TECHNICAL BULLETIN INDEX
Sorted by Bulletin Number
04/03/86

No.	Catalog	Description	Rev. Date
600:001	26-3901	Memory upgrade on the Tandy 600.	01/31/86
600:002	26-3901	Prevent damage caused by battery overcharging.	01/27/86

Date: November 8, 1985

To: All Radio Shack Service Centers

From: Gary Kueck, Technical Support

Subject: Aligning the 3.5" disk drive in the Tandy 600.

     The Tandy 600 disk drive can not be aligned using the Tandy 600. The drive must be removed and attached to a Model 3 or 4. A special DC cable must be made (see the attached drawing for the connections) and the 5 1/4" FDC extender cable must be used. The attached pages detail the procedures for the actual alignments.

     In about 1-2 months a new release of TDC will include the 3.5" drive in its list of drive types. As a note, this version will be TOTALLY new, so if you have any suggestions, call Paul Chamberlain at Tech Support.

- SANKYO FDU335 DRIVE ALIGNMENT WITH TDC -
- Nov. 5, 1985 by Radio Shack Technical Support -

- INTRODUCTION -

This discusses the alignment of the Tandy-600 drive {Sankyo FDU335} with TDC.
The drive is a 3-1/2 in., 80 track, single side, double density drive.

To setup the drive for testing on the Model-3/4, apply power {+12v & +5v} to
CON2 of the drive {See figure-A for power connections to the drive}. Then
connect the card edge connector of the drive test cable to the computer and
the 34-pin header connector to CON1 of the drive. Configure the Drive Select
Dip Switch for the desired drive. Turn on switch 1 or 2 {external drive 0 or
1} to select the drive as 2 or 3 respectively.

For testing, a blank 3-1/2" diskette and a Dymek DK 301-12 alignment diskette
are needed. The alignment disk is for 3-1/2", 80 track, single sided drives.

- Highlights of Drive Alignment with TDC -

To align the drive with TDC, press <D> for drive type and then press <7> to
select the Mitsubishi drive type {this will allow access of all 80 tracks}.
Select step rate, then select the drive # {2 or 3}. Now use TDC to test the
drive, along with specs below for the Sankyo FDU-335 drive.

<0> Speed Check - Remove and insert the diskette to test the write protect,
    then adjust the potentiometer on the Spindle PCB for a speed of 300 RPM.

<1> Carriage Test - Check for abnormal stepper movement as the drive steps
    the head carriage between tk-00 and tk-79.

<2> Head Radial/Azimuth Test - A two part test to check Head Radial and Head
    Azimuth of the drive. Set up the scope as shown below for both tests,
    and use the arrow keys to single-step to the alignment signals on
    track-40. Both tests require a Dymek DK 301-12 alignment disk.

    For Head Radial, go to track-40 and set the timebase to 20msec/div. Align
    the head radial so that the lobes of the "cats-eye" are within 60% of each
    other. When done, press <ENTER> to begin the Azimuth test.

    For Azmuith, set the scope as below and single step to track-40. Set the
    scope timebase to 0.5msec/div. The Azimuth signal will appear as 4 short
    bursts. The 1st and 4th bursts should be smaller than the middle bursts
    to be within specs {30'}. When done, continue to the track-0 tests.

        - - - - - Scope Settings for Head Radial/Azimuth - - - - - -
        | CH1=TPA-1 & CH2=TPA-2 at 50mv/div,   SYNC=IC-8 pin-1 |
        | GND=TPG, Timebase: HR=20msec/div & Azm=0.5msec/div. |
        -

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<3> Track-0 Test - This is a three part test for alignment of the track-0.

First, set up scope as in head radial, step to track-40 and verify the drive is on tk-40 by the cats eyes.

Second, remain in the first part of TK00 module. Set CH-1 of the scope to TPB pin 3, and trigger internally. Use the arrow keys to single step between tracks-00 and 03. The level on the scope should toggle, if not then adjust the track-00 sensor till it toggles between these two tracks. Skip the 2nd test and go to the last part of the track-00 module.

In the third and final part, set the scope as below, and verify the drive is on track-00. The index burst pattern should be present. Since the burst pattern is so short, it may be difficult to see. Press <ENTER> to exit this module.

```
- - - - - - - - Track 00 Scope Setup {3rd Test} - - - - - - -
|   CH1=TPA-1 & CH2=TPA-2 at 50mv/div,   SYNC=IC-8 pin-1      |
|   GND=TPG,   Timebase=50us/div,   Spec: verify signal on tk-0. |
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

<4> Index Timing - Setup the scope as specified below using positive trigger, and step to track-0. Adjust VR1 to bring index timing into specs if necessary.

```
- - - - - - - - Scope Settings for Index Timing - - - - - - -
|   CH1=TPA-1 & CH2=TPA-2 at 50mv/div,   SYNC=IC-8 pin-1      |
|   GND=TPG,   Timebase=50usec/div,   Spec=200us [+-100usec]. |
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

<5> Head Amplitude - Set up scope as specified below for Head Amplitude test. Make sure head amplitude is within specs.

```
- - - - - - - Scope Settings for Head Amplitude - - - - - - -
|   CH1=TPA-1 & CH2=TPA-2 at 50mv/div,   SYNC=IC-8 pin-1      |
|   GND=TPG,   Timebase=20ms/div, Spec=HA no less than 200mv. |
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

<6> Raw Data - Setup the scope as specified below for Raw Data Test. Adjust VR2 {Raw Data} for the minimum amount of data jitter.

```
- - - - - - - - Scope Settings for Raw Data - - - - - - - - -
|   CH1=IC-8 pin-12 {Raw Data} at   2v/div,   Internal Sync  |
|     GND=TPG,   Timebase=1us/div,   Spec=Minimum Jitter.     |
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

- DRIVE DC POWER HOOKUP -
Fig-A

+5v   GND   +12v

Connect power to the pins of
CON2 on the main PCB as shown.
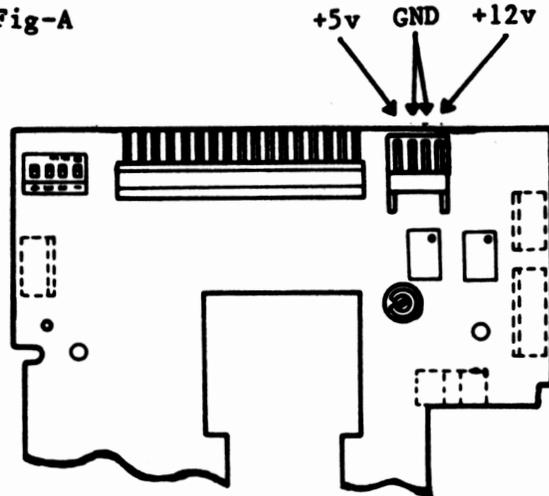
- MAIN LOGIC BOARD TEST POINTS -
Fig-B

TPB3, 2, 1

CON3

CON1 I/O

TPA1-5

VR1

CON2 POWER

TPG

VR2
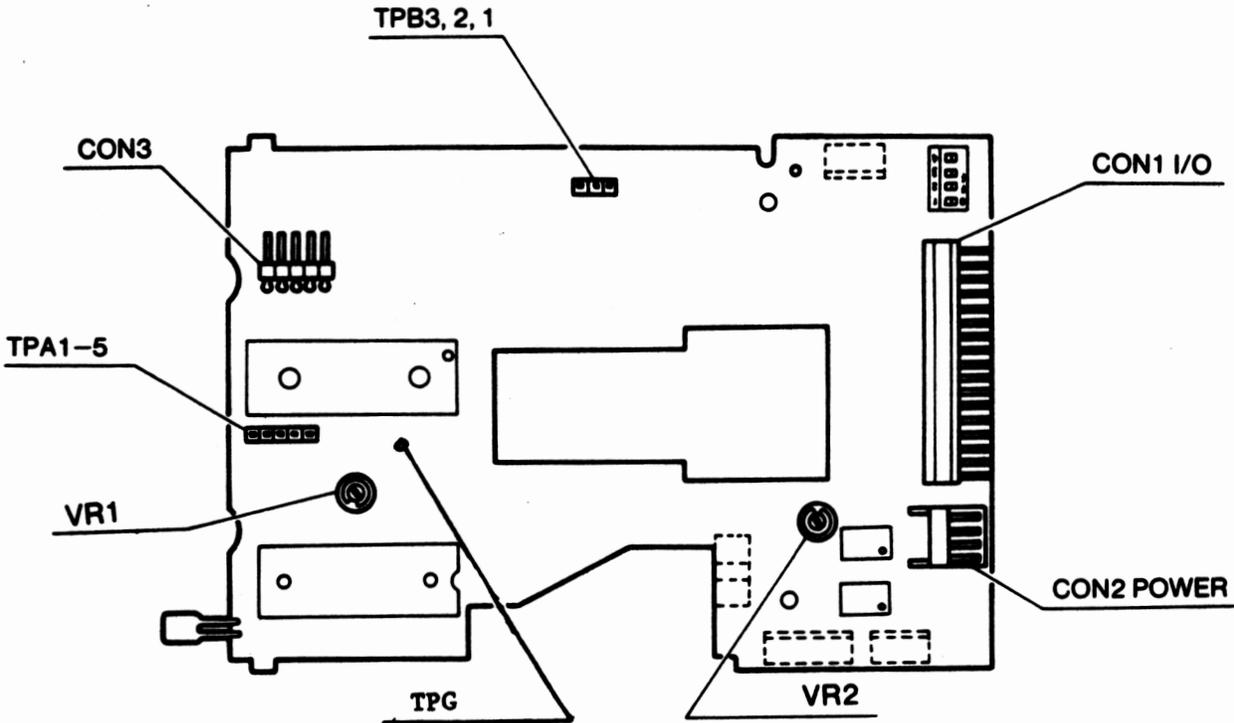
- Sankyo FDU335 Drive Test Points -

TPA pins 1 & 2	Read Amp	–	TPA pins 3 & 4	Differential Amp
TPB pin 1	Write Protect	–	TPB pin 2	Track Zero
TPA pin 5	Ground	–	TPG	Ground {near IC-1}
IC8 pin 1	Index Signal	–	IC8 pin 12	Raw Data Signal
VR1 potent.	Index Timing Pot.	–	VR2 potent.	Raw Data Pot.

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DATE: November 4, 1985

REVISION DATE: January 31, 1986

BULLETIN NO: 600:1

PRODUCT: 26-3901 Tandy 600

SUBASSEMBLY: 26-3910 96K RAM Upgrade Kit

PURPOSE: To discuss 96K upgrade procedure for the Tandy 600.

DISCUSSION: The Tandy 600 can be upgraded to a total of 224K of RAM. It comes with 32K standard and has 2 expansion slots for the 96K RAM upgrade boards.

```
*********************************************************************
*                                                                   *
*                     * * N O T E * *                               *
*                                                                   *
*      Turning off the memory power switch will cause a loss of     *
*   data. Be sure the customer has a save of all important data     *
*   files before doing this upgrade.                                *
*      Also, if the power on key sequence listed below is not       *
*   done correctly the first time, ie., the wrong key sequence is   *
*   used, it will be necessary to turn the memory power switch off  *
*   and on before attempting the power on key sequence again.       *
*                                                                   *
*********************************************************************
```

PROCEDURE:

1. First verify proper operation by turning the unit on to check for the main screen. At the bottom center of the screen there should be an indication of the number of bytes free. The number of bytes free on the 32K machine is 23,920. This number may be different, depending on the amount of customer data files already contained in the unit.

2. Turn off the power button, unplug the power adapter if applicable, and then turn off the memory power switch on the bottom of the unit.

3. Remove the five case screws and seperate the top half of the unit from the bottom half. There will be a 32K RAM board and 2 expansion slots labeled CN1 and CN2. Install the first 96K RAM board in the slot labeled CN1. If slot CN1 already has a 96K RAM board, install the second 96K RAM board in the slot labeled CN2.

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4. To do a cold start, which will be necessary after the memory power has been turned off, turn the memory power switch back on and then press the following keys and while holding them down at the same time, push the power button down, release the power button, and then release the keys.

        CNTRL   ALT   DEL   LABEL

5. After the addition of one 96K RAM board, the number of bytes free will be 122,224.

6. After the addition of the second 96K RAM board, the number of bytes free will be 220,528.

7. Run all applicable diagnostics to ensure proper operation.

DATE: January 27, 1986

REVISION DATE: January 27, 1986

BULLETIN NO: 600:02

PRODUCT: 26-3901   Tandy 600

SUBASSEMBLY: Entire Item

SUBASSEMBLY REVISION: All

PURPOSE: To prevent damage to machine caused by battery overcharging.

DISCUSSION/PROCEDURE:

To prevent possible damage to the Tandy 600, do not overcharge the internal rechargable nickel-cadmium (Nicad) batteries. Doing so may cause the batteries to explode, causing damage to the unit. A full charge will be obtained in 14 hours; no additional charge is gained after this time and there is some danger of damage if the charging process is prolonged past this point.

An informational point: the batteries will only charge when the unit is connected to the AC power supply and turned off. No charging takes place when the unit is turned on and is running off the AC power supply.