

GENERAL ELECTRIC SERVICE INFORMATION

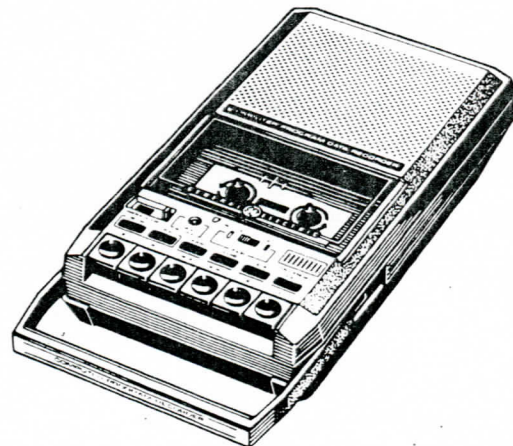
MODEL
3-5158A
PORTABLE AC/DC CASSETTE
TAPE RECORDER FOR
"HOME COMPUTER SYSTEMS"

FILE TAB 3

CAUTION: THIS MANUAL IS DESIGNED FOR USE BY QUALIFIED ELECTRONIC TECHNICIANS ONLY. CONSUMER USERS ARE URGED TO CONTACT QUALIFIED FACTORY AUTHORIZED SERVICE FACILITIES FOR REPAIRS.

FEATURES

- Keyboard type tape transport pushbutton for: Play, Record, Rewind, Fast Forward, Stop, and Eject
- Electrical pause control
- Built-in condenser microphone
- Automatic Level control (ALC) for record
- Automatic end-of-tape shut off in play and record mode
- Separate rotary volume and tone control
- Retractable carry handle
- Two-way LED indicator for: Battery condition and Record level indication
- Three digit tape counter
- Three way power: AC line cord, four "C" cell batteries (Not incl.) or External DC power (optional)
- Detachable AC line cord
- Automatic AC to DC switching when AC power cord is removed
- Optional Jack for: Microphone, Remote On-Off, Earphone, and External DC power & AC power cord



SERVICE		SPECIFICATIONS	
ELECTRICAL (B+)	6.0 Volts DC	MAX. CURRENT DRAINS:	Play 180mA
BATTERIES	1.5 Volt "C" Cell (4)	[Min. Vol., No Signal	Record 180mA
AUTO ADAPTER	5-1077	C60 Cassette installed tape	Rewind 145mA
RECORD SYSTEM	DC Bias	evenly distributed on both	Fast Forward 155mA
ERASE SYSTEM	DC	reels].	
SPEAKER IMPEDANCE	4Ω	POWER OUTPUT @ 10%	400MW
CROSS TALK	-40db Min.	THD WITH 1 KHz TEST	
PLAYBACK FREQ. RESPONSE	250 Hz - 6.3 KHz ± 6 db	TAPE	
RECORD/PLAYBACK FREQ. RESPONSE	200 - 5000 Hz ± 6 db	OPERATING VOLTAGE RANGE	4.4 to 6.9 Volts DC 105 to 130 Volts AC, 60Hz
PLAYBACK WOW & FLUTTER	.35% RMS JIS unweighed or less	TAPE SPEED	1 7/8 i.p.s. ± 3%
		SIGNAL/NOISE RATIO	-30db Min.
		ERASE RATIO	-40db Min.
		MINIMUM VOL. HUM @ 120V AC, 60Hz (line cord)	5.0W Max.

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Replacement parts maybe ordered from : General Electric Company, National Parts Distribution, P.O. Box 7025 Charlotte, N.C. 28217 or in CANADA - Canadian General Electric, 80 Bradford Street, P.O. Box 1060, Barrie, Ontario L4M5E1.

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CABINET BACK REMOVAL

1. Remove AC power cord from unit.
2. Remove battery cover and four "C" batteries.
3. Remove six (6) cabinet back mounting screws:
 - Two (2) located in battery compartment.
 - Four (4) located in screw well holes on cabinet back.
4. Remove cabinet back and carry handle.

TO SERVICE CIRCUIT BOARD

To simplify servicing, troubleshoot from the conductor side of the circuit board whenever possible using "Wiring Diagram - Bottom View". Removal of the circuit board from the tape transport may be necessary to remove a defective component from the circuit board.

1. Remove three (3) circuit board mounting screws.
2. Unsolder tape transport/circuit board grounding wire nearest D5.
3. Lift up on circuit board edge near flywheel/capstan assembly to expose component side of circuit board.

TO SERVICE TAPE MECHANISM"PARTS BELOW BASE PLATE"

1. Perform "To Service Circuit Board", steps (1-3).

"PARTS ABOVE BASE PLATE"

1. Remove cassette tape from unit.
2. Remove two (2) tape mechanism mounting screws:
 - One (1) located through access hole on circuit board near motor assembly.
 - One (1) located on motor mounting bracket between motor and AC power transformer, T1.
3. Hold circuit board between jack pack assembly and circuit board edge near motor. Lift upward to remove tape mechanism from cabinet front.

TO REMOVE CASSETTE LID

1. Depress eject button to open cassette lid and remove cassette tape.
2. Slightly compress lid near stopping posts until they are free of cabinet front.
3. Lift upward on cassette lid to remove from cabinet front.

LUBRICATION

The mechanical parts are factory coated with a thin coat of light grease and should not necessarily require further lubrication. If a light grease is applied, use caution not to get any grease on the record and erase heads, hubs, pulleys, drive belts, tape reels or selector switch. Use a good grade of lubricant such as G.E. Silicone Lube G-322L or Lubriplate (00).

SERVICE ADJUSTMENTS

Before aligning the mechanism, wipe off any dirt accumulated (with denatured alcohol) around the parts where tape contacts, and all rotating parts.
Drive belt is specially processed, do not clean with alcohol.

TO REPLACE DRIVE BELT

1. Perform "To Service Circuit Board", steps (1-3).
2. Remove thrust adjustment screw and thrust tension spring.
3. Remove old drive belt.
4. Install new drive belt.
5. Perform "Flywheel Thrust Adjustment", steps (1-4) listed below.

FLYWHEEL THRUST ADJUSTMENT

1. The clearance between the flywheel and flywheel bearing should be 0.03 - 0.35 mm with the chassis upside down.
2. While moving the capstan up and down, slowly turn the thrust adjustment screw clockwise to obtain a clearance of 0 between the thrust and flywheel. NOTE: DO NOT OVERTIGHTEN THRUST.
3. Turn thrust adjustment screw counterclockwise approximately 1/8 turn.
4. After adjustment, secure thrust adjustment screw with paint or glue.

NOTE: Be sure drive belt and drive belt surfaces are cleaned free of any lubricant.

(Refer to "Exploded View - Tape Mechanism".)

MECHANICAL TORQUES

Take-up Torque	-	40 to 70 gm-cm
Rewind Torque	-	55 gm - cm min.
Fast Forward Torque	-	55 gm - cm min.

PINCHWHEEL PRESSURE

No adjustment determined by pinchroller spring should be sufficient to give adequate and constant pull force eliminating tape "walking and wrinkling" while providing minimum current drain consistent with these objectives.

LOCKED SPINDLE TEST

Because of the difficulty of measuring actual torques in gram-centimeters, it is sometimes possible to obtain an indication of proper torque by placing the unit in each mode and grasping the driven spindle with your fingers. Look for current drain increases as follows:

Locked take-up spindle, PLAY or REC	. . .	10 to 15mA
Locked take-up spindle, FAST FWD	. . .	80 to 200mA
Locked supply spindle, REWIND	. . .	80 to 200mA

TAPE HEAD SERVICING

Any time the unit is serviced, you should demagnetize the tape heads with a commercial demagnetizer, and thoroughly clean the face of the heads, capstan, and pinchroller with denatured alcohol. Accumulation of tape oxide during normal operation can cause several problems, including loss of Highs and Wow and Flutter.

PLAY/RECORD HEAD AZIMUTH ADJUSTMENT

Adjustment of Play/Record head azimuth screw is accessible through a small access hole located between Record/Battery LED and Pause switch on cabinet front.

PLAY/RECORD HEAD AZIMUTH ADJUSTMENT (Cont'd)

1. Insert the 6 KHz section, Side 2 of Hartak Mark XII test tape or use an equivalent 6 KHz test tape.
2. Connect a VTVM with a 4Ω dummy load to the earphone jack and play back test tape.
3. The Play/Record head is aligned by turning the azimuth screw so that the indicator on the VTVM shows the highest output.
4. Secure azimuth adjustment screw with glue or paint after adjustment.

ERASE HEAD

The erase head is properly aligned when the tape rides directly between the tape guides on the head without crinkling the edges of the tape.

MAXIMUM CURRENT DRAINS

MAXIMUM CURRENT DRAINS	Play	180 mA
(Minimum volume @ no signal	Record	180 mA
conditions with C-60 tape	Rewind	145 mA
evenly distributed on both reels)	F. Fwd.	155 mA

TAPE SPEED ADJUSTMENT

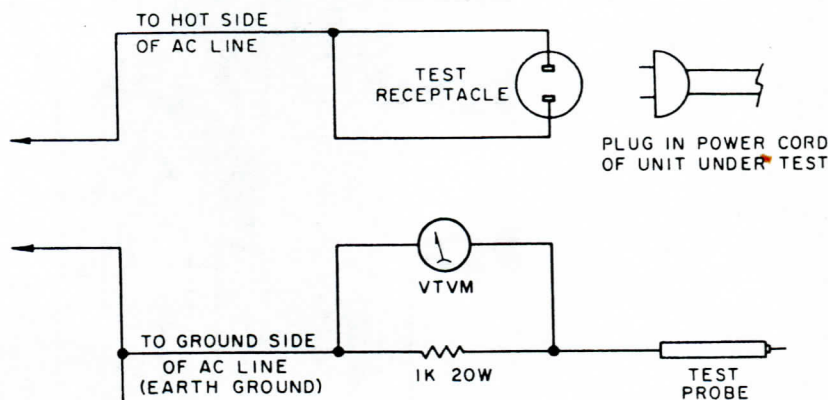
1. Perform "To Service Tape Mechanism Above Base Plate" steps (1-3).
2. Connect a frequency counter with a 4Ω dummy load to the earphone jack and play back 3 KHz section of test tape (Hartak Mark XII).
3. Insert an alignment tool and adjust the tape speed potentiometer located on bottom side of motor until the frequency counter indicates 3 KHz ± 3%.

IMPORTANT

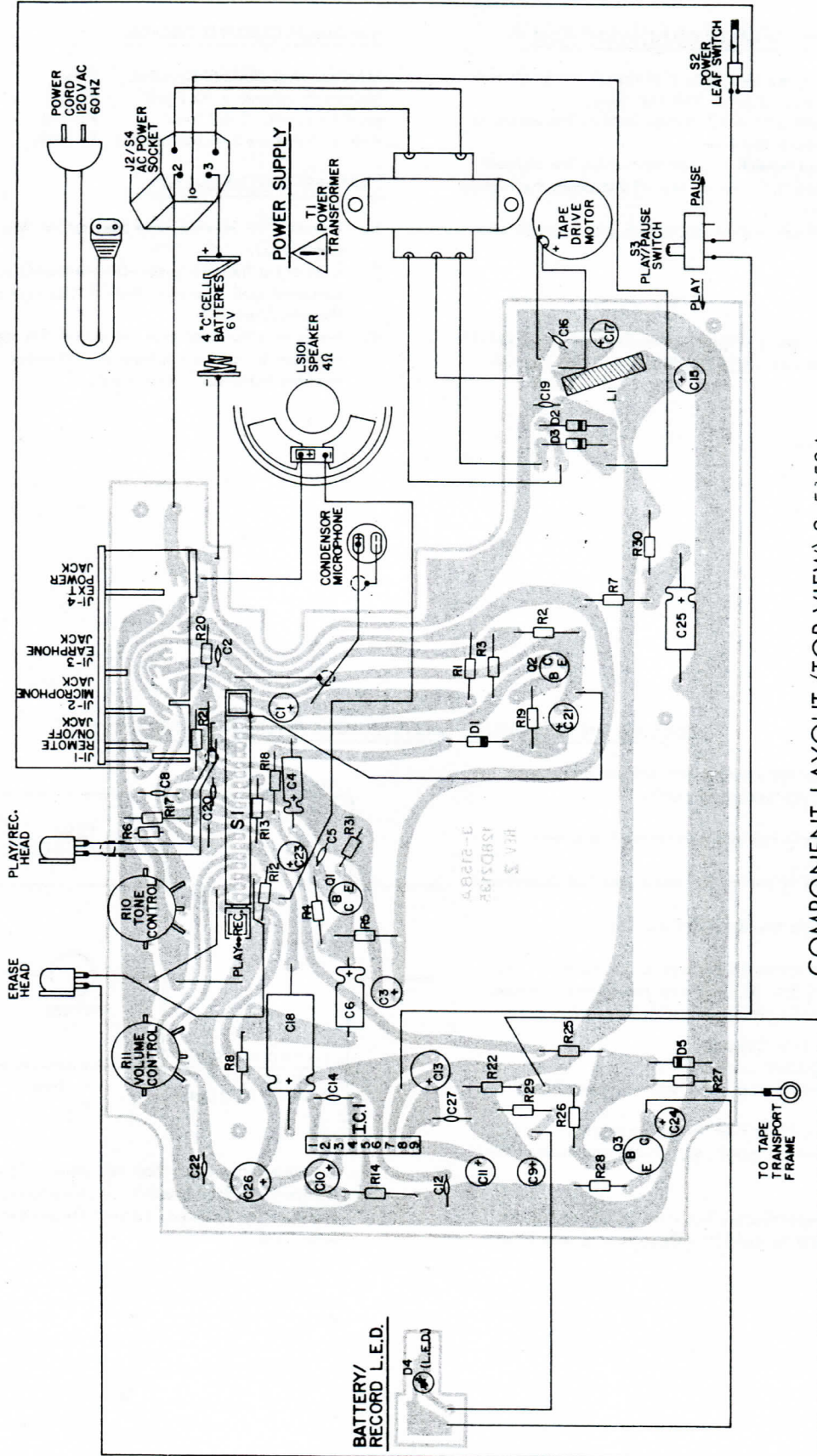
PERFORM THE FOLLOWING SAFETY CHECKS AFTER SERVICING THIS UNIT:

1. Remove all externally connected test equipment and wires before safety testing this unit.
2. Use RT6440 Safety Test Box or construct as shown.
3. Plug power cord of unit to be tested into Test Receptacle
4. Switch unit being tested to ON position.
5. Connect VTVM across 1K resistor in test circuit. Set meter on high (150V AC) scale to avoid meter damage and touch the following points with Test Probe.
 - a) Positive Battery Contact
 - b) Negative Battery Contact
 - c) Any exposed metal part of tape transport through cassette lid.
 - d) All six (6) cabinet back mounting screws.
 - e) Outer contact of earphone, remote and microphone jacks.

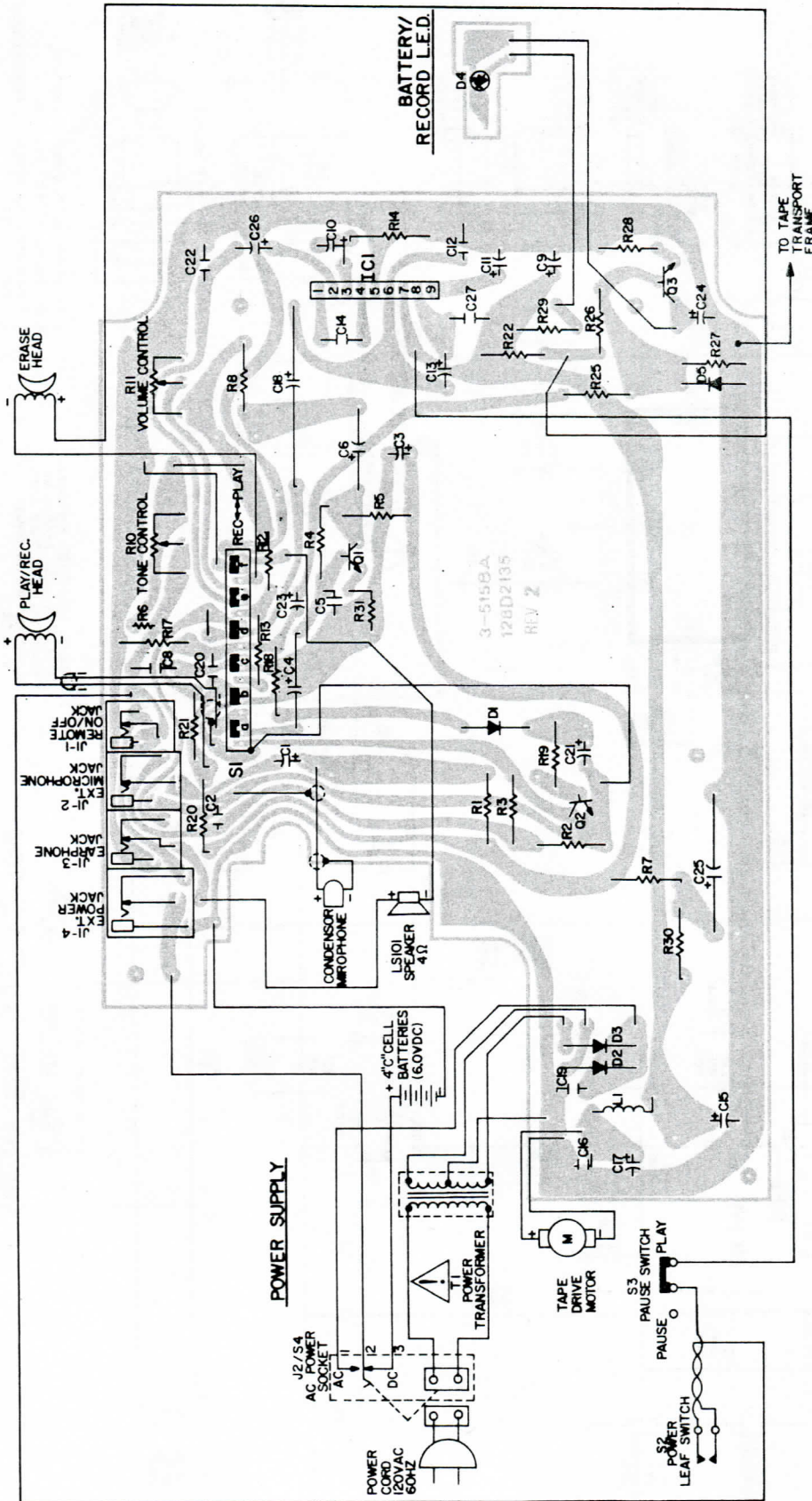
If meter reading indicates less than 3 volts on all test points, set meter to low (3V AC) scale and repeat test.



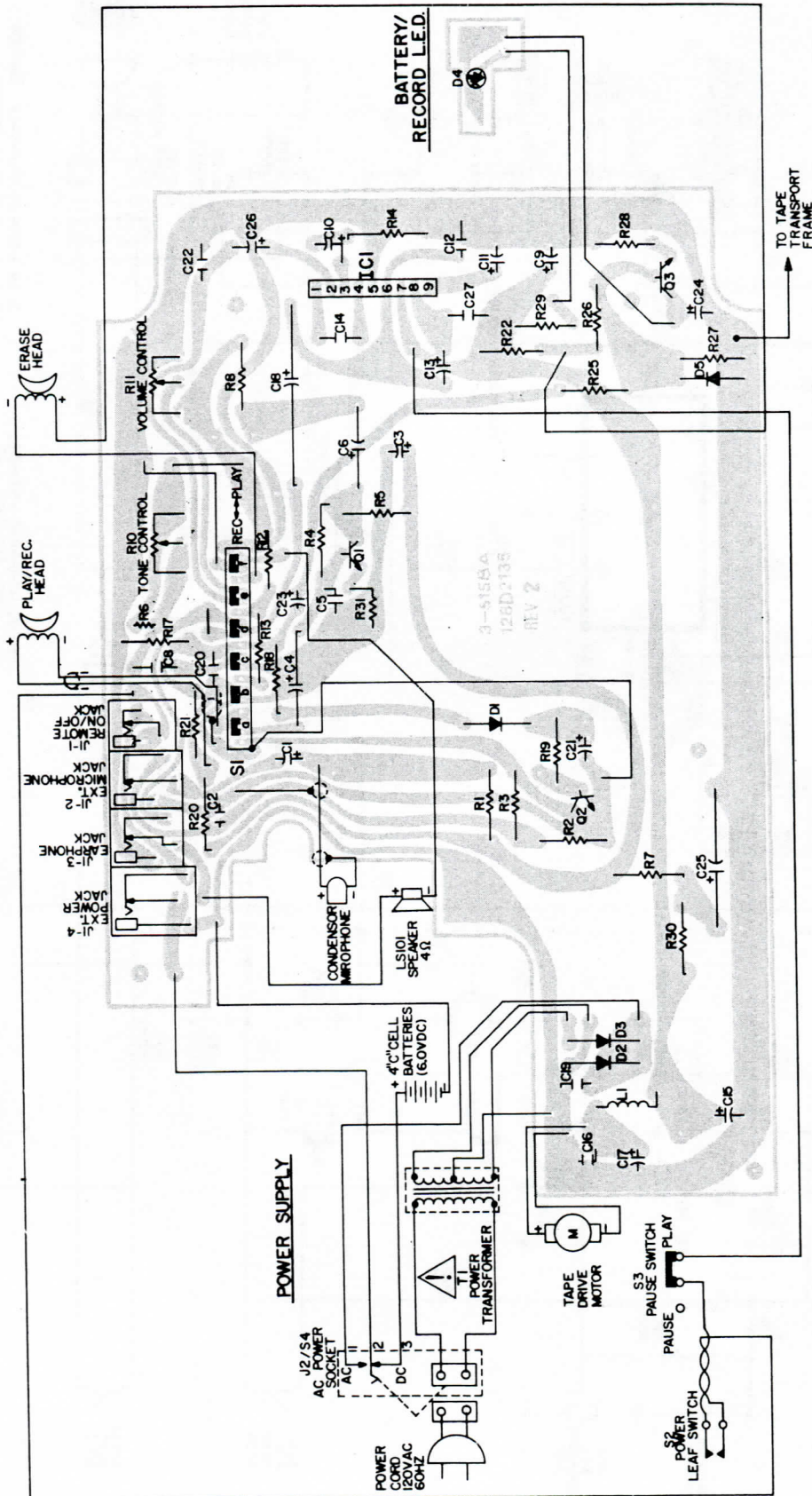
6. Any reading greater than two tenths (.2) volt indicates a potential shock hazard. If this occurs, determine the cause of the leakage, correct the problem, and repeat safety test.



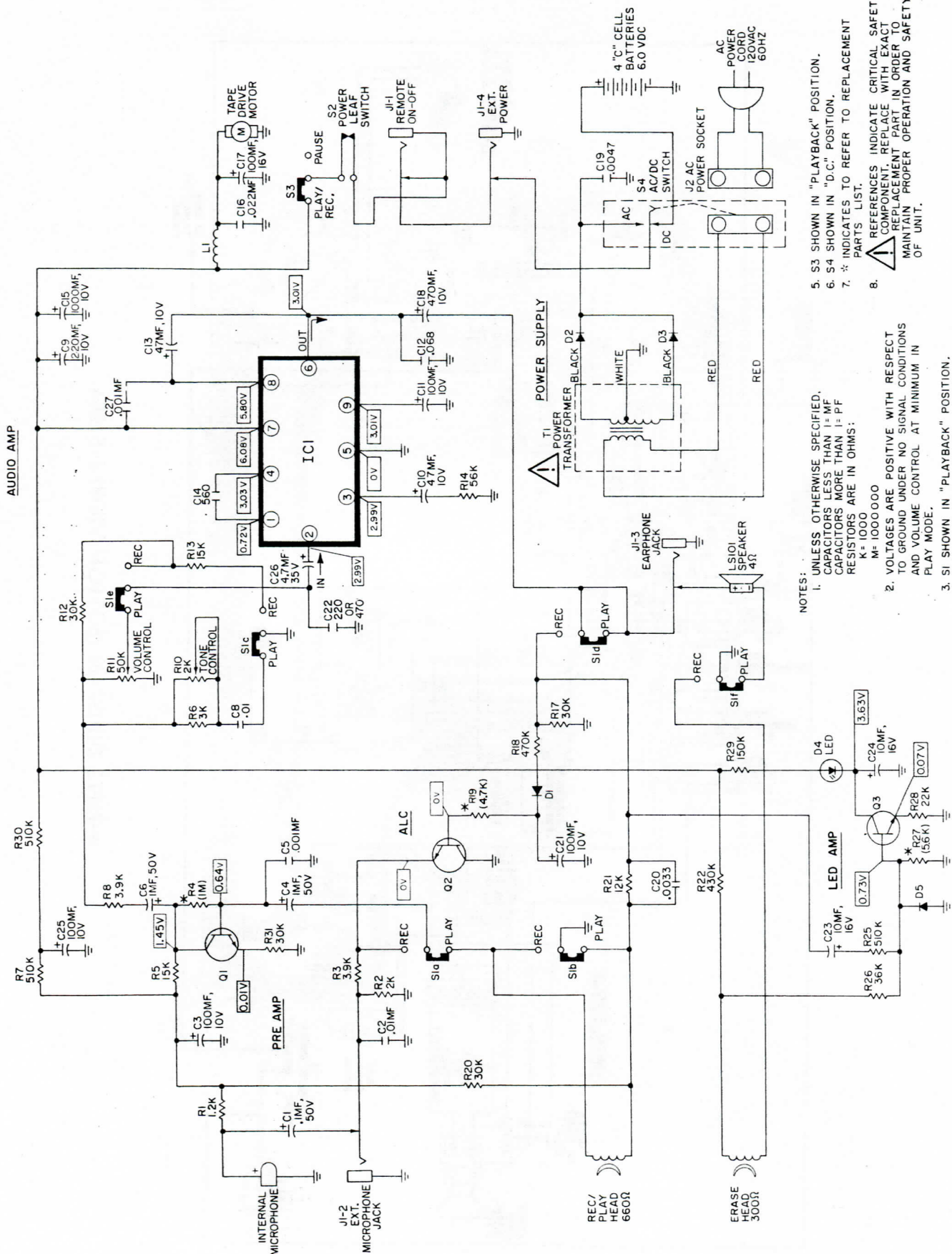
COMPONENT LAYOUT (TOP VIEW) 3-5158A



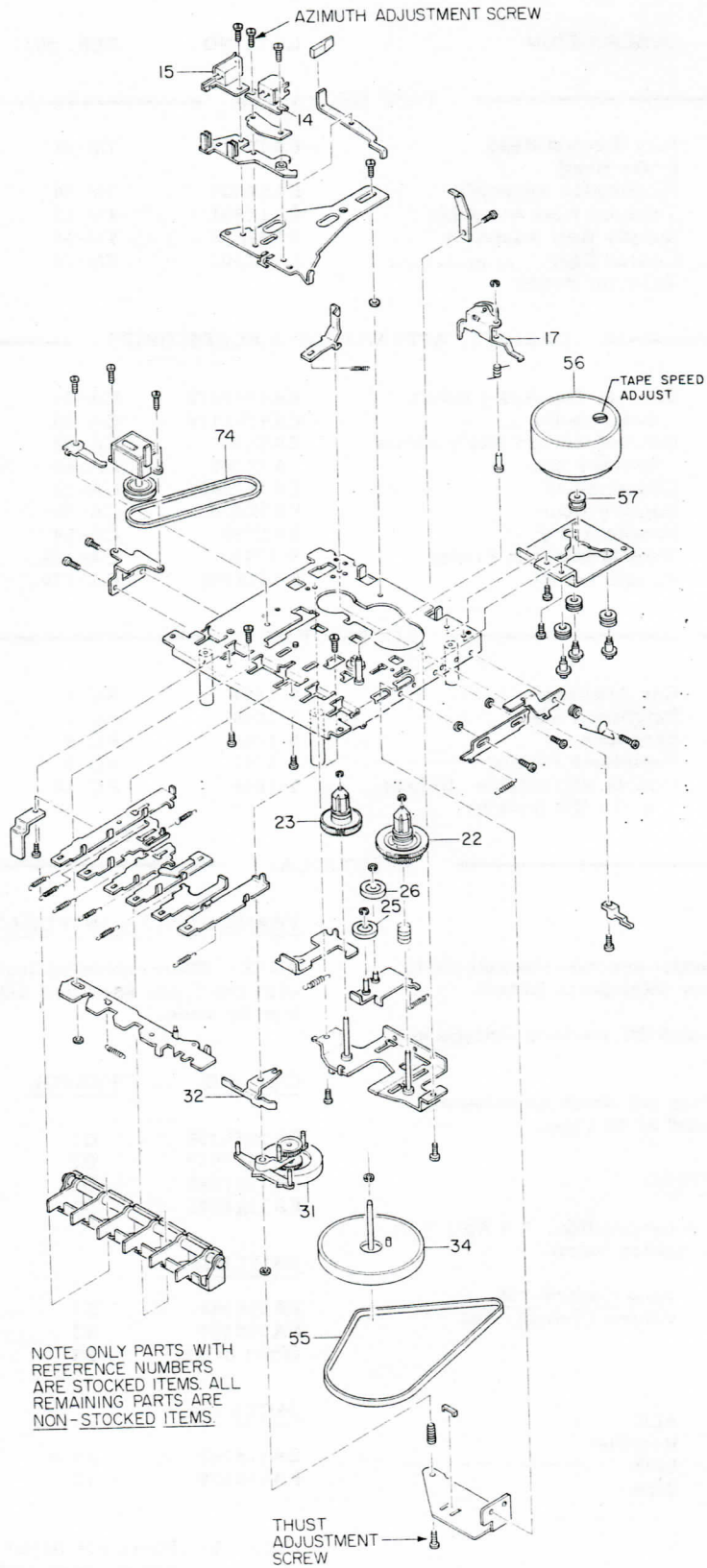
WIRING DIAGRAM (BOTTOM VIEW) 3-5158A



WIRING DIAGRAM (BOTTOM VIEW) 3-5158A



- NOTES:
- UNLESS OTHERWISE SPECIFIED, CAPACITORS LESS THAN 1 μF CAPACITORS MORE THAN 1 μF RESISTORS ARE IN OHMS: K= 1000 M= 1000000
 - VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS AND VOLUME CONTROL AT MINIMUM IN PLAY MODE.
 - S1 SHOWN IN "PLAYBACK" POSITION.
 - S2 SHOWN IN "CLOSED" POSITION.
 - S3 SHOWN IN "PLAYBACK" POSITION.
 - S4 SHOWN IN "D.C." POSITION.
 - * INDICATES TO REFER TO REPLACEMENT PARTS LIST.
 - REFERENCES INDICATE CRITICAL SAFETY COMPONENT. REPLACE WITH EXACT REPLACEMENT PART IN ORDER TO MAINTAIN PROPER OPERATION AND SAFETY OF UNIT.



EXPLODED VIEW - TAPE MECHANISM 3-5158A

REPLACEMENT PARTS LIST - MODEL 3-5158A

CAT. NO.	REF. NO.	DESCRIPTION	CAT. NO.	REF. NO.	DESCRIPTION
TAPE MECHANISM					
EA62X256	TM-14	Play/Record Head	EA5X429	TM-31	RF Clutch Ass'y w/Spring (Ref. 32)
EA62X262	TM-15	Erase Head	EA5X430	TM-34	Flywheel/Capstan
EA5X426	TM-17	Pinchroller Assembly	EA1X801	TM-55	Main Drive Belt
EA5X427	TM-22	Take-up Reel Assembly	EA72X73	TM-56	Motor w/Pulley (Ref. 57)
EA5X428	TM-23	Supply Reel Assembly	EA1X802	TM-74	Counter Belt
EA2X1271	TM-25	Center Gear			
EA2X1280	TM-26	Take-up Roller			

CABINET, APPEARANCE & ACCESSORIES

EA98X934	CA-21	Cabinet Top Ass'y minus cassette lid	EA43X1578	CA-39	Pause Knob
EA98X935	CA-25	Cabinet Bottom Ass'y minus battery door	EA43X1126	CA-40	Volume and Tone Knob
EA9X678	CA-29	Cassette Lid	EA4X907	CA-45	Built-in Microphone Insert
EA9X493	CA-30	Battery Door	EA4X908	CA-49	Cabinet Top Metal Insert
EA78X154	CA-32	Handle Ass'y	EA2X1268	CA-52	Positive Battery Contact
EA43X1591	CA-36	Tape Mechanism Knobs	EA3X470	CA-53	Negative Battery Spring
EA4X909	CA-37	Handle Insert	EA2X90	CA-54	Dual Battery Contact
			5-1723	CA-125	AC Power Cord
			EA62X258	CA-134	Internal Condenser Microphone

ACCESSORIES

5-1077	AC-1	Car Adapter	5-1057	AC-6	Footswitch
5-1051	AC-2	Patchcord Kit	5-1060	AC-7	Remote On/Off Switch
5-1082	AC-3	Earphone	5-1804	AC-8	Erase Plug
5-1056	AC-4	Telephone Pickup	3-5750	AC-9	Lightweight Stereo Headphone
5-1055	AC-5	Remote Microphone (Deluxe w/On-Off Switch)	5-1849	AC-10	1/4" Stereo Headphone Adapter

ELECTRICAL

CAPACITORS

All capacitors used in this model are non-stocked parts and maybe obtained from your local parts jobber.

Electrolitic capacitor values and DC working voltage are noted on schematic diagram.

All remaining capacitors values are noted on schematic diagram and are normally rated at 50 Volts.

RESISTORS & POTENTIOMETERS

All fixed resistors are carbon composition, 1/4 Watt @ 5% tolerance unless otherwise specified below.

EA49X578	R10	Tone Control, 2K
EA49X562	R11	Volume Control, 50K

DIODES

EA16X95	D1	ALC
EA57X14	D2,3	Rectifier
EA16X206	D4	LED
EA16X442	D5	Bias

COILS & TRANSFORMERS

EA95X161	LS101	Speaker 4 ohms, 0.75W
EA88X231	T1	AC Power Transformer

TRANSISTORS & INTEGRATED CIRCUITS

NOTE: When replacing transistors and integrated circuits with the types specified below, corresponding changes must also be made.

CAT. NO.	SYMBOL	COMPONENT CHANGES
EA15X4335	Q1	R4 (1M)
EA15X5939	Q2	R19 (4.7K)
EA15X7595	Q3	R27 (5.6K)
EA33X8505	IC1	None

SWITCHES

EA39X368	S1	Play/Record Switch
EA39X380	S3	Play/Pause Switch
(Part of J2)	S4	AC/DC Switch

JACKS

EA41X262	J1-4	Jack Assembly
EA41X270	J2	AC Power Socket

- Note:
- Parts not listed or listed without catalog numbers are non-stocked items.
 - Parts marked with Δ are important for maintaining the safety of the set. Be sure to replace these with only specified ones for maintaining th safety and performance of the unit.
 - AC, CA, and TM references are for factory use only.

GENERAL ELECTRIC

AUDIO SERVICE SUPPLEMENT

MODEL
3-5158A
PORTABLE AC/DC
CASSETTE TAPE
RECORDER FOR "HOME
COMPUTER SYSTEMS"

FILE TAPE 3

THIS SUPPLEMENT CONTAINS UPDATED OR ADDITIONAL REPLACEMENT PARTS & SERVICE INFORMATION.
FILE AHEAD OF THE SERVICE MANUAL FOR THIS MODEL.

I. FM RF INTERFERENCE IN RECORD MODE

On units returned for service or Customer Experiences FM RF Interference in record mode, the modification below will eliminate this problem.

Solder the following capacitor to conductor side of circuit board.

1. 270pF, 50 ceramic capacitor exactly between collector and emitter of Q2.

II. PART LIST ADDITIONS

CAT. NO.	REF. NO.	DESCRIPTION
EA5X594	TM-21	Reel Rest Ass'y
EA5X720	TM-73	Counter
EA67X106	AC-11	Interface Cable for T199/4A Computer

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AUDIO

SERVICE SUPPLEMENT

MODEL
SERIES
MOUNTING
CIRCUIT
SPEAKER
COMPUTER SYSTEMS

THIS SUPPLEMENT CONTAINS THE LATEST SERVICE INFORMATION FOR THE MODEL
SERIES OF THE SERVICE SUPPLEMENT FOR THE MODEL

REVISIONS TO THIS SUPPLEMENT

The data contained in this supplement is subject to change without notice. The information in this supplement is for reference only and should not be used as a substitute for the original service manual.

For more information, contact your nearest General Electric representative.

REVISIONS TO THIS SUPPLEMENT

REVISION NO.	DATE	DESCRIPTION
1	1-65	Initial Issue
2	3-65	Added Section 1.1
3	5-65	Revised Section 2.2
4	7-65	Added Section 3.3
5	9-65	Revised Section 4.4

GENERAL ELECTRIC SERVICE INFORMATION

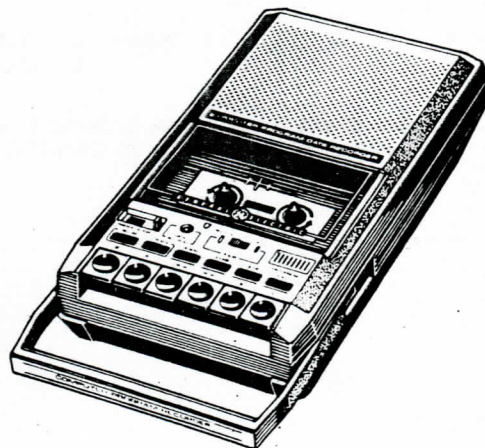
MODEL
3-5158B
PORTABLE AC/DC CASSETTE
TAPE RECORDER FOR
"HOME COMPUTER SYSTEMS"

FILE TAB 3

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BATTERIES	1.5 Volt "C" Cell (4)	POWER OUTPUT @ 10% THD WITH 1 KHz TEST TAPE	400MW
AUTO ADAPTER	5-1077	OPERATING VOLTAGE RANGE	4.4 to 6.9 Volts DC 105 to 130 Volts AC, 60Hz
RECORD SYSTEM	DC Bias	TAPE SPEED	1 7/8 i.p.s. ± 3%
ERASE SYSTEM	DC	SIGNAL/NOISE RATIO	-30db Min.
SPEAKER IMPEDANCE	4Ω	ERASE RATIO	-40db Min.
CROSS TALK	-40db Min.	MINIMUM VOL. HUM @ 120V AC, 60 Hz (line cord)	5.0W Max.
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RECORD/PLAYBACK FREQ. RESPONSE	200 - 5000 Hz ± 6 db		
PLAYBACK WOW & FLUTTER	.35% RMS JIS unweighed or less		

General Information: Model 3-5158B is identical to 3-5158A with exception of appearance features [see reverse side of this sheet for unique replacement parts list]. All remaining parts, as well as electrical, mechanism and layout construction are the same as those used in Model 3-5158A. Refer to service manual 3-5158A Pub. No. 37-8000-83 when servicing this model.

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UNIQUE REPLACEMENT PARTS LIST MODEL 3-5158B

CAT. NO.	REF. NO.	DESCRIPTION
CABINET & CHASSIS		
EA98X1052	CA22	Cabinet Top ass'y w/ Pause Knob [CA39] LED Reflector [CA42] Cassette well insert [CA43] Positive battery terminal [CA52] Speaker grille scrim [CA59] Cabinet top insert [CA136] Insert [CA138]
EA98X1053	CA24	Cabinet bottom ass'y.
EA9X741	CA27	Cassette lid
EA78X163	CA38	Handle

- Note: 1. "CA" references are for factory use only.
2. Unique parts not listed are non-stocked items.

Replacement parts maybe ordered from: General Electric Company, National Parts Distribution, P. O. Box 7025 Charlotte, N.C. 28217 or in CANADA - Canadian General Electric, 80 Bradford Street, P. O. Box 1060, Barrie, Ontario L4M5E1.

