

Field Service  
Manual



410 PROGRAM  
CASSETTE RECORDER



A Warner Communications Company

Printed in U.S. America

ATARI, Incorporated  
May 1982

FD100004

**COPYRIGHT © 1982 BY ATARI, INC. ALL RIGHTS RESERVED.**

No part of this publication may be reproduced by any mechanical, photographic, or electronic process, or in the form of a phonographic recording, nor may it be stored in a retrieval system, transmitted, or otherwise copied for public or private use, without permission from the publisher.

The Atari 410 Program Cassette Recorder, all graphic designs, this technical manual, its accompanying schematic diagrams, and the troubleshooting guide are protected by the new Copyright Act of 1976.

This Act provides for increased penalties for violating federal copyright laws. Courts can impound infringing articles while legal action is pending. If infringers are convicted, courts can order destruction of the infringing articles.

In addition, the Act provides for payment of statutory damages of up to \$50,000 in certain cases. Infringers may also have to pay cost and attorneys' fees, fines up to \$25,000, and face an imprisonment of up to one year.

Atari will aggressively enforce its copyrights against any infringers.

Published By:  
**ATARI, INC.**  
1265 Borregas Avenue  
P.O. Box 427  
Sunnyvale, California 94086

**ATARI 410 PROGRAM CASSETTE RECORDER**

**FIELD SERVICE MANUAL**

ATARI believes that the information described in this manual is accurate and reliable, and much care has been taken in its preparation. However, no responsibility, financial or otherwise, shall be accepted for any consequences arising out of the use of this material. Information contained herein is subject to change. Revisions may be issued to advise of such changes and/or additions.

Correspondence regarding this document should be forwarded to Manager of Technical Support, Consumer Product Service, ATARI, Incorporated, 1312 Crossman Road, Sunnyvale, CA 94086, U.S. America.

## TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
INTRODUCTION		iii
I	TOOLS/MAINTENANCE <ul style="list-style-type: none"><li>● Tool Requirements</li><li>● Maintenance Aids/Areas</li></ul>	1-1 1-1
II	THEORY OF OPERATION <ul style="list-style-type: none"><li>● Data Circuit</li><li>● Motor Control</li></ul>	2-1 2-2
III	PROGRAM CASSETTE RECORDER TEST <ul style="list-style-type: none"><li>● Test Tape</li></ul>	3-1
IV	HEAD ALIGNMENT <ul style="list-style-type: none"><li>● Adjustment/Test Points for Read/Record Head</li></ul>	4-1
V	TEST POINTS <ul style="list-style-type: none"><li>● Operation Amplifer LM324</li><li>● Transistor Array LM3086N</li><li>● Motor Control<ul style="list-style-type: none"><li>Switch S101-S102</li><li>Motor Slow</li></ul></li></ul>	5-1 5-1 5-1
VI	PART NUMBER DESCRIPTION <ul style="list-style-type: none"><li>● All Components on PCB</li></ul>	6-1
VII	SCHEMATICS <ul style="list-style-type: none"><li>● Transtek</li></ul>	7-1

## ATARI 410 RECORDER SERVICE INFORMATION

### INTRODUCTION

The purpose of this package is to aid you at the Regional and Independent Service Center to perform component level repairs on the ATARI 410 Cassette Recorder.

The Test sequence provides you with areas that can be easily and efficiently checked, with a minimum amount of time. However, they do not check everything on the board, but they do allow you to isolate the problem to a specified area.

Prior to troubleshooting the 410 Recorder, you should always make sure the PLAYBACK/RECORD Head is properly cleaned, all mechanics are in good working order, and belts are not loose or worn.

## SECTION I

### Tools/Maintenance

#### Tool Requirements

- 1 Standard Tool Kit
- 1 Digital Voltmeter
- 1 Oscilloscope

#### Maintenance

- Isopropyl Alcohol - For cleaning PLAYBACK/ RECORD head
- Cotton Swabs\*

\*Recommend the use of swabs that are 100% lint free. DO NOT use Q-Tips.

#### Maintenance Areas

- |   |   |
|---|---|
| 1. Dirty Drive Roller                           | Clean with Tetrachloride cleaning fluid.  |
| 2. Stretched Belts                              | Check and replace as needed. Most frequent failure occurs with the counter belt.  |
| 3. Playback/Record Head                         | Worn Head<br>Broken or frayed wires from head-<br>this causes intermittent problems.<br>Do not clean with cleaning fluid.     |
| 4. Cold Solder Joints<br>Broken or Frayed Wires | Possible on components or wiring - do not over look this as a potential problem if everything checks okay or is intermittent. |

5. Motor

Since there is no maintenance or lubrication on the motor, this entry is for your information only.

The motor, along with, Drive Roller and stretched belts can create flutter and wow (slow sounds, errors, etc.)

## SECTION II

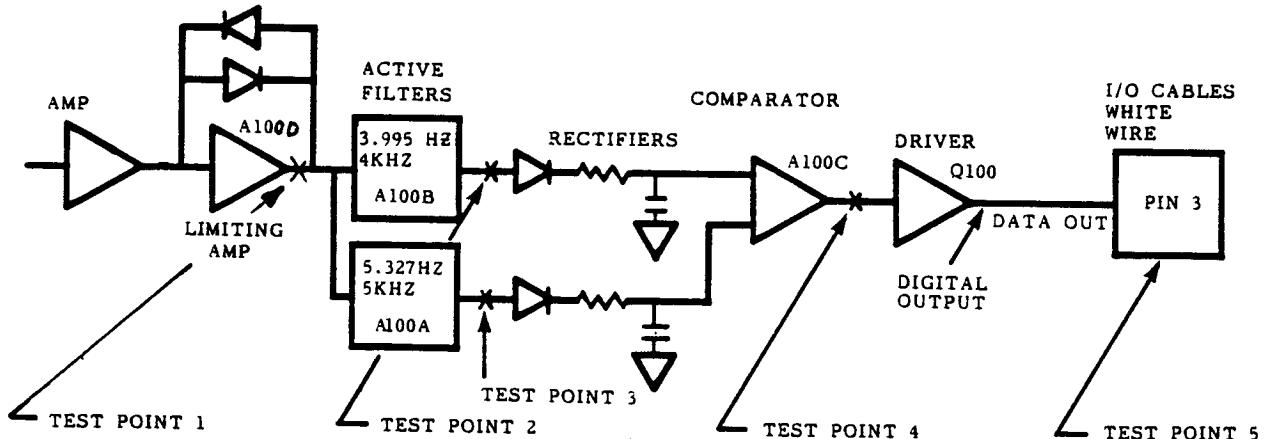
### Theory of Operation

#### Circuit Data Out

The 410 uses an active Filter Network which segregates the frequency encoded data into a comparator (A100C) which generates digital data.

The signals from the READ Head are amplified and applied to a high gain limiting amplifier (A100D). From the limiting amplifier, the signals are applied to two Multi-Pole Active Filters (A100A, A100B) which allow differing outputs as a function of frequency. Rectification and simple filtering of the Active Filter outputs place a pseudo DC input to either side of a comparator. Finally, the output of the comparator is filtered and applied to a Driving Transistor Inverter (Q100), which drives the Data Line to the computer.

Note that the 410 receives its Motor Control power (+5v) from the Motherboard of the 400 or 800 computer it is connected to.

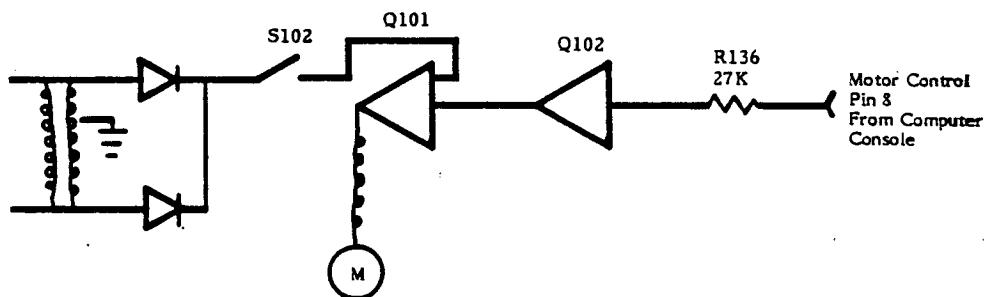


### Motor Control Operation

The Motor Control Line, Pin 8, of the Serial Bus Connector is in a low state upon power up of the system. It is connected to Q102 of the 400 Motherboard and Q107 of the 800 Motherboard. This in turn goes to Q101 and Q102 (Motor Control Circuit) on the 410 PCB.

S101 is activated by the REWIND/FAST FORWARD buttons or when Q102 is switched ON by a high on the Motor Control Line from the 400/800 Computer Console.

The primary motor control switch, S102, is activated when the PLAY/PLAY-RECORD buttons are pressed or when Q101 is activated by Q102.



### SECTION III

#### ATARI 410 Program Cassette Recorder Test

Equipment Needed:

**Working Atari 400 or 800 Computer  
BASIC Cartridge  
Atari Test Tape or States/Capitals Cassette  
Blank Cassette Tape**

The 410 Program Cassette Recorder Test procedure may only be used with a known-good computer. Make sure the Atari 400/800 Computer has been checked out using the proper test procedures for that unit.

The checkout procedure are as follows:

1. Examine cassette deck for physical damage such as frayed cords or broken parts.
2. Hook up Atari 410 to computer as shown in owner's manual.
3. Turn on computer with BASIC cartridge plugged in.
4. Insert and rewind Test Tape (Side 1 up).
5. Press **PLAY** button on Atari recorder.
6. Type **CLOAD** and press **RETURN**.
7. A beep should sound from the keyboard speaker; if not, make sure that you --
  - a. Typed in the word correctly.
  - b. Have a good BASIC cartridge plugged in.
  - c. Have a properly functioning computer.
8. Press **RETURN** to start the loading of the test program. The cassette deck should run for approximately 45 seconds.

If during this time **ERROR-138** appears, rewind the Test Tape, and advance it to a tape counter reading of 15 and go to Step 5.

If any other **ERROR** appears, start the test over from Step 3.

If the unit **ERRORS** twice, the Atari 410 is defective.

9. When **READY** appears below the word CLOAD, type **RUN** and press **RETURN**.
10. Follow the steps on the screen -- at completion of each step -- press **RETURN**.

**THE FOLLOWING STEPS ARE PRINTED FOR REFERENCE PURPOSES**

Test program loaded correctly.

1. Rewind and remove test tape.
2. Insert and rewind blank tape.
3. Simultaneously press **RECORD** and **PLAY** buttons.

At this point, the computer beeps twice, if not -- see Step 7.

4. Press **RETURN** to tape test information.

The cassette deck runs for approximately 45 seconds. If an **ERROR** appears -- cassette deck is defective.

5. Rewind blank tape.
6. Press **PLAY** button.
7. Press **RETURN** to load information from tape.

If **ERROR** message appears -- cassette deck is defective.

When **READY** appears at bottom left of screen, type **RUN** and press **RETURN**.

If CASSETTE TEST PROGRAM does NOT start, cassette deck is defective.

If CASSETTE TEST PROGRAM does start, cassette deck is in good working condition.

This completes the test of the Atari 410 Program Recorder.

## SECTION IV

### Head Alignment

<u>Sequence</u>	<u>Test Point</u>	<u>Reading</u>
1	A101D - Pin 11 (Ground I/O Cable Pin #4)	50MV P-P*
	<b>CAUTION:</b> Prior to making Head Alignment adjustments check for a dirty or worn head, broken head leads and cold solder joints on the PCB.	
2*	Using a scope or DVM, adjust the head-screw, up or down to achieve a minimum signal of 50MV P-P. This signal should be a minimum acceptable level.	
	<b>NOTE:</b> A DVM will have a slower response time. The scope or DVM should have the highest input impedance possible in order for this measurement to be meaningful. Input impedance of 1M ohm is preferable. The test equipment should be on AC and AC coupled mode if available on unit.	
3	If proper reading cannot be obtained, replace the head. However, do not overlook A101 as a possible cause. Also recheck head cables, the wires could be broken inside.	Error codes 138, 140, and 143 cannot be traced to a specific machine problem. Possible causes for these codes can include, the unit is a PAL, a defective ROM, the tape is dirty, the heads are dirty, loose belts, a cold solder joint, a broken head cable, etc.

<u>Sequence Motor</u>	<u>Mode</u>	<u>Reading**</u>
1. Pin 8 I/O Cable  Input from Computer Console. PLAY switch pushed down S102 normally open should closed.	Static*	0.80 VDC
	Input to Motor	4.80 VDC
2. Collector of Q102  Input from Computer Console. PLAY switch pushed down - S102 normally open must be closed.	Static*	4.95 VDC
	Input to Motor	1.65 VDC
3. Q101 Collector  PLAY switch pushed down S102 normally open must be closed.	Static*	0.00 VDC
	Input to Motor	5.95 VDC

\*Static indicates the motor is not running/no input at the motor control terminal, Pin 8 on the 410 PCB. The I/O cable is referenced as ground.

\*\*\*Reading indicates voltage can vary by  $\pm .5$ VDC when the diagnostic tape is running through the 410.

#### Slow Motor

<u>Symptom</u>	<u>Test Point</u>	<u>Problem</u>
With the scope, emitter voltage, waveform should be a full wave.	Emitter	Q101
If Q101 does not have a full wave.	Emitter	CR104/CR105
Base input, should be steady voltage.	Base	Q101
Excessive ripple - could be 400/800 motor control signal - Q102 on 400 Motherboard and Q107 on 800 Motherboard.	N/A	Q102
If voltage is higher than it should be, then replace Q102.	N/A	Q102 Base or Collector
If all above check out to be OK. Replace Motor.	N/A	Replace

### Switch Maintenance

Switch S102 normally open must be closed in order to operate motor in PLAY mode. Need not be closed in REWIND/FAST FORWARD. Switch S101 is used for REWIND/FAST FORWARD.

Switch S100 is used for RECORD/PLAY BACK and will create an occasional problem; usually dirty contact can be cleaned with contact cleaner.

## SECTION V

### ATARI 410 Cassette Test Points

The Test Points are read with a Fluke 8022B, 20 VDC scale. The Test Points provide both a static check and an operational (Output) check. The static mode indicates no operational switches are pushed down - only power is applied to machine. Output indicates that the tape is running. Reading indicates that voltage may vary,  $\pm .5$  VDC. Reference all readings to I/O cable Pin #4 (ground).

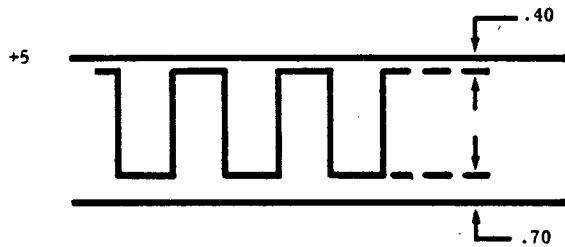
#### Data Out

<u>Sequence</u>	<u>Test Point</u>	<u>Mode</u>	<u>Reading</u>
1	A101D - Pin 11	Static	.07 VDC (near ground)
	If no reading replace I/C LM 3086	Output	3.59 VDC
2	A100A - Pin <u>1</u> *	Static	.13 VDC (near ground)
		Output	1.95 VDC
3	A100B - Pin 7*	Static	.13 VDC (near ground)
		Output	1.95 VDC
4	A100C - Pin 8	Static	0.00 (near ground)
		Output	Varies**
5	Pin 3 - I/O Cable (white wire)	Static	4.69 VDC
		Output	Varies**

\*Both Pin 1 and Pin 7 should show some type of output, if one pin does not show some type of output, replace I/C LM 324.

\*\*Digital Output

Typical waveform showing a ground and +5 reference for scope. Scope is set on DC. With a Test Tape it will be easy to see, with an educational Tape Sync it is difficult.



#### Data In

<u>Sequence</u>	<u>Test Point</u>	<u>Mode</u>	<u>Reading*</u>
1	Pin 5 - I/O Cable	Static Input	.015 1.97/AC

\* $\pm .5$ VAC with a tone

If input okay at Pin 5 - check  
PLAYBACK/RECORD head for broken  
wires, etc.

#### Audio Out

<u>Sequence</u>	<u>Test Point</u>	<u>Mode</u>	<u>Reading*</u>
1	A101B - Pin 5	Output from PB Head	1.0 VDC
2	A101C - Pin 8	Static Output	.08 VDC Varies
3	A101A - Pin 1	Static Output	.08 VDC 2.68 VDC
4	Pin 11 - I/O Cable	Static Output	4.92 VDC 4.90 VDC

\* $\pm .5$ VAC with a tone

## SECTION VI

### ATARI 410 CASSETTE RECORDER SORTED BY ASSY.

<u>ASSY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>LOCATOR</u>
Final	CAO15368	Final Assy (Transtek)	
Main	FC 100018	Cap. Elec Radial 220UF (16V)	C126
Main	FC 100019	Diode 1S2076	CR100,101,102,103
Main	FC 100020	Inductor 100UH	L101
Main	FC 100022	Switch	S100
Main	FC 100021	Switch	S101,S102
Main	FC 100023	Transistor 2SA755	Q101
Main	FC 100024	Transistor 2SC1815	Q100,102
Main	14-5102	Resistor 1/4W 1K	R100,104,107,127,134,137
Main	14-5103	Resistor 1/4W 10K	R102,121,124,125,129
Main	14-5104	Resistor 1/4W 100K	R123
Main	14-5105	Resistor 1/4W 1 Meg	R108,131,132
Main	14-5153	Resistor 1/4W 15K	R115,118
Main	14-5154	Resistor 1/4W 150K	R128
Main	14-5222	Resistor 1/4W 2.2K	R133
Main	14-5272	Resistor 1/4W 2.7K	R139
Main	14-5273	Resistor 1/4W 27K	R136
Main	14-5274	Resistor 1/4W 270K	R116
Main	14-5334	Resistor 1/4W 330K	R101,110,117
Main	14-5470	Resistor 1/4W 47 Ohm	R105
Main	14-5471	Resistor 1/4W 470 Ohm	R103,106,130,135
Main	14-5472	Resistor 1/4W 4.7K	R119,120,122
Main	14-5561	Resistor 1/4W 560 Ohm	R126
Main	14-5562	Resistor 1/4W 5.6K	R113
Main	14-5563	Resistor 1/4W 56K	R112
Main	14-5681	Resistor 1/4W 680 Ohm	R138
Main	14-5683	Resistor 1/4W 68K	R109
Main	14-5752	Resistor 1/4W 7.5K	R111
Main	15-5244	Resistor 1/2W 240K	R114
Main	21-101333	Cap. Mylar .033UF (100V)	C115,116
Main	2A-012	Cap. Disc 50PF (50V)	C100,107
Main	C010821	Cap. Poly 820PF (50V)	C108,109,110,111
Main	C014180-08	Cap. Cer. Axial .0047UF (50V)	C112,114
Main	C014180-12	Cap. Cer. Axial .0068UF (50V)	C117
Main	C014181-01	Cap. Cer. Axial .001UF (25V)	C103,113,118,123
Main	C014181-02	Cap. Cer. Axial .01UF (25V)	C105,106
Main	C014181-03	Cap. Cer. Axial .1UF (25V)	C101,124,128,129
Main	C014320	IC LM324 (OP AMP)	A100
Main	C014369	Cap. Elec Radial 4.7UF (35V)	C102,104,121,122,125
Main	C014373	Cap. Elec Radial 2200UF (16V)	C127
Main	C014398	Diode MR501	CR104,105
Main	C015505	Cap. Elec Radial 47UF (16V)	C120
Main	C016821	IC LM3086N 35-43/912-RCA	A101
Main	CA014124	Cable Assy	
Main	CA015377	PC Board Assy	

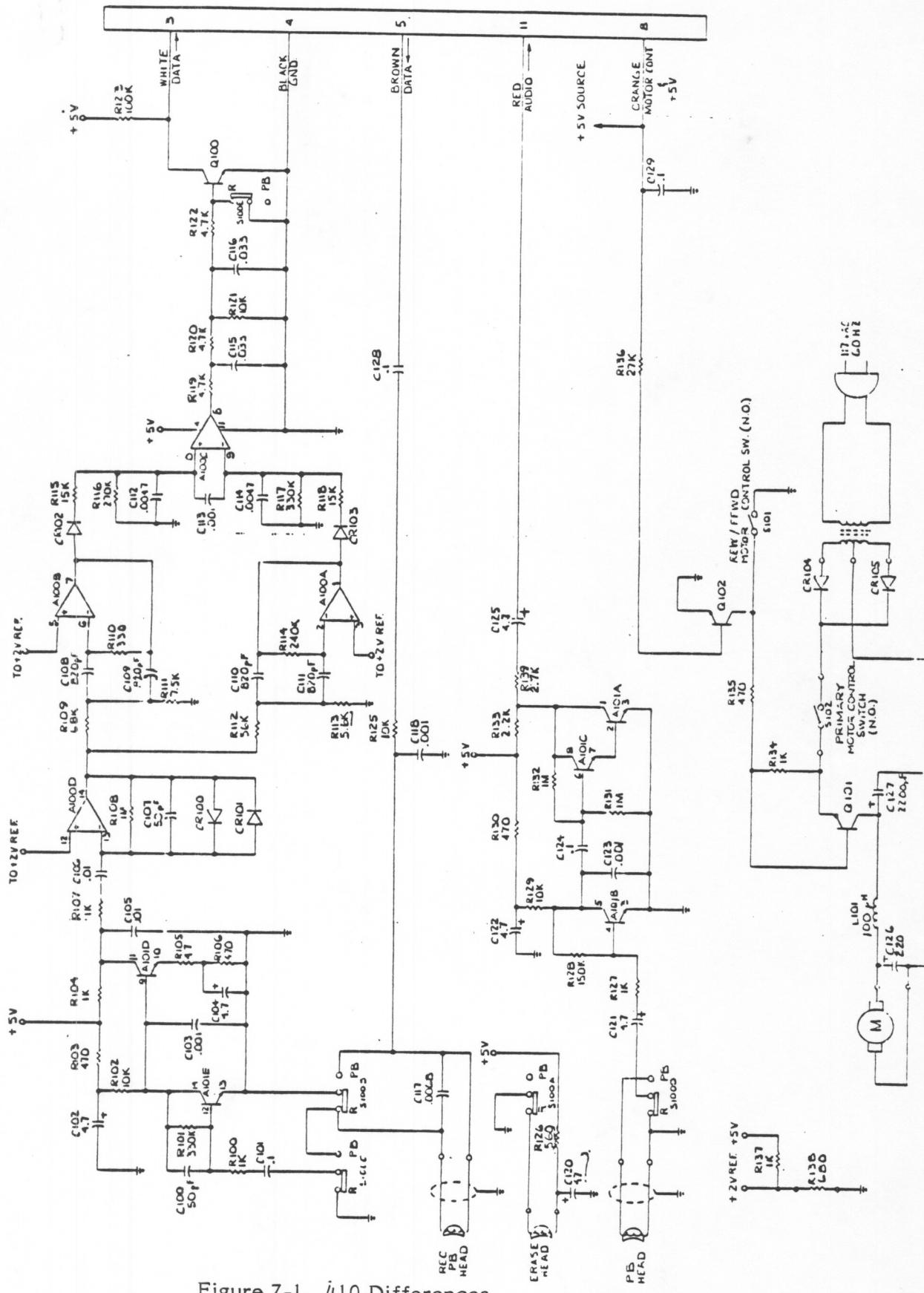


Figure 7-1. 410 Differences



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

USER

1. **New 410**

Problem: Many ATARI cassette-based products have loading problems on the newer model of the 410 (with PAUSE and no carrying handle) but not on the older 410. The newer 410 has a more powerful amplifier which raises previously insignificant background noise to significant levels and causes error conditions when interpreted as data. All ATARI cassette-based products have been remastered and the finished goods stock was replaced as of March 1, 1982.

Solution: Replace the media with inventory acquired after March 1, 1982.

2. **System Reset**

Problem: Pressing SYSTEM RESET does not reset the data I/O line in POKEY. Subsequent use of CSAVE is unreliable because the data I/O line is not clear, POKEY sends garbage, and the data stored is unrecoverable.

Solution: Avoid using SYSTEM RESET. Before using CSAVE or CLOAD, always execute a LPRINT command.

NOTE: Executing a serial bus command properly resets POKEY and clears the data I/O line. The simplest serial bus command to execute is LPRINT. If a printer is not attached when the LPRINT is executed, an error 138 occurs. This occurrence is normal and does not interfere with the reset of POKEY.

3. **Pre-recorded Tape Positioning**

Problem: Tape is improperly positioned.

Solution: Pre-recorded tapes should load properly if rewound completely. If not, manually wind the leader onto the take-up reel before attempting the load.

4. **User-Recorded Tape Positioning**

Problem: Tape is improperly positioned relying on the counter.

Solution: Store only one program per side of tape positioned manually at the end of the tape leader.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

5. Faulty Pre-recorded Media

Problem: Tapes produced in mass quantity are not individually verified to load successfully because of sampling techniques.

Solution: Replace the tape.

6. Faulty User-Recorded Media

Problem: The oxide coating on audio cassette tape is subject to momentary dropouts that does not record data.

Solution: Replace the tape.

7. Worn Media

Problem: Tapes stretch and warp after prolonged normal usage.

Solution: Replace the tape. Avoid leaving the PLAY, ADVANCE, and REWIND button engaged after tape movement is completed.

8. Magnetic Field

Problem: Data is altered during transmission because of the 410 I/O cable's close proximity to a magnetic field.

Solution: Do not set the 410 on or close to a TV or power transformer.

9. Vibration

Problem: Data is altered during transmission because the 410 was bumped, moved, or jarred.

Solution: Keep the 410 stationary during data transmission.

10. CRO<sup>2</sup> Tape

Problem: The bias of CRO<sup>2</sup> tape is incompatible with the 410.

Solution: Use normal ferrite audio tape.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

HCD  
9

number

MODEL: 410 Cassette Recorder

DATE: February 9, 1983

**SUBJECT:**

410 Cassette Recorders that register #143 error codes.

**DESCRIPTION:**

The following procedures and checklist may help to correct problems signified by #143 error codes.

**HEAD ALIGNMENT PROCEDURE**

1. Connect the suspected bad recorder to your 400 system.
2. Check for the following component modifications in the Chelco unit only. These should already be present in the Transtek unit.

R105	50 Ohms
R112	56K
R109	58K
C100	50pf
C107	50pf

If the values of the components on the unit are not correct, replace them.

3. Clean the head and tape drive rollers. Check for stretched/worn belts.
4. Place the Test Tape in the unit.
5. a. Put scope probe on A101, Pin 11 (refer to Head Alignment procedure of Section IV of the Field Service Manual).  
  
b. Type: POKE 54018,52 (turns motor on without error or actual load)  
Press: RETURN (on computer)  
This allows the tape to run continuously when PLAY is pressed on the recorder.  
Press: PLAY (on recorder)
- c. Adjust head-adjust screw clockwise or counter-clockwise and look for a signal of 300MV or greater (The manual's reference to a 50MV signal is incorrect and will be corrected in the next revision of the manual.). Refer to Figures 1 and 2 on the following page for examples of waveform patterns before and after head alignment. (If signal stops, rewind tape and press PLAY again. Repeat procedure as necessary until alignment is complete.)



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

HCD  
number 9

MODEL: 410 Cassette Recorder (Continued)

DATE: February 9, 1983

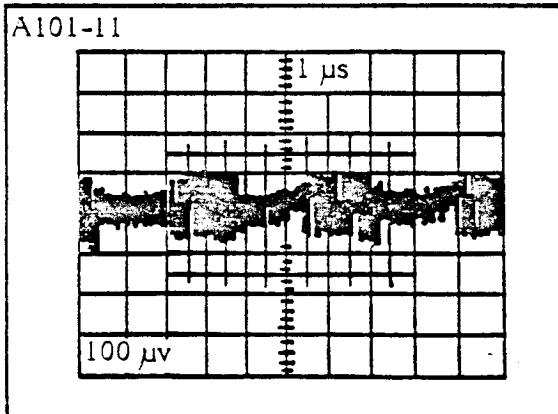


Figure 1. Output Signal  
of the Preamplifier  
Before Head Alignment

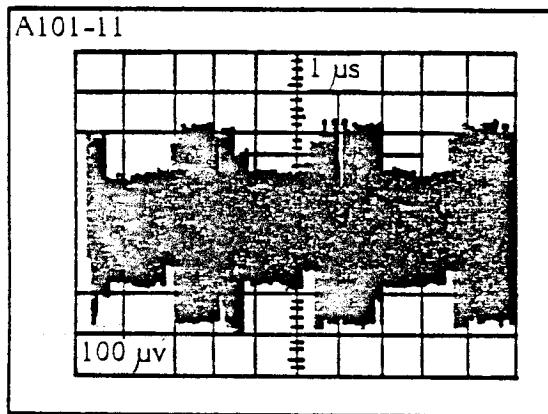


Figure 2. Output Signal  
of the Preamplifier  
After Head Alignment.

6. Replace unit into covers.
7. Rewind tape.
8. Type: CLOAD  
The tape should load.
9. a. Use a blank tape.  
b. Rewind.  
c. Type: CSAVE  
When READY appears, rewind and type CLOAD and press RETURN.  
READY should appear when the tape stops running. The program should execute upon receiving the correct command.  
d. Reassemble if no errors are found.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

HCD  
9  
number \_\_\_\_\_

MODEL: 410 Cassette Recorder (Continued)

DATE: February 9, 1983

**HEAD ALIGNMENT SYMPTOM CHECKLIST\***

<u>SYMPTOM</u>	<u>PROBABLE CAUSE</u>
1) Alignment procedure O.K., signal at pin 11 of A101 O.K., but 410 errors on CLOAD.	I/C LM324
2) No signal at Pin 12 of A101. Unit CLOADS O.K., but will not CSAVE.	PB/Rec Head
3) Will not CSAVE or CSAVE Intermittent.	C117
4) No audio.	A101
5) Signal on Pin 6 Or 2 of A100 incorrect. Note: signals may also be seen on Pins 7 and 1 of A100.	Poly capacitors 820pf before LM324
6) Door won't close : physically broken at hinge area or missing spring clips on inside of door.	Replace door
7) Play button not staying engaged, record button not engaging (broken record detector). Tape jamming or bad rewind.	Replace tape deck
8) Cassette tension spring loose or weak.	Replace or reposition springs in the door. Replace or reposition rear spring holding cassette into head.

\*Symptom and probable cause are listed with most common failure first.

**DIFFICULTY REPORTING**

If you have questions or need further assistance, call the Atari Techline Specialist:

Inside California  
(800) 672-1466

Outside California  
(800) 538-1535



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

SUBJECT:

138, 140, and 143 Errors

DESCRIPTION

It is a common occurrence for a customer to experience problems while trying to load cassette tapes with the 410 program recorder.

TROUBLESHOOTING

We have separated troubleshooting into two sections: one for the servicer and one for the user. The user section has purposely been put on a separate page to allow copies to be made for distribution to users.

SERVICER

1. **Periodic Maintenance**

Problem: Failure to perform periodic maintenance. Dirty pinch roller or capstan can cause uneven tape speed and damage media. Buildup of oxide residue on the read/write head can interfere with proper operation.

Solution: Perform periodic maintenance as outlined in the 410 Operator's Manual.

2. **Peripheral Connection**

Problems: The 410 is connected through a peripheral (810, 850, 820, 822) that does not properly pass on the signal to the console.

Solution: Connect the 410 directly to the console and repair the defective peripheral.

3. **OS Revision B Incompatibility**

Problem: The software is not compatible with Revision B of the OS. All ATARI software is fully compatible with Revisions A or B but some third party titles are not compatible.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

Solution: The third party vendors usually are able to replace the software with an updated version. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 indicates Revision A whereas 0 indicates Revision B.

4. **PAL Operating System**

Problem: An international PAL version of the OS is installed instead of domestic NTSC version.

Solution: Install a domestic 10K ROM. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 or 0 indicates NTSC whereas 249 indicates PAL.

5. **410 Motor Control**

Problem: The console does not properly control the 410 motor. After a cold start in BASIC, merely pushing PLAY on the 410 should not cause the tape to begin moving, POKE 54018,52 should start the motor and POKE 54018,60 should stop the motor.

Solution: Check to see if transistor Q107 on the 800 or Q102 on the 400 motor control line is improperly shorted to ground.

6. **410**

Problem: Faulty I/O cable, drive mechanism, or electronics, necessitates repair or replacement of the 410.

Solution: Follow the procedures in the Field Service Manual.

If you require further clarification call:

Inside California  
(800) 672-1466

Outside California  
(800) 538-1535



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

USER

1. **New 410**

Problem: Many ATARI cassette-based products have loading problems on the newer model of the 410 (with PAUSE and no carrying handle) but not on the older 410. The newer 410 has a more powerful amplifier which raises previously insignificant background noise to significant levels and causes error conditions when interpreted as data. All ATARI cassette-based products have been remastered and the finished goods stock was replaced as of March 1, 1982.

Solution: Replace the media with inventory acquired after March 1, 1982.

2. **System Reset**

Problem: Pressing **SYSTEM RESET** does not reset the data I/O line in POKEY. Subsequent use of CSAVE is unreliable because the data I/O line is not clear, POKEY sends garbage, and the data stored is unrecoverable.

Solution: Avoid using **SYSTEM RESET**. Before using CSAVE or CLOAD, always execute a LPRINT command.

**NOTE:** Executing a serial bus command properly resets POKEY and clears the data I/O line. The simplest serial bus command to execute is LPRINT. If a printer is not attached when the LPRINT is executed, an error 138 occurs. This occurrence is normal and does not interfere with the reset of POKEY.

3. **Pre-recorded Tape Positioning**

Problem: Tape is improperly positioned.

Solution: Pre-recorded tapes should load properly if rewound completely. If not, manually wind the leader onto the take-up reel before attempting the load.

4. **User-Recorded Tape Positioning**

Problem: Tape is improperly positioned relying on the counter.

Solution: Store only one program per side of tape positioned manually at the end of the tape leader.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

5. **Faulty Pre-recorded Media**

Problem: Tapes produced in mass quantity are not individually verified to load successfully because of sampling techniques.

Solution: Replace the tape.

6. **Faulty User-Recorded Media**

Problem: The oxide coating on audio cassette tape is subject to momentary dropouts that does not record data.

Solution: Replace the tape.

7. **Worn Media**

Problem: Tapes stretch and warp after prolonged normal usage.

Solution: Replace the tape. Avoid leaving the **PLAY**, **ADVANCE**, and **REWIND** button engaged after tape movement is completed.

8. **Magnetic Field**

Problem: Data is altered during transmission because of the 410 I/O cable's close proximity to a magnetic field.

Solution: Do not set the 410 on or close to a TV or power transformer.

9. **Vibration**

Problem: Data is altered during transmission because the 410 was bumped, moved, or jarred.

Solution: Keep the 410 stationary during data transmission.

10. **CRO<sup>2</sup> Tape**

Problem: The bias of CRO<sup>2</sup> tape is incompatible with the 410.

Solution: Use normal ferrite audio tape.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

Solution: The third party vendors usually are able to replace the software with an updated version. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 indicates Revision A whereas 0 indicates Revision B.

4. **PAL Operating System**

Problem: An international PAL version of the OS is installed instead of domestic NTSC version.

Solution: Install a domestic 10K ROM. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 or 0 indicates NTSC whereas 249 indicates PAL.

5. **410 Motor Control**

Problem: The console does not properly control the 410 motor. After a cold start in BASIC, merely pushing PLAY on the 410 should not cause the tape to begin moving, POKE 54018,52 should start the motor and POKE 54018,60 should stop the motor.

Solution: Check to see if transistor Q107 on the 800 or Q102 on the 400 motor control line is improperly shorted to ground.

6. **410**

Problem: Faulty I/O cable, drive mechanism, or electronics, necessitates repair or replacement of the 410.

Solution: Follow the procedures in the Field Service Manual.

If you require further clarification call:

Inside California  
(800) 672-1466

Outside California  
(800) 538-1535



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

ODEL: ATARI 410 Recorder

DATE: 11/17/82

Solution: The third party vendors usually are able to replace the software with an updated version. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 indicates Revision A whereas 0 indicates Revision B.

4. **PAL Operating System**

Problem: An international PAL version of the OS is installed instead of domestic NTSC version.

Solution: Install a domestic 10K ROM. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 or 0 indicates NTSC whereas 249 indicates PAL.

5. **410 Motor Control**

Problem: The console does not properly control the 410 motor. After a cold start in BASIC, merely pushing PLAY on the 410 should not cause the tape to begin moving, POKE 54018,52 should start the motor and POKE 54018,60 should stop the motor.

Solution: Check to see if transistor Q107 on the 800 or Q102 on the 400 motor control line is improperly shorted to ground.

6. **410**

Problem: Faulty I/O cable, drive mechanism, or electronics, necessitates repair or replacement of the 410.

Solution: Follow the procedures in the Field Service Manual.

If you require further clarification call:

Inside California  
(800) 672-1466

Outside California  
(800) 538-1535



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

**SUBJECT:**

138, 140, and 143 Errors

**DESCRIPTION**

It is a common occurrence for a customer to experience problems while trying to load cassette tapes with the 410 program recorder.

**TROUBLESHOOTING**

We have separated troubleshooting into two section: one for the servicer and one for the user. The user section has purposely been put on a separate page to allow copies to be made for distribution to users.

**SERVICER**

1. **Periodic Maintenance**

**Problem:** Failure to perform periodic maintenance. Dirty pinch roller or capstan can cause uneven tape speed and damage media. Buildup of oxide residue on the read/write head can interfere with proper operation.

**Solution:** Perform periodic maintenance as outlined in the 410 Operator's Manual.

2. **Peripheral Connection**

**Problems:** The 410 is connected through a peripheral (810, 850, 820, 822) that does not properly pass on the signal to the console.

**Solution:** Connect the 410 directly to the console and repair the defective peripheral.

3. **OS Revision B Incompatibility**

**Problem:** The software is not compatible with Revision B of the OS. All ATARI software is fully compatible with Revisions A or B but some third party titles are not compatible.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

Solution: The third party vendors usually are able to replace the software with an updated version. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 indicates Revision A whereas 0 indicates Revision B.

4. **PAL Operating System**

Problem: An international PAL version of the OS is installed instead of domestic NTSC version.

Solution: Install a domestic 10K ROM. It is possible to determine what version of the OS is installed by checking memory location 58383. From BASIC: PRINT PEEK(58383) (RETURN). A value of 56 or 0 indicates NTSC whereas 249 indicates PAL.

5. **410 Motor Control**

Problem: The console does not properly control the 410 motor. After a cold start in BASIC, merely pushing PLAY on the 410 should not cause the tape to begin moving, POKE 54018,52 should start the motor and POKE 54018,60 should stop the motor.

Solution: Check to see if transistor Q107 on the 800 or Q102 on the 400 motor control line is improperly shorted to ground.

6. **410**

Problem: Faulty I/O cable, drive mechanism, or electronics, necessitates repair or replacement of the 410.

Solution: Follow the procedures in the Field Service Manual.

If you require further clarification call:

Inside California  
(800) 672-1466

Outside California  
(800) 538-1535



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

SUBJECT:

138, 140, and 143 Errors

DESCRIPTION

It is a common occurrence for a customer to experience problems while trying to load cassette tapes with the 410 program recorder.

TROUBLESHOOTING

We have separated troubleshooting into two section: one for the servicer and one for the user. The user section has purposely been put on a separate page to allow copies to be made for distribution to users.

SERVICER

1. Periodic Maintenance

Problem: Failure to perform periodic maintenance. Dirty pinch roller or capstan can cause uneven tape speed and damage media. Buildup of oxide residue on the read/write head can interfere with proper operation.

Solution: Perform periodic maintenance as outlined in the 410 Operator's Manual.

2. Peripheral Connection

Problems: The 410 is connected through a peripheral (810, 850, 820, 822) that does not properly pass on the signal to the console.

Solution: Connect the 410 directly to the console and repair the defective peripheral.

3. OS Revision B Incompatibility

Problem: The software is not compatible with Revision B of the OS. All ATARI software is fully compatible with Revisions A or B but some third party titles are not compatible.



Consumer Product Service  
Manager of Technical Support  
**TECH TIP**

number 5

MODEL: ATARI 410 Recorder

DATE: 11/17/82

USER

1. **New 410**

Problem: Many ATARI cassette-based products have loading problems on the newer model of the 410 (with PAUSE and no carrying handle) but not on the older 410. The newer 410 has a more powerful amplifier which raises previously insignificant background noise to significant levels and causes error conditions when interpreted as data. All ATARI cassette-based products have been remastered and the finished goods stock was replaced as of March 1, 1982.

Solution: Replace the media with inventory acquired after March 1, 1982.

2. **System Reset**

Problem: Pressing SYSTEM RESET does not reset the data I/O line in POKEY. Subsequent use of CSAVE is unreliable because the data I/O line is not clear, POKEY sends garbage, and the data stored is unrecoverable.

Solution: Avoid using SYSTEM RESET. Before using CSAVE or CLOAD, always execute a LPRINT command.

**NOTE:** Executing a serial bus command properly resets POKEY and clears the data I/O line. The simplest serial bus command to execute is LPRINT. If a printer is not attached when the LPRINT is executed, an error 138 occurs. This occurrence is normal and does not interfere with the reset of POKEY.

3. **Pre-recorded Tape Positioning**

Problem: Tape is improperly positioned.

Solution: Pre-recorded tapes should load properly if rewound completely. If not, manually wind the leader onto the take-up reel before attempting the load.

4. **User-Recorded Tape Positioning**

Problem: Tape is improperly positioned relying on the counter.

Solution: Store only one program per side of tape positioned manually at the end of the tape leader.