33220A-02

S E R V I C E N O T E

Supersedes:
NONE

33220A 20 MHz Function/Arbitrary Waveform Generator

Serial Numbers: **MY43000000/MY44022145**
SG43000000/SG44001595

Encoder S1 (P/N 0960-2545) May Be Subject to Early Failure

To Be Performed By: Agilent-Qualified Personnel or Customer

Parts Required:

P/N	Description	Qty.
ONE of the following:		
0960-2545	S1 Encoder	1
33220-66502	A2 Front Panel Board	1
33220-69101	Exchange Unit: MY STD	1
33220-69102	Exchange Unit: MY opt 001	1
33220-69201	Exchange Unit: SG STD	1
33220-69202	Exchange Unit: SG opt 001	1

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION: **MODIFICATION RECOMMENDED**			
ACTION CATEGORY:	[ ] IMMEDIATELY x ON SPECIFIED FAILURE [ ] AGREEABLE TIME	STANDARDS: LABOR: 1.0 Hours	
LOCATION CATEGORY:	x CUSTOMER INSTALLABLE [ ] ON-SITE x SERVICE CENTER	SERVICE INVENTORY: x RETURN [ ] SCRAP [ ] SEE TEXT	USED PARTS: [ ] RETURN [ ] SCRAP x SEE TEXT
AVAILABILITY:	PRODUCT'S SUPPORT LIFE	AGILENT RESPONSIBLE UNTIL: April 2009	
AUTHOR: cld	PRODUCT LINE: PLSP		
ADDITIONAL INFORMATION:			

Agilent Technologies

March 22, 2007

Situation:
Mechanical encoders need to be replaced as they wear out with use, resulting in erratic knob behavior. The normal life expectancy of these encoders is 50,000 cycles, but Agilent has determined some encoders are subject to early failure.

Solution/Action:
Units displaying intermittent behavior of the knob should have the encoder replaced using one of the following options:

- Replace the encoder (S1) on the front-panel PC assembly. The part number is 0960-2545 and is a through-hole component.
- Replace the front-panel (A2) PC assembly. The part number is 33220-66502 and includes the encoder.

Note: Proper ESD precautions should be taken when using either method to replace the encoder.

For original units with serial numbers less than MY44007800 or SG44000600, an additional enhancement was implemented on the A1 board to provide additional noise filtering. Units which have been exchanged have been updated with this enhancement at the factory. Customers with original units (unit has never been repaired) may benefit by having their unit exchanged.

If returning the unit to Agilent for repair, Agilent will, at its discretion, repair, replace, or exchange the unit or assemblies using one of the strategies listed above.

Disassembly
For these procedures, the following tools are required for disassembly:

- T20 Torx driver (most disassembly)
- T15 Torx driver (support plate)

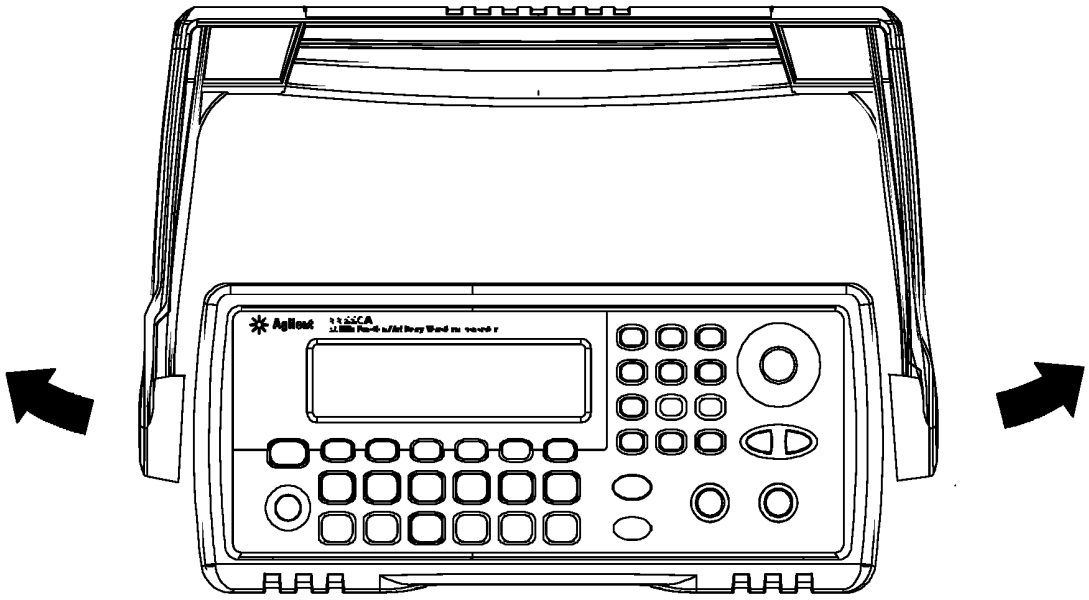
Warning
SHOCK HAZARD. Only service-trained personnel who are aware of the hazards involved should remove the instrument covers. To avoid electrical shock and personal injury, make sure to disconnect the power cord from the instrument before removing the covers. Some circuits are active and have power applied even when the power switch is turned off.

Electrostatic Discharge (ESD) Precautions
Almost all electrical components can be damaged by electrostatic discharge (ESD) during handling. Component damage can occur at electrostatic discharge voltages as low as 50 volts. The following guidelines will help prevent ESD damage when servicing the instrument.

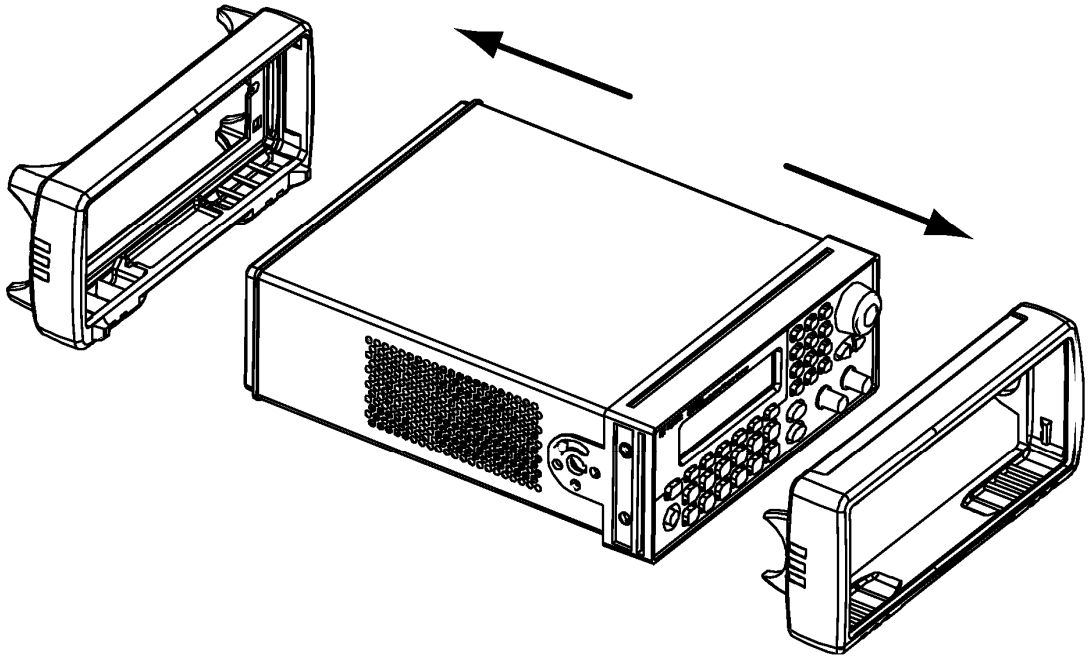
- Disassemble the instrument only in a static-free work area.
- Use a conductive work area to dissipate any static charge.
- Use a conductive wrist strap to dissipate static charge accumulation.
- Minimize handling.
- Keep replacement parts in their original static-free packaging.
- Remove all plastic, foam, vinyl, paper, and other static-generating materials from the immediate work area.
- Use only anti-static solder suckers.

General Disassembly Procedure

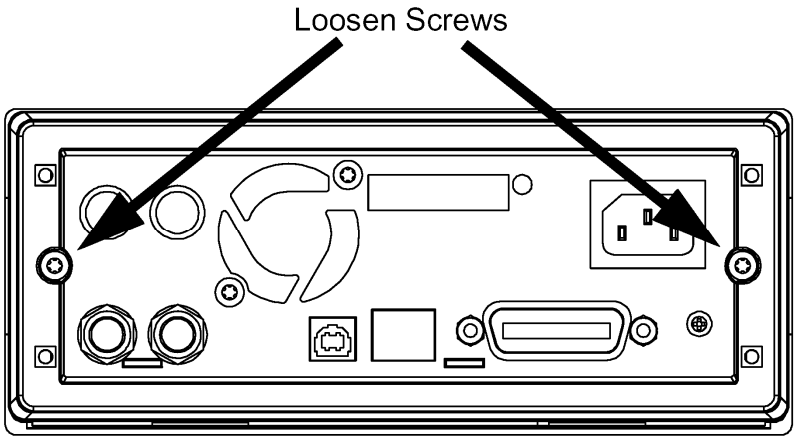
1. Turn off the power. Remove all cables from the instrument.
2. Rotate the handle upright and pull off.



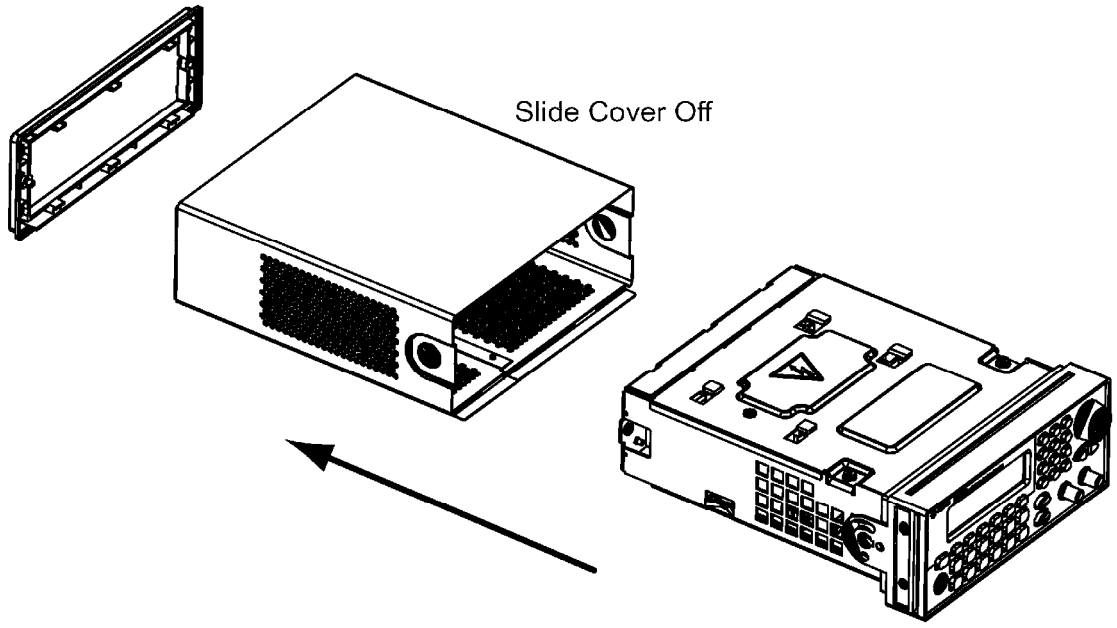
3. Pull off the instrument bumpers.



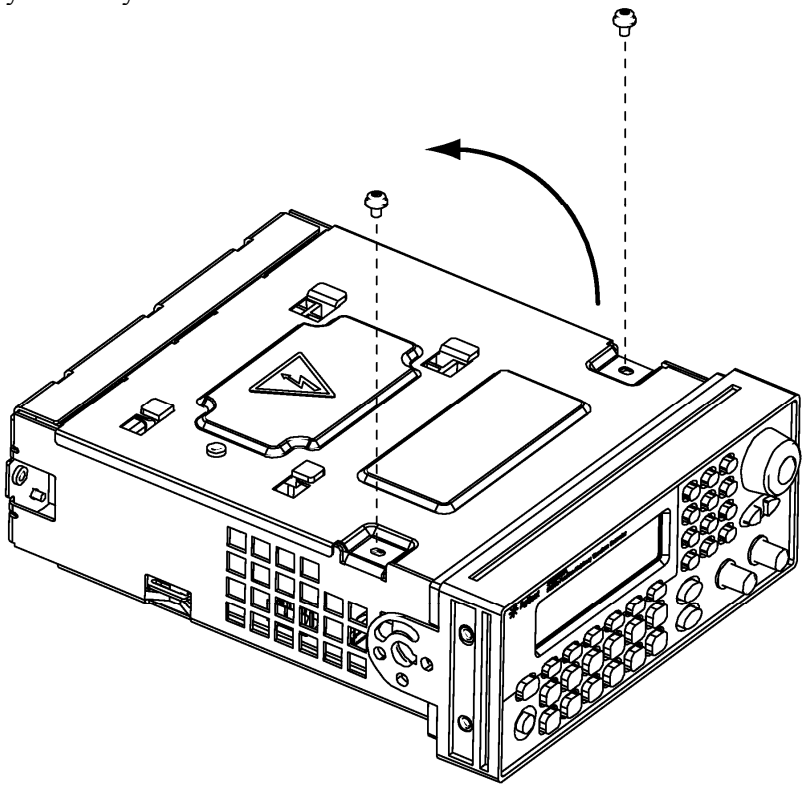
4. Loosen the two captive screws in the rear bezel and remove the rear bezel.



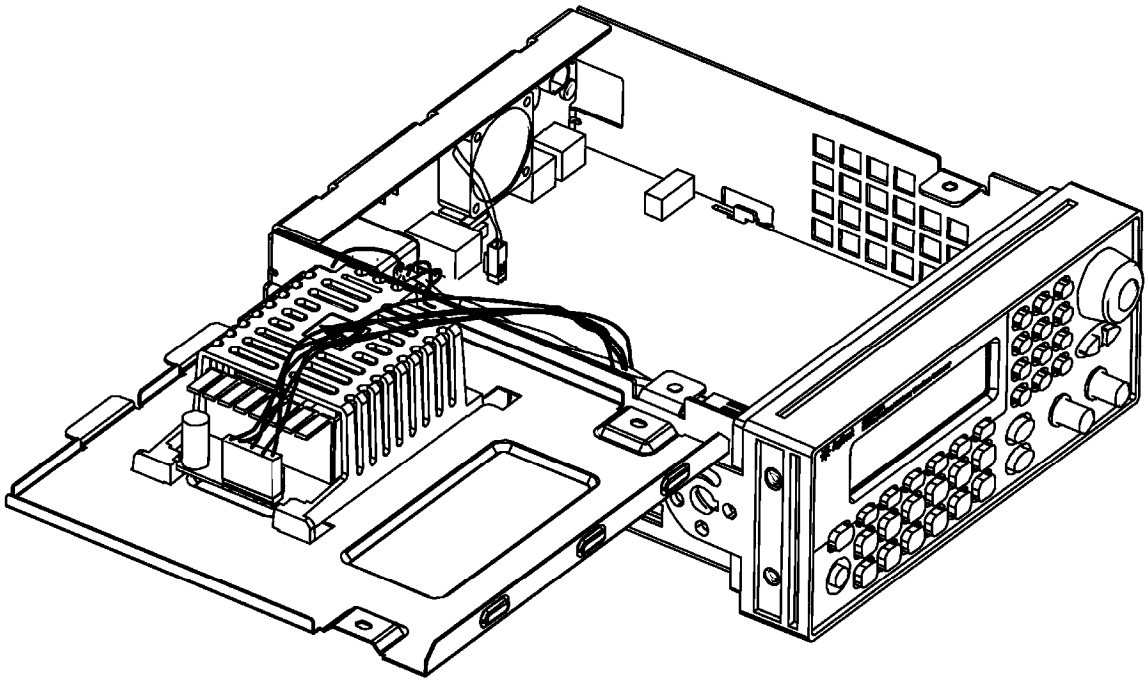
5. Slide off the instrument cover.



6. Remove the two screws securing the power supply deck to the chassis. Lift off the deck. The power supply assembly is attached to the deck.



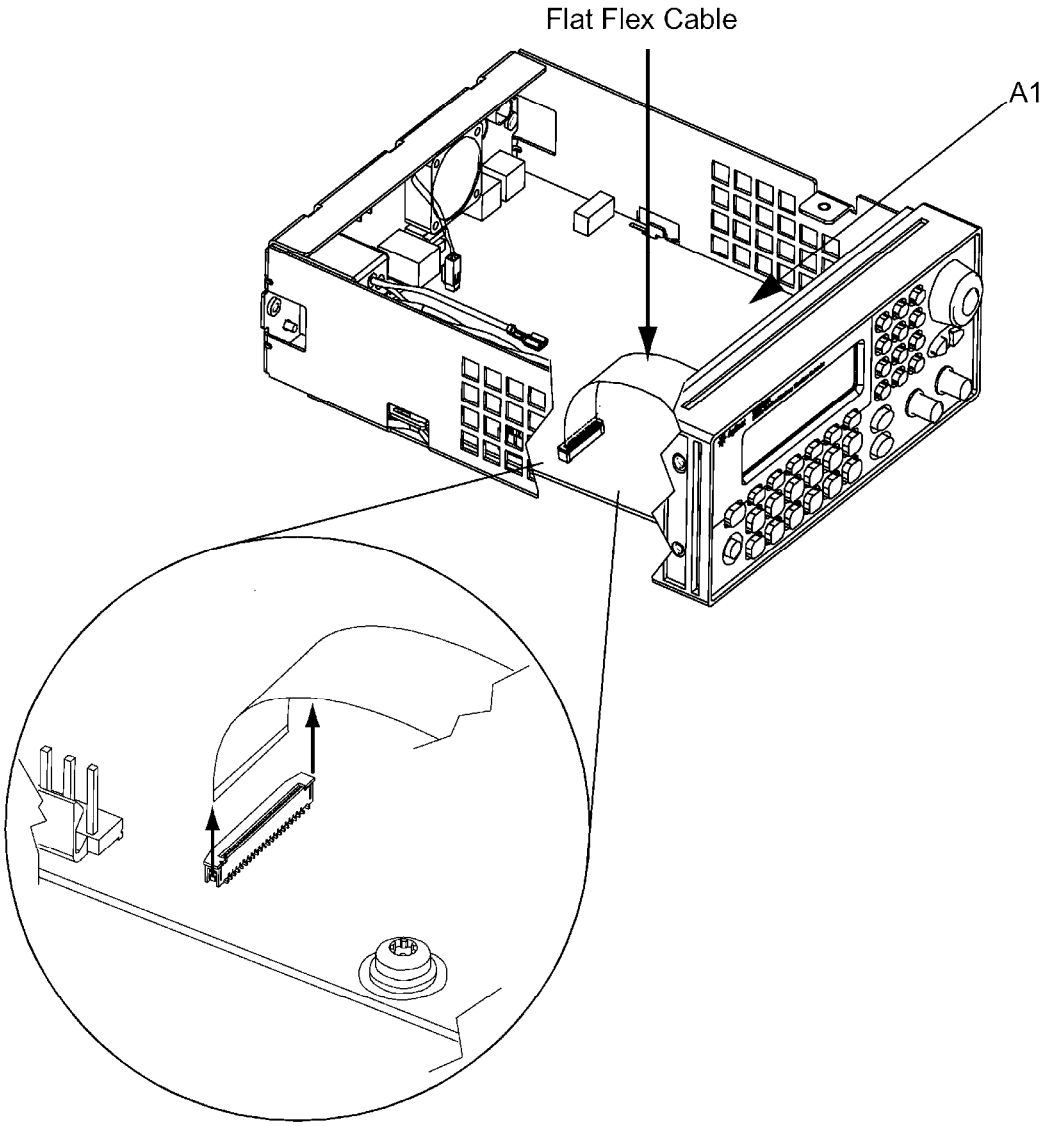
7. Lay the deck and power supply assembly to the side.



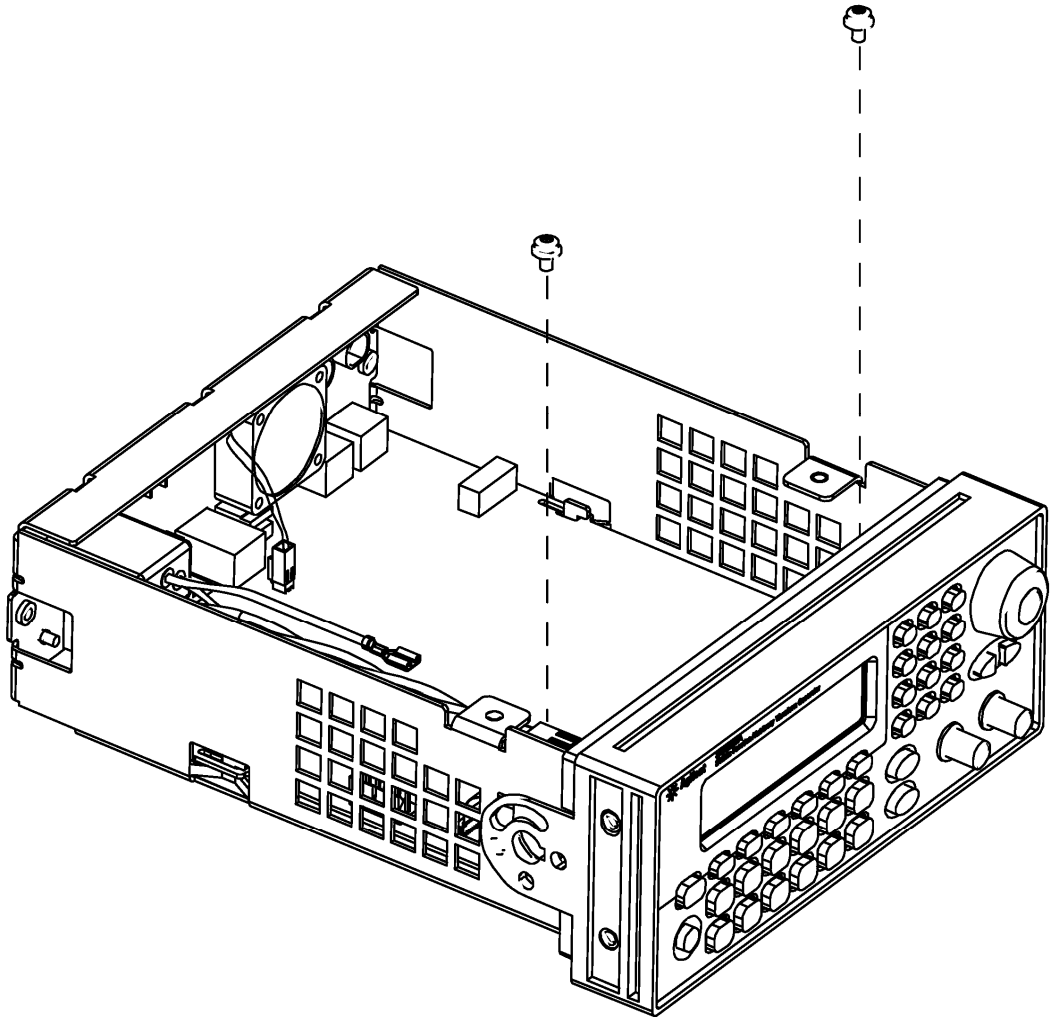
Front-Panel Removal Procedure

1. Gently lift both ends of the flat flex cable connector actuator and disconnect the cable from the main PC board (A1 assembly).

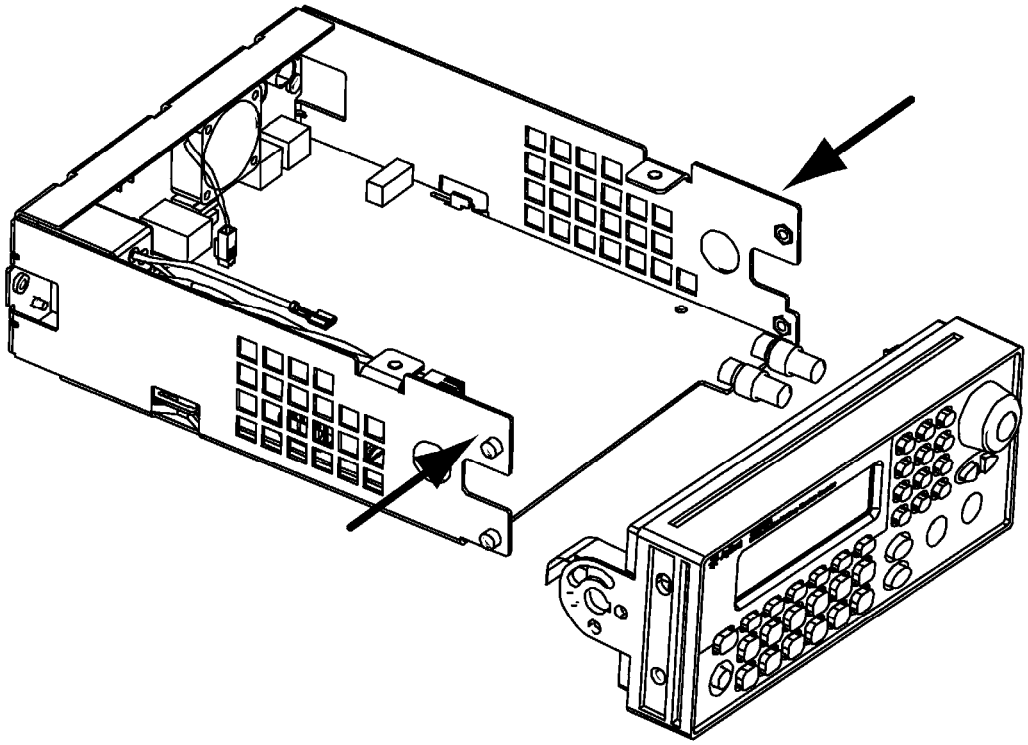
   Caution To prevent damage to the cable and connector, use care when lifting the actuator. Excessive or uneven force may damage the actuator or connector.



2. Remove the two screws from the front edge of the main PC board (A1 assembly).

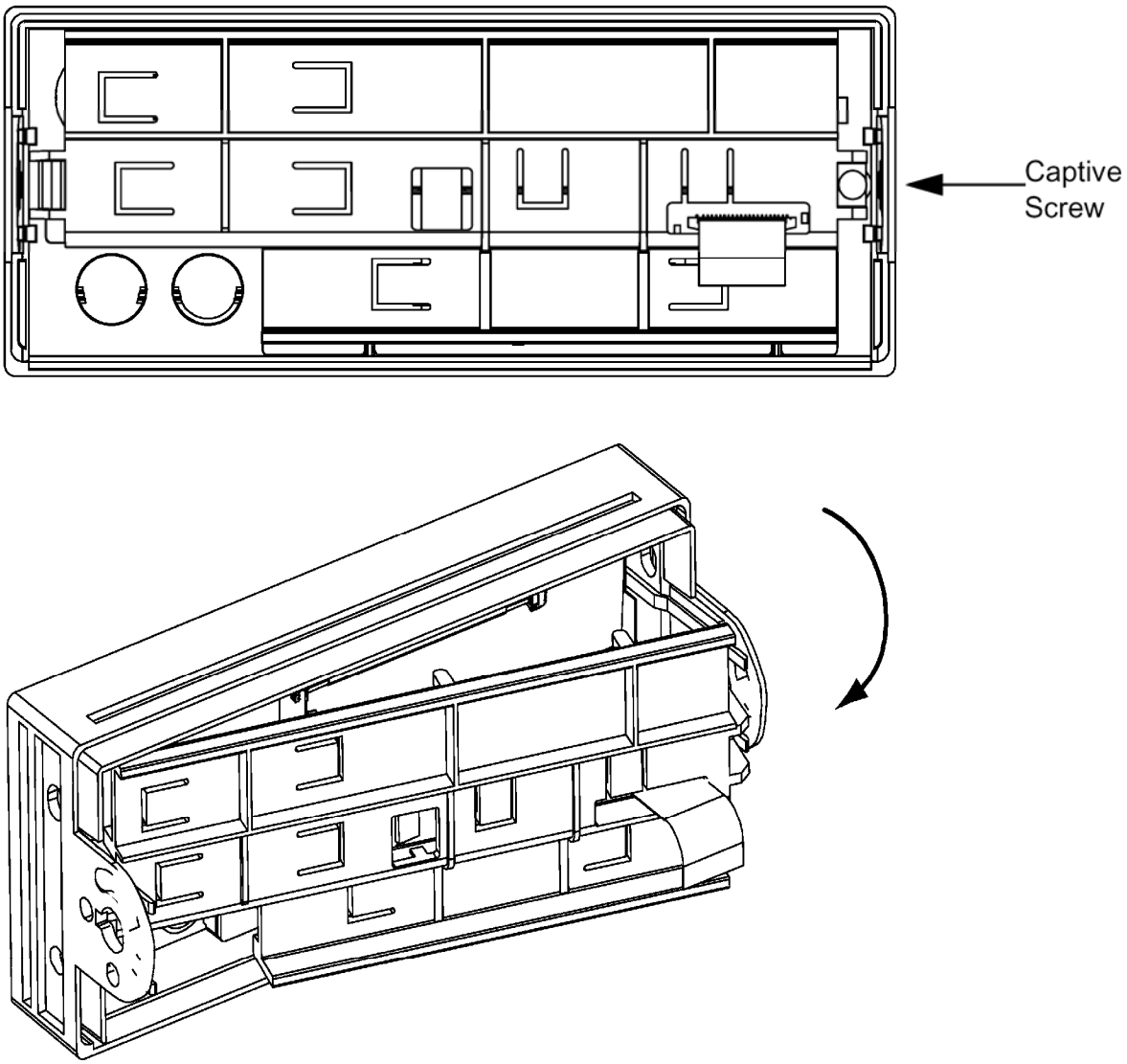


3. Push the side flanges of the chassis inward while lifting off the front panel. There should now be enough play in the chassis sides and front panel assembly to allow the side of the front panel to be disconnected from the chassis.



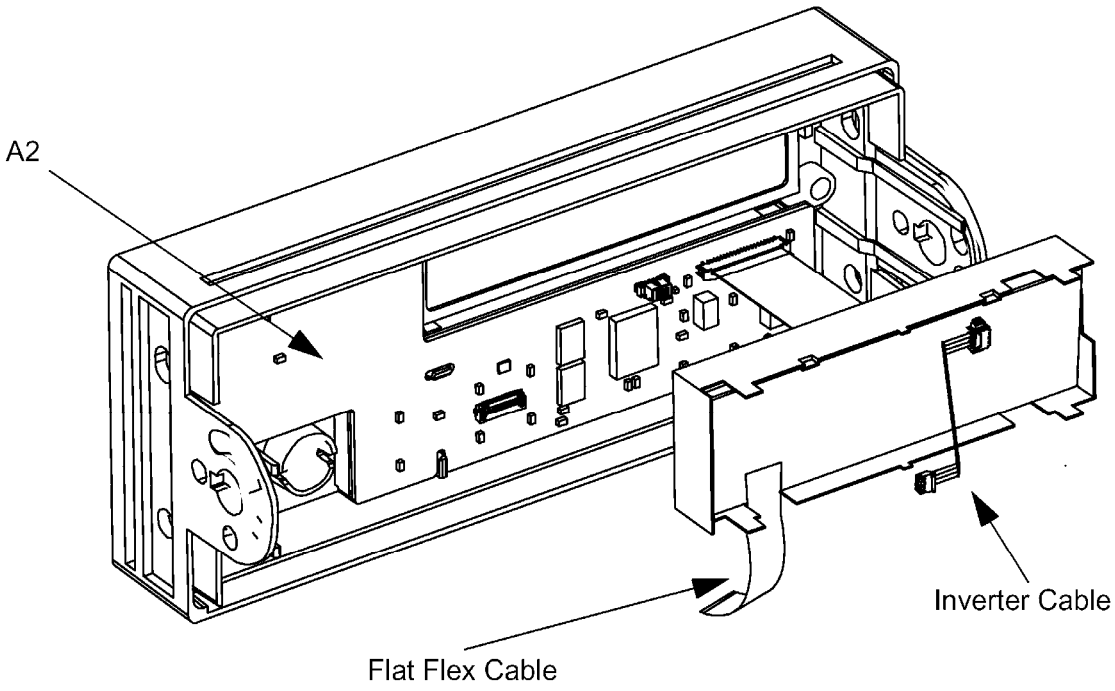
Front-Panel Disassembly

1. Loosen the captive screw holding the support plate. Lift the end of the support plate and rotate out of the front panel assembly.

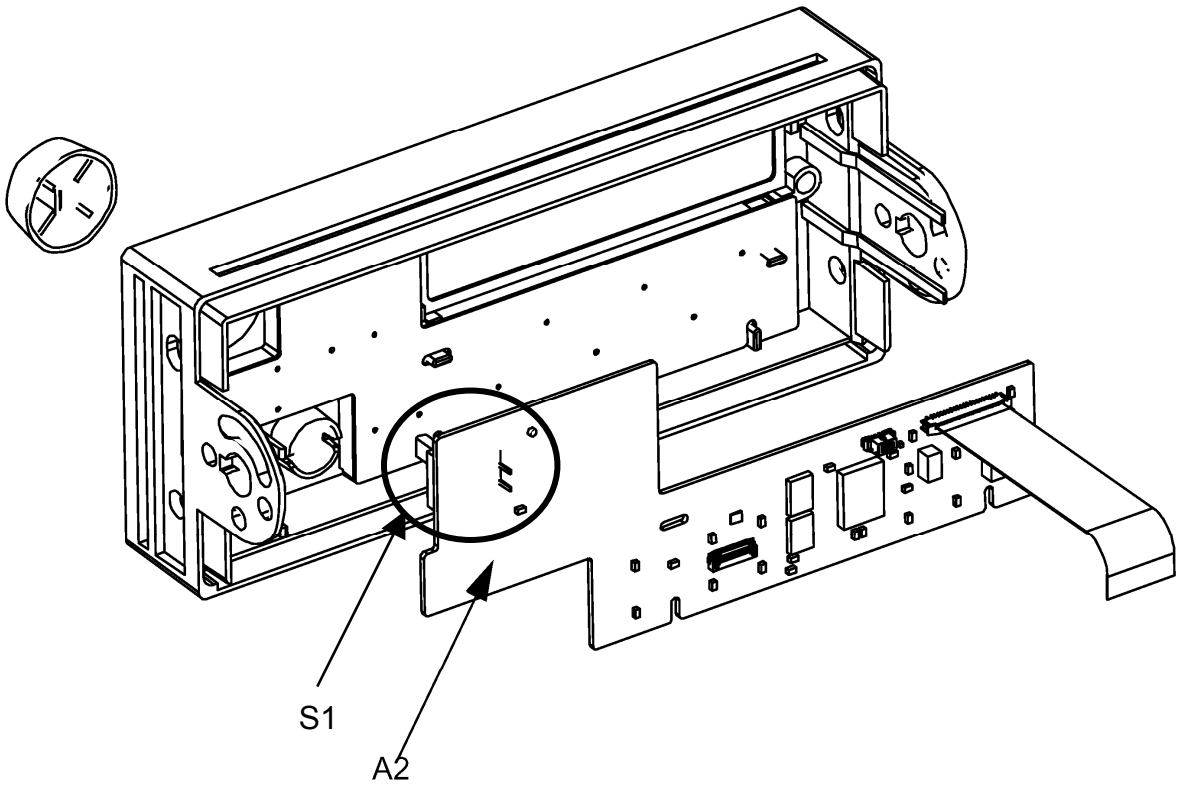


2. Unplug the inverter cable from the keyboard PC board (A2 assembly). Gently lift both ends of the flat flex cable connector actuator and disconnect the cable from the PC board. Lift out the display assembly.

   Caution To prevent damage to the cable and connector, use care when lifting the actuator. Excessive or uneven force may damage the actuator or connector.



3. Pull to remove the knob. Lift out the keyboard PC board (A2 assembly).



4. Replace one of the following assemblies:
   - A2 front panel board, part number 33220-66502
   - S1 encoder, part number 0960-2545. Proper soldering techniques are required when removing/replacing so as not to permanently damage the printed circuit board.

Reassembly and Test

1. Follow the procedures in reverse to reassemble the unit.
2. Power on the instrument and perform a complete self-test:
   - Press Utility on the front panel.
   - Select the **Self Test** softkey from the "Test / Cal" menu.
   - The instrument will automatically perform the complete self-test procedure when you release the key. The self-test will complete in approximately 30 seconds.
   - If the self-test is successful, "Self Test Pass" is displayed on the front panel.
   - If the self-test fails, "Self Test Fail" and an error number are displayed. See the 33220A Service Guide for a complete description of self tests and error numbers.
3. Verify operation of the knob.
4. If the unit is inoperative:
   - Verify that the AC power cord is connected to the instrument.
   - Verify that the front-panel On/Standby switch has been pushed.
   - Verify the flat flex cable connector actuator is properly connected to the main PC board (A1 assembly) by following the **Front-Panel Removal Procedure** (page 6 of this service note)