

Engineering Change Proposal (ECP)

TF2200-2023-010: CCTV 19-Inch Video Monitor w-RCA Input Obsolete



Submitted to

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TF2200-2023-010

VERSION HISTORY

Version	Date	Description of Changes	Author
Draft	9 December 2023	Original draft	Cannon, Bob
1.0	19 March 2024	Initial publication	Cannon, Bob

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1 BACKGROUND

The 19-inch security monitor associated with this Engineering Change Process (ECP) failed in the Truck Shelter Subsystem (TSS) 3; when attempting to order a replacement, it was discovered that the legacy ViewEra V191HV-B was obsolete. This monitor is also utilized in the Operational Shelter Subsystem (OSS) 1, OSS 2, OSS 3, and the Instructional Shelter Subsystem (ISS). This monitor displays the Closed-Circuit TV (CCTV) cameras installed on the shelters and are used for crew situational awareness of the area immediately surrounding the shelter. What makes this monitor unique is the RCA input that provides the analog signal from the security cameras.

This document explains why the contractor team recommends the ViewEra V191HV2 as a suitable replacement for the end-of-life (EOL) ViewEra V191HV-B monitor. See [Table 1: Comparison of ECP item to legacy item](#) for a detailed comparison between the V191HV2 monitor and the V191HV-B monitor.

Table 1: Comparison of ECP item to legacy item

	ECP Item	Legacy Item
Model	ViewEra V191HV2 19-inch monitor	ViewEra V191HV-B 19-inch monitor
Description	Quad screen monitor	Quad screen monitor
Manufacturer	ViewEra	ViewEra
Cost	\$302	N/A; no longer available
Approx Lead Time	5 weeks	N/A; no longer available
Screen Size	19-inch	19-inch
Resolution	1366 x 768 user resolution, 1280 x 1024 Max	1366 x 768 user resolution, 1280 x 1024 Max
Resolution Support	VGA, SVGA, XGA, SXGA	VGA, SVGA, XGA, SXGA
Display Colors	16.7M	16.7M
Response Time	5 ms (Typ.)	10 ms (Typ.)
Video Inputs	Composite RCA Video, S-Video	Composite RCA Video, S-Video
Power Supply	AC Input: 100-240V~1.8A, 50-60 Hz DC DC Output: 12V/5.0A	AC Input: 100-240V~1.8A, 50-60 Hz DC DC Output: 12V/4.0A
Power Consumption	Max 45 watts draw	Max 50 watts draw
Safety & EMI	FCC-B, CE	FCC-B, CE
Wall Mountable	VESA 75 bracket; Screw Spec M4x8	VESA 75 bracket; Screw Spec M4x8
Weight	7.05 lbs.	11 lbs.
Life Cycle		
• Last purchase date	N/A	2017
• Support ending date	2024	2019

2 ENGINEERING DISCIPLINE ASSESSMENT

Separate engineering assessments have been conducted in support of this proposal by the following disciplines: Electrical, Mechanical, Software, Cyber/IA, Test, and Logistics. The separate conclusions of each assessment will be used to create a recommendation for the government.

2.1 ELECTRICAL

The electrical assessment has determined the impacts to the system by the proposed change by identifying the impacts to performance, interfaces, EM compatibility, and power. Additionally, the impacts on existing documentation have been identified, levels of effort to accomplish the change have been predicted, costs specific to the electrical discipline have been identified, and a recommendation has been made.

2.1.1 Electrical Components (or Sub-System) Affected by Change

2.1.2 Component One: 19-inch Video Monitor with RCA Inputs

2.1.2.1 Component Specification Issue

Performance

There will be no impact on the performance of the TSS 3, OSS 1, 2, 3, or the ISS by replacing the legacy monitor with the proposed monitor. The legacy monitor (V191HV-B) has a maximum resolution of 1280 x 1024, and the proposed monitor (V191HV2) also has a maximum resolution of 1280 x 1024 and will accommodate the user's resolution of 1366 x 768.

Interface

The legacy monitor has RCA inputs to accommodate the video source from one of three components used in the family of shelter subsystems: the 4 Channel Color Quad Multiview, the Thor Fiber Optic Receiver, or the LiteLink Fiber Optic Receiver; the manufacturer-recommended replacement also has RCA inputs. Given the similarities in the interface between the legacy monitor and the recommended replacement monitor, no impact is expected.

EM Compatibility

There is no impact; the manufacturer has supplied the Attestation of Conformity certifications that the monitor has achieved. Please see a copy of certificate [here](#).

Power

There is an impact; the legacy monitor has a maximum current draw of 50 watts, and the proposed replacement monitor only has a maximum draw of 45 watts. The reduced power draw of the proposed replacement monitor will slightly lower the overall power draw of the TSS, OSS and ISS shelters.

2.1.2.2 Affected Documents

Drawings

Three electrical drawings will be recommended to be created: one for OSS 1 and ISS, one for OSS 2 and OSS 3, and one for TSS 3.

Interface Control Document (ICD)

Each shelter has its unique ICD, and each ICD will require minor updates to reflect the changes between the legacy and new monitors.

2.1.2.3 LOE to Implement and Timeline to Implement

The estimated LOEs to remove the legacy monitor, install the replacement monitor, update, or create electrical drawings and ICD will be approximately 79 hours. Please see [Table 2: Estimate of timeline and LOE for electrical schematic drawing creation](#), [Table 3: Total timeline and LOE to update ICD for each shelter](#), and [Table 4: Integration](#) for hours breakdown.

Table 2: Estimate of timeline and LOE for electrical schematic drawing creation

	OSS 1, ISS	OSS 2, OSS 3	TSS 3	Total Hours
Drawings needed	Convert sketches to Auto CAD EE	Convert sketches to Auto CAD EE	Convert sketches to Auto CAD EE	
Drafter	10	10	10	30
ME reviewer	3	3	3	9
EE reviewer	5	5	5	15
Grand Total Hours				54

Table 3: Total timeline and LOE to update ICD for each shelter

Task	Per Shelter			Total Hours for 5 Shelters
	No. of Personnel	Hours to Complete	Total Hours	
Update ICD	1	1	1	5
QC ICD update	1	1	1	5
Tech review of	1	1	1	5
Grand Total Hours				15

Table 4: Integration

Task	Per Shelter			Total Hours for 5 Shelters
	No. of Personnel	Hours to Complete	Total Hours	
Monitor R&R	2	1	2	10
Grand Total Hours				10

2.1.2.4 Material Cost

The material cost to install the five monitors into the five shelters will be approximately \$1,510. Each monitor costs approximately \$302.00, and it is estimated that about \$100.00 in consumables (zip ties, wire ties, etc.) will be required.

2.1.2.5 Impact Similar Projects

No other projects are using the legacy ViewEra V191HV-B.

2.1.2.6 Recommendations for Change

The manufacturer-recommended monitor is a suitable replacement for the obsolete monitor and the proposed change is recommended.

2.1.3 Component Two: 4-Channel Quad Multiview (TSS 3)

2.1.3.1 Component Specification Issue

Performance

There is no impact; the recommended replacement monitor supports the same formats delivered by the Quad Multiviewer.

Interface

There is no impact; the recommended replacement monitor supports the same RCA inputs as the legacy model.

EM Compatibility

There is no impact; no changes are recommended for the Quad Multiviewer.

Power

There is no impact; no changes are recommended for the Quad Multiviewer.

Drawings

There is no impact; no changes are recommended for the Quad Multiviewer.

ICD

There is no impact; there are no changes recommended for the Quad Multiviewer.

2.1.3.3 LOE to Implement

There is no impact; no changes are recommended for the Quad Multiviewer, and no additional LOE is required.

2.1.3.4 Timeline to Implement

There is no impact; no changes are recommended for the Quad Multiviewer, and no additional timeline is required.

2.1.3.5 Material Cost

There is no impact; no changes recommended for the Quad Multiviewer, and no additional material cost is required.

2.1.3.6 Impact Similar Projects

There is no impact; there are no changes recommended for the Quad Multiviewer.

2.1.3.7 Recommendations for Change

Replacing the legacy monitor with the proposed monitor will have no impact to the Quad Multiviewer. No replacement of the Quad Multiviewer is required or recommended.

2.1.4 Component Three: Thor Fiber Optic Receiver (OSS 1 & ISS)

2.1.4.1 Component Specification Issue

Performance

There is no impact; the recommended replacement monitor supports the same formats delivered by the Thor Fiber Optic Receiver.

Interface

There is no impact; the recommended replacement monitor supports the same RCA inputs as the legacy model.

EM Compatibility

There is no impact; no changes are recommended for the Thor Fiber Optic Receiver.

Power

There is no impact; no changes are recommended for the Thor Fiber Optic Receiver.

Drawings

There is no impact; no changes are recommended for the Thor Fiber Optic Receiver.

ICD

There is no impact; there are no changes recommended for the Thor Fiber Optic Receiver.

2.1.4.2 LOE to Implement

There is no impact; no changes are recommended for the Thor Fiber Optic Receiver, and no additional LOE is required.

2.1.4.3 Timeline to Implement

There is no impact; no changes are recommended for the Thor Fiber Optic Receiver, and no additional timeline is required.

2.1.4.4 Material Cost

There is no impact; no changes recommended for the Thor Fiber Optic Receiver and no additional material cost is required.

2.1.4.5 Impact Similar Projects

There is no impact; there are no changes recommended for the Thor Fiber Optic Receiver.

2.1.4.6 Recommendations for Change

Replacing the legacy monitor with the proposed monitor will have no impact to the Thor Fiber Optic Receiver. No replacement of the Thor Fiber Optic Receiver is required or recommended.

2.1.5 Component Four: LiteLink Fiber Optic Receiver (OSS 2 & OSS 3)

2.1.5.1 Component Specification Issue

Performance

There is no impact; the recommended replacement monitor supports the same formats delivered by the LiteLink Fiber Optic Receiver.

Interface

There is no impact; the recommended replacement monitor supports the same RCA inputs as the legacy model.

EM Compatibility

There is no impact; no changes are recommended for the LiteLink Fiber Optic Receiver.

Power

There is no impact; no changes are recommended for the LiteLink Fiber Optic Receiver.

Drawings

There is no impact; no changes are recommended for the LiteLink Fiber Optic Receiver.

ICD

There is no impact; there are no changes recommended for the LiteLink Fiber Optic Receiver.

2.1.5.2 LOE to Implement

There is no impact; no changes are recommended for the LiteLink Fiber Optic Receiver, and no additional LOE is required.

2.1.5.3 Timeline to Implement

There is no impact; no changes are recommended for the LiteLink Fiber Optic Receiver, and no additional timeline is required.

2.1.5.4 Material Cost

There is no impact; no changes recommended for the LiteLink Fiber Optic Receiver and no additional material cost is required.

2.1.5.5 Impact Similar Projects

There is no impact; there are no changes recommended for the LiteLink Fiber Optic Receiver.

2.1.5.6 Recommendations for Change

Replacing the legacy monitor with the proposed monitor will have no impact to the LiteLink Fiber Optic Receiver. No replacement of the LiteLink Fiber Optic Receiver is required or recommended.

2.1.6 Component Five: Power Strip 1 at C2 Station

2.1.6.1 Component Specification Issue

Performance

There is no impact; and the power usage is less than that of the original monitor.

Interface

There is no impact; the proposed new monitor has the same NEMA 5-15P as the legacy monitor.

EM Compatibility

There is no impact; no changes are recommended for the power strip.

Power

There is no impact; no changes are recommended for the power strip.

2.1.6.2 LOE to Implement

There is no impact; no changes are recommended for the power strip, and no additional LOE is required.

2.1.6.3 Timeline to Implement

There is no impact; no changes are recommended for the power strip and no additional timeline is required.

2.1.6.4 Material Cost

There is no impact; no changes are recommended for the power strip and no additional material cost is required.

2.1.6.5 Impact Similar Projects

There is no impact; there are no changes recommended for the power strip.

2.1.6.6 Recommendations for Change

Replacing the legacy monitor with the proposed monitor will have no impact to the power strip. No replacement of the power strip is required or recommended.

2.2 MECHANICAL

The mechanical assessment has determined the impacts to the system by the proposed change by identifying the impacts to weight, dimensions, coating, and material. Additionally, the impacts to existing documentation have been identified, levels of effort to accomplish the change has been predicted, costs specific to the mechanical discipline have been identified, and a recommendation to proceed has been made.

2.2.1 Mechanical Components (or Sub-System) Affected by Change

2.2.2 Component One: 19-inch Video Monitor with RCA Inputs

2.2.2.1 Component Specification Issues

Weight

There is an impact; the weight of the proposed replacement is 7.05 lbs., which is lighter than the 11 lbs. legacy monitor.

Dimensions

There is no impact; the dimensions for the proposed monitor are 16.63” x 16.54” x 2.05”, the same dimensions as the legacy monitor.

Coating

There is no impact; the coating on the proposed monitor is the same as on the legacy monitor.

Material

There is no impact; the material on the proposed monitor is the same as that on the legacy monitor.

2.2.2.2 Affected Documents

Drawings

Recommend two mechanical drawings to update the mounting brackets and wall mounts for OSS 1, 2, 3, and TSS 3, which is one drawing, and the ISS will also need to be updated for brackets and wall mounts.

Thermal Analysis

There is an impact; the proposed monitor's power consumption is less than the legacy monitor's.

Size and Weight

There is an impact; the proposed monitor is the same size but lighter than the legacy monitor.

2.2.2.3 Fabrication Required

There is no impact; the proposed monitor will use existing mounting hardware.

2.2.2.4 LOE to Implement and Timeline to Implement

The LOE and timeline to implement are broken down and can be seen in [Table 5: Mechanical drawings](#) on the following page.

Table 5: Mechanical drawings

	OSS 1, 2, 3, TSS 3	ISS	Total Hours
Drawings needed	Update ME Drawings	Create ME Drawings	
Drafter	20	20	40
ME reviewer	5	5	10
EE reviewer	2.5	2.5	5
Grand Total Hours			55

2.2.2.6 Material Cost

There is no impact; the proposed monitor has no additional material cost.

2.2.2.7 Impact Similar Projects

There are no other projects are using the legacy ViewEra V191HV-B.

2.2.2.8 Recommendations for Change

The manufacturer-recommended monitor will work as a replacement for the obsolete monitor.

2.3 SOFTWARE

The software assessment has determined the impacts to the system of the proposed change by identifying the impacts to performance, interfaces, and existing software baseline. Additionally, the levels of effort to implement the change has been predicted and a recommendation to proceed has been made.

2.3.1 Software Components (or Sub-System) Not Affected by Change

The legacy and new monitors have no components that interface with any software within the TSS, OSS, or ISS shelters.

2.4 CYBER

The cyber assessment has determined that the proposed change is not impacted by the NIAP/APL, nor is the MIGS and OTS ATO impacted by the proposed change. The LOE and timeline to implement the change has been predicted as well as the LOE for continued compliance. Lastly, a recommendation to proceed has been made.

2.4.1 Cyber Components (or Sub-System) Not Affected by Change

The legacy and new monitors do not touch any cyber-related equipment and are not tracked by the ATO or NIAP/APL.

2.5 LOGISTICS

The logistics assessment has estimated the timeline for the acquisition of the equipment necessary for this ECP and has assessed the impact to training materials, technical manuals, parts lists, sparring and lifecycle. Additionally, levels of effort to accomplish the changes has been predicted and a recommendation to proceed has been made.

2.5.1 Logistics Components (or Sub-System) Affected by Change

2.5.2 Component One: 19-inch Video Monitor with RCA Inputs

2.5.2.1 Component Specification Issue

Government Purchasing

There is an impact; the proposed five shelter monitors, three spare monitors, and incidentals will require government approval.

2.5.2.2 Impacts to Documentation

Training

There is no impact; the CCTV monitor is not specifically mentioned in the training documents.

Manual

The MIGS and OTS Technical Manuals will need to be updated with a few minor changes. Please see [Table 6: MIGS and OTS Technical Manual updates](#) for details.

Table 6: MIGS and OTS Technical Manual updates

Reference to	Manual	Section	Page	Type of Change
Vendor manual list	MIGS Manual	Appendix B	Page B-7	Update
ICD	MIGS Manual	Appendix C	Page C-190	Update
Vendor manual list	OTS Manual	Appendix B	Page B-1	Add
ICD	OTS Manual	Appendix C	Page C-38	Update

Parts List

There is an impact. Please refer to [Table 10: Combine material costs](#) on Page 14 for more information. No separate parts list exists for TSS 3, OSS 1-3, or the ISS. A Bill of Materials (BOM) will be created for the parts necessary to implement the proposed change.

2.5.2.3 Impacts to Sparring

The recommended spares for the Government Acquired Warehouse (GAW) can be seen in [Table 7: Recommended spares for the GAW](#) on the following page.

Table 7: Recommended spares for the GAW

Item	Quantity	Item Cost	Total Cost
ViewEra V191HV2 19-inch monitor	3	\$302	\$906
Total			\$906

2.5.2.4 Impacts to Reliability, Availability

According to the manufacturer, the return rate for the suggested replacement monitor is less than one percent. No monitor has been returned for repairs in the last three years when the monitors were first deployed.

2.5.2.5 Timeline to Implement

Estimating seven weeks from POR generation to receipt of items, eight hours will be needed to update manuals and other paperwork. The total cost will require government approval. Items are not in CHESS; with that, there will be a two-week lead time for a Statement of Non-Availability (SONA), which is included in the seven-week estimate.

2.5.2.6 Lifecycle Impacts

The manufacturer has indicated that the V191HV2 will be EOL by the end of 2024; however, the actual date was not provided and depends largely on the remaining inventories. Given the undefined timeline of this event and the established reliability of the V191HV2, the proposed monitor is still recommended for replacing the legacy monitor.

2.5.2.7 Recommendations For Change

Logistics recommends the ViewEra V191HV2 as a replacement for the legacy monitor.

2.6 TEST

The test assessment has estimated the level of effort required to produce a regression test for the proposed change being analyzed, as well as the level of effort and timeline necessary to conduct the regression testing. Additionally, a recommendation to proceed has been made.

2.6.1 Test Components (or Sub-System) Affected by Change

2.6.2 Component One

2.6.2.1 LOE and Timeline to Develop Regression Test, Execute, and Report Test Results

Please refer to [Table 8: LOE and timeline to develop regression test, execute, and report test results](#) on the following page for a complete breakdown of numbers.

Table 8: LOE and timeline to develop regression test, execute, and report test results

Event	No. of Personnel	No. of Hours / Personnel	Recurrent Events	Total Hours	Comments
Reviewing Lessons Learned	1	1	1	1	
A-Level Test Generation					
Write Procedure	1	4	1	4	Test procedure is only written once. First device tested during this process.
Procedure QC	1	2	1	2	Test step validation. Test procedure is only written once.
Tech Writer	1	4	1	4	Test procedure is only written once.
Tech Review	1	2	1	2	Test procedure is only written once.
A-Level Test Execution	1	1	7	7	
Regression Test Procedure Generation					
Write Procedure	1	4	1	4	Test procedure is only written once.
Procedure QC	1	1	1	1	Test step validation. Test procedure is only written once.
Tech Writer	1	4	1	4	Test procedure is only written once.
Tech Review	1	2	1	2	Test procedure is only written once.
Regression Test Execution	2	2	5	20	Includes powerup, warmup, testing, and power down.
Test Report Generation	1	2	5	10	
Report QC	1	1	5	5	
Tech Writer (1st Report)	1	2	5	10	
Tech Review	1	1	5	5	
Capturing Lessons Learned	1	1	1	1	
Grand Total Hours				82	

2.6.2.2 Resources Required to Execute Testing

The resources needed for testing will include the TMC Corporate Training Suite with DVD capabilities and RCA outputs for video source testing. Once the monitors are installed, regression tests will require powered-up shelters.

2.6.2.3 Recommendations for Change

This is an appropriate substitution since it aligns with all specifications of its predecessor, ensuring no impact on the equipment in the initial analysis phase. This recommendation is based on the similarities in display resolution, RCA capabilities, size, weight, and power consumption.

3 LOE AND TIMELINE

The total LOE and timeline are broken down in [Table 9: Estimated LOE and timeline](#).

Table 9: Estimated LOE and timeline

Discipline	No. of Personnel	Total Hours Required
Electrical	7-9	79
Mechanical	3-4	55
Software	0	0
Cyber	0	0
Logistics	1-2	8
Test	4-6	82
Grand Total Hours		224

4 COST

4.1 TMC COST ESTIMATES

The TMC cost estimate breakdown can be viewed in [Table 10: Combined material costs](#). The total labor cost for TMC is estimated to be \$32,256.

Table 10: Combined material costs

Item	Qty	Cost ea.	Total Cost	Comments
ViewEra V191HV2 19-inch monitor	5	\$302	\$1,510	Material required to replace monitors in all shelters.
Consumables			\$100	Material required to replace monitors in all shelters.
Recommended spares	3	\$302	\$906	Stored at the GAW
Grand Total Cost			\$2,516	

4.2 DYNETICS COST ESTIMATES

[Proprietary information deleted]

5 CONCLUSION

We recommend the ViewEra V191HV2 19-inch monitor as a suitable replacement for the legacy monitor (V191HV-B). The proposed monitor has the same resolution and RCA input ports as the legacy and is also a few pounds lighter. This monitor is a plug-and-play for the legacy monitor. TMC was recently notified by ViewEra stating that the V191HV2 will be at EOL by the end of 2024, however no specific model number or date was given nor is the future replacement available now. ViewEra will continue to sell the remaining V191HV2s that are in stock while honoring the 3-year warranty. When their stock is depleted, they will begin selling the newest version. Even with the EOL announcement for the V191HV2, the failure rate of this series of monitors has been very low and is still a recommended replacement to the legacy V191HV-B and the number of recommended spares is very likely to be sufficient for the remainder of the MIGS and OTS service life.

APPENDIX A

ATTESTATION OF CONFORMITY



Attestation No.:	21090123
Applicant / Holder:	VITA ELECTRONICS CO., LTD.
Address:	5th Fl 103 Chou Tze St Neihu District Taipei 114 TAIWAN
Trade Name:	VITA
Product / Test Item:	LCD Monitor
Model / Type Reference:	VT-185NTP3, VT-185NTP4, VT-190NAN1, VT-190NTP4, VT-190XAR1, VT-190XTP3, VT-190DAR1, VT-190DTP4, VT-190VAN1, VT-185XXXX, VT-190XXXX (X=0~9,A~Z,a~z OR BLANK)

The submitted sample(s) have been tested with the following standard(s) and found to be in compliance with the essential requirements:

Standard(s)
<p>Applicable to ANSI C63.4 – 2014 (The Information Technology Equipment)</p> <p>That this product has been assessed against the following Applicable Standards</p> <p>CISPR PUB. 22, FCC Part 15 Subpart B</p> <p>Canada ICES-003 Issue 7</p>

The measurements shown in this test report may issue a Supplier's Declaration of Conformity and apply the FCC mark.




 Kero Kuo / EMC & RF Manager
 2021-11-05

Cerpass Technology Corporation

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