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[REDACTED]

Encl # 4 to  
[REDACTED]  
COPY [REDACTED]

ENCLOSURE II  
FCIC  
PROPOSAL AND SPECIFICATIONS  
[REDACTED]  
31 OCTOBER 1958

Declassified and Released by the N R C

In Accordance with E. O. 12958

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DEFENSE PRODUCTS DIVISION

FORMERLY

RECONNAISSANCE SYSTEMS DIVISION

FORBES LANE FORT MONMOUTH PLAZA NEW JERSEY



13 November 1958

Refer: SC-28

Itek Corporation  
700 Commonwealth Avenue  
Boston, Massachusetts

Attention:



Subject:

Itek Letter Subcontract dated 5 May 1958

Reference:

(a) Fairchild Proposal letter SC-18 dated 10/6/58

Enclosures:

- I Three copies of Statement of Work dated 10/25/58
- II Three copies of Cost Breakdowns
- III Three copies Anticipated Monthly Funding Schedule
- IV Ten copies Specification SME-DB-1 dated 9/13/58 and Amendment No. 1 dated 10/25/58
- V Ten copies Specification SME-DC-3(A) dated 9/10/58 and Amendment No. 1 dated 10/23/58
- VI Ten copies Specification SME-DN-24(A) dated 9/12/58 and Amendment No. 1 dated 10/23/58
- VII Ten copies Specification SME-DY-1 dated 8/22/58, Amendment No. 1 dated 9/29/58 and Amendment No. 2 dated 10/25/58
- VIII Ten copies Specification SME-DY-2 dated 8/27/58, Amendment No. 1 dated 9/29/58 and Amendment No. 2 dated 10/23/58
- IX Ten copies Specification SME-DY-3 dated 8/28/58, Amendment No. 1 dated 9/29/58 and Amendment No. 2 dated 10/23/58
- X Ten copies Specification SME-EB-3 dated 9/3/58 and Amendment No. 1 dated 10/25/58
- XI Ten copies Specification SME-EB-4 dated 9/5/58 and Amendment No. 1 dated 10/23/58
- XII Ten copies Specification SME-EB-5 dated 9/9/58 and Amendment No. 1 dated 10/25/58
- XIII Ten copies Specification SME-EN-2(A) dated 9/12/58 and Amendment No. 1 dated 10/24/58
- XIV Ten copies Specification SME-EN-3 dated 9/4/58

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13 November 1958

Refer: SC-28

Gentlemen:

We are pleased to submit herewith our firm cost and delivery proposal to accomplish the work spelled out in Enclosure I, which is being performed under the subject letter subcontract. This proposal supersedes our previous proposal submitted as reference (a).

Our estimated cost and fixed fee to accomplish the work required by Items 1, 2, 3, 3(a), 5, 8, 9, 10, 11, 12 and 14 of Exhibit I of the Statement of Work (Enclosure I) amounts to [redacted] the lot. This firm cost estimate (Estimate No. I) is based on the following understandings and conditions:

1. This estimate also includes the cost of the non deliverable items included in Part III of the Statement of Work, with the exception of the items in Paragraphs (3) and (6) of subject Part III, the cost of which is included in Estimate No. II.
2. Itek shall furnish to Fairchild at no charge the items listed in Part I(D), in accordance with the delivery schedule for these items spelled out in Part II of the Statement of Work.
3. This estimate also includes the cost for the construction, maintenance and purchase of items relative to the security requirements for this program, such as special conference room, enclosed laboratory area, and safe.
4. Our proposal is based on receiving a waiver on performing the White Noise Vibration test as outlined in Paragraph 3.2.2.5.4 of General Environmental Specification 9103-L2916. This is requested as the vibration test outlined in Paragraph 3.2.2.5.3 is considered the more severe test and, therefore, the White Noise test is not required.
5. The transit cases shall be designed in accordance with the applicable specifications of the work statement but no costs are included herein for performing the tests.



Date: \_\_\_\_\_  
Serial: 8712

Our estimated cost and fee to accomplish the work described in Items 4 and 13 of Exhibit I of the Statement of Work, and Part III, Paragraphs (3) and (6) of the Statement of Work amount to [REDACTED] the lot. Our firm cost estimate (Estimate No. II) is based on the following understandings and conditions:

1. Itek approval to purchase a high altitude pump to be used in conjunction with the existing environmental chambers at Fairchild for the environmental evaluation testing of cameras and components.
2. This estimate also includes the costs for enclosing, insulating, painting, special wiring and the special lighting, transportation and related equipment associated with a tower for photographic purposes to check acuity and banding of the camera equipment being provided under Estimate No. I. The basic structure (tower) will be provided by Fairchild. However, a sum of [REDACTED] has been included in this to cover the costs of the above items chargeable on this job.
3. The cost of a small altitude chamber (in the amount of [REDACTED]) for our performance in this program has been included in this estimate.

Our estimated cost and fee (Estimate No. III) to provide the work called for in Item 6 of Exhibit I of the Statement of Work amount to [REDACTED] the lot. This estimate includes the cost to supply for nine months the services of a Project Engineer and a Technician continuously for nine months, commencing with the initial camera deliveries. The above personnel will reside at whatever destination is required by Itek, within the continental United States. In addition to the above, we have included the equivalent of eight man months of engineering type personnel for on-call technical assistance and support for the duration of the contract. We have included in this estimate the cost of a two month break-in period at Fairchild for each of the above personnel, who will be away for the nine month period. Our estimate also includes the cost of travel and subsistence at [REDACTED] per day. This estimate was prepared on the basis of a 54 hour work week as being normal. While away from our facilities.



13 November 1958

Refer: BC-28

Our estimated cost and fee (Estimate No. IV) to provide the spare parts to support the cameras and test consoles being delivered to you in this program, amounts to [REDACTED]. We are proceeding with the fabrication of the spare parts as listed in the attachment to the Statement of Work (Enclosure I).

All of the above estimates are submitted subject to the following:

1. Delivery of equipment will be f.o.b. our plant, Syosset, New York and packaging will be in accordance with standard commercial practice except where transit cases are required.
2. To permit compliance with the delivery schedule, overtime on the basis of a 60 hour work week, with provision for spot overtime up to 72 hours per week, is required. In addition, some of this work will be performed with a multi-shift operation. Therefore, the contract should provide for the allowability for the multi-shift and overtime premium costs.
3. As further assurance for delivery schedule compliance, sole source procurement of some materials and components will be necessary. Wherever possible, competitive quotes will be obtained. In cases where sole source procurement is necessary, vendors and sources with whom we have had previous satisfactory experience will be utilized where practicable.
4. This proposal is submitted on the basis of receipt of a definitive CPFF Contract by 15 December 1958.
5. Costs and delivery quoted herein are contingent on our receipt of Itek and Government Furnished Material and equipment in accordance with the schedule for these items included in the Statement of Work.

This revised estimate is the result of the following increases and decreases in the program from the program on which our previous estimate was based.

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3 November 1958

Report SC-13

1. The addition of six more resistance thermometer instrumentation devices.
2. The addition of V/H Transducer to be designed and fabricated are included as a component of each camera.
3. Increased scope of thermal inputs including isolation of plate #1 from plates #2 and #3 and more sophisticated radiation shielding of the camera.
4. The added requirement of using the second non deliverable camera complete relative to all thermal requirements, and a rescheduling of this camera for a thermal test at the customer's facility.
5. Increase in Liaison and Tech. support from 8 months to 9 months.
6. A deletion of one non deliverable camera and cassette.
7. A deletion of two each flight cameras and cassettes.
8. Reduction of spare parts requirement.
9. Reduction of repair work on the program to a minimum.
10. Reduction in quantity of transit cases.
11. Deletion of the requirement for qualification testing of the transit cases.
12. Establishing the camera weight at 75 pounds as a design objective. This weight objective does not include all customer sponsored weight.
13. Revising the delivery schedule for first delivery on 31 January 1959. The new delivery schedule is such as to permit limiting of night shift operations to a minimum.

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[REDACTED]  
13 November 1958

Refers: 110-26

Enclosure III includes our estimated funding requirements to cover our operation under this program. In this regard, additional funding over that presently provided in the letter subcontract is required. In accordance with our recent telephone conversations, we are proceeding with work under the program although we have exceeded the [REDACTED] funding commitment presently included in the letter subcontract. Your cooperation in furnishing immediate additional funding is requested.

We trust the above meets with your approval. However, if you have any questions, please contact the undersigned.

Very truly yours,

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION  
Defense Products Division

[REDACTED]  
Enclosures

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C O S T   B   R   A   K   D   O   W   N

Estimate No. II - Items 4 and 13 of Exhibit A to the Statement of Work and Part III, Paragraphs (3) and (6) of the Statement of Work

<u>Labor</u>	<u>Hours</u>	<u>Rate</u>	<u>Amount</u>	<u>Amount</u>
Engineer	1,856		\$	
Eng. Technician	285			
Eng. Aide	335			
Sr. Draftsman	410			
Sr. Engineer	1,040			
Project Engineer	510			
Design Engineer	740			
Designer	570			
Photographer	110			
Prod. Design Leader	230			
Technical Writer	120			
Proj. Coordinator	300			
Sr. Proj. Engineer	650			
Sr. Eng. Technician	2,740			
Instrument Maker	2,660			
Total Engrg. Labor			\$	
Overhead @ 120%				
Material				
Sub-Contract				
Incoming Insp.	200		\$	
Mechanical Insp.	400			
Environmental Test	12			
Electrical Insp.	150			
Testing	75			
Total Q.C.			\$	
Overhead @ 175%				
Cost to Date				
Packaging				
Prime Cost			\$	
Genl. & Adm. Exp. @ 15%				
Total Cost			\$	
Fee @ 7.5%				
<u>Sales Price</u>			\$	



COST BREAKDOWN

Estimate No. III - Item 6 of Exhibit I of the Statement of Work

<u>Labor</u>	<u>Hours</u>	<u>Rate</u>	<u>Amount</u>	<u>Amount</u>
Eng. Technician	2,426	[REDACTED]	↓ [REDACTED]	↓ [REDACTED]
Project Engineer	4,316	[REDACTED]	[REDACTED]	
Total Emgrg. Labor				
Overhead @ 120%				
Travel				
Cost to Date				
Prime Cost				
Genl. & Adm. Exp. @ 15%				
Total Cost				
Fee @ 7.5%				
<u>Sales Price</u>				

COST BREAKDOWN

Estimate No. 1 - Items 1, 2, 3(a), 4, 5, 6, 7, 8, 9, 10  
Part of Exhibit I of the Statement of Work



<u>Labor</u>	<u>Hours</u>	<u>Rate</u>	<u>Amount</u>	<u>Notes</u>
Sr. Research Engr.	1,000		\$	
Program Director	1,920			
Engineer	7,212			
Eng. Technician	11,100			
Eng. Aide	1,457			
Sr. Draftsman	3,200			
Sr. Engineer	2,820			
Project Engineer	6,205			
Design Engineer	1,820			
Designer	764			
Photographer	1,412			
Prod. Design. Leader	936			
Product Designer	430			
Technical Writer	295			
Jr. Proj. Coord.	7,914			
Proj. Coordinator	2,243			
Sr. Proj. Engineer	3,859			
Sr. Eng. Technician	6,729			
Instrument Maker	32,102			
Total Engrg. Labor				
Overhead @ 120%				
Material				
Sub-Contract				
Van Dykes				
Travel				
Incoming Insp.	180		\$	
Mechanical Insp.	1,300			
Environmental Test	1,240			
Optical Test	800			
Factory	2,665			
Total Factory & QC				
Overhead @ 175%				
Cost to Date				
Packaging				
Prime Cost				
Genl. & Admin. @ 15%				
Total Cost				
Fee @ 7.5%				

COST BREAKDOWN

Estimate No. IV - Spare Parts to Support the Cameras and Test Consoles

<u>Labor</u>	<u>Hours</u>	<u>Rate</u>	<u>Amount</u>	<u>Amount</u>
Mr. Engineer	80	[REDACTED]	♦ [REDACTED]	♦ [REDACTED]
Jr. Proj. Coord.	20	[REDACTED]	[REDACTED]	[REDACTED]
Sr. Eng. Technician	264	[REDACTED]	[REDACTED]	[REDACTED]
Instrument Maker	450	[REDACTED]	[REDACTED]	[REDACTED]
Total Emgrg. Labor				♦ [REDACTED]
Overhead @ 120%				[REDACTED]
Material				[REDACTED]
Sub-Contract				[REDACTED]
Incoming Insp.	40	[REDACTED]	♦ [REDACTED]	[REDACTED]
Mechanical Insp.	22	[REDACTED]	[REDACTED]	[REDACTED]
Total Q.C.				♦ [REDACTED]
Overhead @ 175%				[REDACTED]
Cost to Date				[REDACTED]
Packaging @ 1.5%				[REDACTED]
Prime Cost				♦ [REDACTED]
Genl. & Adm. Exp. @ 15%				[REDACTED]
Total Cost				♦ [REDACTED]
Fee @ 7.5%				[REDACTED]
<u>Sales Price</u>				♦ [REDACTED]

Anticipated Monthly Funding Schedule

<u>Month</u>	(Monthly Requirement) <u>Total Dollars</u>	<u>Cumulative Total</u>
Cost expended, plus open Commitments thru 10/31/58		
November 1958		
December 1958		
January 1959		
February 1959		
March 1959		
April 1959		
May 1959		
June 1959		
July 1959		
August 1959		
September 1959		

STATEMENT OF WORK

PART I

- (A) FCIC shall, within the period of time specified in Part II hereof, furnish and deliver to ITEK the supplies, data and reports as set forth in Exhibit I attached hereto and hereby made a part hereof.
- (B) Any reports submitted in compliance with this contract shall bear the contract number.
- (C) All specifications, documents, and/or drawings which are referenced in this contract, but are not attached hereto, are hereby incorporated herein by reference.
- (D) ITEK shall furnish the items listed below to FCIC in accordance with the specifications and delivery schedule in Part II hereof:
- (1) Optical Test Fixture
  - (2) Lens Weight and balance mock-ups.
  - (3) Main camera lens assemblies.
  - (4) Velocity sensing fixtures FCIC Part No. 789TEG25. (to be transferred from Air Force Contract No. [REDACTED])
  - (5) Rolls of film as described in specification No. SME-DB-1, dated 13 September 1958 and Amendment No. 1, dated 25 October 1958.
  - (6) Rugs thermometers, calibrated and serialized.

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(A) The work called for in Part I (A) hereof shall be completed and the supplies, data and reports delivered to ITEX in accordance with the following delivery schedule. (All deliveries and acceptance will be at EGIC).

		<u>Quantity</u>	<u>Date</u>
Item 1	Camera Mock-up	1	21 June 1958
		1	7 July 1958
	Cassette Mock-up	1	21 June 1958
		1	7 July 1958
Item 2	Camera Mock-up	1	12 July 1958
		1	19 July 1958
	Cassette Mock-up	1	12 July 1958
		2	19 July 1958
Item 3	Camera Flight Units 12 Total Units	100	31 Jan. 1959
		100	14 Feb. 1959
		100	14 Mar. 1959
		1	11 Apr. 1959
		1	18 Apr. 1959
		1	16 May 1959
		1	30 May 1959
		1	4 July 1959
		1	18 July 1959
		1	15 Aug. 1959
		1	5 Sept 1959
		1	12 Sept 1959
Item 3(a)	Cassette Flight Units 19 Total Units	100 ‡	13 Sept 1958
		200 ‡	20 Sept 1958
		200 ‡	27 Sept 1958
		100 ‡	11 Oct. 1958
		2	23 Nov. 1958
		2	30 Nov. 1958
		2	7 Dec. 1958
		1	27 Dec. 1958
		1	3 Jan. 1959
		1	31 Jan. 1959
		1	14 Feb. 1959
		2	28 Feb. 1959
		1	28 Mar. 1959

\*\* NOTE: These units are essentially the same as deliverable units but may not have completed all acceptance tests at the time of delivery and will not have been qualified.

‡ NOTE: These units delivered without transit cases.

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		<u>Quantity</u>	<u>Date</u>
Item 4	Console, Test and Check-out	1 ea # 1 1	3 Jan. 1959 31 Jan. 1959 28 Feb. 1959
Item 5	Engineering Manual	6 6	Concurrent with first flight units Within 2-1/2 months after initial flight deliveries.
Item 6	Liaison and Technical Support	2 personnel	Concurrent with deliveries of first flight units.
Item 7	Spare Parts	(See Attached List)	Within 30 days after delivery of flight units.
Item 8(a)	Acceptance Test Data Sheets	1 repre and 10 copies	Concurrent with flight unit deliveries
	(b) Qualification Test Data Sheets	1 repre and 10 copies	Within 45 days of completion of tests.
	(c) Final Engineering Report	1 repre and 10 copies	Within 30 days after delivery of final contracted items.
Item 9(a)	Drawings to be furnished	3 copies each	Weekly
	(b) Final Drawings	1 reproducible	Within 45 days after delivery of final contracted items.
Item 10	Supply Spoals	15 25 40 40	27 Aug. 1958 5 Sept. 1958 12 Sept 1958 19 Sept 1958
Item 11	Thermal Mock-up of Camera and Cassette	1 each	15 Aug. 1958

NOTE: These units are essentially the same as deliverable units but may not have completed all acceptance tests at the time of delivery and will not have been qualified.

NOTE: These units delivered without transit cases.

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		<u>Quantity</u>	<u>Date</u>
Item 12	Transit Case		Concurrent with
	Console Cases	2	equipment deliveries
	Camera Cases	14	
	Cassette Cases	14	
Item 13	Handling and Loading Fixture	1	Concurrent with
	Full Supply Spool		delivery of initial
			flight units.
Item 14	Engineering Studies		
	(a) Feasibility Study		
	Thermal Investigation		
	(b) Film Creep Investigation		
	(c) Thermal Insulation -		
	Feasibility between Mech		
	Plates No. 1, 2 and 3.		

(B) ITEK shall furnish at no cost to FCIC the supplies of Item (D) of Part I in accordance with the following delivery schedule:

(1)	Optical Test Fixture	1	14 Nov. 1958
(2)	Lens weight and balance mock-ups.	1	15 July 1958
(3)	Main Camera Lens assemblies		
	14 Total lenses.	1	28 Oct. 1958
		1	23 Nov. 1958
		1	30 Nov. 1958
	First ten (10) lenses to be Type IIa.	1	21 Dec. 1958
		1	4 Jan. 1959
	Last four (4) lenses to be Type IIb.	2	8 Feb. 1959
		2	15 Mar. 1959
		2	12 Apr. 1959
		1	17 May 1959
		2	21 June 1959
(4)	Velocity Sensing Fixtures	2	Transferred from AF contract No. [REDACTED] by [REDACTED] 4 October 1958

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	<u>Quantity</u>	<u>Date</u>
(5) Dummy Film - 30 rolls	3 rolls	14 July 1958
total	3 "	11 Aug. 1958
	4 "	27 Sept 1958
	5 "	4 Oct. 1958
	6 "	29 Nov. 1958
	6 "	20 Dec. 1958
	3 "	7 Feb. 1959
Live Film (SO-1221)	3 rolls	27 Sept. 1958
15 rolls total	4 "	11 Oct. 1958
	4 "	29 Nov. 1958
	4 "	7 Feb. 1959
Live Film (SO-118C)	3 rolls	27 Sept 1958
15 rolls total	4 "	11 Oct. 1958
	4 "	29 Nov. 1958
	4 "	7 Feb. 1959
(6) Range thermometers for Camera and Cassette	40	3 Nov. 1958
	40	17 Nov. 1958
	40	15 Dec. 1958
223 Pieces for Camera	40	12 Jan. 1958
<u>57</u> Pieces for Cassette	40	16 Feb. 1959
	40	23 Mar. 1959
280 Pieces total	40	20 Apr. 1959

Part III - Non-Deliverable Items

FCIC will fabricate the following items which will be retained at FCIC for the duration of the program.

- (1) One (1) set of camera and cassette mock-ups.
- (2) One (1) set of camera and cassette weight and C.G. mock-ups.
- (3) Special test equipment as required to check the performance of the camera and cassette or their components. The optical performance simulator will be furnished by IYK.
- (4) Two (2) additional cameras with transit cases and two (2) cassettes including one (1) transit case for environmental and performance test purposes. The first non-deliverable shall be ready for testing at FCIC on or about 22 November 1958. The second non-deliverable shall be available for thermal tests at the customer's facility on or before 3 January 1959. It is understood that this second non-deliverable will be returned

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to FCIS on or before 17 January 1959. On this basis the second non-deliverable camera will be ready for qualification testing on 7 February 1959.

NOTE: The altitude, temperature, humidity, vibration and shock tests shall be conducted at the ITREK Environmental Test Facility.

(5) Additional camera and cassette components for environmental test program in accordance with the Schedule I of Special Order Nos. SME-PB-1 dated 13 September 1958 and Amendment No. 1 dated 25 October 1958; and SME-DC-1 dated 10 September 1958 and Amendment No. 1 dated 23 October 1958.

(6) Breadboards as indicated below:

- (a) Minimum power film spool drive.
- (b) Reaction and momentum-free breadboard.
- (c) Light Sealing Foot Breadboard.
- (d) Film Drive breadboard.
- (e) Light Weight Mount plane breadboard.
- (f) Cassette sealing breadboard.
- (g) Lens drive breadboard.

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EXHIBIT I

- Item 1 Design and fabricate camera and cassette mock-up in accordance with Specification Nos. SME-DB-1, dated 13 September 1958 and Amendment No. 1 dated 25 October 1958; and SME-DC-3(g), dated 10 September 1958 and Amendment No. 1 dated 23 October 1958.
- Item 2 Design and fabricate camera and cassette weight and balance mock-up in accordance with Specification Nos. SME-DB-1, dated 13 September 1958 and Amendment No. 1 dated 25 October 1958; and SME-DC-3(g), dated 10 September 1958 and Amendment No. 1 dated 23 October 1958.
- Item 3 Design and fabricate camera flight unit, less supply spool, in accordance with Specification No. SME-DB-1, dated 13 September 1958 and Amendment No. 1 dated 25 October 1958.
- Item 3(a) Design and fabricate cassette flight unit in accordance with Specification No. SME-DC-3(g), dated 10 September 1958 and Amendment No. 1 dated 23 October 1958.
- Item 4 Test and Check-out Console in accordance with Specification No. SME-DN-24A, dated 12 September 1958 and Amendment No. 1 dated 23 October 1958.
- Item 5 Engineering type operation and maintenance manual in accordance with Specifications SME-DB-1, dated 13 September 1958 and Amendment No. 1 dated 25 October 1958; SME-DC-3(g), dated 10 September 1958 and Amendment No. 1 dated 23 October 1958; and SME-DN-24A, dated 12 September 1958 and Amendment No. 1 dated 23 October 1958.

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- Item 6 Liaison and Tech Support - The contractor shall provide Tech Support and Liaison as follows:
- (a) 1 each Engineer - Electro-Mechanical for a period of nine (9) months. The engineer must be thoroughly familiar with all the deliverable equipment spelled out in this work statement.
  - (b) 1 each Engineering Technician - Electro-Mechanical for a period of nine (9) months. The technician must be capable of maintaining all equipment provided by FCIC in accordance with the work statement.
  - (c) Technical Liaison and Support equivalent to two (2) months for each of four(4) engineering type personnel covering the duration of the contract.
- Item 7 Spare parts in accordance with attached lists as follows:
- (a) Camera Spare Parts List, Rev. B., dated 25 October 1958.
  - (b) Test Console Spare Parts List, Rev. A, dated 23 October 1958.
- Item 8 Data
- (a) Engineering Data Sheets with sufficient information to permit evaluation of the acceptance tests in accordance with Specifications SME-EB-3, dated 3 September 1958 and Amendment No. 1 dated 25 October 1958; SME-EB-4 dated 5 September 1958 and Amendment No. 1 dated 23 October 1958; and SME-EN-2A, dated 12 September 1958, and Amendment No. 1 dated 23 October 1958.
  - (b) Engineering Data Sheets with sufficient information to permit evaluation of the qualification tests in accordance with Specifications Nos. SME-EB-5 dated 9 September 1958 and Amendment No.1 dated 25 October 1958.

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- (c) Final engineering reports summarizing significant accomplishments of this program with recommendations.

Item 9 Drawings to be furnished.

- (a) Interim drawings covering the following categories: Major assemblies, layouts (functional), outlines and installation drawings (weight and C.G. data), and schematics including power requirements.

(b) Set of all final drawings.

Item 10 Design and fabricate Supply Spools compatible with the applicable paragraphs of Specification SME-DB-1, dated 13 September 1958 and Amendment No. 1, dated 25 October 1958.

Item 11 Design and fabricate a thermal mock-up of the camera and cassette to simulate the heat transfer conditions of the equipment.

Item 12 Design and fabricate transit cases in accordance with Specifications SME-DY-1, dated 22 August 1958 and Amendment No. 1 dated 22 August 1958, and Amendment No. 2 dated 25 October 1958; SME-DY-2, dated 27 August 1958, and Amendment No. 1 dated 29 September 1958 and Amendment No. 2 dated 23 October 1958; SME-DY-3, dated 23 August 1958, and Amendment No. 1 dated 29 September 1958 and Amendment No. 2 dated 23 October 1958.

Item 13 Design and fabricate full supply spool handling and loading fixtures compatible with deliverable equipment.

Item 14 Engineering Studies

- (a) Feasibility study thermal investigation.  
(b) Film creep investigation.  
(c) Thermal insulation - feasibility between Mech Plates 1, 2 and 3.

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TEST CONSOLE SPARE PARTS LIST

<u>Part No.</u>	<u>Item</u>	<u>Vendor</u>	<u>Qty.</u>
Model 1500	2000 cps Power Oscillator	Industrial Test Equipment Co.	2
ND-2622-00	Oscillograph Recorder	Brush Instruments	2
ND-5621-00	Dual Channel Amplifier	Brush Instruments	2
RA-2921-30	Ink, Roll Chart Paper	Brush Instruments	4 doz. rolls
RA-2821-30	Ink, Pen	Brush Instruments	4
RA-2760-16	Ink, Red, Pint	Brush Instruments	2
Model SS-32-20	28 Volt Power Supply	NJE Corporation	1
5AR-SS-1	Amplifier	NJE Corporation	2
PPM-50-3000	Capacitor	Pyramid	4
AN-1020	Rectifier, Metallic	Automatic Mfg.	8
PT-530	Rectifier, Metallic	Automatic Mfg.	8
696DC	Lamp	General Electric	12
FEM-15	Fuse, 15A, 125V	Bussmann	12
MDX-7	Fuse, 7a, 125V	Bussmann	12
2W176	Transistor	Motorola	4
2W141	Transistor	DeLoe	24
	3AG, 6.25A, 125V Slo-Blo Fuse	Bussmann	12
	3AG, 1.5A, 250V Fuse	Bussmann	12
	3AG, 2A, Slo-Blo Fuse	Bussmann	12
	3AG, 3A, 125V Fuse	Bussmann	12
	3AG, 3/4A, 125V, Slo-Blo Fuse	Bussmann	12
5Y30T	Vacuum Tube		4
5U4OA/OB	Vacuum Tube		4
6X4	Vacuum Tube		4
12AT7	Vacuum Tube		20
12AX7	Vacuum Tube		12
0A2	Vacuum Tube		8
12BD4	Vacuum Tube	Tung Sol	8
5687	Vacuum Tube	General Electric	16
5881	Vacuum Tube	General Electric	8
6550	Vacuum Tube	CBS	16
96	3 Watt Lamp		16
47	Lamp		10
126621	Neon Lamp Assembly	Brush Instruments	4
TR132-R	Mercury Battery	Mallory	4

# - These items not now used in consoles, but procured before new spares policy directive issued.

\* - Quantity reduced to 1 by cancelling 1 with NJE.

NOTE: All items shown on this list were procured and in the house before new spare parts policy was directed by customer. Difference in items and quantities between list dated 13 September 1958 and this Revision A list, 23 October 1958, reflect spare parts savings.

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25 October 1953  
Revision 3

CAMERA SPARE PARTS LIST

<u>Part No.</u>	<u>Name</u>	<u>Quantity</u>
956-40	Commutator	2
956-429	Boot, Lens to Camera	2
956-518	Boot, Camera to Vehicle	2
956-519	Boot, Horizon	1
956-520	Cap. Lens	2
956E19	Brush Assembly	2
956E20	Preamplifier Assembly	2
956E78	Lamp Assembly, Digitote	2
956E19	Piducial Assembly	2
956E60	Piducial Assembly	2
956E87	Drive Motor Gear Assembly	2
956E112	Lens Assembly, Digitote	2
956E139	Accelerating Control Assembly	2
956E144	Supply Assembly, Synchronizing	2
956E10	Lamp Assembly, Frequency	2
956C11-1	Aperture	2
956C11-2	Aperture	2
956C11-3	Aperture	2

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SYSTEMS MANAGEMENT AND ENGINEERING DEPARTMENT  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

~~SECRET~~

SPECIFICATION  
NO. SME-DB-1

13 September 1958

HIGH ACUITY PANORAMIC CAMERA

Prepared by:



Proj. Engineer

Approved by:



Program Director

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1. SCOPE

- 1.1 This specification covers one type of photographic high acuity panoramic camera for aerial reconnaissance. The basic design of this panoramic camera utilizes a curved focal plane arc with panoramic scanning by rotation of the lens about its nodal point.

2. APPLICABLE DOCUMENTS

- 2.1 The following documents of the issue in effect on the date of this specification, form a part of this specification to the extent specified herein.

9103-L2916 - Revised 9 May 1958 - Project Stovepipe -  
"General and Environmental Specification."

3. REQUIREMENTS

- 3.1 Component Parts - The camera shall consist of the complete photographic system including lens, camera structure, film advance mechanism, image motion compensation, horizon recording optics, and time recording as described in the following paragraphs.

3.1.1 Horizon Recording - These units shall record both horizons 180° apart and perpendicular to the flight direction. Recording shall occur on alternate frames only and shall be initiated by the position of the camera at the nadir position.

3.1.2 Elapsed Time Recording - Elapsed time will be recorded on an area of the film outside the picture format and to be determined by convenience of camera design. The component selected for the recording shall be mutually accepted by the contractor and the customer and shall be provided with suitable inputs from the system in order to operate. Minimum size and weight shall be a major consideration in the choice of components.

3.1.3 Frequency Recording - During the scanning operation of the camera, a lamp pulsed by a fixed frequency shall record a series of exposed equally spaced marks along the edge of the format. The customer shall be informed of the input requirements necessary to the camera design.

.2 Basic Camera Design

- 3.1.1 Configuration - The design of the camera shall conform to the basic configuration and space limitations as shown in Figure No. 1.

- 3.2.2 Camera Weight - The weight of the complete camera system shall be held to an absolute minimum; and shall not exceed 65 pounds. This 65 pound limit however, shall not include the weight of the Digitote and its associated components and an additional 2 pound allowance for camera mounting structure as mutually agreed upon by the contractor and customer.
- 3.2.3 Lens Assembly - The main camera lens shall be a 24" focal length f5.0 high acuity optical system suitable for covering a 70mm slit format. The lens assembly in a suitable barrel will be furnished to the contractor by the customer. The lens barrel construction shall include mounting features that are mutually agreeable to the customer and contractor. The lenses furnished to the contractor shall be calibrated so that these nodal points will be coincident with the axis of rotation and the focal length will be held to  $24.000" \pm .005"$ .
- 3.2.4 Camera Scan Angle - The active format scan angle shall be  $70^\circ$  utilizing approximately  $15^\circ$  each of mechanical travel of the lens scanning system for acceleration and deceleration. This requires a total angle of scanning of approximately  $160^\circ$ .
- 3.2.5 Film Requirements - Unperforated thin base film of a nominal 3-1/2 mil (0.0035") thickness and 70mm width shall be used. The emulsions that will be used with this camera shall be Eastman Kodak type SO-1221 and SO-1188 (designations for thin base SO-1213 and SO-1166 respectively).
- 3.2.6 Film Capacity - The camera shall be designed to properly handle a 20" diameter film capacity properly wound on a 4" diameter core. The film spool of special design shall have a minimum of 1/8" spool flange projection above the full roll of film.
- 3.2.7 Space Between Picture Format - The space between adjacent formats shall be utilized for data recording and shall be held to a minimum. The maximum space permitted between picture formats shall not exceed 2-1/2".
- 3.2.8 Allowable Film Wastage During Camera Start - The total allowance for film wastage during any starting of the film transport mechanism shall be a maximum of two (2) frames. This maximum wastage shall be the total average of starts over a full roll of film at maximum film speed. From the time the start sequence command is received, the camera system shall be up to speed in less than 15 seconds.
- 3.2.9 Format Width - The effective picture width of each frame shall be  $2.1" \pm .03$ .

- 3.2.10 Exposure Time - Exposure time shall be preset with a fixed slit to provide exposure times of 1/500 sec., 1/1000 sec., and 1/2000 sec. at the nominal scanning rate. These three (3) fixed slits shall be readily interchangeable into the final camera in a minimum amount of time.
- 3.2.11 Camera Cycling Rate Range - The camera shall be capable of providing a cycling rate range from .263 cycles per second to .613 cycles per second. This range shall be governed by a systems command driving the camera drive motor at the appropriate speed. Camera operation is initiated and terminated by the receipt or deletion of vehicle power derived from the basic vehicle programmer. The scanning drive of the camera shall be determined in flight by a V/H signal supplied by the vehicle and compatible with the camera servo system.
- 3.2.12 Reaction and Momentum Balance - The design of the camera shall provide an absolute minimum of residual reaction and momentum to the basic vehicle. The degree of reaction and momentum balance required shall be as mutually agreed upon by the contractor and the customer.
- 3.2.13 Optical Scanning Rate - The optical scanning rate shall be a function of the camera cycling rate and shall vary proportionately with the camera cycling rate. The relationship shall be radians/second scanning rate corresponding to the nominal camera cycling rate of .438 cycles per second.
- 3.2.14 Forward Motion Compensation Rate - The required forward motion compensation rate at the nadir shall be .828 inches/second for the nominal cycling rate of .438 cycles per second. The camera drive mechanism shall be such that there is a fixed mechanical relationship between the forward motion compensation, the cycling rate and the scanning rate. Therefore, the forward motion compensation rate ranges from .497 inches/second to 1.159 inches/second. The relationship of the forward motion compensation and the cycling rate has been established for a 10% overlap condition at the nadir.
- 3.3 Performance Requirements
- 3.3.1 Camera General Performance - Every effort shall be made toward producing a high acuity photographic camera which, when operated, will produce a minimum degradation of static lens-film resolution. The design objective shall be such that photography taken under simulated operating conditions with the customer furnished test equipment shall not be degraded by more than 10% of the static lens-film resolution, also determined with the same customer furnished test equipment.

3.3.1.1 Forward Motion Compensation Accuracies - The forward motion compensation mechanism and the servo system shall have performance compatible with the design objective of paragraph 3.3.1.

3.3.1.2 Lens Drive Smoothness - The lens drive system, which is used for focal plane scanning in addition to forward motion compensation shall be smooth such that no appreciable visual banding can be detected with the unaided eye on the resulting photograph.

### 3.3.2 Data Recording Performance

3.3.2.1 Horizon Recording - The design objective for the horizon recording shall be such that roll and pitch information can be extracted to an accuracy of  $\pm 1^\circ$ . Yaw measurements shall be extracted by edge lap measurements of adjacent photographs and it shall be a design objective that these measurements properly compensated will yield yaw accuracies of  $\pm 1^\circ$ . For calibration purposes, four fiducial marks of sufficient quality, spaced  $90^\circ$  apart, shall be recorded on each horizon exposure.

3.3.2.2 Time Recording - Time shall be recorded in each frame from the appropriate command system to produce time information to within .1 second. A digital recording head shall be utilized in the camera for this purpose and the time recording accuracy shall be in accordance with the accuracy of the command.

3.3.2.3 Nadir Recording - A single fiducial mark locating the camera nadir position shall be recorded outside of the picture format area and on each exposure.

3.3.2.4 Serial Number Recording - A camera serial number shall be recorded outside of the picture format area and in the proximity of the nadir fiducial mark on each exposure.

3.3.3 Focal Plane Accuracy - The curved focal plane shall be a fixed arc of  $24''$  nominal radius. The accuracy of the focal plane shall be compatible to the lens system and the general camera performance requirements of paragraph 3.3.1.

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3.3.4 Power Consumption of Camera System - The total power consumption of the camera system shall be held to an absolute minimum and shall be compatible with the following sources. The maximum total average power permitted from all these sources shall not exceed 165 watts. The power required by the Digitote and its associated components shall not be included in this 165 watt total.

- (a) 28 volt battery supply varying from 22 to 29.5 volts.
- (b) 28 volt DC supply, regulated to  $\pm 0.5\%$ .
- (c) 115 volts AC, 2000 cycles, single phase, regulated to  $\pm 1.0\%$  in frequency and  $\pm 5.0\%$  in voltage.
- (d) 115 Volts AC, 400 cycles, three phase, regulated to  $\pm .02\%$  in frequency and  $\pm 1.0\%$  in voltage.
- (e) 115 volts AC, 400 cycles, single phase, regulated to  $\pm 1.0\%$  in frequency and  $\pm 5.0\%$  in voltage.

3.4 Camera Design Details

- 3.4.1 Allowance for Film Splices - The camera film handling systems and guides shall be designed to allow for smooth passage of the required number of proper film splices expected in each roll of operational film. The camera shall be capable of passing film that has been properly butt spliced with 1" wide polyester film tape (Minnesota Mining and Manufacturing Co. type #850 or equivalent).
- 3.4.2 Film Loading - The camera shall be capable of being loaded in subdued light using live film for leader without excessive light striking of the supply of live film.
- 3.4.3 Main Lens Light Shield - The main lens light shield design shall be mutually agreed upon between contractor and the customer. For convenience of installation, this light shield may be attached to the lens assembly after the camera has been installed in the vehicle.
- 3.4.4 Film Transport Rollers - A minimum diameter of 1" shall be used for all rollers in the film transport system.
- 3.4.5 Remote Indication Requirements - The contractor shall provide the necessary transducers and/or electrical connections to permit remote indication of various operating functions of the camera system as mutually agreed upon between the contractor and the customer.

- 3.4.6 Operational Temperature - For the purposes of design, the operational temperature shall be  $70^{\circ} \pm 3^{\circ}$  F as mutually agreed upon between the contractor and the customer.
- 3.4.7 Thermal Considerations - To assure stable operational temperatures, the structural mounting plates shall be gold plated to the extent as mutually agreed upon between the contractor and the customer. To further assure stable temperatures, open areas in the plates shall be kept to a minimum where practical. Where not practical for reasons of handling, assembly or threading of film, the Prime contractor shall seal off open areas deemed necessary with gold foil at their facilities. The above requirements apply only to the deliverable flight units.
- 3.5 Mock-ups - Appropriate space and weight and balance mock-ups shall be provided in accordance with the Work Statement. A simple mock-up shall be fabricated to be used in space utilization application. An accurate simulator of the final camera configuration shall be fabricated to permit the ready mock-up of total system weight and balance. A mock-up designated to be retained at the contractors facilities for the duration of the program shall reflect the current external configuration whenever changes occur.
- 3.6 Engineering Manual - An engineering manual shall be furnished which shall contain test and service procedures necessary to assure the satisfactory operation of the system. This manual shall be furnished in the form of standard quality reproduction and need not be prepared to any Military Specification.
- 3.7 Technical Support and Liaison - Engineering and technical assistance shall be provided at places designated by the customer for the check out and flight conditioning of the reconnaissance equipment, system design and Liaison with the customer.
- 3.8 Reports - All reports called for in the contract shall be of an engineering type and need not be prepared in accordance with any special format or Military Specification. These reports however, shall be complete and include all necessary data to properly permit engineering evaluation.
- 3.9 Drawings - All drawings to be prepared for this project shall be working drawings of sufficient detail to permit fabrication of additional equipment at a future time by an experimental or model shop facility. These drawings need not conform to any military specification and shall include sketches wherever possible.

- 3.10 Design and Selection of Components - The design and selection of components for this camera shall be compatible with the performance and environmental requirements of the system. The best available items shall be used and the components need not be in accordance with specific military specifications.
- 3.11 Environmental Conditions - The components and overall camera shall be designed in accordance with specification 9103-L2916 entitled, "Project Stovepipe - General Environmental Specification - revised 9 May 1958." The components to be evaluated shall be tested in accordance with Schedule I attached. The environmental tests performed are detailed under the Qualification Test Section, paragraph 4.
- 3.12 Spare Parts - A complete list of spare parts requested for the camera shall be submitted for customer approval by 23 August 1958. Customer approval of the submitted list will be requested within two (2) weeks after receipt. This revised list shall be priced by the contractor and resubmitted by 13 September 1958 for formal approval. Formal approval of prices and quantities shall be provided to the contractor no later than 27 September 1958.

4. QUALIFICATION TESTING

- 4.1 Acceptance Tests - Acceptance tests shall be performance tests to be accomplished on each deliverable camera system to assure proper functioning of the equipment. The tests shall be in conformance with the requirements of Acceptance Test Specification, SME-EB-3.
- 4.2 Environmental Tests - The environmental testing shall be performed on selected components and the first non-deliverable flight units for the purposes of qualifying the deliverable equipments. The components to be tested and the tests they are to undergo are included in Schedule I attached and hereby form a part of this specification. The environmental tests shall be as indicated in the following paragraphs which reference the appropriate paragraph of the General Environmental Specification 9103-L2916 Rev. 2, dated 9 May 1958. The tests selected represent the most critical in accordance with the requirements and therefore shall constitute the qualification test specification for the camera system.
  - 4.2.1 Temperature, Altitude and Humidity Tests - The temperature, altitude and humidity tests shall be conducted in accordance with the requirements of paragraph 4.1.3 of the General Environmental Specification referenced herein.

- 4.2.2 Explosion Proof Tests - Explosion proof tests shall be conducted in accordance with requirements of paragraph 4.6 of General Environmental Specification referenced herein.
- 4.2.3 Drop Tests - Drop tests shall be conducted in accordance with the requirements of paragraph 4.7.1.2 of the General Environmental Specification referenced herein.
- 4.2.4 Vibration Tests - Vibration tests shall be conducted in accordance with the requirements of paragraph 4.8 of the General Environmental Specification referenced herein.
- 4.2.5 Shock Tests - Shock tests shall be conducted in accordance with the requirements of paragraph 4.9 of the General Environmental Specification referenced herein.
- 4.2.6 Acceleration Tests - Acceleration tests shall be conducted in accordance with the requirements of paragraph 4.10 of the General Environmental Specification referenced herein.

5. FURNISHED EQUIPMENT

- 5.1 Customer Furnished Equipment - The customer shall furnish to the contractor on or before 4 October 1950 an optical test fixture capable of mounting the camera and furnishing tests of the camera. This equipment shall also be capable of testing the camera's forward motion compensation mechanism results within the desired order of accuracy.
- 5.2 Government Furnished Equipment - The contractor shall be furnished with two (2) Velocity Sensing Fixtures (FCIG part No. 789TEC25 previously used on Air Force Contract [REDACTED] for the duration of the program. The contractor shall be permitted to alter the design of this equipment as necessary without the requirements of returning it to its original form.



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SCHEDULE I

COMPONENT ENVIRONMENTAL TEST SCHEDULE

<u>Part No.</u>	<u>Name</u>	<u>Temperature Alt, &amp; Hum. TS 956-2001</u>	<u>Vibration TS 956-2003</u>	<u>Shock TS 956-2002</u>	<u>Accel. TS 956-2004</u>	<u>Explosion TS 956-2005</u>
956-174	Transistor	X				
956-427	Solenoid, F.	X	X	X	X	
956-428	Solenoid	X	X	X	X	
956-508	Tach. Generator	X				
956B30	Preamplifier Assy	X	X	X		
956B42	Accelerating Control Assembly	X	X	X		
956B72	Clutch and Brake Assembly	X				
956B74	Clutch Assembly	X				
956B76	Clutch Assembly	X				
956B77	Brake Assembly	X				
956B78	Recording Assy, Digitote	X	X	X	X	
956B79	Fiducial Assembly	X	X			
956B82	Recording Assembly	X	X	X	X	
956B87	Drive Motor Gear Assy	X				
956B91	Supply Assembly, Synch, Pulsing	X	X			
956C10	Lamp Assy, Freq.		X			
956E4	Spool Assembly		X	X	X	
956B88	Flaten Assembly	X				
956B63	Main Mtg Plate Assy.		X			

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DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

Amendment No. 1

Specification No. SNE-DB-1

25 October 1958

High Acuity Panoramic Camera

Prepared by:

[REDACTED]

Project Engineer

Approved by:

[REDACTED]

Program Director

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AMENDMENT

Dated 25 October 1958

No. 1

This Amendment forms part of and is attached to (FMCA) Systems  
Management and Engineering Department Specification No. SME-DB-1

Dated 13 September 1958

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The following paragraphs of Specification SME-DB-1, dated 13 September 1958 shall be amended as follows:

Paragraph 2.1 Change #9103-L2916 - Revised 9 May 1958 - Project Stovepipe-  
"General Environmental Specification."  
to read "SME-EB-5, Environmental Test Specification dated  
9 September 1958."

Paragraph 3.3.2 Change to read as follows: "Camera Weight - The weight of  
the complete camera system shall be held to an absolute  
minimum with a design objective of 75 pounds. This weight  
objective, however, shall not include the weight of the  
Digitote and its associated components and an additional  
two pounds allowance for camera mounting structure as  
mutually agreed upon by the contractor and customer."

Paragraph 3.3.2.4 Change "nadir fiducial mark" to read "horizon recording."

Paragraph 3.4.5 Delete in its entirety.


Insert: "Instrumentation Requirements - For the purposes  
of telemetering, the following functions shall be brought  
to the camera main connector:

- a) Thirteen Temperature Signals - The temperature sensors shall be Customer supplied and shall be located in the camera as mutually agreed upon between the contractor and the customer.
- b) Four (4) V/H Signals - The V/H transducer shall be supplied by the contractor.
- c) One (1) Light Leak Signal - The light leak transducer shall be supplied by the contractor.

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Reason:

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Approved by: 

25 October 1958

- d) One (1) Center of format signal.
- e) One (1) Film transport signal.
- f) Five (5) Elapsed time signals. (Representing 5 digits).

NOTE: The increase in weight due to above instrumentation requirements is considered Customer sponsored and therefore for the purposes of contractual weight agreements, shall not be charged to the final camera weight."

Paragraph 3.4.7

Delete in its entirety.

Insert - "Thermal Considerations - To assure stable operational temperatures, the following design features shall be incorporated.

- a) Structural Plate No. 1 - Shall have black finish on side facing supply spool. Opposite side shall have a highly polished reflective surface finish. Plate No. 1 shall be thermally insulated from Plate No. 2 wherever practical.
- b) Structural Plate No. 2 - Shall have highly polished evaporated gold finish of 10 to 12 microinch thickness on side facing Plate No. 1. Opposite side shall have a black finish.
- c) Structural Plate No. 3 - Shall have a black finish on side facing Plate No. 1. Opposite side shall have highly polished evaporated gold finish of 10 to 12 microinch thickness.
- d) Supply Spool Thermal Shield - Shall be of light weight construction, polished on the inside and polished gold finish of 10 to 12 microinch thickness on the outside.
- e) Camera Double Thermal Shield - Shall extend from Plate No. 1 to Plate No. 3, but insulated from Plate No. 1. The double thermal shield shall be comprised of two gold plated skins sandwiching on insulating spacer with a thermal conductivity k equal to .028 BTU/hr./sq.ft./°F/ft. or less.
- f) Component Thermal Insulation - All heat generating components mounted on Plate No. 2 shall be insulated from Plate No. 2 wherever practical.

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Dated 25 October 1958

- g) Sub-Plates, Spacer Posts and Gussets - Sub-plates, spacer posts and gussets between Plate No. 1 and Plate No. 2 shall be prepared with suitable thermal radiating qualities compatible with overall camera thermal requirements wherever practical.
- h) Boot, Lens to Camera - The boot from lens to camera shall have a highly polished gold surface on both sides.
- i) Boot, Camera to Vehicle - The boot from camera to vehicle shall be black on side facing lens and have a highly polished gold surface on opposite side.
- j) Boot Clamps - Boot clamps shall have appropriate thermal finishes compatible with the requirements of (h) and (i).

NOTE: The increase in weight due to above thermal requirements is considered Customer sponsored and, therefore for the purposes of contractual weight agreements, shall not be charged to the final camera weight.

The above designs shall be incorporated commencing with the second non-deliverable camera."

Paragraph 4.2

Change third sentence to read as follows: "The environmental tests shall be as indicated in the following paragraphs which reference the appropriate paragraph of the Environmental Test Specification SME-EB-5, dated 9 September 1958."

Delete the last sentence.

Paragraph 4.2.1

Change to read as follows:

"Temperature, Altitude and Humidity Tests - The temperature, altitude and humidity tests shall be conducted in accordance with the requirements of paragraph 4.2.1 of the Environmental Test Specification referenced herein."

Paragraph 4.2.2

Change to read as follows:

"Explosion Proof Tests - shall be conducted in accordance with requirements of paragraph 4.2.6 of Environmental Test Specification referenced herein."

Dated 25 October 1958

Paragraph 4.2.3 Change to read as follows:

"Drop Tests - Drop tests shall be conducted in accordance with the requirements of paragraph 4.2.4.2 of the Environmental Test Specification referenced herein."

Paragraph 4.2.4 Change to read as follows:

"Vibration Tests - Vibration tests shall be conducted in accordance with the requirements of paragraph 4.2.2 of the Environmental Test Specification referenced herein."

Paragraph 4.2.5 Change to read as follows:

"Shock Tests - Shock tests shall be conducted in accordance with the requirements of paragraph 4.2.4 of the Environmental Test Specification referenced herein."

Paragraph 4.2.6 Change to read as follows:

"Acceleration Tests - Acceleration tests shall be conducted in accordance with the requirements of paragraph 4.2.3 of the Environmental Test Specification referenced herein."

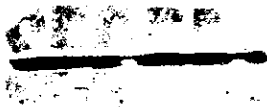
Page No. 9 (Schedule I)

Change Part No. "956H42"  
to read "956H139"

Change Part No. "956B91"  
to read "956H144"

Change Part No. "956B88"  
to read "956H122"

Change Part No. "956B78"  
to read "956H127"



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SYSTEMS MANAGEMENT AND ENGINEERING DEPARTMENT  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

SPECIFICATION  
NO. SME-DC-3A

10 September 1958

CASSETTE, TAKE-UP,

FOR

HIGH ACUITY PANORAMIC CAMERA

Prepared by:



Proj. Engineer

Approved by:



Program Director

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1. SCOPE

- 1.1 This specification covers one type of film cassette for use with a high acuity panoramic camera. The basic design of the cassette shall be to take-up the exposed film from the camera in accordance with the details of this specification.

2. APPLICABLE DOCUMENTS

- 2.1 The following document of the issue in effect on the date of this specification, form a part of this specification to the extent specified herein.

9103-L2916 - Revised 9 May 1958 - Project Stovepipe -  
"General and Environmental Specification"

3. REQUIREMENTS

- 3.1 Component Parts - The cassette shall consist of the take-up spool, film drive system and telemetering potentiometer.
- 3.2 Basic Cassette Design
- 3.2.1 Configuration - The design of the cassette shall conform to the basic configuration and space limitation as shown in Figure 1.
- 3.2.2 Cassette Weight - The weight of the complete cassette without film shall be held to an absolute minimum and shall not exceed 20 pounds.
- 3.2.3 Film Spool Drive System - The cassette drive shall be integral to the cassette and shall be designed for minimum power consumption. The drive motor shall be a 28 volt DC motor.
- 3.2.4 Mounting Provisions - Provision shall be made for mounting the cassette within the vehicle in accordance with the mounting provisions as shown in Figure 1.
- 3.3 Performance Requirements



- 3.3.1 Film Take-up Performance - The cassette shall be capable of taking up the required amount of film as specified in the cassette detail section (paragraph 3.4) under simulated operating conditions.
  - 3.3.1.1 The cassette shall be started and stopped at least twenty times over the range of taking up a complete roll of film. The rate of film take-up shall be 20 inches per second.
  - 3.3.1.2 The maximum acceleration time permitted under the worst conditions of the take-up spool starting shall not exceed 15 seconds.
- 3.3.2 Power Consumption - The total power consumption of the cassette shall be held to an absolute minimum. The maximum total power consumed shall not exceed 35 watts of 28 volt DC supply regulated to  $\pm 0.5\%$ .
- 3.4 Cassette Design Details
  - 3.4.1 Allowance for Film Splices - The cassette film handling system and guides shall be designed to allow for smooth passage of the required number of proper film splices expected in each roll of operational film. The assembly shall be capable of passing film that has been properly butt spliced with 1" wide polyester film tape (Minnesota Mining and Manufacturing Co. type #850 or equivalent).
  - 3.4.2 Film Loading - The cassette shall be assembled with leader attached to the spool and threaded through the film handling system with six feet of leader external to the cassette film entrance slot. This leader shall be spliced to the camera film for final assembly and testing purposes.
  - 3.4.3 Remote Indication Requirement - The cassette shall be provided with a transducer and the necessary electrical connections to permit remote indication of the amount of film that is on the take-up spool at any time during the operation.
  - 3.4.4 Anti-Kick-Up Device - The cassette shall be designed to incorporate an anti back-up mechanism in the spool drive system to prevent the take-up spool from unwinding. This anti-back-up device shall be capable of being released for test and check-out purposes by applying 28 volts DC on an appropriate pin connection. The anti-back-up device shall be mechanically engaged when the voltage is removed.

- 3.4.5 Film Capacity - The cassette shall contain a film spool of special design with a 4" diameter core and a 20-1/4" diameter flange capable of handling a film capacity of 20" diameter.
- 3.4.6 Film Requirements - The film to be handled by the cassette and spool shall be thin based unperforated film of a nominal 3-1/2 mil, (0.0035") thickness and 70 mm width. The cassette shall be capable of properly winding this film onto the spool tightly without excessive pressure marking or scratching.
- 3.5 Mock-Ups - Appropriate space and weight and balance mock-ups shall be provided in accordance with the Work Statement. A single mock-up shall be fabricated to be used in space utilization application. An accurate simulator of the final cassette configuration shall be fabricated to permit the ready mock-up of total system weight and balance. A mock-up designated to be retained at the contractor's facilities for the duration of the program shall reflect the current external configuration whenever changes occur.
- 3.6 Engineering Manual - An engineering manual shall be furnished which shall contain test and service procedures necessary to assure the satisfactory operation of the system. This manual shall be furnished in the form of standard ozalid reproductions and need not be prepared to any military specifications.
- 3.7 Reports - All reports called for in the contract shall be of an engineering type and need not be prepared in accordance with any special format or military specification. These reports, however, shall be complete and include all necessary data to properly permit engineering evaluation.
- 3.8 Drawings - All drawings to be prepared for this project shall be working drawings of sufficient detail to permit fabrication of additional equipment at a future time by an experimental or model shop facility. These drawings need not conform to any military specification and shall include sketches wherever possible.
- 3.9 Design and Selection of Components - The design and selection of components for this cassette shall be compatible with the performance and environmental requirements of the system. The best available items shall be used and the components need not be in accordance with specific Military Specifications.

- 3.10 Environmental Conditions - The components and overall cassette shall be designed in accordance with specification 9103-L2916 entitled, "Project Stovepipe - General and Environmental Specification, Revised 9 May 1958." The environmental tests performed are detailed under the qualification test section, paragraph 4.
- 3.11 Spare Parts - A complete list of spare parts requested for the cassette shall be submitted for customer approval by 23 August 1958. Customer approval of the submitted list will be requested within two weeks after receipt. This revised list shall be priced by the contractor and resubmitted by 13 September 1958 for formal approval. Formal approval of prices and quantities shall be provided to the contractor, no later than 27 September 1958.

4. QUALIFICATION TESTING

- 4.1 Acceptance Tests - Acceptance tests shall be performance tests to be accomplished on each deliverable cassette to assure proper functioning of the equipment. The details of the tests shall be as mutually agreed upon by the contractor and the customer.

Acceptance Tests

1. Mechanical and electrical inspection.
2. Film Spool Acceleration Test.
3. Film Take-up Test.
4. Checking the Anti-Back-Up Device.
5. Checking the Remote Indication Transducer Output.

The order in which these acceptance tests have been listed shall not necessarily indicate the order in which the acceptance tests shall be run. The acceptance shall be run in the most expeditious order by which to accomplish the requirements.

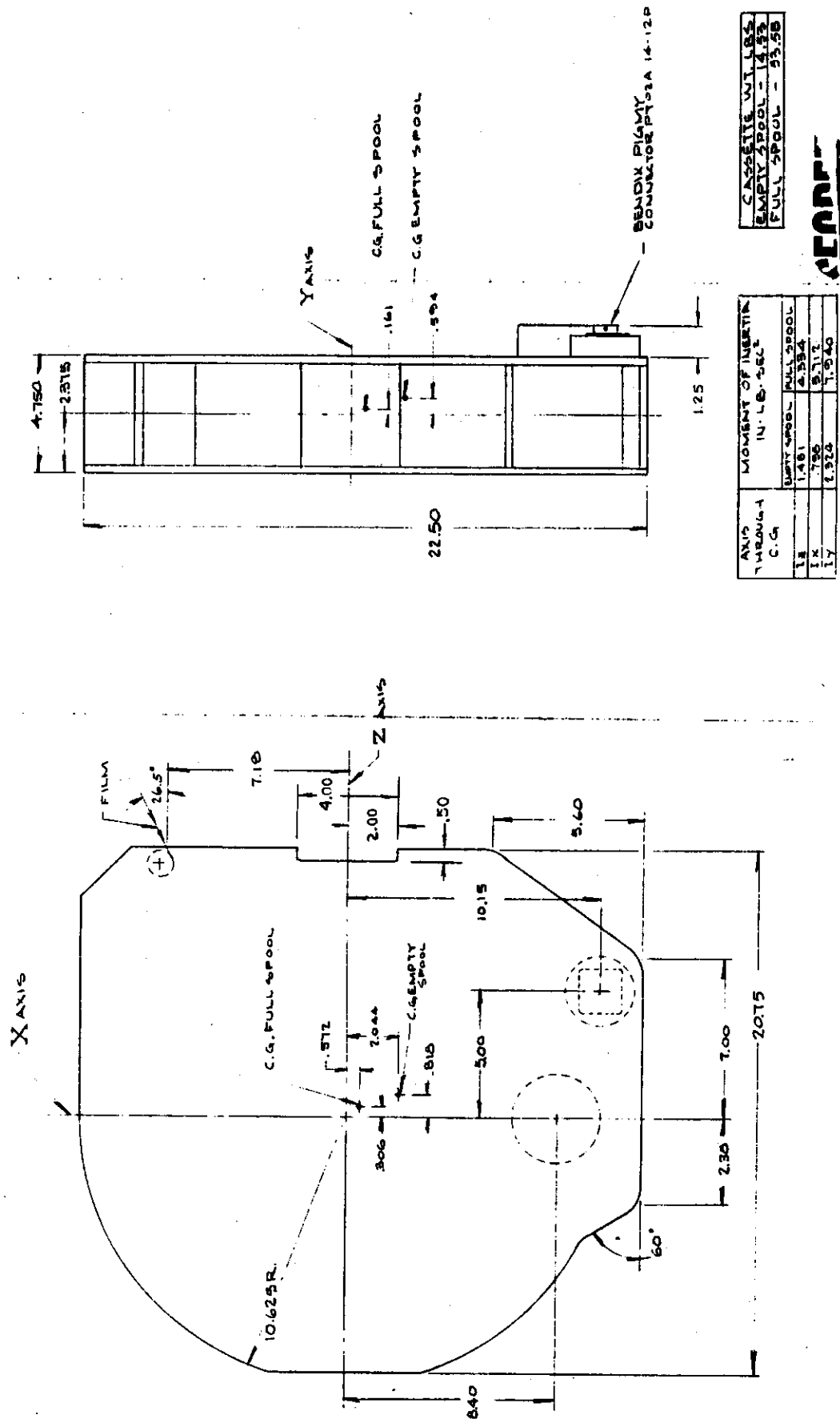
- 4.2 Environmental Tests - The environmental testing shall be performed on the first non-deliverable flight unit for the purposes of qualifying the deliverable cassettes. The environmental tests shall be as indicated in the following paragraphs, which reference the appropriate paragraph of the General Environmental Specification 9103-L2916 Rev. 2, dated 9 May 1958. The tests selected represent the most critical in accordance with the requirements and therefore shall constitute the qualification test specification for the cassette.
  - 4.2.1 Temperature, Altitude, and Humidity Tests - The temperature, altitude and humidity test shall be conducted in accordance with the requirements of paragraph 4.1.3 of the General Environmental Specification referenced herein.

- 4.2.2 Explosion Proof Tests - Explosion proof tests shall be conducted in accordance with the requirements of paragraph 4.6 of the General Environmental Specification referenced herein.
- 4.2.3 Drop Tests - Drop tests shall be conducted in accordance with the requirements of paragraph 4.7.1.2 of the General Environmental Specification referenced herein.
- 4.2.4 Vibration Tests - Vibration tests shall be conducted in accordance with the requirements of paragraph 4.8 of the General Environmental Specification referenced herein.
- 4.2.5 Shock Tests - The cassette shall be subjected to three 75 g shocks along the roll axis as determined by the orientation of the cassette when mounted in the vehicle. The cassette shall then be subjected to three 20 g shocks in both directions along each of its three mutually perpendicular axes for a total of eighteen shocks. Time to peak of each shock shall be approximately 5-1/2 milliseconds. Duration of each shock shall be  $11 \pm 1$  millisecond. The cassette shall not be operated during this test. The cassette shall be operable after the 20 g shock tests but need not be operable after the 75 g shock test along the longitudinal axes.
- 4.2.6 Acceleration Tests - shall be conducted in accordance with the requirements of paragraph 4.10 of the General and Environmental Specification referenced herein. In addition to this test, an acceleration test shall be applied along the longitudinal axis of the cassette when properly oriented in the vehicle at 25 g's for a period not less than three minutes. The cassette need not be operable after this additional test.

SCHEDULE I

<u>Part No.</u>	<u>Name</u>	TS 956-2201	TS 956-2003	TS 956-2002	TS 956-2004	TS 956-2005
956 B4	Motor Assy	X	X	X	X	X
956 B25	Miniclutch Assembly		X	X	X	
956-265	Potentiometer	X	X	X	X	

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CASSETTE WT LBS	
EMPTY SPOOL	14.52
FULL SPOOL	33.58

AXIS THROUGH C.G.	MOMENT OF INERTIA IN. LB. SEC <sup>2</sup>
UX	1.181
UY	2.324
UX	7.795
UY	1.940

**GEORGE  
JONES**

FIG. 1

DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

~~SECRET~~

Amendment No. 1

23 October 1958

Specification No. SME-DC-3 (A)

Cassette, Take-up  
for  
High Acuity Panoramic Camera

Prepared by:

[REDACTED]

Project Engineer

Approved by:

[REDACTED]

Program Director

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AMENDMENT

Dated: 23 October 1958

No. 1

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

SME-DC-3

Dated: 10 September 1958

---

The following paragraphs of Specification SME-DC-3, dated 10 September 1958 shall be amended as follows:

- Paragraph 2.1 Delete "9103-L2916 - Revised 9 May 1958 - Project Stovepipe -  
"General and Environmental Specification."  
Insert "FCIC No. SME-EB-5, dated 9 September 1958 -  
Environmental Test Specification."
- Paragraph 3.4.7 Resistance Thermometer - The cassette shall contain three  
resistance thermometers. The type and location shall be as agreed  
upon by FCIC and the customer.
- Paragraph 3.10 Revise the first sentence to read:  
The components and overall cassette shall be designed to satisfy  
the requirements of FCIC Specification SME-EB-5, entitled  
"Environmental Test Specification", dated 9 September 1958.
- Paragraph 4.2 Change third sentence to read as follows:  
"The environmental tests shall be as indicated in the following  
paragraphs, which reference the appropriate paragraph of the FCIC  
Environmental Test Specification, SME-EB-5, dated 9 September 1958.  
Delete the last sentence.
- Paragraph 4.2.1 Change to read as follows:  
"Temperature, Altitude, and Humidity Tests - The temperature,  
altitude and humidity tests shall be conducted in accordance with  
the requirements of paragraph 4.2.1 of the FCIC Environmental  
Test Specification referenced herein.

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Reason:

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Dated 23 October 1958

Paragraph 4.2.2 Change to read as follows:

"Explosion Proof Tests - Explosion proof tests shall be conducted in accordance with the requirements of paragraph 4.2.6 of the FCIC Environmental Test Specification referenced herein.

Paragraph 4.2.3 Change to read as follows:

"Drop Tests" - Drop tests shall be conducted in accordance with the requirements of paragraph 4.2.4.2 of the FCIC Environmental Test Specification referenced herein.

Paragraph 4.2.4 Change to read as follows:

"Vibration Tests - Vibration tests shall be conducted in accordance with the requirements of paragraph 4.2.2 of the FCIC Environmental Test Specification referenced herein."

Paragraph 4.2.6 Change first sentence to read as follows:

"Acceleration Tests - Shall be conducted in accordance with the requirements of paragraph 4.2.3 of the FCIC Environmental Test Specification referenced herein.

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DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

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Specification No. SME-DN-24A

Test and Check-out Console  
For  
High Acuity Panoramic Camera

12 September 1958

Prepared by:

[REDACTED]

Sr. Project Engineer

Approved by:

[REDACTED]

Program Chief

~~CONFIDENTIAL~~



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## 1. SCOPE

1.1 This specification covers one type of test and check-out console to provide for a complete functional operating test of a panoramic camera and cassette including indication of correct operation of all mechanical and electrical functions.

## 2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on the date of this specification form a part of this specification to the extent specified herein.

SME-DB-1	High Acuity Panoramic Camera
SME-DC-3	Cassette, Take-up, for High Acuity Panoramic Camera

## 3. REQUIREMENTS

3.1 Component Parts: The test and check-out console shall consist of a chassis on wheels containing the necessary instrumentation and circuitry to record or present for rapid interpretation the information provided by the camera system transducers and/or camera system circuits.

### 3.2 Basic Console Design:

3.2.1 Configuration: The design of the console shall conform to the basic configuration and space limitations as shown in Figure 1. The console weight shall be kept at a minimum with a design goal of 750 lbs.

3.2.2 Console Functions: The console shall be capable of making functional operating checks of the camera system which shall include the following:

- (a) Constancy of Scan Velocity.
- (b) Relative change of Scan Velocity due to change of V/H Commands.
- (c) Camera Cycling Rate.
- (d) Film Transport Indication.
- (e) Cassette anti-back-up operation and film remaining indicator operation.
- (f) Data Recording Functions.
- (g) Temperature Sensors
- (h) Light Leak Detector

3.2.3 Instrumentation: The console shall contain standard commercial instruments wherever practicable. These instruments shall be installed integral to the console and furnished as part of the console. Modification of these standard instruments and the proper interconnections between them shall be included in the console design. A 400 cps power supply shall provide

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power for the Programmer and Camera-Cassette. A 2000 cps power supply shall be provided to furnish power to the time totalizer. A power supply converting 60 cps line power to supply the 28V D.C. requirements of the Test Console and Camera-Cassette shall be provided. No batteries for prime power shall be used. All power supplies shall be over-rated to allow for system change and growth potential.

3.2.4 General: Connecting means (wire) shall be provided for inter-connection between the console and the camera system. Remote telemetering receiver, if required, is not a part of the console. The console shall supply power and operating control command signals to the camera system. The console shall be capable of testing the camera and cassette on test fixtures supplied by the customer as well as when installed in the vehicle. The latter capability will be accomplished by interconnecting patch cables to be customer furnished.

### 3.3 Performance Requirements:

3.3.1 Console Performance: The selection of all components for the tests and check-out console shall have accuracies consistent with the accuracy of the camera and cassette performance requirements as reflected in Specification No. SME-DB-1, entitled "High Acuity Panoramic Camera", and Specification No. SME-DC-3, entitled "Cassette, Take-up, for High Acuity Panoramic Camera".

3.3.2 Power Requirements: The console shall provide the necessary power requirements consistent with the camera and cassette specifications referenced herein for pre-flight check-out. The power required for the console shall utilize standard 110 volts, 60 cycles, three phase, "Y", 4 wire (208V Phase to Phase) supply.

3.4 Engineering Manual: An engineering manual shall be furnished which shall contain tests and service procedures necessary to assure the satisfactory operation of the console. This manual shall be furnished in the form of standard ozalid reproduction and need not be prepared to any Military Specification.

3.5 Reports: All reports called for in the contract shall be of an engineering type and need not be prepared in accordance with any special format or Military Specification. These reports however, shall be complete and include all necessary data to properly permit engineering evaluation.

3.6 Drawings: All drawings to be prepared for this project shall be working drawings of sufficient detail to permit fabrication of additional equipment at a future time by an experimental or model shop facility. These drawings need not conform to any Military Specification and shall include sketches wherever possible.

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3.7 Design and Selection of Components: The design and selection of components for this console shall be compatible with the performance and environmental requirements of the system. The best available items shall be used and the components need not be in accordance with specific Military Specifications.

3.8 Spare Parts: A complete list of spare parts requested for the console shall be furnished and delivered, as mutually agreed between FCIC and the customer.

#### 4. QUALIFICATION TESTING

4.1 Acceptance Tests: Acceptance tests shall be performance tests to be accomplished on the first deliverable console to assure proper functioning of the equipment. The details of the tests shall be as mutually agreed upon by FCIC and the customer. The acceptance tests performed on articles subsequent to the first deliverable will be of reduced detail as mutually agreed upon by FCIC and the customer.

##### ACCEPTANCE TESTS

- (a) Mechanical and electrical inspection.
- (b) Calibration check of all standard instruments in accordance with normal procedure.
- (c) Check of each functions the console is designed to handle, utilizing standard type of commands.

4.2 Environmental Tests: The test console shall operate in a controlled environment which will basically be that of normal room conditions. It is not necessary therefore, to environmentally test the console with the following exception as detailed in Paragraph 4.2.1

4.2.1 Drop Tests: The equipment packaged for shipment shall be dropped to a flat concrete surface once in each direction along each of the three major perpendicular axes. Height of drops to be 12 inches. Equipment over 1,000 pounds weight shall be dropped once only in its mounting and transportation position. After the drop tests the console shall pass the acceptance tests of Paragraph 4.1.

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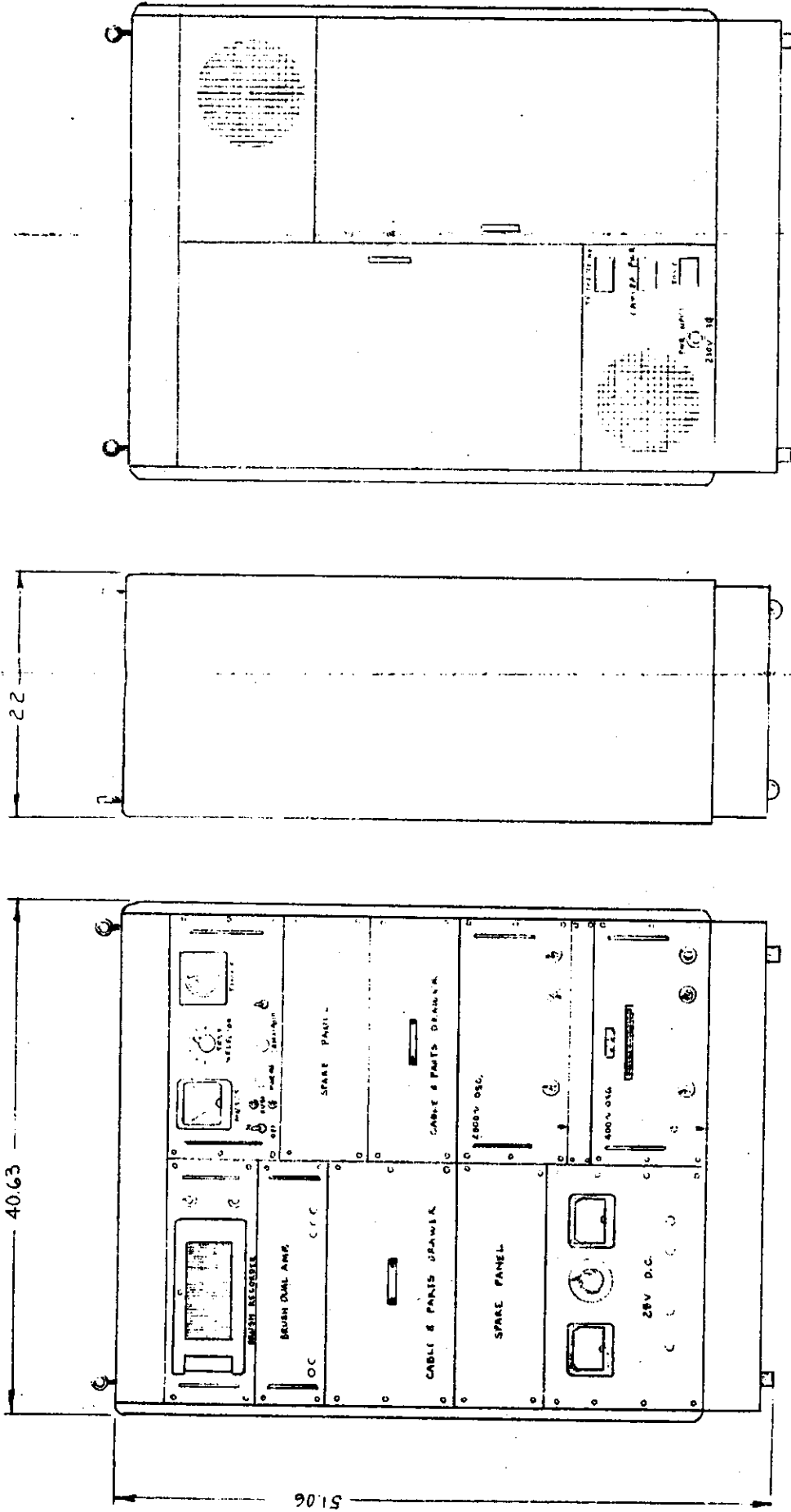
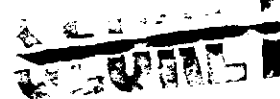


FIGURE NO. 1



Amendment 1

Specification No. SCE-DM-24(A)

Test and Check-out Console  
For  
High Acuity Panoramic Camera

23 October 1958

Prepared by:

Sr. Project Engineer

Approved by:

Program Director

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AMENDMENT

Dated: 23 October 1958

No. 1

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

SEE-DM-24(A)

Dated: 12 September 1958

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The following paragraphs of Specification No. SEE-DM-24(A), dated 12 September 1958 shall be changed to read as follows:

Paragraph 3.2.3 Delete the sentence: "A 2000 cps power supply shall be provided to furnish power to the time totalizer."

Paragraph 4.2 Change the last sentence to read: "It is not necessary therefore, to environmentally test the console."

Paragraph 4.2.1 Delete in its entirety.

Figure 1 Replace old Figure 1 dated 12 September 1958 with revised Figure 1, dated 23 October 1958

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Reason:

Design changes and customer directed reduction in effort.



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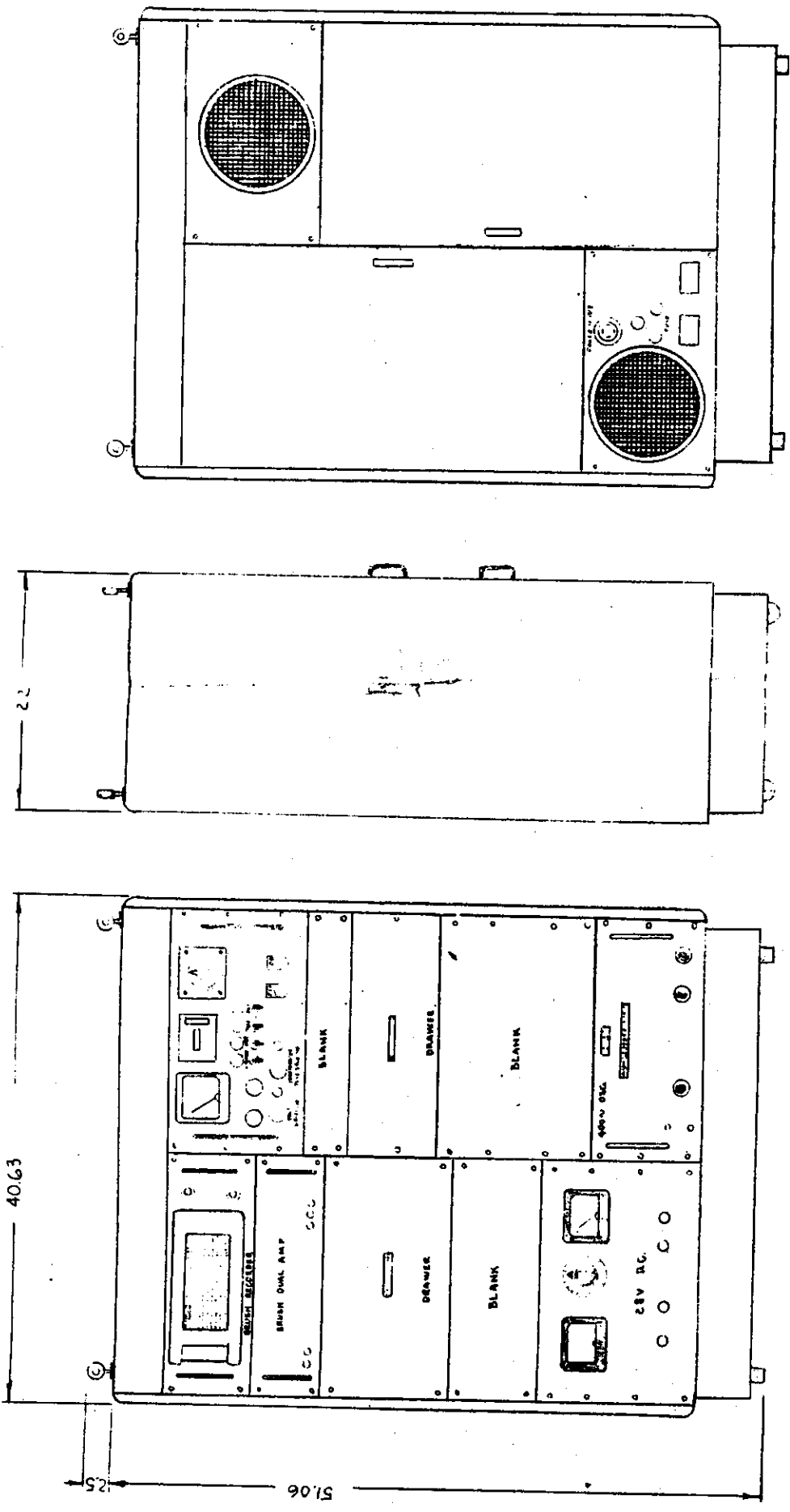


FIGURE NO. 1

SPECIFICATION  
NO. SME-DY-1

22 August 1958

TRANSIT CASE  
FOR  
HIGH ACUITY PANORAMIC CAMERA

Prepared by:

[Redacted Signature]

Project Engineer

Approved by:

[Redacted Signature]

Program Chief

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1. SCOPE

1.1 This specification covers the design and manufacture of a transit case for the High Acuity Panoramic Camera, FCIC Part No. 956-A1.

2. APPLICABLE DOCUMENTS

2.1 The following specifications and drawings in effect on the date of this specification, form a part of this specification to the extent specified herein.

A. Specifications

- 9103-L2916 - Revised 9 May 1958, Project Stovepipe, "General and Environmental Specification."
- MIL-E-005272B - Environmental Testing.
- MIL-F-14072 (Sig C) - Finishes for Ground Signal Equipment.

B. Drawings

FCIC Drawing No. 956L73

3. DESIGN REQUIREMENTS

3.1 Physical Description

3.1.1 General - The transit case shall be constructed from Balsa panels with 0.016" aluminum faces and the necessary aluminum extrusions. Suitable gasket material shall be installed between the case and its cover. Case shall be equipped with an Atwood Morrill Duplex Automatic Relief Valve Model No. 5462 or equivalent.

3.1.2 Details

3.1.2.1 Cover - The cover of this case shall not be hinged and shall be completely removable. The cover shall be fastened to the case on all four (4) sides by recessed spring loaded clamps of a type which will enable the case to meet the test requirements herein specified. Provisions shall be made for locking the cover in its closed position by means of key operated locks.

3.1.2.2 Handles - The transit case shall be equipped with four (4) spring loaded recessed handles.

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- 3.1.1.3 Interior of Case - The interior of the case shall be fitted with molded hair inserts or equal to protect the camera against the test requirements herein specified. In order to protect camera gearing, etc. from pieces of the molded hair which may become dislodged a smooth protective vinyl coating or equivalent shall be sprayed, dipped or applied in some other manner, to all exposed surfaces of the molded hair. Fairchild Drawing No. 956L73 gives the outline dimensions of the camera which shall be transported and stowed in this case. Provision shall be made inside the case for the following:
- a. Space for stowing a box 4" x 1-1/2" x 1-1/2".
  - b. Sufficient space around the open sides of the camera for a dessicant packaged in bags of a type approved by FCIC.
- 3.1.1.4 Dimensions - The approximate inside dimensions of the case shall be 50" x 50" x 24". The thickness of the molded hair inserts between the walls of the transit case and the parts of the camera which are supported by the inserts shall not be less than 4.5 inches.
- 3.1.1.5 Weight - The weight of the transit case shall not exceed 75 pounds. The case shall be designed to hold a camera which does not exceed 85 pounds in weight.
- 3.1.1.6 Materials - Materials which are flammable, toxic, fungus nutrient, corrosive, etc., shall not be used without suitable protective treatment.
- 3.1.1.7 Finishes - Material used in the transit case shall be finished in accordance with finish Specification MIL-F-14072 (Sig C).
- 3.1.1.8 Color - The exterior of the case shall be painted light blue color No. 501 Federal STD No. 595 Color No. 15102.

- 3.1.1.9 Marking and Identification - All four (4) sides and top shall have stenciled the warning "Fragile - Delicate Equipment" and "This Side Up". The sides shall have arrows indicating the up direction. The stenciling shall be in orange-yellow, Color No. 506 Federal STD No. 595 Color No. 13538.
- 3.1.1.10 Workmanship - The transit case shall be manufactured and finished in a thoroughly workmanlike manner.
- 3.1.1.11 Drawings - The Vendors shop drawings of the transit case shall be provided to FCIC.

4. SERVICE ENVIRONMENT

The transit case with camera installed shall be designed so that no fixed part or assembly will become loose, and no movable part or assembly will become undesirably free or sluggish in operation when subjected to the service environments listed below. The transit case shall also protect the camera from any damage under these service environments.

- 4.1 Temperature - The transit case with camera shall be capable of safe storage and transportation under the following conditions:
  - a. Lower Limit - minus 65°F for periods of at least 8 hours duration.
  - b. Upper Limit - plus 125°F plus the full impact of solar radiation of 360 BTU/sq.ft./hr., for periods of 4 hours per day, or 160°F with no solar radiation for periods of 4 hours per day, which ever is greater.
- 4.2 Atmospheric Pressure - Transit case shall be designed to withstand atmospheric pressure ranging between 3.44 inches of mercury and 30.5 inches of mercury.
- 4.3 Fungus - The transit case shall be capable of withstanding Fungus Resistance Tests in accordance with MIL-E-005272B.
- 4.4 Humidity - Transit case shall be designed to withstand relative humidities up to 100 per cent, including condensation due to temperature change. Test in accordance with MIL-E-005272B except that 5 cycles shall be run instead of 10 cycles.
- 4.5 Watertight - The transit case shall be made watertight in accordance with MIL-STD-108C Table II.

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- 4.6 Other Atmospheric Elements - The transit case shall be designed to withstand and to protect the camera from any of the probable combinations of the following atmospheric elements: rain, snow, sleet, hail, i.e, fog, smoke, wind, ozone, sand and dust, sunshine, salt and corrosive atmosphere.
- 4.7 Shock - The transit case with camera shall be capable of withstanding a shock of 40g with a 2 millisecond rise and a 6 millisecond dwell, at least once along each of three mutually perpendicular axis. The decay time shall be such that the area under the decay portion of the acceleration time curve is less than 50% of the total area.
- 4.8 Drops - The transit case with camera shall be capable of withstanding drops to a flat concrete surface in both directions along each of the three major mutually perpendicular axis. Height of drop shall be 18 inches.
- 4.9 Vibration - The transit case and camera shall withstand vibration tests conducted under both resonant and cycling conditions as follows:
  - 4.9.1 Resonance - Resonant frequencies shall be determined by varying the frequency of applied vibration slowly through the 5 to 500 cps frequency at double amplitudes or acceleration not exceeding those given below:
 

<u>Frequency</u>	<u>Double Amplitude or Vibration Acceleration</u>
5 cps to 27.5 cps	± 1.3g
27.5 cps to 52 cps	0.036 inch
52 cps to 500 cps	± 5g

This procedure shall be followed successively for vibration applied along each of three mutually perpendicular axis of the case. The case shall be vibrated for thirty minutes at each resonant node encountered. When resonant frequencies within the specified frequency range are not apparent, the specimen shall be vibrated for one hour along each axis under the cycling conditions given below:
  - 4.9.2 Cycling - The test frequency shall vary linearly from 10 cps to 500 cps and return to 10 cps in a 15 minute interval. Between 10 cps and 52 cps, the double amplitude applied shall be 0.036 inch and from 52 cps to 500 cps the vibratory acceleration shall be ± 5g.
- 4.10 Shipping Instructions - The transit case shall be delivered to 5 Aerial Way, Syosset, New York packaged in a suitable container.

AMENDMENT NO. 1

Specification No. SME-DY-1

Transit Case  
For  
High Acuity Panoramic Camera

29 September 1958

Prepared by:

  
Project Engineer

Approved by:

  
Program Director



AMENDMENT

Dated: 29 September 1958

No. 1

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

SM-XY-1

Dated: 22 August 1958

The following paragraphs of Specification SM-XY-1, dated 22 August 1958 should be changed to read as follows:

3.1.1.3 Interior of Case: Change the first two sentences to read:  
The interior of the case shall be fitted with an aluminum ring to which the camera may be belted in place. This ring is to be molded into a polyurethane insert of suitable density. The molded insert shall give sufficient isolation to the mounted camera to protect it from the test requirements specified herein. The dimensions of this ring are shown in Figure 1 of this amendment.

3.1.1.4 Dimensions: Change second sentence to: The molded insert shall be sufficient to support the belted aluminum mounting ring in all directions of freedom.

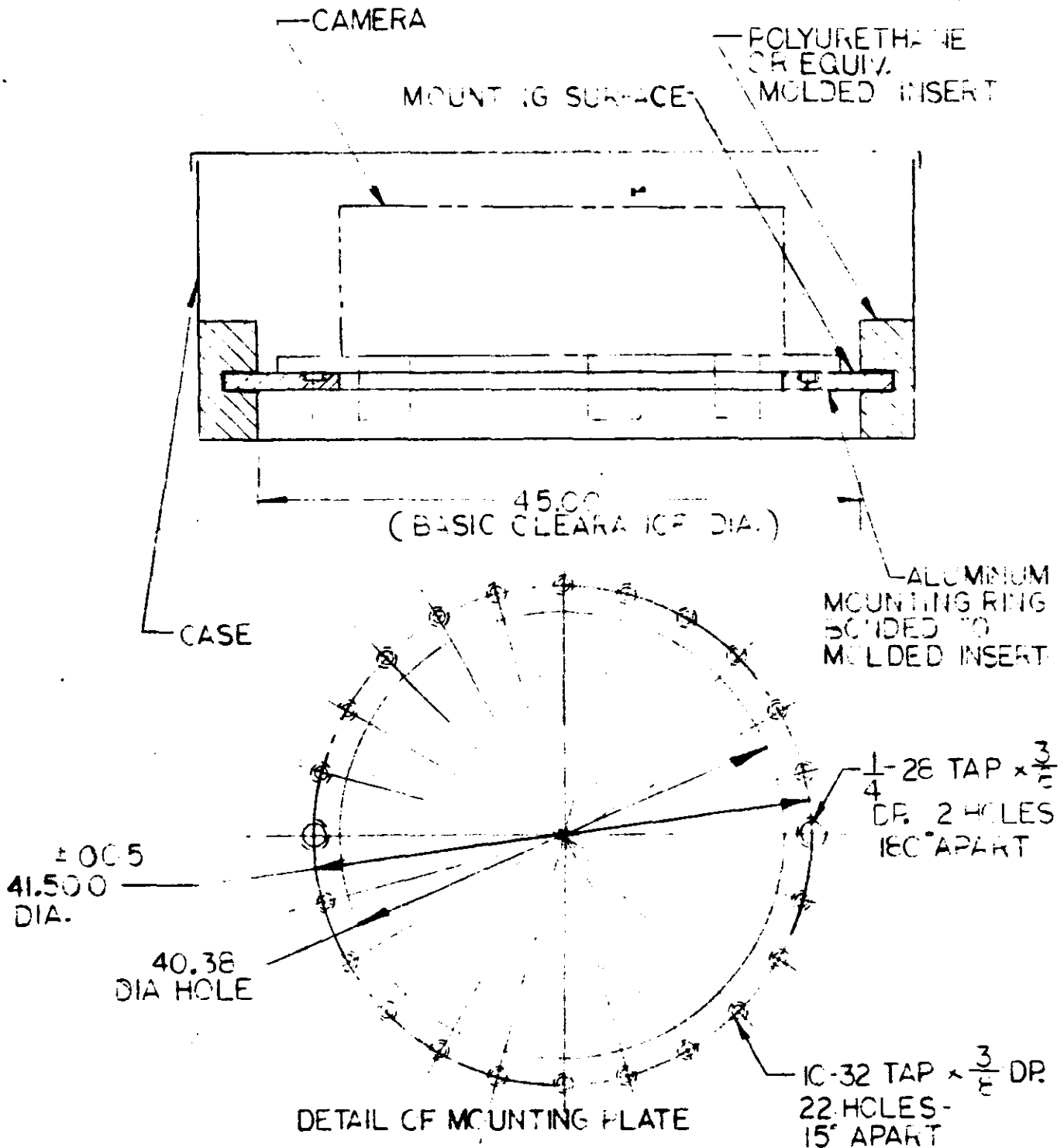
Add the following paragraphs:

3.1.1.12 Humidity Indicator: A humidity indicator shall be installed approximately on the center of one side panel of the case. It shall be vented to the interior of the case where the camera is located. The indicator shall be a type similar to the Culligan Co., Type No. 6942 and meet Specification MIL-I-26860.

3.1.1.13 Stacking: The corners of the cover and case shall use the proper hardware to permit stacking cases one on top of the other.

Reason: Engineering Change.

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NOTE

MOUNTING SURFACE OF RING TO BE FLAT WITHIN .003 AND ANODIZED

FIGURE 1

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DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

Amendment No. 2

Specification No. SPE-DY-1

Transit Case  
for  
High Acuity Pancrastic Camera

25 October 1958

Prepared by:

  
Project Engineer

Approved by:

  
Program Director

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AMENDMENT

Dated 25 October 1958

No. 2

This Amendment forms part of and should be attached to (FCIC) Systems  
Management and Engineering Department Specification No. SME-DY-1

Dated 22 August 1958

---

The following paragraph of Specification SME-DY-1, dated 22 August 1958  
should be changed to read as follows:

Paragraph 2.1 Change Part A to read as follows:

A. Specifications

MIL-E-005272B - Environmental Testing  
MIL-F-14072 (Sig G) - Finishes for Ground Signal  
Equipment.

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SPECIFICATION  
NO. SME-DY-2

27 August 1958

TRANSIT CASE FOR  
FILM TAKE-UP CASSETTE OF  
THE HIGH-ACUITY PANORAMIC CAMERA

Prepared by:

  
Engineer

Approved by:

  
Program Chief

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Specification No. SME-DY-2  
Page 1 of 4 Pages  
27 August 1958

1. SCOPE

- 1.1 This specification covers the design and manufacture of a transit case for the Film Take-up Cassette of the High Acuity Panoramic Camera, FCIC Part No. 956E2.

2. APPLICABLE DOCUMENTS

- 2.1 The following specifications and drawings in effect on the date of this specification, form a part of this specification to the extent specified herein.

A. Specifications

- 9103-L2916 - Revised 9 May 1958, Project Stovepipe,  
"General and Environmental Specification."  
MIL-E-005272B - Environmental Testing.  
MIL-F-11072(Sig C)- Finishes for Ground Signal Equipment.

B. Drawings

FCIC Drawing No. 956L21

3. DESIGN REQUIREMENTS

3.1 Physical Description

- 3.1.1 General - The transit case shall be constructed from Balsa panels with 0.016" aluminum faces and the necessary aluminum extrusions. Suitable gasket material shall be installed between the case and its cover. Case shall be equipped with an Atwood-Morrill Duplex Automatic Relief Valve Model No. 5462 or equivalent.

3.1.2 Details

- 3.1.2.1 Cover - The cover of this case shall not be hinged and shall be completely removable. The cover shall be fastened to the case on all four (4) sides by recessed spring loaded clamps of a type which will enable the case to meet the test requirements herein specified. Provisions shall be made for locking the cover in its closed position by means of key operated locks.

- 3.1.2.2 Handles - The transit case shall be equipped with two (2) spring loaded recessed handles.

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Specification No. SME-DY-2  
Page 2 of 4 Pages  
27 August 1958

- 3.1.1.3 Interior of Case - The interior of the case shall be fitted with molded hair inserts or equal to protect the cassette against the test requirements herein specified. In order to protect cassette gearing, etc. from pieces of the molded hair which may become dislodged a smooth protective vinyl coating, or equivalent shall be sprayed, dipped or applied in some other manner, to all exposed surfaces of the molded hair. Fairchild Drawing No. 956L21 gives the outline dimensions of the cassette which shall be transported and stowed in this case. Provision shall be made inside the case for sufficient space around the open sides of the cassette for a desiccant packaged in bags of a type approved by FCIC.
- 3.1.1.4 Dimensions - The approximate inside dimensions of the case shall be 32" x 32" x 15". The thickness of the molded hair inserts between the walls of the transit case and the parts of the cassette which are supported by the inserts shall not be less than 4.5 inches.
- 3.1.1.5 Weight - The weight of the transit case shall not exceed 25 pounds. The case shall be designed to hold a cassette which does not exceed 20 pounds in weight.
- 3.1.1.6 Materials - Materials which are flammable, toxic, fungus nutrient, corrosive, etc., shall not be used without suitable protective treatment.
- 3.1.1.7 Finishes - Material used in the transit case shall be finished in accordance with finish Specification MIL-F-14072(Sig C).
- 3.1.1.8 Color - The exterior of the case shall be painted light blue color No. 501 Federal STD No. 595 Color No. 15102.
- 3.1.1.9 Marking and Identification - The top of the transit case shall have stenciled the warning "Fragile - Delicate Equipment," and "This Side Up." The stenciling shall be in orange-yellow, color No. 506 Federal STD No. 595 Color No. 13538.

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Specification No. SIE-DY-2  
Page 3 of 4 Pages  
27 August 1958

3.1.1.10 Workmanship - The transit case shall be manufactured and finished in a thoroughly workmanlike manner.

3.1.1.11 Drawings - The Vendors shop drawings of the transit case shall be provided to FCIC.

4. SERVICE ENVIRONMENT

The transit case with cassette installed shall be designed so that no fixed part or assembly will become loose, and no movable part or assembly will become undesirably free or sluggish in operation when subjected to the service environments listed below. The transit case shall also protect the cassette from any damage under these service environments.

- 4.1 Temperature - The transit case with cassette shall be capable of safe storage and transportation under the following conditions:
- a. Lower Limit - minus 65°F for periods of at least 8 hours duration.
  - b. Upper Limit - plus 125°F plus the full impact of solar radiation of 360 BTU/sq.ft./hr., for periods of 4 hours per day, or 160°F with no solar radiation for periods of 4 hours per day, which ever is greater.
- 4.2 Atmospheric Pressure - Transit case shall be designed to withstand atmospheric pressure ranging between 3.44 inches of mercury and 30.5 inches of mercury.
- 4.3 Fungus - The transit case shall be capable of withstanding Fungus Resistance Tests in accordance with MIL-E-005272B.
- 4.4 Humidity - Transit case shall be designed to withstand relative humidities up to 100 per cent, including condensation due to temperature change. Test in accordance with MIL-E-005272B except that 5 cycles shall be run instead of 10 cycles.
- 4.5 Watertight - The transit case shall be made watertight in accordance with MIL-STD-108C Table II.
- 4.6 Other Atmospheric Elements - The transit case shall be designed to withstand and to protect the cassette from any of the probable combinations of the following atmospheric elements: rain, snow, sleet, hail, i.e., fog, smoke, wind, ozone, sand and dust, sunshine, salt and corrosive atmosphere.

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- 4.7 Shock - The transit case with cassette shall be capable of withstanding a shock of 40g with a 2 millisecond rise and a 6 millisecond dwell, at least once along each of three mutually perpendicular axis. The decay time shall be such that the area under the decay portion of the acceleration time curve is less than 50% of the total area.
- 4.8 Drops - The transit case with cassette shall be capable of withstanding drops to a flat concrete surface in both directions along each of the three major mutually perpendicular axis. Height of drop shall be 18 inches.
- 4.9 Vibration - The transit case and cassette shall withstand vibration tests conducted under both resonant and cycling conditions as follows:

- 4.9.1 Resonance - Resonant frequencies shall be determined by varying the frequency of applied vibration slowly through the 5 to 500 cps frequency at double amplitudes or accelerations not exceeding those given below:

<u>Frequency</u>	<u>Double Amplitude or Vibration Acceleration</u>
5 cps to 27.5 cps	± 1.3g
27.5 cps to 52 cps	0.036 inch
52 cps to 500 cps	± 5g

This procedure shall be followed successively for vibration applied along each of three mutually perpendicular axis of the case. The case shall be vibrated for thirty minutes at each resonant node encountered. When resonant frequencies within the specified frequency range are not apparent, the specimen shall be vibrated for one hour along each axis under the cycling conditions given below:

- 4.9.2 Cycling - The test frequency shall vary linearly from 10 cps to 500 cps and return to 10 cps in a 15 minute interval. Between 10 cps and 52 cps, the double amplitude applied shall be 0.036 inch and from 52 cps to 500 cps the vibratory acceleration shall be ± 5g.
- 4.10 Shipping Instructions - The transit case shall be delivered to 5 Aerial Way, Syosset, New York packaged in a suitable container.

DEFENSE PRODUCTS DIVISION  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

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Amendment No. 1  
To  
Specification No. SME-DY-2

Transit Case For  
Film Take-Up Cassette of  
The High-Acuity Panoramic Camera

29 September 1958

Prepared by:



Engineer

Approved by:



Program Director

~~SECRET~~  
~~CONFIDENTIAL~~

AMENDMENT

Dated: 29 September 1958

No. 1

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No. SME-DY-2

Dated: 27 September 1958

The following paragraphs of Specification No. SME-DY-2, dated 27 September 1958 should be changed to read as follows:

- 3.1.1.3 Interior of Case - Delete the first two sentences and substitute as follows: "The interior of the case shall be fitted with a molded polyurethane insert of proper density to protect the cassette against the test requirements herein specified. The cavity in this molded insert shall have a smooth surface so as not to mar or in any way deface the cassette surfaces and in addition shall fit the unit snugly when installed.
- 3.1.1.4 Dimensions - Change "32 X 32 X 15" to "32 X 32 X 11."  
Change "4.5 inches" to "3.0 inches."

Add the following paragraphs:

- 3.1.1.12 Humidity Indicator - A humidity indicator shall be installed approximately in the center of the one side panel of the case. It shall be vented to the interior of the case where the cassette is located. The indicator shall be a type similar to the Culligan Co. type No. 6942 and meet Specification No. MIL-I-26860.
- 3.1.1.13 Stacking - The corners of the cover and case shall use the proper hardware to permit stacking cases one on top of the other.

Reason:

Design changes.

DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

~~SECRET~~

Amendment No. 2

Specification No. SME-DY-2

23 October 1958

Transit Case For  
Film Take-Up Cassette of  
The High-Acuity Panoramic Camera

Prepared by:

  
Project Engineer

Approved by:

  
Program Director

~~SECRET~~

AMENDMENT

Dated 23 October 1958

No. 2

This Amendment forms part of and should be attached to (FCIC) Systems  
Management and Engineering Department Specification No. SME-DY-2

Dated 27 August 1958

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The following paragraphs of Specification No. SME-DY-2 dated 27 August 1958  
shall be changed as follows:

Paragraph 2.1 Delete "9103-L2916 - Revised 9 May 1958, Project Stovepipe,  
"General and Environmental Specification."  
Insert "FCIC No. SME-EB-5 dated 9 September 1958 -  
Environmental Test Specification."

Paragraph 3.1.1 Change .016 Aluminum faces to .025 aluminum faces.

Paragraph 3.1.1.2 In Amendment No. 1 of SME-DY-2, dated 29 September 1958,  
Change to read as follows:

"The interior of the case shall be fitted with a molded  
polyurethane or equal insert of proper density to protect  
the cassette against the test requirements herein specified.  
The cavity in this molded insert shall have a smooth  
surface so as not to mar or in any way deface the cassette  
surfaces and in addition shall fit the unit snugly when  
installed."

---

Reason:

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~~SECRET~~

Approved by: 

DEFENSE PRODUCTS DIVISION  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

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AMENDMENT NO. 1

Specification No. SMC-IX-3

Shipping Case  
For  
Test Console

29 September 1958

Prepared by:



SR. Project Engineer

Approved by:



Program Director

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AMENDMENT

Dated: 29 September 1958

No. 1

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

SM-IX-3

Dated: 28 August 1958

---

The following paragraphs of Specification SM-IX-3, dated 28 August 1958 shall be changed to read as follows:

Paragraph 3.1 Add the following sentence: Consideration shall be given to provide empty stacking capability, by the selection of suitable corner shapes on the top and bottom of the case.

Paragraph 3.3.4 Change to read as follows:

3.3.4 Humidity:

3.3.4.1 The Test Console, while stored in the Transit Case, shall be protected against humidity of up to 100%. A 16 unit Lantus Bag, Protak-Bark, 121 Silico Gel, Davidson Chemical Co., Code No. 36-10-IX-1971 or equivalent, meeting the requirements of specification MIL-D-3464A, Class 2 shall be installed in a suitable place in the Transit Case.

3.3.4.2 A humidity indicator shall be installed on one of the sides of the front of the Transit Case, and vented to the interior of the case. The humidity indicator shall be Type No. 6942, Culligan Co., or the equivalent thereof, meeting the requirements of specification MIL-I-26860. Markings shall be provided containing instructions to interpret the humidity indicator.

Paragraph 3.3.5 Delete the last sentence.

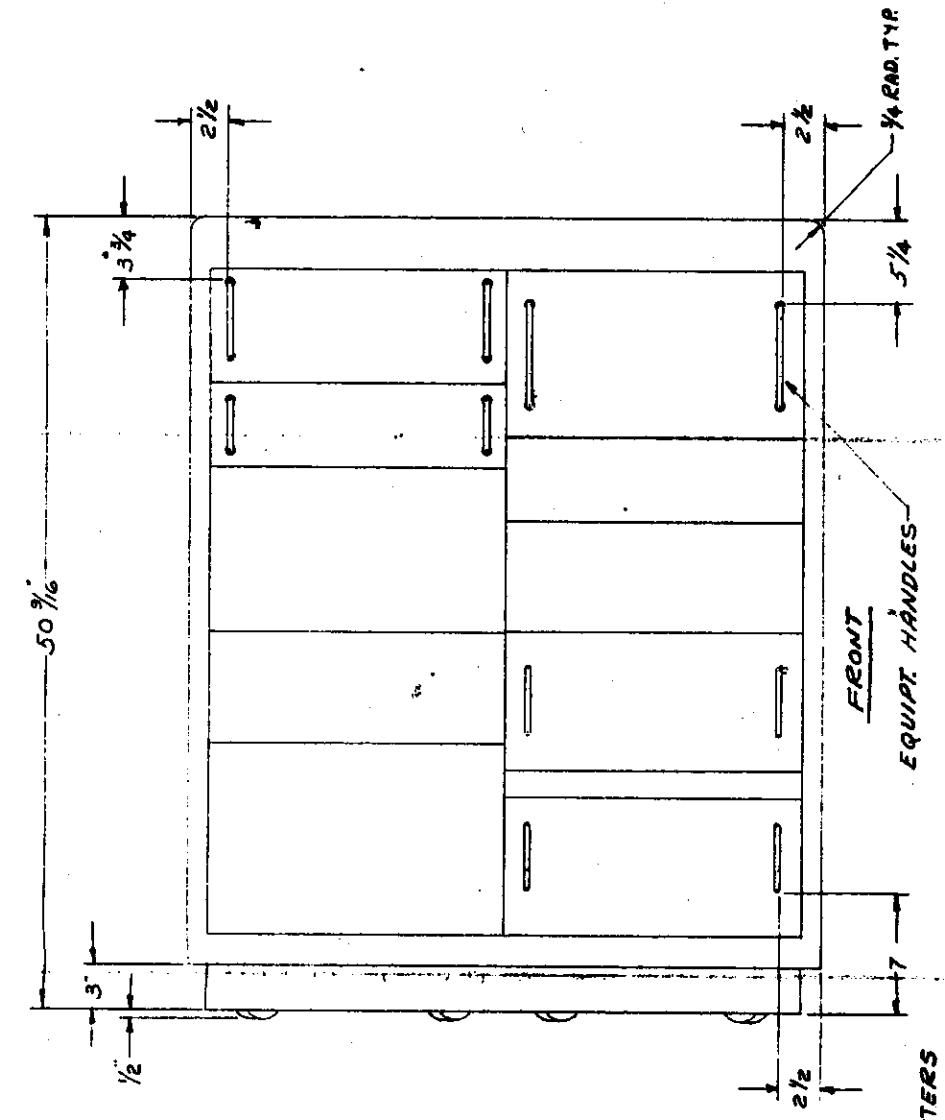
Replace Figure 1 (one page) with attached Figure 1 (two pages)

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Reason: Design Requirements.

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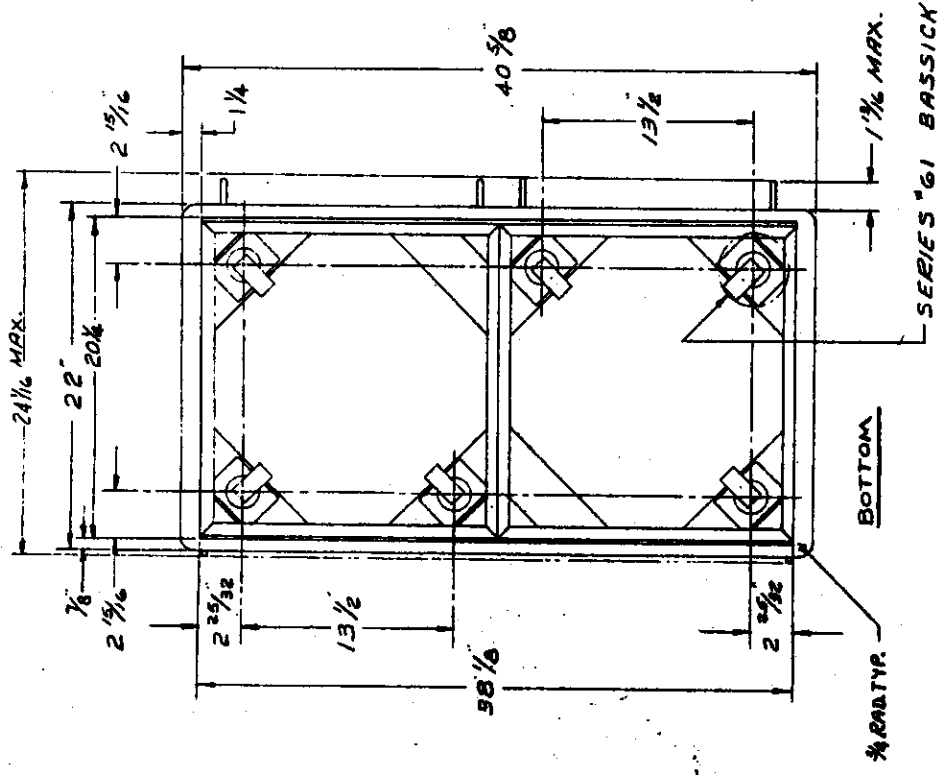
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CONSOLE 5M / OF 2

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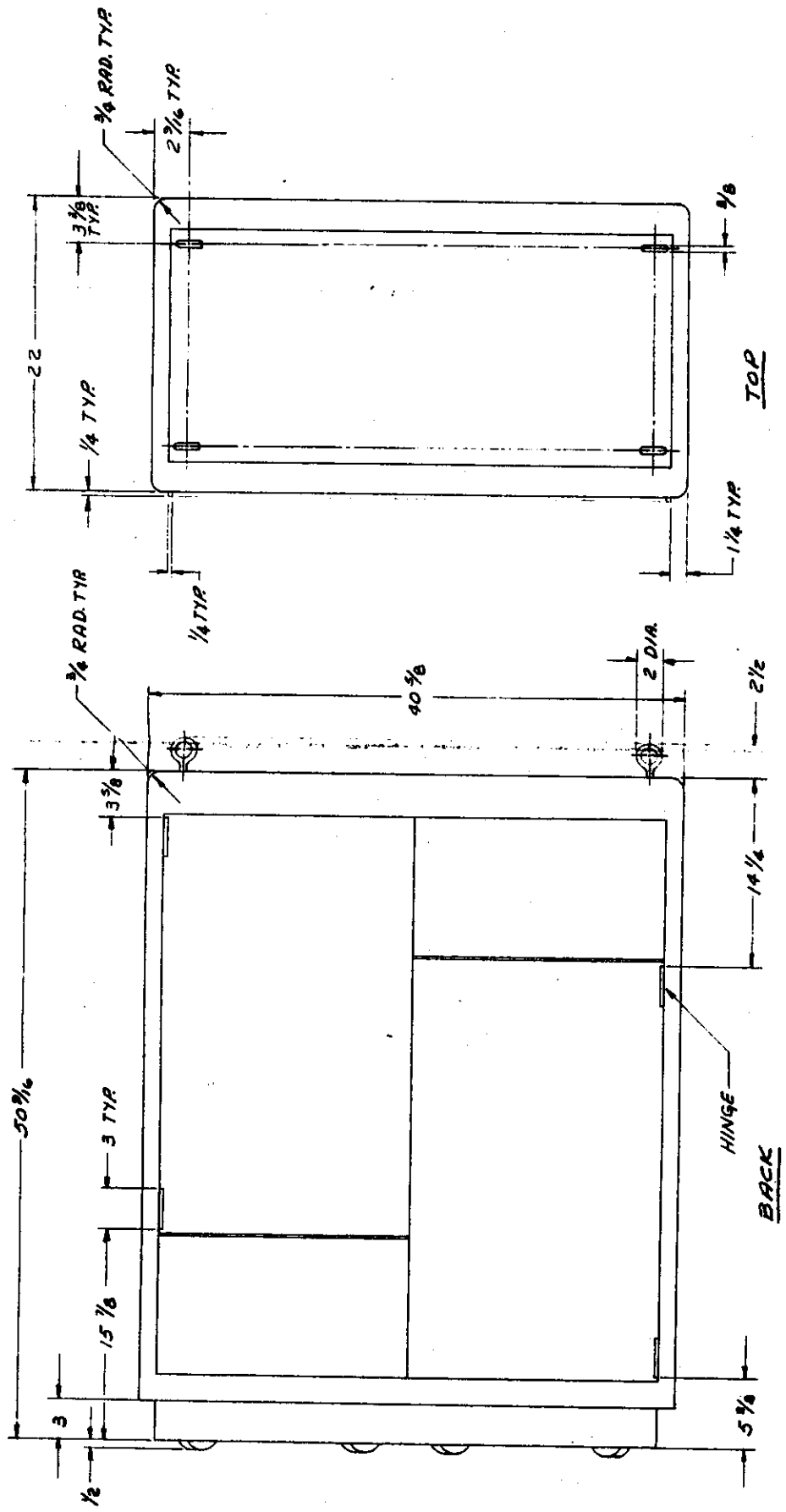
FIG. 1



SERIES "G1" BASSICK CASTERS  
SWIVEL RAD. 2 1/8.  
2 1/2 DIA WHEEL



**GEORGE  
FLUNLI**



DIM.  $\pm \frac{1}{16}$

CONSOLE

SH. 2 OF 2

FIG. #1

**GEORGE  
FLUNLI**

Specification No. SMC-DY-3

Shipping Case  
For  
Test Console

Part No. 8956-164

28 August 1958

Prepared by



Sr. Project Engineer

Approved by:



Program Chief

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1. SCOPE

1.1 This specification covers one type of Shipping Case used to store and protect the Test Console, Part No. 956-T60, during transportation.

2. APPLICABLE DOCUMENTS

2.1 Federal Standard 595 Colors

ANA Bulletin 166 Colors, List of Standard Aircraft, Glossy

3. DESIGN REQUIREMENTS

3.1 Construction: The shipping case shall be constructed of the most suitable material to provide the minimum size and weight consistent with insuring protection to the Test Console as set forth herein. Provisions shall be incorporated to handle the shipping case together with the Test Console packed within by both fork lift truck and by lifting rings (Eyebolts). The configuration shall be clam-shell construction, not hinged. The cover shall be secured on four (4) sides to meet the requirements stated herein. Locking of cover shall be provided.

3.2 Console Configuration: The Test Console consists of a Steel Frame with enclosed sides, top and bottom, containing various test instruments mounted on 19" rack panels. The Test Console weighs 750 lbs. complete. The overall dimensions of the Test Console including front panel protrusions are shown in Figure 1.

3.3 Test Console Protection: The shipping case shall protect the Test Console against all non-operating environments during storage or transportation as described herein.

3.3.1 Drop Test: The Test Console, housed within the shipping case, shall not be damaged when dropped once in both directions in each of the three mutually perpendicular axes. Height of drop shall be 12 inches. Maximum shock imparted to the Test Console shall be 12g. Design of shipping case shall provide a minimum shock on the console as determined by best trade-off between size and cost. A design goal of 6g is desired.

3.3.2 Temperature: Insulation shall be provided, if necessary to limit the temperature in any part of the Test Console to 40°F when subjected to a storage temperature of -65°F for 8 hours and to 100°F when subjected to a storage temperature of 160°F for 4 hours.

3.3.3 Fungus: The Test Console shall be protected against fungus in environments encountered in the United States.

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3.3.4 Humidity: The Test Console shall be protected against humidity of 100%.

3.3.5 Pressure: The Test Console shall be subjected to pressures varying between 3.44 inches Hg and 30.5 inches Hg during transportation. The shipping case shall be provided with a two-way automatic pressure relief valve, or a valve manually operated and adequately marked with instructions for shipment per MIL-STD-130. Desiccants as approved by FCIC shall be provided to protect against humidity per Para. 3.3.4 during exposure when valve is open.

3.3.6 Other Environments: The Test Console shall be protected against rain, snow, sleet, fog, wind, and sand and dust normally encountered during shipment.

#### 4. FINISHES

All aluminum shall be protected by alodizing prior to painting. The shipping case shall be painted with Aircraft Gray Color No. 16473 of Federal Standard 595 or to USAF Color 512 of ANA Bulletin 166.

#### 5. MARKING AND IDENTIFICATION

All four (4) sides and top shall have the markings "FRAGILE - DELICATE INSTRUMENT" and "THIS SIDE UP". The sides shall have arrows indicating the UP direction. The markings shall be in orange-yellow Color No. 506 of ANA Bulletin 166 or Color 13538 of Federal Standard 595.

#### 6. PACKAGING AND SHIPPING

The shipping case shall be properly packaged for shipment by common carrier and shall be shipped to 5 Aerial Way, Syosset, New York.

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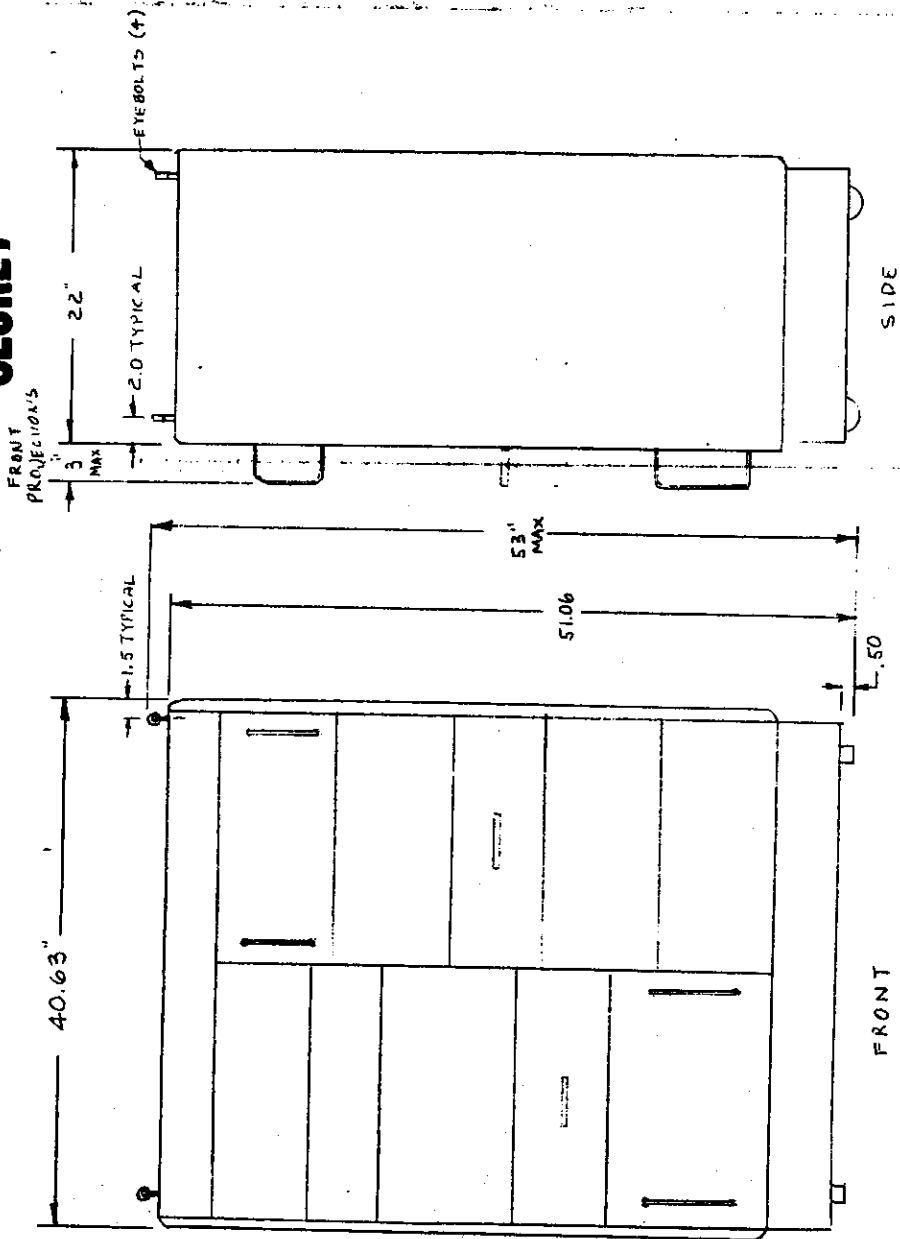


FIG. 1  
CONSOLE OUTLINE DIMENSIONS  
9156 T 60

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DEFENSE PRODUCTS DIVISION  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

AMENDMENT NO. 1

Specification No. SMI-DY-3

Shipping Case  
For  
Test Console

29 September 1958

Prepared by:



Sr. Project Engineer

Approved by:



Program Director

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AMENDMENT

Dated: 29 September 1958

No. 1

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

SCC-MK-3

Dated: 28 August 1958

The following paragraphs of Specification SCC-MK-3, dated 28 August 1958 shall be changed to read as follows:

Paragraph 3.1 Add the following sentence: Consideration shall be given to provide empty stacking capability, by the selection of suitable corner shapes on the top and bottom of the case.

Paragraph 3.3.4 Change to read as follows:

3.3.4 Humidity:

3.3.4.1 The Test Console, while stored in the Transit Case, shall be protected against humidity of up to 100%. A 16 unit Lantuck Bag, Protec-Sorb, 121 Silica Gel, Davidson Chemical Co., Code No. 36-10-3X-1951 or equivalent, meeting the requirements of specification MIL-D-3464A, Class 2 shall be installed in a suitable place in the Transit Case.

3.3.4.2 A humidity indicator shall be installed on one of the sides of the front of the Transit Case, and vented to the interior of the case. The humidity indicator shall be Type No. 6942, Culligan Co., or the equivalent thereof, meeting the requirements of specification MIL-I-26860. Markings shall be provided containing instructions to interpret the humidity indicator.

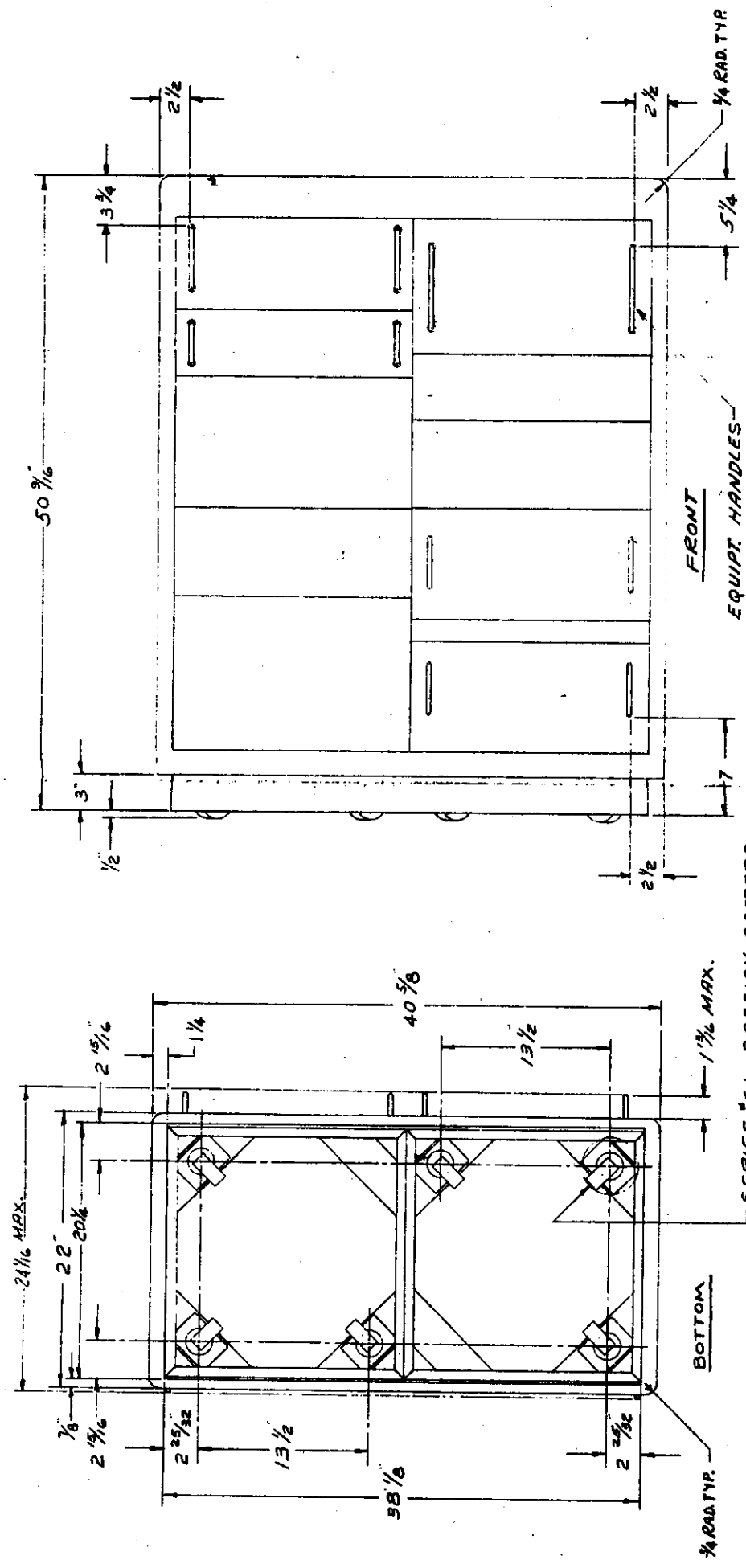
Paragraph 3.3.5 Delete the last sentence.

Replace Figure 1 (one page) with attached Figure 1 (two pages)

Reason: Design Requirements.

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 CONSOLE SH. 1 OF 2

FIG. # 1

SERIES '61 BASSICK CASTERS  
 SWIVEL RAD.  $2 \frac{1}{8}$   
 $2 \frac{1}{2}$  DIA WHEEL

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DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

Acceptance Test Specification

SME-EB-3

3 September 1958

High Acuity Panoramic Camera

Part No. 956A1

Prepared by:

  
Project Engineer

Approved by

  
Program Chief

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1. SCOPE

1.1 It is the purpose of this specification to outline and describe the acceptance tests which must be performed on the subject equipment in order to assure the proper functioning of this equipment.

2. APPLICABLE DOCUMENTS AND DRAWINGS

2.1 The following documents and drawings form a part of this specification.

FCIC Specification No. SMC-DB-1  
FCIC Drawing No. 956-A1 Final Assembly  
FCIC Drawing No. 956-SD10 Electrical Schematic - Camera  
FCIC Drawing No. 956-WD2 Wiring Diagram - Camera

3. Acceptance Tests: These tests are divided into two groups, namely, Mechanism Tests and Photographic Tests.

3.1 Mechanism Tests: The following tests will be made on each camera in order to check mechanical and electrical operation.

3.1.1 Film Transport: Load camera with dummy film and operate over the limits of the camera cycling rate. Start and stop camera several times. Look for erratic operation and formation of slack in film. No slack or loops should appear. Observe film transport indicator output pulse. This pulse will have a magnitude of  $28 \pm 5\%$  D.C. volts and a repetition rate of  $6.5 \pm 5\%$  pps at maximum film speed (20 inches per second) and  $2.8 \pm 5\%$  pps at minimum film speed (6 inches per second). The pulse duration varies from 50 to 120 milliseconds  $\pm 20\%$  over the speed range.

3.1.2 Nadir Indication: Observe the "Nadir" pulse transmitted from the camera. This pulse will occur once every camera cycle and will be  $5.0 \pm 5\%$  volts in magnitude. The pulse duration will remain within the limits of 100 milliseconds to 300 milliseconds as the camera cycling rate varies from maximum to minimum.

3.1.3 Time Indicator Light Source: Observe the pulse which actuates the time indicator light source. This pulse will have a magnitude of  $4.0 \pm 3\%$  volts and a duration of  $20 \pm 10\%$  milliseconds. Since this pulse is controlled by "nadir" it will occur once every camera cycle. In order to check the interlock between the light source and the "digitote" indicator measure the time between a vehicle clock pulse and the light pulse. The light pulse will lag the clock pulse by  $70 \pm 10\%$  milliseconds.

3.1.4 "Digitote": In order to check the operation of the "Digitote" unit and the accuracy of the vehicle clock, measure the time required for the 0.1 second telemetering potentiometer of the "Digitote" to make one complete revolution. This time will be  $1.00000 \pm .001\%$ .

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3.1.5 Horizon Camera Fiducial Lamps: Observe the pulse which actuates the fiducial lamp. This pulse will have a magnitude of  $5.0 \pm 3\%$  volts and a duration of  $40 \pm 10\%$  milliseconds. Since this pulse is triggered by the "Nadir" switch and an interlocking switch which operates at  $1/2$  the camera cycling rate it will occur every other camera cycle.

3.1.6 Frequency Recording Lamp: Observe the pulse which actuates the recording lamp. This pulse will be  $4 \pm 3\%$  volts in magnitude and  $1 \pm 10\%$  milliseconds in duration. The frequency of the pulse will be 160 cps  $\pm 0.001\%$ . This pulse occurs only in the forward scan portion of the camera cycle.

3.1.7 Temperature Indicators: Check the operation of the temperature indicators at room temperature. The accuracy of the indicators will be  $\pm$  degrees.

3.1.8 Cycling Rate: Operate the camera at various V/H Command Voltages and determine the cycling rates. These rates will be as follows:

<u>V/H Command</u> <u>DC Volts</u>	<u>Cycling Rate</u> <u>Cycles/Sec</u>
	$0.263 \pm 3\%$
	$0.438 \pm 3\%$
	$0.613 \pm 3\%$

3.1.9 Operational Test - Camera and Cassette: Operate camera and cassette as a system and observe film handling performance. The camera system will be up to speed in 6 to 10 seconds.

### 3.2 Photographic Tests:

3.2.1 Actual Photography: Locate Camera on roof of building, or suitable tower and take actual photographs over the range of camera cycling rates. Develop film and examine to determine the following items:

3.2.1.1 Lens Drive Smoothness: Examine each photograph for visual banding. The lens drive will be considered smooth if no appreciable banding can be detected with the unaided eye.

3.2.1.2 Film Scratch and Pressure Marks: Examine photographs for excessive marking.

3.2.1.3 Time Recording: A picture of the "Digitote" face will appear between the main picture formats. It will be possible to read the elapsed time with the unaided eye.

3.2.1.4 Horizon Recording: Photographs from the Port and Starboard Cameras will appear between the main picture formats. These pictures will be of good quality. Each side of the format will be bisected by a fiducial mark. These marks will be well defined and visible to the unaided eye.

3.2.1.5 Nadir: Examine photographs for the appearance of a "Nadir" mark. This mark will indicate the center of the main picture format and will be located between the edge of the film and the format. This mark will be visible to the unaided eye.

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3.2.1.6 Frequency Recording: Examine film for laydown of timing marks. These marks will be visible to the unaided eye and will appear as a series of dots extending from one end of the format to the other.

3.2.1.7 Scan Rate: In order to determine scan rate measure the distance between timing marks. These marks will be equally spaced when camera is scanning at constant speed. The distance between marks for various scan rates follows:

<u>Scan Rate</u> <u>Degrees/Sec</u>	<u>Distance between Marks</u> <u>Inches</u>
108	0.2827 ± 1%
180	0.4711 ± 1%
252	0.6596 ± 1%

3.2.2 Tests Using Collimator: Mount camera in Collimator and determine the following:

3.2.2.1 Resolution: The degree of resolution should be determined for both static and operating conditions. Examination of the resolution charts on the film will indicate that the photography has not been degraded by more than 10% of the static lens-film resolution.

3.2.2.2 Horizon Camera Location: Determine the relationship of the port and starboard horizon camera optical axes with the camera nadir axis. The angle between the horizon camera optical axis and the nadir axis will be  $75^\circ \pm .1$  degrees.

#### 4. TEST PROCEDURES

The test procedures to be followed and the data sheets to be used when performing the test outlined in Paragraph No. 3 are given in Appendix A of this specification.

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DEFENSE PRODUCTS DIVISION  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

AMENDMENT NO. 2

Specification No. SME-DY-3

Shipping Case  
for  
Test Console

Part No. 956-T60

23 October 1958

Prepared by:

  
Sr. Project Engineer

Approved by:

  
Program Director

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AMENDMENT

Dated: 23 October 1958

No. 2

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

SME-DY-3

Dated: 28 August 1958

---

The following paragraphs of Specification No. SME-DY-3, dated 28 August 1958 shall be changed to read as follows:

Paragraph 3.1 - Change the last sentence to read: "Locking of cover shall be provided by four (4) key operated latches (Excelsior or equal), two (2) each to be located on the front and rear sides of the case; all latches to be painted per Paragraph 4."

Add the following sentence: "Consideration shall be given to provide empty stacking capability by selection of suitable corner configurations on the top and bottom of the case."

Paragraph 3.3.1 - Add to the first sentence: "on a flat concrete surface."

Paragraph 3.3.4 - Change to read as follows:

3.3.4 Humidity:

3.3.4.1 The Test Console, while stored in the Transit Case, shall be protected against humidity of up to 100%. A 16 unit Lantuck Bag, Protek-Sorb, 121 Silica Gel, Davidson Chemical Co., Code No. 36-10-3X-1951 or equivalent, meeting the requirements of Specification MIL-D-3464A, Class 2 shall be installed in a suitable place in the Transit Case.

3.3.4.2 A humidity indicator shall be installed on one of the sides or the front of the Transit Case, and vented to the interior of the case. The humidity indicator shall be Type No. 6942, Culligan Co., or the equivalent thereof, meeting the requirements of Specification MIL-I-26860. Markings shall be provided containing instructions to interpret the humidity indicator.

Paragraph 3.3.5 - Delete the last sentence.

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Reason:

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Approved by:

AMENDMENT

Dated: 23 October 1958

No. 2

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

SME-DY-3

Dated: 28 August 1958

---

Paragraph 5 - MARKING AND IDENTIFICATION - Replace entire paragraph with:  
"The four (4) ends and top shall have two (2) inch high markings, 'FRAGILE -  
DELICATE EQUIPMENT' and 'THIS END UP'. The ends shall have arrows indicating  
the 'up' direction. The markings shall be in gloss black, color 1770 of  
Federal Standard 595".

Replace Figure 1 (one page) with attached Figure 1 (two pages).

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Reason:

Design detail changes.

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ACCEPTANCE TEST SPECIFICATION

SME-EB-4

5 September 1958

Cassette, Take-Up, Part No. 956E2 for  
High Acuity Panoramic Camera Part No. 956A1

Prepared by:

  
Project Engineer

Approved by:

  
Program Chief

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1. SCOPE

1.1 It is the purpose of this specification to outline and describe the acceptance tests which must be performed on the subject equipment in order to assure the proper functioning of this equipment.

2. APPLICABLE DOCUMENTS

2.1 The following documents and drawings form a part of this specification:

- FCIC Specification No. SME-DC-3
- FCIC Drawing 956E2 Assembly
- FCUC Drawing 956SD2 Electrical Schematic

3. Acceptance Tests:

3.1 Film Handling: Connect the cassette with a simulated camera loaded with dummy film. The simulated camera must be capable of feeding film to the cassette at a rate of 20 inches per second and accelerating from standstill to maximum speed in 5.0  $\pm 10\%$  seconds. Start cassette and simulated camera. Operate until the cassette has taken up a complete roll of film. Start and stop system at least twenty times during this period. The film handing capabilities of the cassette are satisfactory if the complete roll of film is taken up without formation of loops, excessive slack, or breakage.

3.2 Power Consumption: Measure the operating 28 volt DC power at the maximum film take up rate. This power shall not exceed 35 watts average.

3.3 Film Indication - Quantity: Measure the DC voltage output from the transducer which indicates the amount of film on the takeup spool. This voltage will vary from 0 to approximately 4.5 volts. Zero voltage represents an empty film spool and 4.5 volts represents approximately 7000 feet of film. In order to check correct operation of the device, measure the output voltage for various radii of film on the spool. Typical values are as follows:

<u>Radius of Film on Spool</u> <u>Inches</u>	<u>Transducer Output</u> <u>DC Volts</u>
4.0	1.04 $\pm$ .06
6.0	2.10 $\pm$ .06
7.5	2.92 $\pm$ .06
9.5	4.04 $\pm$ .06

The actual error in feet of film will vary from approximately 40 feet at the start of take up to approximately 140 at the end of take up.

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3.4 Anti-Back-up Device: The anti-back-up device will be engaged with the film spool in such a manner as to prevent the take-up spool from unwinding during normal operation of the camera and cassette. Check by attempting to unwind spool by hand. Apply 28.0  $\pm 0.5\%$  DC volts to the operating coil of the Anti-back-up device. Spool will be free to rotate in both directions.

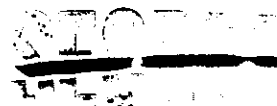
#### 4. TEST PROCEDURES

The test procedures to be followed and the data sheets to be used when performing the tests outlined in paragraph No. 3 are given in appendix "A" of this specification.

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DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York



Amendment No. 1

Acceptance Test Specification  
No. SNE-EB-3

25 October 1958

High Acuity Panoramic Camera  
Part No. 95641

Prepared by:



Project Engineer

Approved by:



Program Director

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AMENDMENT

Dated 25 October 1958

No. 1

This Amendment forms part of and should be attached to (FCIC) Systems  
Management and Engineering Department Specification No. SME-EB-3

Dated 3 September 1958

The following paragraphs of Specification No. SME-EB-3 dated  
3 September 1958 should be changed to read as follows:

Paragraph 3.1.1 Film Transport: Load camera with dummy film and operate over the limits of the camera cycling rate. Start and stop camera several times. Look for erratic operation and formation of slack in film. No slack or loops should appear. Observe film transport indicator pulse being transmitted to telemetering system. This pulse will have a magnitude of  $4.0 \pm 5\%$  D.C. volts and a repetition rate of  $6.37 \pm 5\%$  pps at maximum film speed (20 in/sec.). The pulse duration at this speed will be approximately 100 milliseconds.

Paragraph 3.1.2 Center of Format: Observe the "Center of Format" pulse being transmitted to the telemetering system. This pulse will occur once every camera cycle and will be  $4.0 \pm 5\%$  D.C. volts in magnitude. The pulse duration will not be less than 100 milliseconds at the maximum camera cycling rate.

Paragraph 3.1.3 Time Indicator Light Source: Place the emulsion speed switch in the "ASA 10" position and observe the pulse which appears across the time indicator lamps. This pulse will have a peak amplitude of approximately 8.0 volts and will occur once every camera cycle. Check the synchronization of the lamp pulse and the movement of the digitote dials. The lamp pulse will occur when the digitote dials are noticeable.

Paragraph 3.1.4 Digitote: In order to check the operation of the "Digitote" unit measure the time required for the one (1) second telemetering transducer of the "Digitote" to make one complete

Reason:

**SECRET**

Approved by: 

Dated 25 October 1958

revolution. The time will be  $10.0 \pm 1.0\%$  seconds. The output of this transducer will be a step function consisting of 10 equally spaced steps per revolution. The maximum voltage output of the transducer will be  $4.0 \pm 5\%$  D.C. volts. Check for the presence of a telemetering signal from each dial of the "Digitote."

## Paragraph 3.1.5

Horizon Camera Fiducial Lamps: In order to obtain an indication of the operation of the fiducial lamps for each horizon camera observe the voltage which appears at fiducial lamp test point for each camera. A voltage will appear at these test points every other camera cycle. When the "center of format" switch closes the voltage will rise from zero to approximately 28 volts instantaneously and remain at this value until the "center of format" switch opens. The voltage then returns to approximately zero over a long period of time. If the return to zero voltage is instantaneous all lamp circuits are open.

## Paragraph 3.1.6

Frequency Recording Lamp: Place the emulsion speed switch on the "ASA 10" position and observe the pulse which actuates the recording lamp. This pulse will be approximately 4.5 volts in magnitude and  $1 \pm 10\%$  milliseconds in duration. The frequency of the pulse will be  $160 \pm 0.05\%$ . This pulse occurs only in the forward scan portion of the camera cycle.

## Paragraph 3.1.7

Temperature Indicators: Check the output of each temperature indicator to the telemetering system. Make these tests at room temperature and compare with the calibration data supplied with indicators.

## Paragraph 3.1.8

Cycling Rate: Operate the camera at various V/H command voltages and determine the cycling rates. These rates will be as follows:

<u>V/H Command</u> <u>DC Volts</u>	<u>Cycling Rate</u> <u>Cycles/Sec.</u>
5.250	$0.269 \pm 1\%$
8.250	$0.421 \pm 1\%$
12.000	$0.613 \pm 1\%$

## Paragraph 3.2.1.5

Center of Format: Examine photographs for the appearance of a "center of format" mark. This mark will indicate the center of the main picture format and will be located between the edge of the film and the format. This mark will be visible to the unaided eye.

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Dated 25 October 1958

Paragraph 3.2.1.7 Scan Rate: In order to determine scan rate measure the distance between timing marks. These marks will be equally spaced when the camera is scanning at constant speed. The distance between marks for various scan rates follows:

<u>Scan Rate</u> <u>Degrees/Sec.</u>	<u>Distance between Marks</u> <u>Inches</u>
110.25	0.2876 ± 2%
173.25	0.4535 ± 2%
252.00	0.6596 ± 2%

Paragraph 3.2.2.2 Horizon Camera Location: Determine the relationship of the port and starboard horizon camera optical axes with the camera "center of format" axis. The angle between each horizon camera optical axis and the "center of format" axis will be 75 ± 0.1 degrees.

Add the following paragraphs to Specification No. SME-EB-3 dated 3 September 1958:

Paragraph 3.1.10 Light Sensor: Check the output of the light sensor to the telemetering system. Compare with calibration data supplied with the sensor.

Paragraph 3.1.11 V/H Transducer: Determine the proper operation of the V/H transducer by checking the operation of the stepping switch and the generation of V/H and telemetering signals for each switch position. The signals generated by the transducer will be as follows:

<u>Switch Position</u>	<u>Telemetering Signals DC Volts*</u>				<u>V/H Signal</u> <u>D. C. Volts</u>
	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	
1	1	1	1	4	0
2	1	1	4	4	3.00 ± 3%
3	1	1	4	1	3.75 ± 3%
4	1	4	4	1	4.50 ± 3%
5	1	4	4	4	5.25 ± 3%
6	1	4	1	4	6.00 ± 3%
7	1	4	1	1	6.75 ± 3%
8	4	4	1	1	7.50 ± 3%
9	4	4	1	4	8.25 ± 3%
10	4	4	4	4	9.00 ± 3%
11	4	4	4	1	12.00 ± 3%

\* NOTE: Voltage Tolerance ± 5%.

Paragraph 4. Delete in entirety.

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DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

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Amendment No. 1

Acceptance Test Specification  
No. SME-EB-4

23 October 1958

Cassette, Take-up  
Part No. 956E2  
for

High Acuity Panoramic Camera  
Part No. 956A1

Prepared by

  
Project Engineer

Approved by

  
Program Director

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AMENDMENT

Dated 23 October 1958

No. 1

This Amendment forms part of and should be attached to (FCIC) Systems Management and Engineering Department Specification No. SME-EB-4

Dated 23 October 1958

The following paragraphs of Specification No. SME-EB-4 dated 23 October 1958, shall be changed as follows:

Paragraph 3.3 In third sentence delete; "approximately 7,000 feet of film" and insert "a full film spool."

Delete -

Radius of Film on Spool Inches	Transducer Output D.C. Volts
4.0	1.04 ± .06
6.0	2.10 ± .06
7.5	2.92 ± .06
9.5	4.04 ± .06

Insert -

Radius of Film on Spool Inches	Transducer Output D.C. Volts
2.0	0.00 ± 0.01
4.0	1.08 ± 0.05
6.0	2.17 ± 0.10
8.0	3.31 ± 0.20
10.0	4.50 ± 0.30

Delete last sentence: "The actual error in feet of film will vary from approximately 40 feet at the start of take-up to approximately 140 at the end of take-up."

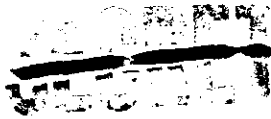
Add paragraph 3.5 Resistance Thermometers - Resistance of each resistance thermometers shall be 2400 ohms ± 10%.

Reason:

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Approved by: \_\_\_\_\_

Dated 23 October 1958



Revised Appendix A as follows:

Paragraph 1.2 Delete in its entirety.

Paragraph 2.1(f) Revise to read as follows:

"Measure and record the resistance of each temperature sensor."

Paragraph 2.2(b) Revise to read as follows:

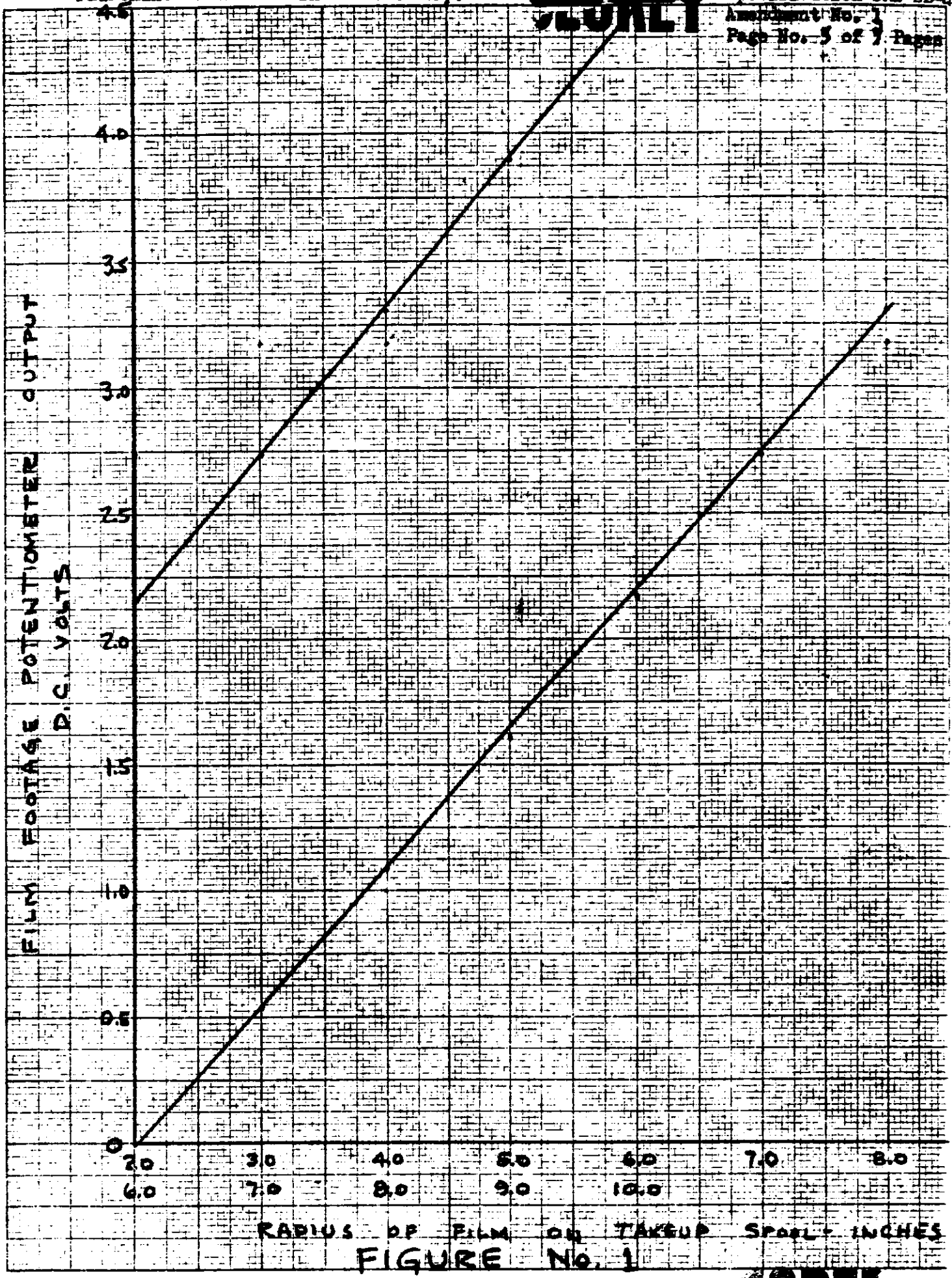
"Measure the output of the film footage potentiometer at the various film radii indicated on Page 7 of this specification."

Pages 5, 6 and 7 are completely revised.

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KOE  
10 X 10 TO THE 1/2 INCH  
KEUFEL & BERBER CO.  
MADE IN U.S.A.



RADIUS OF FILM ON TAKEUP SPool - INCHES  
FIGURE No. 1

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TEST SPECIFICATION

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Amendment No. 1

ACCEPTANCE TEST DATA SHEET

Cassette, Take-up, Part No. 956E2

Cassette Serial No.

Motor Serial No.

	<u>Requirements and Limits</u>	<u>Check-off</u>	<u>Data</u>
1. Operation of Anti-back-up device	Releases spool on application of +28VDC and locks spool on removal of 28VDC.		X
2. Temperature Sensors	Resistance - 2400 ohms $\pm$ 10% Motor Roller Center		
3. Film Footage Potentiometer Operation Check	Output zero volts for empty spool. Voltage increases in positive direction as spool drive arm is raised.		X
4. Film Handling	Cassette must complete test run without formation of loops, excessive slack or breakage.		X
5. Power	Running power shall not exceed 35 watts.  Running      Amperes Volts D.C. Watts  Stall            Amperes Volts D.C. Watts		

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by Supervisor			
Date:	Witness			
	Witness			
	Witness			
	Witness			

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# TEST SPECIFICATION

Amendment No. 1

## ACCEPTANCE TEST DATA SHEET

Cassette, Take-up, Part No. 956E2

Cassette Serial No.  
Motor Serial No.

### 6. Film Footage Potentiometer Accuracy Test

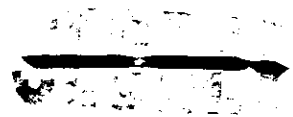
Observation Number	Measured Radius of Film on Spool Inches	Measured Output of Potentiometer D.C. Volts	Theoretical Output of Potentiometer D.C. Volts	Tol. L.C. Volts	Error
1	2.0			+0.01	
2	4.			±0.05	
3	6.			±0.10	
4	8.			±0.20	
5	10.		4.5	±0.30	

REMARKS

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by Supervisor Witness Witness Witness Witness			
Date:				

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Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York



Appendix A

To

ACCEPTANCE TEST SPECIFICATION

ESB-EB-4

5 September 1958

Cassette, Take-Up, Part No. 956E2 for  
High Acuity Panoramic Camera Part No. 956A1

Prepared by:



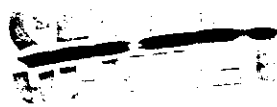
Project Engineer

Approved by:



Program Chief

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1. Test Equipment: The following equipment is required for performing acceptance tests:

1.1 D. C. Power Supply - +28 volts at 3 amperes. Voltage regulation  $\pm 0.5\%$ .

1.2 Command and Control Fixture FCIC Drawing No. 956T29 or equal.

1.3 Metered Film Supply Fixture FCIC Drawing No. 956T12 or equal.

1.4 D. C. Wattmeter - Accuracy 1%, Scale - suitable for measuring 35 watts.

1.5 D. C. Voltmeter - High impedance type accuracy 0.5%, range to cover 0 to 30 volts.

2. Test Procedures: Mount Cassette on metered film supply fixture (FCIC Drawing No. 956T12) and make the necessary connections to the power supply and test equipment. Load supply fixture with a full spool of film and proceed as follows:

2.1 Energize 28 volt stand-by power to cassette.

(a) Cassette spool should be free to move in the film wind direction only.

(b) Close anti-back-up switch on control panel - Cassette spool should be free to rotate in both directions.

(c) Open anti-back-up switch on control panel - Cassette spool should be free to move in film wind direction only.

(d) Output of film footage potentiometer should read zero volts.

(e) Lift film spool drive arm - output of film footage potentiometer should increase in a positive direction.

(f) Measure and record the D. C. output voltage of each temperature sensor.

2.2 Turn on 28 volt operate power to Cassette and start up film metering fixture. Cassette should now take up film at a rate of 20 inches per second.

(a) Monitor the output of the film footage potentiometer with a high impedance D. C. Voltmeter. Shut down and start up the Cassette every time the output of the film footage potentiometer increases approximately  $1/4$  of a volt until the Cassette has taken up a full spool of film (Make at least 20 stops) Observe film handling during this run.

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(b) Measure the radius of the film on the Cassette spool at approximately the following output voltages of the film footage potentiometer:  $1/2$ ,  $1-1/2$ ,  $2-1/2$ ,  $3-1/2$ , and 4 volts. Make an accurate measurement of the output voltage with the high impedance voltmeter for each radius measured. Use the curve given in Figure 1 to determine the correct voltage for each radius measured. The measured voltage should agree with value obtained from the curve to within  $\pm 0.06$  volts.

3. Record all data on Pages 6 and 7 of this Specification.

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Environmental Test Specification

SME-EB-5

9 September 1958

High Acuity Panoramic Camera, Part No. 956A1  
Cassette, Take-Up, Part No. 956E2

Prepared by:



Project Engineer

Approved by:



Program Chief

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## 1. SCOPE

1.1 It is the purpose of this specification to outline and describe the environmental tests which must be made on the High Acuity Panoramic Camera, Part No. 956A1, and the Cassette, Take-Up, Part No. 956E2. These tests will be made on the first non-deliverable flight units for the purpose of qualifying the deliverable equipments.

## 2. APPLICABLE SPECIFICATIONS AND OTHER PUBLICATIONS

2.1 The following documents form a part of this specification to the extent specified herein.

### A. Specifications

FCIC No. SME-DB-1	High Acuity Panoramic Camera
FCIC No. SME-DC-3	Cassette, Take-Up
FCIE No. SME-EB-3	Acceptance Tests - High Acuity Panoramic Camera
FCIC No. SME-EB-4	Acceptance Tests - Cassette, Take-Up
MIL-C-9435	Chamber, Explosion Proof Testing

3. Requirements: The equipment shall be capable of tolerating the following environments.

### 3.1 Non-Operating Conditions

#### 3.1.1 Temperature, Humidity and Atmospheric Pressure

##### 3.1.1.1 Temperature

- (a) Lower Limit - Plus 200°F for periods of at least one hour duration.
- (b) Upper Limit - Plus 160°F for periods of two hours.

3.1.1.2 Humidity - Relative humidities up to 100 percent, including condensation during temperature change.

##### 3.1.1.3 Atmospheric Pressure

- (a) Upper Limit - 30.5 inches of mercury
- (b) Lower Limit - 5 x 10<sup>-5</sup> inches of mercury

3.1.2 Vibration - Equipment shall be capable of withstanding along each of the three major mutually perpendicular axes sinusoidal vibration as follows:

- (a) 5 - 24.5 cps @ 1/8 inch zero to peak
- (b) 25 - 2000 cps @ 10g

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**3.1.3 Acceleration** - Equipment shall be capable of withstanding accelerations as follows:

- (a) Longitudinal Axis - 12 g's for 5 minutes
- (b) 2 Lateral Axes at Right Angles - 3 g's for 5 minutes

**3.1.4 Shock** - Equipment shall be capable of withstanding the following shock conditions:

- (a) When the equipment is not packaged for shipment it shall be capable of withstanding a shock of 20 g's at least three times along each of three mutually perpendicular axes.
- (b) When the equipment is packaged for shipment it shall be capable of withstanding drops to a flat concrete surface in both directions along each of the three major perpendicular axes. Height of drop shall be 18 inches.

**3.1.5 Additional Non-Operating Tests which apply to Cassette**

- (a) Acceleration - Roll Axis of Vehicle - 25 g's for 3 minutes.  
The cassette need not be operable after this test.
- (b) Shock - Roll Axis of Vehicle - Three 75 g shocks.  
The cassette need not be operable after this test.

**3.2 Operating Conditions**

**3.2.1 Temperature, Humidity and Atmospheric Pressure**

3.2.1.1 Temperature - Plus 70° ± 10° F

3.2.1.2 Humidity - Zero to 70 percent

3.2.1.3 Atmospheric Pressure - 30.5 to 5 x 10<sup>-5</sup> inches of mercury

3.2.2 Vibration - None

3.2.3 Acceleration - None

3.2.4 Shock - None

3.2.5 Explosion - Equipment shall operate in an ambient explosive atmosphere without causing ignition of such atmosphere.

**4. TESTING**

**4.1 Test Conditions**

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4.1.1 Atmospheric Conditions - Unless otherwise specified, herein, all tests required by this specification shall be performed at an atmospheric pressure of between 28 and 32 inches of mercury, a temperature of between plus 60°F and plus 95°F, and a relative humidity of not more than 90 percent.

4.1.2 Tolerances - The maximum allowable tolerances on test conditions during environmental testing shall be as follows:

- (a) Temperature - plus or minus 5°F
- (b) Barometric Pressure - plus or minus 5 percent
- (c) Relative Humidity - plus or minus 5 percent
- (d) Vibration Amplitude - plus or minus 10 percent
- (e) Vibration Frequency - plus or minus 2 percent
- (f) Shock - plus or minus 10 percent
- (g) Acceleration - plus or minus 10 percent

4.1.3 Measurements - All measurements shall be made with instruments of laboratory precision type, whose accuracy has been certified.

4.1.4 Temperature Stabilization - Temperature stabilization has been reached when the temperature of the largest centrally located internal mass of the equipment does not vary more than 5°F from the temperature ambient to the equipment.

## 4.2 Test Procedures

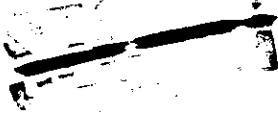
### 4.2.1 Temperature-Altitude-Humidity Tests

4.2.1.1 Rate of Change of Temperature - During change of chamber temperature, the temperature rate of change shall be 0.75 to 1.25°F per minute.

4.2.1.2 Tests - The following test sequence shall be conducted:

- (a) Prior to placing Camera and Cassette in test chamber performance record tests must be performed in accordance with paragraph No. 3 of FCIC Specification No. SME-EB-3 and paragraph No. 3 of FCIC Specification No. SME-EB-4. These tests must be performed in the atmospheric conditions outlined in paragraph 4.1.1 of this specification with the following exceptions:
  - (1) Temperature Range - plus 60°F to plus 80°F.
  - (2) Relative humidity of not more than 70 percent.
- (b) Place the equipment in the test chamber at the conditions specified in paragraph 4.1.1 (load camera with a full spool of film). The chamber temperature and relative humidity shall be stabilized and maintained at plus 160°F and greater than 95 percent, respectively, for a period of three hours.

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- 
- (c) Reduce the chamber temperature to plus 20°F and maintain at this temperature and a relative humidity of greater than 95 percent for one hour.
  - (d) Return chamber to conditions specified in paragraph 4.1.1.
  - (e) Repeat the above temperature humidity cycle two (2) times.
  - (f) After the three (3) temperature humidity cycles have been completed stabilize the chamber at 70°F and operate the camera and cassette. Reduce the chamber internal pressure to one millimeter of mercury, within a period of 10 minutes, and maintain at one millimeter of mercury for a minimum of ten minutes. While the chamber pressure is at one millimeter of mercury, conduct tests on the camera and cassette in accordance with paragraphs 3.1.1, 3.1.2, 3.1.7, 3.1.8 of FCIC specification SME-EB-3. Compare with test results obtained in paragraph 4.2.1.2 (a) above. Test results must fall within the tolerances given in specification SME-EB-3.
  - (g) Return chamber to conditions specified in paragraph 4.1.1 and remove camera and cassette. Subject camera and cassette to complete acceptance tests as described in paragraph No. 3 of FCIC Specification No. SME-EB-3 and paragraph No. 3 of FCIC Specification No. SME-EB-4. Test results must fall within the tolerances given in these specifications.

#### 4.2.2 Vibration Tests

4.2.2.1 Test Conditions - The camera shall be tested with a spool of film attached. The cassette shall be tested without film on spool. Vibrations shall be applied through the mounting points of the equipment to major air frame structure. All tests must be performed in the atmospheric conditions outlined in paragraph 4.1.1 of this specification. Test shall be conducted with the equipment inoperative.

4.2.2.2 Sweep Tests and Determination of Resonant Frequencies - The vibrations given in paragraph 3.1.2 shall be applied along each of three major mutually perpendicular axis. At the specified vibration values a sinusoidal sweep shall be performed starting at the lower frequency limit and continuing at a constant octave sweep rate to the upper frequency limit in one-half hour. The resonant frequencies for each axis shall be determined by the following methods:

- (a) Increased accelerations measured on the equipment with constant input accelerations, measured at the equipment mounting points.
- (b) Excessive noise emitted from equipment.

At the conclusion of the sweep test on each axis the equipment under test shall be examined for mechanical failure.

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4.2.2.3 Resonant Frequency Tests - If resonant frequencies are found, the equipment shall be vibrated for a period of five (5) minutes at each resonant frequency and at the amplitude specified in paragraph 3.1.2. After resonant frequency tests on each axis, examine equipment under test for mechanical failures.

4.2.2.4 Performance Record - After the completion of all vibration tests subject the camera and cassette to the acceptance tests described in paragraph No. 3 of FCIC Specification No. SME-EB-3 and paragraph No. 3 of FCIC specification No. SME-EB-4. The test results must fall within the tolerances given in these specifications.

4.2.3 Acceleration Tests - The camera and cassette shall be subjected to the accelerations specified in paragraph 3.1.3. During tests the camera shall be equipped with a spool of film and the cassette shall be equipped with an empty film spool. The acceleration test on the longitudinal axis shall be in one direction only and the acceleration test on each lateral axis shall be made in both directions. Tests shall be conducted with equipment inoperative.

Note: The longitudinal axis shall be considered as the roll axis of the vehicle.

4.2.3.1 Performance Record - After the completion of all acceleration tests subject the camera and cassette to the tests given in paragraph 4.2.2.4.

#### 4.2.4 Shock Tests

4.2.4.1 Equipment Not Packaged for Shipment - The camera and cassette shall be subjected to the shock tests as specified in paragraph 3.1.4 (a). The shocks shall be applied through the normal mounting points of the camera and cassette to the vehicle primary structures. The shocks shall be applied to the camera and cassette successively along three mutually perpendicular axes. The reference axis shall be the roll axis of the vehicle. This cycle shall be repeated three times. These tests shall be conducted with the camera and cassette inoperative. After completion of these tests, examine camera and cassette for mechanical failure. If no failures occur, subject the camera and cassette to the tests specified in paragraph 4.2.2.4.

Note: During the shock tests the camera shall be equipped with a spool of film and the cassette shall be equipped with an empty film spool.

#### 4.2.4.2 Equipment Packaged for Shipment

- (a) Camera - Place camera less film spool in its shipping container. Drop container on a flat concrete surface in both directions along each of the three major perpendicular axis. Height of drop shall be 18 inches. Examine camera for mechanical failure. Subject camera to test specified in paragraph 4.2.2.4.

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- (b) Cassette - Place cassette less film in shipping container and subject to same drop tests as camera. Examine cassette for mechanical failure. Subject cassette to tests specified in paragraph 4.2.2.4.

4.2.5 Acceleration and Shock Tests, Cassette - The cassette shall be subjected to the following tests which are in addition to those outlined in paragraphs 4.2.3 and 4.2.4:

4.2.5.1 Acceleration - Load the cassette with film and subject to an acceleration of 25 g's for 3 minutes along the axis corresponding to the roll axis of the vehicle. At the end of this test the cassette need not be operable but the film shall be undamaged.

4.2.5.2 Shock - Load the cassette with film and subject to a series of three (3) shocks of 75 g's each along the axis corresponding to the roll axis of the vehicle. At the end of this test the cassette need not be operable but the film shall be undamaged.

4.2.6 Explosion Tests - The explosion test shall be conducted in an explosion chamber equal to the chamber specified in MIL-C-9435. Conduct the explosion test in the following manner:

- (a) Operate the camera and cassette in order to determine that it is functioning properly and to observe the location of any sparking which shall be considered a potential hazard.
- (b) Install the camera and cassette in the chamber in such a manner that normal electrical operation is possible.
- (c) The temperature within the chamber during the test procedure is not critical, but should be maintained between 68°F and 122°F.
- (d) A single test shall be conducted as follows:
  - (1) The chamber shall be sealed and the internal pressure reduced to approximately 10,000 feet above sea level, to compensate for leakage or increase in pressure when fuel vapor is introduced. The predetermined quantity of fuel shall be introduced into the chamber. The amount of fuel used shall depend upon the size of the chamber, test altitude, and atmospheric conditions existing at the time of the test. The explosive mixture shall be capable of producing an instantaneous explosion when ignited by the chamber spark plug. If necessary, an additional quantity of air shall be bled into the chamber until the desired test pressure is obtained. Fuel used shall conform to MIL-G-5572B grade 100/130 or commercial butane.

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- (2) Operate camera and cassette through 20 cycles at the maximum camera cycling rate.
- (3) If an explosion does not occur, as a result of the operation of the equipment under test, ignite the explosive mixture by the chamber spark plug.
- (e) If the equipment under test causes an explosion, it shall be considered as failing this test.

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3.1.2.2 Equipment Operation: The equipment shall be operated as described in Paragraph 4.2 before and after the tests.

3.1.2.3 Adjustments and Repairs: Adjustments and repairs may be made after each drop, prior to operation, provided the adjustments and repairs are limited to replacement of loose parts or parts not associated with major component attachment to Console frame. Loosening of a mount, securing hardware or parts, during a drop may be readjusted or tightened before the next drop. Any major component found to have broken loose during the drop test shall constitute failure of the Console.

3.1.2.4 Performance Record: Prior to conducting the drop tests, the equipment shall be operated under the procedure of Paragraph 4.2 and a record made of necessary data to determine compliance with the Acceptance Test Specification, SME-EH-2. These data shall provide base line data for checking performance of the equipment after the drop. Variation from performance shall be within limits agreed to between FCIC and the customer.

#### 4. TEST PROCEDURES

4.1 Examination: Prior to the test, the equipment shall be examined in accordance with Paragraph 4.1 of Acceptance Test Specification SME-EH-2 to assure the equipment meets the requirements of the specification.

4.2 Equipment Operation: Prior to conducting the test, the equipment shall be operated and calibrated in accordance with Paragraph 4.2 of Acceptance Test Specification SME-EH-2. The data collected from these measurements shall be entered in the data sheet and shall serve as base line data for comparison of equipment performance before and after the drops. Subsequent data falling within the limits defined in Paragraph 3.1.2.4 of this specification shall establish satisfactory compliance to the requirements of this specification. The equipment may or may not be operated and data compared after each drop, as agreed between FCIC and the customer.

4.3 Drop Tests: The Test Console, packaged in its shipping case shall be subjected to one drop to a flat concrete surface in both directions along each of the three major mutually perpendicular axes. Height of the drop shall be 12 inches. Total number of drops shall be 6. Bending and distortion shall be permitted and do not constitute failure. There shall be no failure of the attachment joints and the major component shall remain in place.

4.3.1 Handling Equipment: The equipment shall be lifted to the 22 inch height for the drop, using the eye bolts, for the drop to be made on the shipping case bottom. For all other drops, a sling shall be used to hoist the equipment to the required height above the drop surface.

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DEFENSE PRODUCTS DIVISION  
Systems Management and Engineering Department  
Fairchild Camera and Instrument Corporation  
5 Aerial Way, Syosset, New York

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Amendment No. 1

Environmental Test Specification  
No. SME-EB-5

25 October 1958

High Acuity Panoramic Camera  
Part No. 956A1  
and  
Cassette, Take-Up  
Part No. 956E2

Prepared by:

[Redacted Signature]  
Project Engineer

Approved by:

[Redacted Signature]  
Program Director

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AMENDMENT

Dated 25 October 1958

No. 1

This Amendment forms part of and should be attached to (FCIC) Systems Management and Engineering Department Specification No. SME-EB-5

Dated 9 September 1958

The following paragraphs of Specification No. SME-EB-5 dated 9 September 1958 shall be changed as follows:

Paragraph 3.1.2

Vibration: Equipment shall be capable of withstanding along each of three major mutually perpendicular axes sinusoidal vibration as follows:

- (a) 5 - 24.5 cps @ 1/8 inch zero to peak
- (b) 25 - 2000 cps @ 7.5 g.

Paragraph 3.1.4

Shocks: Delete part (b) of this paragraph.

Paragraph 4.2.1.2

Tests: Change part (f) to read as follows:

(f) After the three (3) temperature humidity cycles have been completed stabilize the camera and cassette at 70°F and operate. Reduce the chamber internal pressure to one millimeter of mercury, within a period of ten (10) minutes, and maintain at one millimeter of mercury for a minimum of ten minutes. While the chamber pressure is at one millimeter of mercury, conduct tests on the camera and cassette in accordance with paragraphs 3.1.1, 3.1.2, 3.1.7, and 3.1.8 of FCIC specification SME-EB-3 and paragraph 3.1 of FCIC specification SME-EB-4. Compare with test results obtained in paragraph 4.2.1.2 (a) above. Test results must fall within the tolerances given in specification Nos. SME-EB-3 and SME-EB-4.

Paragraph 4.2.2.3

Resonant Frequency Tests - If resonant frequencies are found, the equipment shall be vibrated for a period of five (5) minutes at the most severe resonance or the period may be divided among the resonant frequencies, whichever is considered most likely to produce failure. The vibration applied shall be in accordance with paragraph 3.1.2 of this specification. After resonant frequency tests on each axis examine equipment under test for

Reasons:

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Approved by: 

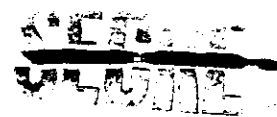
Dated 25 October 1958

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mechanical failures.

Paragraph 4.2.4.2 Equipment Packaged for Shipment - Delete this paragraph.

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ACCEPTANCE TEST SPECIFICATION

SME-EN-2A

FOR TEST CONSOLE, 956-T60  
AND SHIPPING CASE, 956-T64

12 September 1958

Prepared by:



Mr. Project Engineer

Approved by:



Program Chief

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## 1. SCOPE

1.1 This specification covers the tests and procedures to be used in performing the Acceptance Test of the Test Assembly, Console, FCIC Part Number 956-T60.

## 2. APPLICABLE SPECIFICATIONS, DOCUMENTS AND DRAWINGS

2.1 The following specifications, documents and drawings of the issue in effect on the date of this specification, form a part of this specification to the extent specified herein:

### Specifications and Documents:

SME-DN-24	Test and Check-out Console for High Acuity Panoramic Camera
SME-DY-3	Shipping Case for Test Console
	Engineering Instruction Manual, Test Console

### Drawings:

FCIC	956-T60
FCIC	956-T64

## 3. REQUIREMENTS

3.1 Inspection: Inspections will be performed, as described in detail in Section 4, assuring that the Test Console satisfies the design requirements as specified in Specification No. SME-DN-24.

3.2 Calibration: Calibration tests will be performed, as described in detail in Section 4, assuring that the Test Console will interpret and record accurate operations of the Camera-Cassette as specified in Specification No. SME-DN-24.

3.3 Functional: The Camera-Cassette and Console shall be tested together, as described in Section 4, to insure that the Console meets the performance requirements as specified in Specification No. SME-DN-24. There shall be no malfunction in the Camera-Cassette caused by connection to or operation of the Test Console.

## 4. PROCEDURE

4.1 Inspections: Inspections shall be performed, under FCIC Quality Control and customer selected witnesses, if desired. Data sheets, attached as Appendices to this specification, will be used to record the data collected.

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4.1.1 Mechanical Inspection: Perform the following mechanical inspections to the referenced drawings.

4.1.1.1 Determine that Test Console and Shipping Case do not exceed the outline dimensions shown. Inspect for correct markings on Shipping Case.

4.1.1.2 Inspect for workmanship including cleanliness, neatness, and general physical appearance.

4.1.1.3 Inspect for tightness of screws and securing devices; check that test cables mate properly with console connectors.

4.1.2 Electrical Inspection: Perform the following electrical inspections to the referenced drawings.

4.1.2.1 Inspect for positive and secure solder connections on components and cable assemblies.

4.1.2.2 Inspect for proper size and types of fuses, vacuum tubes and plug-in devices, such as relays, etc.

4.2. Calibration: Perform the following calibration tests of the various components of the Console described herein, using calibrated standard test equipment. Console to be turned on for 30 minutes prior to recording calibration measurements.

4.2.1 28 Volt Power Supply: Measure output voltage and record in data sheet; voltage to be 22 to 29.5 volts D.C.

4.2.2 400 CPS Power Supply: Measure output voltage and record in data sheet; voltage to be 114.85 to 116.15 (115V + 1%). Measure output frequency and record in data sheets; frequency to be 399 to 401 CPS (400 CPS,  $\pm$  0.25%).

4.2.3 2000 CPS Power Supply: Measure output voltage and record in data sheet; voltage to be 109.25 to 120.75 (115V + 5%). Measure output frequency and record in data sheet; frequency to be 1980 to 2020 CPS (2000 CPS,  $\pm$  1%).

4.2.4 Recorder and Amplifier: Check calibration of the recorder and amplifier (dual channel) as described herein.

4.2.4.1 Recorder Test:

4.2.4.1.1 Turn the SELECTOR switch to "standby".

4.2.4.1.2 Turn the CHART SPEED switch to "25". Twenty-five millimeters per second is fast enough to align chart paper and slow enough to conserve chart paper.

4.2.4.1.3 Turn the POWER switch "on".

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- 4.2.4.1.4 Turn the SELECTOR switch to "mm/sec". This is the operational switch which starts the oscillograph.
- 4.2.4.1.5 Test all eight standard speeds momentarily by means of the CHART SPEED switch.
- 4.2.4.1.6 Turn the SELECTOR switch to "standby". This stops the oscillograph.
- 4.2.4.2 Amplifier Test:
- 4.2.4.2.1 Balancing - To balance either channel of the amplifier, proceed as follows:
- 4.2.4.2.1.1 Center the pen on the chart by means of the mechanical pen centering adjustment on the penmotor.
- 4.2.4.2.1.2 Turn both VOLTS/CHART LINE switches to "off". Turn the amplifier POWER switch to "on" and allow 10 to 15 minutes for the amplifier to warm up.
- 4.2.4.2.1.3 Turn the oscillograph "on".
- 4.2.4.2.1.4 Set the INPUT switch in the "balanced" position.
- 4.2.4.2.1.5 Turn the CALIBRATION control full clockwise and bring the oscillograph pen approximately to chart center by means of the "B" (BALANCE) control.
- 4.2.4.2.1.6 Turn the CALIBRATION control full counterclockwise, then full clockwise, noting the direction of pen deflection as the CALIBRATION control is turned in a clockwise direction. If the pen is deflected to the right, turn the "A" (BALANCE) control in a clockwise direction until no pen deflection is noted as the CALIBRATION control is operated. If the pen is deflected to the left, turn the "A" (BALANCE) control in a counterclockwise direction until no deflection is noted as the CALIBRATION Control is operated.
- 4.2.4.2.1.7 Center the pen on the chart by means of the "B" (BALANCE) control.
- 4.2.4.2.2 Calibration - Calibrate the amplifier as follows:
- 4.2.4.2.2.1 Turn the VOLTS/CHART LINE switch "off" and set the INPUT switch in the "balanced" position. If the oscillograph pen is not on the center line of the chart, repeat the "balancing" procedure described above.

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4.2.4.2.2 Turn the VOLTS/CHART LINE switch to the "Calibrate" position and adjust the CALIBRATION control as necessary to obtain a pen deflection of 20 chart lines below center. (Pen deflection below center indicates positive signal.) Turn the VOLTS/CHART LINE switch to "off".

4.2.4.2.3 Check 20 line deflection by again turning the VOLTS/CHART LINE switch to the "calibrate" position. If necessary, readjust the CALIBRATION control to obtain a pen deflection of 20 chart lines.

#### 4.2.5 Control Panel:

4.2.5.1 Command Signal Supply: Measure the three V/E Command Voltages and record in the data sheet; voltage to be  $\pm 2\%$  of the nominal values.

4.2.5.2 Timer: Measure the elapsed time versus that indicated on the Timer during a scan cycle and record on the data sheet. Time to be accurate to  $\pm 1$  second.

4.3 Functional Tests: Functional tests described herein shall be performed to assure that the Test Console and Camera-Cassette operate compatibly together. The Test Console shall cause no operational malfunction of the Camera-Cassette. Refer to Instruction Manual for Operation of the Test Console in all tests described herein.

4.3.1 Constant Scan Velocity: Operate Camera-Cassette at nominal cycling rate. Read the Scan velocity variation over the scan portion of the sweep. Velocity to be within  $\pm 2\%$  of nominal over the scan portion. Prior to this test record transport indicator reading in space provided on data sheet for Film Transport Tests.

4.3.2 Film Transport and Cassette Operation: After the test of 4.3.1 above, observe the reading of the Transport Indicator Counter and compare this count to that before the Test of 4.3.1. This is a Go-No-Go test indicating proper film handling.

4.3.3 Camera Cycling Rate: Operate Camera-Cassette at the three speeds provided for by the Control Panel command simulator. Cycling rate to be within  $\pm 2\%$  of the nominal for the selected command input. The nadir pulse should be recorded on the data sheets.

4.3.4 Film Footage Indicator: Perform pre-operating test for this item per instruction in Console Operating Manual. This is a Go-No-Go Test.

4.3.5 Data Recording: The following data signals are tested for operation during a part of the pre-operating test. Time, Fiducial Lamps, Frequency Recording, Digitote Illumination, Horizon Camera #1, Horizon Camera #2, Temperature Sensors, and Light Leak Detector. Record the check-offs on the data sheet for these tests, which are Go-No-Go-type tests.



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4.4 Overall Acceptance: Successful completion of the tests described in Paragraph 4 above constitute an acceptance of the Console and Shipping Case.

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# TEST SPECIFICATION

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## ACCEPTANCE TEST DATA SHEET Console Shipping Case, 956-T64

### MECHANICAL INSPECTION.

	<u>Drawings</u> <u>956-T64</u>	<u>Actual</u> <u>(Record or check-off)</u>
1. <u>Dimensions</u>		
A. Length		
B. Depth		
C. Height		
2. <u>Markings</u>		
A. Sides		
(1)	"Fragile, Delicate Instrument"	
(2)	"This Side Up"	
(3)	Arrow "Up"	
B. Top		
(1)	"Fragile, Delicate Instrument"	
(2)	"This Side Up"	
3. <u>Workmanship</u>		
A. General	--	
B. Secure Devices	--	

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by			
	Supervisor			
Date:	Witness			
	Witness			
	Witness			
	Witness			

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# TEST SPECIFICATION

## ACCEPTANCE TEST DATA SHEET Test Console, 956-T60

### MECHANICAL INSPECTION.

1. Dimensions
  - A. Length
  - B. Depth
  - C. Height
  
2. Workmanship
  - A. General
  - B. Secure Devices

Drawings and limits 956-T60	Actual (Record or check-off)

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by			
	Supervisor			
Date:	Witness			
	Witness			
	Witness			
	Witness			

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TEST SPECIFICATION

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ACCEPTANCE TEST DATA SHEET  
TEST CONSOLE, 956-T60

ELECTRICAL INSPECTION.

1. Solder Connections

Drawings and Limits  
956-T60

Actual  
(Record or check-off)

2. Parts (Fuses, Tubes)

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by			
	Supervisor			
Date:	Witness			
	Witness			
	Witness			
	Witness			

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# TEST SPECIFICATION

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ACCEPTANCE TEST DATA SHEET  
Test Console, 956-T60

CALIBRATION.

	<u>Drawings and Limits</u>	<u>Actual</u> (Record or check-off)
1. <u>28V Power Supply</u>	956-4200	
A. Voltage	22-29VDC	
2. <u>400 CPS Power Supply</u>	956-4201	
A. Voltage $\pm 1\%$	114.85 to 116.15VAC	
B. Frequency $\pm 0.25\%$	399 - 401 CPS	
3. <u>2000 CPS Power Supply</u>	956-4202	
A. Voltage $\pm 5\%$	109.25 to 120.75VAC	
B. Frequency $\pm 1\%$	1980 to 2020 CPS	
4. <u>Oscillograph Recorder</u>	956-4203	
A. Paper Feed		
B. Writing		
5. <u>Recorder Amplifier</u>	956-4204	
A. Balancing		
B. Calibration		

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by			
	Supervisor			
Date:	Witness			
	Witness			
	Witness			
	Witness			

# TEST SPECIFICATION

## ACCEPTANCE TEST DATA SHEET Test Console, 956-T60

### CALIBRATION (Cont'd)

6. Control Panel

A. V/H 1  $\pm 2\%$

B. V/H 2  $\pm 2\%$

C. V/H 3  $\pm 2\%$

D. Timer Period  $\pm 1$  Sec.

<u>Drawings and Limits</u>	<u>Actual</u> (Record or check-off)
956-T62	

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by Supervisor  Witness Witness Witness Witness			
Date:				

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# TEST SPECIFICATION

## ACCEPTANCE TEST DATA SHEET Test Console, 956-T60

### FUNCTIONAL TESTS.

1. Scan Velocity

A. Nadir

B. Velocity Constancy  $\pm 2\%$

2. Film Transport and Cassette

A. Count Before Test

B. Count After Test

3. Cycling Rate

A. Command 1  $\pm 2\%$

B. Command 2  $\pm 2\%$

C. Command 3  $\pm 2\%$

4. Film Footage Indicator

<u>Drawings and Limits</u>	<u>Actual (Record or check-off)</u>
956-4203	
956-4203	
956-T62	
-	
Go-No-Go	
956-4203	
956-T62 Pre-Operating Go-No-Go	

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by Supervisor Witness Witness Witness Witness			
Date:				

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# TEST SPECIFICATION

## ACCEPTANCE TEST DATA SHEET Test Console, 956-T60

### FUNCTIONAL TESTS (Cont'd)

	<u>Drawings and Limits</u>	<u>Actual (Record or check-off)</u>
5. <u>Data Recording</u>		
A. Time	956-T62 Pre-Operating Go-No-Go	
B. Fiducial Lamps		
(1) Lamps	956-T62 Pre-Operating Go-No-Go	
(2) Pulse Source	956-4203	
C. Frequency Recording		
(1) Lamps	956-T62 Pre-Operating Go-No-Go	
(2) Pulse Source	956-4203	
D. Digitote Illumination		
(1) Lamps	956-T62 Pre-Operating Go-No-Go	
(2) Pulse Source	956-4203	

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by Supervisor Witness Witness Witness Witness			
Date:				

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Amendment No. 1

Acceptance Test Specification

SME-EH-2(A)

For Test Console, 956-T60  
And Shipping Case, 956-T64

24 October 1958

Prepared by:



Sr. Project Engineer

Approved by:



Program Director

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AMENDMENT

Dated: 24 October 1958

No. 1

This Amendment forms part of and should be attached to (FCIC)  
Systems Management and Engineering Department Specification No.

EME-KN-2(A)

Dated: 12 September 1958

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Change Specification No. EME-KN-2(A), dated 12 September 1958 to read as follows:

Table of Contents - Page 1,, Paragraph 4.2.3: Delete this line and Page Number reference

Paragraph 1.1 - Add the following: "and Shipping Case, FCIC Part No. 956-164".

Paragraphs 2.1, 3.1, 3.2, and 3.3 - Where reference is made to Specification No. EME-KN-24, change to EME-KN-24(A).

Paragraph 4.2.3 - Delete this paragraph in its entirety.

Paragraph 4.2.5.1 Delete this paragraph in its entirety.

Paragraph 4.3.3 - Delete this paragraph and substitute therefore: "With control panel operate switch "off" and console telemetering switch "on", operate the V/H "Step" switch to cause the V/H Computer in the camera to operate over the eleven (11) positions. Observe that the V/H Computer is sequencing according to the binary readout on the Control Panel. Operate the camera-cassette at three speeds selected by the Control Panel command simulator "Step" switch. Cycling rate to be within  $\pm 2\%$  of the nominal for the selected command input. The presence of the nadir pulse should be recorded on the data sheet."

Replace old data sheets, Numbered 6 of 13 through 13 of 13, dated 12 September 1958 with new data sheets numbered 6 of 14 through 14 of 14, dated 24 October 1958.

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Reason:

Design changes.

Approved by: 



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TEST SPECIFICATION

ACCEPTANCE TEST DATA SHEET  
Test Console, 956-T60

MECHANICAL INSPECTION.

1. Dimensions

- A. Length
- B. Depth
- C. Height

2. Workmanship

- A. General
- B. Secure Devices

Drawings and limits 956-T60	Actual (Record or check-off)

9. TEST DATA

Location: \_\_\_\_\_  
Date: \_\_\_\_\_

Conducted by  
Supervisor \_\_\_\_\_  
Witness \_\_\_\_\_  
Witness \_\_\_\_\_  
Witness \_\_\_\_\_  
Witness \_\_\_\_\_

NAME	REPRESENTING	SIGNATURE

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# TEST SPECIFICATION

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## ACCEPTANCE TEST DATA SHEET TEST CONSOLE, 956-T60

### ELECTRICAL INSPECTION.

1. Solder Connections

2. Parts (Fuses, Tubes)

Drawings and Limits <u>956-T60</u>	Actual (Record or check-off)

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by			
Date:	Supervisor			
	Witness			
	Witness			
	Witness			
	Witness			

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NO.  
PAGE  
DATE

# TEST SPECIFICATION

## ACCEPTANCE TEST DATA SHEET TEST CONSOLE, 100-100

### CALIBRATION.

1. 28V Power Supply
  - A. Voltage
2. 100 CPS Power Supply
  - A. Voltage  $\pm 1\%$
  - B. Frequency  $\pm 0.25\%$

**DELETED**

3. Oscillograph Recorder
  - A. Paper Feed
  - B. Writing
4. Recorder Amplifier
  - A. Balancing
  - B. Calibration

<u>Drawings and Limits</u>	<u>Actual</u> (Record or check-off)
956-4200 22-29VDC	
956-4201 114.85 to 116.15VAC	
399 - 401 CPS	
956-4203	
956-4204	

DATE

SIGNATURE

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TEST SPECIFICATION

ACCEPTANCE TEST DATA SHEET  
Test Console, 956-T60

CALIBRATION (Cont'd)

6. Control Panel

A. Timer Period  $\pm$  1 Sec.

<u>Drawings and Limits</u>	<u>Actual</u> <u>(Record or check-off)</u>
956-T62	

9. TEST DATA

Location: \_\_\_\_\_  
Date: \_\_\_\_\_  
Conducted by  
Supervisor \_\_\_\_\_  
Witness \_\_\_\_\_  
Witness \_\_\_\_\_  
Witness \_\_\_\_\_  
Witness \_\_\_\_\_

NAME

REPRESENTING

SIGNATURE

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TEST SPECIFICATION

ACCEPTANCE TEST DATA SHEET  
Test Console, 956-T60

FUNCTIONAL TESTS.

	<u>Drawings and Limits</u>	<u>Actual (Record or check-off)</u>
1. <u>Scan Velocity</u>		
A. Nadir	956-4203	
B. Velocity Constancy $\pm 2\%$	956-4203	
2. <u>Film Transport and Cassette</u>	956-T62	
A. Count Before Test	-	
B. Count After Test	Go-No-Go	
3. <u>Cycling Rate</u>	956-4203	
A. Command 1 $\pm 2\%$		
B. Command 2 $\pm 2\%$		
C. Command 3 $\pm 2\%$		
4. <u>Film Footage Indicator</u>	956-T62 Pre-Operating Go-No-Go	

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by			
Date:	Supervisor			
	Witness			
	Witness			
	Witness			
	Witness			



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**TEST SPECIFICATION**

ACCEPTANCE TEST DATA SHEET  
Test Console, 956-T60

FUNCTIONAL TESTS (Cont'd)

	<u>Drawings and Limits</u>	<u>Actual (Record or check-off)</u>
5. <u>Data Recording</u>		
A. Time	956-T62 Pre-Operating Go-No-Go	
B. Fiducial Lamps		
(1) Lamps	956-T62 Pre-Operating Go-No-Go	
(2) Pulse Source	956-4203	
C. Frequency Recording		
(1) Lamps	956-T62 Pre-Operating Go-No-Go	
(2) Pulse Source	956-4203	
D. Digitote Illumination		
(1) Lamps	956-T62 Pre-Operating Go-No-Go	
(2) Pulse Source	956-4203	

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by			
	Supervisor			
Date:	Witness			
	Witness			
	Witness			
	Witness			



~~SECRET~~

# TEST SPECIFICATION

## ACCEPTANCE TEST DATA SHEET Test Console, 956-T60

### FUNCTIONAL TESTS (Cont'd)

H. Light Leek Detector

Drawings and Limits	Actual Record or check-off
956-T62	
Pre-Operating Go-No-Go	

### FINAL ACCEPTANCE

(Sign off)

9. TEST DATA		NAME	REPRESENTING	SIGNATURE
Location:	Conducted by Supervisor			
Date:	Witness			
	Witness			
	Witness			
	Witness			



ENVIRONMENTAL TEST SPECIFICATION

SME-EN-3

TEST CONSOLE

PART NO. 956-T60

4 September 1958

Prepared by:

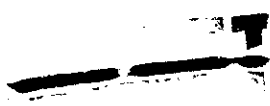


Br. Project Engineer

Approved by:



Program Chief



~~CONFIDENTIAL~~

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1. SCOPE

1.1 This specification covers the tests and procedures to be used in performing the Environmental Tests of the Test Assembly, Console, FCIC Part Number 956-T60.

2. APPLICABLE SPECIFICATIONS, DOCUMENTS, AND DRAWINGS

2.1 The following specifications, documents and drawings of the issue in effect on the date of this specification, form a part of this specification to the extent specified herein:

Specifications:

SME-DN-24	Test and Check-out Console for High Acuity Panoramic Camera
SME-DY-3	Shipping Case for Test Console
SME-EN-2	Acceptance Tests Specification, Test Console, 956-T60 and Shipping Case, 956-T64

Drawings:

FCIC	956-T60
FCIC	956-T64

3. REQUIREMENTS

3.1 Environmental Condition: The Test Console shall operate in a controlled temperature and humidity environment such as an air conditioned room or trailer. The Console and Case shall be subjected to a drop test to simulate the normal handling conditions encountered during shipment. Test procedures for the drop test are described herein.

3.1.1 Drop Test: When packaged for shipment, the Test Console, properly installed in its Shipping Case, shall be capable of withstanding drops to a flat concrete surface in both directions along each of the three major mutually perpendicular axes. Height of the drops shall be 12 inches.

3.1.2 Test Conditions: The drop tests shall be performed at the normal local atmospheric pressure, temperature and relative humidity conditions at the place of test.

3.1.2.1 Measurements: All measurements shall be made with calibrated laboratory instruments whose accuracy has been certified.

3.1.2.2 Equipment Operation: The equipment shall be operated as described in Paragraph 3.2 before and after the tests.

3.1.2.3 Adjustments and Repairs: Adjustments and repairs may be made after each drop, prior to operation, provided the adjustments and repairs are limited to replacement of loose parts or parts not associated with major component attachment to Console frame. Loosening of a mount, securing hardware or parts, during a drop may be readjusted or tightened before the next drop. Any major component found to have broken loose during the drop test shall constitute failure of the Console.

3.1.2.4 Performance Record: Prior to conducting the drop tests, the equipment shall be operated under the procedure of Paragraph 4.2 and a record made of necessary data to determine compliance with the Acceptance Test Specification, SSI-III-2. These data shall provide base line data for checking performance of the equipment after the drop. Variation from performance shall be within limits agreed to between FCIC and the customer.

4. TEST PROCEDURES

4.1 Examination: Prior to the test, the equipment shall be examined in accordance with Paragraph 4.1 of Acceptance Test Specification SSI-III-2 to assure the equipment meets the requirements of the specification.

4.2 Equipment Operation: Prior to conducting the test, the equipment shall be operated and calibrated in accordance with Paragraph 4.2 of Acceptance Test Specification SSI-III-2. The data collected from these measurements shall be entered in the data sheet and shall serve as base line data for comparison of equipment performance before and after the drops. Subsequent data falling within the limits defined in Paragraph 3.1.2.4 of this specification shall establish satisfactory compliance to the requirements of this specification. The equipment may or may not be operated and data compared after each drop, as agreed between FCIC and the customer.

4.3 Drop Tests: The Test Console, packaged in its shipping case shall be subjected to one drop to a flat concrete surface in both directions along each of the three major mutually perpendicular axes. Height of the drop shall be 12 inches. Total number of drops shall be 6. Bending and distortion shall be permitted and do not constitute failure. There shall be no failure of the attachment joints and the major component shall remain in place.

4.3.1 Handling Equipment: The equipment shall be lifted to the 22 inch height for the drop, using the eye bolts, for the drop to be made on the shipping case bottom. For all other drops, a sling shall be used to hoist the equipment to the required height above the drop surface.

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