Tape Player.	Measure output using scope or AC VTVM, look for approximately 100 mu AC.	
Hum for record player—all other operations normal.	Shield of shielded cable between record player and master.	Check continuity of shield between each end of cable.	Replace shielded cable.
	Ground connection between master rough-in and record player rough-in.	Add heavy grounding strap to ensure good ground.	
	Unplug record player from master.	If hum stops problem is most likely in record player.	
No Audio Muting during intercom operation.	Pin 11 of IC106.	Measure approximately 1.6 volt DC when I/P talk is pressed.	Amp and Control P.C. Board (7667A).
	IC106 Pins 1 and 2.	See voltage chart.	Amp and Control P.C. Board (7667A).
	IC103 Pin 11.	Measure near 0 volts DC when I/P talk is pressed.	Amp and Control P.C. Board (7667A).
	IC105 Pin 10.	Measure approximately 5vDC when I/P talk is pressed.	Amp and Control P.C. Board (7667A).
	IC102 Pin 3.	Measure approximately 5vDC when I/P talk is pressed. Pin 3 will stay at 5vDC for approximately 20 seconds after last intercom talk operation.	Amp and Control P.C. Board (7667A).
	Emitter of transistor Q102.	Measure approximately 5vDC when I/P talk is pressed. Emitter will stay at 5vDC for approximately 20 seconds after last intercom talk operation.	Amp and Control P.C. Board (7667A).
	Base of transistor Q109.	Measure approximately 65 volts DC during intercom operation.	Amp and Control P.C. Board (7667A).
Audio muting on when no I/P talk switch is activated.	IC106 Pin 11.	Measure approximately 9.5vDC, If voltage is lower look for stuck I/P/Door Talk switches or shorted intercom wiring between master and remotes.	Amp and Control P.C. Board (7667A).
	Base of transistor Q109.	Measure approximately 0vDC.	Amp and Control P.C. Board (7667A).
	Collector to Emitter of transistor Q109.	Disconnect collector of Q109, measure resistance using ohm meter. Look for shorted transistor.	Amp and Control P.C. Board (7667A).
Signals from chime and/or alarm and from speakers in monitor mode are too low.	Program, Intercom and Master/Remote Volume Control.	Reduce program volume control, increase master/remotes volume control to increase intercom volume control.	

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
No Intercom signal from any speaker or from chime and/or alarm—all other functions normal.	Intercom volume control.	Turn control to maximum and retest.	
	Input transformer T301.	Measure approximately .20 ohms on input side of transformer, measure approximately 550 ohms on output side of transformer.	Switch P.C. Board (7666A).
	Transistor Q302.	See voltage chart.	Switch P.C. Board (7666A).
	Base of Transistor Q101.	Check for 50 ms pulse going from 0 volts to .65 volts DC.	Amp and Control P.C. Board (7667A).
	Collector—Emitter of transistor Q101.	Measure approximately 60K ohms between collector and Emitter.	Amp and Control P.C. Board (7667A).
Door speaker cannot receive nor transmit intercom signals	Door speaker and wiring between master and door speaker.	Measure approximately 15 ohms between door terminals on terminal P.C. Board.	Replace door speaker or wiring.
	Relay L101.	Check relay coil and contacts.	Amp and Control P.C. Board (7667A).
Door speaker can hear I/P and Master Unit but cannot send signal to I/P and master speaker—all other operations normal.	Collector of Q107.	Press and release door talk button. Measure approximately 15.5vDC on collector of Q107.	Amp and Control P.C. Board (7667A).
	Relay L101.	Check N/C Contacts.	Amp and Control P.C. Board (7667A).
	Control VR103.	Measure approximately 500 r across control, also check wiper. Be sure control is not set at minimum.	Amp and Control P.C. Board (7667A).
	Capacitor C121.	Check capacitor by substituting a known good capacitor.	Amp and Control P.C. Board (7667A).
	Emitter of Q110.	Measure approximately 5 volts DC after Door Talk is pressed and released.	Amp and Control P.C. Board (7667A).
	Anode of Diode D106.	Measure approximately .75 volts DC after Door Talk is pressed and released.	Amp and Control P.C. Board (7667A).
Door speaker can send signal to, but cannot receive from I/P and master unit speaker—all other operations normal.	Collector of Q107.	Press and hold Door Talk button, measure approximately 0 volts DC.	Amp and Control P.C. Board (7667A).
	Relay L101.	Check N/O Contacts—Contacts should close when Door Talk button is pressed.	Amp and Control P.C. Board (7667A).
Signals cannot be heard from I/P speaker in monitor mode—all other operations normal.	Switch S301 through S310.	Check monitor contacts.	Switch P.C. Board (7666A).
	Resistors R321 through R330.	Check for open resistors.	Switch P.C. Board (7666A).
	I/P Speakers	Check each individual speaker by substituting known good speaker.	
High Pitch Squeal	Wiring of remote speakers	Look for short between silver (output) and copper (input) wires, look for shorts on terminal P.C. Board. Center wire of each remote speaker must be connected to its own individual common terminal.	
Low frequency feedback between speakers during intercom operation.	Volume setting on remotes.	Reduce volume setting on the offending speaker.	
	Speaker placement.	Speaker must not be installed back to back on common wall.	
	Intercom volume control at master.	Reduce intercom volume control at master until feedback stops.	

# SERVICE TROUBLE-SHOOTING GUIDE: ANSWERING MACHINE

## PROBLEM AREA: ANSWER POWER LED

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
Answer Power LED does not light when answer power switch is pressed. Radio Power On/Off LED works properly.	2-pin and 4-pin connector at Power Supply P.C. Board (37826).	Check that cables are plugged in and ribbon cables are not broken.	Power Supply P.C. Board (7644A).
	Voltage at emitter of Q901 on Power Supply P.C. Board (37826).	Voltage should measure 14.4vDC.	Power Supply P.C. Board (7644A).
	Proper Operation of Answer Power On/Off switch (SW901).	Switch should be shorted when in and open when out—look for broken foil around switch.	Replace Power Switch (7643A).
	Voltage at Pin 5 of IC706.	Voltage should measure .4vDC.	Replace Logic Control P.C. Board (7641A).
	Voltage at Pin 10 of IC706.	Voltage should measure 7vDC.	Replace Logic Control P.C. Board (7641A).
	LED D810		Replace LED or LED and Switch P.C. Board (7642A).

## PROBLEM AREA: OGM

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
OGM will not play.	OGM tape.	OGM tape must be in place.	OGM tape
	Proper operation of OGM play switch (SW-802).	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board.	Check that cables are plugged in and not broken.	LED and Switch P.C. Board (7642A).
	Pin 5 of IC-701.	Check for 100ms pulse from 0vDC to 9vDC when OGM play button is pressed.	Logic Control P.C. Board (7641A).
	Pin 21 of IC701.	Check for voltage change from 9vDC to 2.5vDC after OGM play button is pressed.	Logic Control P.C. Board (7641A).
	Pin 3 of IC 708.	Check for 9vDC when OGM play button is pressed.	Logic Control P.C. Board (7641A).
	Pin 18 of IC701.	Check for 130ms pulse from 9vDC to 0vDC when OGM play button is pressed.	Logic Control P.C. Board
	Collector of Q705.	Check for 250ms pulse from 9vDC to 1vDC after OGM play button is pressed. Also check Solenoid SL1.	Logic Control P.C. Board 7641A or Solenoid SL1.
OGM play LED Off-OGM play works properly.	Pin 11 of IC715.	Check for voltage change from 0vDC to 9vDC when OGM play button is pressed.	Logic Control P.C. Board (7641A).
	Pin 2 of IC706.	Check for voltage change from 0vDC to 9vDC when OGM play button is pressed.	Logic Control P.C. Board
	Pin 13 of IC706.	Check for voltage change from 13vDC to .7vDC when OGM play button is pressed.	Logic Control P.C. Board (7641A).
	LED D802.		LED or LED and Switch P.C. Board (7642A)
OGM will not record.	OGM tape.	OGM tape must be in place and record lockout tab on rear of cassette must be in place.	OGM tape.
	Proper operation of OGM record switch SW802	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board	Check that cables are plugged in and are not broken.	LED and Switch P.C. Board (7642A).
	Pin 3 of IC701.	Check for a series of .1ms pulses switching from 0vDC to 9vDC when OGM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 5 of IC701.	Check for a 100ms pulse from 0vDC to 9vDC when OGM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 23 of IC701.	Check for voltage change from 9vDC to 0vDC when OGM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 3 of IC708.	Check for voltage change from 0vDC to 9vDC when OGM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 18 of IC701.	Check for a 130ms pulse from 9vDC to 0vDC when OGM record button is pressed.	Logic Control P.C. Board (7641A).
Collector of Q705.	Check for a 250ms pulse from 9vDC to 0vDC after OGM record button is pressed.	Logic Control P.C. Board (7641A).	
OGM record LED off-OGM record works properly.	Pin 10 of IC715.	Check for voltage change from 0vDC to 9vDC when OGM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 6 of IC707.	Check for voltage change from 0vDC to 9vDC when OGM record button is pressed.	Logic Control P.C. Board (7641).



PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
OGM record LED off— OGM record works properly.	Pin 9 of IC707.	Check for voltage change from 13vDC to .7vDC when OGM record button is pressed.	Logic Control P.C. Board (7641A).
	LED801		LED or LED and Switch P.C. Board (7642A).
OGM does not switch from channel to channel.	Pin 1 and pin 2 of IC705.	Check for voltage change from 0vDC to 9vDC when OGM record or play buttons are pressed—also check ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board.	Logic Control P.C. Board (7641A).
	Pin 4 and pin 5 of IC707.	Check for voltage change from 0vDC to 9vDC when OGM record or play button are pressed. Pin 5 for channel 1; pin 4 for channel 2.	Logic Control P.C. Board (7641A).
	Pin 10 and 11 of IC707.	Check for voltage change from 13vDC to .7vDC when OGM record or play button are pressed: Pin 10 for channel 1; pin 11 for channel 2.	Logic Control P.C. Board (7641A).
	Pin 3 of IC718	Check for 9vDC when in OGM record and on channel 1.	Logic Control P.C. Board (7641A).
	Pin 11 of IC718.	Check for 9vDC when in OGM record and on channel 2.	Logic Control P.C. Board (7641A).
	Pin 4 of IC 718.	Check for 9vDC when in OGM play and on channel 1.	Logic Control P.C. Board (7641A).
	Pin 10 of IC718.	Check for 9vDC when in OGM play and on channel 2.	Logic Control P.C. Board (7641A).
	LED D811 and D812.		LED or LED and Switch P.C. Board (7642A).

### PROBLEM AREA: ICM

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
ICM will not play.	ICM tape.	ICM tape must be in place.	ICM tape.
	Proper operation of ICM play switch (SW804).	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board.	Check that cables are plugged in and not broken.	LED and Switch P.C. Board
	Pin 5 of IC701.	Check for 100ms pulse from 0vDC to 9vDC when ICM play button is pressed.	Logic Control P.C. Board (7641A).
	Pin 4 of IC708.	Check for 9vDC.	Logic Control P.C. Board (7641A).
	Pin 21 of IC701.	Check for voltage change from 9vDC to 2.5vDC after ICM play button is pressed.	Logic Control P.C. Board (7641A).
	Pin 18 of IC701.	Check for 130ms pulse from 9vDC to 0vDC when ICM play button is pressed.	Logic Control P.C. Board (7641A).
	Collector of Q707.	Check for 250ms pulse from 9vDC to 1vDC after ICM play button is pressed. Also check Solenoid SL2.	Logic Control P.C. Board (7641A) or Solenoid SL2.
ICM play LED off—ICM play works properly.	Pin 3 of IC706.	Check for voltage change from 0vDC to 9vDC when ICM play button is pressed.	Logic Control P.C. Board (7641A).
	Pin 12 of IC706.	Check for voltage change from 13vDC to .7vDC when ICM play button is pressed.	Logic Control P.C. Board (7641A).
	LED D804.		LED or LED and Switch P.C. Board (7642A).
ICM will not record.	ICM tape.	ICM tape must be in place and record lockout tab on rear of cassette must be in place.	ICM tape.
	Proper operation of ICM record switch SW803.	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board.	Check that cables are plugged in and not broken.	LED and Switch P.C. Board (7642A).
	Pin 3 of IC701.	Check for a series of .1ms pulses switching from 0vDC to 9vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 5 of IC701.	Check for a 100ms pulse from 0vDC to 9vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 21 of IC701.	Check for voltage change from 9vDC to 0vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 23 of IC701.	Check for voltage change from 9vDC to 0vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 4 of IC708.	Check for a voltage of 9vDC.	Logic Control P.C. Board (7641A).
	Pin 18 of IC701.	Check for a 130ms pulse from 9vDC to 0vDC after ICM record button is pressed.	Logic Control P.C. Board (7641A).
Collector of Q707.	Check for a 250ms pulse from 9vDC to 0vDC after ICM record button is pressed. Also check Solenoid SL2.	Logic Control P.C. Board 7641A or Solenoid SL2.	

# SERVICE TROUBLE-SHOOTING GUIDE: ANSWERING MACHINE

## PROBLEM AREA: ICM

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
ICM record LED off—ICM record works properly.	Pin 4 of IC715.	Check for voltage change from 0vDC to 9vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 10 of IC719.	Check for voltage change from 0vDC to 9vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 3 of IC706.	Check for voltage change from 0vDC to 9vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 6 of IC706.	Check for voltage change from 0vDC to 9vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 2 of IC706.	Check for a voltage of 0vDC before and after ICM record button is pressed.	Logic Control P.C. Board (7641A).
	Pin 9 of IC706.	Check for voltage change from 13vDC to .7vDC when ICM record button is pressed.	Logic Control P.C. Board (7641A).
	LED D803 and D804.		LEDs or LED and Switch P.C. Board (7642A).
ICM will not rewind.	ICM tape.	ICM tape must be in place before rewind will function.	ICM tape.
	Proper operation of ICM rewind switch (SW805).	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board	Check that cables are plugged in and not broken.	LED and Switch P.C. Board (7642A).
	Pin 4 of IC701.	Check for 70ms pulse from 0vDC to 9vDC when rewind button is pressed.	Logic Control P.C. Board (7641A).
	Pin 22 of IC701.	Check for voltage change from 9vDC to 0vDC after rewind button is pressed.	Logic Control P.C. Board (7641A).
	Pin 11 of IC701.	Check for voltage change from 0vDC to 9vDC when rewind button is pressed.	Logic Control P.C. Board (7641A).
	Pin 6 of IC702.	Check for voltage change from 0vDC to 9vDC when rewind button is pressed.	Logic Control P.C. Board (7641A).
	Pin 10 of IC702.	Check for voltage change from 0vDC to 9vDC when rewind button is pressed.	Logic Control P.C. Board (7641A).
Rewind LED off—rewind works properly.	Pin 11 of IC728.	Check for voltage change from 0vDC to 9vDC when rewind button is pressed.	Logic Control P.C. Board (7641A).
	Pin 4 of IC706.	Check for voltage change from 0vDC to 9vDC when rewind button is pressed.	Logic Control P.C. Board (7641A).
	Pin 11 of IC706.	Check for voltage change from 13vDC to .7vDC when rewind button is pressed.	Logic Control P.C. Board (7641A).
	LED D805.		LED or LED and Switch P.C. Board (7642A).
ICM will not fast forward.	ICM Tape.	ICM tape must be in place before fast forward will function.	ICM tape.
	Proper operation of ICM fast forward switch (SW807).	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board.	Check that cables are plugged in and not broken.	LED and Switch P.C. Board (7642A).
	Emitter of Q710.	Check for a series of .1ms pulses switching from 0vDC to 9vDC when fast forward button is pressed.	Logic Control P.C. Board (7641A).
	Pin 6 of IC701.	Check for a series of .1ms pulses switching from 0vDC to 9vDC when fast forward button is pressed.	Logic Control P.C. Board (7641A).
	Pin 24 of IC701.	Check for voltage change from 9vDC to 0vDC when fast forward button is pressed.	Logic Control P.C. Board (7641A).
	Pin 12 of IC701.	Check for voltage changes from 0vDC to 9vDC when fast forward button is pressed.	Logic Control P.C. Board (7641A).
	Pin 5 of IC702.	Check for voltage change from 0vDC to 6vDC when fast forward button is pressed.	Logic Control P.C. Board (7641A).
	Pin 2 of IC702.	Check for voltage change from 0vDC to 9vDC when fast forward button is pressed.	Logic Control P.C. Board 7641A.
Fast forward LED off. Fast forward works properly.	Pin 4 of IC710.	Check for voltage change from 0vDC to 9vDC when fast forward button is pressed.	Logic Control P.C. Board (7641A).
	Pin 1 of IC706	Check for voltage change from 0vDC to 9vDC when fast forward button is pressed.	Logic Control P.C. Board (7641A).
	Pin 4 of IC706.	Check for a voltage of 0vDC.	Logic Control P.C. Board (7641A).
	LED D806.		LED or LED and Switch P.C. Board (7642A).

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
ICM will not rewind erase.	ICM tape.	ICM tape must be in place before rewind erase will function.	ICM tape.
	Proper operation of ICM rewind erase switch SW806.	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon Cable between LED and Switch P.C. Board and Logic Control P.C. Board	Check that cables are plugged in and not broken.	LCD and Switch P.C. Board (7642A).
	Pin 11 of IC731.	Check for voltage change from 0vDC to 9vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 4 of IC701.	Check for 70ms pulse from 0vDC to 9vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 5 of IC701.	Check for 70ms pulse from 0vDC to 9vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 21 of IC701.	Check for voltage change from 9vDC to 0vDC after rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 22 of IC701.	Check for voltage change from 9vDC to 0vDC after rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 11 of IC701.	Check for voltage change from 0vDC to 9vDC after rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 6 of IC702.	Check for voltage change from 0vDC to 6vDC after rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 10 of IC702.	Check for voltage change from 0vDC to 9vDC after rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 4 of IC711.	Check for voltage change from 0vDC to 9vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 2 of IC712.	Check for voltage change from 0vDC to 9vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 3 of IC712.	Check for voltage change from 0vDC to 9vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 12 of IC712.	Check for voltage change from 9vDC to .7vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
Pin 13 of IC712.	Check for voltage change from 9vDC to .7vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).	
Relay RE603.	Check coil resistance and contacts.	Power Amp Supply P.C. Board (7646A).	
Rewind erase LED off—rewind erase works properly.	Pin 3 of IC713.	Check for voltage change from 9vDC to 0vDC after rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 1 of IC707.	Check for voltage change from 0vDC to 9vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	Pin 14 of IC707.	Check for voltage change from 13vDC to .7vDC when rewind erase button is pressed.	Logic Control P.C. Board (7641A).
	LED D807.		LED or LED and Switch P.C. Board (7642A).

### PROBLEM AREA: ANNOUNCE ONLY

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
Announce only LED will not light.	OGM tape.	OGM tape must be in place before Announce only will function.	OGM tape.
	Proper operation of announce only switch (SW809).	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cable between LED and Switch and Logic Control P.C. Board.	Check that cables are plugged in and not broken.	LED and Switch P.C. Board (7642A).
	Pin 11 of IC738.	Check for voltage change from 0vDC to 9vDC when announce only button is pressed.	Logic Control P.C. Board (7641A).
	Pin 2 of IC707.	Check for voltage change from 0vDC to 9vDC when announce only button is pressed.	Logic Control P.C. Board (7641A).
	Pin 13 of IC707.	Check for voltage change from 13vDC to .7vDC when announce only button is pressed.	Logic Control P.C. Board (7641A).
	LED D809.		LED or LED and Switch P.C. Board (7642A).

# SERVICE TROUBLESHOOTING GUIDE: ANSWERING MACHINE

## PROBLEM AREA: ANSWER/ANNOUNCE ONLY

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
Announce only or answer will not answer when phone rings—answer or announce only LEDs work properly.	Collector of Q601.	Place unit into answer mode—ringer to MIN. Call unit and measure voltage. Voltage should switch to 9vDC when the phone rings and 2vDC when the phone is not ringing.	Power Amp Supply P.C. Board (7646A).
	Pin 7 of IC602.	Place unit into answer mode—ringer to MIN. Call unit and measure voltage. Voltage should switch to 9vDC for .5 seconds after approximately 3 rings.	Power Amp Supply P.C. Board (7646A).
	Pin 11 of IC724.	Place unit into answer mode—ringer to MIN. Call unit and measure voltage. Voltage should switch from 9vDC to 0vDC for .5 seconds after approximately 3 rings.	Power Amp Supply P.C. Board (7646A).
	Pin 6 of IC712.	Place unit into answer mode—ringer to MIN. Call unit and measure voltage. Voltage should rise from 0vDC to 7vDC in approximately .5 seconds after approximately 3 rings.	Logic Control P.C. Board (7641A).
	Pin 9 of IC712.	Place unit into answer mode—ringer to MIN. Call unit and measure voltage. Voltage should change from 14vDC to .7vDC after approximately 3 rings.	Logic Control P.C. Board (7641A).
	Relay RE601.	Check coil resistance and contacts.	Power Amp Supply P.C. Board (7646A).
	Pin 3 of IC730.	Place unit into answer mode—ringer to MIN. Call unit and measure voltage. Voltage should pulse from 0vDC to 9vDC for .5 seconds after approximately 3 rings.	Logic Control P.C. Board (7641A).

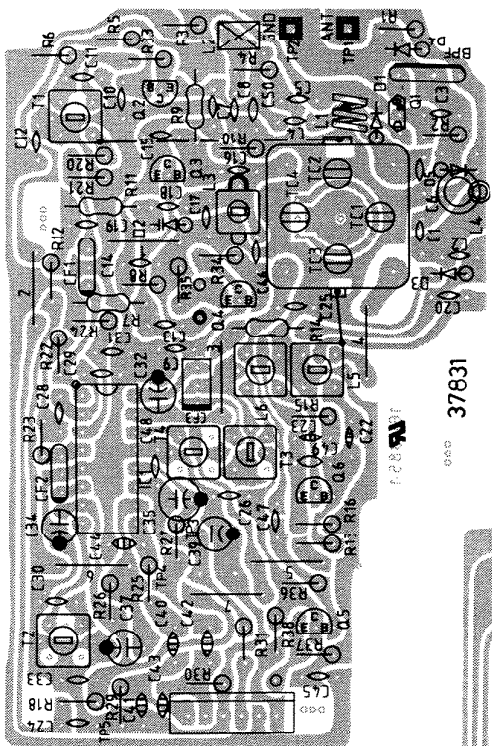
## PROBLEM AREA: ANSWER

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
Answer LED will not light.	ICM tape.	ICM tape must be in place and record lockout tab on rear of cassette must be in place.	ICM tape.
	OGM tape.	OGM tape must be in place before going into answer mode.	OGM tape.
	Collector of Q802.	Check for voltage change from 9vDC to 0vDC when answer button is pressed.	LED and Switch P.C. Board (7642A).
	Proper operation of Answer Switch (SW808).	Switch should short when pressed.	LED and Switch P.C. Board (7642A).
	Ribbon cables between LED and Switch P.C. Board and Logic Control P.C. Board.	Check that cables are plugged in and not broken.	LED and Switch P.C. Board (7642A).
	Pin 11 of IC737.	Check for voltage change from 9vDC to 0vDC when answer button is pressed.	Logic Control P.C. Board (7641A).
	Pin 4 of IC723.	Check for voltage change from 0vDC to 9vDC when answer button is pressed.	Logic Control P.C. Board (7641A).
	Pin 3 of IC707.	Check for voltage change from 0vDC to 9vDC when answer button is pressed.	Logic Control P.C. Board (7641A).
	Pin 12 of IC707.	Check for voltage change from 13vDC to .7vDC when answer button is pressed.	Logic Control P.C. Board (7641A).
	LED D808.		LED or LED and Switch P.C. Board (7642A).
VOX		Place unit into answer mode—call unit and allow it to answer.	
	Pin 2 of IC602.	Check for AC voltage of approximately .2v P–P when whistling into calling telephone.	Power Amp Supply P.C. Board (7646A).
	Pin 1 of IC602.	Check for AC voltage of approximately 7v P–P when whistling into calling telephone.	Power Amp Supply P.C. Board (7646A).
	Collector of Q605.	Check for DC voltage change from 9vDC to 0vDC when whistling into calling telephone.	Power Amp Supply P.C. Board (7646A).
	Emitter of Q607.	Check for voltage change from 9vDC to 0vDC when whistling into calling telephone. Hanging up calling telephone should cause the voltage to rise to 4vDC in approximately 7 to 12 seconds. IM-3103 should disconnect.	Power Amp Supply P.C. Board (7646A).
	Pin 11 of IC724.	Check for voltage change from 0vDC to 9vDC when IM-3103 answers phone line. Voltage will switch back to 0vDC when 3103 disconnects.	Logic Control P.C. Board (7641A).
Time recording (30/60 seconds) does not function.	Pin 10 of IC720.	Check for voltage change from 9vDC to 0vDC for approximately 1 second after OGM stops and ICM tape starts.	Logic Control P.C. Board (7641A).
	Pin 5 of IC703.	Check for voltage changes from 0vDC to 9vDC when ICM starts. Voltage should stay high for 30 or 60 seconds then switch to 0vDC.	Logic Control P.C. Board (7641A).
	Pin 11 of IC724.	Check for voltage change from 0vDC to 9vDC when OGM starts. Voltage will return to 0vDC when ICM stops.	Logic Control P.C. Board (7641A).

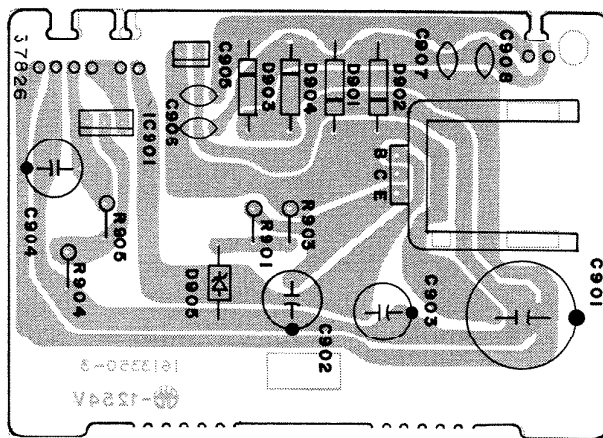
## PROBLEM AREA: TAPE RECORDER AUDIO

PROBLEM	MEASURE/CHECK	CORRECT RESULT	REPLACE
Unit will not record using microphone.		Place unit into ICM or OGM record mode—input to "MIC".	
	Pin 11 of IC723.	Check that voltage changes from 0vDC to 9vDC when record button is pressed.	Logic Control P.C. Board (7641A).
	Switch SW812.	Check that switch is in the "MIC" position and switch is working correctly.	LED and Switch P.C. Board (7642A).
	Pin 5 of IC606.	Check for voltage change from 0vDC to 9vDC when record button is pressed.	Power Amp Supply P.C. Board (7646A).
	Pin 3 of IC606.	Check for a 20 mV P—P AC signal when whistling into microphone.	Power Amp Supply P.C. Board (7646A).
	Pin 4 of IC601.	Check for a 100 mV P—P AC signal when whistling into microphone.	Power Amp Supply P.C. Board (7646A).
	Pin 10 of IC601.	Check for a 3v P—P AC signal when whistling into microphone.	Power Amp Supply P.C. Board (7646A).
Unit will not record from radio.	Pin 13 of IC601.	Check for a 3v P—P AC signal when whistling into microphone.	Power Amp Supply P.C. Board (7646A).
		Place unit into ICM record mode—Input to "Line".	
	J603	Check for a 3v P—P AC signal when tuned to a radio station. Check Audio Cables between Power Amp Supply and Switch P.C. Board	Switch P.C. Board /666A.
	Pin 10 of IC601.	Check for a 3v P—P AC signal when tuned to a radio station.	Power Amp Supply P.C. Board (7646A).
Unit will not record from telephone.	Pin 13 of IC601.	Check for a 3v P—P AC signal when tuned to a radio station.	Power Amp Supply P.C. Board (7646A).
		Place unit into ICM record mode—Input to "TEL". Lift telephone handset.	
	Capacitor C653.	Check for a 5v P—P AC signal when whistling into telephone.	Power Amp Supply P.C. Board (7646A).
	Pin 3 of IC606.	Check for a 20 mV P—P AC signal when whistling into telephone.	Power Amp Supply P.C. Board (7646A).
	Pin 10 of IC601.	Check for a 3v P—P AC signal when whistling into telephone.	Power Amp Supply P.C. Board (7646A).
Pin 13 of IC601.	Check for a 3v P—P AC signal when whistling into telephone.	Power Amp Supply P.C. Board (7646A).	

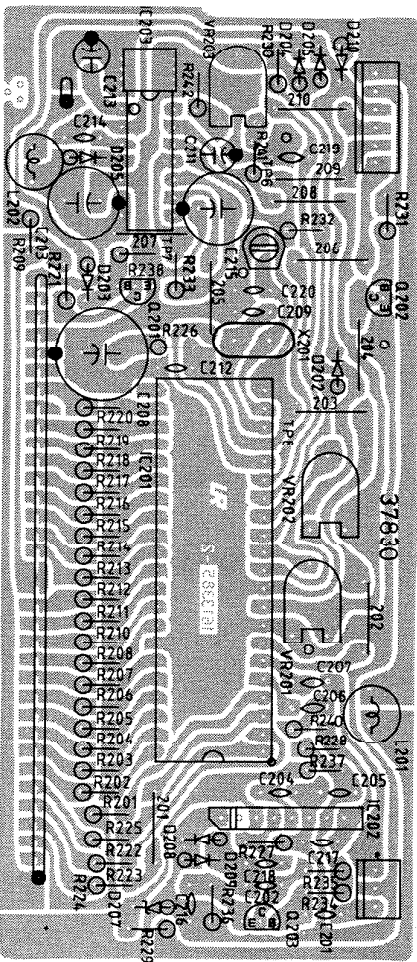
# MASTER UNIT P.C. BOARD LAYOUTS



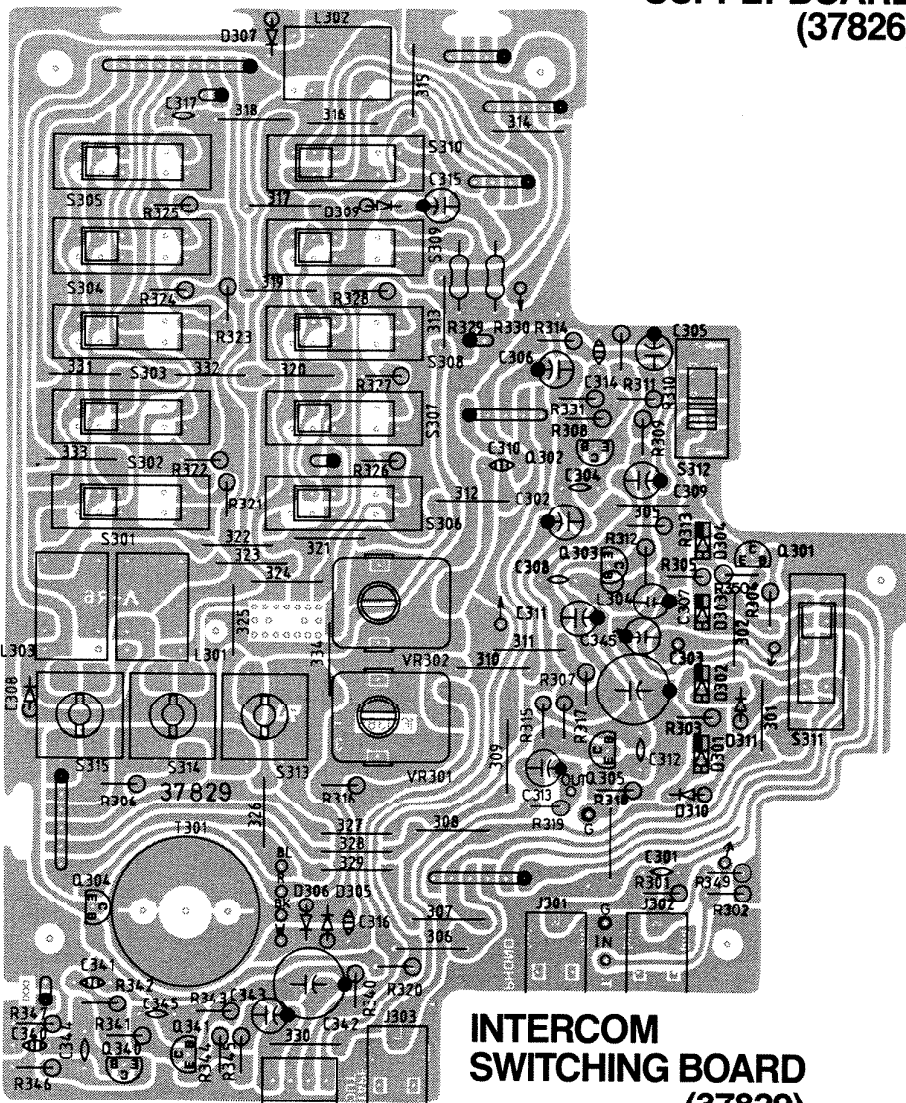
**TUNER BOARD  
(37831)**



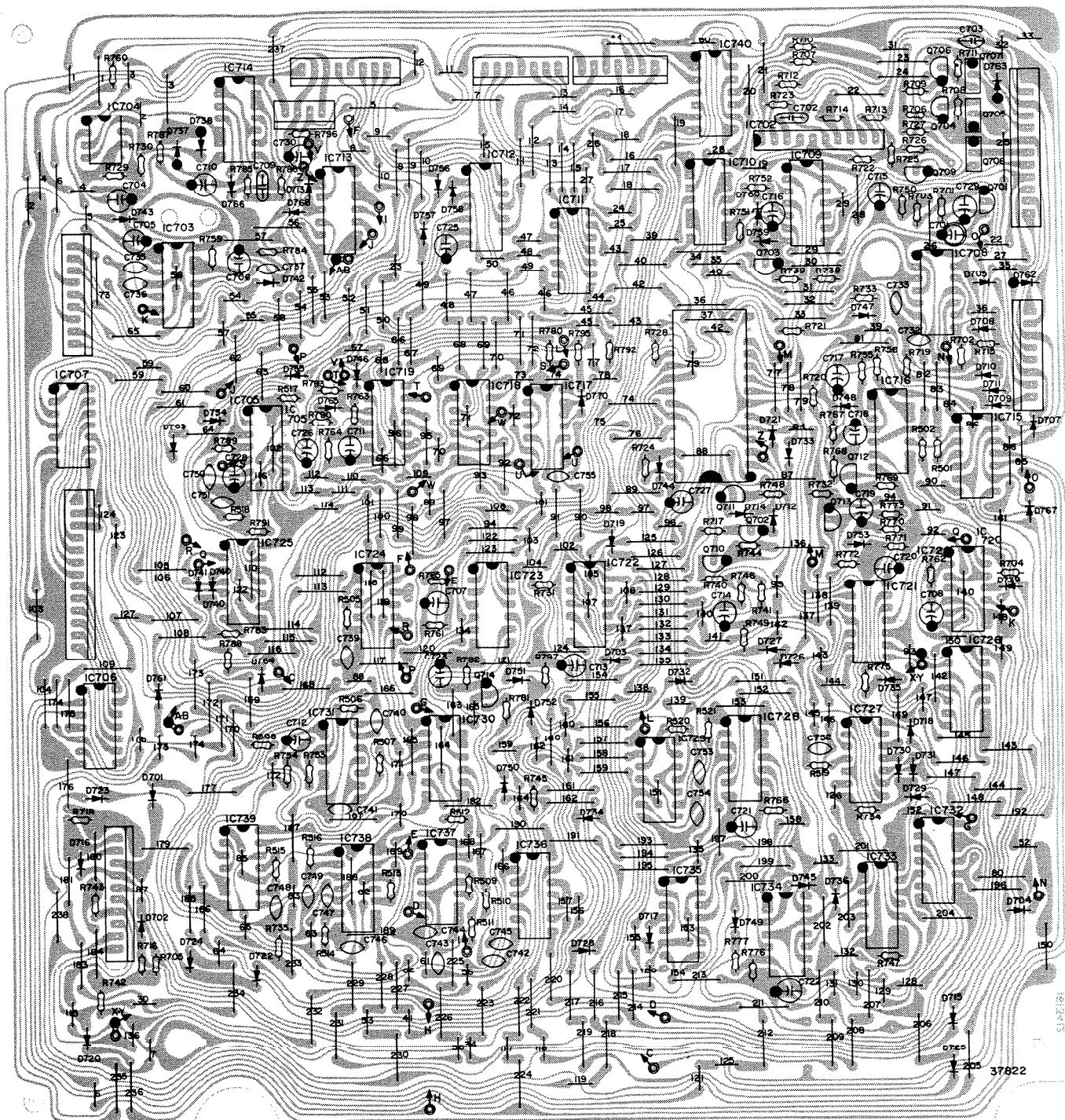
**MAIN POWER  
SUPPLY BOARD  
(37826)**



**DIGITAL DISPLAY  
BOARD (37830)**

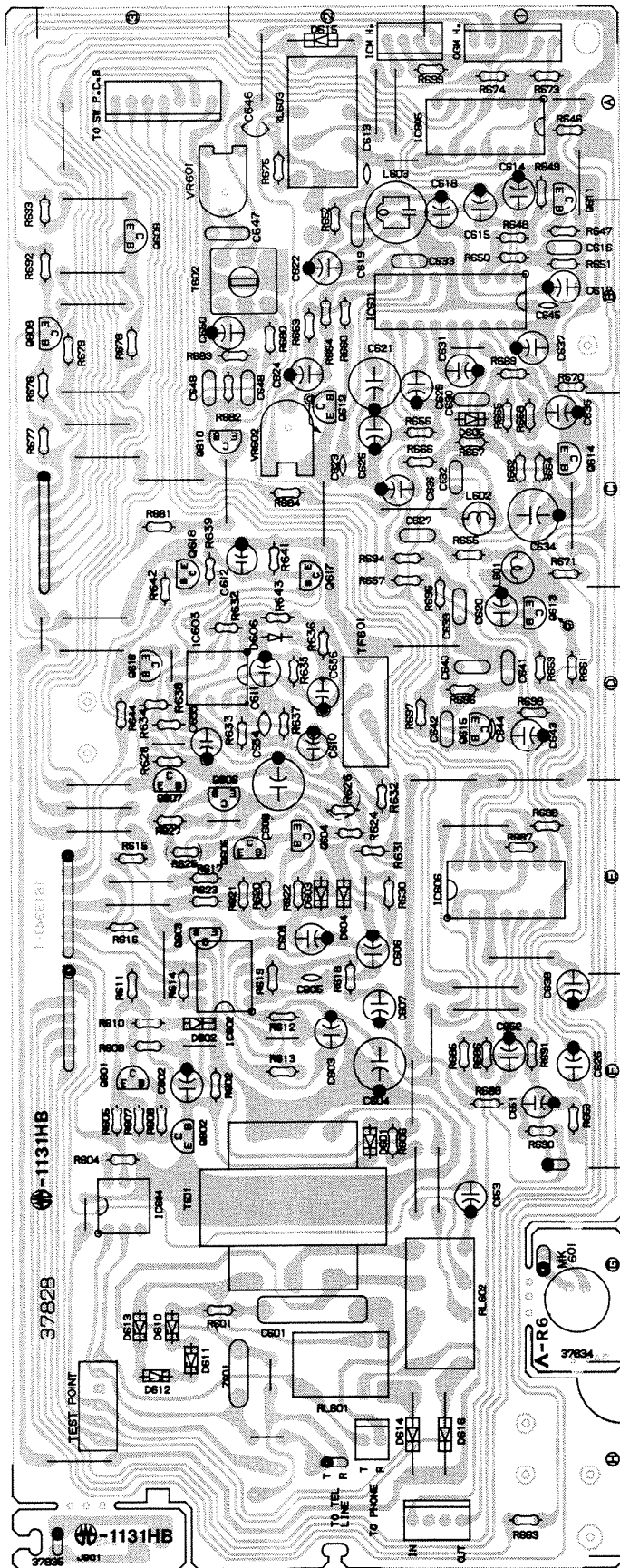


**INTERCOM  
SWITCHING BOARD  
(37829)**



**CASSETTE LOGIC  
CONTROL BOARD  
(37822)**

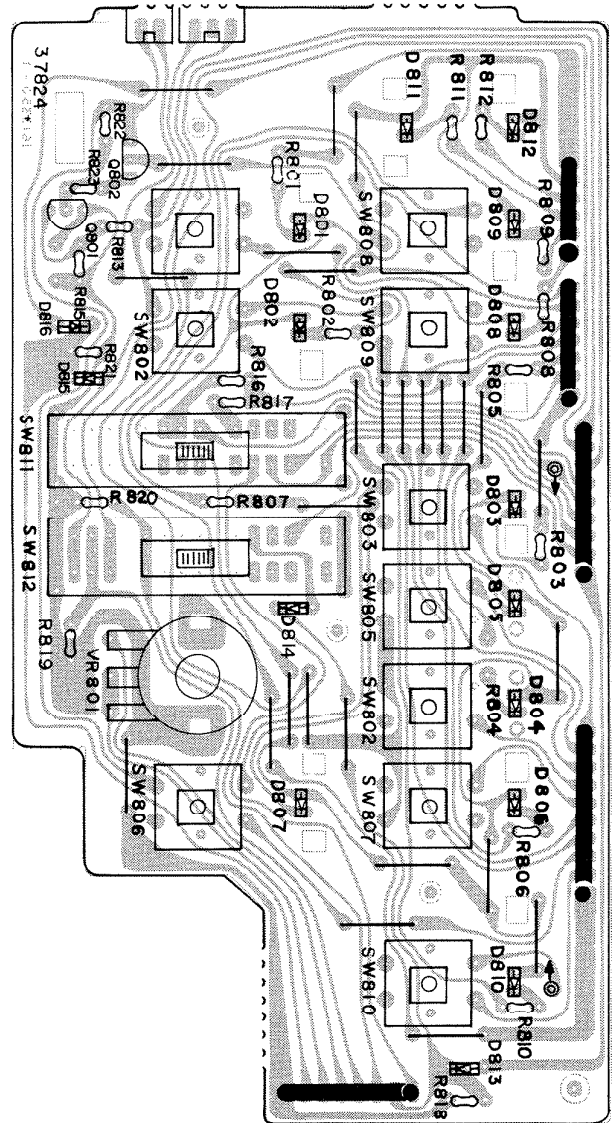
# MASTER UNIT P.C. BOARD LAYOUTS



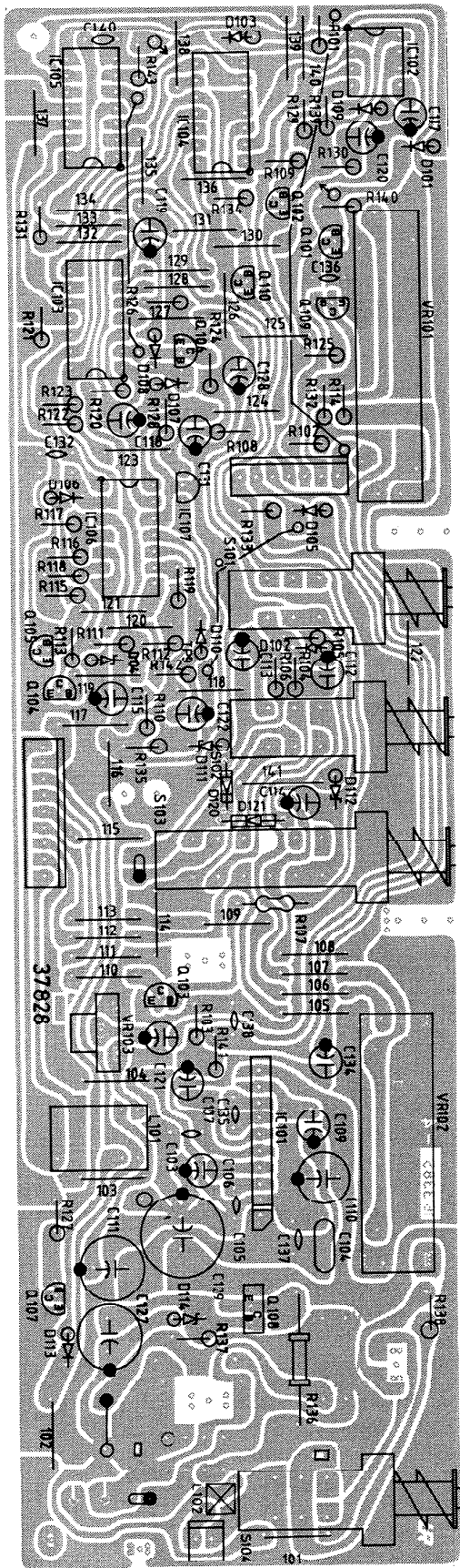
## CASSETTE/TELEPHONE AUDIO BOARD (37828)\*

\* THIS PC BOARD AND CONTROL, AMPLIFIER AND POWER SUPPLY PC BOARD BOTH HAVE THE SAME PART NO. REFER TO 7646A PC BOARD ASSEMBLY FOR SERVICING.

## CASSETTE LED SWITCHING BOARD (37824)



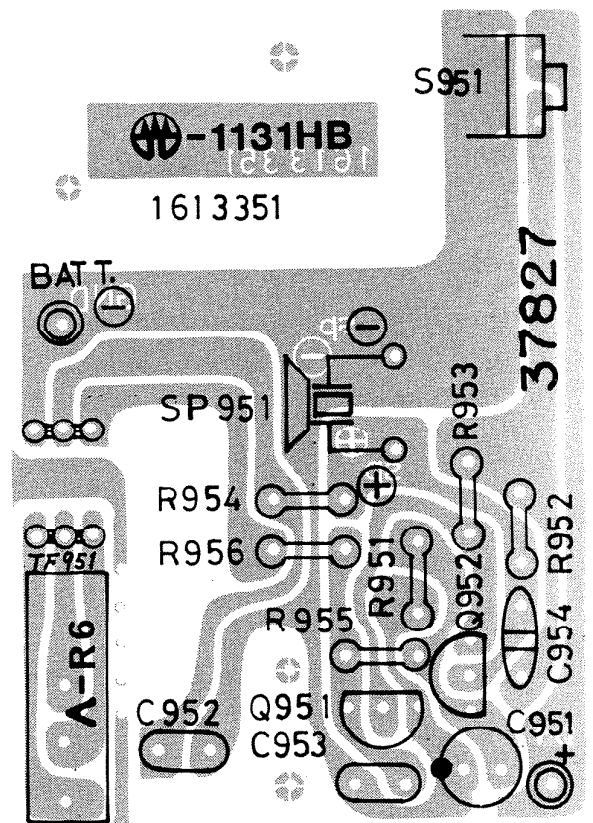




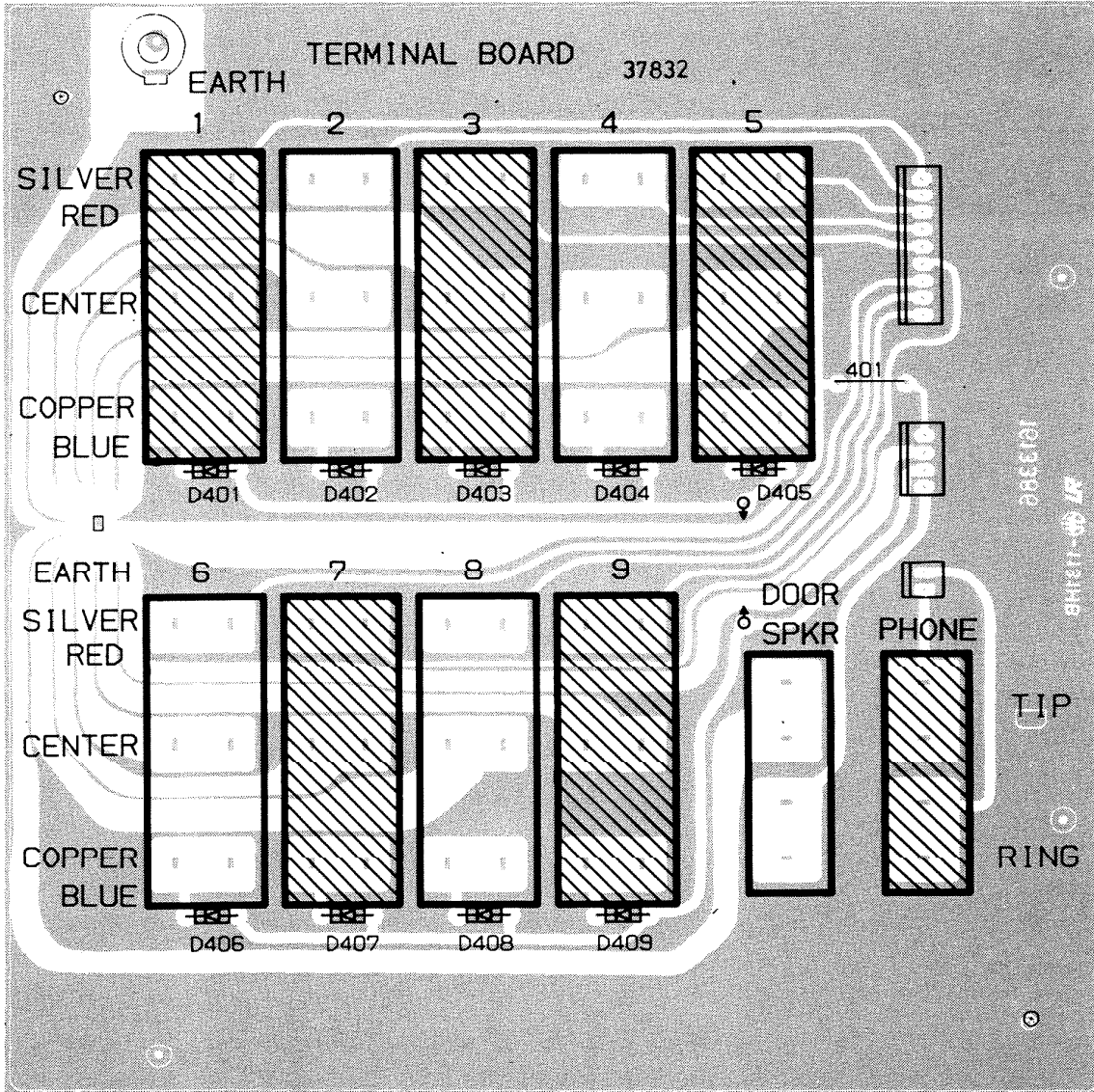
# CONTROL, AMPLIFIER AND POWER SUPPLY (37828)\*

\* THIS PC BOARD AND CASSETTE/TELEPHONE AUDIO PC BOARD BOTH HAVE THE SAME PART NO. REFER TO 7667A PC BOARD ASSEMBLY FOR SERVICING.

# REMOTE BEEPER BOARD (37827)



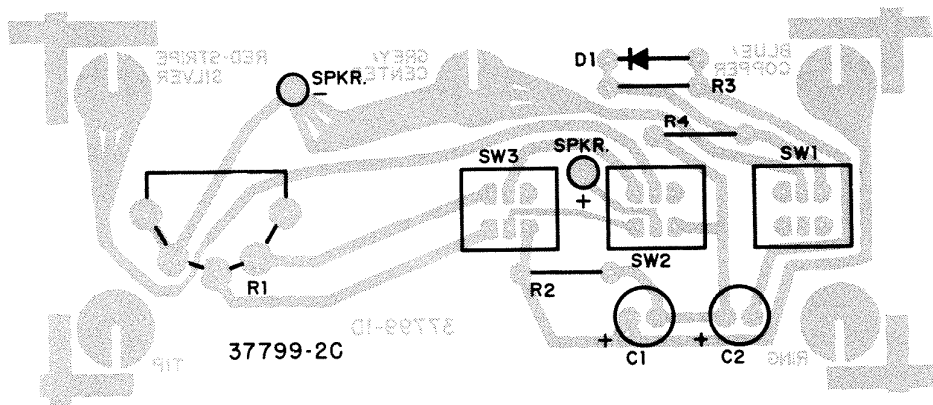
# MASTER UNIT P.C. BOARD LAYOUTS



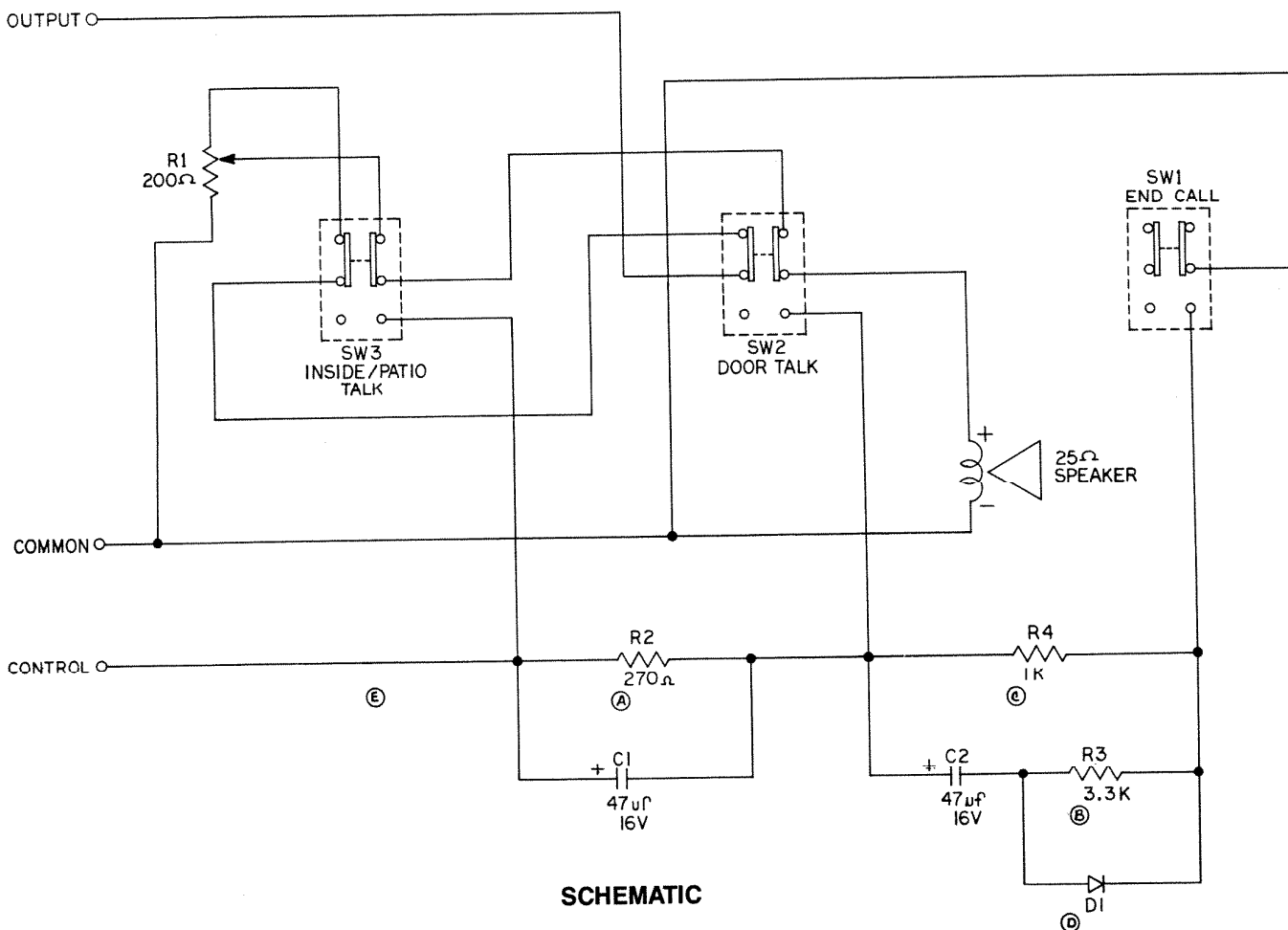
**TERMINAL  
BOARD  
(37832)**

# REMOTE SPEAKERS & CONTROLS: P.C. BOARD LAYOUTS & SCHEMATIC DIAGRAMS

IS 305, IS 308, IS 309, IC 301, IC 301W



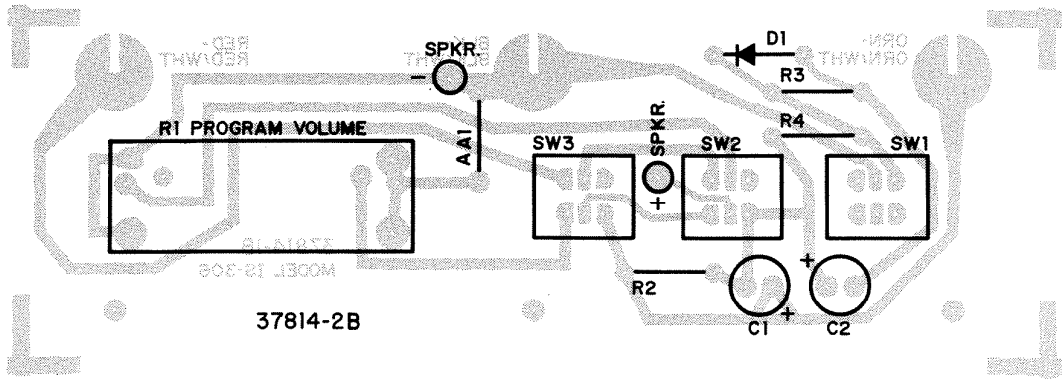
P.C. BOARD



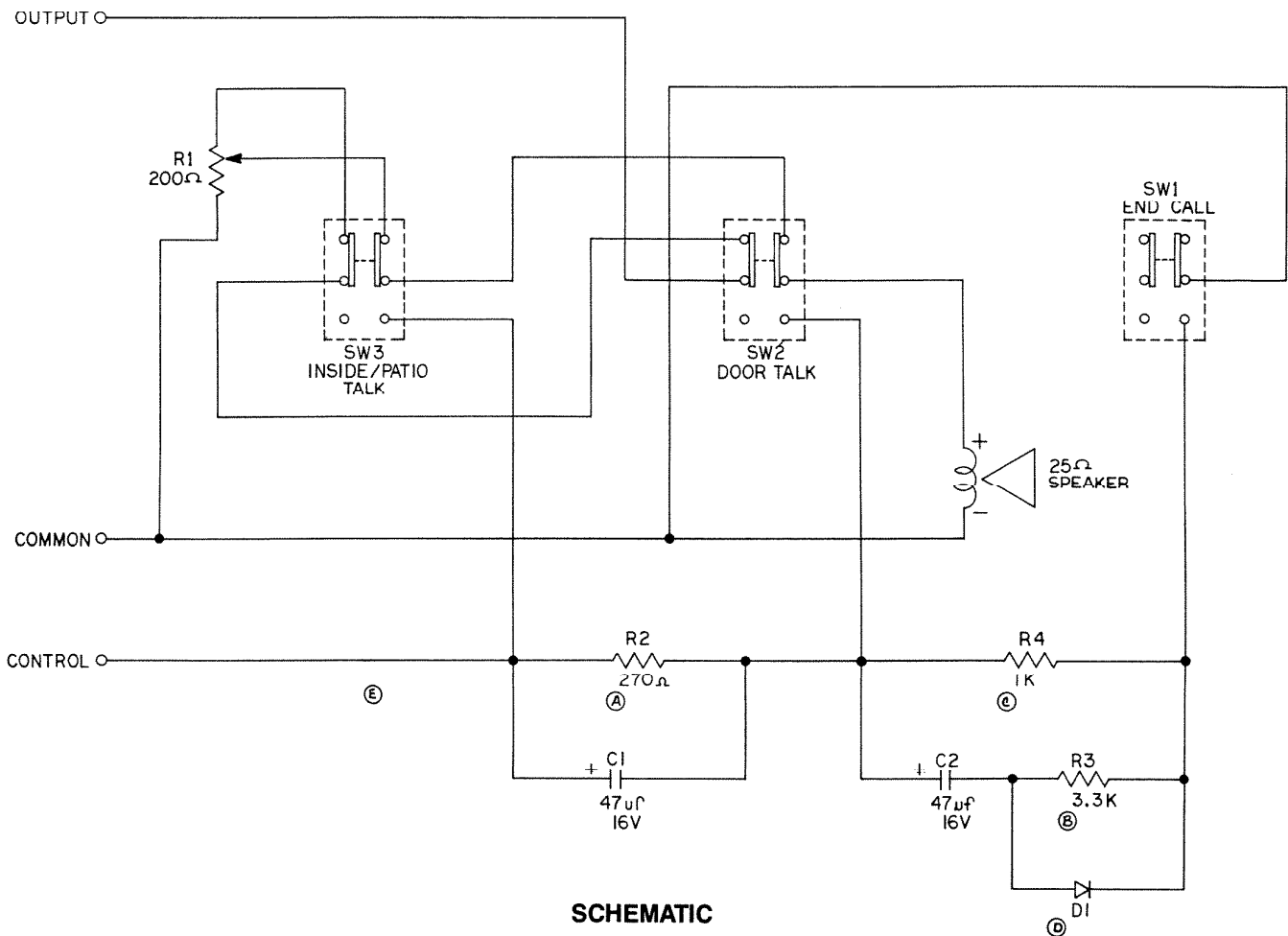
SCHEMATIC

# REMOTE SPEAKERS & CONTROLS, P.C. BOARD LAYOUTS & SCHEMATIC DIAGRAMS

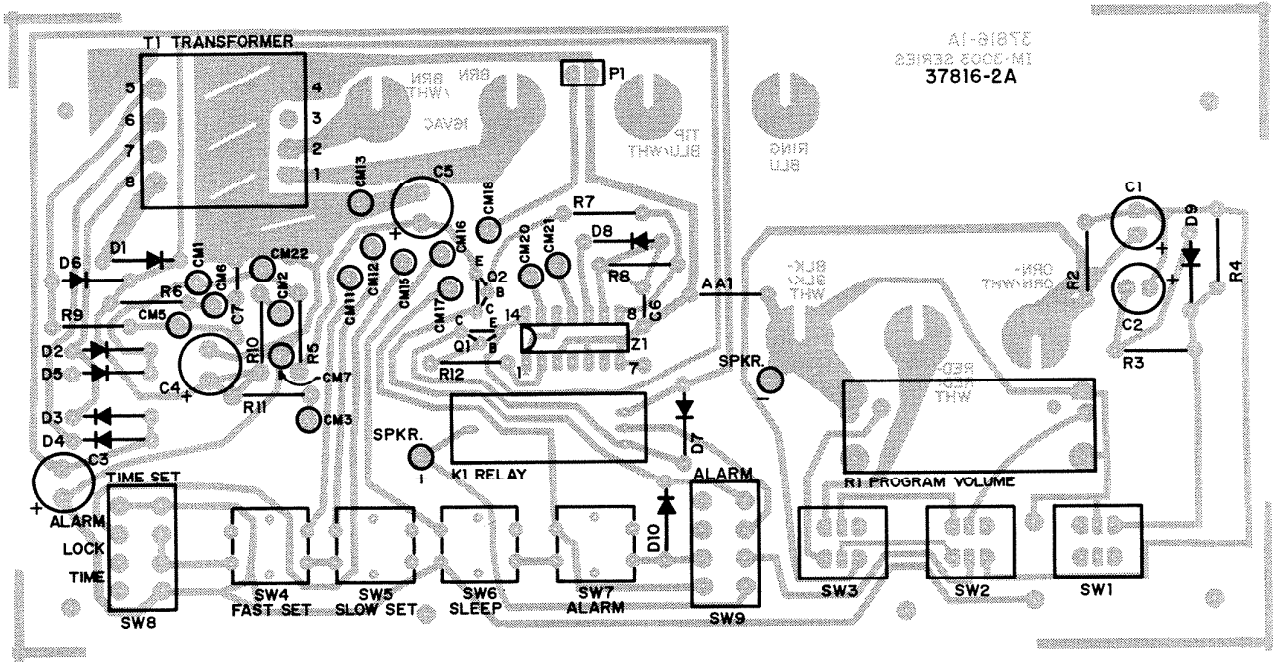
## IS 306



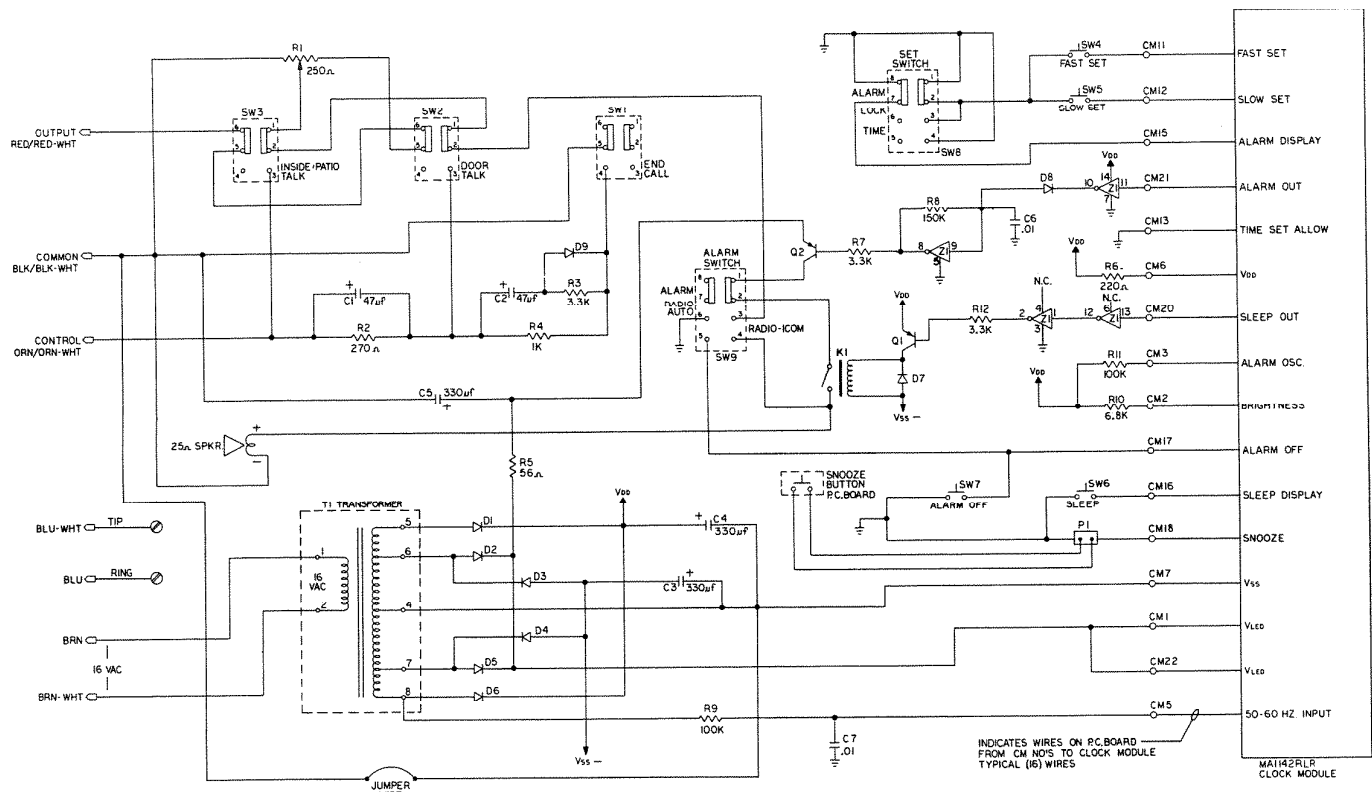
P.C. BOARD



SCHEMATIC



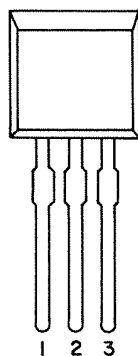
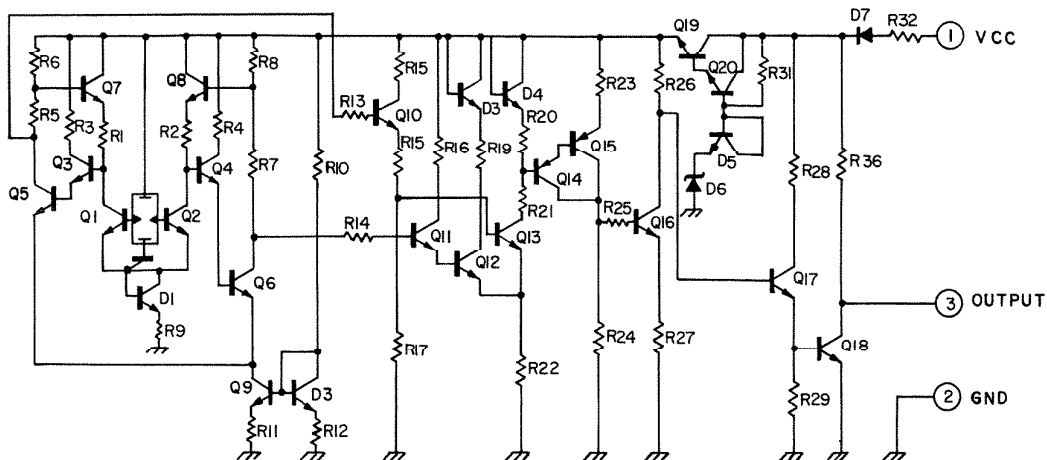
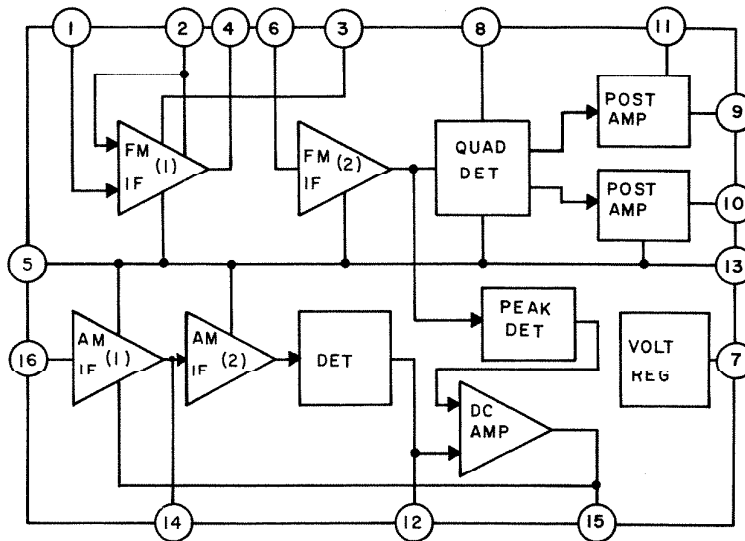
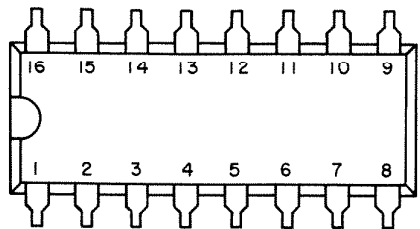
P.C. BOARD



SCHEMATIC

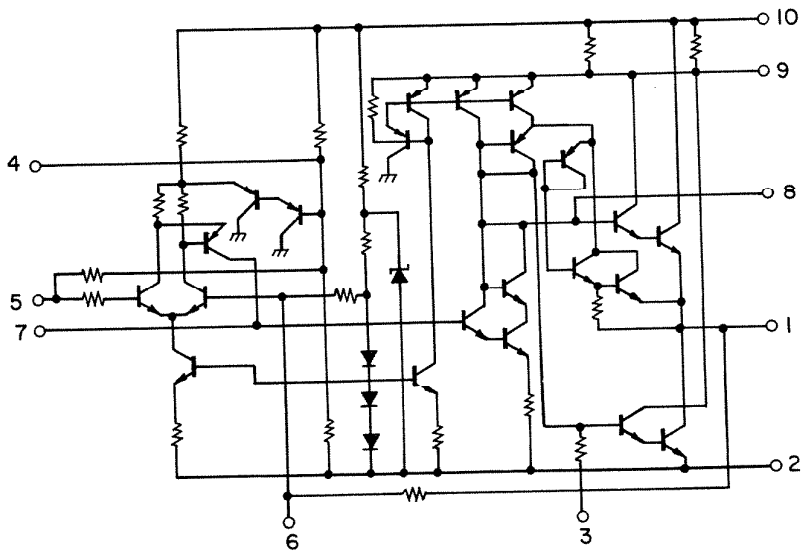
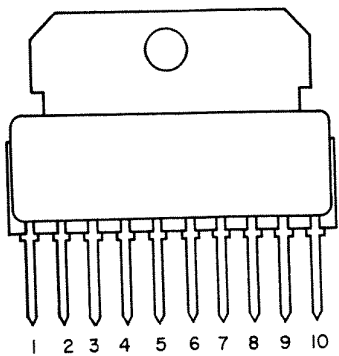
# IC LEAD IDENTIFICATION, BLOCK DIAGRAMS AND SCHEMATICS

IC 1

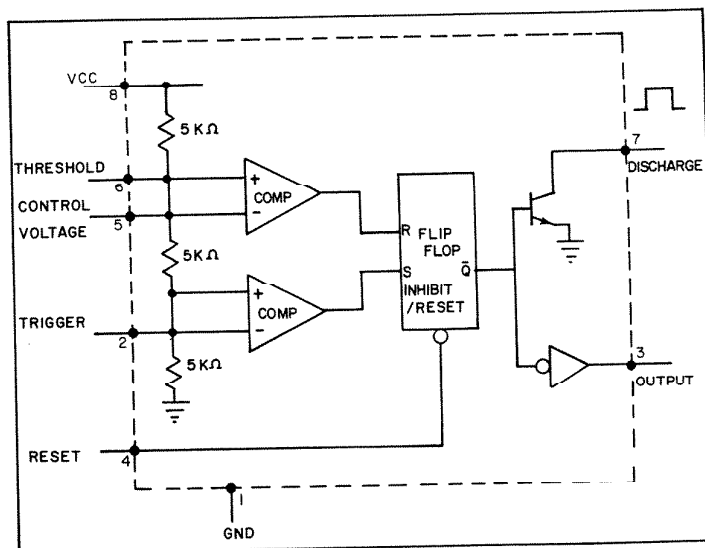
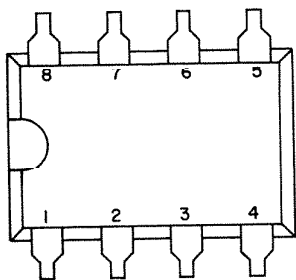


VCC GND OUT

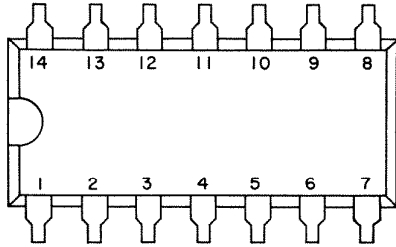
## IC 101



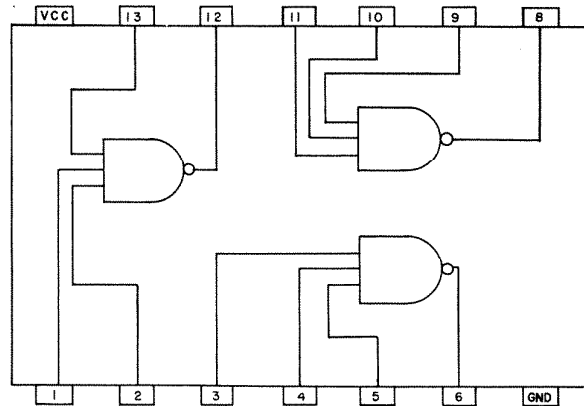
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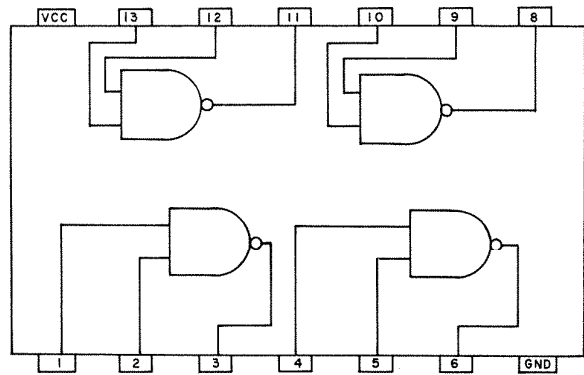
# IC LEAD IDENTIFICATION, BLOCK DIAGRAMS AND SCHEMATICS



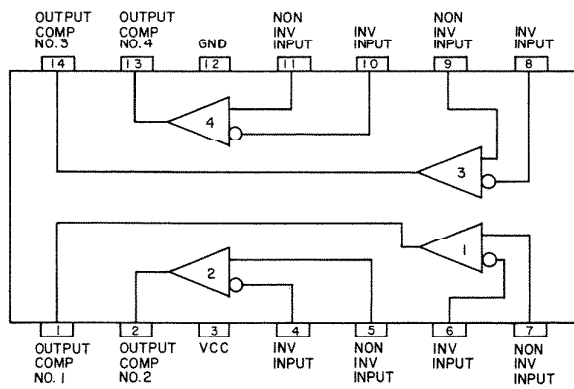
**IC 103, IC 104, IC 105, IC 106**



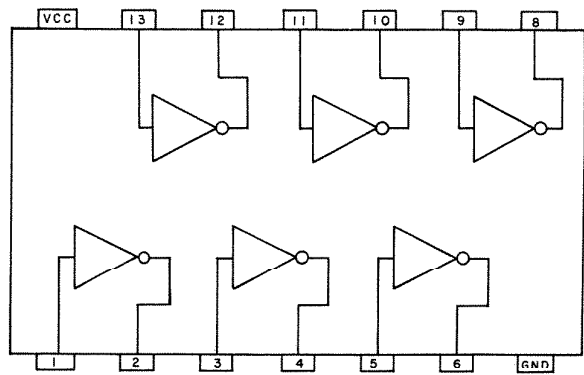
**IC 103**



**IC 104**

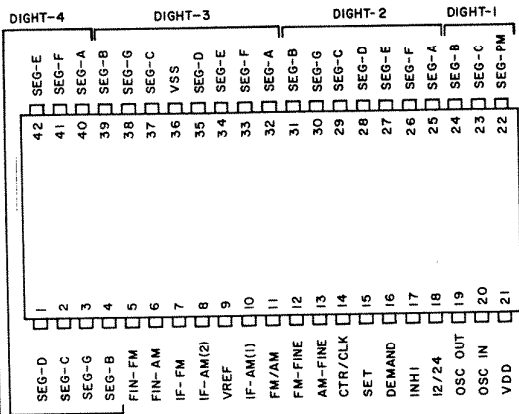


**IC 106**

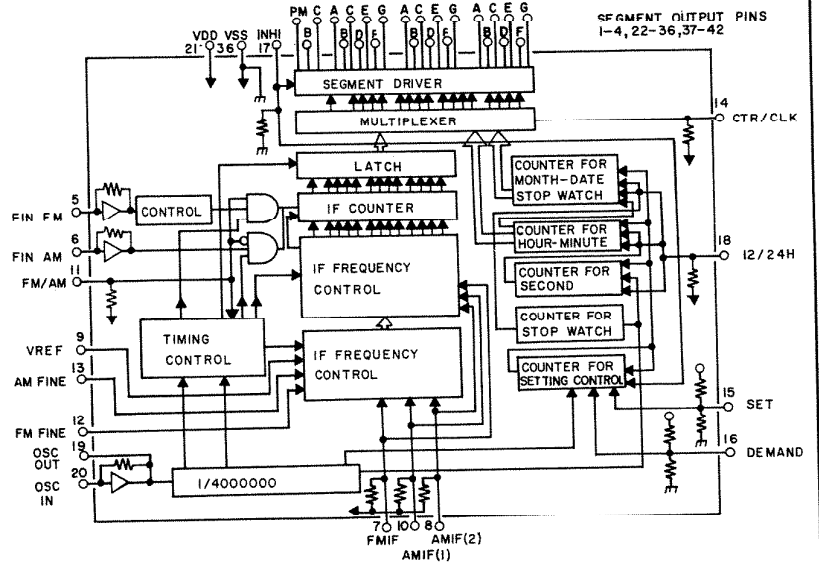


**IC 105**

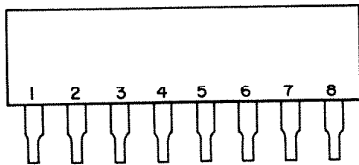




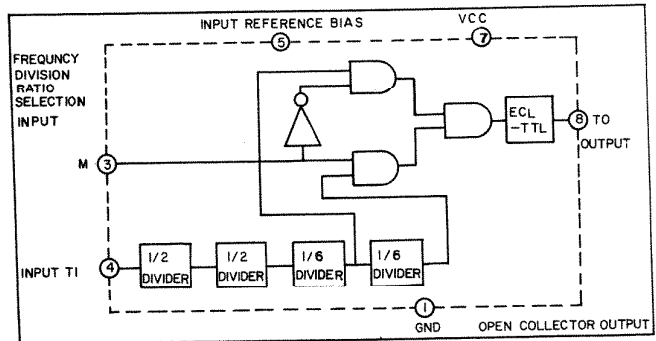
**IC 201**



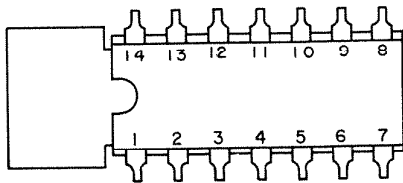
**IC 201**



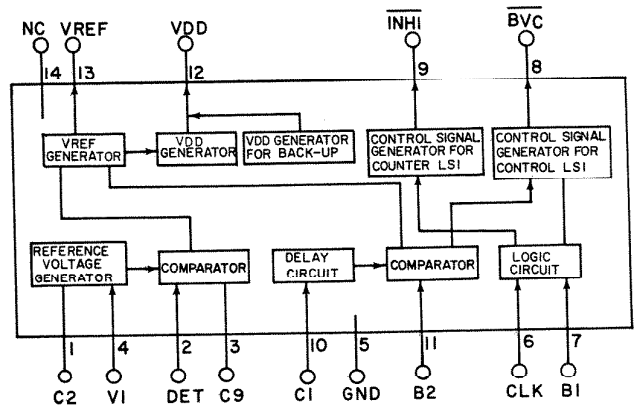
**IC 202**



**IC 202**



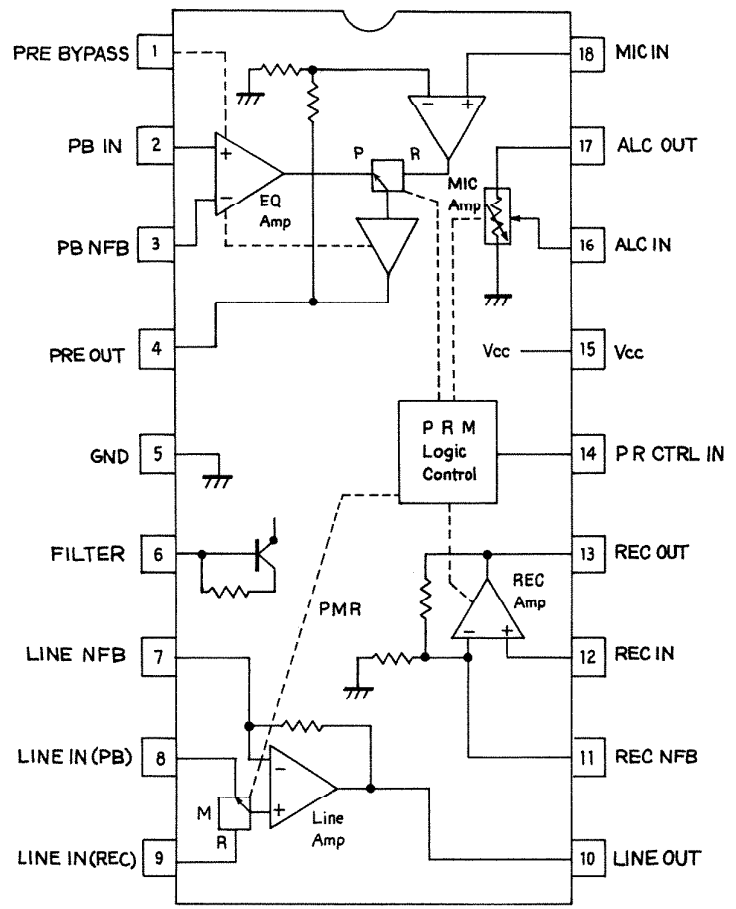
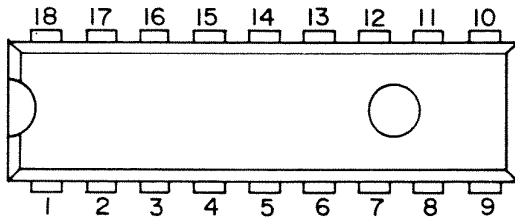
**IC 203**



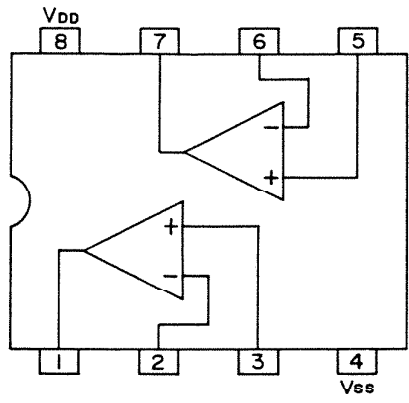
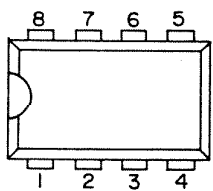
**IC 203**

# IC LEAD IDENTIFICATION, BLOCK DIAGRAMS AND SCHEMATICS

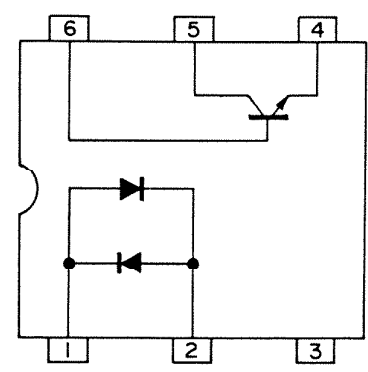
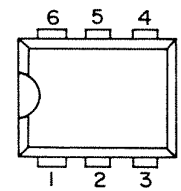
**IC 601**



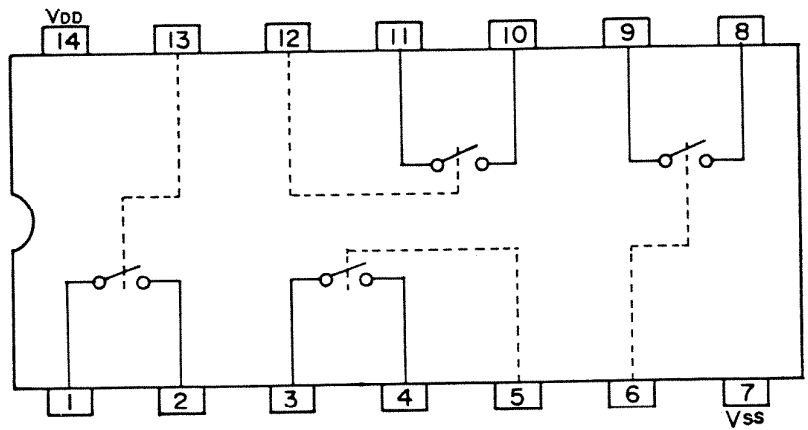
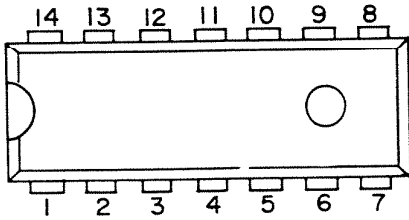
**IC 602, IC 603**



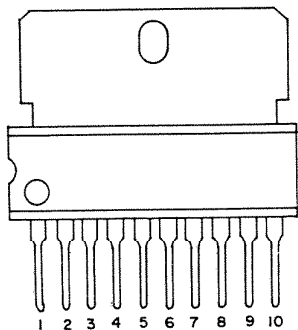
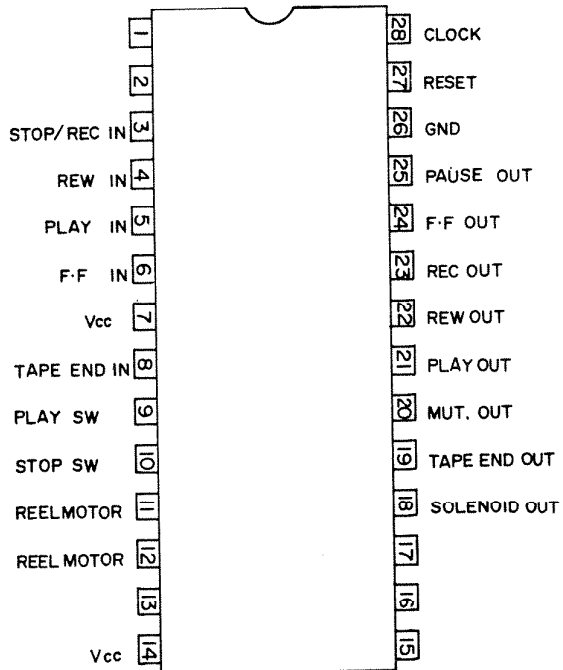
**IC 604**



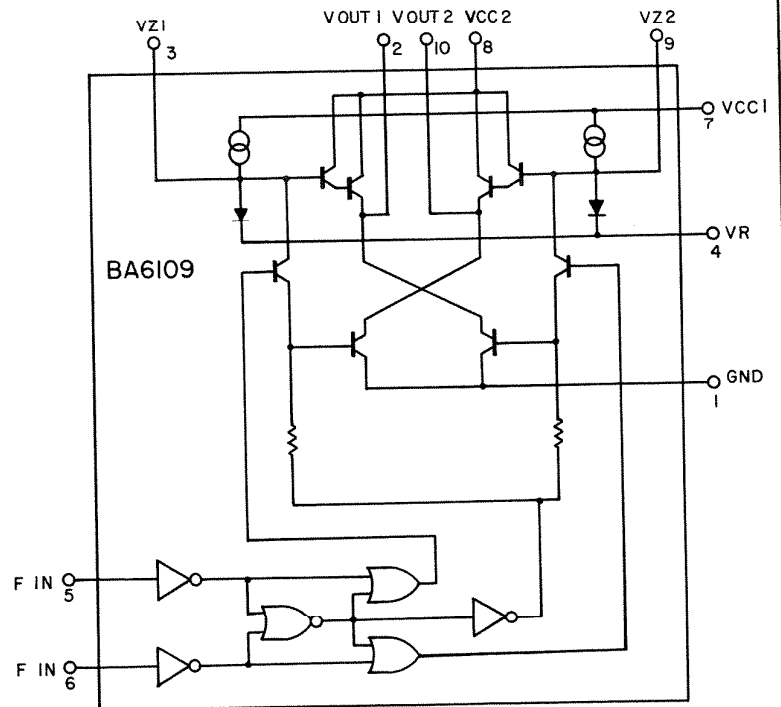
### IC 605, IC 606



### IC 701

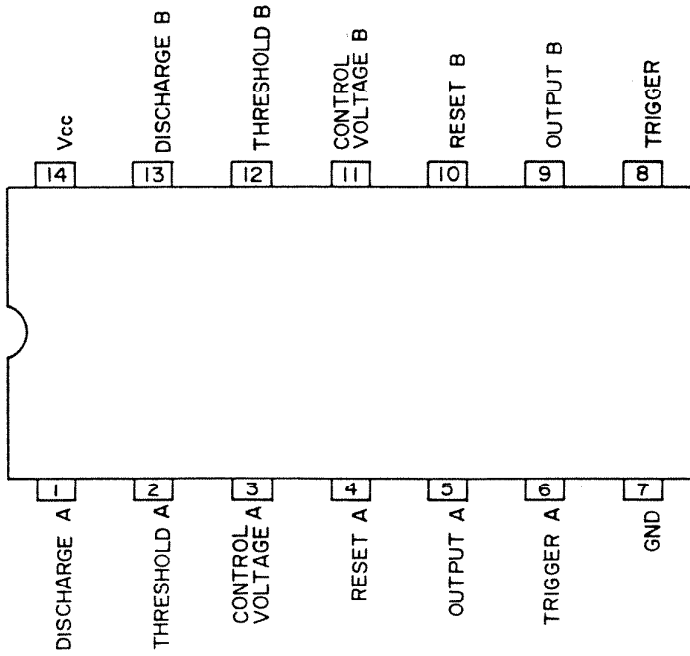


### IC 702



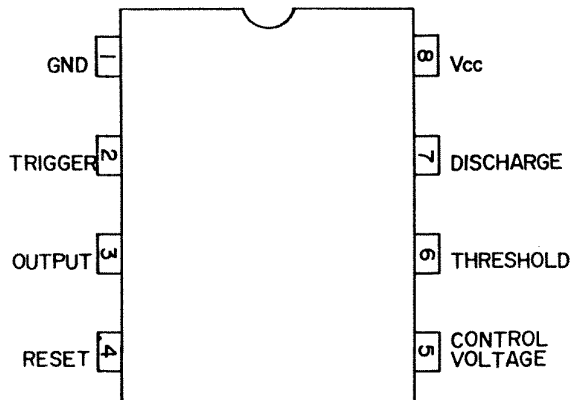
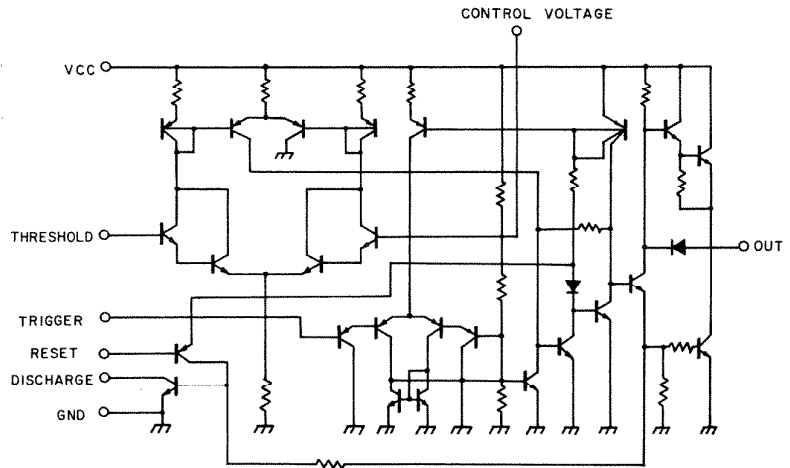
### IC 702

# IC LEAD IDENTIFICATION, BLOCK DIAGRAMS AND SCHEMATICS

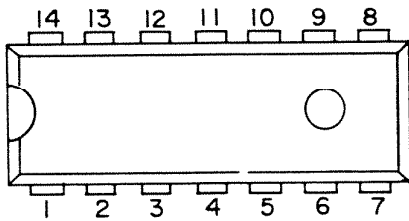


**IC 703**

**IC 703  
IC 704**

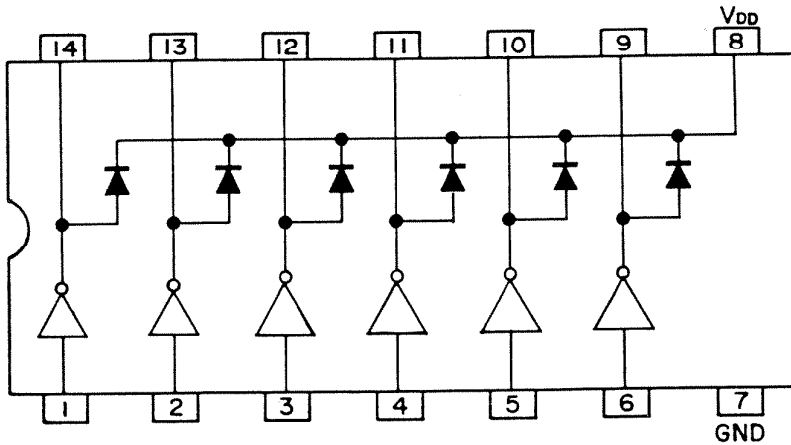
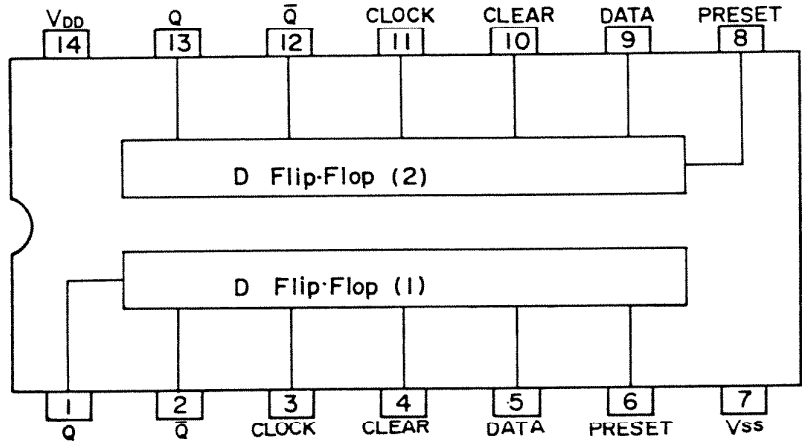


**IC 704**



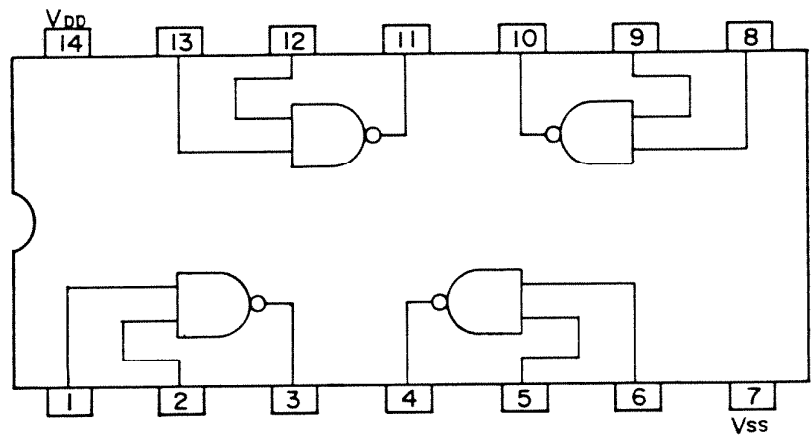
- |        |        |        |        |
|--------|--------|--------|--------|
| IC 705 | IC 714 | IC 728 | IC 737 |
| IC 706 | IC 716 | IC 729 | IC 738 |
| IC 707 | IC 717 | IC 731 | IC 739 |
| IC 708 | IC 724 | IC 733 | IC 740 |

**IC 705**

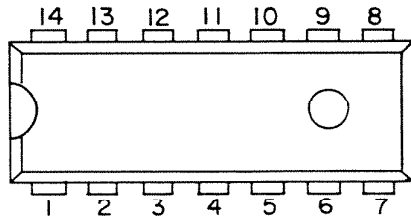


**IC 706  
IC 707**

- |        |        |
|--------|--------|
| IC 708 | IC 729 |
| IC 714 | IC 731 |
| IC 716 | IC 733 |
| IC 717 | IC 737 |
| IC 724 | IC 738 |
| IC 728 | IC 739 |
|        | IC 740 |

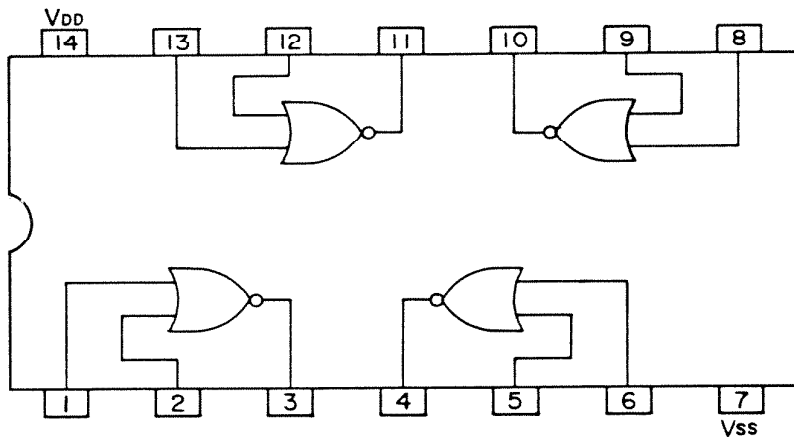
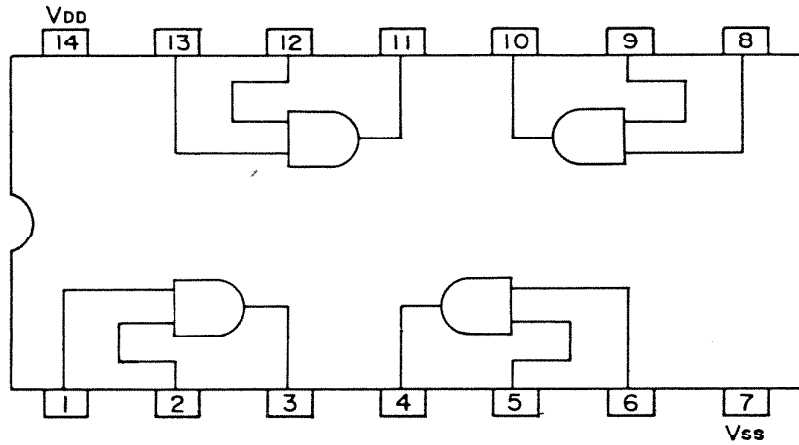


# IC LEAD IDENTIFICATION, BLOCK DIAGRAMS AND SCHEMATICS



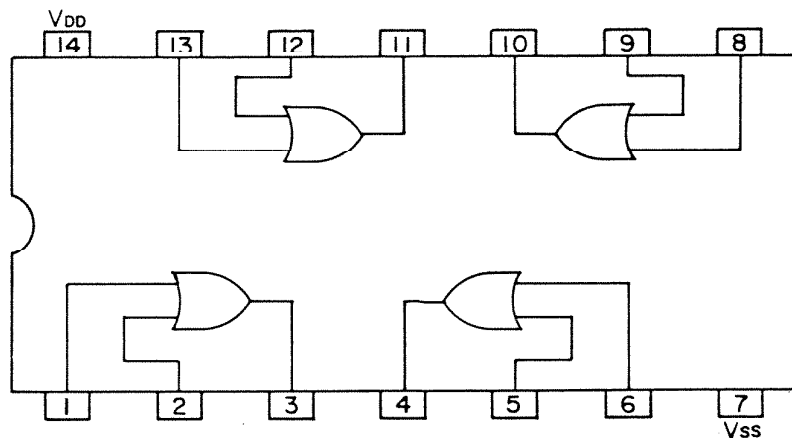
- |        |        |        |        |        |
|--------|--------|--------|--------|--------|
| IC 709 | IC 713 | IC 720 | IC 725 | IC 732 |
| IC 710 | IC 715 | IC 721 | IC 726 | IC 734 |
| IC 711 | IC 718 | IC 722 | IC 727 | IC 735 |
| IC 712 | IC 719 | IC 723 | IC 730 | IC 736 |

- |        |        |
|--------|--------|
| IC 709 | IC 725 |
| IC 713 | IC 726 |
| IC 715 | IC 727 |
| IC 718 | IC 730 |
| IC 719 | IC 734 |
|        | IC 735 |

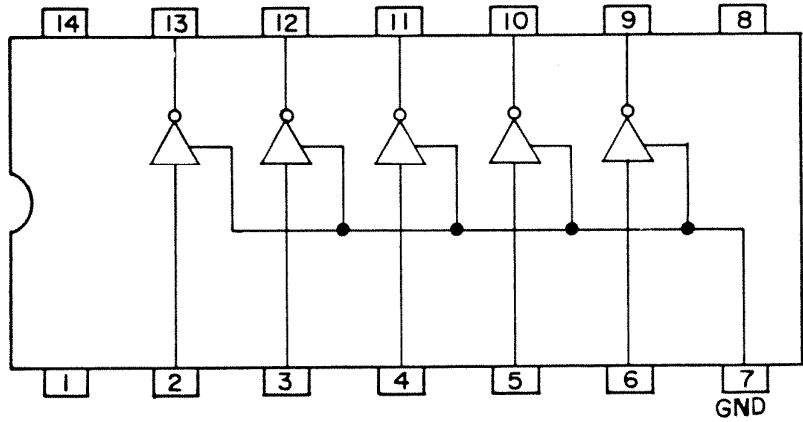


- |        |
|--------|
| IC 710 |
| IC 720 |
| IC 723 |
| IC 732 |

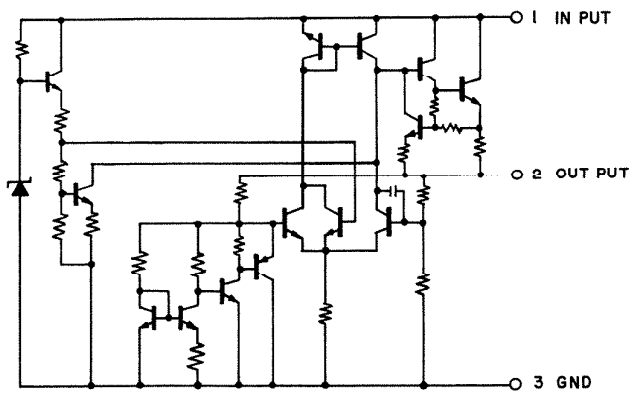
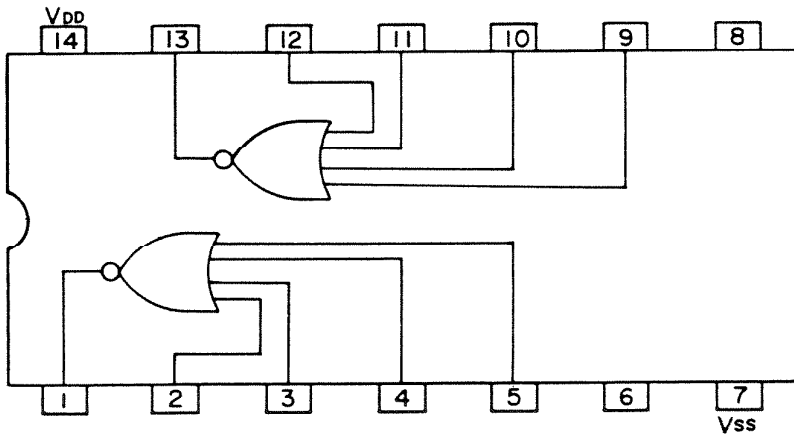
- |        |
|--------|
| IC 711 |
| IC 721 |
| IC 736 |



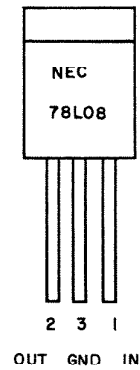
IC 712



IC 722



IC 901



IC 901

# IC VOLTAGE CHARTS

	IC1		IC101	IC201	IC202	IC203	IC102	IC103	IC104	IC105	IC106			
	AM	FM	FM	FM	FM	FM	I/P TALK			DOOR TALK	END CALL	ALL LISTEN		
1	1.3	1.7	8.2	X	0	0	0	H	H	H	5.0	0	5.0	5.0
2	1.3	1.7	0	X	0	7.6	0	H	L	L	0	5.0	5.0	5.0
3	0	12.7	1.1	X	6.4	9.0	4.8	L	H	H	8.5	8.2	9.3	9.3
4	2.0	1.8	4.0	X	3.0	15.1	5.0	L	L	L	1.9	1.9	2.2	0
5	0	0	3.4	—	3.0	3.6	3.4	H	L	H	0.9	2.6	5.0	9.3
6	1.3	1.3	4.1	—	0	8.3	0.5	H	H	L	0.5	3.4	4.0	0
7	2.1	2.0	1.4	9.0	5.3	8.3	0.5	0	0	0	0.9	2.6	5.0	9.3
8	1.9	1.8	9.2	0	0.3	15.0	5.1	L	H	L	0	0	6.6	0
9	2.3	1.9	14.9	7.6		15.0		H	H	H	0.9	2.6	5.0	9.3
10	2.3	2.0	15.6	0		0		H	L	L	0.2	1.9	4.3	14.5
11	12.0	12.0		7.2		14.5		H	L	H	0.9	2.6	5.0	9.3
12	0.5	0.3		5.1		4.7		H	H	L	0	0	0	0
13	0	0		3.8		3.2		L	H	H	5.0	5.0	5.0	0
14	2.0	2.0		—		3.2		5.0	5.0	5.0	5.0	5.0	0	5.0
15	0.2	16.3		3.8										
16	0.9	0.8		3.8										
17				8.3										
18				9.0										
19				3.8										
20				—										
21				9.0										
22				X										
23				X										
24				X										
25				X										
26				X										
27				X										
28				X										
29				X										
30				X										
31				X										
32				X										
33				X										
34				X										
35				X										
36				X										
37				X										
38				X										
39				X										
40				X										
41				X										
42				X										

IC107	
ALL POSITION	
IN	15.6
GND	0
OUT	5.0

	E (S)	C (D)	B (G)	OPERATING POSITION
Q1	0.1	14.6	0	FM
Q2	1.3	15.5	1.7	FM
Q3	1.2	12.5	1.4	FM
Q4	2.9	12.5	1.7	FM
Q5	3.7	15.2	0	AM
Q6	1.2	15.2	0	AM
Q101	0	0	0.7	AM
Q102	3.8	5.1	3.4	I/P TALK
Q103	0	0.1	0.7	ALL LISTEN
Q104	0	0	0.6	ALL LISTEN
Q105	0	0	0.6	I/P TALK
Q106	0	5.0	0	I/P TALK
Q107	0	0.1	0.7	DOOR TALK
Q108	15.6	20.0	16.3	AM
Q109	0	0	0.6	I/P TALK
Q110	3.4	5.1	3.8	DOOR TALK
Q201	0	0	0.7	FM
Q202	0	0	0.7	AM
Q203	0.3	3.7	0.8	FM
Q301	0.9	0	0.2	PHONO
Q302	0.5	4.2	0.6	I/P TALK
Q303	3.8	10.0	9.0	PHONO
Q304	0	0.1	0.8	I/P TALK
Q305	0.4	4.0	0.75	PHONO
Q340	0.1	7.0	0.6	AM
Q341	8.6	14.0	2.3	AM



PIN NO.	IC605	IC606	IC703	IC705	IC706	IC707	IC708	IC709	IC710	IC711	IC712	IC713	IC714	IC715
1	0	0	0	9.3	0	3.5	0	9.0	9.3	0	0	9.3	9.3	9.3
2	9.2	0	0	9.3	0	3.5	0	0	9.3	0	0	9.3	9.3	9.3
3	9.2	0	6.2	9.2	0	4.6	0	0	9.3	0	0	9.1	0	9.3
4	0	0	9.3	8.4	0	4.4	0	0	0	0	0	9.3	0	0
5	0	0	0	9.3	0	4.6	14.1	0	9.3	0	0	0	9.2	9.0
6	0	0	9.3	7.7	0	4.7	0	9.1	9.3	0	0	0	9.2	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	1.9	8.5	0	0	14.1	14.1	9.0	9.1	0	0.3	0	0	0
9	0	0	0	0	0	12.8	0.8	7.5	9.1	0	14.2	0	9.3	0
10	0	0	9.3	0	0	12.8	12.8	9.2	0	0	9.3	0	9.3	0
11	0	0	6.2	0	9.3	12.8	12.8	0	0	0	14.2	0	9.3	0
12	0	0	0	0	8.9	12.8	12.8	0	9.3	0	14.2	0	0	0
13	0	0	0	9.3	9.3	12.8	12.8	9.0	9.3	0	13.7	0	0	0
14	9.3	9.3	9.3	9.3	9.3	12.8	12.8	9.3	9.3	9.3	14.2	9.3	9.3	9.3

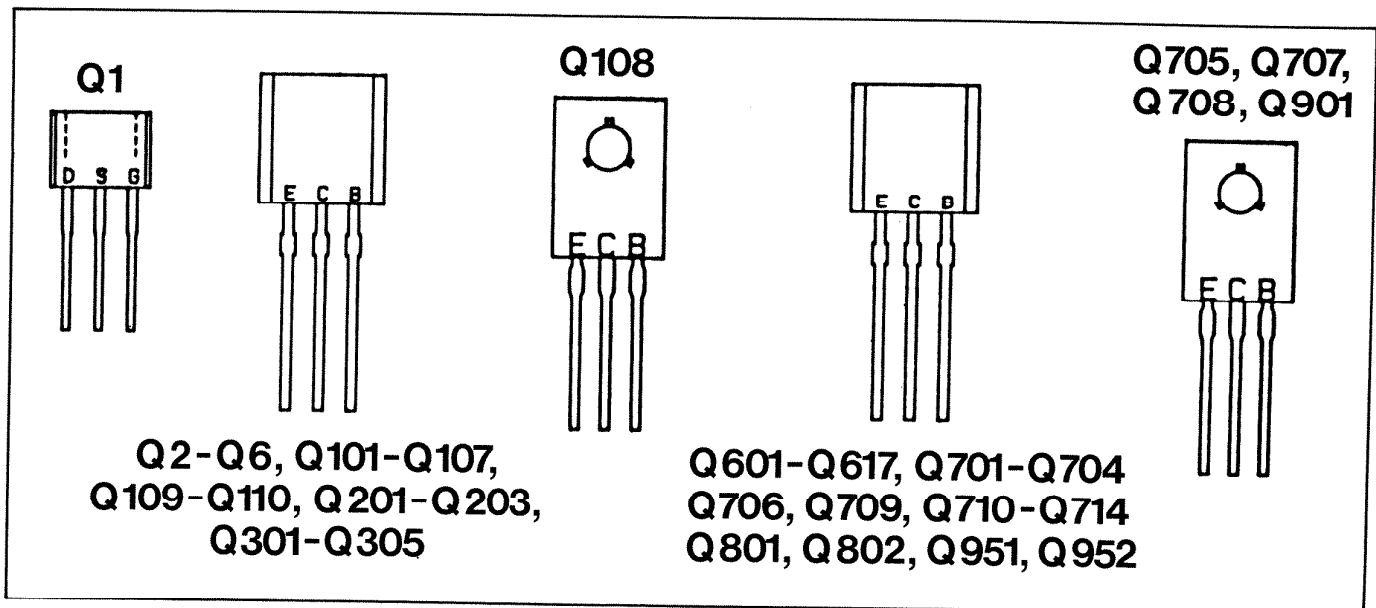
PIN NO.	IC716	IC717	IC718	IC719	IC720	IC721	IC722	IC723	IC724	IC725	IC726	IC727	IC728	IC729
1	9.3	9.3	0	0	9.3	0	8.9	0	0	9.3	0	9.3	9.0	0
2	9.3	9.3	0	0	9.2	0	0	9.3	0	9.3	0	9.3	9.3	0
3	0	0	0	0	0	0	0	0	9.3	0	0	9.3	0	9.3
4	9.3	9.3	0	0	0	0	0	0	9.3	0	0	9.3	9.3	9.3
5	9.3	0	0	0	9.3	0	0	0	0	0	0	9.3	0	0
6	0	0	0	0	8.9	0	0	8.9	8.9	0	0	9.3	8.9	8.9
7	0	0	0	9.3	0	0	0	0	0	0	0	0	0	0
8	0	9.3	0	0	0	0	0	0	1.4	0	0	0	0	9.3
9	0	9.3	0	9.0	0	0	0	0	0	0	0	0	9.3	8.9
10	9.3	0	0	0	9.3	0	0	9.2	9.3	0	0	0	9.3	0
11	9.3	0	0	0	9.3	0	0	0	0	0	9.3	0	0	9.3
12	0	9.3	0	9.3	0	0	0	0	8.9	0	8.9	0	9.3	0
13	0	9.3	0	0	0	0	9.3	9.3	0	9.3	9.3	0	9.3	0
14	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3

PIN NO.	IC730	IC731	IC732	IC733	IC734	IC735	IC736	IC737	IC738	IC739	IC740			
1	1.4	9.3	9.3	0	0	9.3	0	8.8	0	0	0			
2	0	9.3	9.3	0	0	0	0	8.5	8.9	9.3	0			
3	0	0	0	9.3	0	0	0	9.3	0	9.3	9.3			
4	9.3	9.3	0	9.3	0	0	0	9.3	9.3	9.3	9.3			
5	9.3	0	9.3	9.3	9.3	0	0	0	0	0	9.3			
6	9.3	0	0	0	0	9.3	0	8.9	8.9	0	0			
7	0	0	0	0	0	0	0	0	0	0	0			
8	9.3	8.9	9.3	0	9.3	0	0	0	0	0	0			
9	9.3	0	9.3	0	0	0	0	0	0	8.9	0			
10	9.3	0	0	9.3	0	0	0	9.3	9.3	0	9.3			
11	9.3	0	0	9.3	0	0	0	0	0	9.3	9.3			
12	8.1	0	9.3	9.3	0	0	0	9.1	9.1	0	0			
13	8.1	8.9	9.3	0	9.3	9.3	0	0	0	1.4	9.3			
14	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3			

# IC VOLTAGE CHARTS

PIN NO.	IC701	IC601	IC702	IC602	IC603	IC704	IC604	IC901
1	8.7	1.2	0	5.1	1.4	9.3	0	14.1
2	0.1	0.6	0	5.2	8.8	9.1	0	1.0
3	0	0	0	5.2	5.1	8.9	0	9.3
4	0	5.1	0	0	0	9.3	0	
5	0	0	0	5.2	5.2	9.3	9.3	
6	0	11.5	0	7.2	5.2	9.1	0	
7	9.3	0.5	14.2	1.4	5.2	9.1		
8	8.7 or 0	0	14.2	9.3	9.3	9.3		
9	0	0	0					
10	8.4	5.9	0					
11	0	0						
12	0	0.3						
13	0	6.4						
14	9.3	7.4						
15	0	11.6						
16	0	0						
17	0	0						
18	9.3	0.6						
19	9.3							
20	0							
21	9.3							
22	9.3							
23	9.3							
24	9.3							
25	9.3							
26	0							
27	0							
28	7.2							

# TRANSISTOR LEAD IDENTIFICATION



## TRANSISTOR VOLTAGE CHARTS

	EMITTER (V)	COLLECTOR (V)	BASE (V)
Q601	9.3	5.2	9.2
Q602	0	9.3	0
Q603	5.2	5.5	0
Q604	0	0	0
Q605	0	9.2	0
Q606	9.1	0	9.2
Q607	8.6	9.3	9.1
Q608	0	9.3	0
Q609	0	9.3	0
Q610	13.7	14.2	14.1
Q611	0	0	0
Q612	0	0	0
Q613	0	0	0.7
Q614	0	7.4	0
Q615	4.4	11.6	5.0
Q616	8.8	9.3	9.3
Q617	9.3	9.3	8.6
Q618	0.7	0	0

	EMITTER (V)	COLLECTOR (V)	BASE (V)
Q701	9.3	0	9.3
Q702	0	0	0
Q703	0	0	0
Q704	9.3	0	9.3
Q705	0	14.2	0
Q706	9.3	0	9.3
Q707	0	14.2	0
Q708	0	13.2	0
Q709	0	9.3	0
Q710	0	8.7	0
Q711	0	8.7	0
Q712	8.1	9.3	8.6
Q713	0	9.3	0
Q714	8.1	9.3	8.6

	EMITTER (V)	COLLECTOR (V)	BASE (V)
Q801	0.7	0	0
Q802	8.9	8.9	8.2

	EMITTER (V)	COLLECTOR (V)	BASE (V)
Q901	14.1	20.1	14.8
Q951	0	0.9	0.6
Q952	0.9	3.1	0.9

## TUNER ALIGNMENT AND SETUP DIAGRAMS

### Equipment Needed

1. AM Signal Generator
2. FM Signal Generator
3. IF Sweep Generator with marker capabilities
4. Oscilloscope
5. VTVM
6. Nonmetallic alignment tool
7. AF Oscillator
8. Frequency counter

### Important Reminders

1. Check line voltage.
2. Set function switch to band being aligned.
3. Remove the antenna from the terminal.
4. Connect low side of signal source and output indicator to chassis ground (unless otherwise specified). Ground connection should be kept close to high side connection.
5. Signal input should be kept as low as possible to avoid AVC and AFC action. (Set output indicator to high sensibility).
6. Standard modulation is 1000Hz 30% amplitude for AM. (1000Hz 22.5KHz deviation for FM).

# TUNER ALIGNMENT AND SET-UP DIAGRAMS

## AM Alignment

Circuit Alignment Equipment Connection				
IF	AM Signal Generator with dummy antenna VTVM across 8ohm (See Fig. 1)			
	Step	Gen. Freq.	Dialsetting	Adjustments
	1	455KHz (1000Hz Mod)	Tuning gang Fully closed	T3.4 (AM IFT) Adjust for Maximum Output
2			Repeat until no further improvement can be made.	
BAND	AM Signal Generator with dummy antenna VTVM across 8ohm load. (See Fig. 2)			
	3	505KHz (1000Hz Mod)	Tuning gang Fully closed	L6 (AM OSC. Coil) Adjust for Maximum Output
	4	1680KHz (1000Hz Mod)	Tuning gang Fully open	TC4 (AM OSC. trimmer) Adjust for Maximum Output
	5			Repeat steps 3 and 4
Tracking	AM signal Generator with dummy antenna VTVM across 8ohm load. (See Fig. 2)			
	6	600KHz (1000Hz Mod)	Tune to Signal	L5 (AM Ant. Coil) Adjust Coil for Maximum Output
	7	1400KHz (1000Hz Mod)	Tune to Signal	TC3 (AM Trimmer) Adjust for Maximum Output
	8			Repeat steps 6 and 7 Several times.

## FM Alignment

Circuit Alignment Equipment Connection				
IF	FM Signal Generator with dummy antenna VTVM across 8ohm (See Fig. 3)			
	Step	Gen. Freq.	Dialsetting	Adjustments
	1	10.7MHz (1000Hz Mod)	Tuning gang Fully closed	T1.2 (FM IFT) Adjust for Maximum Output
2			Repeat until no further improvement can be made.	
BAND	FM Signal Generator with dummy antenna VTVM across 8ohm load. (See Fig. 4)			
	3	87MHz (1000Hz Mod)	Tuning gang Fully closed	L3 (FM OSC. Coil) Adjust for Maximum Output
	4	109MHz (1000Hz Mod)	Tuning gang Fully open	TC2 (FM OSC. trimmer) Adjust for Maximum Output
	5			Repeat steps 3 and 4
	Tracking	FM signal Generator with dummy antenna VTVM across 8ohm load. (See Fig. 4)		
6		90MHz (1000Hz Mod)	Tune to Signal	L1 (FM Ant. Coil) Adjust Coil for Maximum Output
7		106MHz (1000Hz Mod)	Tune to Signal	TC1 (FM Trimmer) Adjust for Maximum Output
8				Repeat steps 6 and 7 Several times.

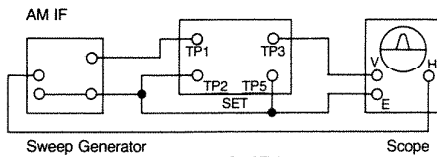


FIGURE 1

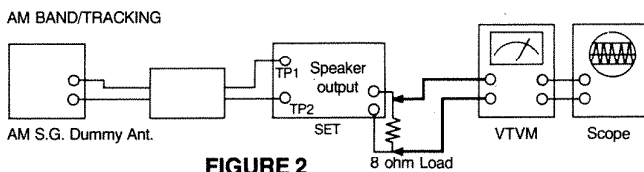


FIGURE 2

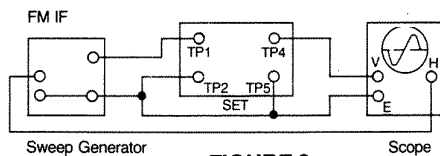


FIGURE 3

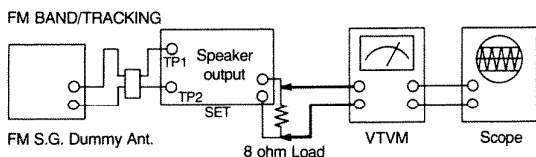


FIGURE 4

## Voltage Regulator Alignment

Adjust VR203, until the output voltage of #12 pin of IC203(TP6) becomes 9V. See Master Unit schematic diagram.

## FM Display Alignment

FM SIGNAL GENERATOR connects to TP1, TP2. Scope & VTVM connect to speaker output leads with 8 ohm load. Set FM SIGNAL GENERATOR to 98.0MHz and tune to signal; then adjust VR201, until DISPLAY becomes 98.0MHz.

## AM Display Alignment

AM SIGNAL GENERATOR connects to TP1, TP2. Scope & VTVM connect to speaker output leads with 8 ohm load. Set AM SIGNAL GENERATOR to 1000kHz and tune to signal; then adjust VR202, until DISPLAY becomes 1000kHz.

## Door Speaker Level Set

Adjust VR103.

## 4MHz Clock Alignment

Connect Frequency counter as illustrated in Fig 5. Adjust TC201 until scope indicates 4.000000MHz.

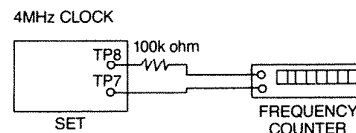
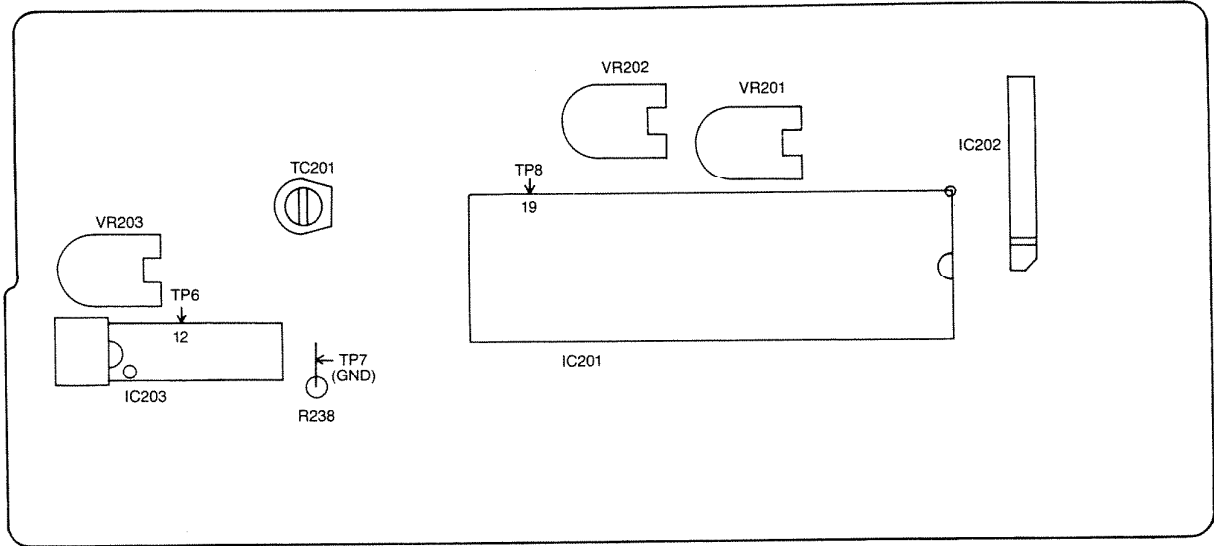
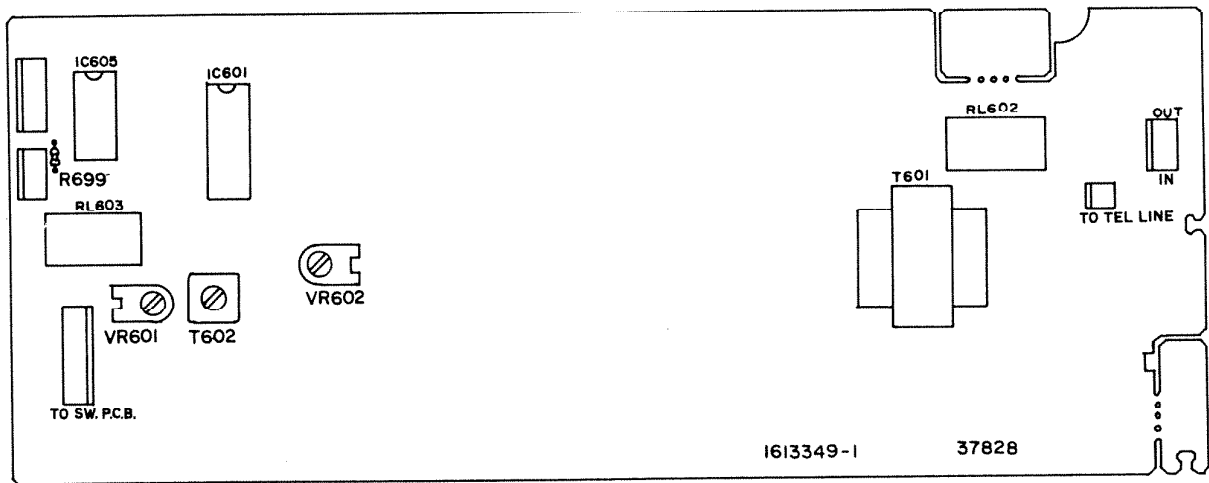


FIGURE 5



**4 MHz CLOCK ALIGNMENT**



**TUNER BOARD ALIGNMENT ADJUSTMENT POINTS**

## **TAPE ALIGNMENT**

### **A. BIAS FREQUENCY AND BIAS CURRENT ALIGNMENT**

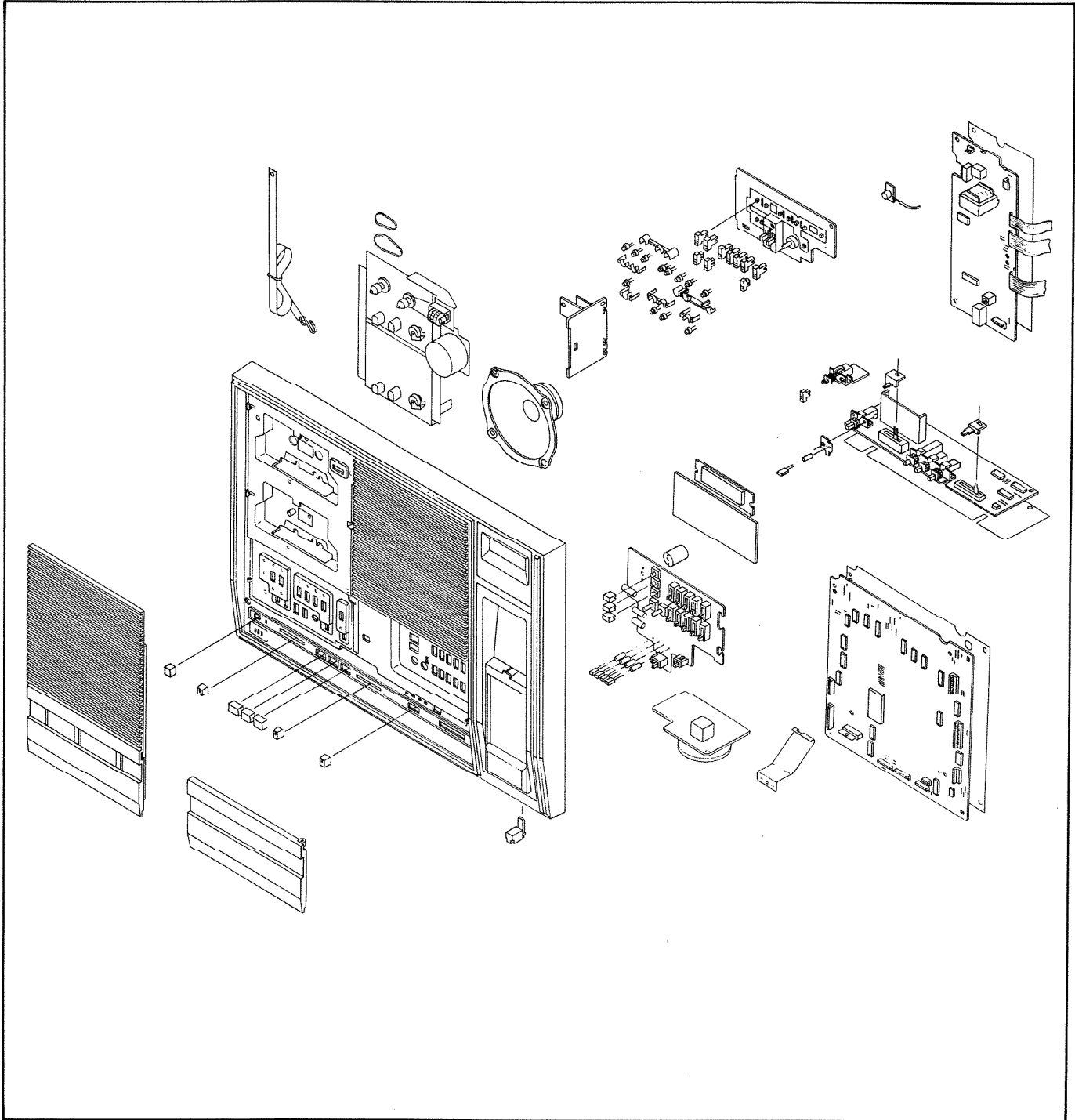
1. VTVM is to be connected across with R699 10 ohm. Frequency Counter is to be connected with output terminals.
2. ICM deck to be placed in recording mode and T602 is to be aligned so that bias frequency may be  $50\text{KHz} \pm 100\text{Hz}$ .
3. VR601 is to be adjusted so that bias current may be  $300\mu\text{A} \pm 10\mu\text{A}$ .

### **B. ALIGNMENT OF OUTPUT LEVEL AT PLAYBACK.**

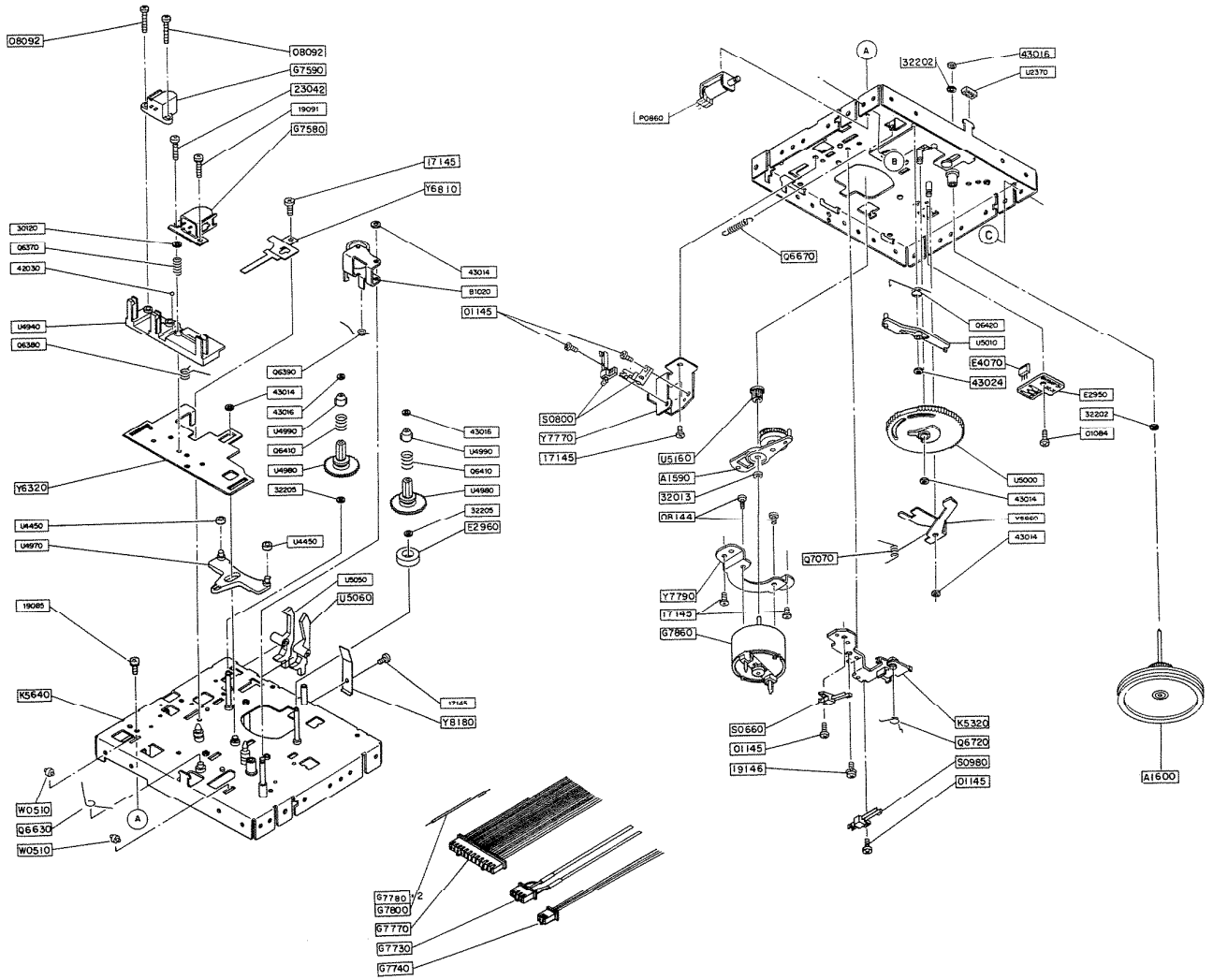
1. VTVM is to be connected between line out (J602) and ground.
2. Test tape TCC-140 is to be loaded on ICM deck and played back. VR602 is to be adjusted so that output level at playback may be  $100\text{mV } 1\text{dB}$  at line out jack J602.

# EXPLODED VIEW DRAWINGS

## Master Panel

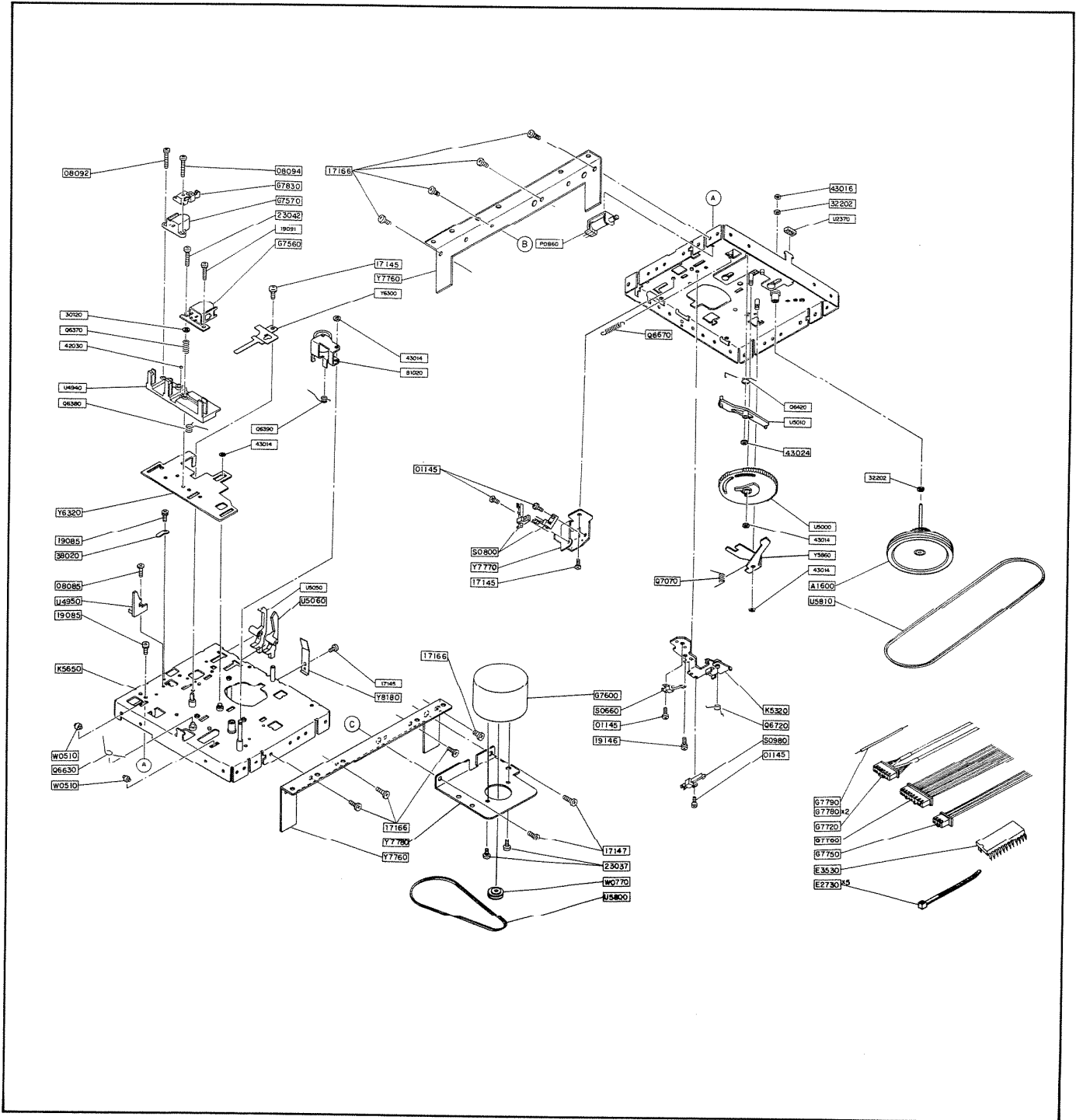


# ICM Tape Drive



# EXPLODED VIEW DRAWINGS

## OGM Tape Drive





# REPLACEMENT PARTS

Capacitors: Value in Micro (10<sup>-6</sup>) Farads. Other Specifications As Noted.

Resistors: Value In Ohms  $\pm$  5%, 1/2 Watt, Other Specifications as Noted.  
 K = Kilos = 1,000      M = Mega = 1,000,000

## Model IM-3103 Radio-Intercom Master Unit

Schematic Symbol	NuTone Part No.	Description
<b>CONTROL, AMPLIFIER AND POWER SUPPLY BOARD</b>		
	7667A-000	Control, Amplifier and Power Supply with Power L.E.D. Board Assembly Complete
	7668A-000	Control, Amplifier and Power Supply P.C. Board Assembly Complete
<b>Integrated Circuits</b>		
IC-101	7015A-000	Power Amplifier—BA532
IC-102	7238A-000	Single Timing Circuit—NE555
IC-103	7239A-000	Quad 2-Input Nand—SN74L500 or DN74L500
IC-104	7240A-000	Triple 3-Input Nand—SN74L510 or DN74L510
IC-105	7242A-000	Hex Inverter—SN74L504 or DN74L504
IC-106	7243A-000	Comparator—LM339
IC-107	724A-000	Voltage Regulator—78L05A
<b>Transistors</b>		
Q101	7030A-000	Intercom Muting—2SC945Q or 2SC828S
Q102	7030A-000	Switching—2SC945Q or 2SC828S
Q103	7037A-000	Relay Driver—2SC945P or 2SCR28R
Q104	7030A-000	Switching—2SC945Q or 2SC828S
Q105	7030A-000	Switching—2SC945Q or 2SC828S
Q106	7037A-000	Switching—2SC945P or 2SC828R
Q107	7037A-000	Relay Driver—2SC945P or 2SC828R
Q108	7235A-000	Voltage Stabilizer—2SD882Q or MJE9400
Q109	7236A-000	Rapid Muting—2SC1317R
Q110	7030A-000	Switching—2SC945Q or 2SC828S
<b>Diodes</b>		
D101	7038A-000	Silicon—IN4148 or IS2473 or BA317
D102	7038A-000	Silicon—IN4148 or IS2473 or BA317
D103	7038A-000	Silicon—IN4148 or IS2473 or BA317
D104	7248A-000	Zenner—UZ-9 or IBH or RD-10ED1
D105	7038A-000	Silicon—IN4148 or IS2473 or BA317
D106	7038A-000	Silicon—IN4148 or IS2473 or BA317
D107	7038A-000	Silicon—IN4148 or IS2473 or BA317
D108	7038A-000	Silicon—IN4148 or IS2473 or BA317
D109	7038A-000	Silicon—IN4148 or IS2473 or BA317
D110	7038A-000	Silicon—IN4148 or IS2473 or BA317
D111	7249A-000	Zenner—UZ-16BL or M or RD-16EB3 or RD-18EB1
D112	7249A-000	Zenner—UZ-6, 2BH or RD-6 or 8EB1
D113	7038A-000	Silicon—IN4148 or IS2473 or BA317
D114	7251A-000	Zenner—UZP-15B
D120	7038A-000	Silicon—IN4148 or IS2473 or BA317
D121	7708A-000	GE-1K261

Schematic Symbol	NuTone Part No.	Description
<b>Capacitors</b>		
C103	7133A-000	Ceramic 50V .001uf
C104	7134A-000	Mylar 50V 0.15uf
C105	7135A-000	Ceramic 25V .01uf
C106	7126A-000	Electrolytic 10V 100uf
C107	7136A-000	Electrolytic 10V 10uf
C109	7126A-000	Electrolytic 10V 100uf
C110	7382A-000	Electrolytic 16V 100uf
C111	7137A-000	Electrolytic 10V 470uf
C112	7138A-000	Electrolytic 16V 47uf
C113	7138A-000	Electrolytic 16V 47uf
C114	7125A-000	Electrolytic 50V 1uf
C115	7138A-000	Electrolytic 16V 47uf
C117	7140A-000	Electrolytic 50V 1uf
C118	7136A-000	Electrolytic 10V 10uf
C119	7141A-000	Electrolytic 10V 47uf
C120	7158A-000	Electrolytic 10V 22uf
C121	7136A-000	Electrolytic 10V 10uf
C122	7138A-000	Electrolytic 16V 47uf
C127	7142A-000	Electrolytic 25V 220uf
C128	7141A-000	Electrolytic 10V 47uf
C129	7143A-000	Electrolytic 16V 1000uf
C131	7136A-000	Electrolytic 10V 10uf
C132	7135A-000	Ceramic .01uf
C134	7125A-000	Electrolytic 50V 1uf
C135	7144A-000	Ceramic 50V 68pf
C136	7114A-000	Ceramic 50V 330pf
C137	7114A-000	Ceramic 50V 330pf
C138	7114A-000	Ceramic 50V 330pf
C140	7108A-000	Ceramic 25V .022uf
<b>Resistors</b>		
R101	7701A-000	Carbon Film 10K
R102	7697A-000	Carbon Film 22K
R103	7709A-000	Carbon Film 82Ω
R104	7702A-000	Carbon Film 1K
R105	7699A-000	Carbon Film 3.3K
R106	7690A-000	Carbon Film 330
R107	7710A-000	Carbon Film 1/4W 5.6K
R108	7701A-000	Carbon Film 10K
R109	7701A-000	Carbon Film 10K
R110	7705A-000	Carbon Film 1/4W, 470Ω
R111	7711A-000	Carbon Film 1/4W 3.9K
R112	7702A-000	Carbon Film 1K
R113	7712A-000	Carbon Film 100K
R114	7706A-000	Carbon Film 100Ω
R115	7691A-000	Carbon Film 3.9K
R116	7713A-000	Carbon Film 2.7K
R117	7699A-000	Carbon Film 3.3K
R118	7712A-000	Carbon Film 100K
R119	7712A-000	Carbon Film 100K
R120	7714A-000	Carbon Film 5.6K
R121	7714A-000	Carbon Film 5.6K
R122	7714A-000	Carbon Film 5.6K

# REPLACEMENT PARTS

Schematic Symbol	NuTone Part No.	Description
R123	7714A-000	Carbon Film 5.6K
R124	7714A-000	Carbon Film 5.6K
R125	7705A-000	Carbon Film 470
R126	7701A-000	Carbon Film 10K
R127	7699A-000	Carbon Film 3.3K
R128	7701A-000	Carbon Film 10K
R129	7714A-000	Carbon Film 5.6K
R130	7715A-000	Carbon Film 1.2M
R131	7693A-000	Carbon Film 1.5K
R132	7716A-000	Carbon Film 33K
R133	7702A-000	Carbon Film 1K
R134	7701A-000	Carbon Film 10K
R135	7688A-000	Carbon Film 1M
R136	7179A-000	Metal 2W, 1Ω
R137	7180A-000	Metal 1W, 220Ω
R138	7717A-000	Carbon Film 1.2K
R139	7714A-000	Carbon Film 5.6K
R140	7716A-000	Carbon Film 33K
R141	7690A-000	Carbon Film 330
R142	7718A-000	Carbon Film 3.3
R143	7701A-000	Carbon Film 10K
<b>Coils</b>		
L101	7264A-000	Relay (Door)
L102	7719A-000	Spring Coil
<b>Variable Resistors</b>		
VR101	7050A-000	Program Volume—50K
VR102	7252A-000	Master Volume—200Ω
VR103	7253A-000	Semi-Fixed—500Ω
<b>Switches</b>		
	7278A-000	Switch and Bracket Assembly, includes: Switch—End Call Switch—Door Talk Switch I/P Talk
S101		
S102		
S103		
S104	7279A-000	Power On/Off
<b>General</b>		
	7280A-000	Base Post—2 Pin
	7281A-000	Base Post—7 Pin
	7282A-000	Base Post—9 Pin
	6992A-000	Heat Sink
	7928A-000	Terminal—Push On
	7929A-000	Insulator
	7928A-000	Terminal—Push On
	7929A-000	Insulator
	7930A-000	Terminal—Ring
	7293A-000	Connector Assembly
	7258A-000	Housing—2 Pin
	7101A-000	Contact
	6995A-000	P.C. Board Bracket
	7285A-000	Insulator—Plastic 3" x 10 3/8"
<b>L.E.D. Board</b>		
	7670A-000	Power L.E.D. Board Assembly Complete
D501	7274A-000	L.E.D. (Red)—LN242RPH
B7	7879A-000	LED Spacer—2M0683

Schematic Symbol	NuTone Part No.	Description
<b>ANSWER POWER SWITCH BOARD</b>		
SW901	7643A-000	P.C. Board Assembly Complete
	7927A-000	Push Switch
	7280A-000	Connector Base—2 Pin
	7862A-000	Pushbutton
<b>TUNER BOARD</b>		
	7664A-000	Tuning Wheel & Tuning Board Assembly Complete
	7676A-000	Tuner Assembly—Includes: FM-RF Tuning Section FM Oscillator Tuning Section AM-RF Tuning Section AM Oscillator Tuning Section FM Antenna Trimmer FM Oscillator Trimmer AM Antenna Trimmer AM Oscillator Trimmer Tuning Wheel
<b>Coils</b>		
	7677A-000	FM RF
	7678A-000	Trap
	7066A-000	FM Oscillator
	7679A-000	Trap
	7068A-000	AM Antenna
	7069A-000	AM Oscillator
<b>Transformers</b>		
	7059A-000	FM IF 10.7 MHz
	7060A-000	FM Detector
	7061A-000	1st AM IF 455K Hz
	7062A-000	2nd AM IF 455K Hz
<b>Filters and Amplifiers</b>		
	7073A-000	FM IF (Ceramic)
	7074A-000	AM IF (Ceramic)
	7075A-000	FM RF (Print)
<b>Integrated Circuit</b>		
	7014A-000	AM/FM IF Amplifier—HA 12413-03
<b>Transistors</b>		
Q1	7025A-000	FM RF Amplifier
Q4	7026A-000	FM Counter Buffer
Q6	7283A-000	AM Converter
<b>Diodes</b>		
D1	7038A-000	Silicon—IN4148 or BA317 or IS2473
D2	7039A-000	Vari Cap—SD-116
D3	7038A-000	Silicon—IN4148 or BA317 or IS2473
D4	7038A-000	Silicon—IN4148 or BA317 or IS2473
D5	7038A-000	Silicon—IN4148 or BA317 or IS2473
<b>Capacitors</b>		
C1	7106A-000	Ceramic SL 10pf
C2	7107A-000	Ceramic SL 100pf
C3	7108A-000	Ceramic Z .022uf
C4	7109A-000	Ceramic SL 5pf

Schematic Symbol	NuTone Part No.	Description
C5	7108A-000	Ceramic Z .022uf
C6	7683A-000	Ceramic SL 18pf
C7	7111A-000	Ceramic NPO 5pf
C8	7112A-000	Ceramic YB 450pf
C9	7108A-000	Ceramic Z .022uf
C10	7684A-000	Ceramic .0047uf
C11	7108A-000	Ceramic Z .022uf
C12	7114A-000	Ceramic YB 330pf
C13	7114A-000	Ceramic YB 330pf
C14	7106A-000	Ceramic SL 10pf
C15	7115A-000	Ceramic NPO 10pf
C16	7116A-000	Ceramic NPO 24pf
C17	7117A-000	Ceramic N330 16pf
C18	7118A-000	Ceramic NPO 7pf
C19	7108A-000	Ceramic Z .022uf
C20	7119A-000	Ceramic Z .047uf
C22	7120A-000	Semi .022uf
C23	7120A-000	Semi .022uf
C24	7108A-000	Ceramic Z .022uf
C25	7121A-000	Ceramic SL 3pf
C26	7119A-000	Ceramic Z .047uf
C28	7685A-000	Ceramic .022uf
C29	7108A-000	Ceramic Z .022uf
C30	7119A-000	Ceramic Z .047uf
C31	7108A-000	Ceramic Z .022uf
C32	7122A-000	Electrolytic 10v 22uf
C33	7119A-000	Ceramic Z .047uf
C34	7123A-000	Electrolytic 10v 100uf
C35	7124A-000	Electrolytic 50v .1uf
C37	7125A-000	Electrolytic 50v 1uf
C39	7126A-000	Electrolytic 10v 100uf
C40	7686A-000	Semi 25v .047uf
C41	7687A-000	Semi 25v .0047uf
C42	7130A-000	Semi 25v .056uf
C43	7131A-000	Semi 25v .015uf
C44	7132A-000	Semi 25v .018uf
C45	7114A-000	Ceramic 50v 330pf
C46	7129A-000	Ceramic 50v 1pf
C47	7129A-000	Ceramic 1pf
C48	7108A-000	Ceramic Z .022uf
C49	7107A-000	Ceramic SL 100pf
C50	7106A-000	Ceramic SL 10pf
<b>Resistors</b>		
R1	7688A-000	Carbon Film 1M
R2	7689A-000	Carbon Film 56
R3	7690A-000	Carbon Film 330
R4	7691A-000	Carbon Film 3.9K
R5	7692A-000	Carbon Film 6.8K
R6	7690A-000	Carbon Film 330
R7	7214A-000	Carbon Film 1K
R8	7693A-000	Carbon Film 1.5K
R9	7215A-000	Carbon Film 18K
R10	7694A-000	Carbon Film 2.2K
R11	7696A-000	Carbon Film 330K
R12	7688A-000	Carbon Film 1M
R13	7965A-000	Carbon Film 27K
R14	7697A-000	Carbon Film 22K
R15	7698A-000	Carbon Film 22
R16	7693A-000	Carbon Film 1.5K
R18	7699A-000	Carbon Film 3.3K
R20	7700A-000	Carbon Film 120
R21	7690A-000	Carbon Film 330
R22	7700A-000	Carbon Film 120
R23	7701A-000	Carbon Film 10K

Schematic Symbol	NuTone Part No.	Description
R24	7702A-000	Carbon Film 1K
R25	7694A-000	Carbon Film 2.2K
R26	7692A-000	Carbon Film 6.8K
R27	7701A-000	Carbon Film 10K
R29	7703A-000	Carbon Film 18K
R30	7704A-000	Carbon Film 12K
R31	7705A-000	Carbon Film 470
R33	7706A-000	Carbon Film 100
R34	7707A-000	Carbon Film 330K
R35	7702A-000	Carbon Film 1K
R36	7707A-000	Carbon Film 330K
R37	7702A-000	Carbon Film 1K
R38	7178A-000	Solid
<b>General</b>		
	7259A-000	Connector Base—6 Pin
TP1	7682A-000	Wrapping Pin
TP2	7682A-000	Wrapping Pin
	7102A-000	Connector Assembly
	7098A-000	Housing—3 Pin
	7101A-000	Contacts
<b>MAIN POWER SUPPLY BOARD</b>		
	7644A-000	Power Supply Board Assembly Complete
<b>Integrated Circuit and Transistor</b>		
IC901	7832A-000	BV Regulator—UPC78L08
Q901	7831A-000	15V Regulator—DP794P, Q or D882Q
D901	7829A-000	Silicon Rectifiers—G2D
D902	7829A-000	Silicon Rectifiers—G2D
D903	7829A-000	Silicon Rectifiers—G2D
D904	7829A-000	Silicon Rectifiers—G2D
D905	7830A-000	15V Zener Rectifiers—UZ15BL
<b>Capacitors</b>		
C901	7833A-000	Electrolytic 25V 2200uf
C902	7383A-000	Electrolytic 16V 470uf
C903	7143A-000	Electrolytic 16V 1000uf
C904	7382A-000	Electrolytic 16V 100uf
C905	7119A-000	Ceramic .047uf 25V
C906	7119A-000	Ceramic .047uf 25V
C907	7119A-000	Ceramic .047uf 25V
C908	7119A-000	Ceramic .047uf 25V
<b>Resistors</b>		
R901	7834A-000	Carbon Film 390
R902	7788A-000	Carbon Film 270
R904	7796A-000	Carbon Film 180
R905	7724A-000	Carbon Film 4.7K
R906	7835A-000	Metal Oxide 1
<b>Connectors</b>		
	7280A-000	Connector Base—2 Pin
	7297A-000	Connector Assembly
	7272A-000	Housing—4 Pin
	7101A-000	Contact

# REPLACEMENT PARTS

Schematic Symbol	NuTone Part No.	Description
<b>DIGITAL DISPLAY BOARD</b>		
	7665A-000	Digital Display Board Assembly Complete
	7284A-000	Digital Display
<b>Coils and Crystal</b>		
L201	7256A-000	Micro-Inductor Coil
L202	7256A-000	Micro-Inductor Coil
X201	7247A-000	Crystal
<b>Variable Resistors</b>		
VR201	7254A-000	Variable Resistor 10K
VR202	7254A-000	Variable Resistor 10K
VR203	8038A-000	Variable Resistor 2K
<b>Integrated Circuits</b>		
IC201	7245A-000	Clock—LC7250
IC202	7246A-000	Pre-Skelar—M54459L
IC203	7241A-000	Power—LA5700
<b>Transistors</b>		
Q201	7037A-000	Display Driver—2SC945P or 2SC828R
Q202	7037A-000	Switching—2SC945P or 2SC828R
Q203	7026A-000	FM Counter Amplifier—2SC1674L or 2SC1359B
<b>Diodes</b>		
D202	7038A-000	Silicon—IN4148 or IS2473 or BA317
D203	7038A-000	Silicon—IN4148 or IS2473 or BA317
D204	7038A-000	Silicon—IN4148 or IS2473 or BA317
D205	7038A-000	Silicon—IN4148 or IS2473 or BA317
D206	7038A-000	Silicon—IN4148 or IS2473 or BA317
D207	7255A-000	Zenner—UB-6 or 2BH or RD-6 or 8EBI
D208	7038A-000	Silicon—IN4148 or IS2473 or BA317
D209	7038A-000	Silicon—IN4148 or IS2473 or BA317
D210	7038A-000	Silicon—IN4148 or IS2473 or BA317
<b>Capacitors</b>		
TC201	7257A-000	Trimmer—Capacitor
C201	7133A-000	Ceramic 50V .001uf
C202	7133A-000	Ceramic 50V .001uf
C203	7382A-000	Electrolytic 16V 100uf
C204	7133A-000	Ceramic 50V .001uf
C205	7108A-000	Ceramic 25V .022uf
C206	7135A-000	Ceramic 25V .01uf
C207	7108A-000	Ceramic 25V .022uf
C208	7146A-000	Electrolytic 10V 1000uf
C209	7147A-000	Ceramic 50V 27pf
C211	7148A-000	Electrolytic 50V 3.3uf
C212	7108A-000	Ceramic 25V .022uf
C213	7149A-000	Electrolytic 50V .22uf
C214	7150A-000	Ceramic 5V 47pf
C215	7383A-000	Ceramic 16V 470uf
C216	7108A-000	Ceramic 25V .022uf
C218	7133A-000	Ceramic 50V .001uf
C219	7108A-000	Ceramic 25V .022uf
C220	7159A-000	Ceramic 50V 9pf

Schematic Symbol	NuTone Part No.	Description
<b>Resistors</b>		
R201	7694A-000	Carbon Film 2.2K
R202	7694A-000	Carbon Film 2.2K
R203	7694A-000	Carbon Film 2.2K
R204	7694A-000	Carbon Film 2.2K
R205	7694A-000	Carbon Film 2.2K
R206	7694A-000	Carbon Film 2.2K
R207	7694A-000	Carbon Film 2.2K
R208	7694A-000	Carbon Film 2.2K
R209	7702A-000	Carbon Film 1K
R210	7694A-000	Carbon Film 2.2K
R211	7694A-000	Carbon Film 2.2K
R212	7694A-000	Carbon Film 2.2K
R213	7694A-000	Carbon Film 2.2K
R214	7694A-000	Carbon Film 2.2K
R215	7694A-000	Carbon Film 2.2K
R216	7694A-000	Carbon Film 2.2K
R217	7694A-000	Carbon Film 2.2K
R218	7694A-000	Carbon Film 2.2K
R219	7694A-000	Carbon Film 2.2K
R220	7694A-000	Carbon Film 2.2K
R221	7694A-000	Carbon Film 2.2K
R222	7694A-000	Carbon Film 2.2K
R223	7694A-000	Carbon Film 2.2K
R224	7694A-000	Carbon Film 2.2K
R225	7694A-000	Carbon Film 2.2K
R226	7702A-000	Carbon Film 1K
R227	7720A-000	Carbon Film 47K
R228	7704A-000	Carbon Film 12K
R229	7705A-000	Carbon Film 470
R330	7714A-000	Carbon Film 5.6K
R231	7714A-000	Carbon Film 5.6K
<b>INTERCOM SWITCHING BOARD</b>		
	7666A-000	Switch Board Assembly
<b>Switches</b>		
S301	7260A-000	Remote Speaker
S302	7260A-000	Remote Speaker
S303	7260A-000	Remote Speaker
S304	7260A-000	Remote Speaker
S305	7260A-000	Remote Speaker
S306	7260A-000	Remote Speaker
S307	7260A-000	Remote Speaker
S308	7260A-000	Remote Speaker
S309	7260A-000	Remote Speaker
S310	7260A-000	Master Speaker
S311	7260A-000	Function
S312	7261A-000	Clock—Frequency
S313	7262A-000	Minute
S314	7262A-000	Hour
S315	7262A-000	Time Set
<b>Transformer and Coils</b>		
L301	7264A-000	Relay (Hands Free)
L302	7264A-000	Relay (Intercom)
L303	7264A-000	Relay (Intercom)
I.304	7072A-000	Bead Core
T301	7263A-000	Intercom—Input

Schematic Symbol	NuTone Part No.	Description
<b>Jacks</b>		
J301	7076A-000	Phono
J302	7076A-000	Tape
J303	7076A-000	Line Out
<b>Transistors</b>		
Q301	7266A-000	Switching—2SA564R
Q302	7267A-000	Intercom Pre-Amp—2SC1844(E) (F) or 2SC2634 (S) (T)
Q303	7267A-000	Radio Signal Buffer—2SC1844(E) (F) or 2SC2634(S) (T)
Q304	7037A-000	Relay Driver—2SC945P or 2SC828R
Q305	7037A-000	Line Out Pre-Amp—2SC945P or 2SC828R
Q340	7267A-000	Chime Pre-Amp—2SC1844(E) (F) or 2SC2634(S) (T)
Q341	7037A-000	Chime Buffer—2SC945P or 2SC828R
<b>Diodes</b>		
D301	7265A-000	LED (AM)—LN242RPH
D302	7265A-000	LED (FM)—LN242RPH
D303	7265A-000	LED (Phono)—LN242RPH
D304	7265A-000	LED (Tape)—LN242RPH
D305	7038A-000	Silicon—IN4148, IS2473, BA317
D306	7038A-000	Silicon—IN4148, IS2473, BA317
D307	7038A-000	Silicon—IN4148, IS2473, BA317
D308	7038A-000	Silicon—IN4148, IS2473, BA317
D309	7038A-000	Silicon—IN4148, IS2473, BA317
D310	7038A-000	Silicon—IN4148, IS2473, BA317
D311	7038A-000	Silicon—IN4148, IS2473, BA317
<b>Variable Resistors</b>		
VR301	7268A-000	Intercom Volume
VR302	7268A-000	Tone 20K
<b>Capacitors</b>		
C302	7125A-000	Electrolytic 50V 1uf
C303	7145A-000	Electrolytic 16V 220uf
C304	7133A-000	Ceramic YB .001uf
C305	7138A-000	Electrolytic 16V 47uf
C306	7125A-000	Electrolytic 50V 1uf
C307	7125A-000	Electrolytic 50V 1uf
C308	7133A-000	Ceramic YB .001uf
C309	7153A-000	Electrolytic 50V .47uf
C310	7127A-000	Semi 25V .033uf
C311	7153A-000	Electrolytic 50V .47uf
C312	7133A-000	Ceramic YB .001uf
C313	7154A-000	Electrolytic 50V 4.7uf
C314	7155A-000	Semi 25V .01uf
C315	7156A-000	Electrolytic 16V 47uf
C316	7157A-000	Semi 25V .0082uf
C317	7114A-000	Ceramic YB 330PF
C340	7127A-000	Semi 25V .033uf
C341	7127A-000	Semi 25V .003uf
C342	7145A-000	Electrolytic 16V 220uf
C343	7125A-000	Electrolytic 50V 1uf
C344	7133A-000	Ceramic YD .001uf
C345	7133A-000	Ceramic YB .001uf
C346	7125A-000	Electrolytic 50V 1uf
<b>Resistors</b>		
R301	7725A-000	Carbon Film 560K
R302	7725A-000	Carbon Film 560K
R303	7717A-000	Carbon Film 1.2K

Schematic Symbol	NuTone Part No.	Description
R304	7693A-000	Carbon Film 1.5K
R305	7717A-000	Carbon Film 1.2K
R306	7694A-000	Carbon Film 2.2K
R307	7702A-000	Carbon Film 1K
R308	7688A-000	Carbon Film 1M
R309	7690A-000	Carbon Film 330Ω
R310	7699A-000	Carbon Film 3.3K
R311	7707A-000	Carbon Film 470Ω
R312	7707A-000	Carbon Film 330K
R313	7694A-000	Carbon Film 2.2K
R314	7714A-000	Carbon Film 5.6K
R315	7725A-000	Carbon Film 560K
R316	7724A-000	Carbon Film 4.7K
R317	7724A-000	Carbon Film 4.7K
R318	7690A-000	Carbon Film 330Ω
R319	7702A-000	Carbon Film 1K
R320	7699A-000	Carbon Film 3.3K
R321	7726A-000	Carbon Film 12Ω
R322	7726A-000	Carbon Film 12Ω
R323	7726A-000	Carbon Film 12Ω
R324	7726A-000	Carbon Film 12Ω
R325	7726A-000	Carbon Film 12Ω
R326	7726A-000	Carbon Film 12Ω
R327	7726A-000	Carbon Film 12Ω
R328	7726A-000	Carbon Film 12Ω
R329	7727A-000	Carbon Film 12Ω
R330	7727A-000	Carbon Film 12Ω
R331	7690A-000	Carbon Film 330Ω
R340	7690A-000	Carbon Film 330Ω
R341	7714A-000	Carbon Film 5.6K
R342	7688A-000	Carbon Film 1M
R343	7707A-000	Carbon Film 330K
R344	7694A-000	Carbon Film 2.2K
R345	7728A-000	Carbon Film 220Ω
R346	7706A-000	Carbon Film 100Ω
R347	7729A-000	Carbon Film 15Ω
R349	7730A-000	Carbon Film 820K
R350	7717A-000	Carbon Film 1.2K
<b>General</b>		
	7731A-000	Connector—4 Pin
	7294A-000	Connector Assembly
	7270A-000	Housing—9 Pin
	7101A-000	Contacts
	7297A-000	Connector Assembly
	7272A-000	Housing—4 Pin
	7101A-000	Contacts
	7296A-000	Connector Assembly
	7915A-000	Housing—6 Pin
	7101A-000	Contact
	7295A-000	Connector Assembly
	7271A-000	Housing—7 Pin
	7101A-000	Contacts
	7273A-000	Connector Assembly (multi color) Housing—9 Pin Contact
	7103A-000	Cable Tie
	7843A-000	Spacer—LED
<b>CASSETTE LED AND SWITCHING BOARD</b>		
	7624A-000	LED & Switch Board Assembly Complete

# REPLACEMENT PARTS

Schematic Symbol	NuTone Part No.	Description
<b>Switches</b>		
SW801	7794A-000	Outgoing Message—Record
SW802	7794A-000	Outgoing Message—Play
SW803	7794A-000	Incoming Message—Record
SW804	7794A-000	Incoming Message—Play
SW805	7794A-000	Incoming Message—Rewind
SW806	7794A-000	Incoming Message—Rewind/Erase
SW807	7794A-000	Incoming Message—Fast Forward
SW808	7794A-000	Outgoing Message—Answer
SW809	7794A-000	Outgoing Message—Announce Only
SW810	7794A-000	Stop
SW811	7795A-000	Slide Switch—Record Time
SW812	7795A-000	Slide Switch—Input
VR801	7826A-000	Variable Resistor (Ringer) 50K
<b>Transistors</b>		
Q801	7037A-000	Switching—LC945PX or C945P
Q802	7748A-000	Switching—A733P or LA733PX
<b>Diodes</b>		
D801	7827A-000	Red LED—SLC-26VRS, 1401224
D802	7827A-000	Red LED—SLC-26VRS, 1401224
D803	7827A-000	Red LED—SLC-26VRS, 1401224
D804	7827A-000	Red LED—SLC-26VRS, 1401224
D805	7827A-000	Red LED—SLC-26VRS, 1401224
D806	7827A-000	Red LED—SLC-26VRS, 1401224
D807	7827A-000	Red LED—SLC-26VRS, 1401224
D808	7827A-000	Red LED—SLC-26VRS, 1401224
D809	7827A-000	Red LED—SLC-26VRS, 1401224
D810	7827A-000	Red LED—SLC-26VRS, 1401224
D811	7827A-000	Red LED—SLC-26VRS, 1401224
D812	7827A-000	Red LED—SLC-26VRS, 1401224
D813	7814A-000	Silicon—SLC-26VRS, US1040MTAT or ISS133T
D814	7814A-000	Silicon—SLC-26VRS, US1040MTAT or ISS133T
D815	7814A-000	Silicon—SLC-26VRS, US1040MTAT or ISS133T
D816	7814A-000	Silicon—SLC-26VRS, US1040MTAT or ISS133T
<b>Resistors</b>		
R801	7694A-000	Carbon Film 2.2K
R802	7694A-000	Carbon Film 2.7K
R803	7694A-000	Carbon Film 2.2K
R804	7694A-000	Carbon Film 2.2K
R805	7694A-000	Carbon Film 2.2K
R806	7694A-000	Carbon Film 2.2K
R807	7694A-000	Carbon Film 2.2K
R808	7694A-000	Carbon Film 2.2K
R809	7694A-000	Carbon Film 2.2K
R810	7694A-000	Carbon Film 2.2K
R811	7694A-000	Carbon Film 2.2K
R812	7694A-000	Carbon Film 2.2K
R813	7695A-000	Carbon Film 27K
R815	7712A-000	Carbon Film 100K
R816	7712A-000	Carbon Film 100K
R817	7828A-000	Carbon Film 200K
R818	7720A-000	Carbon Film 47K
R819	7720A-000	Carbon Film 47K
R820	7720A-000	Carbon Film 47K
R821	7720A-000	Carbon Film 47K
R822	7712A-000	Carbon 100K
R823	7701A-000	Carbon 10K

Schematic Symbol	NuTone Part No.	Description
<b>General</b>		
	7587A-000	Pushbutton
	7861A-000	Pushbutton
	7932A-000	Insulator
	7845A-000	Mounting Bracket L.E.D.—Single
	7846A-000	Mounting Bracket L.E.D.—Double
	7847A-000	Mounting Bracket L.E.D.—Triple
<b>Connectors</b>		
	7841A-000	Connector Base—2 Pin
	7842A-000	Connector Base—3 Pin
	7848A-000	Connector Assembly—Black
	7917A-000	Housing—7 Pin
	7101A-000	Contact
	7049A-000	Connector Assembly—Black
	7918A-000	Housing—10 Pin
	7101A-000	Contact
	7850A-000	Connector Assembly—Black
	7919A-000	Housing—9 Pin
	7101A-000	Contact
	7851A-000	Connector Assembly—Black
	7920A-000	Housing—13 Pin
	7101A-000	Contact
<b>CASSETTE/TELEPHONE AUDIO BOARD</b>		
	7646A-000	Cassette/Telephone Audio Board Assembly Complete
<b>Inductors</b>		
L601	7732A-000	Micro Inductor 3.9mH
L602	7733A-000	Micro Inductor—2 Lead 6.8mH
L603	7734A-000	Micro Inductor—3 Lead 6.8mH
<b>Transformer and Coil</b>		
T601	7735A-000	Audio Transformer
T602	7736A-000	Oscillator Coil
<b>Variable Resistors</b>		
VR601	7737A-000	Semi-Fixed 100K
VR602	7738A-000	Semi-Fixed 10K
<b>Relays</b>		
RL601	7739A-000	Relay
RL602	7740A-000	Relay
RL603	7740A-000	Relay
<b>Integrated Circuits</b>		
IC601	7744A-000	Record/Playback Amp—BA5102A
IC602	7745A-000	VOX Amp Ring Timer—NJM4558D
IC603	7745A-000	Remote Beeper Amp/Detector—NJM4558D
IC604	7746A-000	Telephone Off Hook Detector—PC733H
IC605	7747A-000	Analog Switch—MN4066B or TC4066BP
IC606	7747A-000	Analog Switch—MN4066B or TC4066BP
<b>Transistors</b>		
Q601	7748A-000	Ring Timer Driver—A733P or LA733P

Schematic Symbol	NuTone Part No.	Description
Q602	7037A-000	Ring Timer Pre-Driver—C945P or LC945P
Q603	7037A-000	Switching—C945P or LC945P
Q604	7037A-000	VOX Muting—C945P or LC945P
Q605	7037A-000	VOX Switch—C945P or LC945P
Q606	7748A-000	VOX Switch—A733P or LA733PX
Q607	7037A-000	VOX Time Constant Switch—C945P or LC945PX
C608	7037A-000	OGM #1 Erase Head Driver—C945P or LC945PX
C609	7037A-000	OGM #2 Erase Head Driver—C945P or LC945PX
Q610	7037A-000	ICM Erase Oscillator—C945P or LC945PX
Q611	7037A-000	Switching—C945P or LC945PX
Q612	7037A-000	Switching—C945P or LC945PX
Q613	7037A-000	Switching—C945P or LC945PX
Q614	7037A-000	Switching—C945P or LC945PX
Q615	7037A-000	Telephone Line Amplifier—C945P or LC945PX
Q616	7037A-000	Switching—C945P or LC945PX
Q617	7748A-000	Remote Beeper Timer—A733P or LA733PX
Q618	7037A-000	Remote Beeper Timer—C945P or LC945AP
<b>Diodes</b>		
D601	7749A-000	Silicon—US1040MTAT or ISS133T or US1040MTA or ISS133
D603	7749A-000	Silicon—US1040MTAT or ISS133T or US1040MTA or ISS133
D605	7749A-000	Silicon—US1040MTAT or ISS133T or US1040MTA or ISS133
D606	7749A-000	Silicon—US1040MTAT or ISS133T or US1040MTA or ISS133
D610	7750A-000	Zener 24V—UZ24BM
D611	7750A-000	Zener 24V—UZ24BM
D612	7750A-000	Zener 24V—UZ24BM
D613	7750A-000	Zener 24V—UZ24BM
D614	7751A-000	Silicon—SRIK-2 or 10D-1
D615	7751A-000	Silicon—SRIK-2 or 10D-1
D616	7751A-000	Silicon—SRIK-2 or 10D-1
<b>Capacitors</b>		
C601	7753A-000	Metal .27uf 250V
C602	7141A-000	Electrolytic 47uf 10V
C603	7754A-000	Electrolytic 22uf 10V
C604	7755A-000	Electrolytic 220uf 10V
C605	7756A-000	Ceramic SL 33pf
C606	7757A-000	Electrolytic .47uf 50V
C607	7757A-000	Electrolytic .47uf 50V
C608	7758A-000	Electrolytic 22uf 10V
C609	7759A-000	Electrolytic 100uf 10V
C610	7760A-000	Electrolytic 10uf 16V
C611	7761A-000	Electrolytic 1uf 50V
C612	7762A-000	Electrolytic 33uf 10V
C613	7763A-000	Mylar .001uf
C614	7762A-000	Electrolytic 33uf 10V
C615	7760A-000	Electrolytic 10uf 16V
C616	7765A-000	Mylar .018uf
C617	7766A-000	Electrolytic 4.7uf 25V
C618	7766A-000	Electrolytic 4.7uf 25V
C619	7767A-000	Mylar .0015uf
C620	7761A-000	Electrolytic 1uf 50V
C621	7768A-000	Electrolytic 100uf 16V
C622	7769A-000	Electrolytic 22uf 16V
C623	7770A-000	Ceramic 100pf

Schematic Symbol	NuTone Part No.	Description
C624	7760A-000	Electrolytic 10uf 16V
C625	7760A-000	Electrolytic 10uf 16V
C626	7760A-000	Electrolytic 10uf 16V
C627	7771A-000	Ceramic .056uf
C629	7760A-000	Electrolytic 10uf 16V
C630	7763A-000	Mylar .001uf
C631	7761A-000	Electrolytic 1uf 50V
C632	7767A-000	Mylar .0015uf
C633	7764A-000	Mylar .0015uf
C634	7768A-000	Electrolytic 100uf 16V
C635	7772A-000	Electrolytic 47uf 10V
C636	7761A-000	Electrolytic 1uf 50V
C637	7773A-000	Electrolytic .1uf 50V
C638	7760A-000	Electrolytic 10uf 16V
C639	7774A-000	Mylar .0018uf
C640	7774A-000	Mylar .0018uf
C641	7774A-000	Mylar .0018uf
C642	7775A-000	Mylar .0022uf
C643	7761A-000	Electrolytic 1uf 50V
C644	7776A-000	Ceramic .001uf
C645	7776A-000	Ceramic .001uf
C646	7777A-000	Ceramic 330pf
C647	7778A-000	Mylar .015uf
C648	7779A-000	Mylar .01uf
C649	7780A-000	Mylar .0068uf
C650	7762A-000	Electrolytic 33uf 10V
C651	7760A-000	Electrolytic 10uf 16V
C652	7773A-000	Electrolytic .1uf 50V
C653	7760A-000	Electrolytic 10uf 16V
C654	7781A-000	Ceramic 68pf
C655	7759A-000	Electrolytic 100uf 10V
C656	7760A-000	Electrolytic 10uf 16V
<b>Resistors</b>		
R601	7701A-000	Carbon Film 10K
R602	7720A-000	Carbon Film 47K
R604	7782A-000	Carbon Film 470K
R605	7720A-000	Carbon Film 47K
R606	7701A-000	Carbon Film 10K
R607	7720A-000	Carbon Film 47K
R608	7701A-000	Carbon Film 10K
R609	7712A-000	Carbon Film 100K
R610	7783A-000	Carbon Film 220K
R611	7724A-000	Carbon Film 4.7K
R612	7724A-000	Carbon Film 4.7K
R613	7784A-000	Carbon Film 4.7M
R614	7701A-000	Carbon Film 10K
R615	7701A-000	Carbon Film 10K
R616	7701A-000	Carbon Film 10K
R617	7712A-000	Carbon Film 100K
R618	7695A-000	Carbon Film 27K
R619	7688A-000	Carbon Film 1M
R620	7724A-000	Carbon Film 4.7K
R621	7782A-000	Carbon Film 470K
R622	7702A-000	Carbon Film 1K
R623	7701A-000	Carbon Film 10K
R624	7712A-000	Carbon Film 100K
R625	7701A-000	Carbon Film 10K
R626	7712A-000	Carbon Film 100K
R627	7701A-000	Carbon Film 10K
R628	7720A-000	Carbon Film 47K
R630	7694A-000	Carbon Film 2.2K
R631	7694A-000	Carbon Film 2.2K
R632	7697A-000	Carbon Film 22K
R633	7724A-000	Carbon Film 4.7K

# REPLACEMENT PARTS

Schematic Symbol	NuTone Part No.	Description
R634	7714A-000	Carbon Film 5.6K
R635	7692A-000	Carbon Film 6.8K
R636	7712A-000	Carbon Film 100K
R637	7688A-000	Carbon Film 1M
R638	7722A-000	Carbon Film 180K
R639	7701A-000	Carbon Film 10K
R640	7785A-000	Carbon Film 270K
R641	7720A-000	Carbon Film 47K
R642	7720A-000	Carbon Film 47K
R643	7712A-000	Carbon Film 100K
R644	7701A-000	Carbon Film 10K
R646	7712A-000	Carbon Film 100K
R647	7701A-000	Carbon Film 10K
R648	7700A-000	Carbon Film 120Ω
R649	7786A-000	Carbon Film 560Ω
R650	7692A-000	Carbon Film 6.8K
R651	7787A-000	Carbon Film 150K
R652	7788A-000	Carbon Film 270Ω
R653	7789A-000	Carbon Film 15K
R654	7789A-000	Carbon Film 15K
R655	7790A-000	Carbon Film 33Ω
R656	7791A-000	Carbon Film 82K
R657	7789A-000	Carbon Film 15K
R659	7701A-000	Carbon Film 10K
R660	7713A-000	Carbon Film 2.7K
R661	7701A-000	Carbon Film 10K
R662	7792A-000	Carbon Film 56K
R663	7701A-000	Carbon Film 10K
R664	7712A-000	Carbon Film 100K
R665	7702A-000	Carbon Film 1K
R666	7694A-000	Carbon Film 2.2K
R667	7701A-000	Carbon Film 10K
R668	7702A-000	Carbon Film 1K
R669	7730A-000	Carbon Film 820K
R670	7724A-000	Carbon Film 4.7K
R671	7701A-000	Carbon Film 10K
R672	7701A-000	Carbon Film 10K
R673	7720A-000	Carbon Film 47K
R674	7704A-000	Carbon Film 12K
R675	7704A-000	Carbon Film 12K
R676	7702A-000	Carbon Film 1K
R677	7701A-000	Carbon Film 10K
R678	7702A-000	Carbon Film 1K
R679	7701A-000	Carbon Film 10K
R680	7700A-000	Carbon Film 120
R681	7793A-000	Carbon Film 10
R682	7789A-000	Carbon Film 15K
R683	7706A-000	Carbon Film 100Ω
R684	7796A-000	Carbon Film 180Ω
R685	7688A-000	Carbon Film 1M
R686	7797A-000	Carbon Film 390Ω
R687	7722A-000	Carbon Film 180K
R688	7798A-000	Carbon Film 680Ω
R689	7704A-000	Carbon Film 12K
R690	7694A-000	Carbon Film 2.2K
R691	7694A-000	Carbon Film 2.2K
R692	7797A-000	Carbon Film 390Ω
R693	7797A-000	Carbon Film 390Ω
R694	7701A-000	Carbon Film 10K
R695	7701A-000	Carbon Film 10K
R696	7701A-000	Carbon Film 10K
R697	7799A-000	Carbon Film 390K
R698	7702A-000	Carbon Film 1K
R699	7800A-000	Carbon Film ¼W, 10Ω

Schematic Symbol	NuTone Part No.	Description
<b>Connectors</b>		
	7280A-000	Connector Base—2 Pin
	7317A-000	Connector Base—4 Pin
	7259A-000	Connector Base—6 Pin
	7839A-000	Connector Base—6 Pin
	7281A-000	Connector Base—7 Pin
	7295A-000	Connector Assembly
	7271A-000	Housing—7 Pin
	7101A-000	Contact
	7856A-000	Connector Assembly
	7921A-000	Housing—8 Pin
	7101A-000	Contact
<b>General</b>		
J601	7741A-000	Modular Jack
Z601	7752A-000	Surge Absorber
TF601	7743A-000	Tuning Fork—1132, 5Hz
<b>MICROPHONE BOARD</b>		
	7647A-000	Microphone Board Assembly Complete
M601	7742A-000	Microphone
<b>CASSETTE LOGIC CONTROL BOARD</b>		
	7641A-000	Logic Control Board Assembly Complete
<b>Integrated Circuits</b>		
IC701	7801A-000	Tape Function MPU—UPD7520C
IC702	7802A-000	Fast Forward/Rewind Motor Driver—BA6109
IC703	7803A-000	30/60 Second Timer/Remote Beeper Timer—NJM55560
IC704	7804A-000	Timer—NJM555D
IC705	7805A-000	Dual Flip Flop—UPD4013BC or 14013BCP
IC706	7806A-000	LED Driver—BA664
IC707	7806A-000	LED Driver—BA664
IC708	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC709	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC710	7809A-000	2 Input NOR—MC14001BCP or 14001BCP or UPD4001BC
IC711	7810A-000	2 Input OR—MC14071BCP or 14071BCP or UPD4071BC
IC712	7811A-000	Driver—IR3403
IC713	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC714	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC715	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC716	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BCP
IC717	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BCP
IC718	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BCP
IC719	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BCP
IC720	7809A-000	2 Input NOR—MC14001BCP or 14001BCP or UPD4001BCP



Schematic Symbol	NuTone Part No.	Description
IC721	7810A-000	2 Input OR—MC14071BCP or 14071BCP or UPD4071BC
IC722	7809A-000	4 Input NOR—MC14002BCP or 14002BCP or UPD4002BC
IC723	7809A-000	2 Input NOR—MC14001BCP or 14001BCP or UPD4001BC
IC724	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC725	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC726	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC727	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC728	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC729	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC730	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC731	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC732	7809A-000	2 Input NOR—MC14001BCP or 14001BCP or UPD4001BC
IC733	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC734	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC735	7808A-000	2 Input AND—MC14081BCP or 14081BCP or UPD4081BC
IC736	7810A-000	2 Input OR—MC14071BCP or 14071BCP or UPD4071BC
IC737	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC738	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC739	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
IC740	7807A-000	2 Input NAND—MC14011BCP or 14011BCP or UPD4011BC
<b>Transistors</b>		
Q701	7748A-000	Switching—A733P or LA733PX
Q702	7812A-000	Switching—C945P or LC945PX
Q703	7812A-000	Switching—C945P or LC945PX
Q704	7748A-000	Pre-Driver for Solenoid SL1—A733P or LA733PX
Q705	7813A-000	Driver for Solenoid SL1—D1189Q
Q706	7748A-000	Pre-Driver For Solenoid SL2—A733P or LA733PX
Q707	7813A-000	Driver for Solenoid SL2—D1189Q
Q708	7813A-000	Driver for Capstar Motor—D1189Q
Q709	7812A-000	Pre-Driver for Capstan Motor—C945P or LC945PX
Q710	7812A-000	Switching—C945P or LC945PX
Q711	7812A-000	Switching—C945P or LC945PX
Q712	7812A-000	Halleffects Pulse Buffer—C945P or LC945PX
Q713	7812A-000	Halleffects Switching—C945P or LC945PX
Q714	7812A-000	Switching—C945P or LC945PX
<b>Diodes</b>		
D701	7814A-000	Silicon—US1040MTAT or ISS133T
D702	7814A-000	Silicon—US1040MTAT or ISS133T
D703	7814A-000	Silicon—US1040MTAT or ISS133T
D704	7814A-000	Silicon—US1040MTAT or ISS133T
D705	7814A-000	Silicon—US1040MTAT or ISS133T
D707	7814A-000	Silicon—US1040MTAT or ISS133T
D708	7814A-000	Silicon—US1040MTAT or ISS133T

Schematic Symbol	NuTone Part No.	Description
D709	7814A-000	Silicon—US1040MTAT or ISS133T
D710	7814A-000	Silicon—US1040MTAT or ISS133T
D711	7814A-000	Silicon—US1040MTAT or ISS133T
D712	7814A-000	Silicon—US1040MTAT or ISS133T
D713	7814A-000	Silicon—US1040MTAT or ISS133T
D714	7814A-000	Silicon—US1040MTAT or ISS133T
D715	7814A-000	Silicon—US1040MTAT or ISS133T
D716	7814A-000	Silicon—US1040MTAT or ISS133T
D717	7814A-000	Silicon—US1040MTAT or ISS133T
D718	7814A-000	Silicon—US1040MTAT or ISS133T
D719	7814A-000	Silicon—US1040MTAT or ISS133T
D720	7814A-000	Silicon—US1040MTAT or ISS133T
D721	7814A-000	Silicon—US1040MTAT or ISS133T
D722	7814A-000	Silicon—US1040MTAT or ISS133T
D723	7814A-000	Silicon—US1040MTAT or ISS133T
D724	7814A-000	Silicon—US1040MTAT or ISS133T
D725	7814A-000	Silicon—US1040MTAT or ISS133T
D726	7814A-000	Silicon—US1040MTAT or ISS133T
D727	7814A-000	Silicon—US1040MTAT or ISS133T
D728	7814A-000	Silicon—US1040MTAT or ISS133T
D729	7814A-000	Silicon—US1040MTAT or ISS133T
D730	7814A-000	Silicon—US1040MTAT or ISS133T
D731	7814A-000	Silicon—US1040MTAT or ISS133T
D732	7814A-000	Silicon—US1040MTAT or ISS133T
D733	7814A-000	Silicon—US1040MTAT or ISS133T
D734	7814A-000	Silicon—US1040MTAT or ISS133T
D735	7814A-000	Silicon—US1040MTAT or ISS133T
D736	7814A-000	Silicon—US1040MTAT or ISS133T
D737	7817A-000	Silicon—SRIK-2 or 10D-1
D738	7817A-000	Silicon—SRIK-2 or 10D-1
D739	7814A-000	Silicon—US1040MTAT or ISS133T
D740	7814A-000	Silicon—US1040MTAT or ISS133T
D741	7814A-000	Silicon—US1040MTAT or ISS133T
D742	7814A-000	Silicon—US1040MTAT or ISS133T
D743	7814A-000	Silicon—US1040MTAT or ISS133T
D744	7814A-000	Silicon—US1040MTAT or ISS133T
D745	7814A-000	Silicon—US1040MTAT or ISS133T
D746	7814A-000	Silicon—US1040MTAT or ISS133T
D747	7814A-000	Silicon—US1040MTAT or ISS133T
D748	7814A-000	Silicon—US1040MTAT or ISS133T
D749	7814A-000	Silicon—US1040MTAT or ISS133T
D750	7814A-000	Silicon—US1040MTAT or ISS133T
D751	7814A-000	Silicon—US1040MTAT or ISS133T
D752	7814A-000	Silicon—US1040MTAT or ISS133T
D753	7814A-000	Silicon—US1040MTAT or ISS133T
D754	7814A-000	Silicon—US1040MTAT or ISS133T
D755	7814A-000	Silicon—US1040MTAT or ISS133T
D756	7814A-000	Silicon—US1040MTAT or ISS133T
D757	7814A-000	Silicon—US1040MTAT or ISS133T
D758	7814A-000	Silicon—US1040MTAT or ISS133T
D759	7815A-000	Zener—UZ4.3B
D760	7816A-000	Zener—UZ7.5BL
D761	7814A-000	Silicon—US1040MTAT or ISS133T
D762	7817A-000	Silicon—SRIK-2 or 10D-1
D763	7817A-000	Silicon—SRIK-2 or 10D-1
D764	7814A-000	Silicon—US1040MTAT or ISS133T
D765	7814A-000	Silicon—US1040MTAT or ISS133T
D766	7814A-000	Silicon—US1040MTAT or ISS133T
D767	7814A-000	Silicon—US1040MTAT or ISS133T
D768	7814A-000	Silicon—US1040MTAT or ISS133T
D769	7814A-000	Silicon—US1040MTAT or ISS133T
D770	7814A-000	Silicon—US1040MTAT or ISS133T
D771	7814A-000	Silicon—US1040MTAT or ISS133T
D772	7814A-000	Silicon—US1040MTAT or ISS133T
D773	7814A-000	Silicon—US1040MTAT or ISS133T
D774	7814A-000	Silicon—US1040MTAT or ISS133T

# REPLACEMENT PARTS

Schematic Symbol	NuTone Part No.	Description
<b>Capacitors</b>		
C701	7818A-000	Electrolytic 1 T 50V
C702	7779A-000	Mylar .01uf
C703	7819A-000	Ceramic .01uf
C704	7141A-000	Electrolytic 47uf 10V
C705	7820A-000	Electrolytic 220uf 10V
C706	7123A-000	Electrolytic 100uf 10V
C707	7141A-000	Electrolytic 47uf 10V
C708	7122A-000	Electrolytic 22uf 10V
C709	7763A-000	Mylar .001uf
C710	7124A-000	Electrolytic .1uf 50V
C711	7760A-000	Electrolytic 10uf 16V
C712	7821A-000	Electrolytic 1uf 50V
C713	7822A-000	Electrolytic 4.7uf 25V
C714	7822A-000	Electrolytic 4.7uf 25V
C715	7822A-000	Electrolytic 4.7uf 25V
C716	7760A-000	Electrolytic 10uf 16V
C717	7823A-000	Electrolytic 0.1uf 50V
C718	7760A-000	Electrolytic 10uf 16V
C719	7760A-000	Electrolytic 10uf 16V
C720	7141A-000	Electrolytic 47uf 10V
C721	7762A-000	Electrolytic 33uf 10V
C722	7141A-000	Electrolytic 47uf 10V
C723	7141A-000	Electrolytic 47uf 10V
C725	7759A-000	Electrolytic 100uf 10V
C726	7141A-000	Electrolytic 47uf 10V
C727	7760A-000	Electrolytic 10uf 16V
C728	7125A-000	Electrolytic .1uf 50V
C729	7125A-000	Electrolytic .1uf 50V
C730	7760A-000	Electrolytic 10uf 16V
C732	7776A-000	Ceramic .001uf
C733	7776A-000	Ceramic .001uf
C735	7108A-000	Ceramic .022uf
C736	7108A-000	Ceramic .022uf
C737	7108A-000	Ceramic .022uf
C739	7133A-000	Ceramic .001uf
C740	7133A-000	Ceramic .001uf
C741	7133A-000	Ceramic .001uf
C742	7133A-000	Ceramic .001uf
C743	7133A-000	Ceramic .001uf
C744	7114A-000	Ceramic 330pf
C745	7114A-000	Ceramic 330pf
C746	7133A-000	Ceramic .001uf
C747	7133A-000	Ceramic .001uf
C748	7133A-000	Ceramic .001uf
C749	7133A-000	Ceramic .001uf
C750	7133A-000	Ceramic .001uf
C751	7133A-000	Ceramic .001uf
C752	7133A-000	Ceramic .001uf
C753	7133A-000	Ceramic .001uf
C754	7133A-000	Ceramic .001uf
C755	7133A-000	Ceramic .001uf
C758	7133A-000	Ceramic .001uf
C759	7133A-000	Ceramic .001uf
C760	7133A-000	Ceramic .001uf
C761	7114A-000	Ceramic SL, 330pf
C762	7123A-000	Electrolytic 100uf 10V
<b>Resistors</b>		
R701	7701A-000	Carbon Film 22K
R702	7712A-000	Carbon Film 100K
R703	7702A-000	Carbon Film 1K
R704	7712A-000	Carbon Film 100K
R705	7712A-000	Carbon Film 100K
R706	7694A-000	Carbon Film 2.2K

Schematic Symbol	NuTone Part No.	Description
R707	7701A-000	Carbon Film 10K
R708	7720A-000	Carbon Film 47K
R709	7694A-000	Carbon Film 2.2K
R710	7701A-000	Carbon Film 10K
R711	7720A-000	Carbon Film 47K
R712	7824A-000	Carbon Film ¼W 1Ω
R713	7824A-000	Carbon Film ¼W 1Ω
R714	7825A-000	Carbon Film ½W 1Ω
R715	7712A-000	Carbon Film 100K
R716	7712A-000	Carbon Film 100K
R717	7701A-000	Carbon Film 10K
R718	7720A-000	Carbon Film 100K
R719	7697A-000	Carbon Film 22K
R720	7697A-000	Carbon Film 22K
R721	7789A-000	Carbon Film 15K
R722	7720A-000	Carbon Film 47K
R723	7720A-000	Carbon Film 47K
R724	7688A-000	Carbon Film 1M
R725	7720A-000	Carbon Film 47K
R726	7712A-000	Carbon Film 100K
R727	7724A-000	Carbon Film 4.7K
R729	7697A-000	Carbon Film 22K
R730	7799A-000	Carbon Film 390K
R731	7712A-000	Carbon Film 100K
R732	7720A-000	Carbon Film 47K
R733	7720A-000	Carbon Film 47K
R734	7720A-000	Carbon Film 47K
R735	7712A-000	Carbon Film 100K
R738	7697A-000	Carbon Film 22K
R739	7697A-000	Carbon Film 22K
R740	7701A-000	Carbon Film 10K
R741	7712A-000	Carbon Film 100K
R742	7712A-000	Carbon Film 100K
R743	7712A-000	Carbon Film 100K
R744	7712A-000	Carbon Film 100K
R745	7720A-000	Carbon Film 47K
R746	7720A-000	Carbon Film 47K
R747	7712A-000	Carbon Film 100K
R748	7701A-000	Carbon Film 10K
R749	7712A-000	Carbon Film 100K
R750	7701A-000	Carbon Film 10K
R751	7782A-000	Carbon Film 470K
R752	7701A-000	Carbon Film 10K
R753	7688A-000	Carbon Film 1M
R754	7699A-000	Carbon Film 3.3K
R755	7782A-000	Carbon Film 470K
R756	7699A-000	Carbon Film 3.3K
R759	7697A-000	Carbon Film 22K
R760	7701A-000	Carbon Film 10K
R761	7782A-000	Carbon Film 470K
R762	7712A-000	Carbon Film 100K
R763	7701A-000	Carbon Film 10K
R764	7783A-000	Carbon Film 220K
R765	7697A-000	Carbon Film 22K
R766	7701A-000	Carbon Film 10K
R767	7720A-000	Carbon Film 47K
R768	7712A-000	Carbon Film 100K
R769	7724A-000	Carbon Film 4.7K
R770	7724A-000	Carbon Film 4.7K
R771	7782A-000	Carbon Film 470K
R772	7694A-000	Carbon Film 2.2K
R773	7701A-000	Carbon Film 10K
R775	7701A-000	Carbon Film 10K
R776	7712A-000	Carbon Film 100K
R777	7701A-000	Carbon Film 10K
R780	7701A-000	Carbon Film 10K

Schematic Symbol	NuTone Part No.	Description
R781	7701A-000	Carbon Film 10K
R782	7783A-000	Carbon Film 220K
R783	7712A-000	Carbon Film 100K
R784	7712A-000	Carbon Film 100K
R785	7782A-000	Carbon Film 470K
R786	7699A-000	Carbon Film 3.3K
R787	7720A-000	Carbon Film 47K
R788	7724A-000	Carbon Film 4.7K
R789	7712A-000	Carbon Film 100K
R790	7701A-000	Carbon Film 10K
R791	7712A-000	Carbon Film 100K
R793	7695A-000	Carbon Film 27K
R795	7701A-000	Carbon Film 10K
R796	7712A-000	Carbon Film 100K
R797	7720A-000	Carbon Film 47K
R501	7782A-000	Carbon Film 470K
R502	7782A-000	Carbon Film 470K
R505	7782A-000	Carbon Film 470K
R506	7782A-000	Carbon Film 470K
R507	7782A-000	Carbon Film 470K
R508	7782A-000	Carbon Film 470K
R509	7783A-000	Carbon Film 220K
R510	7782A-000	Carbon Film 470K
R511	7782A-000	Carbon Film 470K
R512	7782A-000	Carbon Film 470K
R513	7783A-000	Carbon Film 220K
R514	7782A-000	Carbon Film 470K
R515	7782A-000	Carbon Film 470K
R516	7782A-000	Carbon Film 470K
R517	7712A-000	Carbon Film 100K
R518	7688A-000	Carbon Film 1M
R519	7782A-000	Carbon Film 470K
R520	7782A-000	Carbon Film 470K
R521	7782A-000	Carbon Film 1/4W 470K
R530	7704A-000	Carbon Film 1/4W 12K
R531	7704A-000	Carbon Film 1/4W 12K
R533	7701A-000	Carbon Film 10K
R534	7701A-000	Carbon Film 10K
R535	7783A-000	Carbon Film 220K
R536	7782A-000	Carbon Film 470K
R537	7782A-000	Carbon Film 470K
R538	7782A-000	Carbon Film 470K
R539	7712A-000	Carbon Film 100K
	<b>Connectors</b>	
	7317A-000	Connector Base—4 Pin
	7922A-000	Connector Base—8 Pin
	7282A-000	Connector Base—9 Pin
	7933A-000	Connector Base—10 Pin
	7924A-000	Connector Base—12 Pin
	7925A-000	Connector Base—13 Pin
	7281A-000	Connector Base—7 Pin
	<b>General</b>	
	7931A-000	Insulator 3/4 x 9
	<b>Miscellaneous</b>	
	7584A-000	Front Panel
	7585A-000	Door (Control)
	7586A-000	Door (Cassette)
	35550-000	Telephone Handset (Ref. Model No.: TEL-101-SDA)
	7587A-000	Knob—Cassette Control "A"
	6967A-000	Knob—Intercom Control

Schematic Symbol	NuTone Part No.	Description
	7861A-000	Knob—Cassette Control "B"
	6964A-000	Knob—Volume
	6966A-000	Knob—Power
	6965A-000	Knob—Slide
	7591A-000	Inlay—Switch
	7592A-000	Inlay—Cassette
	7593A-000	Inlay Intercom Control
	7594A-000	Inlay—Microphone
	49334-000	Directory Card
	43092-000	Remote Control (Ref. Model No.: IA-31RR)
	8040A-000	Cassette
	49657-000	Homeowner's Manual
	49656-000	Installation Instructions
	7305A-000	Hinge
	7040A-000	Hinge Bracket
	7308A-000	Tapping Screw (M4X14)
	7552A-000	Hardware Bag Complete
	7307A-000	Side Bracket
	7311A-000	Tapping Screw M3.5x10
	7310A-000	Tapping Screw M3.5x10
	7309A-000	Screw M3.5x20
	7553A-000	Tuner PCB Bracket
	6976A-000	Volume Knob Guide (A)
	6991A-000	Volume Guide Knob (B)
	7888A-000	Band
	7860A-000	Door Protector
	7863A-000	Door Stopper
	7868A-000	Refraction Plate
	7870A-000	Directory Card Window
	7871A-000	Timer Window
	7897A-000	Microphone Cushion
	7898A-000	Button Sealed Plate
	7894A-000	Isolation Plate
	7906A-000	Isolation Fiber (B)
	8082A-000	Hanger Strap Assembly
	7013A-000	Speaker—5" 25 ohm
	7648A-000	Telephone Jack
	7899A-000	Screw—Hexagon Head, M2.6x4
	7900A-000	Screw—Pan Head Taptite, M3x6
	7901A-000	Screw—Pan Head Taptite, M3x8
	7902A-000	Screw—Pan Head Tapping, M3.5x6
	7903A-000	Screw—Pan Head Tapping, M4x10
	7904A-000	Lug—4.2 x 7
	7905A-000	Lug—3.2 x 16
	7914A-000	Screw—Pan Head, M3.5x15
	<b>TERMINAL BOARD</b>	
	7669A-000	Terminal Board Assembly Complete
	7852A-000	Wiring Terminal
	7854A-000	Earth Lug
	7855A-000	Connector Pin
	7280A-000	2-Pin Base Post
	7317A-000	4-Pin Base Post
	7282A-000	9-Pin Base Post
	7038A-000	Isolation—N4148 or BA317 or IS2473
D401-D409		

# REPLACEMENT PARTS

## Model IR-310 Rough-In Frame

Schematic Symbol	NuTone Part No.	Description
	43079-000	Frame Assembly
	35570-000	Housing—Transformer
	08701-910	Transformer (Reference: Model 301T)
	43080-000	Cover Assembly—Transformer
	35314-000	Cover Transformer
	35446-000	Insulator
	52789-000	Screw—#6 x 3/8 COMB. PH. SLT. OV. "25"
	43012-000	F.M. Antenna Assembly Complete
	49313-000	Instruction Sheet
	49623-000	Instruction Sheet

## Model IA-31RB Remote Control

Schematic Symbol	NuTone Part No.	Description
<b>REMOTE CONTROL BOARD</b>		
	7645A-000	Remote Control Board Assembly
<b>Transistors</b>		
Q951	7037A-000	Pre-Amp Driver—LC945AP, C945P
Q952	7037A-000	Buzzer Driver—LC945AP, C945P
<b>Capacitors</b>		
C951	7141A-000	Electrolytic 10V 47uf
C952	7836A-000	Electrolytic—Mylar .0027uf
C953	7837A-000	Electrolytic—Mylar .0047uf
<b>Resistors</b>		
R951	7838A-000	Carbon 1/4W 150
R952	7728A-000	Carbon 1/4W 220
R953	7697A-000	Carbon 1/4W 22K
R954	7712A-000	Carbon 1/4W 100K
R955	7785A-000	Carbon 1/4W 270K
R956	7785A-000	Carbon 1/4W 270K
<b>General</b>		
SW951	7857A-000	Switch—Tact
SP951	7858A-000	Buzzer—Piezo
TF951	7859A-000	Tuning Fork (1132.5 Hz)
<b>Miscellaneous</b>		
	7616A-000	Housing—Remote Control
	7617A-000	Pushbutton
	7618A-000	Cover—Back
	7874A-000	Earpiece Rubber
	7876A-000	Remote Control Plate
	7878A-000	Battery Terminal A
	7879A-000	Battery Terminal B
	7880A-000	Battery Terminal C
	7881A-000	Battery Terminal D
	7882A-000	Battery Cushion
	7883A-000	M 2.6 x 10 Tapping Screw

## Model IC-301 Inside Remote Control

Schematic Symbol	NuTone Part No.	Description
	35479-000	Remote Control Panel
	42929-000	P.C. Board Assembly
R2	33082-271	Resistor—Film 1/4W. 270
R3	33082-332	Resistor—Film 1/4W. 3.3K
R4	33082-102	Resistor—Film 1/4W. 1K
C1, C2	35091-109	Capacitor 47 MFD. 16V
R1	34059-000	Potentiometer—Volume Control
SW1, SW2, SW3	34698-000	Switch—Momentary
	32558-W46	Wire Assembly—Blue
	39872-000	Terminal
	39403-000	Terminal
D1	36549-000	Diode—Rectifier
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (terminal board mounting)
	35473-000	Knob—Switch
	35506-000	Knob—Volume Control
	42899-000	Bag Assembly
	52872-000	Screw #8 x 2" PH. FILL. HD. "A"
	49269-000	Instruction Sheet

## Model IC-301W Outdoor Remote Control

Schematic Symbol	NuTone Part No.	Description
	35479-000	Remote Control Panel
	35497-000	Rain Shield
	31967-000	Cable Clamp
	42929-000	P.C. Board Assembly Complete
R2	33082-271	Resistor—Film 1/4W. 270
R3	33082-332	Resistor—Film 1/4W. 3.3K
R4	33082-102	Resistor—Film 1/4W. 1K
C1, C2	35091-109	Capacitor 47 MFD. 16V
R1	34059-000	Potentiometer—Volume Control
SW1, SW2, SW3	34698-000	Switch—Momentary
	32558-W46	Wire Assembly—Blue
	39872-000	Terminal
	39403-000	Terminal
D1	36549-000	Diode—Rectifier
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (terminal board mounting)
	35473-000	Knob—Switch
	35506-000	Knob—Volume Control
	42966-000	Envelope Assembly
	66731-039	Screw #8 x 3/4 PH. FILL. HD. "25" (mounting screws—light finish)
	35351-000	Gasket
	39890-000	Surface Mount Bezel
	49036-000	Instruction Sheet

## Model IS-305 5" Inside Speaker

Schematic Symbol	NuTone Part No.	Description
	35467-000	Remote Speaker Panel (Dark)
	35494-000	Remote Speaker Panel (Light)
	36090-000	Speaker—5"
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (speaker mounting)
	42929-000	P.C. Board Assembly Complete
R2	33082-271	Resistor—Film 1/4W. 270
R3	33082-332	Resistor—Film 1/4W. 3.3K
R4	33082-102	Resistor—Film 1/4W. 1K
C1, C2	35091-109	Capacitor 47 MFD. 16V
D1	36549-000	Diode—Rectifier
R1	34059-000	Potentiometer—Volume Control
SW1, SW2, SW3	34698-000	Switch—Momentary
	32558-W46	Wire Assembly—Blue
	39872-000	Terminal
	39403-000	Terminal
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (terminal board mounting)
	35473-000	Knob—Switch
	35475-000	Knob—Volume Control
	35506-000	Knob—Volume Control
	42930-000	Envelope Assembly (dark finish)
	42931-000	Envelope Assembly (light finish)
	52872-068	Screw #8 x 2" PH. FILL. HD. "A" (mounting screws—dark finish)
	52872-039	Screw #8 x 2" PH. FILL. HD. "A" (mounting screws—light finish)
	49249-000	Instruction Sheet

## Model IS-306 5" Portable Speaker

Schematic Symbol	NuTone Part No.	Description
	43057-000	Speaker Panel Assembly Complete
	35544-000	Speaker Panel—Desk Top
	35546-000	Panel Insert
	36133-000	Speaker
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (speaker mounting)
	42979-000	P.C. Board Assembly Complete
R2	33082-271	Resistor—Film 1/4W. 270
R3	33082-332	Resistor—Film 1/4W. 3.3K
R4	33082-102	Resistor—Film 1/4W. 1K
D1	36549-000	Diode—Rectifier
C1, C2	35091-109	Capacitor 47 MFD. 16V
R1	34100-000	Potentiometer—Volume Control
SW1, SW2, SW3	34698-000	Switch—Momentary
	32558-W46	Wire Assembly—Blue
	39872-000	Terminal
	39403-000	Terminal
AA1	32742-000	Jumper Wire (.500)
	42320-000	Connector & Cable Assembly Complete
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (terminal board mounting)
	31851-000	Cable Clamp
	35473-000	Knob—Switch
	35511-000	Knob—Volume Control
	35512-000	Inlay—Nameplate
	35510-000	Speaker Base
	39680-000	Foot Bumper
	39395-000	Screw #8 x 15/32 PH. PAN. HD. "25" (base mounting screws)
	49327-000	Instruction Sheet
	49687-000	Operator's Manual

## Model IS-308 8" Inside Speaker

Schematic Symbol	NuTone Part No.	Description
	35471-000	Remote Speaker Panel (Dark)
	35472-000	Remote Speaker Panel (Light)
	36089-000	Speaker—8"
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (speaker mounting)
	42929-000	P.C. Board Assembly Complete
R2	33082-271	Resistor—Film 1/4W. 270
R3	33082-332	Resistor—Film 1/4W. 3.3K
R4	33082-102	Resistor—Film 1/4W. 1K
C1, C2	35091-109	Capacitor 47 MFD. 16V
D1	36549-000	Diode—Rectifier
R1	34059-000	Potentiometer—Volume Control
SW1, SW2, SW3	34698-000	Switch—Momentary

Schematic Symbol	NuTone Part No.	Description
	32558-W46	Wire Assembly—Blue
	39872-000	Terminal
	39403-000	Terminal
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (terminal board mounting)
	35473-000	Knob—Switch
	35475-000	Knob—Volume Control
	35478-000	Knob—Volume Control
	42932-000	Envelope Assembly (dark finish)
	42933-000	Envelope Assembly (light finish)
	39941-068	Screw #8 x 2-1/2 PH. FILL. HD. "A" (mounting screws—dark finish)
	39941-039	Screw #8 x 2-1/2 PH. FILL. HD. "A" (mounting screws—light finish)
	49251-000	Instruction Sheet

# REPLACEMENT PARTS

## Model IS-309 5" Patio Speaker

Schematic Symbol	NuTone Part No.	Description
	35495-000	Remote Speaker Panel
	36108-000	Speaker—5" (Weatherproof)
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (speaker mounting screws)
	35497-000	Rain Shield
	31967-000	Cable Clamp
	42929-000	P.C. Board Assembly Complete (humi-sealed)
R2	33082-271	Resistor—Film 1/4W. 270
R3	33082-332	Resistor—Film 1/4W. 3.3K
R4	33082-102	Resistor—Film 1/4W. 1K
C1, C2	35091-109	Capacitor 47 MFD. 16V
R1	34059-000	Potentiometer—Volume Control
SW1, SW2, SW3	34698-000	Switch—Momentary
	32558-W46	Wire Assembly—Blue

Schematic Symbol	NuTone Part No.	Description
D1	39872-000	Terminal
	39403-000	Terminal
	36549-000	Diode—Rectifier
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (terminal board mounting)
	35474-000	Knob—Switch
	35478-000	Knob—Volume Control
	35496-000	Surface Mount Frame
	42961-000	Envelope Assembly
	52872-039	Screw #8 x 2" PH. FILL. HD. "25" (surface frame mounting)
	52807-015	Screw #6 - 32 x 1-1/4" PH. OV. HD. (speaker mounting)
	35491-000	Gasket
	49277-000	Instruction Sheet

## Model IS-304 Portable Alarm Clock Speaker

Schematic Symbol	NuTone Part No.	Description
	43055-000	Speaker Panel Assembly Complete
	35544-000	Speaker Panel—Desk Top
	35547-000	Panel Insert
	35551-000	Pushbutton—Snooze
	35521-000	Pushbutton—Time Setting
	36133-000	Speaker
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (speaker mounting)
	42989-000	P.C. Board (Snooze) Assembly Complete
	34683-000	Switch—Pushbutton
	42729-102	Ribbon Wire Assembly—2 CRKT.
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (P.C. Board [snooze] mounting screws)
	42990-000	P.C. Board Assembly Complete
D1 thru D10	36549-000	Diode—Rectifier
R2	33082-271	Resistor—Film 1/4W. 270
R4	33082-102	Resistor—Film 1/4W. 1K
R5	33082-560	Resistor—Film 1/4W. 56
R6	33082-221	Resistor—Film 1/4W. 220
R7, R12, R3	33082-332	Resistor—Film 1/4W. 3.3K
R8	33082-154	Resistor—Film 1/4W. 150K
R9, R11	33082-104	Resistor—Film 1/4W. 100K
R10	33082-682	Resistor—Film 1/4W. 6.8K
AA1	32742-000	Jumper Wire (.500)
C1, C2	35091-109	Capacitor—Electrolytic 47uf
C3, C4, C5	35091-123	Capacitor—Electrolytic 330uf
C6, C7	35100-166	Capacitor—Ceramic .01uf
Q1, Q2	36606-000	Transistor—PNP
Z1	36677-000	Integrated Circuit—Trigger
R1	34101-000	Potentiometer—Volume Control
K1	39337-000	Relay
T1	30615-000	Transformer—P.C. Mount

Schematic Symbol	NuTone Part No.	Description
SW1, SW2, SW3	34698-000	Switch—Momentary
SW4, SW5, SW6, SW7	34683-000	Switch—Pushbutton
SW8, SW9	34699-000	Slide Switch
	39897-103	Right Angle Post Header Assembly
	32558-W46	Wire Assembly—Blue
	39872-000	Terminal
	39403-000	Terminal
	32558-W4	Wire Assembly
	39872-000	Terminal
	43101-000	Connector & Cable Assembly
	39717-000	Receptacle—Pin Housing
	32785-000	Cable
	39677-000	Terminal—Pin
	39719-000	Strain Relief
	39718-000	Grommet
	52787-015	Screw #6 x 3/8 PH. PAN. HD. "B"
	36774-000	Clock Module
	35526-000	Tinnerman Clip
	L2607-015	Screw #8 x 3/8 PH. PAN. HD. "25" (clock module mounting screws)
	31851-000	Cable Clamp
	35525-000	Speaker Base
	39395-000	Screw #8 x 15/32 PH. PAN. HD. "25" (base mounting screws)
	39680-000	Foot Bumper
	35553-000	Inlay—Nameplate
	35523-000	Inlay—Plain
	35511-000	Knob—Slide Potentiometer
	35552-000	Knob—3 Position Switch
	35473-000	Knob—Switch
	49651-000	Instruction Sheet
	49685-000	Operator's Manual

## Model IS-304P Portable Alarm Clock Speaker with Telephone

Schematic Symbol	NuTone Part No.	Description	Schematic Symbol	NuTone Part No.	Description
	43056-000	Speaker Panel Assembly Complete	SW4, SW5, SW6, SW7 SW8, SW9	34683-000	Switch—Pushbutton
	35545-000	Speaker Panel—Desk Top		34699-000	Slide Switch
	35547-000	Panel Insert		39897-103	Right Angle Post Header Assembly
	35551-000	Pushbutton—Snooze		32558-W46	Wire Assembly—Blue
	35521-000	Pushbutton—Time Setting		39872-000	Terminal
	36133-000	Speaker		39403-000	Terminal
	L2607-000	Screw #8 x 3/8 PH. PAN. HD. "25" (speaker mounting screws)		32558-W4	Wire Assembly—Blue
	42989-000	P.C. Board Assembly Complete (Snooze)		39872-000	Terminal
	34683-000	Switch—Pushbutton		43101-000	Connector & Cable Assembly
	42729-102	Ribbon Wire Assembly—2 CRKT.		39717-000	Receptacle—Pin Housing
	L2607-015	Screw #8 x 3/8 PH. PAN. HD. "25" (P.C. Board [Snooze] mounting screws)		32785-000	Cable
	42990-000	P.C. Board Assembly Complete		39677-000	Terminal—Pin
D1 thru D10	36549-000	Diode—Rectifier		39719-000	Strain Relief
R2	33082-271	Resistor—Film 1/4W. 270		39718-000	Grommet
R4	33082-102	Resistor—Film 1/4W. 1K		52787-000	Screw #6 x 3/8 PH. PAN. HD. "B"
R5	33082-560	Resistor—Film 1/4W. 56		36774-000	Clock Module
R6	33082-221	Resistor—Film 1/4W. 220		35526-000	Tinnerman Clip
R7, R12, R3	33082-332	Resistor—Film 1/4W. 3.3K		L2607-015	Screw #8 x 3/8 PH. PAN. HD. "25" (clock module mounting screws)
R8	33082-154	Resistor—Film 1/4W. 150K		31851-000	Cable Clamp
R9, R11	33082-104	Resistor—Film 1/4W. 100K		35528-000	Speaker Base
R10	33082-682	Resistor—Film 1/4W. 6.8K		35507-000	Phone Jack
AA1	32742-000	Jumper Wire (.500)		39395-000	Screw #8 x 15/32 PH. PAN. HD. "25" (base mounting screws)
C1, C2	35091-109	Capacitor—Electrolytic 47uf		39680-000	Foot Bumper
C3, C4, C5	35091-123	Capacitor—Electrolytic 330uf		35553-000	Inlay—Nameplate
C6, C7	35100-166	Capacitor—Ceramic .01uf		35523-000	Inlay—Plain
Q1, Q2	36606-000	Transistor—PNP		35511-000	Knob—Slide Pot
Z1	36677-000	Integrated Circuit—Trigger		35552-000	Knob—3 Position Switch
R1	34101-000	Potentiometer—Volume Control		35473-000	Knob—Switch
K1	39337-000	Relay	49349-000	Directory Card	
T1	30615-000	Transformer—P.C. Mount	35500-000	Telephone Handset	
SW1, SW2, SW3	34698-000	Switch—Momentary	49350-000	Instruction Sheet	
			49700-000	Operator's Manual	

# CONNECTOR PIN FUNCTIONS

This section should be used with the inserted fold-out drawing: "Interconnect Schematic."

When trouble-shooting an IM-3103 Master Unit, first find the P.C. Board on the interconnect diagram, locate the pin connector, and then find the pin functions in the following list according to board number and connector number.

## AN EXAMPLE:

To troubleshoot the Tuner P.C. Board:

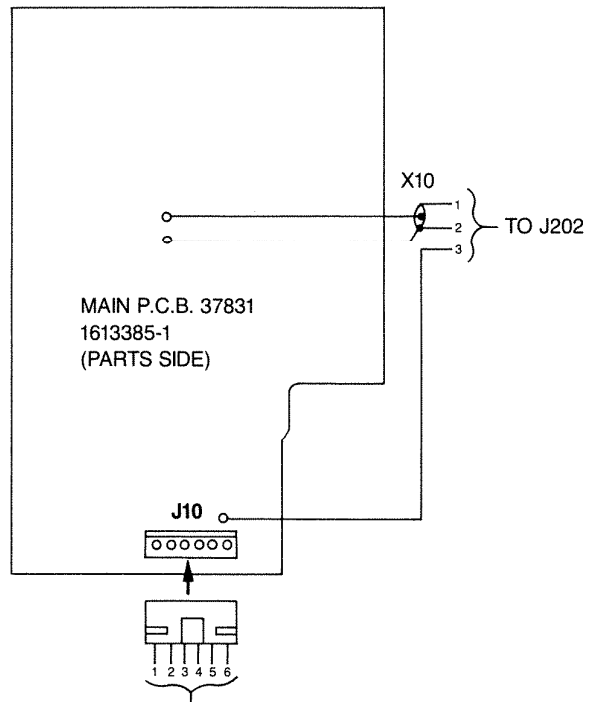
1. Find the Tuner Board on the interconnect diagram.
2. Locate J10 connector.
3. Find pin functions listed under Tuner Board—37831, J10.

### Tuner Board—37831

#### J10 (TO INTERCOM SWITCHING BOARD)

PIN	FUNCTION
1	FM AUDIO (TO INTERCOM SWITCHING BOARD)
2	AM AUDIO (TO INTERCOM SWITCHING BOARD)
3	CIRCUIT GROUND
4	B+ SUPPLY (+15V)
5	(+15V) IN FM MODE ONLY
6	(+15V) IN AM MODE ONLY

**NOTE:** The information in parenthesis ( ) denotes the *initial state* after power-up before any button is pressed.



TUNER P.C. BOARD FROM INTERCONNECT DIAGRAM

### Tuner Board—37831

#### J10 (TO X301 INTERCOM SWITCHING BOARD)

PIN	FUNCTION
1.	FM AUDIO
2.	AM AUDIO
3.	CIRCUIT GROUND
4.	(+15V) B+ SUPPLY
5.	(+15V) IN FM MODE ONLY
6.	(+15V) IN AM MODE ONLY

#### X10 (TO J202 DIGITAL DISPLAY BOARD)

WIRE	FUNCTION
1.	(+3V) FM; all others = OV
2.	CIRCUIT GROUND
3.	(+4V); all others = OV (sign wave varies with AM signal)

### Digital Display Board—37830

#### J202 DISPLAY (TO X10 37831 TUNER BOARD)

PIN	FUNCTION
1.	(+3V) FM ALL OTHERS = OV
2.	CIRCUIT GROUND
3.	(+4V) AM—ALL OTHERS = OV (SIGN WAVE VARIES WITH AM SIGNAL)



## Main Power Supply Board—37826

J901 (TO X102 CONTROL & AMP and POWER SUPPLY BOARD)	
PIN	FUNCTION
1.	CIRCUIT GROUND
2.	(19.8V) B+ SUPPLY
X901 (TO J704 MAIN POWER SUPPLY BOARD)	
WIRE	FUNCTION
1.	(+14V) TAPE POWER ON
2.	(9V) B+ SUPPLY TAPE POWER ON
3.	CIRCUIT GROUND
4.	CIRCUIT GROUND
X902 (TO J901 MAIN POWER SUPPLY BOARD)	
WIRE	FUNCTION
1.	(+14V) B+ SUPPLY
2.	(+14V) TAPE POWER ON
X903 (TO TRANSFORMER)	
WIRE	FUNCTION
1.	16vAC FROM TRANSFORMER (WHITE)
2.	16vAC FROM TRANSFORMER (RED)

## Intercom Switching Board—37829

X301 (TO J10 TUNER BOARD)	
WIRE	FUNCTION
1.	FM AUDIO (FROM TUNER)
2.	AM AUDIO (FROM TUNER)
3.	CIRCUIT GROUND
4.	(+15V) B+ SUPPLY
5.	(+15V) IN FM MODE ONLY
6.	(+15V) IN AM MODE ONLY
X304 (TO J402 TERMINAL BOARD)	
WIRE	FUNCTION
1.	DOOR CIRCUIT AUDIO IN/OUT
2.	CONTROL LINE TO TERMINAL BOARD
3.	CIRCUIT GROUND (MONITOR POSITION)
4.	CIRCUIT GROUND
X305 (TO J403 TERMINAL BOARD)	
WIRE	FUNCTION
1.	AUDIO TO REMOTE #9
2.	AUDIO OUT TO REMOTE #8
3.	AUDIO OUT TO REMOTE #6
4.	AUDIO OUT TO REMOTE #7
5.	AUDIO OUT TO REMOTE #3
6.	AUDIO OUT TO REMOTE #4
7.	AUDIO OUT TO REMOTE #5
8.	AUDIO OUT TO REMOTE #2
9.	AUDIO OUT TO REMOTE #1
X306 (TO J201 DIGITAL DISPLAY BOARD)	
WIRE	FUNCTION
1.	(+4V) PUSH TIME SET GOES TO +9V
2.	(+9V) ALL FUNCTIONS
3.	(+4V) PUSH HOUR (+9V) PUSH MINUTES (OV) (HOLD TIME SET)
4.	TIME—FREQ. GOES TOO (+12V) (DISPLAY = OV)
5.	AM (+14V)—0 ALL OTHER FUNCTIONS
6.	FM (+14V)—0 ALL OTHER FUNCTIONS

# CONNECTOR PIN FUNCTIONS

## Cassette Logic Control Board—37822

J704 (TO X901 MAIN POWER SUPPLY BOARD)	
PIN	FUNCTION
1.	(+14V) B+ SUPPLY
2.	(+9V) B+ SUPPLY
3.	PUR. SUPPLY GROUND
4.	CIRCUIT GROUND
J705 (TO X802 CASSETTE LED AND SWITCHING BOARD)	
PIN	FUNCTION
1.	(+9V) ICM RECORD/OGM 1 & 2 RECORD
2.	(+9V) ANSWER MODE
3.	(+9V) ICM RECORD/OGM 1 & 2 RECORD (TEL.)
4.	(0-9V) GOES HIGH ON (ANSWER MODE INCOMING CALL)
5.	(+9V) B+ SUPPLY
6.	(+9V) IN 305 & 605 (VOX DROPS TO 0) VOX TIME OUT
7.	(+9V) GOES LOW TO TAKE MESSAGE ICM
8.	(+9V) ICM PLAY, OGM 1 & 2 PLAY REWIND ERASE
9.	(+9V) ANSWER MODE (GOES TO 0 AFTER MESSAGE)
J706 (TO X801 CASSETTE LED AND SWITCHING BOARD)	
PIN	FUNCTION
1.	(+12V) OGM 1 & 2 RECORD
2.	(+14V) B+ SUPPLY
3.	(+12V) CH. 1 RECORD/PLAY
4.	(+12V) CH. 2 RECORD/PLAY
5.	(+12V) ANSWER MODE
6.	(+12V) ANNOUNCE ONLY MODE
7.	(+12V) REWIND ERASE MODE
8.	(+12V) OGM 1 & 2 RECORD/PLAY
9.	(12V) FAST FORWARD
10.	(+12V) ICM RECORD/PLAY REWIND/ERASE
11.	(+12V) REWIND & REWIND/ERASE
12.	(0) POWER ON (GOES TO .73V)
13.	(+12V) ICM RECORD

J707 (TO X803 CASSETTE LED AND SWITCHING BOARD)	
PIN	FUNCTION
1.	(+9V PULSE) ICM RECORD
2.	(+9V PULSE) ICM REWIND
3.	(+9V PULSE) OGM PLAY
4.	(+9V PULSE) ICM PLAY
5.	(+9V PULSE) FF ICM
6.	(+9V PULSE) OGM 1 & 2 RECORD
7.	(+9V PULSE) ANNOUNCE ONLY MODE
8.	(+9V PULSE) REWIND ERASE
9.	(+9V) WHEN STOP BUTTON DEPRESSED
10.	(+9V PULSE) ANSWER MODE
J708 (TO TAPE MECHANISM)	
PIN	FUNCTION
1.	B+ SUPPLY +9V
2.	FF/PLAY/RECORD REEL MOTOR DRIVE (ICM)
3.	B+ SUPPLY +14V
4.	(+9V) REWIND/REWIND ERASE
5.	ICM GOES LOW (+14V) PLAY/RECORD/REWIND ERASE
6.	CIRCUIT GROUND
7.	ICM (+14V) PLAY/RECORD/REWIND ERASE
8.	(+1 to +18V) ICM RECORD/PLAY
9.	(+9V) OGM 1 & 2 LED'S ON
10.	(+9V) ICM PLAY/RECORD
11.	ICM (+9V) FF/PLAY/REWIND ALL FUNCTIONS OGM
12.	(+9V) PLAY/RECORD/REWIND ERASE OGM 1 & 2 RECORD/PLAY ICM
J709 (TO TAPE MECHANISM)	
PIN	FUNCTION
1.	CIRCUIT GROUND
2.	(+14) B+ SUPPLY
3.	ICM & GND (+9V) ALL FUNCTIONS
4.	(+14V) OGM PLAY/RECORD 1-2
5.	(+9V) OGM 1 & 2 AT END TAPE
6.	OGM 1 & 2 LED'S GOES HIGH (0) PLAY/RECORD/REWIND ERASE
7.	(0) OGM 1 & 2 RECORD/PLAY GOES HIGH
8.	(0) ICM PLAY/RECORD/REWIND ERASE GOES HIGH, OGM 1 + 2 LED'S HI

# Cassette Telephone Audio Board—37828\*

J601 (TO TAPE DECK MACHINE)	
PIN	FUNCTION
1.	(+2.53V) OGM 2 RECORD (ERASE CONTROL VOLTS)
2.	(+2.53V) OGM 1 RECORD (ERASE CONTROL VOLTS)
3.	CIRCUIT GND
4.	CIRCUIT GND
5.	OGM 1 R/P HEAD AUDIO
6.	OGM 2 R/P HEAD AUDIO
J602 (TO TAPE DECK MACHINE)	
PIN	FUNCTION
1	ICM R/P HEAD AUDIO
2.	ICM R/P HEAD AUDIO
3.	CIRCUIT GND
4.	(50 K Hz) ICM Record/Rewind Erase
J603 (TO X804 CASSETTE LED AND SWITCHING BOARD)	
PIN	FUNCTION
1.	(+9) ANSWER MODE (TEL) ICM RECORD/OGM 1 & 2 RECORD
2.	(+5 TO +8) RINGER ADJUST CONTROL
3.	(+5) RINGER ADJUST CONTROL
4.	(+9V) ICM RECORD/OGM 1 & 2 RECORD (LINE)
5.	(+9V) ICM RECORD/OGM 1 & 2 RECORD (MIC)
6.	(+9V) (TEL) ICM PLAY/REWIND ERASE/OGM 1 & 2 PLAY
7.	VOX TIME OUT
J604 (TO TELEPHONE JACK BOARD)	
PIN	FUNCTION
1.	TELEPHONE LINE (TIP)
2.	TELEPHONE LINE (RING)
J605 (TO X307 INTERCOM SWITCHING BOARD)	
PIN	FUNCTION
1.	VOICE/RADIO AUDIO INPUT TO TAPE MACHINE
2.	CIRCUIT GROUND FROM INTERCOM BOARD
3.	CIRCUIT GROUND FROM INTERCOM BOARD
4.	AUDIO OUT FROM TAPE MACHINE

**\* THIS PC BOARD AND CONTROL, AMPLIFIER AND POWER SUPPLY PC BOARD BOTH HAVE THE SAME PART NO. REFER TO 7646A PC BOARD ASSEMBLY FOR SERVICING.**

X601 (TO J701 CASSETTE LOGIC CONTROL BOARD)	
WIRE	FUNCTION
1.	(+9V) OGM 2 RECORD MODE
2.	(+9V) OGM 1 RECORD MODE
3.	(+9V) ANSWER/PLAYS OUTGOING MESSAGE
4.	ICM RECORD/GOES LOW
5.	(+9V) ANNOUNCE ONLY/OGM 2 MESSAGE
6.	(+14V) SUPPLY (B+)
7.	CIRCUIT GROUND
8.	(+9V) SUPPLY (B+) TAPE DECK ON
X602 (TO J702 CASSETTE LOGIC CONTROL BOARD)	
WIRE	FUNCTION
1.	(+9V) RING (+1.5V) ANSWER—LOW
2.	(+9V) PHONE ANSWER
3.	(+9V) ICM PLAY/RECORD OGM 1 & 2 PLAY RECORD (GOES HIGH)
4.	(+9V) ICM RECORD/OGM 1 & 2 RECORD
5.	OUTPUT BEEPER DETECTOR
6.	(+9V) ANSWER/ANNOUNCE GOES LOW 6 Sec.
7.	(+14V) ICM RECORD CONTROL/ GOES LOW REWIND ERASE CONTROL
X603 (TO J703 CASSETTE LOGIC CONTROL BOARD)	
WIRE	FUNCTION
1.	(+14) ANSWERS PHONE GOES LOW
2.	(+9V) ICM PLAY/REWIND ERASE OGM 1 & 2 RECORD R/P WHEN LOW
3.	(+9V) ICM FF, REWIND, REWIND ERASE
4.	(+9V) ICM RECORD; OGM 1 & 2 RECORD
5.	(+9V) WHEN CHANNEL 1 OR 2 LED'S ON
6.	(+14V) ANSWERS PHONE GOES LOW
7.	AUDIO IN FROM TELEPHONE
X604 (TO J404 TERMINAL BOARD PHONE LINE)	
WIRE	FUNCTION
1.	TELEPHONE LINE (RING)
2.	TELEPHONE LINE (TIP)
X605 (TO MICROPHONE INPUT BOARD)	
WIRE	FUNCTION
1.	CIRCUIT GROUND
2.	MICROPHONE AUDIO

# CONNECTOR PIN FUNCTIONS

## Cassette LED And Switching Board—37824

J801 (TO J706 CASSETTE LOGIC CONTROL BOARD)	
PIN	FUNCTION
1.	(+9V) ALL FUNCTIONS ICM & OGM
2.	(+9V) ALL FUNCTIONS ICM & OGM
J802 (TO J705 CASSETTE LOGIC CONTROL BOARD)	
PIN	FUNCTION
1.	(+9V) ALL FUNCTIONS ICM & OGM
2.	NO CONNECTION
3.	(+9V) ALL FUNCTIONS ICM & OGM

## Control Amplifier And Power Supply Board—37828\*

J101 (TO X201 DISPLAY)	
PIN	FUNCTION
1.	CIRCUIT GROUND
2.	(+15V) B+ SUPPLY POWER SWITCH ON
J102 (TO X303 SWITCH P.C. BOARD)	
PIN	FUNCTION
1.	DOOR SPEAKER AUDIO LINE
2.	(+9V) E/C = 4.3V D/T = 2.2V I/P = .9V (CONTROL LINE)
3.	HANDS FREE REPLAY CONTROL (0)
4.	DOOR VOLUME GROUND CIRCUIT
5.	(+15V) B+ SUPPLY
6.	MASTER SPEAKER AUDIO
7.	MASTER SPEAKER GROUND CIRCUIT
8.	CIRCUIT GROUND
9.	AUDIO OUT/RADIO & INTERCOM
J103 (TO X302 SWITCH P.C. BOARD)	
PIN	FUNCTION
1.	PROGRAM VOLUME GROUND
2.	AUDIO IN (MONITOR POSITION)
3.	AUDIO IN FROM CHIME MODULE
4.	CHIME MODULE MUTE VOLTAGE
5.	AUDIO IN (INTERCOM I/P D/T PUSHED)
6.	AUDIO IN (PROGRAM AM, FM, PHONO, TAPE)
7.	AUDIO OUT (INTERCOM I/P, D/T PUSHED)
X101 (TO MASTER SPEAKER)	
PIN	FUNCTION
1.	CIRCUIT GROUND (WHITE)
2.	AUDIO OUTPUT (RED)

\* THIS PC BOARD AND CASSETTE/TELEPHONE AUDIO PC BOARD BOTH HAVE THE SAME PART NO. REFER TO 7667A PC BOARD ASSEMBLY FOR SERVICING.

# NuTone