

# Joint Fires

Combat Support Program's Quarterly Information Circular



**Results from  
LAND 17 FIC  
Working Group  
at Enoggera  
Barracks in Aug**

**DTCS *Next Gen*:  
transition from  
requirements  
setting to Tender  
Release**

**AIR 90 tests  
Mode 5 IFF at  
BOLD QUEST  
17-2**

## **BOLD QUEST 17-2**

Testing of DTCS  
version 3

Australian AFATDS  
in the Joint Mission  
Thread

VMF vs ASCA

DAFS ECP #1

4 SQN tests ATAK as  
part of AFM1007



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## Contributors

- AL LTCOL Andrew Langford
- AM MAJ Andrew McDonell
- CS LTCOL Charles Slinger
- JH CAPT James Haggerty
- RM MAJ Rhys Myors
- TM CAPT Tony Mumford



LTCOL Andrew Langford  
SO1 Joint Fires

While we patiently wait for ministerial sign-off on LAND 17 Ph 1C2, the AHQ team is now very much focused on supporting infrastructure and training outcomes. We are working closely with CSSPO and the School to reinvigorate TMO and stand up a Reserve solution to replace IFACT. The aim is to conduct the first lot of TMO training and assessment for one of the Regiments before the end of the year as agreed at the last LAND 17 FIC Working Group. Discussions are well under way on the establishment of a Part Task Trainer capability at the School, with associated training laptops to be rolled out to all Reserve Units as a potential solution to IFACT which has reached its Life of Type. The School is looking at replacing the current IFACT training for Reserve operators with training on the new systems and software as a more permanent solution for the training of Reserve Artillery Forward Observers.

The team is working hard behind the scenes to obtain the appropriate approvals to secure the much needed working accommodation for 102 (Coral) Battery at Robertson Barracks. The aim is to achieve Investment Committee approval in December by appropriating project savings from the current infrastructure build (Simulators, Hangars, RPS).

The future of AFATDS and VMF have kept us incredibly busy and we are working closely with CSSPO to secure future versions of AFATDS through FMS. Strategic messaging has been critical in securing initial US support with the possibility of co-development being a discussion point with the view to being privy to the future direction of AFATDS - this is especially relevant with version 7 to be developed by Leidos for an anticipated introduction into service around 2020.

LAND 17 Ph 2 (DTCS *Next Gen*) has now moved from the requirements phase to the final preparations of Request for Tender before the end of the year to determine the *art of the possible*.

We are now also turning our attention to the start-up work, including key project documentation, to support projects LAND 8113 (Long Range Fires) and LAND 8112 (Replacement Artillery Project) which is Army's opportunity to look at the upgrade and possible replacement of M777A2. — AL



LTCOL Charles Slinger  
SO1 Air & Missile  
Defence

As the end of the year draws near, Air and Missile Defence projects continue to achieve objectives across all three key areas; namely LAND 19 Ph 7A (C-RAM), LAND 19 Ph 7B (SRGBAD) and C-UAS.

16 ALR recently deployed a contingent of personnel to BOLD QUEST 17-2 to conduct OT&E on Mode 4 IFF for the complete sensor-to-shooter chain of the GBAD system. Additionally, the activity allowed partial certification of Mode 5 IFF for the RBS-70 weapon system. All reports indicate 16 ALR capabilities have achieved a great deal of success and are leading the way with regard to Mode 5 IFF certification for the ADF.

LAND 19 Ph 7B continues its path to Second Pass in early 2019. Contract negotiations between CASG and Raytheon have been locked in, allowing project risk mitigation activities to commence. Assessment is also being conducted to determine the most acceptable solution for LAND 19 Ph 7B facilities; with likely options being Edinburgh, Amberley or Woodside. A decision on location will be made in early 2018 and will be based on affordability, Joint functionality (with AIR 6500) and impacts on existing infrastructure.

Significant development with C-UAS continues with capabilities to be acquired and fielded in the near-term which will inform future project acquisitions.

Safe travels this Christmas and I look forward to working with all again in 2018. — CS



# LAND 17 FIC Working Group - August 2017

The Joint Fires Cell at AHQ convened the second LAND 17 FIC Working Group for the year at Gallipoli Barracks in mid August to continue progressing the joint fires capability for Army. The event was well attended by 1 Div, CASG, CATC, the three Gun Regiments and School.

In his opening remarks LTCOL Langford (SO1 Joint Fires - Army) addressed numerous issues that are underpinned by the requirement to adopt a coherent narrative for RAA matters. In this context he spoke of Army's decision, agreed by FORCOMD, to adopt a cap of 14,000 rounds per year in order to build up war stocks; the successful progress of LAND 136 (Mortar replacement project) and LAND 8115 (Mortar ammunition); the significant achievement of LAND 17 1C2 (Future Artillery Ammunition) which passed Gate 2 at Investment Committee in early August; and other topics of interest.

## **LAND 136 (Mortars)**

This project will see the delivery of new tubes, the M32A1 LHMBC (Lightweight Handheld Mortar Ballistic Computer) and provision of DTCS. There has been a delay in receiving the new tubes after the Australian Army followed a decision by USMC to change its acquisition from the original USMC option to the US Army's more robust mortar tube. The Australian order is expected to be filled once the USMC order is catered for. A total of 15 tubes will be made available to Army for testing in December 2017 with the remainder to be delivered in November 2018. The provision of DTCS to Battalions will occur in 2020 (FOC for LAND 136) to align with LAND 17 Ph 2's IOC. Subsequent to this meeting AHQ convened a LAND 136 FIC Working Group in Brisbane to gain further input from the Mortar community across the Battalions.

## **LAND 8115 (Mortar Ammunition)**

This project achieved Gate 0 at Investment Committee in June and will pursue a US-FMS only option in order to update the current fleet of 60mm (including introduction into service) and 81mm ammunition and will return for Gate 2 in 2019.

## **LAND 1C1 (Infrastructure)**

Construction work has commenced at seven barracks locations across the country with schedule completion in Q1 2018 for the Gun Regiments and Q2 2018 for the School. The builds at each of these locations will see the delivery of additional Gun and vehicle hangars, improved RPS stores, and the structures to house the new DTCS (Dome) Simulators. The simulators are being delivered to 1, 4, 8/12 Regts, 4 Sqn, 2 Cdo, SASR, and two simulators to the School. Fitout of the simulators will be conducted by Rockwell Collins at the completion of the build with the expected fitout to be completed by the end of the year (2018).

Antenna Mounts - a proposal from RSM 8/12 Regt (WO1 Sinclair) has been considered by the Infrastructure project team that would provide an external antenna capability to the DTCS Simulators principally for the conduct of CPX. The proposed solution will see all eight simulators provided with a secure 'hole in the wall' to allow for the passing of cables to ground mounted antennas.

## **IFACT**

The requirement to continue running IFACT courses still remains in order to satisfy the Reserve Artillery units in observer training. An enduring solution which accommodates the distributed Reserve locations is still to be identified. The JF Cell will continue to work with the Simulation Cell in AHQ, CASG and 2 Div to address this gap.

## **Future ULC**

RPDE's Task 59 currently has two prototypes in development - one from BAE and one from Sea Box. The purpose of Task 59 is to inform the acquisition of ULCs by LAND 121 in circa 2022. Both companies have been conducting testing at the School and external



locations for the last two months. There is no change to the intent to deliver the prototypes to 1 Regt at the end of this year for user trials to be carried out in Q1/2 2018.

#### **TMO**

The School reported on its success in receiving re-accreditation for TMO training. To enable the continuation of training AHQ has committed to funding fly-away teams for delivery of training to Units for a minimum period of six months. Database - the requirement for a sustainable JTAC/JFO/TMO database remains unresolved. VCDF Gp (through LTCOL Meakin) is continuing to investigate potential solutions.

#### **RAA Directives**

CO 4 Regt (LTCOL Payne) prompted a discussion about the multiple sources of doctrine and directives that relate to RAA range planning - the result being a request for an directive that brings together the various sources. The resulting action item is for the School to consider producing a consolidated RAA Directive, potentially in the form of a reference list, for range planning.

#### **Gun Position Communication**

MG 1 Regt (WO1 Boswell) briefed on the need to augment current Gun Position internal communications with a system that provides a loudspeaker option. His current investigation has led to an option with a UK company Resilience Communications. The pursuit of this requirement supports 7 Bde's work in signature management. AHQ supports 1 Regt's proposal to use a concept demonstrator from Resilience Communications during CATA.

#### **Guardian**

LTCOL Cooper (S8, CATC) briefed on the formal trial conducted by CAPT Barclay in June-July 2017. The trial was a deep dive into the sub-systems of Guardian to report on the scalability and suitability for both RAA and wider Army. The consensus amongst unit COs was that the system would not be used to its full extent in Brigades, particularly with the advent of the AFATDS laboratories and DTCS Simulators, while CO School

(LTCOL Fletcher) highlighted the potential for Guardian to be used in the IAMD environment. LTCOL Cooper indicated that CATC is keen to pursue options for the simulator to be used within the manoeuvre training environment including COAC. As such, the decision was made to relinquish responsibility to CATC for determining the future of Guardian.

#### **PGM Live Fire Activity**

SO1 Joint Fires briefed on Head of Regiment's intent to conduct a live fire demonstration of Excalibur, Smart 155 and Course Correcting Fuse for a one and two star audience. Current work between AHQ and LEOSPO has been to identify the technical aspects that need to be achieved to progress the activity. Various members of the working group raised numerous points for consideration along technical, practical and funding themes. A PGM Working Group will be held in November to continue planning for the activity.

#### **Future Artillery Ammunition**

MAJ Abundo (PM for LAND 17 Ph 1C2) briefed on the status of the Future Artillery Ammunition project describing the proposed suite of ammunition, the increase in capability and the verification plan. More information to follow after 2nd Pass approval. — AM

Next  
LAND 17 FIC  
Working Group  
March 2018

# BOLD QUEST

## 17-2

BOLD QUEST is a multi-national event that has run annually since 2005. Originally formed as an opportunity to test friendly force recognition systems, the activity has evolved into a significant test arena for air and land based digital systems. The ADF has attended in different guises over the last 10 years with a consistent interest in Digitally Aided Close Air Support (DACAS) systems.

This year saw an increased involvement by ADF with contributions to the Digitally Aided Fire Support program (LAND 17), testing of Mode 5 IFF (AIR 90), and continued involvement in DACAS testing and capability development (LAND 17 and AFM 1007). ADF members were drawn from FORCOMD, SOCOMD, RAAF, AHQ, 1 Div, CASG and ADFTA. Contractor support included, but was not limited to, Rockwell Collins Australia and SAAB.

### **Digitally Aided Fire Support (DAFS)**

DTCS v3 and AFATDS 6.8.0.1 were put through their paces in the Joint Fire Support Joint Mission Thread (JFS JMT) laboratory at Ft Stewart. The two-week event had 16 nations participating with 25 distinct fire control systems and 101 personnel, and was delivered in three phases:

- Message compliance testing
- Systems Assessment
- Multinational CPTactical Demonstration

The ADF representatives were WO1 Donaldson (1 Div) and GNR Hart (8/12 Regt), and the technical lead was Mr Ian Burch from Rockwell Collins Australia.

### **DAFS ECP #1**

The first phase allowed for the testing of DAFS Engineering Change Proposal #1 (ECP #1) - an ECP that Australia (CS Program, AHQ) is co-sponsoring with the US Joint Staff. The intent of this ECP is to streamline the thread for the standard fire mission via VMF - it links the K series messages together in a coherent sequence. Importantly it provides

a standard against which user communities, acquisition groups and industry can develop fire control systems that are inter-operable without additional engineering. The adoption of such a standard will assist in the pursuit of cross-domain fires in both joint and coalition contexts. Near-term utility could be realised in the DTCS pursuit of NSFS with Anzac Class and subsequently with the Future Frigate.

Whilst we wait for the formal reporting to come from the Joint Fires Branch at Norfolk, VA in January next year, it certainly appears that there was success in ECP #1 VMF Compliance Testing between Australian, US and Norwegian fire control systems. This success has provided the resolve for AHQ to continue pursuing the completion of this body of work with the desired end-state being international adoption of the standard.

### **US-Australian AFATDS Interoperability**

Dedicated testing sessions allowed for the examination of VMF interfacing and processes between AS AFATDS (6.8.0.1) and US AFATDS (6.8.1.1).

The interim feedback from GNR Hart indicates that currently we can achieve decent interoperability with the US version via VMF, however transfer via proprietary protocol is not achievable due to the different versions. The cumulative experience of this activity adds weight to Army's case for pursuing the acquisition of current and future versions of AFATDS by FMS.

### **VMF v ASCA**

In a concerted attempt to address the challenge of national fire control systems communicating with each other there has been significant work in a number of NATO countries to come up with a solution. Their ASCA (Artillery Systems Cooperation Activity) protocol has achieved this to some degree, with a limited set of missions capable of being digitally routed between national systems.

Interestingly, a successful thread was achieved from AS AFATDS to an ASCA-

capable system using US AFATDS for the routing. The implication for the ADF is that acquiring AFATDS 6.8.1.1 by FMS would allow improved interoperability with the US *and* the ability to engage with NATO systems as well.

In the context of VMF v ASCA, Army's position is clear: VMF is the way forward due to its maturity and proliferation throughout the land, air and even naval domains; and it is a view that has been formally adopted by ABCANZ this year.

### **DTCS v3**

BQ 17-2 proved to be an excellent opportunity to test the next version of DTCS with international air platforms and other nations' ground kits.

CAPT Cowley (8/12 Regt) and WO2 Knight (108 Bty, 2 RAR) worked with our Rockwell engineer Josh Roth to test DTCS v3 against a number of the DACAS ECPs that are in development worldwide.

A particularly positive comment is that 'DTCS v3 worked very well with all aircraft and, in comparison to other systems, DTCS transferred the most 'data' with minimal voice controls.' When considering this comment in conjunction with the successful incorporation of the targeted DACAS ECPs, it is clear that there have been some excellent technical advances in this version. Another significant development is the introduction of a software modem - the PCIDM (Personal Computer Improved Data Modem) is gone!

These improvements though should be read as being 'incremental'. User feedback over the past 12 months has been clear that the performance and usability of the mapping engine has not kept pace with modern standards. Further, the proliferation of android-based end user devices (EUDs) has opened up seemingly numerous options for the DTCS display. All of which are being considered as part of DTCS *Next Gen*. — AM

## **DTCS v3 and DTCS Next Gen**

### **DTCS v3**

The currently fielded version of DTCS is v2.1, and there are two subsequent versions that have been developed but not yet released - v2.1.1 and the new v3. The positive experience from BQ 17-2 suggests that the best option may be to skip straight to the release of v3 during the first quarter of next year. This decision to be made by the JF Cell will be done so shortly in conjunction with advice from CASG and with consideration of the School and Unit training cycle.

It should also be noted that the JF Cell has provided direction to CASG for this to be the last upgrade of the current DTCS, with all future work to be dedicated to the development of DTCS *Next Gen*.

### **DTCS Next Gen**

LAND 17 Ph 2 is responsible for delivering the next generation of DTCS to Army and RAAF with an intended introduction into service of 2020.

A series of User Requirements workshops and feedback sessions were carried out from April until August this year, with the AHQ User Requirement document provided to CASG in September. Concurrently, the CASG project team in Melbourne have been developing the Request for Tender (inclusive of a Functional Performance Specification document) for release in early December.

A response is expected in approximately February next year, after which the tender evaluation will be carried out by CASG, and AHQ will subsequently pursue Investment Committee and Second Pass approval in the second half of the year.

From next year we will conduct a series of Risk Reduction Activities that will incorporate User input and feedback to inform the development of the capability. User support will be crucial. — AM

## Mode 5 IFF testing at BOLD QUEST

*AIR 90 has reached a significant Test & Evaluation milestone with the successful testing of Mode 5 IFF with the RBS 70 in a coalition environment*

Captain James Haggerty (16 ALR) reports from Savannah, Georgia.

BOLD QUEST 17-2 saw a contingent from 16 ALR deploy to Ft Stewart Training Area in Savannah, Georgia over period 11-30 Oct 17. The contingent deployed to support the T&E of Mode 5 IFF for the RBS 70 under project AIR 90. The testing was supported through the acquisition of a prototype TSA 1422 Mode 5 IFF Interrogator from Thales Communications and Security which was integrated by SAAB Dynamics into the RBS 70. Additionally, a prototype TaCCS (Tactical Command and Control System) was provided which allowed the GAMB to provide cuing to the RBS 70 rather than the previous system which used the PSTAR-ER.

### **What is IFF?**

IFF (Identify Friend or Foe) is used to determine the location, altitude, heading and specific type of aircraft (nationality, airframe, etc) and operates a two-channel system with separate receiving and responding frequencies. Mode 3 is the most common IFF system and is employed by all civilian and military aircraft. In this system aircraft are allocated a four-digit number by air traffic control authorities. This is married up with an airspace control plan for the region and allows a primitive ability to determine aircraft type in a permissive environment.

### **IFF Modes**

Mode 4 IFF uses the concept of the civilian Mode 3, however is differentiated by the centralised allocation of IFF through a military agency and has additional security

protocols such as time synchronisation and encryption. Mode 5 IFF continues to build on these concepts from Mode 4 with enhanced security protocols and incorporates a 'lethal interrogation' capability. A Mode 5 capable aircraft has the ability to toggle between 'normal' and 'standby' modes. The 'normal' mode is similar to the operation of Modes 3 and 4 with the standard protocol of receiving and responding. 'Standby' mode refers to the ability of an aircraft to receive interrogations without responding unless interrogated by an effector unit. On successful lethal interrogation by a Mode 5 capable effector unit the aircraft will switch to normal mode and begin broadcasting Mode 5 data in order to reduce the risk of fratricide. The RBS 70 was the first platform in the ADF to undergo certification as a Mode 5 IFF system capable of lethal interrogation.

### **Distribution of IFF codes**

BQ 17-2 provided ample opportunity to conduct the T&E of the system due to the volume of aircraft as well as the involvement of numerous coalition nations. It is important to note that Mode 5 is a coalition fill and the ability to achieve successful interrogation across international platforms is extremely important. As many would appreciate, there is a requirement for significant planning and cooperation between coalition partners to distribute these identical fills. The ADF receives its codes from a distribution chain that starts at the US DoD, and through a series of intermediaries arrives at Woodside where it is finally loaded into the IFF interrogator unit.

### **16 ALR's role in BQ 17-2**

16 ALR's primary commitment to BQ 17-2 was to provide support to the T&E objectives for AIR 90. A secondary set of objectives saw attempts to integrate with the BQ Mission Network by pushing the GAMB feed through the FAAD (Forward Area Air Defence) C2 system, and separately to acquire Mode 5 fills



from US DoD whilst in country. Critically, the T&E objectives were met, however the secondary objectives were less successful.

### Test & Evaluation objectives

The T&E phase had two main objectives:

- Ground based testing of codes
- Air testing of normal and standby modes

### Ground based testing

Ground based testing occurred at Savannah International Airport with the French Air Force's Mirage 2000 Aircraft. This objective was conducted by a small team who loaded the IFF fill into the ground based testing unit and interrogated the aircraft which was loaded with identical codes provided through their signals chain. This was a successful test and demonstrated confidence in the independent supply chains of coalition partners for acquiring coalition fills.



### Air testing

The air testing, which was also supported by the French Air Force, provided a number of 20 minute windows throughout a two-day period and allowed the critical T&E objective to be met: successful interrogation of an aircraft in standby mode and the subsequent reaction of the IFF system.

To achieve this objective the 16 ALR force elements deployed to the urban operating facility at Colmar Range where the multi-storey buildings offered the best line of sight against approaching aircraft. The roof of Colmar 'High School' provided the best vantage point for occupation by the RBS 70 unit which was fitted with the

prototype Mode 5 IFF interrogator. The GAMB provided early warning and cuing through the TaCCS system which allowed the detachment commander to identify the target in a congested airspace and ensure the operator (who receives cuing signals to the target) was aligned onto the allocated target in preparation for an interrogation. A key difference from previous capabilities was the ability for the GAMB to relay altitude data to the command post and the weapon detachment.



### Conclusion

BQ 17-2 provided an unparalleled opportunity to link in with an existing coalition activity with a vast array of aircraft and a multi-national mission network. For AIR 90 and 16 ALR this allowed a significant T&E milestone to be met in the testing of Mode 5 IFF. But it also provided an opportunity to plan and execute the force projection of a Troop (-) via strategic lift into a coalition activity; it saw the successful receipt and confirmation of Mode 5 IFF codes; it provided the opportunity to confirm the viability of using the GAMB to cue the RBS 70 fire unit; it provided the opportunity to develop new TTPs and further refine existing procedures; and finally it allowed us to turn our attention to the future of Air Defence in the context of the upcoming acquisition of medium range effectors and C2 systems (LAND 19 Ph 7B). — JH

## Snapshot

### **Future Artillery Ammunition (LAND 17 Ph 1C2)**

The Safety-in-Gun and qualification trial of FAA has been completed with 299 rounds fired at P&EE Port Wakefield. The collection requirements have been met and analysis is ongoing. Accordingly, we expect the ammunition to be deemed safe once the data has been analysed.

One identified issue from the trial that requires addressing is that the in-service unload bell is not suitable for the ammunition, options for a redesign are being considered at AHQ.

### **Met System (LAND 17 Ph 1 C1)**

Training has commenced on the MW32 Met system.

### **Mortars (LAND 136)**

The project team from LAND 136 recently conducted a successful Critical Design Review (CDR) of the M32A1 Lightweight Handheld Mortar Ballistic Computer (LHMBC) with all indications the system is fit for purpose.

A training working group was hosted by the School where the US-supplied training packages were reviewed and methods for implementing training were discussed. The US supplier has provided a similar product to what Army uses and conversion work will commence early next year.

### **Hearing Tests**

In accordance with extant ADF policy there is a requirement for RAA members to undergo a hearing test every six months. AHQ will assist with coordination of the tests through liaison with Joint Health Command (JHC) to ensure that the resources are available for testing at times appropriate to the training cycle.

As background, in 2014 Accredited Test Services measure the peak noise levels of the M777 at various differences in order to inform the current hearing protection requirements (Report TS4297R - *Noise Attenuation and*

*Blast Overpressure Measurements on a M777A2 Howitzer*). The results showed that even at a distance of 50m with M3A1 Green Bag the average noise level was above 166dB.

AHQ will commence engagement with JHC to determine the most efficient method for achieving the six-monthly tests and advise Regiments on the way forward.

### **Long Range Fires (LRF) & Land Based Maritime Strike (LBMS) (LAND 8113-1 / SEA4100-1)**

Work has begun on initiating the ADF's two land based long range surface fires projects. Throughout the next 12-24 months various workshops will be held to help set the needs and requirements for these burgeoning projects.

### **Digitally Aided Range Safety - Artillery**

Work has commenced on version 3.0 of DARS-A through QinetiQ and Shoal Engineering. As part of v3.0 the software will be upgraded to include the production of traces with Gun Areas and will also incorporate M777 firing tables. QinetiQ with AHQ is developing a Capability Realisation Plan to outline the roll-out and sustainment of the product.

### **Headline 17**

Headline occurred in Brisbane in October with a focus on the Army and Joint contribution to the ADF's Anti Access/Area Denial (A2/AD) capability. The activity which was supported by ACSC-J, 1 Div, AHQ and ADF HQ will help to inform Army's procurement of LRF and LBMS capabilities.

**DTCS Tech  
Support  
Helpline**

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## JTAC Accreditation of Flat Screen Trainers

The newly installed Flat Screen Trainers at 1, 4 and 8/12 Regts have received accreditation for the majority of simulated JTAC controls which allow the majority of currency to be achieved in locality.

The ADF JTAC Standards Officer (MAJ Ross Wehby) conducted the accreditation assessment on behalf of the Joint Fire Support Executive Steering Committee (JFS ESC) in June.

The following JTAC controls/currency requirements can be counted towards currency in the simulator:

- **Type 2 and 3**
- **Day and night**
- **Laser and IR pointer**
- **Video down link**
- **DACAS and DAFS**
- **Air to surface fires**
- **Surface to surface fires**

The benefit of achieving the majority of currency in simulation means that the focus of live events can be directed towards continuation training. Valuable air hours and soldier training time can be devoted to more complex serials that see JTACs become proficient (a significant step beyond currency).

## Do we need FSRs for AFATDS?

Joint Fires Cell at AHQ is seeking your input to inform us about the future requirement for Fleet Support Representatives (FSRs) for AFATDS.

The impending move to acquire AFATDS (6.8.1.1 P2) through FMS from the US Government (current version 6.8.0.1 is purchased from Raytheon) will provide the RAA an opportunity to assess how we support the introduction and sustainment of the next version that we acquire.

Do we have the technical expertise and the confidence to 'go it alone'? Alternatively, do we feel the need to maintain support from the US in the future, albeit on an as required or agreed part-time basis?

There are numerous pros and cons for each option, and no one approach is the correct answer. But we need to establish the 'why' so that when Army embarks on contract future negotiations with the AFATDS Program Office we have an agreed position from which we can develop our technical support strategy.



Do we need  
AFATDS FSRs  
in the future?

Email: [ahqjointfires@drn.mil.au](mailto:ahqjointfires@drn.mil.au)  
(AHQ Joint Fires)



# Solar Flex Chargers

Diggerworks has successfully rolled out a total of 55 Solar Flex Chargers to be trialled across the three Gun Regiments and the New Equipment Training Team at the School. MAJ Matt Haar and Mr Steve Canil from Diggerworks delivered the equipment and training to each of the three Regiments over the last three months.

This is in response to the feedback from 1 Regt and 4 Regt at the end of last year, which provided the impetus for the Joint Fires Cell (AHQ) to fund an expanded trial of this solar blanket capability.

Over the next 12 months the formal feedback to Diggerworks will help to inform the development of the Soldier Combat System and LAND 17 Ph 2 (DTCS).

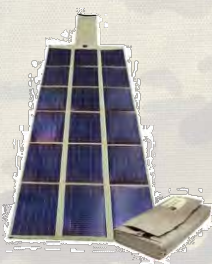
It is important for all users to remember that these kits are a one-off issue, with no sustainment or repair parts available. The 18 kits per Regiment are a finite resource.



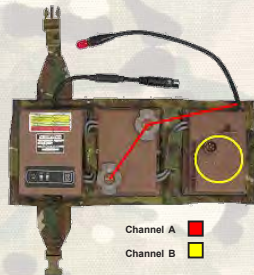
## CHARGER, ROLL-UP, MULTI



### Bren-Tronics Foldable Lightweight EXpeditionary (FLEX) Charger Kit



- BTP-70986-2G 60W Solar Panel**
- Voltage at MPP 22.5 VDC
  - Rated Current 2.8 A
  - Operating Temp -40 to +80C
  - L x W x H 277 x 325 x 51 mm
  - L x W (unfolded) 1905 x 813 mm
  - Weight 1200 g
  - Efficiency ≈ 5% at 1000 W/m2



- BTC-70911-7 Multi Roll-Up Charger**
- Input Voltage 20 - 36 VDC (15V Cut-Off)
  - Input Power 130 W (Max)
  - Operating Temp -20 to +50C
  - L x W x H 127 x 143 x 76 mm
  - L x W (unfolded) 343 x 143 x 44 mm
  - Weight 540 g
  - USB Power 10 W (2A @ 5 VDC)

#### Charger Operation

- Low Power 90 W Flashing Yellow (for Cigarette and Scavenge input cable)
- High Power 120 W Flashing Green (Hold blackout for 5 sec to toggle to LP)
- Channel A and B share input power (~60W maximum Channel Power)
- Channel A in Low Power Mode shares 45W Channel Power between 2 x 152
- Sequential Charging on Channel A - delay 2<sup>nd</sup> battery insertion for 20 seconds
- Concurrent Charging on Channel A - connect all batteries before powering
- Fast Charge only one battery at a time



- BB-2590/U ≈ 207Wh, 6.8Ah**
- Low Power 46W (max) ≈ 7 hrs
  - High Power 67W (max) ≈ 5 hrs



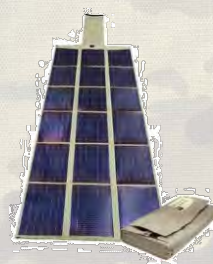
- AN/PRC-152 ≈ 63Wh, 5.8Ah**
- Low Power 42W (1 x 152) ≈ 2.8 hrs
  - High Power 42W (1 x 152) ≈ 2.8 hrs
  - Low Power 45W (2 x 152) ≈ 5.75 hrs
  - High Power 67W (2 x 152) ≈ 4 hrs

CHARGER

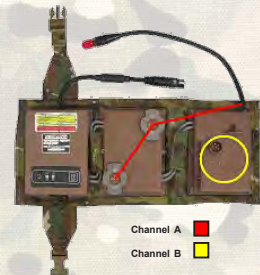
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  - Operating Temp -40 to +80C
  - L x W x H 277 x 325 x 51 mm
  - L x W (unfolded) 1905 x 813 mm
  - Weight 1200 g
  - Efficiency ≈ 5% at 1000 W/m2



- BTC-70911-7 Multi Roll-Up Charger**
- Input Voltage 20 - 36 VDC (15V Cut-Off)
  - Input Power 130 W (Max)
  - Operating Temp -20 to +50C
  - L x W x H 127 x 143 x 76 mm
  - L x W (unfolded) 343 x 143 x 44 mm
  - Weight 540 g
  - USB Power 10 W (2A @ 5 VDC)

#### Charger Operation

- Low Power 90 W Flashing Yellow (for Cigarette and Scavenge input cable)
- High Power 120 W Flashing Green (Hold blackout for 5 sec to toggle to LP)
- Channel A and B share input power (~60W maximum Channel Power)
- Channel A in Low Power Mode shares 45W Channel Power between 2 x 152
- Sequential Charging on Channel A - delay 2<sup>nd</sup> battery insertion for 20 seconds
- Concurrent Charging on Channel A - connect all batteries before powering
- Fast Charge only one battery at a time



- BB-2590/U ≈ 207Wh, 6.8Ah**
- Low Power 46W (max) ≈ 7 hrs
  - High Power 67W (max) ≈ 5 hrs



- AN/PRC-152 ≈ 63Wh, 5.8Ah**
- Low Power 42W (1 x 152) ≈ 2.8 hrs
  - High Power 42W (1 x 152) ≈ 2.8 hrs
  - Low Power 45W (2 x 152) ≈ 5.75 hrs
  - High Power 67W (2 x 152) ≈ 4 hrs

CHARGER



## Spotlight: RAA's representative at DSTG



MAJ Geoff Robertson, SO2 Combat Support, Joint Effects and Electronic Warfare is part of Army's Military Staff embedded in the Defence Science and Technology Group (DSTG), Edinburgh, Adelaide, SA.

He acts as a liaison officer in the Joint Effects and Electronic Warfare space, facilitating and enabling interaction between DSTG and Army in order to deliver outcomes for the Land Force.

Most recently he has enabled the integration of a number of Defence Science and Engineering teams conducting trials and experimentation in support of Exercise Talisman Sabre 2017 at Shoalwater Bay Training Area.

His postings have included BC (Field Guns), 2IC RAA Regt, S5 Bde HQ, 2IC AAC BDE, Regt 2IC of a University Regiment.

If you believe he can be of assistance to you in any way his contact details are:

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## Future Events

### **RAA Regimental Conference**

School of Artillery  
08-11 November 2017

### **LAND 17-2 Risk Workshop**

Russell  
17 November 2017  
0900-1230 h

### **DARS-A CRP Workshop**

CATC  
22 November 2017  
1000-1630 h

### **DARS-A CRP Workshop**

CASG  
23 November 2017  
0900-1600 h

### **RAA Tie Presentation (RMC Graduands)**

Fellows Bar, ANU  
04 December 2017  
1800-2000 h

## LAND 17 Working Group

Convenor: LTCOL Andrew Langford  
Month: March 2018  
Time: 0900-1600  
Place: TBC



**Army**