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Lil'DMXter (FD DMX-1) Power Supply FAQ V1s

How long should a battery last?

There is no exact answer to this question. If you leave your unit in deep discharge in the cold trunk of your car in winter, you can kill a battery in three months. On the other hand we have seen units with 4-year-old batteries that still work. We feel that when a battery is more than two years old it definitely time to replace it. A unit in hard use may require a new battery every 12 to 18 months.

1) We are having problems with a number of our DMXters. Even when plugged into AC power the operation is intermittent. In particular, cable test causes the unit to crash, often writing random characters to the display.

2) We are having problems with our Lil'DMXter; it works fine from the mains supply, but isn't charging the internal battery.

The single most likely cause of a problem with your Lil'DMXter (FD DMX-1) is a dead or dying battery.

It is important to realize that the Lil'DMXter always runs on battery. This is a floating battery design, there are no large storage capacitors in this supply. The battery charges when AC mains are at peak and discharges when the line is low. For a unit running on AC with a battery that is nearly charged the net charge current to the battery is very low. When the battery is discharged, the net charge will be high.

As batteries age they get less able to accept charge. At first they do charge but the charging current is greatly reduced. The cell voltage will rise properly and they will drive the load but have lower amp-hour rating.

I leave my DMXter in my road tool box in my car. It is often discharged when I go to use it. Am I hurting the batteries?

Yes, The lead-acid gel cells we use are not harmed by shallow charges. While charging any battery wears it out gel cells are damaged far quicker by being left in fully discharged (a.k.a. deep discharge) for a long period of time. While I know it is a pain, get in the habit of opening the unit after a job and switching off the battery. Or if you are feeling flush, buy a new Lil'DMXter2 that has a 4-6 month battery shelf life.

At what point does the DMXter start showing ‘feed me’ messages?

A fully charged battery provides about 6.3 volts. Reasonably quickly this will drop down to 6 volts. When the battery voltage drops to 5.6 - 5.5 volts (5.56 volts nominal) the DMXter will start sending low battery warnings. When the voltage drops to 5.28- 5.14 (5.2 volts nominal) the unit will shut down. The battery voltage is somewhat dependant on the current drawn hence some operation will cause low battery messages sooner. Cable test consumes the most power and will cause low battery messages soonest.

How much voltage must a battery have for a DMXter to work correctly?

To turn **on** The *Lil’*DMXter must have a charge of at least 5.6 volts on its battery. Since the battery voltage drops under load a unit with a standby voltage of 5.7 will start but will most likely send low battery messages almost immediately. A unit that has a charge of 5 volts when in standby and NOT plugged into AC will probably work immediately when plugged into AC power. A unit with a charge of 4 volts will require recharging time before working.

My DMXter is discharged, I plugged it in for two hours and it still does not work. Is there any point in letting it charge further?

Yes, a battery that has been deep discharged may take charge very slowly at first. After a period of time the rate of charge will increase greatly and the battery will return from a near death experience. We find that charging a unit for 24 - 48 hours may salvage a battery. A good test of your battery’s condition is how long it will run double end cable test. We have seen batteries sent to us as dead recover to the point that they will run double ended cable test for six hours. (A new battery will do this for seven to eight hours.

But if you have to resort to a long charge to get your unit to work you have a damaged battery and should consider buying a backup one.

I know my DMXter has a good battery but it will only run when plugged into AC and then it does not produce good DMX-512 out. I also notice that the display back light flickers what is wrong?

Did you remember to turn on the internal battery switch? This is a common ‘cockpit problem’. Is it possible that one of the push terminals used to connect the battery has come lose? You should also check that the battery wire hasn’t broken or the crimp connection to the terminals has come loose. This is also a symptom of a dead battery, use a volt meter and check that ‘good’ battery.

My Lil’DMXter charges fine but does not hold a charge on the shelf. What is wrong with the charger?

Unfortunately the Lil'DMXter-model FD DMX-1 only has a charge shelf life of fifteen to twenty days. If left with the battery switch on it will discharge to the point that it will not operate without recharging. This characteristic has been greatly improved on model FD DMX-1B *Lil'*DMXter 2.

If you are getting a shorted shelf life the problem is most likely an aged battery. If you wish to eliminate any electronic problem as the cause of a short shelf life, you can measure the standby battery current.

With the battery switch off connect a good DC ammeter in series with the battery. Turn the battery switch back on. To get a valid measurement you must turn the unit 'on' and have it running correctly. Then shut it off using the <OFF> key. Once the "is sleeping" message is removed from the display the unit has entered standby. The current now showing on the meter is the standby current. It should be 2.8 mA or less, 250µA or less for a FD DMX-1B.

On a few units produced in 1993 and 94 we have had problems with the .1µF bypass capacitors becoming leaky with age. This causes the increased drain noted above. These units should be returned for service.

> What is the nominal power supply voltage? How much current should it be able to supply to the Lil'DMXter?

Over the life of the Lil'DMXter 1 there were three major revisions to the power supply card. The first version is all PCB's R2 or less. The other two versions are R3 and R4-R5-R6. All versions can supply 5 volts +/- .1 volts at 200mA. All three versions are current limited. R2 and R3 versions will fold back to 95mA or less under a dead short. R4 boards will supply about 300mA into a dead short and will supply considerably more in a low load for a few moments. The R4 version is thermally protected and will shut down when the device temperature requires.

> I have tested the output from the charging circuit and am getting 6.9 volts dc @ 47ma when the DMXter is turned off.

Into no load with the battery replaced by a 1000uf capacitor the charger should put out 6.9 volts. This voltage is controlled by the trim pot on the board. This will be the voltage into a fully charged battery. I consider that a battery that only accepts 30mA is fully charged. Your battery is very nearly charged. It may also be very nearly dead.

A new battery charged to say 5.5 volts should accept an average charge current of more than 150 mA. The supply should at least supply 6.6 volts peak into a 30-ohm load.

> When turned on the current drops to about 8mA.

I would suspect an old battery. The charger is a simple device consisting of the mains transformer, a full wave bridge, and an LM317 adjustable voltage regulator set for 6.9 volts as per above.

I have tried new batteries but this doesn't improve the situation.

If the supply is not able to supply the current required, it is possible that one of the four windings in the transformer is open. Each primary winding has a DC resistance of approximately 330-ohms (A total of 660-ohms wire for 240VAC and 165-ohms wired for 120VAC.)
Each secondary winding has a DC resistance of approximately 4.4- ohms. They are wired in parallel by the PCB so you will see 2.2 on a good unit. I would not expect these values to be too exact, just a good guide. (This problem is extremely rare.)

I use my DMXter on my test bench. It is always plugged into AC. Will this shorten the battery life?

Yes, Leaving a unit always plugged in can shorten battery life. It is not as bad as letting it sit on the shelf in deep discharge but it does not help maters that much. There are several things that you can do to improve matters. **The first suggestion from our V1.70 manual is something that we recommend that owners of all units shipped before April 1997 do.**

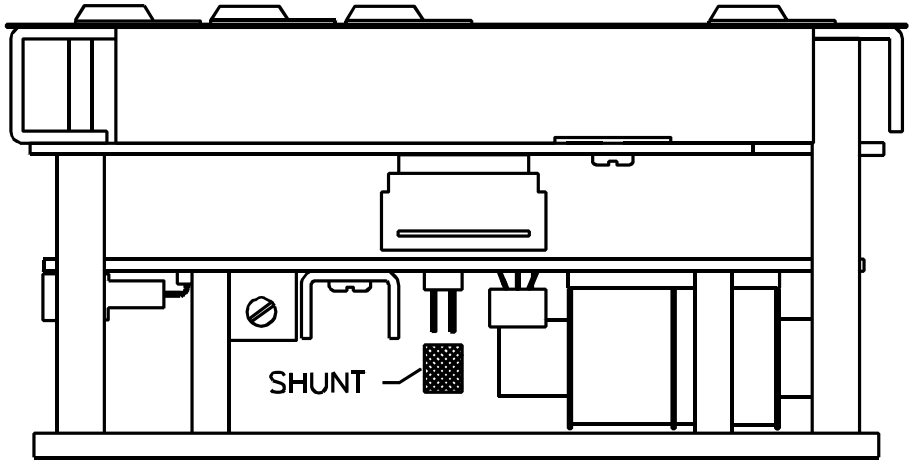
12.3 MODIFICATION FOR CONTINUOUS LINE OPERATION

If you plan to use the unit plugged into AC on a continuous basis, you may wish to make a simple modification to the unit to prolong battery life. As above, remove the unit from the case. Place the unit on a table with the Goddard Design Co. logo on the left. Approximately in the center of the open side of the end toward you, you will see a flat cable connector. Below it, on the other side of the PC board is the shunt. Pull this straight down, using your fingernail, to remove it. This removes the trickle charger; the unit will work just the same without it. Do hold onto the shunt you have removed in case you use the unit in a field situation in the future. The unit will certainly work on battery operation without the shunt.

Units shipped after April of 1997 (serial 1775 or greater) do not have the above-mentioned shunt. Experience has shown the trickle charge to be unnecessary and it was removed. This shunt will be found on DMX PS printed circuit boards through etch revision R3 and is missing on all later etch revisions.

12.3(1) **WE RECOMMEND DISABLING THE TRICKLE CHARGER !NEW!**

It is Goddard Design's feeling that the trickle charger provides little benefit to most users. We now recommend that most users will get better battery life with this feature disabled and will experience little increase in the amount of time needed to fully charge the battery. On the other hand we expect that the improvement in battery life will be minimal so we do not see this as important change for most users.



The second suggestion is one that will keep your *Lil'*DMXter ready to go without overcharging the batteries. Purchase an air conditioner timer of the type that is a 24-hour clock that switches on and off the AC power at set times. Set it to be off for 23 hours and on for one hour. Whenever the Lil'DMXter is just sitting around plug it into the timer.

I never use my unit on battery. Is there a way to set the Lil'DMXter so that it will run regardless of battery charge?

Yes, If you either replace or parallel the battery with a 1000µF 16V or greater capacitor the Lil'DMXter will work when connected AC mains. If the battery is present and charged it will still work on battery as well.

If you could send me any relevant information/circuit diagrams, it would be most appreciated.

If you need schematics of the power supplies, please contact us.

Hopefully this information will help you repair your units. Please contact us if we can be of further help.

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