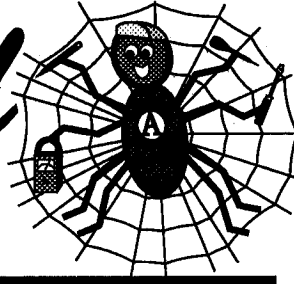


From the Originator of Electronic Darts

Arachnid Tech. Tips



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A Quarterly Publication for Operators and Technicians who service Arachnid Products

Welcome to the PREMIER ISSUE of Arachnid Tech. Tips !

This publication is designed especially for the field technicians and operators who troubleshoot, repair, and maintain Arachnid games. It is a technical tool designed to keep all the latest updates, service tips, suggestions, and ideas together in one neat package. Free binders are available to keep all Tech Tips issues and any other service information together. To receive yours, call or write to the address below.

This first issue contains some of the latest information available on the Galaxy Series and 6300/6500 (Super 6 Plus II) Series dart games. Future issues will contain additional background information, some of which may have been published before in other Service Bulletins and Update sheets. Additional facts and findings are collected from the technical notes of the Service Technicians at Arachnid, and from suggestions received from technicians around the country, and some from around the world!

Your input is welcome. If you have a special idea, or tip you would like to share, send it to: It will be reviewed and considered for publication.

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HAVE A TECHNICAL QUESTION OR PROBLEM? Call us at 1-800-435-8319 and ask for Technical Service. We'll be happy to assist you in any way we can.



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Top Gun Challenge...A New Strategy to Promote Play after Leagues

The most popular addition to the game choices on the Galaxy Series dart game is the Top Gun Challenge. Players challenge each other to 3, 5, or 7 game matches, and the winners' names are displayed for all to see on the attract screen. When the players enter their names, they also can enter a special "pin" number of their choice to keep other people from shooting on their name. The object is for the player to become the "Top Gun" of the location by climbing to the top of the list. This is done by challenging and winning matches against other players, whose names may already be ranked on the list.

The match size (2 out of 3, 3 out of 5, or 5 out of 7) is determined by the operator and set in the Test/Setup mode. The more games played, the more money needed per match. However, it will also tie the game up for a longer period of time. Each location may have different match length requirements depending on player expertise, player activity, and so on.

Top Gun Challenge is proving itself to be a popular addition from the players' standpoint. The feedback received by players and operators has been that of praise for this new feature. Operators can promote play by awarding prizes to the "Top Gun of the Week," and holding Top Gun Tournaments. Players can be more competitive with each other, and play matches more often to try and hold or improve his/her position on the ladder.

Ideas for promoting the Top Gun Challenge are coming in from operators and players alike. Call Arachnid for help with setting up Top Gun matches in your locations.

The New SUPER SPIDER Darthead - for Galaxies and 6300's : New Design...Better Reliability

The Super Spider Darthead is a totally new design. The thin spider and new-style segments will catch even slow, angled dart throws. The assembly itself is simpler, only two screws and two layers, making for easier alignment and faster servicing.

Kits are available for 6300 games only (order part# 26834). Installation on a 6300 involves replacing the darthead, Target Interface (T.I.) Board, Eprom and U6 (a 10K resistor network) on the Main P.C. board. Older model dart games must first be converted to a 6300 before installing the kit (conversion kits are available for all models).

Service Tip: If it becomes necessary to use a converted 6000 Main Board on an older 6000 game, U6 need not be switched back. Older dartheads will function properly with it. However, if the Eprom is not changed back to the old style, coinage and scoring will be incorrect.

The Galaxy Dart Game...Questions and Answers...from the Technician's Point of View

Modem Data Transfer, Card Programming, Automatic League Play...will this game be difficult to service?

The Galaxy isn't all that different to service from the 6300's. The Main P.C. board is similar, with the addition of a few more parts. There are L.E.D. indicators on the Main Board and Smart Target board to show that the darthead is being scanned properly. The new darthead, though re-vamped, is still a similar assembly. The power supply is also a modified version of the 6300 supply. The monitor is the same one that has been used for the 6300T games.

The entire game was designed with service in mind - All components are accessible from the front. A "service shelf" is added below the receptacle and Main Board for meters, setting tools down, etc. This gives the technician extra workspace. The lamps used in the target area are now standard 60-watt bulbs. The switch and fuse on the back of the game kills power to the electronics, while the switch and fuse on the side of the game turn on the target lamps and inner receptacle only. This provides light for servicing, and a handy outlet available for plugging in soldering irons or other test instruments. **CAUTION: With the game plugged in, there is still 110V under the Power Supply. Unplug the game if the Supply needs to be serviced.**

Test and Reset switches are located on the Main Board. When a board is on the bench, it can be reset or put into Test Mode without the use of jumpers. In the game, they can be used without access to the coin door as in previous models.

The Galaxy power supply has been improved from the 6000 Series supply. The 5 volt regulator has a larger heat sink, there is a heat-dissipating resistor on the top board, the 8 Amp bridge now has a special heat dissipating top. Sound is run with the 12V supply instead of a separate 15V regulator on the Main Board. (There is a 5V regulator on the Main Board, but it is only there for protection of the Card Reader Assembly.) Since all D.C. power is run from one source voltage, the transformer has a single secondary instead of a dual secondary.

Using a Modem with Galaxy Games

Some questions and answers about installing and using modems:

Appendix B of the Dartman II manual contains complete modem installation instructions. Take this manual with you when performing all new installations.

Is a modem required for each game in a location?

No. Only one modem is required per location. All games at a particular location are networked together with phone cables so that they can all use the same modem. Modem installation is outlined here. Further details on the proper hookup for these are provided in the Dartman II manual.

To run an automated league, must all Galaxy games be used?

Not necessarily. To have a truly automated league, all Galaxy games must be used, but score sheets from other games can be entered manually and mixed with stats collected with an Operator Card or by modem, as long as the score sheet stats match. There are upgrade kits available to convert a 6300 to a Galaxy as well. So don't worry if there are still older model games on the route, they can all be put to use until they can be replaced or upgraded.

What special wiring must be done at a location in order to use the modem collection system?

The modem is plugged into the Main board of the Galaxy. It can usually use an existing phone line, and share it with the phone in the location. In some cases, however, a location owner may wish to have a new line installed, in which case the telephone company must be notified. A new jack can be installed to the existing phone line, and mounted near the game without intervention from the phone company, or a "Y" splitter can be used at the existing jack. The phone line is plugged into the jack marked LINE on the Galaxy.

The COM IN and COM OUT jacks on the Main board are used for connecting multiple Galaxy games in a location to a single modem. Since male plugs are on each end of the cable, the wires are reversed end-to-end. **Always use 4 conductor modular phone cable.**

Phone cable test - With game power on, plug a telephone into the jack marked PHONE on the Main board of the game with the modem. If the phone cable is terminated properly, you will get a dial tone.

There is a set of D.I.P. switches on the Main board. If there are multiple games connected to one modem, these switches are set as follows: The game with the modem must have switches 1 and 2 on, and the end games must each have switch 3 on.

In the Test/Setup mode, check the clock and date settings, and set the modem answer times on the game with the modem. Give each game a node number (Node 01, 02, etc) and a separate location name (i.e. Foxys I, Foxys II, etc), so that stats collected by modem can be traced to a particular game. Set the password on each game to be 8 characters long; make it the same for each game at a location.

If all connections, cables, switch settings, passwords, etc. appear to be correct, but the modem hangs up immediately after connection, check the polarity of the phone line at the wall. This can be done with the use of a simple polarity tester made especially for phone lines, available at most electronics stores. If the service to the building appears to be reversed, the Telephone Company may need to be called to repair it.

Can games be shut off at night when automatic collection is done by modem?

The power switch in back will shut off all power to the Main P.C. board, and must be left on for modem collection. The switch on the right-hand side of the game can be used at night to shut off the lights and the monitor. Operators should train location owners to use this side switch at all times, so they will develop the habit of using it. That way, statistics will always be accessible by phone.

What if stats are not collected from a location?

Locations can be re-called manually any time of the day or night. You must call the location and inform them not to answer their telephone while re-collection is taking place, so that the modem can pick up the call. If re-collection is not successful, the stats can be collected manually with Operator Cards.



—IMPORTANT—

Please note that static electricity and voltage spikes can affect the Galaxy game. Both hardware and software have been modified to protect against these things, but grounded outlets are still very important for Galaxy games. Check all outlets for proper grounding, and add a ground line if necessary, or call an electrician to do it.

The Archives: Service Information, Past and Present... for 6300's and Older Dart Game Models



What's the Difference? A Summary of all English Mark Dart Game Models

A commonly asked question among many technicians and operators is, "How can I tell which game model I have?" There have been many subtle changes, especially in the 6000 Series games, which can make identification difficult at times. The following list explains all models, from the first game built by Arachnid to the most recent Galaxy Series game. **Please Note - The only games which are currently in production are the 6500 Series and the Galaxy Series games. All others listed are no longer available.**

Model AD 1000: This was the first game ever sold; it has a large cabinet, and plays 301 only. The darthead is made up of individual reed switches, with a flexible circuit surrounding the outside.

Model AD 2000: Only a few of these games were ever built. It is similar to the AD 1000, with some circuit modifications.

Model AD 3000: This game was the first that gave a selection of games: 301, Cut Throat, and Count Up. The darthead was made up of a flat contact P.C. board and a conductive rubber mat. An identifying feature is the "BUST" indicator. It appears as a bright red rectangle on the game front.

Model AD 4000: This game was a redesign of the AD 3000. It also plays 301, Cut Throat, and Count Up. The darthead and game cabinet style are similar, but the Main P. C. board and L.E.D. displays are a bit smaller. The "BUST" indicator on this model is a red and black starburst pattern. The AD 4000 is still being used in some areas, whereas the first three models described are seldom encountered.

—NOTICE—

SPECIALTY COMPONENTS, P.C. BOARDS, DARTHEADS, ETC. FOR MODELS AD 1000 THRU 4000 ARE NO LONGER AVAILABLE THROUGH ARACHNID. WE WILL, HOWEVER, OFFER AS MUCH PHONE ASSISTANCE AS WE CAN, AND TRY TO RECOMMEND A DISTRIBUTOR THAT MAY STILL HAVE SOME STOCK ON THESE DISCREET PARTS.

Model AD 5000: This series offers a choice of 8 different games. Four of them are one credit games, and four of them are two credit games. Arachnid did not offer a cricket kit for this game. This model proved to be very reliable, and is still used in some locations, though many have been converted to 6300's. A kit is available from Arachnid to do this. The AD 5000 was the first to use a flexible switch matrix, and except for the lead length, is the same design as is used in the 6000 series games. Parts are still available for this game from Arachnid, but complete P.C. board assemblies may not be in stock.

Model AD 4500: This game was first produced as a cost-reduced version of the AD 5000 (which is why the model number is smaller!). It became very popular, and is still widely used. The darthead is the same flexible matrix design, except the lead length was shortened from 11" to 6". When first introduced, this game had a one-piece touch panel for the Game Select and Player Change switches. Later, these proved to be too fragile for the "rougher" locations, and was replaced by a push-button panel. A kit is also available for the 4500 to convert it to a 6300 game.

The 6000 Series Games: From the first 6000 introduced to the latest Super 6 Plus II (6500 Series), these by far have been the most popular dart games produced by Arachnid. The main reason for this was the introduction of Cricket, and the visual versatility of the video monitor over L.E.D. displays. From a service standpoint, the component tray design was a plus as well. The darthead is the same as is used in the 4500 Series, but is rotated so that the leads point downward. Main P.C. boards are interchangeable between types, as long as the EPROM is correct. There are several different generations of the 6000, as outlined below:

Original 6000 Series: This game plays 301, Count Up, Cut Throat, 501 Team Doubles, 701 Open in/Double out, 301 Double in/Double out, Baseball, and Cricket. The latest software for this game also includes the Cricket 200 option, and Spider Writer. Coins-per-credit is fixed on this model...there is no Coin Credit Board.

6100 Series (The first Super 6 Plus): Cut Throat and Baseball are replaced by Tic-Tac Darts and Horse for this game version. This game did not use a Coin Credit Board. Otherwise, it is the same as the original 6000 Series. Spider Writer was first introduced for this model. Cricket 200 is also available with the latest software version.

6200 Series (The second Super 6 Plus): This game series is identical to the 6100, except that it uses a Coin Credit Board to change coins-per-credit. Cricket 200 and the Arachnid Web were first introduced with this game series.


6300 Series (The first Super 6 Plus II): This is the most current 6000 series game produced. The game of Horse was dropped, and a Cricket selection screen was added to give the choices of Original Cricket, Team Cricket, or Cut Throat Cricket. All cricket choices were also expanded to allow up to four players to compete at one time. It uses a Coin Credit Board and has Spider Writer as well. A double bull matrix was introduced for use with this game.

6500 Series (The second Super 6 Plus II): This game is the same as the 6300, except it is housed in a Galaxy style cabinet. It has lighting and a monitor like the Galaxy, and a service receptacle.

Kits are available to convert all 6000 Series games into 6300's. Specify which game series you are starting from, and the proper parts and instructions will be provided to make the conversion.

The 7000 Series (Master 7): This was a specialty game designed for experienced players. The games consist of Black Jack Darts, Ship/Captain/Crew Darts, 301 Open in/Open out, 301 Double in/Double out, 701 Open in/Double out, Darts Roulette 200, and Cricket. Game design is similar to the 6000 series, but the Main P.C. board is not interchangeable.

The Galaxy Series Game: This game is designed specifically for automatic league play. The games types are similar to the 6300, with the exception of the Top Gun Challenge, which uses traditional games, but creates more competition between players. The Super Spider darthead features a new double bull switch matrix design, and a thin spider with redesigned segments.

Here are the part numbers of the latest EPROMS for current games...use these numbers when ordering from distributors: 

5000 = 33635	4500 = 25856	6000 = 32535
6100 = 34755	6200 = 21424	6300 = 16981
6300(S.S.head) 16987	7000 = 29094	GALAXY = 32541



The following tips and suggestions were collected from previously published service bulletins, technical notes and phone conversations with technicians in the field:

Main Fuse Blowing Periodically: The main fuse in all Arachnid dart games can be upgraded to a 2 Amp, 250Volt slow blow. Some locations appear to have higher line voltages, and will cause the 1.5 Amp fuse to fatigue after a period of time. **Important: Do not use larger than a 2 Amp Slow blow.**

Fuse Blows Immediately Upon Power-up: Check for direct line shorts. If game has incandescent bulbs, remove all three and try powering up again. If this works, then the filament has broken in one of the bulbs and is shorting the line from the inside. Check and replace burnt bulb(s). If this is not the solution, check the Power Supply for 5V and 12V outputs. Bridge BR1 may be shorted.

No Top Lights: Replace the MOC3030 Opto Isolator on the Power Supply bottom board.

Top Lights Stay Bright all the Time: Replace the SC146D Triac on the Power Supply bottom board.

Game Operates Very Slowly on Power-up: Disconnect darthead and re-power up. If game operates properly, there is a stuck segment in the darthead. Coin up a game, and when game goes to Throw Darts, plug the darthead back in. The stuck segment should now flash on the screen.

Thin Line on 12V Monitor or Faded/Shrunken Screen: Replace capacitor C9 on the Power Supply with a 4.7 uf TANTALUM type. It is recommended that C4 and C10 also be changed to a 4.7uf tantalum at the same time that C9 is changed.

Sound Affecting the 12V Monitor or Sound Sticking On: Replace capacitor C19 on the Main P.C. Board with a 4.7 uf TANTALUM type. Also, reroute the wires that go to the monitor so that they do not rest on top of the Main Board. Frequencies can be radiated from the Board into the video wires.

PLEASE NOTE: Arachnid has changed its part number system! As you order parts, you will notice the new numbers. Please bear with us during this time of transition. If you don't have the new number, tell us the old one. Thank you for your patience.

IN THE NEXT ISSUE OF ARACHNID TECH TIPS: Additional service tips for Galaxy Games // DARTMAN II Information 5000 and 4500 Service Tips // and Much More !!!

12V Monitor Pulls to the Right: Replace C304(Kristel monitor) or C38(Omnivision monitor) on the monitor board. **TIP: The quickest way to tell the difference between monitor brands: Kristel monitors have tan-colored P.C. boards (component side), Omnivision monitors have green-colored P.C. boards.**

12V Monitor Board Burnt in Corner Near Focus Adjustment: This is most often caused by liquids dripping down into the monitor area from the front of the game (Can be caused by spills or cleaning). When cleaning the game, be careful not to let cleaning solutions seep behind the component tray cover.

Garbaged or Scrambled Screen: Bad U12 or U13 (TMS4416). If 4416's cannot be found use TMS4464's instead.

No Video at all; Problem Isolated to the Main Board: Bad U11 (TMS9118), or transistor Q1 is open.

Game Requires Two Coins for One Credit but not Desired to be Set That Way: A 6200 or 6300 EPROM has been installed in an older 6000 game. The newer EPROM will not credit properly unless the game is converted to a 6300 by adding a Coin Credit Board and new harness. If a Coin Credit Board is there, then make sure that switch #2 is pushed down in the ON position for all three switch banks.

Game Gives Two Credits For Every Coin but not Desired to be Set That Way: An older 6000 EPROM has been installed in a game that has a Coin Credit Board. Setting the switches so that switch #1 is pushed down in the ON position for all three switch banks will take care of this. Installing the correct EPROM will also take care of it.

Game Automatically Goes into Test Mode Upon Power-Up: This is usually an indication that the momentary Test Mode switch is bad. Even if it appears to test good, try disconnecting one side of it. It has been found that they don't always appear bad when metered. Replace it if disconnecting solves the problem. If game still goes into Test Mode, replace U7 on the Main Board.

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