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A&A Report No. 290

(CR-17 Collection Receiver

25X1

25X1

Project No. 2004-183

Date: 7 November 1960

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ABSTRACT

This report presents the results of the tests conducted on the CR-17 Collection Receiver.

The quality of the CR-17 is generally good. There are four areas, however, where the receiver does not meet the specifications. They are: (1) temperature range, (2) video output impedance, (3) RF input to produce saturation, and (4) operation of the signal actuated relay.

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1. INTRODUCTION

This report presents the results of tests conducted on the CR-17 Collection Receiver developed by [REDACTED]

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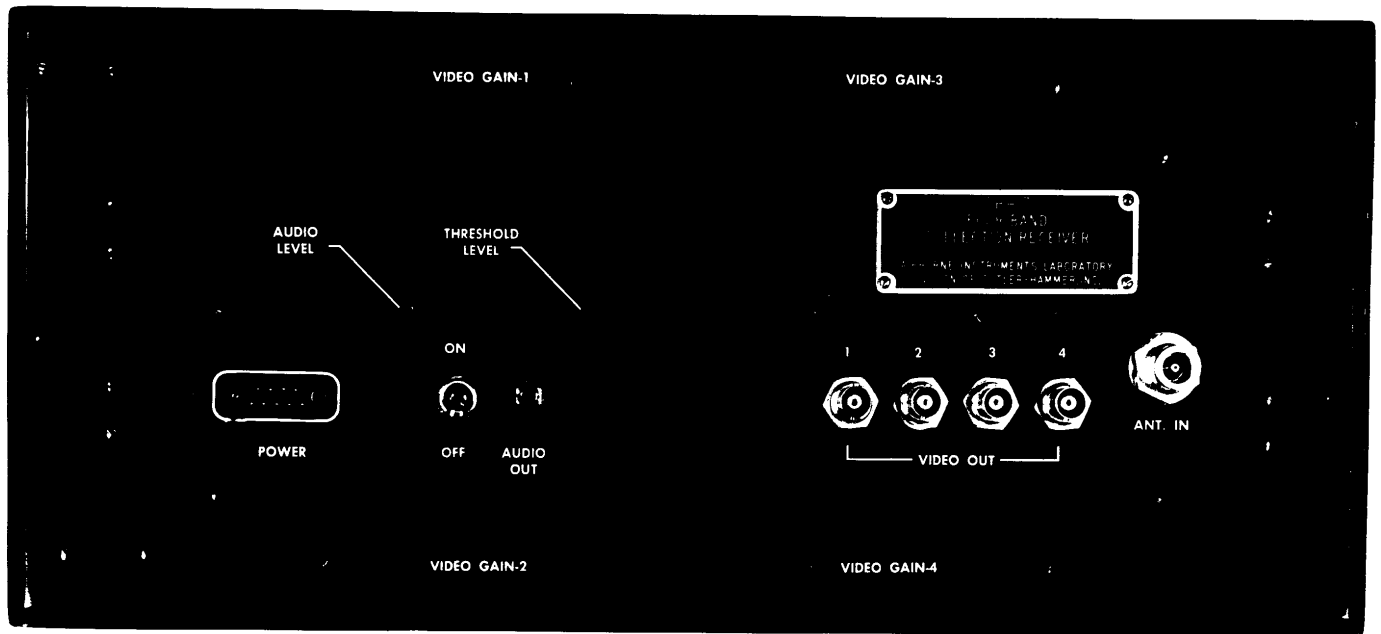
2. DISCUSSION

The CR-17 Collection Receiver is designed to [REDACTED]

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Each channel is approximately 4 MC broad and contains its own detector and video amplifier. Input signals for all four channels are supplied by a single broadband amplifier. A video combining unit and a signal actuated relay are also incorporated in the receiver. Power is supplied by an external 24 to 30 volt dc source.

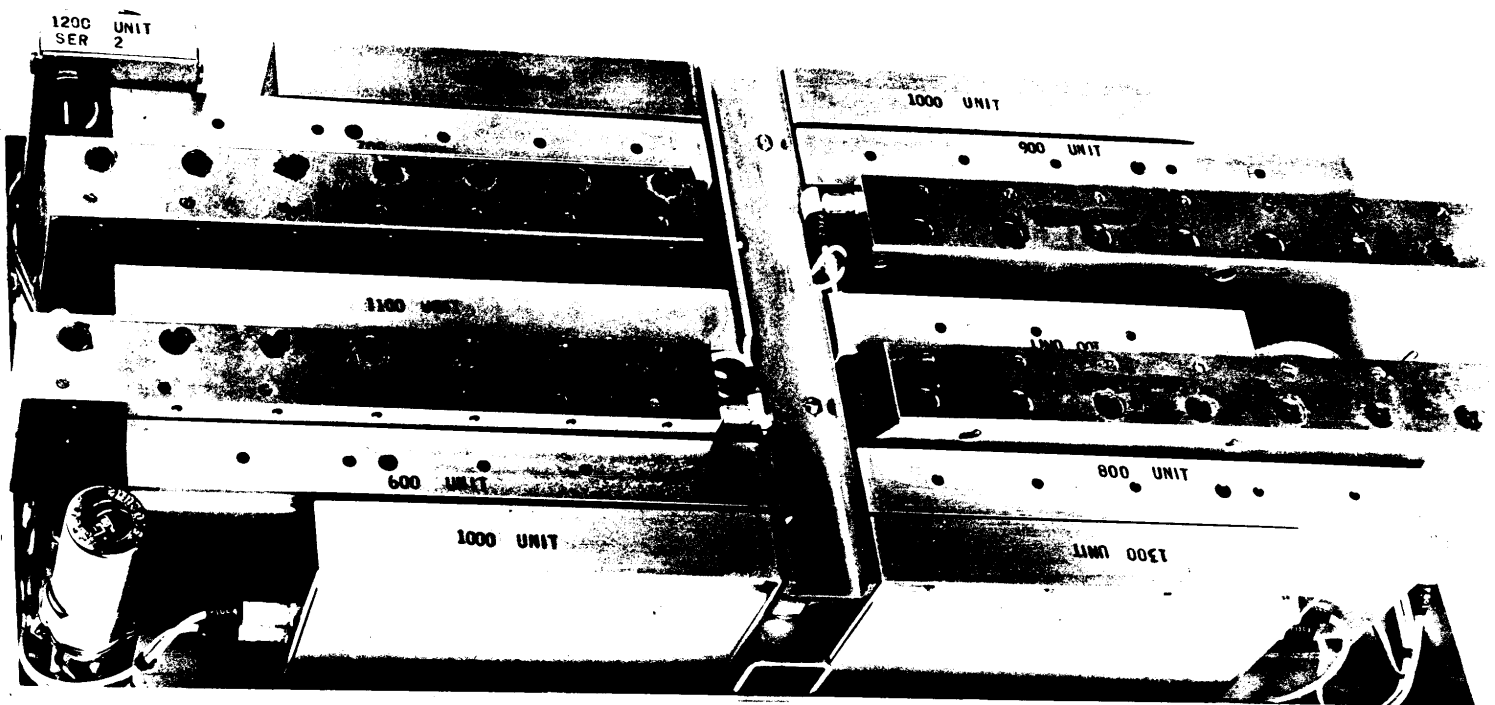
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CR-17 COLLECTION RECEIVER

FIGURE 1

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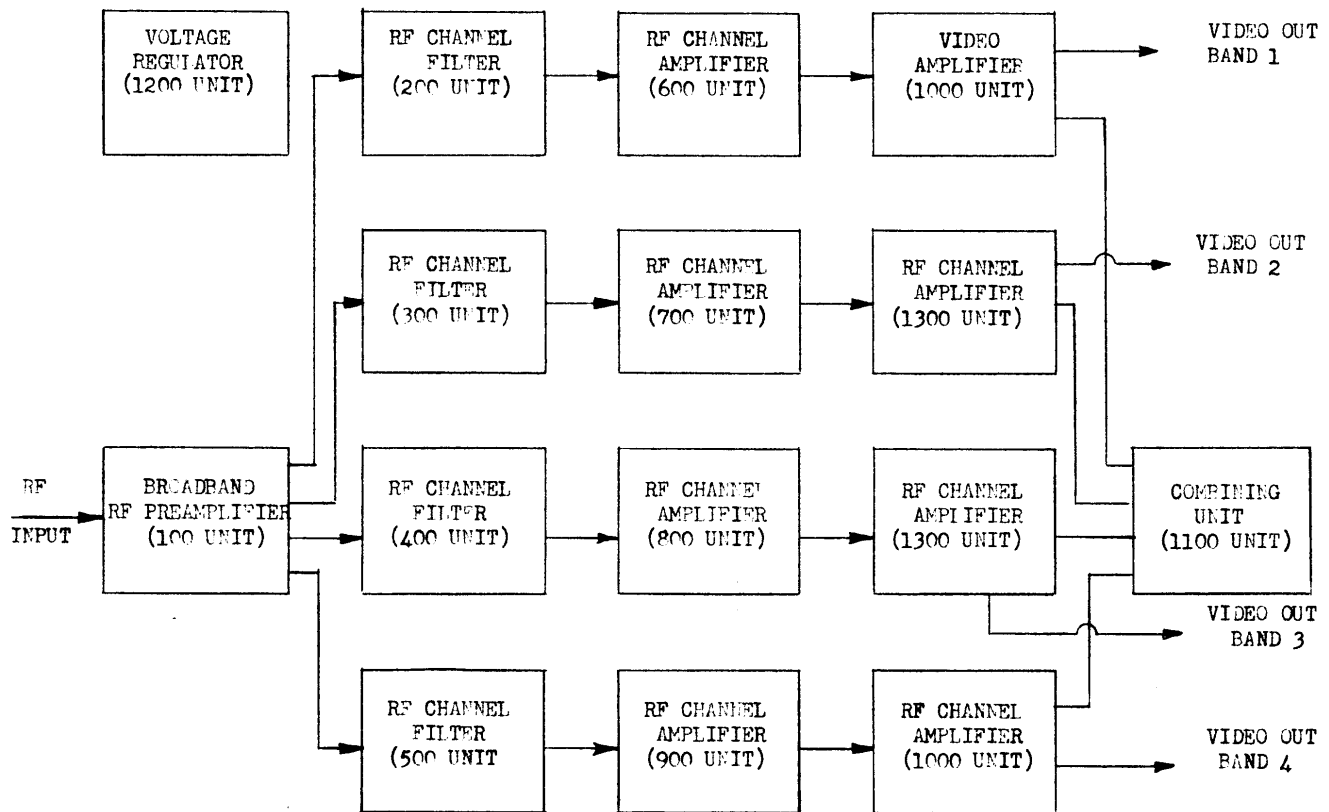


UNIT
100
200,300,400,500
600,700,800,900
1000,1300
1100
1200

NOMENCLATURE
R.F. PREAMPLIFIER
R.F. CHANNEL FILTER
R.F. CHANNEL AMPLIFIERS
VIDEO AMPLIFIERS
COMBINING UNIT
VOLTAGE REGULATOR

CR-17 COLLECTION RECEIVER
FIGURE 2

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BLOCK DIAGRAM

FIGURE 3

3. SUMMARY OF TEST DATA

(Complete Measurements are Presented in Section 4)

	<u>Typical Value</u>	<u>Specification</u>
Frequency Range		
RF Input Impedance	20/10 ⁰ Ohms	50 Ohms
Noise Figure	9 db	None

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Video Output Characteristics

Impedance	10 Ohms	100 Ohms
Bandwidth	>500 KC	500 KC

Combiner Characteristics

Audio Output from Pulse Stretcher

Pulse Duration	70 μ s	None
Pulse Repetition Rate	Follows to 10K pps	None
Output Impedance	200 Ohms	50 Ohms
Minimum Pulse Width to Trigger Stretcher	0.1 μ s	None

Signal Actuated Relay Operative

Power Consumption

Voltage	24 - 30 V DC	24 - 30 V DC
Current	180 MA	200 MA
Power	4.3 to 5.4 W	4.8 to 6.0 W

Environment

Temperature	+50 ⁰ C to -20 ⁰ C	+50 ⁰ C to -20 ⁰ C
Humidity	No effects from 100%	100%

The following graphs are included as part of this report:

- Figure 4 - Sensitivity (Both Tangential and Saturation) vs. Frequency
- Figure 5 - Video Wave Shapes
- Figure 6 - RF Input vs. Video Output
- Figure 7 - Temperature vs. Tangential Sensitivity

4. DETAILS OF TEST DATA

4.1. Mechanical Inspection

4.1.1. General

In general, the CR-17 is well constructed and should withstand airborne or mobile transportation and operation. Form factor and rack mounting capabilities make it applicable for either field or base station use. Over-all dimensions are: 17" X 7½" X 3½" and the approximate weight is 15 pounds.

4.1.2. Construction

Subassembly construction is used in the fabrication of this receiver. There are fifteen separate subchassis, namely, the broadband RF preamplifier, four RF channel filters, four RF channel amplifiers, four video amplifiers, a combining unit, and a voltage regulator. The individual chassis are interconnected by a multiple cable system.

4.1.3. Fabrication

Printed circuit board is used in the individual subchassis except in the four RF channel filters and the voltage regulator. Printed circuit technique is considered satisfactory for this receiver. The components used in this receiver are considered satisfactory.

4.1.4. Ventilation

Because of the lower power consumption of this unit, no ventilation is used. Cooling is considered adequate.

4.2. Electrical Section

4.2.1. Electrical Inspection

4.2.1.1. General

The CR-17 Collection Receiver is designed to

STAT
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Each channel is approximately 4 MC broad and contains its own detector and video amplifier. A complete block diagram of the receiver appears in Figure 3.

4.2.1.2. Controls and Markings

By referring to Figure 1 it can be seen that all controls are appropriately marked.

4.2.1.3. Standard Test Conditions

Unless otherwise noted the following standard conditions will prevail:

Nominal RF Input	-80 dbm
Modulation	100% (pulses)
Pulse Repetition Rate	1000 pps
Pulse Duration (Input)	30 microseconds
Input Impedance	50 Ohms
Video Gain	<u>Full</u>
Video Output Impedance	100 Ohms
DC Power Supply	24 Volts at 180 Milliamps

4.2.2. Details of Electrical Test Data

4.2.2.1. Frequency Range -



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4.2.2.2. Band Coverage

See Figure 4

4.2.2.3. Sensitivity

Tangential
To Produce Saturation

See Figure 4
See Figure 4

4.2.2.4. RF Input Impedance

20 10⁰ Ohms

4.2.2.5. Crosstalk

? No crosstalk appears on pulses occurring at the same time on adjacent channels with unwanted signals of -40 dbm and wanted signals of -80 dbm.

4.2.2.6. Desensitization

? No desensitization appears on pulses occurring at the same time on adjacent channels with unwanted signals of -30 dbm and wanted signals of -80 dbm.

4.2.2.7. Noise Figure

<u>Band</u>	<u>Noise Figure (db)</u>
1	7.0
2	8.7
3	10.0
4	11.5

4.2.2.8. Video Output Characteristics

Impedance	10 Ohms
Bandwidth	>500 KC
Wave Shapes	See Figure 5
RF Input vs. Video Output	See Figure 6

4.2.2.9. Combiner Characteristics

Audio Output from Pulse Stretcher

Pulse Duration	70 μ s
Pulse Repetition Rate	Follows Output to 10 KC
Output Impedance	200 Ohms
Minimum Pulse Width to Trigger Stretcher	0.1 μ s

Signal Actuated Relay	Operative
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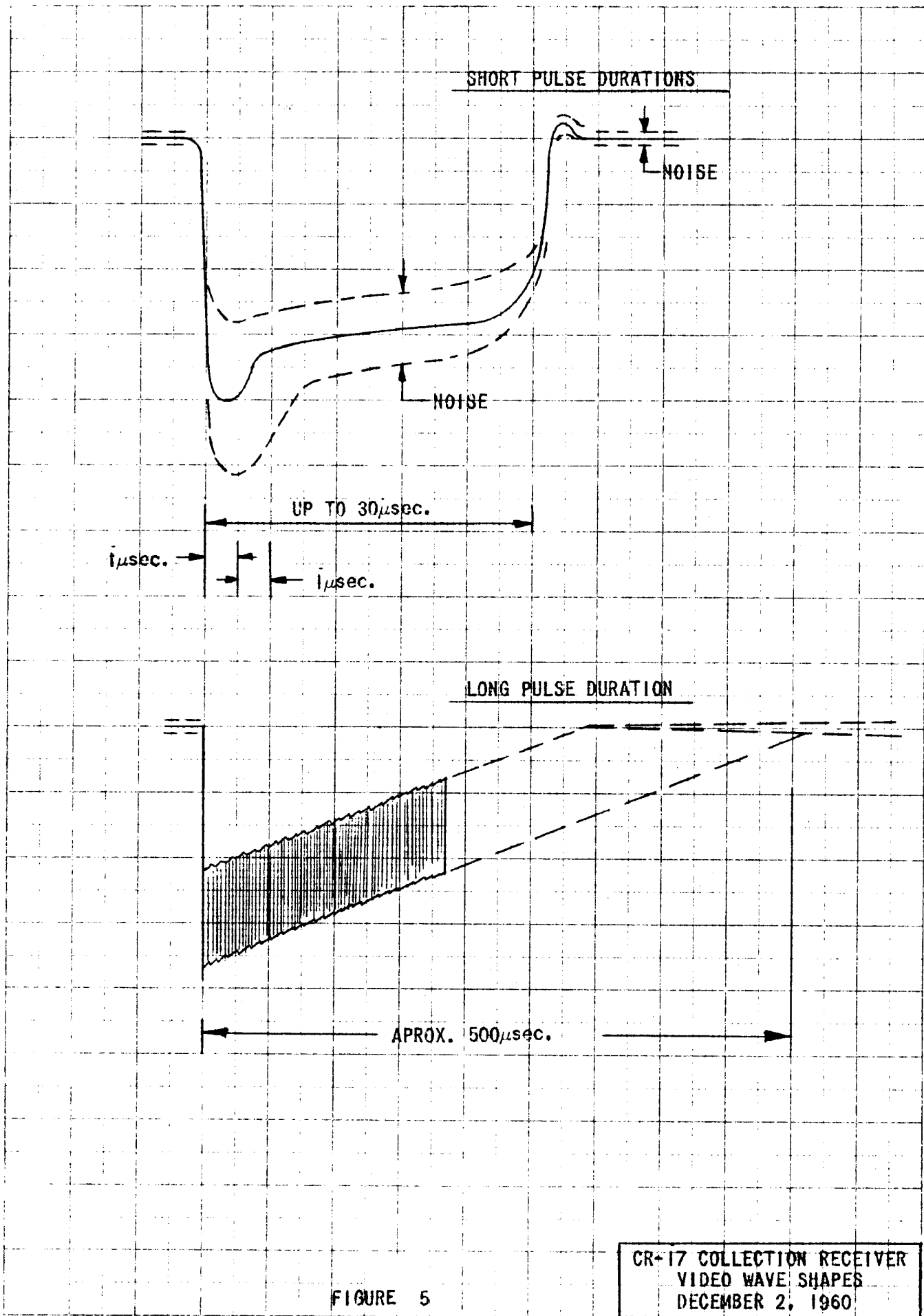
4.2.2.10. Power Consumption

Voltage	24 - 30 V DC
Current	180 MA
Power	4.3 to 5.4 Watts

4.2.2.11. Environment

Temperature Range	See Figure 7
Humidity	Not affected by 100% humidity

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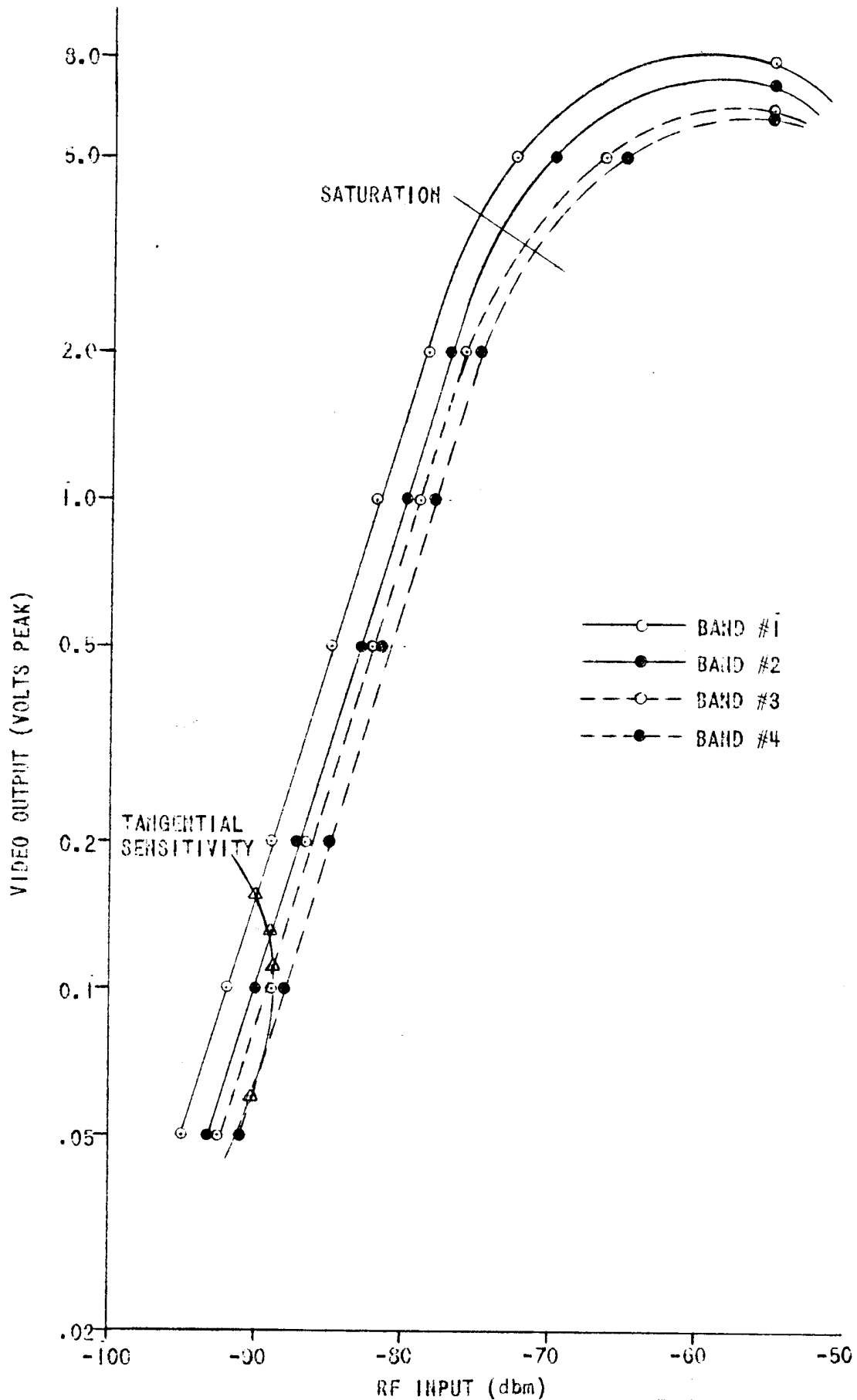
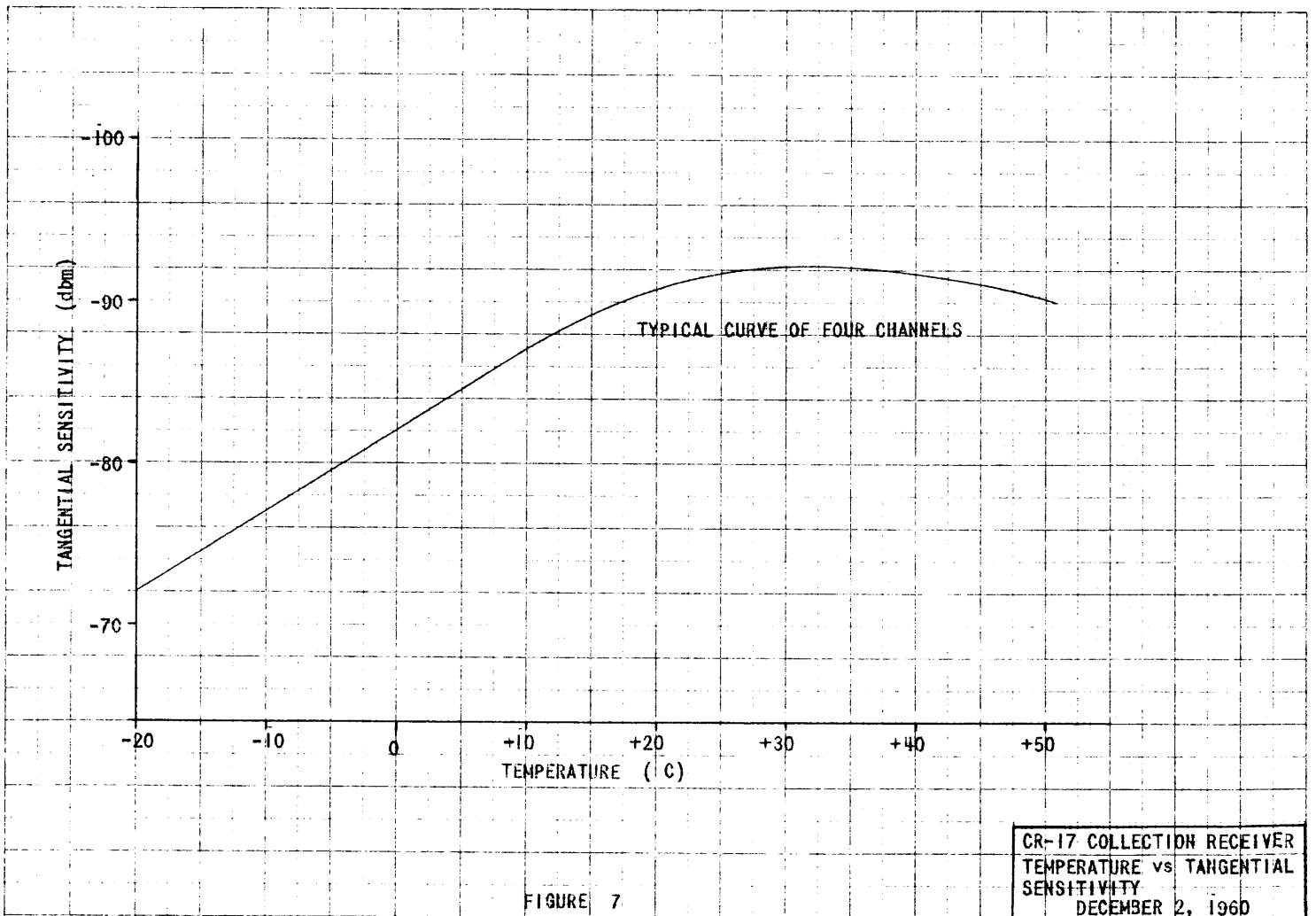


FIGURE 6

CR-17 COLLECTION RECEIVER
 RF INPUT vs VIDEO OUTPUT
 DECEMBER 2, 1960



5. CONCLUSIONS

In general, the performance of the CR-17 Collection Receiver is acceptable. Both the mechanical construction and the major electrical characteristics are well within the specified goals. There are, however, three items which do not meet specifications.

- (a) The operating temperature specification is not explicit. As can be seen in Figure 7, the unit operates (although not uniformly) over the range of +50° to -20°C. It is evident that this unit could be exposed to storage temperatures within this range without malfunctioning.

SPECIFICATION:

2.1.1. Operating Temperatures

The design considerations of the CR-17 shall be such as to preclude malfunctioning of the equipment when exposed or storage temperatures of from -20°C to +50°C.

- (b) The section of the specification labeled video output contains two areas which do not meet specifications. First, the output impedance is 10 rather than 100 ohms. Second, limiting began at approximately -70 to -75 dbm instead of the specified -20 dbm.

SPECIFICATION:

3.2.3. Video Output

The video amplifier shall have an output impedance of 100 ohms. Video bandwidths shall be 500 kc. *(with max. video gain)*

Outputs: 0.2 volts at tangential signal, 3.5 volts peak.

No limiting below -20 dbm input signal.

- (c) The signal actuated relay does not meet specifications because of the limiting mentioned in objection (b). The specified maximum triggering level of 0 dbm cannot be reached because of the -70 to -75 dbm limiting level.

SPECIFICATION:

3.2.8. Signal Actuated Relay

.....At maximum sensitivity the relay shall be triggered by noise, and the threshold control shall provide for relay triggering at signal thresholds up to 0 dbm.....

SPARE PARTS LIST

CONTRACT NO. 7630-00

EQUIPMENT Broadband RF Amp. 100 Unit (1 Required Per System)

SHEET 1 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R101	Resistor - 22K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF223J	Allen-Bradley	1	1	.39	.39
2	R102 R107	Resistor - 11K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF113J	Allen-Bradley	2	1	.39	.39
3	R103 R110	Resistor - 5.6K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF562J	Allen-Bradley	2	1	.39	.39
4	R104 R111	Resistor - 75K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF753J	Allen-Bradley	2	1	.39	.39
5	R105 R109	Resistor - 2K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF202J	Allen-Bradley	2	1	.39	.39
6	R106 112	Resistor - 15 ohm +10%, $\frac{1}{10}$ w carbon, fixed		Ohmite	2	1	.39	.39
7	R113	Resistor - 6.8K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF682J	Allen-Bradley	1	1	.39	.39
8	R114	Resistor - 12K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF123J	Allen-Bradley	1	1	.39	.39
9	R115	Resistor - 1.2K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF122J	Allen-Bradley	1	1	.39	.39
10	R116	Resistor - 5K, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF502J	Allen-Bradley	1	1	.39	.39
11	R117 R118 R119 R120	Resistor - 62ohms, 5%, $\frac{1}{4}$ w carbon, fixed	RC07GF620J	Allen-Bradley	4	1	.39	.39

SPARE PARTS LIST

CONTRACT NO. 7630-00
EQUIPMENT Broadband RF Amp, 100 Unit

SHEET 2 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
12	C101 C102 C104 C105 C106 C110 C111 C114 C116 C119	Capacitor - 1000uuf, 10% fixed		Arco-El Menco DM-15-102K	10	3	.79	2.37
13	C108	Capacitor - 5uuf, 10% fixed		Arco-ElMenco DM-15-050K	1	1	.39	.39
14	C113	Capacitor - 3uuf, 10% fixed		Arco-El Menco DM-15-030K	1	1	.39	.39
15	C118	Capacitor - 11uuf, 10% fixed		Arco-El Menco DM-15-110K	1	1	.39	.39
16	C103 C107 C109 C112 C115 C117	Capacitor, Variable (.8 - 8.5 uuf)		JFD VC9GW	6	2	8.40	16.80
17	L101	Coil, RF .25 uh		Jeffers Elect- ronics 10100-1	1	1	.39	.39
18	L102 L106 L110	Choke 3 uh, 50 turns of #38 wire close wound on CF107			3	1	.39	.39
								STAT

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CONTRACT NO. 7630-00
EQUIPMENT Broadband RF Amp. 100 Unit

SHEET 3 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
19	L103 L107 L111	Coil, RF			3	1	2.93	2.93
20	L104 L108 L112	Coil, RF			3	1	2.93	2.93
21	L115 L119 L113	Coil, RF			3	1	2.93	2.93
22	Q101 Q102	Transistor		Texas Inst. J335(3N35)	2	1	55.13	55.13
23	Q103	Transistor		Texas Inst. 2N1143	1	1	28.00	28.00

SPARE PARTS LIST

CONTRACT NO. 7630-00
EQUIPMENT RF Channel Filter 200 Unit (1 Required Per System)

SHEET 1 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	C201	Capacitor, Fixed			1	1	4.42	4.42
2	C202	Capacitor, Fixed			1	1	4.42	4.42
3	C203	Capacitor, Fixed			1	1	4.42	4.42
4	C204	Capacitor, Fixed			1	1	4.42	4.42
5	C205	Capacitor, Fixed			1	1	4.42	4.42
6	C206	Capacitor, Fixed			1	1	4.42	4.42
7	C207	Capacitor, Fixed			1	1	4.42	4.42
8	C208	Capacitor, Fixed			1	1	4.42	4.42
9	C209	Capacitor, Fixed			1	1	4.42	4.42
10	C210	Capacitor, Fixed			1	1	4.42	4.42
11	C211	Capacitor, Fixed			1	1	4.42	4.42
12	C212	Capacitor, Fixed			1	1	4.42	4.42

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CONTRACT NO. 7630-00
EQUIPMENT RF Channel Filter 200 Unit

SHEET 2 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
13	C213	Capacitor, Fixed			1	1	4.42	4.42
14	C214	Capacitor, Fixed			1	1	4.42	4.42
15	C215 C216 C217 C218 C219 C220 C221 C222 C223 C224 C225 C226 C227 C228	Capacitor, Fixed 150 uuf		Erie Silver Mka. 150 uuf +5%, 370-FA-151J	14	3	1.56	4.68
16	L201 L202 L203 L204 L205 L206 L207 L208 L209 L210 L211 L212 L213 L214	Coil, RF			14	3	2.93	8.79
								STAT

CONTRACT NO. 7630-00

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EQUIPMENT RF Channel Filter 300 Unit (1 Required Per System)

SHEET 1 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	C301	Capacitor, Fixed			1	1	4.42	4.42 STAT
2	C302	Capacitor, Fixed			1	1	4.42	4.42
3	C303	Capacitor, Fixed			1	1	4.42	4.42
4	C304	Capacitor, Fixed			1	1	4.42	4.42
5	C305	Capacitor, Fixed			1	1	4.42	4.42
6	C306	Capacitor, Fixed			1	1	4.42	4.42
7	C307	Capacitor, Fixed			1	1	4.42	4.42
8	C308	Capacitor, Fixed			1	1	4.42	4.42
9	C309	Capacitor, Fixed			1	1	4.42	4.42
10	C310	Capacitor, Fixed			1	1	4.42	4.42
11	C311	Capacitor, Fixed			1	1	4.42	4.42
12	C312	Capacitor, Fixed			1	1	4.42	4.42

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CONTRACT NO. 7630-00

EQUIPMENT RF Channel Filter 300 Unit

SHEET 2 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
13	C313	Capacitor, Fixed			1	1	4.42	4.42 STAT
14	C314	Capacitor, Fixed			1	1	4.42	4.42
15	C315 C316 C317 C318 C319 C320 C321 C322 C323 C324 C325 C326 C327 C328	Capacitor, Fixed		Erie Silver Mks. 150unf +5%, 370-FA-151J	14	3	1.56	4.68
16	L301 L302 L303 L304 L305 L306 L307 L308 L309 L310 L311 L312 L313 L314	Coil, RF			14	3	2.93	8.79 STAT

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CONTRACT NO. 7630-00

EQUIPMENT RF Channel Filter 400 Unit (1 Required Per System)

SHEET 1 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	C401	Capacitor, Fixed			1	1	4.42	4.42
2	C402	Capacitor, Fixed			1	1	4.42	4.42
3	C403	Capacitor, Fixed			1	1	4.42	4.42
4	C404	Capacitor, Fixed			1	1	4.42	4.42
5	C405	Capacitor, Fixed			1	1	4.42	4.42
6	C406	Capacitor, Fixed			1	1	4.42	4.42
7	C407	Capacitor, Fixed			1	1	4.42	4.42
8	C408	Capacitor, Fixed			1	1	4.42	4.42
9	C409	Capacitor, Fixed			1	1	4.42	4.42
10	C410	Capacitor, Fixed			1	1	4.42	4.42
11	C411	Capacitor, Fixed			1	1	4.42	4.42
12	C412	Capacitor, Fixed			1	1	4.42	4.42

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EQUIPMENT RF Channel Filter 400 Unit

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SHEET 2 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
13	C413	Capacitor, Fixed			1	1	4.42	STAT 4.42
14	C414	Capacitor, Fixed			1	1	4.42	4.42
15	C415 C416 C417 C418 C419 C420 C421 C422 C423 C424 C425 C426 C427 C428	Capacitor, Fixed 150 uuf		Erie Silver Mks. 150 uuf +5%, 370-FA-151J	14	3	1.56	4.68
16	L401 L402 L403 L404 L405 L406 L407 L408 L409 L410 L411 L412 L413 L414	Coil, RF			14	3	2.93	STAT 8.79

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CONTRACT NO. 7630-00
 EQUIPMENT RF Channel Filter 500 Unit (1 Required Per System)

SHEET 1 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	C501	Capacitor, Fixed			1	1	4.42	4.42
2	C502	Capacitor, Fixed			1	1	4.42	4.42
3	C503	Capacitor, Fixed			1	1	4.42	4.42
4	C504	Capacitor, Fixed			1	1	4.42	4.42
5	C505	Capacitor, Fixed			1	1	4.42	4.42
6	C506	Capacitor, Fixed			1	1	4.42	4.42
7	C507	Capacitor, Fixed			1	1	4.42	4.42
8	C508	Capacitor, Fixed			1	1	4.42	4.42
9	C509	Capacitor, Fixed			1	1	4.42	4.42
10	C510	Capacitor, Fixed			1	1	4.42	4.42
11	C511	Capacitor, Fixed			1	1	4.42	4.42
12	C512	Capacitor, Fixed			1	1	4.42	4.42

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CONTRACT NO. 7630-00
EQUIPMENT RF Channel Filter 500 Unit (1 Required Per System)

SHEET 2 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
13	C513	Capacitor, Fixed			1	1	4.42	4.42 STAT
14	C514	Capacitor, Fixed			1	1	4.42	4.42
15	C515 C516 C517 C518 C519 C520 C521 C522 C523 C524 C525 C526 C527 C528	Capacitor, Fixed 150 uuf		Erie Silver Mka. 150 uuf +5%, 370-FA-151J	14	3	1.56	4.68
16	L501 L502 L503 L504 L505 L506 L507 L508 L509 L510 L511 L512 L513 L514	Coil, RF			14	3	2.03	8.79 STAT

STAT

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CONTRACT NO. 7630-00

EQUIPMENT RF Channel Amplifier 600 Unit (1 Required Per System)

SHEET 1 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R601 R607 R612 R618 R627	Resistor 22K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF223J	Allen-Bradley	5	2	.39	.78
2	R602 R606 R613 R617 R622	Resistor 11K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF113J	Allen-Bradley	5	2	.39	.78
3	R603 R608 R614 R619 R623	Resistor 5.6K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF562J	Allen-Bradley	5	2	.39	.78
4	R604 R609 R615 R620 R624	Resistor 75K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF753J	Allen-Bradley	5	2	.39	.78
5	R605 R610 R616 R621	Resistor 15 ohms, +10%, 1/10w carbon, fixed		Ohmite	4	1	.39	.39
6	R611	Resistor, Variable 2000 ohms Glass		Heli Trim Model #50 2K	1	1	14.00	14.00
7	R625	Resistor 510 ohms, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF511J	Allen-Bradley	1	1	.39	.39

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CONTRACT NO. 7630-00

EQUIPMENT RF Channel Amplifier 600 Unit

SHEET 2 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
8	R626	Resistor 10K, $\frac{1}{4}$ W, 5%, carbon, fixed	RC07GF103J	Allen-Bradley	1	1	.39	.39
9	C601 C603 C604 C605 C607 C609 C610 C612 C614 C615 C616 C619 C620 C621 C624 C625	Capacitor 1000 uuf, 10%, fixed		Arco-El Menco DM-15-102K	16	4	.79	3.16
10	C602 C606 C608 C611 C613 C617 C618 C622 C623 C628	Capacitor (.8 - 8.5 uuf) Variable		JFD VC9GW	10	3	8.40	25.20
11	L601 L605 L609 L613 L617	Coil, RF - uh			5	2	2.93	5.86
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CONTRACT NO. 7630-00
EQUIPMENT RF Channel Amplifier 600 Unit

SHEET 3 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
12	L602 L606 L610 L614 L618	Coil, RF - uh			5	2	2.93	5.86 (STAT)
13	L603 L607 L611 L615 L619	Coil, RF - uh			5	2	2.93	5.86
14	L604 L608 L612 L616 L620	Coil, RF - 3 uh, 50 turns of #38 wire close wound on CF107			5	2	2.93	5.86
15	GR601	Diode, Germanium		Raytheon 1N67	1	1	1.82	1.82
16	Q601 Q602 Q603 Q604 Q605	Transistor		Texas Inst. J335 (3N35)	5	2	55.13	110.26

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Schematic - SPARE PARTS LIST
 CONTRACT NO. 7630-00
 EQUIPMENT RF Channel Amplifier 700 Unit (1 Required Per System)

SHEET 1 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R701 R707 R712 R718 R727	Resistor 22K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF223J	Allen-Bradley	5	2	.39	.78
2	R702 R706 R713 R717 R722	Resistor 11K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF113J	Allen-Bradley	5	2	.39	.78
3	R704 R708 R714 R719 R723	Resistor 5.6K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF562J	Allen-Bradley	5	2	.39	.78
4	R704 R709 R715 R720 R724	Resistor 75K, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF753J	Allen-Bradley	5	2	.39	.78
5	R705 R710 R716 R721	Resistor 15 + 10%, 1/10w Carbon, fixed		Ohmite	4	1	.39	.39
6	R711	Resistor, Variable 2000 ohms, Glass		Heli Trim Model #50 2K	1	1	14.00	14.00
7	R725	Resistor 510ohms, $\frac{1}{4}$ w, 5%, carbon, fixed	RC07GF511J	Allen-Bradley	1	1	.39	.39

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SPARE PARTS LIST

CONTRACT NO. 7630-00

EQUIPMENT RF Channel Amplifier 700 Unit

SHEET 2 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
8	R726	Resistor 10K, $\frac{1}{4}$ W, 5%, carbon, fixed	RC07GF103J	Allen-Bradley	1	1	.39	.39
9	C701 C703 C704 C705 C707 C709 C710 C812 C714 C715 C716 C719 C720 C721 C724 C725	Capacitor 1000 uuf, 10%, fixed		Arco-ElMenco DM-15-102K	16	4	.79	3.16
10	C702 C706 C708 C711 C713 C717 C718 C722 C723 C728	Capacitor (.8 - 8.5 uuf) Variable		JFD VC9GW	10	3	8.40	25.20
11	L701 L705 L709 L713 L717	Coil, RF - uh			5	2	2.93	5.86
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SPARE PARTS LIST

CONTRACT NO. 7630-00
EQUIPMENT RF Channel Amplifier 700 Unit

SHEET 3 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
12	L702 L706 L710 L714 L718	Coil, RF - uh			5	2	2.93	5.86 STAT
13	L703 L707 L711 L715 L719	Coil, RF - uh			5	2	2.93	5.86
14	L704 L708 L712 L716 L720	Coil, RF - 3 uh, 50 turns of #38 wire close wound on CF107			5	2	2.93	5.86
15	CR701	Diode, Germanium		Raytheon 1N67	1	1	1.82	1.82
16	Q701 Q702 Q703 Q704 Q705	Transistor		Texas Inst. J335 (3N35)	5	2	55.13	110.26

Schematic -

SPARE PARTS LIST

CONTRACT NO. 7630

EQUIPMENT RF Channel Amplifier 800 Unit (1 required per system)

SHEET 1 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R801 R807 R812 R818 R827	Resistor, 5%, 22K, 1/4w, Carbon fixed	RC07GF223J	Allen-Bradley	5	2	.39	.78
2	R802 R806 R813 R817 R822	Resistor 11K, 1/4w, 5%, carbon, Fixed	RC07GF113J	Allen-Bradley	5	2	.39	.78
3	R803 R808 R814 R819 R823	Resistor 5%, 5.6K, 1/4w, Carbon Fixed	RC07GF562J	Allen-Bradley	5	2	.39	.78
4	R804 R809 R815 R820 R824	Resistor 7.5K, 1/4w, 5% Carbon, Fixed	RC07GF753J	Allen-Bradley	5	2	.39	.78
5	R805 R810 R816 R821	Resistor 15 ± 10%, 1/10w Carbon, fixed		Ohmite	4	1	.39	.39
6	R811	Resistor, Variable 2000 ohms, Glass		Heli Trim Model #50 2K	1	1	14.00	14.00
7	R825	Resistor 510, 1/4w, 5%, carbon fixed	RC07GF511J	Allen-Bradley	1	1	.39	.39
8	R826	Resistor 10K, 1/4w, 5% carbon, fixed	RC07GF103J	Allen-Bradley	1	1	.39	.39

SPARE PARTS LIST

CONTRACT NO. 7630
EQUIPMENT RF Channel Amplifier 800 Unit

SHEET 2 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
9	C801 C803 C804 C805 C807 C809 C810 C812 C814 C815 C816 C819 C820 C821 C824 C825	Capacitor 1000 uuf, 10%, fixed		Arco-Elmenco DM-15-102K	16	4	.79	3.16
10	C802 C806 C808 C811 C813 C817 C818 C822 C823 C828	Capacitor (.8-8.5 uuf) Variable		JFD VC9GW	10	3	8.40	25.20
11	L801 L805 L809 L813 L817	Coil, RF - uh			5	2	2.93	5.86
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SPARE PARTS LIST

CONTRACT NO. 7630
EQUIPMENT RF Channel Amplifier 800 Unit

SHEET 3 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
12	L802 L806 L810 L814 L818	Coil, RF - uh	.AT		5	2	2.93	5.86 STAT
13	L803 L807 L811 L815 L819	Coil, RF - uh			5	2	2.93	5.86
14	L804 L808 L812 L816 L820	Coil, RF - 3 uh, 50 turns of #38 wire close wound coil CF107			5	2	2.93	5.86
15	CR801	Diode, Germanium		Raytheon 1N67	1	1	1.82	1.82
16	Q801 Q802 Q803 Q804 Q805	Transistor		Texas Inst. J935 (3N35)	5	2	55.13	110.26

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SPARE PARTS LIST

Schematic -
 CONTRACT NO. 7630
 EQUIPMENT RF Channel Amplifier 900 Unit (1 required per system)

SHEET 1 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R901 R907 R912 R918 R927	Resistor 5%, 22K, 1/4w, carbon fixed	RC07GF223J	Allen-Bradley-	5	2	.39	.78
2	R902 R906 R913 R917 R922	Resistor, 11K, 1/4w, 5%, Carbon, fixed	RC07GF113J	Allen-Bradley	5	2	.39	.78
3	R903 R908 R914 R919 R923	Resistor 5%, 5.6K, 1/4w, Carbon, fixed	RC07GF562J	Allen-Bradley	5	2	.39	.78
4	R904 R909 R915 R920 R924	Resistor 75K, 1/4w, 5%, carbon fixed	RC07GF753J	Allen-Bradley	5	2	.39	.78
5	R905 R910 R916 R921	Resistor 15 ±10%, 1/10w, carbon, fixed		Ohmite	4	1	.39	.39
6	R911	Resistor, Variable 2000 ohms, Glass		Heli Trim Model #50 2K	1	1	14.00	14.00
7	R925	Resistor 510, 1/4w, 5%, carbon, fixed	RC07GF511J	Allen-Bradley	1	1	.39	.39
8	R926	Resistor 10K, 1/4w, 5% carbon, fixed	RC07GF103J	Allen-Bradley	1	1	.39	.39

SPARE PARTS LIST

CONTRACT NO. 7630
EQUIPMENT RF Channel Amplifier 900 Unit

SHEET 2 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
9	C901 C903 C904 C905 C907 C909 C910 C912 C914 C915 C916 C919 C920 C921 C924 C925	Capacitor 1000 uuf, 10%, fixed		Arco-Elmenco DM-15-102K	15	4	.79	3.16
10	C902 C906 C908 C911 C913 C917 C918 C922 C923 C928	Capacitor Variable (.8-8.5 uuf)		JFD VC9GW	10	3	8.40	25.20
11	L901 L905 L909 L913 L917	Coil, RF - uh			5	2	2.93	5.86

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SPARE PARTS LIST

CONTRACT NO. 7630

EQUIPMENT RF Channel Amplifier 900 Unit

SHEET 3 OF 3

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
12	L902 L906 L910 L914 L918	Coil, RF - uh			5	2	2.93	5.86 STAT
13	L903 L907 L911 L915 L919	Coil, RF - uh			5	2	2.93	5.86
14	L904 L908 L912 L916 L920	Coil, RF - 3 uh, 50 turns of #38 wire close wound on CF107			5	2	2.93	5.86
15	CR901	Diode, Germanium		Raytheon 1N67	1	1	1.82	1.82
16	Q901 Q902 Q903 Q904 Q905	Transistor		Texas Inst. J335 (3N35)	5	2	55.13	110.26

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SPARE PARTS LIST

CONTRACT NO. 7630
EQUIPMENT Video Amp. 1000 Unit (4 Reqd. per system)

SHEET 1 OF 4

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R1001	Resistor, Variable 5K, 1/2w, 20%		Allen-Bradley Type G	1	1	8.75	8.75
2	R1003 R1007 R1012	Resistor, 56K, 1/4w, 5% carbon, fixed	RC07GF563J	Allen-Bradley	3	1	.39	.39
3	R1004 R1008 R1013	Resistor 33K, 1/4w, 5%, carbon, fixed	RC07GF333J	Allen-Bradley	3	1	.39	.39
4	R1005 R1009 R1014	Resistor 3K, 1/4w, 5% carbon, fixed	RC07GF502J	Allen-Bradley	3	1	.39	.39
5	R1006 R1010 R1015	Resistor 150, 1/4w, 5% carbon, fixed	RC07GF151J	Allen-Bradley	3	1	.39	.39
6	R1011	Resistor 600, 1/4w, 5% carbon, fixed	RC07GF601J	Allen-Bradley	1	1	.39	.39
7	R1016 R1021	Resistor 2K, 1/4w, 5%	RC07GF202J	Allen-Bradley	2	1	.39	.39
8	R1017 R1022	Resistor 8.2K, 1/4w, 5% carbon, fixed	RC07GF822J	Allen-Bradley	2	1	.39	.39
9	R1024	Resistor 4.7K, 1/4w, 5% carbon, fixed	RC07GF472J	Allen-Bradley	1	1	.39	.39
10	R1018 R1023	Resistor 1.5K, 1/4w, 5% carbon, fixed	RC07GF152J	Allen-Bradley	2	1	.39	.39
11	R1025	Resistor 110 ohm, 1/4w, 5% carbon, fixed	RC07GF111J	Allen-Bradley	1	1	.39	.39

SPARE PARTS LIST

CONTRACT NO. 7630
EQUIPMENT Video Amp. 1000 Unit

SHEET 2 OF 2

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
12	R1019	Resistor 2.4K, 1/4w, 5% carbon, fixed	RC07GF242J	Allen-Bradley	1	1	.39	.39
13	R1020	Resistor 220, 1/4w, 5%, carbon, fixed	RC07GF221J	Allen-Bradley	1	1	.39	.39
14	C1001 C1002 C1008 C1011 C1014	Capacitor, Fixed .22uf, 35u NDC, 20%		Sprague 150D225X0035A2	5	2	2.38	4.76
15	C1003 C1004 C1006 C1007 C1009 C1010	Capacitor 1000 uuf, 10%, fixed		Elmenco DM-15-102K	6	2	1.40	2.80
16	C1013 C1016	Capacitor, 15uf, 15vdc fixed		Fansteel PF15B15A2	2	1	5.52	5.52
17	C1005 C1012 C1015	Capacitor, Fixed 20uf, 15 vdc		Sprague Type TE1157	3	1	1.26	1.26
18	Q1001 Q1002 Q1003	Transistor		Texas Inst. 2N334	3	1	28.00	28.00
19	Q1004 Q1005	Transistor		GE 2N43A	2	1	28.00	28.00
20	C1017	Capacitor 10uf, 25vdc		Texas Inst. T301	1	1	6.40	6.40

SPARE PARTS LIST

CONTRACT NO. 7630
EQUIPMENT

Combining Network

1100 Unit (1 required per system)

SHEET 1 OF 4

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R1105 R1107 R1110	Resistor, Fixed 2K, 1/4w, 5%, carbon	RC07GF202J	Allen-Bradley	3	1	.39	.39
2	R1108	Resistor 8.2K, 1/4w, 5% carbon, fixed	RC07GF822J	Allen-Bradley	1	1	.39	.39
3	R1109	Resistor 2K, 1/2w, 5%	RC20GF202J	Allen-Bradley Stock	1	1	.39	.39
4	R1111 R1112 R1113 R1114	Resistor 10K, 1/4w, 5% carbon, fixed	RC07GF103J	Allen-Bradley	4	1	.39	.39
5	R1115 R1116 R1117	Resistor 3K, 1/4w, 5% carbon, fixed	RC07GF302J	Allen-Bradley	3	1	.39	.39
6	R1119	Resistor 3.3K, 1/4w, 5%, carbon, fixed	RC07GF332J	Allen-Bradley	1	1	.39	.39
7	R1121 R1122	Resistor 1.5K, 1/4w, 5%, carbon, fixed	RC07GF152J	Allen-Bradley	2	1	.39	.39
8	R1103 R1123	Resistor 4.7K, 1/4w, 5%, carbon, fixed	RC07GF472J	Allen-Bradley	2	1	.39	.39
9	R1124 R1118 R1102 R1106 R1104	Resistor 16K, 1/4w, 5% carbon, fixed	RC07GF163J	Allen-Bradley	5	2	.39	.78

SPARE PARTS LIST

CONTRACT NO.
EQUIPMENT

1100 Unit

SHEET 2 OF 4

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
10	R1125 R1101	Resistor 20K, 1/4w, 5% carbon, fixed	RC07GF203J	Allen-Bradley	2	1	.39	.39
11	R1129 R1132 R1126 R1130 R1131	Resistor 5.6K, 1/2w, 5%, carbon, fixed	RC20GF562J	Allen-Bradley Stock	5	2	.39	.78
12	R1127 R1128	Resistor, variable 1/2w, 2.5K, 20%		Allen-Bradley Type G	2	1	8.75	8.75
13	C1101	Capacitor, fixed .22uf, 35vdc, 20%		Sprague Type 150D 224X003642	4	1	1.15	1.15
14	C1105	Capacitor, Fixed .001, 10%		Arco Elmenco DM-15-102K	1	1	.79	.79
15	C1107	Capacitor, Fixed, .01uf, 10%		Sprague Type 150D	1	1	1.15	1.15
16	C1112	Capacitor, Fixed 20uf, 15vdc		Sprague Type TE1157	1	1	1.26	1.26
17	C1114 C1115	Capacitor, Fixed 50uf, 25vdc		Texas Inst. Type T304	2	1	10.28	10.28
18	C1113 C1111	Capacitor, Fixed 39uf, 10vdc		Mallory Type TAM	2	1	.67	.67
19	C1110	Capacitor, Fixed 16.8uf, 25vdc		Mallory Type TAM	1	1	.67	.67

SPARE PARTS LIST

CONTRACT NO.
EQUIPMENT

1100 Unit

SHEET 3 OF 4

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
20	Q1101 Q1102 Q1103 Q1104 Q1108	Transistor		GE 2N43A	5	2	8.00	16.00
21	Q1106 Q1107 Q1105	Transistor		Texas Inst. TL 2N334	3	1	28.00	28.00
22	Q1109 Q1113 Q1110 Q1111 Q1114	Transistor		Texas Inst. T1 904	5	2	29.67	29.67
23	CR1101	Diode 1N67		Raytheon 1N67	1	1	1.82	1.82
24	CR1102 CR1103	Diode 1N659		Texas Int.	2	1	3.07	3.07
25	CR1104	Diode 1N1775A		Hoffman	1	1	4.87	4.87
26	K1101	Relay		Potter Brumfield PW5L5 5K	1	1	15.75	15.75
27	Q112	Transistor		2N496, Philco	1	1	30.34	30.34
28	R1138 R1139	Resistor, Fixed 18K, 1/4w, 5%		RC07GF183J	2	1	.39	.39
29	R1140	Resistor, Fixed 1K, 1/4w, 5%		RC07GF102J	1	1	.39	.39
30	R1134	Resistor, Fixed 82K, 1/4w, 5%		RC07GF823J	1	1	.39	.39
31	R1137	Resistor, Fixed 1M, 1/4w, 5%		RC07GF105J	1	1	.39	.39

SPARE PARTS LIST

CONTRACT NO.
EQUIPMENT

1100 Unit

SHEET 4 OF 4

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
32	R1133	Resistor, Fixed 470K, 1/4w, 5%		RC07GF474J	1	1	.39	.39
33	R1136	Resistor, Fixed 4.3K, 1/4w, 5%		RC07GF432J	1	1	.39	.39
34	R1141	Resistor, Fixed 680 ohm, 1/4w, 5%		RC07GF681J	1	1	.39	.39
35	R1135	Resistor, Fixed 51 ohm, 1/4w, 5%		RC07GF510J	1	1	.39	.39

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Schematic -
 CONTRACT NO. 7630
 EQUIPMENT

SPARE PARTS LIST

Voltage Regulator 1200 Unit (1 required per system)

SHEET 1 OF 1

ITEM NO.	CIRCUIT SYMBOL	DESCRIPTION	JAN/MIL DESIGNATION	MANUFACTURER STOCK/TYPE NO.	ITEMS PER EQUIP	SPARES PER EQUIP	UNIT PRICE	EXTENDED PRICE
1	R1201	Resistor 1 ohm, 1/2w, 10% wire wound		IRC BW-1/2	1	1	.44	.44
2	R1202 R1203 R1204	Resistor - 1.1K, 1/2w, 5% carbon, fixed	RC20GF112J	Allen-Bradley	3	1	.39	.39
3	R1205	Resistor - .1 ohms, 28t of #30 wire close wound on CF125			1	1	.39	.39
4	R1206	Resistor - 3.3K, 5%, 1/2w, carbon, fixed	RC20GF332J	Allen-Bradley	1	1	.39	.39
5	R1207	Resistor - 2.2K carbon, fixed	RC20GF222J	Allen-Bradley	1	1	.39	.39
6	R1208	Resistor - 5.1K carbon, fixed	RC20GF512J	Allen-Bradley	1	1	.39	.39
7	C1201	Capacitor - 50 uf, 20% 25vdc, solid tantalum		Texas Inst. T304	1	1	10.28	10.28
8	CR1201	Zener Diode	1N755	Texas Inst. #755	1	1	7.62	7.62
9	Q1201	Transistor--	2N301A	RCA	1	1	8.46	8.46
10	Q1202	Transistor	2N43A	GE	1	1	7.70	7.70
11	Q1203	Transistor	2N169A	GE	1	1	4.38	4.38
12	J1201	Connector		Amphenol 126-214	1	1	2.63	2.63

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