



IRIS
TECHNOLOGY

Merlin Adapters for Tactical Radios the New Standard in Power Management

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Iris Technology at 25 Years



Aerospace Technology
Cryogenics and Imaging
Technology Development

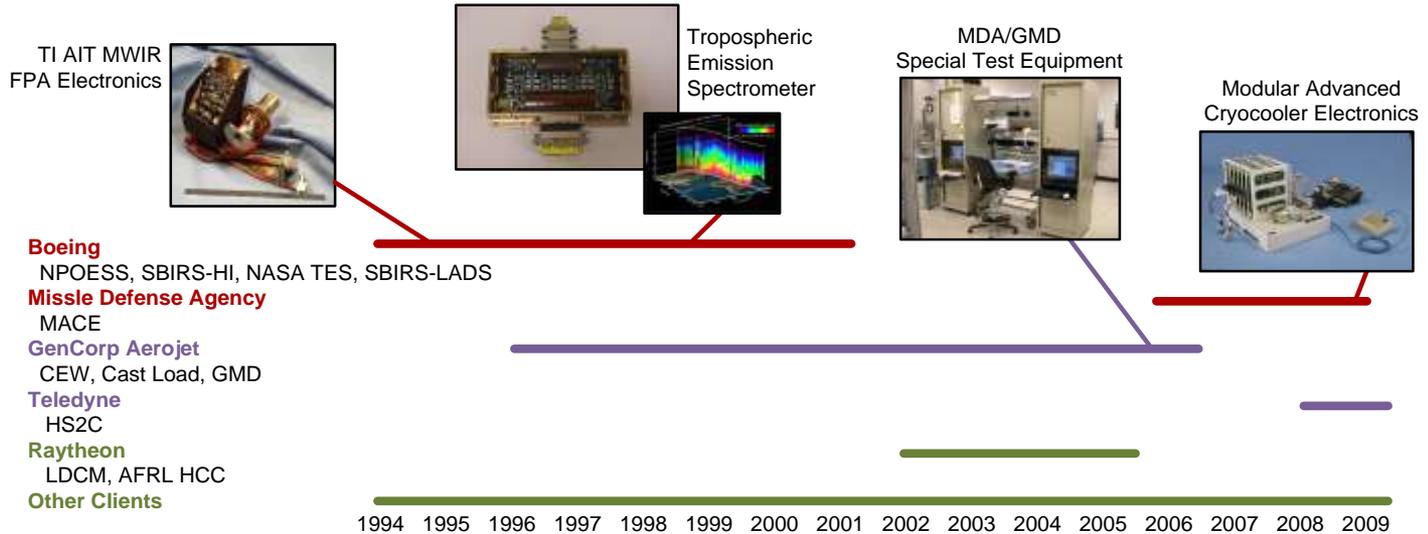


Military Power
Large Production
Intelligent Design

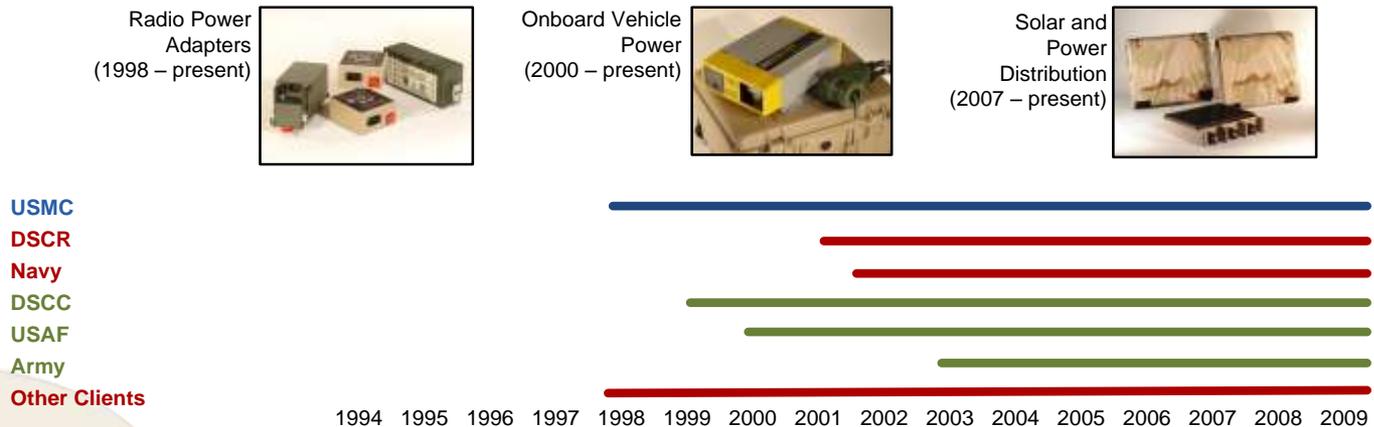


Snapshot of Major Iris Programs Since 1994

AEROSPACE



MILITARY



OVER \$10,000,000 (Blue line)
 OVER \$1,000,000 (Red line)
 OVER \$500,000 (Purple line)
 OVER \$100,000 (Green line)

Military / SPACES



**Tactical Solar Power
2,000 Fielded to Date
Customer: USMC**

Military / QuietPower



**Vehicle Inverter System
10,000 Fielded to Date
Customer: Joint**



Iris Radio Power Adapters (AC/DC)

PAC-216/U
6130-01-465-2867



1996
PAC-216/U
AN/PRC-119D
AC/DC RPA

2006
VB-90
AN/PRC-119F
AC/DC RPA



VB-90



2003
PAC-24
AN/PRC-117F
AC/DC RPA

Iris Merlin-3 Radio Power Adapter



Snapshot:

High efficiency SLICE

Transportable by air

User provided BX-XX90

Reuse radio battery box

Permits battery hot-swap

Variety of I/O accessories

Technology:

Software centric

Smart cable outputs

Native solar capable

High power ~ 240W

High efficiency ~ 97%

Cell energy rebalancing

Other ideas:

Use without battery

Use as battery charger

Iris Merlin-2 Radio Power Adapter



Snapshot:

High efficiency SLICE

Transportable by air

User provided BX-XX90(s)

Reuse radio battery box

Permits battery hot-swap

Variety of I/O accessories

Technology:

Software centric

Smart cable outputs

Native solar capable

High power ~ 240W

High efficiency ~ 97%

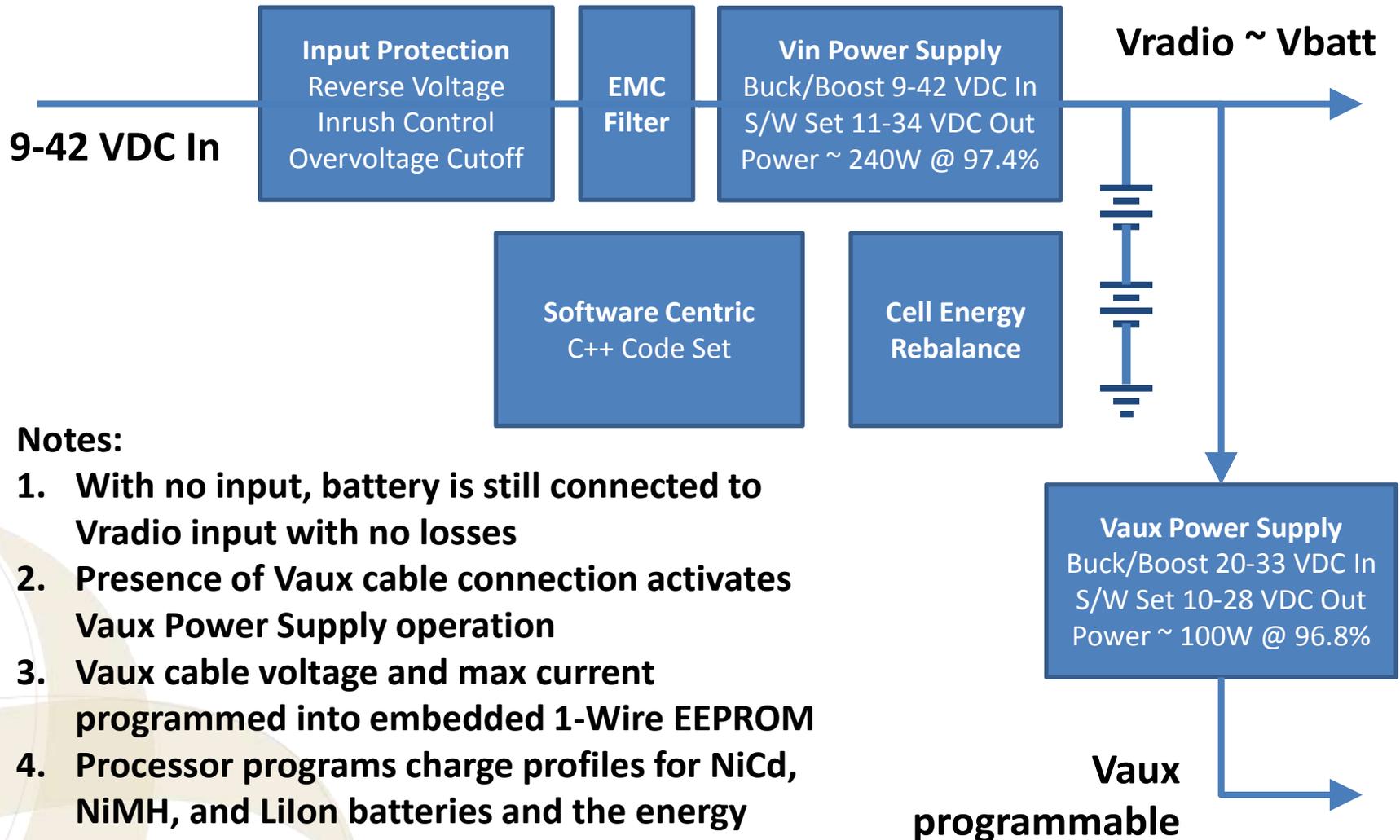
Cell energy rebalancing

Other ideas:

Use without battery

Use as battery charger

Merlin Architecture

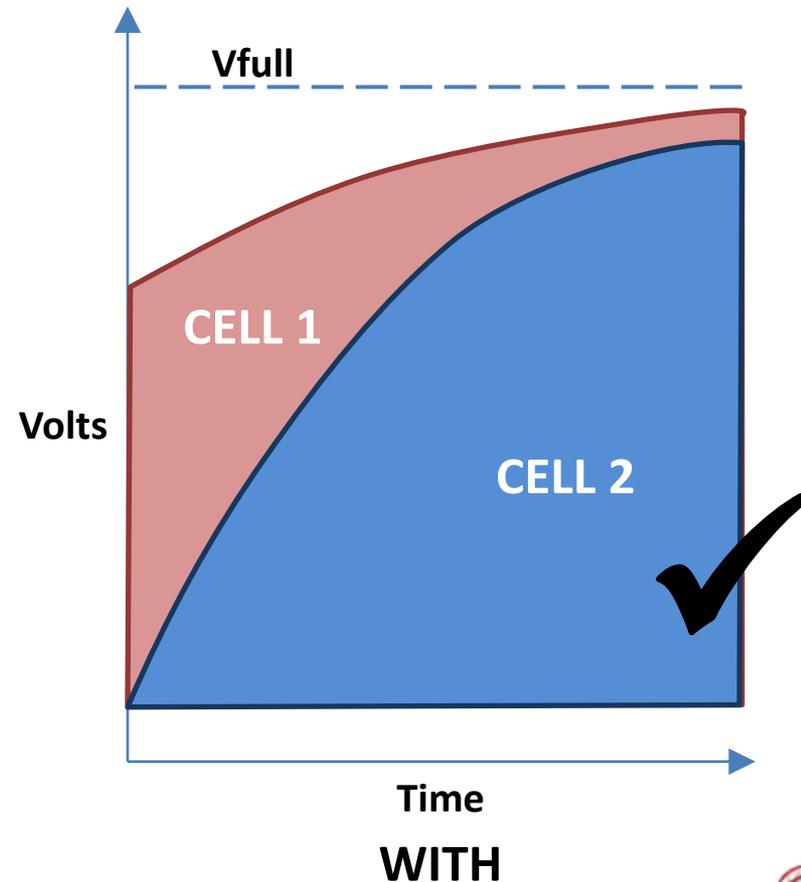
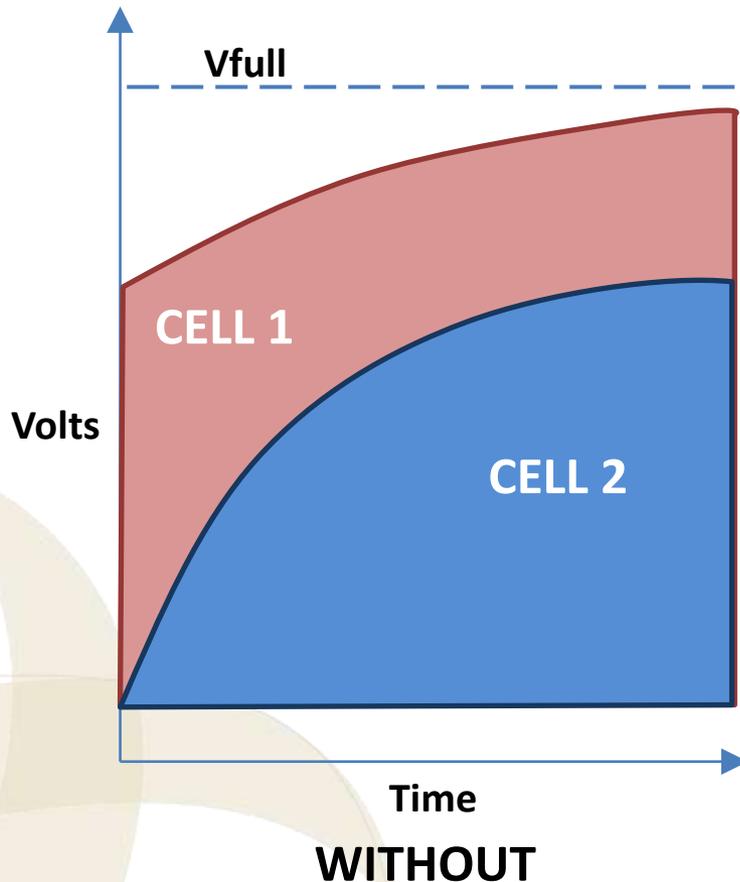


Notes:

1. With no input, battery is still connected to Vradio input with no losses
2. Presence of Vaux cable connection activates Vaux Power Supply operation
3. Vaux cable voltage and max current programmed into embedded 1-Wire EEPROM
4. Processor programs charge profiles for NiCd, NiMH, and Lilon batteries and the energy rebalance circuit

Cell Rebalancing

In series charging, cell energy rebalancing shifts charge between cells to provide headroom for full charging of the more depleted cell. Without this rebalancing, charging effectively terminates when the higher energy cell reaches capacity.



Iris Merlin-3 Radio Power Adapter

Status:

Available on GS-07F-0131N
Selected by USMC for RPA
M67854-11-A-5044 / \$13.5M



Parameter	Characteristics
Weight of Merlin-3™	1.8 lbs (829 g)
Size of Merlin-3™	7.6"(L) x 3.5" (W) x 1.9" (H) 193 mm (L) x 89 mm (W) x 48 mm (H)
Input Connector	MS3114-E8-4P
Output Connector	MS3114-E8-4S
Radio Connector	SC-C-179492
Environmental	MIL-STD-810, MIL-STD-461
Housing Material	Aluminum
Operating Temperature	-40°F (-40°C) to +131°F (+55°C)
Storage Temperature	-59°F (-50°C) to +160°F (+71°C)
Input Voltage	9-36 VDC @ 12 ADC (max)
Input Power (max)	280 W @ 24 VDC
Radio Power (max)	26.5 VDC @ 3.5 ADC
Output Voltage	12 or 24 VDC @ 5 Watts for Speakers or 12-28 VDC @ 4 ADC for Auxiliary
Efficiency	97%
BB-2590/U Charge Time	3 hours (typ)

Merlin Technology Features / Benefits (1/2)

Features	Benefits
Uses standard, full size rechargeable batteries	<ul style="list-style-type: none">• No reduction in runtime when powered from battery• Uses BB-2590/U (preferred) or BB-390B/U (alternate) battery• Programmable charging algorithms ensure future growth capability
Uses existing battery box	<ul style="list-style-type: none">• No tools required for installation or use• Using existing parts reduces system cost and weight• Eliminates need to store battery box when using the Merlin-3™
Mechanical latching system allows hot-swap of battery	<ul style="list-style-type: none">• Able to change-out battery and recharge extra batteries without power interruption to the radio or crypto-fill loss (when powered externally)
Cell energy rebalancing	<ul style="list-style-type: none">• Electronics redistributes charge between cells to create a healthier battery with a higher capacity

Merlin Technology Features / Benefits (2/2)

Features	Benefits
Compact size and weight	<ul style="list-style-type: none">• Light weight and easy to install• Totally integrated with battery box and radio
Functions with a variety of input and output accessories	<ul style="list-style-type: none">• Operates using a wide range of input sources including: native solar, NATO, AC/DC, Zinc-Air batteries, fuel cell, BX-XX90, and personal vehicle• Outputs power to a variety of accessories including speakers, laptop computer and small personal electronics – inverter compatible• Profile consistent with installed base of vehicle mounts
Solar Portable Alternative Communications Energy System (SPACES) Interoperable	<ul style="list-style-type: none">• User friendly – no user controls required• Compatible with Iris Technology SPACES elements• SmartCables configure the loads to the auxiliary



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