DETAILED DESIGN PACKAGE

FOR

DESIGN OF A VIDEO SYSTEM PROVIDING OPTIMAL VISUAL INFORMATION FOR CONTROLLING PAYLOAD AND EXPERIMENT OPERATIONS WITH TELEVISION

PREPARED FOR:

NASA
JOHNSON SPACE CENTER
HOUSTON, TEXAS

SUBMITTED BY:

RCA
ASTRO-ELECTRONICS DIVISION
PRINCETON, N. J.

CONTRACT No. NAS 9-14266
JUNE 30, 1975

DETAILED DESIGN PACKAGE

FOR

DESIGN OF A VIDEO SYSTEM PROVIDING OPTIMAL VISUAL INFORMATION FOR CONTROLLING PAYLOAD AND EXPERIMENT OPERATIONS WITH TELEVISION

PREPARED FOR:

NASA
JOHNSON SPACE CENTER
HOUSTON, TEXAS

SUBMITTED BY:

RCA
ASTRO-ELECTRONICS DIVISION
PRINCETON, N. J.

CONTRACT NO. NAS 9-14266
JUNE 30, 1975

PREFACE

This Design Package is submitted in accordance with Item 7 of the Data Requirement list of JSC contract NAS 9-14266 by the RCA Astro-Electronics Division (AED). The material contains documentation for the breadboard equipment both as configured for the simulation testing and for the delivered complement. The block diagrams and specification of the recommended system are also provided.

TABLE OF CONTENTS

Section		Page
I	INTRODUCTION AND SUMMARY	I-1
II	SIMULATION TEST SET	II-1
III	DELIVERABLE EQUIPMENT	III-1
IV	RECOMMENDED EQUIPMENT	IV-1
V	EQUIPMENT SPECIFICATION	V-1

Appendicies

A	Simulator Mechanical Sketches	
B	Simulator Apparatus Electrical Sketches .	
C	Breadboard TV System Documentation	

I. INTRODUCTION AND SUMMARY

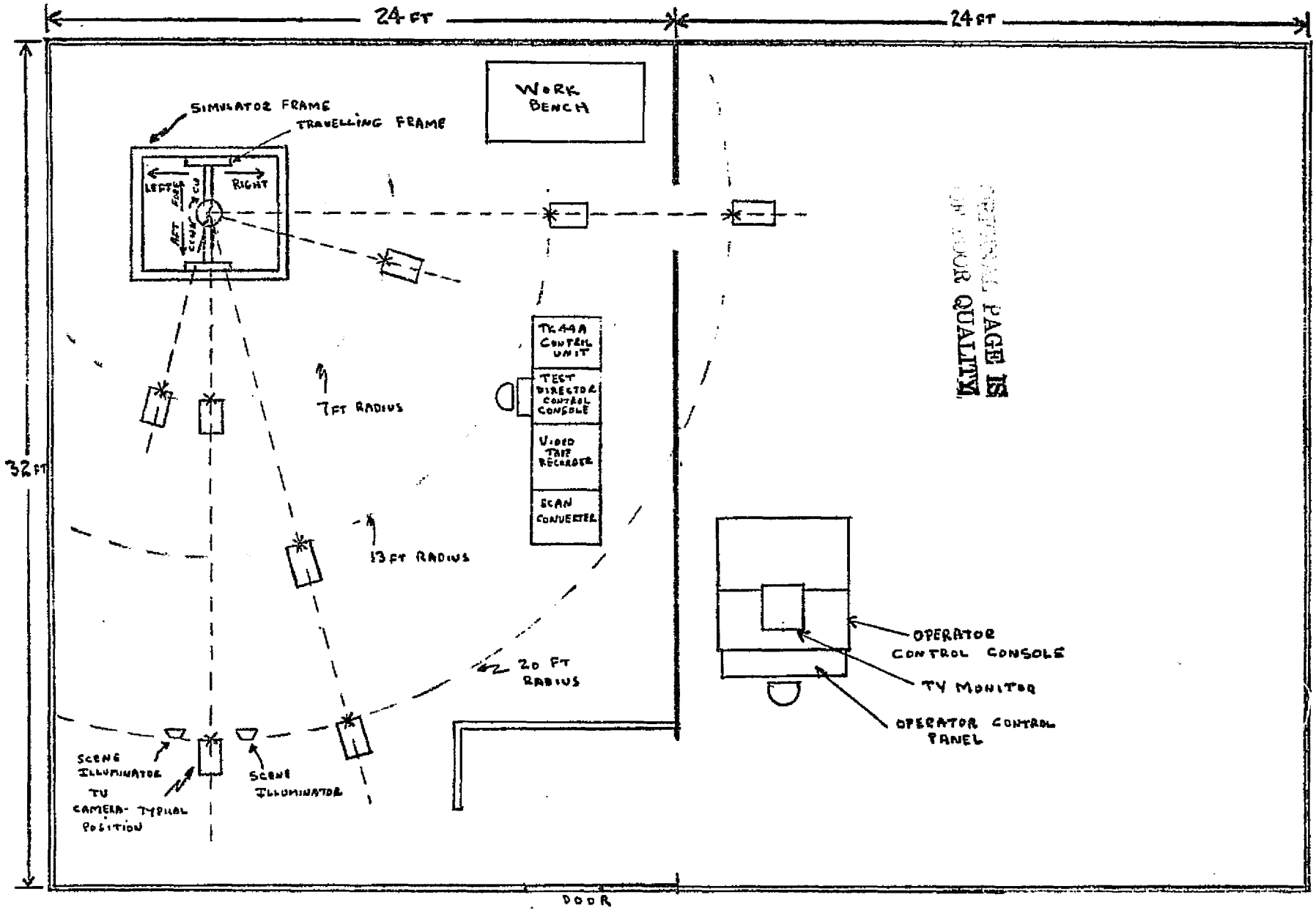
The detailed description of the effort performed under contract NAS 9-14266 is contained in two technical reports delivered at the Preliminary Design Review (PDR) and Critical Design Review (CDR), First and Second Engineering Design Reports respectively, and in the Final Report submitted jointly with this design package.

The material contained in the four subsequent sections of this package contains system descriptions, design data, and specifications for the recommended 2-view system. Section II contains diagrams relating to the simulation test configuration of the 2-view system. System III contains descriptions and drawings of the deliverable breadboard equipment. A description of the recommended system is contained in Section IV with equipment specifications in Section V.

II. SIMULATION TEST SET-UP

The simulation test arrangement is shown in Figure II-1. The operator test set-up, located to the right of the curtain partition, is shown in Figure II-2, where the two 17 inch monitors are used for viewing. (The deliverable equipment will consist of two 9 inch monitors, rack mounted.)

The camera, simulation apparatus, and control rack is located on the opposite side of the partition. Photographs of the simulator apparatus are shown in Figure II-3. Figure II-4 contains photographs of the control rack and TV cameras used to provide the two views of the scene. For convenience in test sequencing the color camera (with chrominence off) was used to provide the second view. The interconnection arrangement for the 2-view system is contained in the block diagram of Figure II-5. Note that a second control panel is included to permit repositioning of the test piece during testing. This panel is visible below the frame in the upper photograph of Figure II-3.



SCALE: 3/16 IN = 1FT.

Figure II-1. Simulation Test Arrangement

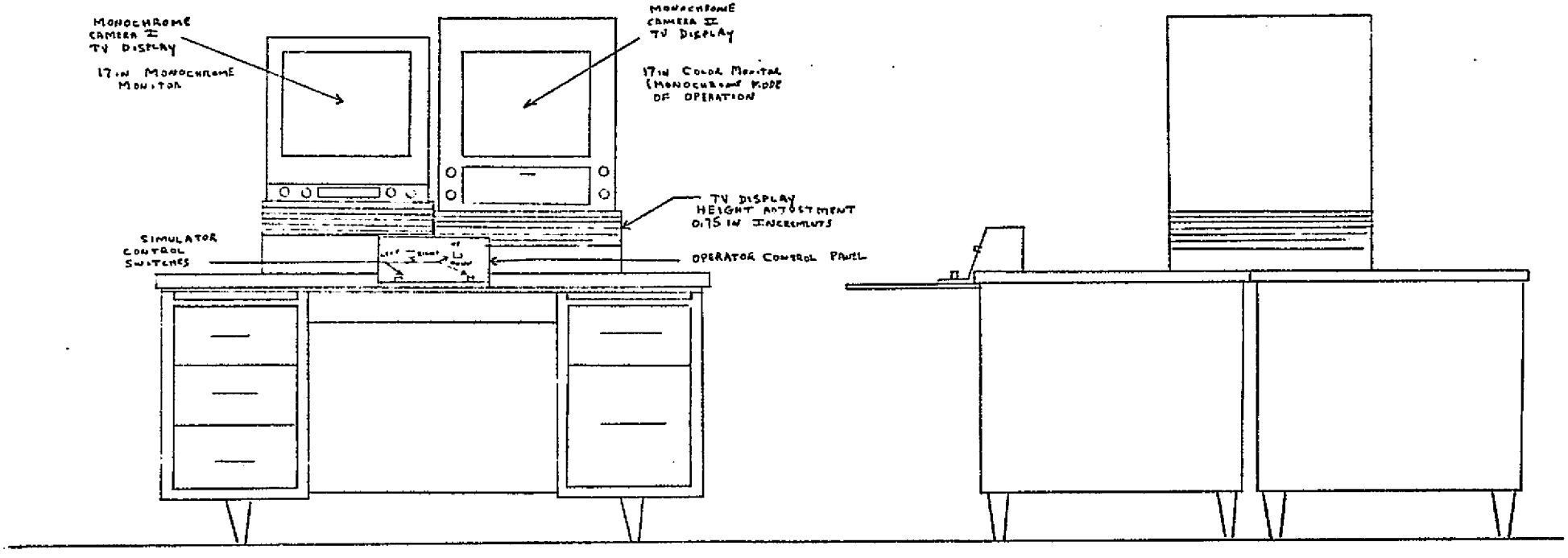
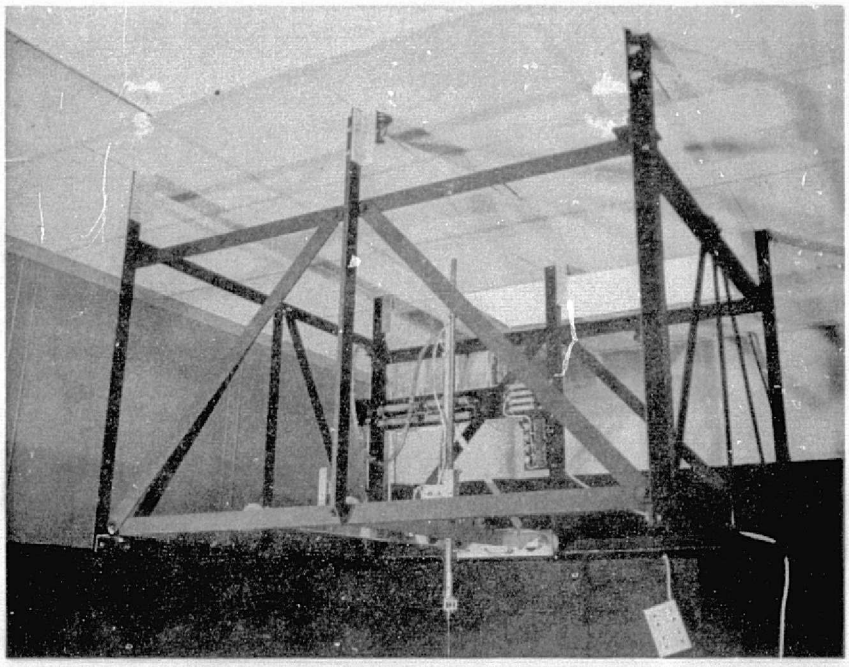


Figure II-2. Operator Test Set-Up



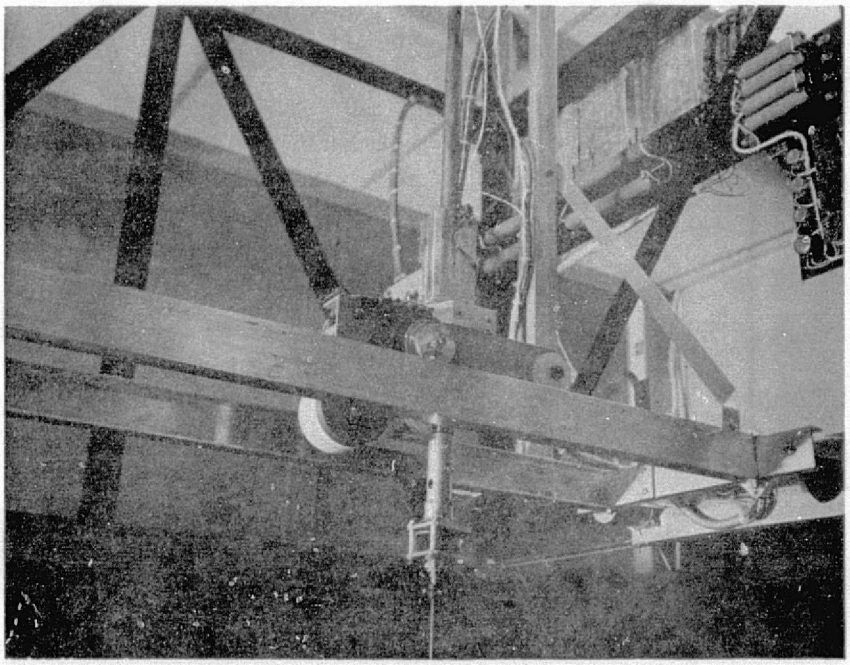
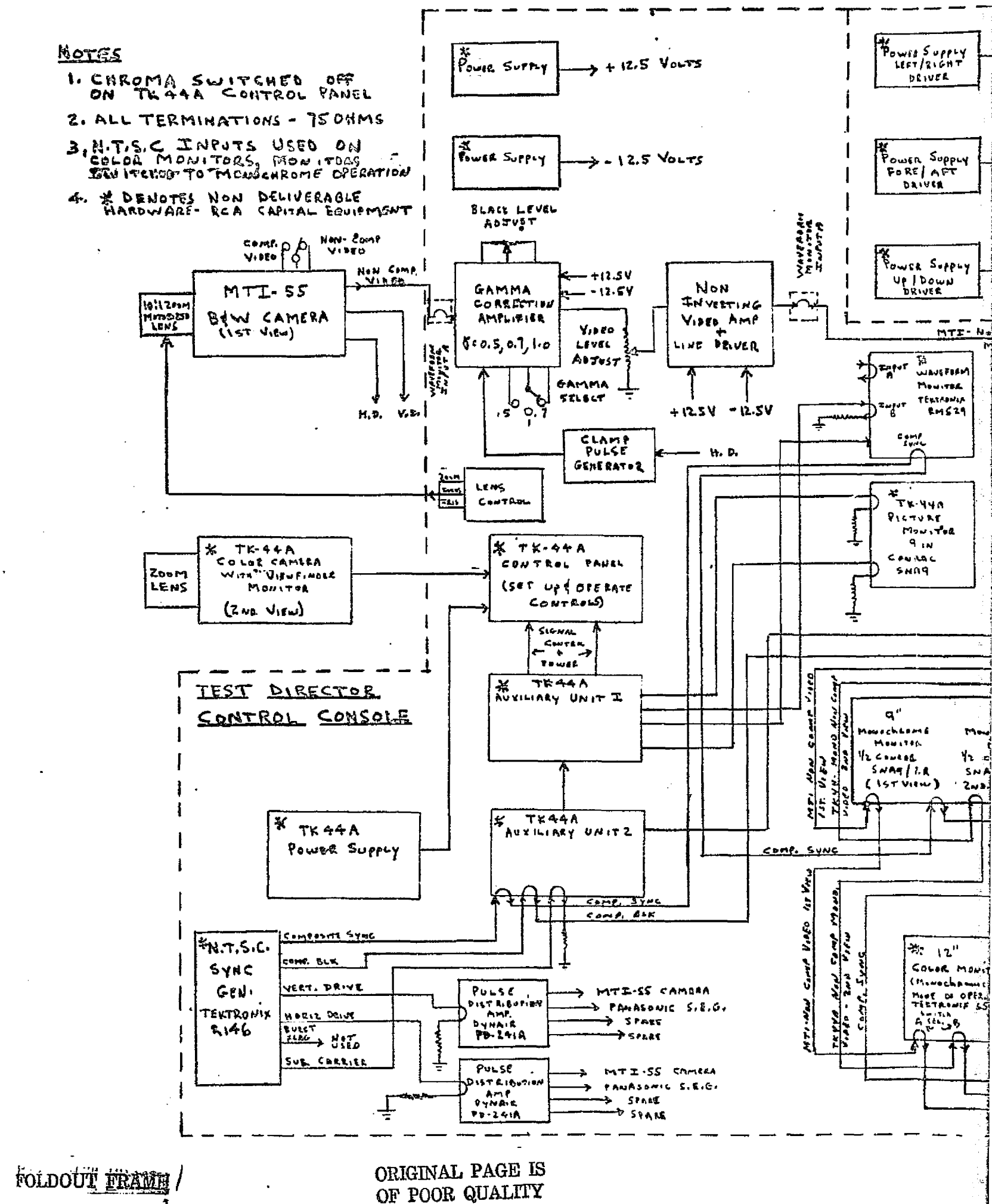


Figure II-3. Simulator Apparatus



FOLDOUT FRAME

ORIGINAL PAGE IS
OF POOR QUALITY

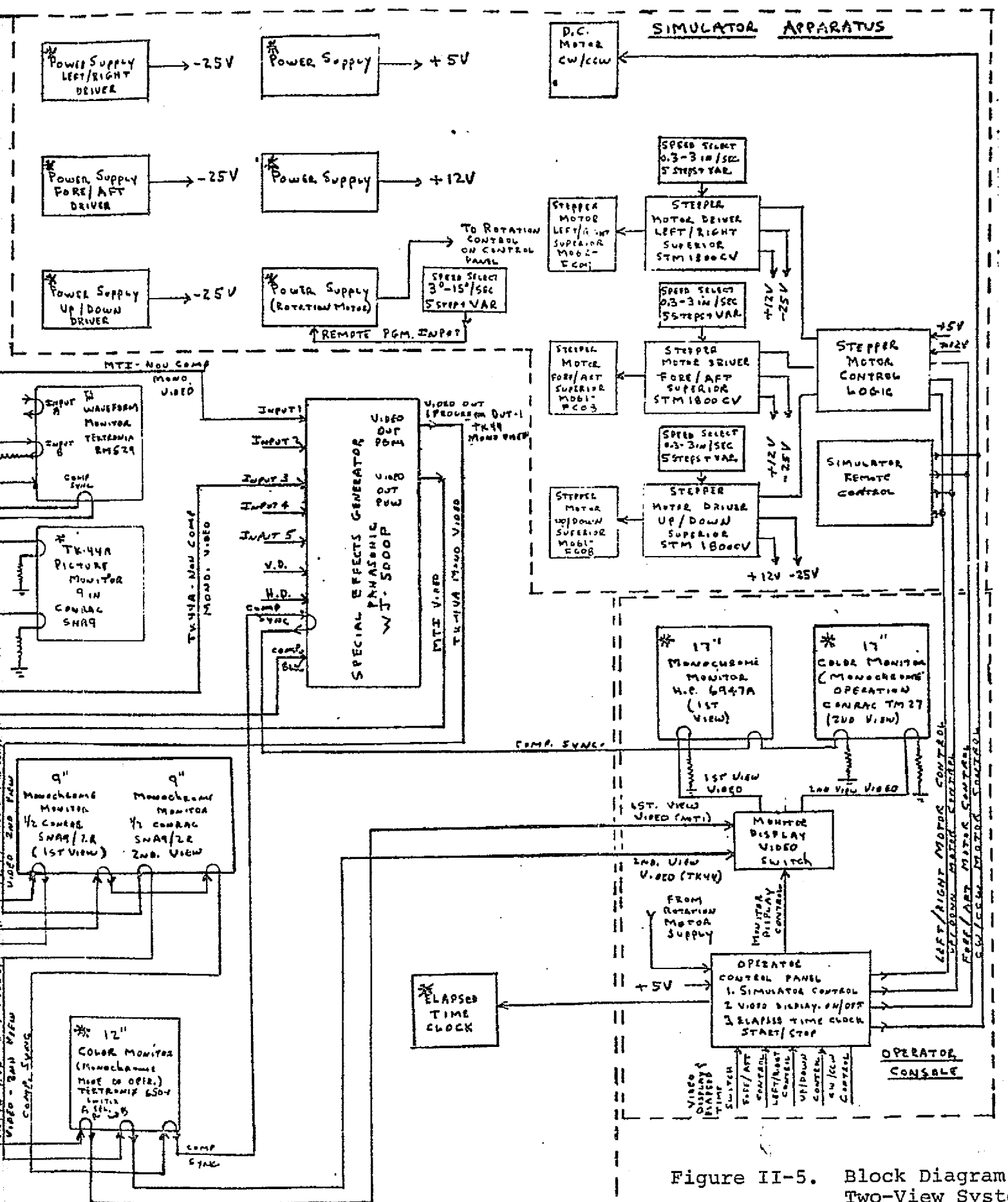


Figure II-5. Block Diagram, Two-View System

FOLDOUT FRAME 2

III. DELIVERABLE EQUIPMENT

The deliverable 2-view breadboard system is shown in functional form in Figure III-1. The major elements consist of the simulation apparatus, the TV cameras, and the control rack.

The simulator apparatus, designed and constructed by AED, is documented mechanically by the engineering sketches listed in Table III-1. Copies of all mechanical sketches are contained in Appendix A. The equipment is self-contained with the exception of six power supplies required to operate the control electronics and motors. These supplies are not included in the list of deliverable items (see Table III-2 for characteristics).

Electrical documentation for the simulator apparatus is listed in Table III-3. Engineering sketches generated by AED are contained in Appendix B; instruction sheets as available will be delivered separately.

Documentation for the deliverable control rack and camera equipments are listed in Table III-4. Engineering sketches listed in the table are contained in Appendix C. Vendor supplied items are described in instruction sheets or operations manuals and will be supplied in a separate package.

Camera and lens instruction manuals are vendor supplied items and will be supplied separately. Interconnection wiring for these items are contained in the rack interconnection diagram.

TABLE III-1. SIMULATOR APPARATUS SKETCHES - MECHANICAL

X-Y Drive, Simulation Test Mechanism	SK 2284406
Frame [2 Sheets]	2284378
Tie Member	2273452
Bearing Housing Details [2 Sheets]	2288013
Angle Strut	2273451
Spacers	2273442
Idler Shaft	2273456
Idler Wheel	2273455
Drive Shaft	2273450
Drive Wheel	2273446
Drive Wheel, Free End	2273447
Y-Axis Drive	2288010
Spacer	2273454
Coupling	2273453
Rotation Drive & PL [3 Sheets)	2282449
Y-Axis Idler	2273443
Y-Axis Carriage	2282467
POT Mounting Details	2273458
Spring Compression, Z-Axis Shaft Stabilizer	2273457
Z-Axis Shaft	2273449
Z-Axis (Detail Parts) [2 Sheets]	2273448
Ball Nut Adaptor	2273445
Jam Nut	2273444
Z-Axis Drive Housing	2282468
Z-Axis Drive, and PL [3 Sheets]	2282450
Rotation Drive Details	2288000
Drive Wheel, Y-Axis	2273471
Gear, Modified	2273472
Y-Axis Supports	2282707

TABLE III-2. SIMULATOR APPARATUS POWER SUPPLY REQUIREMENTS

USE	CHARACTERISTICS
X-Axis Motor Travel	25 Volts, 10 Amperes
Y-Axis Motor Travel	25 Volts, 10 Amperes
Z-Axis Motor Travel	25 Volts, 10 Amperes
Logic Circuits	12 Volts, 1 Ampere
Logic and Lamp Power	5 Volts, 3 Ampere
Rotation Motor Power	24 Volts, 1 Ampere, Remote Programable

TABLE III-3. SIMULATOR APPARATUS DOCUMENTATION - ELECTRICAL

ITEM	DOCUMENTATION/VENDOR PART
Interconnection Diagram - Simulator	SK 2288237
Simulator Remote Control Box	2282794
Stepper Motor Remote Control Logic	2288238
Stepper Motor Control Logic - Board Layout A1	2273622
Translator Modules (3) Slo-Syn	STM 1800CV
Fore/Aft Motor Slo-Syn	MC061-FC08
Up/Down Motor Slo-Syn	MC061-FC08
Left/Right Motor Slo-Syn	M062-FC09
Rotation Motor, Clifton Precision	7805-AA
Switches [Speed Controls]	SK 2288237

TABLE III-4. CONTROL RACK DOCUMENTATION

ITEM	DOCUMENTATION/VENDOR PART
Video System Rack Layout	SK 2282789
Video System Interconnection Diagram	SK 2288234
Interconnection Diagram - Video Processor	SK 2282790
Master Gain Module - Schematic & Assy	SK 2288235
Gamma Select - Assy	SK 2282791
Gamma Select - Schematic	SK 2288236
Simulator Control	SK 2286792
AC Control Panel - Schematic	SK 2273623
Jack Panel Assy	SK 2282793
RCA Processor Module [Modified] Gamma Amplif & Clamp	RCA MI-557789
Monitors/CONRAC	SNA9/2R
Special Effects Generator/ Panasonic	WJ-5000P
Pulse DA/Dynair (2)	PD 241/A
Cameras/MTI (2)	MTI-55
Zoom Lenses/Cannon (2)	V10X15R
Zoom Lens Control Boxes (2)	6-20161-N2

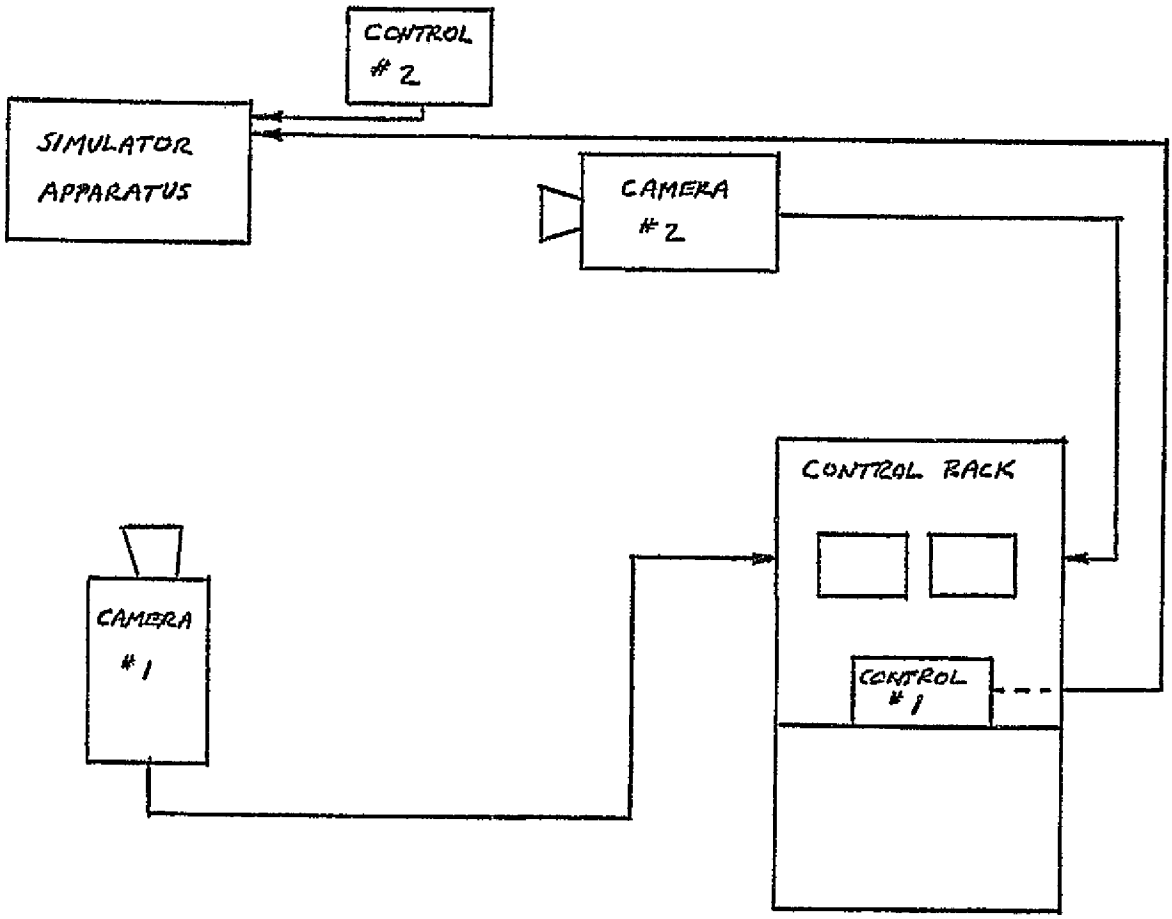


Figure III-1. Breadboard Equipment Arrangement

IV. RECOMMENDED EQUIPMENT

The recommended equipment complement, termed a 2-view system, is shown in block form in Figure IV-1. The system is configured assuming a single operations location, and may be expanded to include several locations. For additional locations, one or more additional cameras allowing direct line of sight by 2 cameras offset, in general, by 75 to 90 degrees is assumed.

The cameras will be equipped with zoom lenses with sufficient range to provide an overall perspective of the work area at the short focal length extreme and adequate detail at the long focal length extreme. Detail will generally be adequate when the smallest element of interest is represented by about 3-to-5 picture elements. Travel time between the two extremes should be short so that perspective information is retained by the operator after the close-up view is available.

Iris and focus lens controls are available and, as for the zoom, will be adjustable from the operator control station. Generally, scene illumination should be such that the iris is several f-stops down from maximum to provide good depth of field. Focus adjustment will not be critical, then, and repeated tweaking will not be required.

Changes in light level will be accommodated by the camera with automatic adjustment of the ALC function. Depending on the scene, this function may be operated in the peak mode, to prevent highlight overload, or in the average mode, to permit better visibility of the darker portions of the scene.

Gamma correction is also incorporated in the video channel to improve visibility of darker areas of the scene. This type of circuitry "stretches" blacks and emphasizes noise so that high quality pre-amplifiers are required.

The cameras are mounted on pan/tilt units to permit pointing at the work volume and framing of the area(s) of interest on close-ups. Rates of motion are variable to permit rapid adjustment and accurate settings where alignment aids are used.

All remote adjustments are made by the operator at a control panel. Control signals issued by the operator are encoded and multiplexed with master sync signals in the controller electronics. These are fed to the cameras via a video coax line (one line per camera)where they are separated and decoded for implementation of the control information.

The video signal from the camera is fed via coax line to the processor unit. The processor incorporates the funcions of line equalization, video switching and routing, and distribution amplification. In general, a multiplicity of cameras will be used 2 at a time with the appropriate video selected and routed to either of the two monitors.

The monitors are mounted in front of the operator at a distance permitting visual observation with no less than 2 minutes of arc per picture element. At a viewing distance of 20 inches, a 9-inch monitor is employed. Adjustable brightness to at least 100 foot-lamberts is provided, with spot size no larger than 0.7 of the scan line pitch to provide essentially full reproduction of the video signal.

The following section contains the specifications for equipment providing the required characteristics.

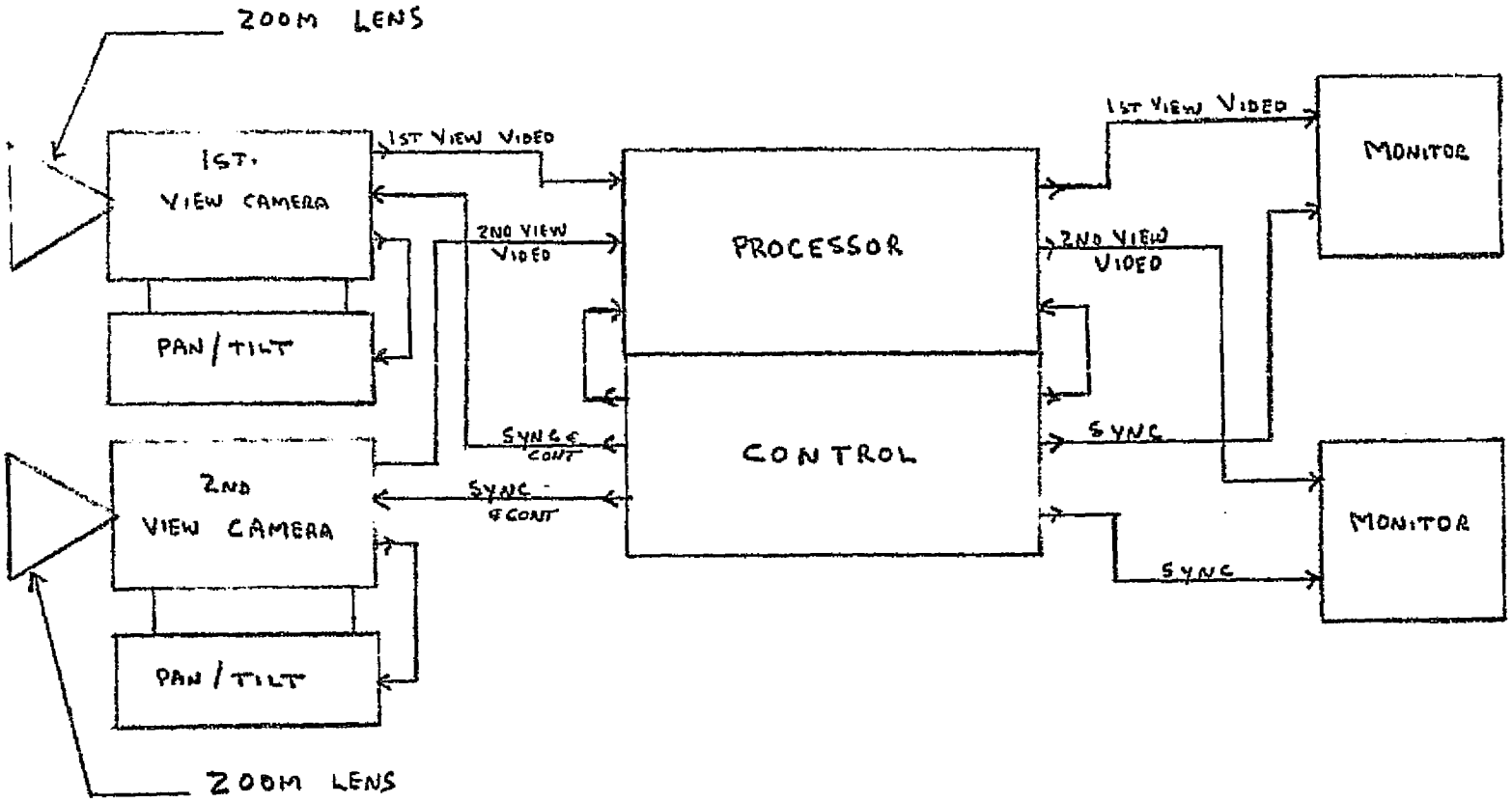


Figure IV-1. Two-View System Functional Block Diagram

SPECIFICATION

FOR

A TELEVISION SYSTEM FOR CONTROLLING PAYLOAD AND EXPERIMENT OPERATIONS

SPECIFICATION

TABLE OF CONTENTS

Section			Page
1	SCOPE		V-1
2	GENERAL REQUIREMENTS		V-1
3	TV CAMERA		V-1
	3.1 General		V-1
	3.2 Physical Requirements		V-2
	3.2.1 Mechanical		V-2
	3.2.2 Optical		V-2
	3.2.3 Modularity		V-2
	3.3 Functional Requirements		V-2
	3.3.1 Scan		V-2
		3.3.1.1 Direction	V-2
		3.3.1.2 Scan Line Rate	V-2
		3.3.1.3 Field Scan Rate	V-3
		3.3.1.4 Scan Lines	V-3
		3.3.1.5 Aspect Ratio	V-3
		3.3.1.6 Scan Rate Tolerance	V-3
		3.3.1.7 Blanking Intervals	V-3
	3.3.2 Camera Video Output		V-3
		3.3.2.1 Polarity	V-3
		3.3.2.2 Impedance	V-3
		3.3.2.3 Composite Signal	V-3
		3.3.2.4 Levels	V-4
	3.3.3 Controls		V-4
		3.3.3.1 Camera Identification	V-4
		3.3.3.2 Power	V-4
		3.3.3.3 Automatic Light Control	V-4
		3.3.3.4 Focus	V-5

TABLE OF CONTENTS (Continued)

Section			Page
		3.3.3.5 Iris	V-5
		3.3.3.6 Zoom	V-5
		3.3.3.7 Azimuth	V-5
		3.3.3.8 Elevation	V-5
		3.3.3.9 Spares	V-6
	3.4 Performance		V-6
	3.4.1 Sensitivity		V-6
	3.4.2 Operating Light Range		V-6
	3.4.3 Automatic Light Control (ALC)		V-6
	3.4.4 Iris Range		V-6
	3.4.5 Dynamic Range		V-7
	3.4.6 Signal-to-Noise Ratio (SNR)		V-7
		3.4.6.1 Non-Coherent Noise	V-7
		3.4.6.2 Coherent Noise	V-7
	3.4.7 Resolution		V-7
		3.4.7.1 Center Resolution	V-7
		3.4.7.2 Edge Resolution	V-7
	3.4.8 Geometric Distortion		V-7
	3.4.9 Shading		V-8
	3.4.10 Power Consumption		V-8
	3.5 Environmental		V-8
	3.5.1 Temperature		V-8
	3.5.2 Operating Pressure		V-8
	3.5.3 Vibration, Shock and Acceleration		V-8
	3.5.4 Sun Exposure		V-8
4	PAN/TILT UNIT		V-9
	4.1 General		V-9
	4.2 Physical Requirements		V-9
	4.2.1 Mechanical		V-9
	4.3 Functional Requirements		V-9
	4.3.1 Coverage		V-9

TABLE OF CONTENTS (Continued)

Section			Page
		4.3.2 Rates	V-9
		4.3.3 Interference	V-10
		4.3.4 Drive Quality	V-10
	4.4	Performance	V-10
		4.4.1 Azimuth Range	V-10
		4.4.2 Elevation Range	V-10
		4.4.3 Rates	V-10
		4.4.4 Power	V-10
	4.5	Environmental	V-10
5	TV MONITOR		V-11
	5.1	General	V-11
	5.2	Physical Requirements	V-11
		5.2.1 Mechanical	V-11
		5.2.2 Electrical	V-11
	5.3	Functional Requirements	V-11
		5.3.1 Synchronization	V-11
		5.3.2 Controls	V-12
		5.3.3 Video	V-12
	5.4	Performance	V-12
		5.4.1 Brightness	V-12
		5.4.2 Contrast Ratio	V-12
		5.4.3 Resolution	V-12
		5.4.4 Picture Quality	V-12
		5.4.5 Geometry	V-13
		5.4.6 Video Channel	V-13
	5.5	Environmental	V-13
		5.5.1 Temperature	V-13
		5.5.2 Operating Pressures	V-13
		5.5.3 Vibration, Shock and Acceleration	V-13

TABLE OF CONTENTS (Continued)

Table			Page
6	CONTROL UNIT		V-14
	6.1	General	V-14
	6.2	Physical Requirements	V-14
		6.2.1 Mechanical	V-14
		6.2.2 Electrical	V-14
	6.3	Functional Requirements	V-15
		6.3.1 Controls and Commands	V-15
		6.3.1.1 Power	V-15
		6.3.1.2 Video Select	V-15
		6.3.1.3 Gamma Correction	V-15
		6.3.1.4 Camera Identification	V-16
		6.3.1.5 Automatic Light Control (ALC)	V-16
		6.3.1.6 Focus	V-16
		6.3.1.7 Iris	V-16
		6.3.1.8 Zoom	V-16
		6.3.1.9 Azimuth and Elevation	V-16
		6.3.2 Synchronization	V-17
		6.3.3 Levels	V-17
	6.4	Environmental	V-17
7	PROCESSOR		V-18
	7.1	General	V-18
	7.2	Physical Requirements	V-18
		7.2.1 Mechanical	V-18
		7.2.2 Electrical	V-18
	7.3	Functional Requirements	V-18
		7.3.1 Line Equalization	V-18
		7.3.2 Switching	V-19
		7.3.3 Gamma Correction	V-19

TABLE OF CONTENTS (Continued)

Section			Page
	7.3.4	Distribution Amplifiers	V-19
7.4	Performance		V-19
	7.4.1	Frequency Response	V-19
	7.4.2	Waveform Distortion	V-19
	7.4.3	Gain	V-20
	7.4.4	Signal-to-Noise Ratio	V-20

V. EQUIPMENT SPECIFICATION

1. SCOPE

This Specification is intended to define the characteristics of the TV system recommended for spacecraft use to control payloads and experiments. The specified two-view monochrome system was selected as a result of analyses, tests, and trade-off studies. The specification deals with the major elements of the equipment, including physical characteristics and major electrical interface requirements.

2. GENERAL REQUIREMENTS

The two-view system is intended to provide television coverage of remote operations. Therefore, the equipment shown in block form in Figure IV-1 is divided into local and remote segments The cameras and pan/tilt units are remote from the operator controlling the operation, while the monitors, control unit and processor are located in the immediate vicinity of the operator. While the general installation may consist of two or more two-view camera set-ups, it is assumed that only the control unit and processing complexity would be affected, and the specified characteristics of this document would be largely unaffected.

3. TV CAMERA

3.1 General. The camera consists of a sensor assembly and a zoom lens, attachable without disassembly of the sensor assembly. The lens contains motors and drive provisions to permit adjustment of focal length (zoom), iris, and focus. The sensor assembly consists of the light sensitive device together with scanning, signal amplifying and processing circuitry; synchronizing, timing, and decoding circuitry; and power supply and conditioning circuits.

3.2 Physical Requirements

3.2.1 Mechanical. The camera, excluding lens, shall occupy a volume no larger than 5 x 7 x 13 inches and shall weigh a maximum of 11 pounds. The lens shall be attachable via a standard "C" mount arrangement; a single electrical connector shall be employed for lens adjust motor drives. The nominal zoom lens is estimated to add no more than 3 pounds and 5 inches to the 13-inch long sensor assembly.

3.2.2 Optical. The zoom lens shall have a focal length range of from 15-to-150 millimeters corresponding to an angular width-of-view of 46-to-4.8 degrees. The open iris lens relative aperture shall be f/2.5 or smaller. A minimum aperture range of 30-to-1 shall be obtainable via the iris adjustment.

3.2.3 Modularity. The camera shall be designed with a high degree of modularity to permit replacement of elements with a minimum of set-up and adjustment. The lens assembly in particular shall be replaceable from the exterior of the camera case and will require no adjustment, other than focus, to achieve normal operation.

3.3 Functional Requirements

3.3.1 Scan

3.3.1.1 Direction. The camera scan will be in a direction such that the scene will be readout top-to-bottom and left-to-right as the scene is viewed.

3.3.1.2 Scan Line Rate. The scan rate (horizontal rate) will be nominally 15,734 scan lines per second. Phase and frequency lock to the externally provided sync signal will be maintained.

3.3.1.3 Field Scan Rate. The field scan rate (vertical rate) will be 1/262.5 of the horizontal rate or about 59.94 fields per second. Phase and frequency lock to the externally provided sync signal will be maintained.

3.3.1.4 Scan Lines. There will be 262.5 scan lines per field resulting in 525 interlaced scan lines per frame, with a frame defined as two successive fields.

3.3.1.5 Aspect Ratio. The total area occupied by the picture will consist of four units of horizontal dimension and three units of vertical dimension, an aspect ratio of 4:3.

3.3.1.6 Scan Rate Tolerance. Refer to Federal Communications Commission standards for synchronization.

3.3.1.7 Blanking Intervals. Refer to waveforms in reference 3.3.1.6.

3.3.2 Camera Video Output

3.3.2.1 Polarity. The video polarity, defined as the potential of a black area of a scene relative to a white area, shall be black negative.

3.3.2.2 Impedance. The standard load impedance on the single-ended video line shall be a nominal 75 ohms. The output impedance of the video line shall be constant to within $\pm$5 percent over the useful video band.

3.3.2.3 Composite Signal. The composite video is the signal resulting from the combination of video and synchronizing (sync) signals. (The location of the combining of the sync to the video signal, internal to the camera or in the processing equipment,

is not constrained by the camera operation. The description of the video level is given with the presumption that the signal is composite at the camera output.)

3.3.2.4 Levels. The blanked picture signal with setup, as measured from blanking-to-peak-white across the standard load impedance, shall be 0.714 ±0.1 volt (100 IRE units). The sync signal shall be 0.286 ±0.05 volt (40 IRE units). The standard setup is 7.5 ±5 IRE units. The composite signal, then, is nominally 140 IRE units from sync-tip to peak-white. (See document 58 IRE 23.51 for method of measurement.)

3.3.3 Controls

3.3.3.1 Camera Identification. The camera identification and control information will be fed to all cameras on the sync line. The camera controls will operate only when the particular camera is addressed. The particular camera code number will be established prior to installation, and after removal may be changed by simple adjustment such as via plug-in board replacement or switch setting.

3.3.3.2 Power. The camera power control ON signal will result in the application of power to the camera (tentatively established as +24 to +33 volts dc). The power OFF signal will result in the removal of dc power and turn the camera off.

3.3.3.3 Automatic Light Control. Three-position control is required. The camera modes resulting from the three-position signal are ALC peak-Mode, ALC Average-Mode, and ALC Disable. The third control signal shall result in disabling the ALC feedback loop and allowing the sensor to operate with maximum sensitivity for any input light level.

3.3.3.4 Focus. Lens focus will be accomplished via this control. The control information will result in the lens focus motor rotating to accomplish a closer or farther focus position of the lens. The rate of focus adjustment will permit complete travel in 20 seconds.

3.3.3.5 Iris. Lens iris adjustment will be accomplished via this control. The control information will result in the lens iris motor rotating to open or clsoe the iris in response to the control information. The rate of iris adjustment will permit complete travel in 10 seconds.

3.3.3.6 Zoom. Lens field-of-view adjustment will be accomplished via this variable rate control. The control information will result in the zoom motor rotating to shorten or lengthen the lens focal length, at rates sufficient to encompass the complete zoom range in from 3-to-15 seconds.

3.3.3.7 Azimuth. This control information will be decoded by the particular camera being addressed and fed to the corresponding azimuth/elevation drive mechanism. The decoded information will contain direction (left or right) and rate information. Power for the azimuth drive circuitry (external to the camera) will be derived from, or controlled by, the camera circuitry and applied in response to the camera ON/OFF control signal.

3.3.3.8 Elevation. This control information will be decoded by the particular camera being addressed and fed to the corresponding azimuth/elevation drive mechanism. The decoded information will contain direction (up or down) and rate information. Power for the elevation drive circuitry, which is external to the camera, will be derived from, or controlled by, the camera circuitry and applied in response to the camera ON/OFF control signal.

3.3.3.9 Spares. Three additional control functions are assumed but not yet defined. These may include, for example, test signal ON/OFF or heater power ON/OFF. It is assumed that these signals are bi-level in nature.

3.4 Performance

3.4.1 Sensitivity. The camera shall be capable of providing an output video signal-to-noise ratio (snr) of 35 dB when the camera is viewing a scene containing a highlight of 1.0 foot-lamberts. The snr is defined as the ratio of peak-to-peak signal to rms noise within a 2 MHz bandwidth. For purposes of this measurement, the rms noise may be considered as 1/6 of the peak-to-peak noise. The observation/measurement of noise may exclude any coherent noise in the signal. Aperture compensation required to meet any of the following performance specifications shall be operative for confirming measurements of this and the following performance elements.

3.4.2 Operating Light Range. The camera must be capable of operating over a total scene highlight brightness range of 1.0 to 10,000 foot-lamberts. The snr shall be at least 35 dB over this range.

3.4.3 Automatic Light Control (ALC). ALC circuitry shall be incorporated to permit operation over a 1000:1 range of scene illumination. When operative, the circuitry will function on average scene brightness or in a peak mode (5 percent, or more, field-of-view for peak scene brightness).

3.4.4 Iris Range. The operating range of the iris shall provide a light range of 900:1. A range of f/2.2 to f/66 may be considered typical.

3.4.5 Dynamic Range. With the ALC in peak mode and the camera viewing a static scene, the camera shall be capable of providing an output signal, black-to-white, which encompasses a 32-to-1 range of scene brightness (11 EIA logarithmic shades of gray).

3.4.6 Signal-to-Noise Ratio (SNR)

3.4.6.1 Non-Coherent Noise. The output snr shall be at least 35 dB for a 2 MHz bandwidth over the operating light range, exclusive of any coherent noise components in the signal.

3.4.6.2 Coherent Noise. The ratio of peak-to-peak output signal to peak-to-peak coherent noise in a 2 MHz bandwidth shall be at least 1000. (Compliance may be considered adequate if the noise is not perceptible in a normally adjusted monitor picture.)

3.4.7 Resolution

3.4.7.1 Center Resolution. The horizontal resolution shall be at least 80 percent at 200 TV lines. (The central vertical stripes on a RETMA chart may be used for the measurement.) Limiting resolution as viewed on a monitor display of a RETMA chart shall be 350 TV lines per picture height for the center horizontal and vertical wedges.

3.4.7.2 Edge Resolution. Numerical values shall be 80 percent of the requirements for center resolution. Response at 200 TV lines on the corner wedges shall be 65% and limiting resolution shall be 280 lines per picture height.

3.4.8 Geometric Distortion. The displacement of any element in a center, 80% ellipse, shall be no more than 3% of picture height, and no more than 5% for the remaining area. (A design objective shall be less than 2% distortion for the entire raster).

3.4.9 Shading. Black or white shading shall not exceed 10% within the 80% ellipse and shall not exceed 20% for the remainder of the raster. Shading is defined as a percentage of the video signal in the center of the picture for a 300 nanoampere output excursion. The measurement may be made neglecting, or subtracting, the effects of lens produced shading components.

3.4.10 Power Consumption. The TV camera shall require no more than 15 watts for operation at +28 volts.

3.5 Environmental

3.5.1 Temperature. Environmental temperature conditions are not specified. It is assumed, however, that an extreme temperature range may be encountered and that heaters and/or coolers may be required to maintain a safe operating temperature range.

3.5.2 Operating Pressure. It must be assumed, for camera design and modularization, that for some remote operations, critical pressure will be experienced. Potting materials and interconnection should be designed for operation in any environmental pressure. Approximately normal atmospheric gas content should be assumed.

3.5.3 Vibration, Shock and Acceleration. Vibration, shock, and acceleration should tentatively be based on worst case Apollo-camera test values, see RCA Dwg. No. PS-2260580.

3.5.4 Sun Exposure. Inadvertent imaging of the sun may occur. The camera performance should recover within one minute following a maximum 30 seconds exposure to the sun, and undegraded performance should then be available.

4. PAN/TILT UNIT

4.1 General. The pan/tilt unit is a remotely controlled azimuth/elevation mount for the TV camera that permits control of camera pointing angle from a remote location. The pan/tilt unit electronics will receive power via the command decode circuitry in the TV camera. The camera will also provide decoded azimuth and elevation signals to the pan/tilt unit.

4.2 Physical Requirements

4.2.1 Mechanical. The form factor of the pan/tilt unit may depend on the available spacecraft volume. A realistic maximum volume of 960 cubic inches is specified as being representative of a typical installation for a form factor of 12-by-10-by-8 inches. The unit weight shall not exceed 10 pounds.

While in orbit maintenance or replacement of a TV camera is not a planned operation, the camera-to-pan/tilt unit interface shall be of simplified design to permit emergency replacement. The camera attachment mechanism shall permit replacement with no more than a single special purpose tool.

4.3 Functional Requirements

4.3.1 Coverage. The pan/tilt unit will be capable of travel adequate to permit camera pointing which will encompass the complete volume for the planned operation or experiment. Limit switches will be employed to restrict the travel to the desired range of elevation and azimuth.

4.3.2 Rates. The typical remote operation will require variable rate operation of the pan/tilt unit. This function may be met with a continuously variable or a series of discrete step rate increments. A range of 5-to-1 in rates is required.

4.3.3 Interference. The pan/tilt unit shall generate no radiated or conducted interference that will be visible in the TV picture.

4.3.4 Drive Quality. Motion shall be smooth and free from apparent jerkiness as judged by viewing a TV monitor during system test.

4.4 Performance

4.4.1 Azimuth Range. In response to pan signals with the limit switches adjusted for maximum range, the azimuth angle will be adjustable to ±170° from the nominal center (zero) position.

4.4.2 Elevation Range. In response to tilt signals with the limit switches adjusted for maximum range, the elevation angle will be adjustable from 60 degrees below-to-90 degrees above the horizontal (zero) position.

4.4.3 Rates. Rates of motion for both pan and tilt shall encompass a range of from 2-to-10 degrees per second. If discrete increments are employed to obtain this range, nominal rates shall be 2, 3, 4.5, 6·7, and 10 degrees per second.

4.4.4 Power. The pan/tilt unit shall consume no more than 10 watts when the motors are stationary. An additional 5 watts, maximum, may be consumed for a motor drive when a pointing adjustment is being made.

4.5 Environmental. The conditions specified in Paragraph 3.5 are applicable to the pan/tilt unit.

5. TV MONITOR

5.1 General. The TV monitor is the functional unit providing the visual display of the remote operation to the monitor. As such it provides the visual interface between the operator and the scene. Therefore, primary emphasis must be given to observer field-of-view, brightness and contrast range. It is assumed for the following paragraphs that the observer viewing distance is in the range of 15-to-30 inches, with a 20 inch nominal distance, and that surround illumination is low, or controllable to a maximum of 25 percent of monitor brightness.

5.2 Physical Requirements

5.2.1 Mechanical. The weight of the TV monitor shall not exceed 15 pounds. The form factor of the monitor will be approximately rectangular in the horizontal and vertical planes and will be contained within a volume of 8-by-8-by-13 inches (width-by-height-by-depth).

5.2.2 Electrical. The monitor will employ an eight inch diagonal, rectangular kinescope with P4 phosphor. The nominal picture format will be 4.8-by-6.4 inches. Normal operation of the monitor will be obtained with a power source of 28 volts, ±10 percent.

5.3 Functional Requirements

5.3.1 Synchronization. The monitor must be capable of precise lock to the synchronization signal. Two switchable operational modes are required. The primary mode will employ a separate 75 ohm coax feed line carrying a composite sync signal to permit monitor phase and frequency lock to the TV signal. The alternate mode requires stripping of the sync signal from the composite video line to effect the same result.

5.3.2 Controls. In addition to the sync mode selector described above, operator accessible controls will include brightness, contrast, and power.

5.3.3 Video. The monitor will be designed to receive the video signal from a 75 ohm coaxial line. The monitor shall provide a 75 ohm termination to the video line. Normal video level on the terminated line is 140 units of composite signal.

5.4 Performance

5.4.1 Brightness. The monitor with implosion shield and any external front surface filter shall provide a highlight brightness of no less than 100 foot-lamberts, termed reference brightness. The brightness level control shall provide an adjustment range of no less than 20-to-1.

5.4.2 Contrast Ratio. The monitor shall provide a contrast ratio of 10-to-1, minimum, at reference highlight brightness with an incident surround light level of 25 foot-candles. The contrast control shall have a minimum range of 20-to-1. At reference highlight, with low surround lighting, the monitor shall be capable of displaying a contrast ratio of 50-to-1 minimum.

5.4.3 Resolution. The horizontal MTF, without aperture compensation, shall be a minimum of 0.8 at a packing density of 75 TV lines per inch. Vertical resolution shall be the same as horizontal (circular spot cross section) except as modified by the scan line process.

5.4.4 Picture Quality. No low frequency streaking shall be observable for a 100 percent video step. Ringing, undershoot or overshoot, shall not be discernible at transitions equivalent to full amplitude at the system resolution of 360 TV lines

per picture height. With a blank raster spurious background patterns shall be less than 0.05 of reference brightness.

5.4.5 Geometry. Non-linearities in horizontal or vertical directions shall be less than 2 percent of the format.

5.4.6 Video Channel. In addition to the requirements imposed by the previous performance paragraphs, the video channel shall be flat to within 1 dB up to 5 megahertz at any control setting and shall be capable of full kinescope drive at 30 percent video level.

5.5 Environmental

5.5.1 Temperature. The monitor shall operate within specification for an ambient of from 0-to-50 degrees Centigrade.

5.5.2 Operating Pressures. The monitor is intended for operation in a nominal pressure environment. However, exposure to vacuum for extended periods shall not result in degradation. Compliance may be demonstrated by 12 hours exposure at vacuum/temperature extremes of -10 and +60 degrees Centigrade.

5.5.3 Vibration, Shock, and Acceleration. Paragraph 3.5.3 shall apply.

6. CONTROL UNIT

6.1 General. The control unit is the functional segment of the TV system that enables operator control of the TV cameras, generates signals for routing of video information, and master synchronization of the system. Together with a companion processing unit, which it is assumed will share a mounting location, it provides all of the remaining electrical functions not contained in the cameras and monitors.

6.2 Physical Requirements

6.2.1 Mechanical. The control unit will consist of two parts, a control panel and control electronics which may be physically separated. The control panel will contain the switches and potentiometers necessary to provide control information while the control electronics will interpret, format, and encode the information.

The control panel will be contained in a volume of 300 cubic inches or less, consisting of a depth of no more than 2.5 inches and panel dimensions of approximately 10-by-12 inches. Weight shall not exceed 2 pounds.

The control electronics will be contained in a package weighing no more than 6 pounds. The volume of the package will occupy a maximum of 300 cubic inches in a form factor such as 6-by-8-by-6 inches.

6.2.2 Electrical. Normal operation of the control unit will be obtained with a 28 volt, ±10 percent, power source. Power consumption will not exceed 8 watts.

6.3 Functional Requirements

6.3.1 Controls and Commands. Signals generated by activation of controls shall be divided into classes: (1) those signals causing an electronic switch to be activated and thereby affect a video routing or processing change in the processor unit, and (2) those signals which control or activate the TV cameras and their associated pan/tilt units. In the second category, with the exception of the camera power (ON/OFF), all signals will be multiplexed in a format suitable for transmission over a single 75 ohm video line and for efficient decoding at the TV camera locations.

6.3.1.1 Power. An individual toggle switch will be employed for each camera to apply or remove power. Power application will be effected by activating a latching relay to complete the power feed circuit to a particular camera.

6.3.1.2 Video Select. A separate video select pushbutton or switch closure, shall be provided to enable selection and routing of each video signal for feed to either monitor, to a particular transmitter for earth or other satellite feed, to a particular on-board video tape recorder, or any other as yet undefined equipment segment requiring video information. All video switching shall be accomplished during the vertical blanking interval.

6.3.1.3 Gamma Correction. The gamma correction control shall modify the transfer characteristic of the video amplifier(s) in the Processor. The range shall extend from a minimum of at least 0.5 to unity (no correction), and is either continuously variable or will have a minimum of three positions: 0.5, 0.7 and 1.0.

6.3.1.4 Camera Identification. A camera identification, assigned to each camera, will be selected via a control panel switch. The camera identification number will serve to activate a particular camera decode system to enable processing of commands addressed to that camera.

6.3.1.5 Automatic Light Control (ALC). A three position switch is required to generate the multiplexed command. The command will be issued at least twice and then be inoperative until a change is initiated. After decoding, a latching relay arrangement will establish the appropriate ALC mode: (1) peak, (2) average, or (3) out. Reissuance of the same command will not alter the operation of the camera unless a new mode is ordered.

6.3.1.6 Focus. Two commands are required, one to focus the camera lens closer and the other to focus farther. The control will be via a single, return-to-neutral, lever type switch. The command will be encoded and multiplexed with any other simultaneously issued commands and executed at the camera subsequent to decoding.

6.3.1.7 Iris. Two commands are required to open or close the iris. Paragraph 6.2.1.6 is otherwise operative.

6.3.1.8 Zoom. Two variable rate commands are required, one to shorten and the other to lengthen the lens focal length. Coding for a minimum of 5 rates is required and activation via a joystick control is preferred.

6.3.1.9 Azimuth and Elevation. A single joystick control will be employed to effect variable rate positioning of pan/tilt. The amount of joystick deflection, horizontally and vertically will generate information to be encoded and establish the rate of adjustment. The information will be decoded at

the camera location and fed to the associated pan/tilt unit for execution.

6.3.2 Synchronization. The master sync generator is located in the control unit. The composite synchronization information, horizontal and vertical, will be compatible with the requirements of Paragraph 3.3.1. The sync generator output will be time division multiplexed with the command information, with command intervals limited to normal active video time, and routed to each camera via a 75 ohm coaxial line.

6.3.3. Levels. The sync and command information will be combined to provide a normal amplitude composite signal of 140 IRE units. The sync amplitude will have the same 40 units as for the normal video lines (Paragraph 3.3.2.4) with the command information contained in the usual 100 units normally containing video.

6.4 Environmental. Paragraph 5.5 shall apply.

7. PROCESSOR

7.1 General. The Processor is the functional segment of the TV System that compensates for loss in video lines, switches and routes signals, provides controllable levels of gamma correction, and provides buffer amplification of the video signals for distribution to other locations. Together with the companion Control Unit it provides all of the electrical functions not contained within the cameras and monitors.

7.2 Physical Requirements

7.2.1 Mechanical. The Processor will consist of an electronics box with connectors for power feed and incoming control/command and video signals, and outgoing video signals. The box will be nominally rectangular in cross-section and have a volume of 250 cubic inches, or less, in a form factor such as 6-by-8-by-5.2 inches. The weight of the box shall not exceed 5 pounds.

7.2.2 Electrical. Normal operation of the Processor will be obtained with a 28 volt, ±10 percent, power source. Power consumption will not exceed 6 watts.

7.3 Functional Requirements

7.3.1 Line Equalization. Termination of each video line (signal) at the processor input shall be provided. Buffer amplification and signal equalization shall be incorporated to normalize the signal amplitude and compensate for any frequency dependent roll-off.

7.3.2 Switching. Switching of any video line shall be accomplished in response to a select signal fed from the Control Unit. Switching capability shall permit routing of each video signal to either monitor, to an associated tape recorder, to any operational transmitters, or any undefined equipment segment requiring video information. Interruption and re-routing of a video signal shall take place during the vertical blanking interval.

7.3.3 Gamma Correction. The transfer characteristic (gamma) of the video amplifier shall be adjustable in response to operator initiated adjustments. The correction circuitry shall also function to maintain constant amplitude for a video signal extending from black-to-peak white.

7.3.4 Distribution Amplifiers. Buffer amplifiers shall be included in the Processor, for each output video line. These amplifiers shall provide 75 ohms sending end impedances for each output signal to be distributed external to the Processor. Each amplifier shall be designed so that a short on one, or more, of the lines shall not affect the remaining amplifiers.

7.4 Performance.

7.4.1 Frequency Response. The frequency response from a camera output (input to the camera coax line) to the output of the processor shall be flat within $\pm$0.5 dB to 3.5 MHz and $\pm$1.0 dB to 5 MHz. Measurements shall normally be made with the gamma control set to unity.

7.4.2 Waveform Distortion. Waveform testing and bar (half line and half field) shall be used to establish waveform response from the camera output to the Processor output. Measurements with a 2T pulse shall result in an amplitude difference no larger than 1 percent of the half line pulse. Distortion of the

half line bar shall similarly not exceed 1%, overshoot or undershoot, of nominal amplitude.

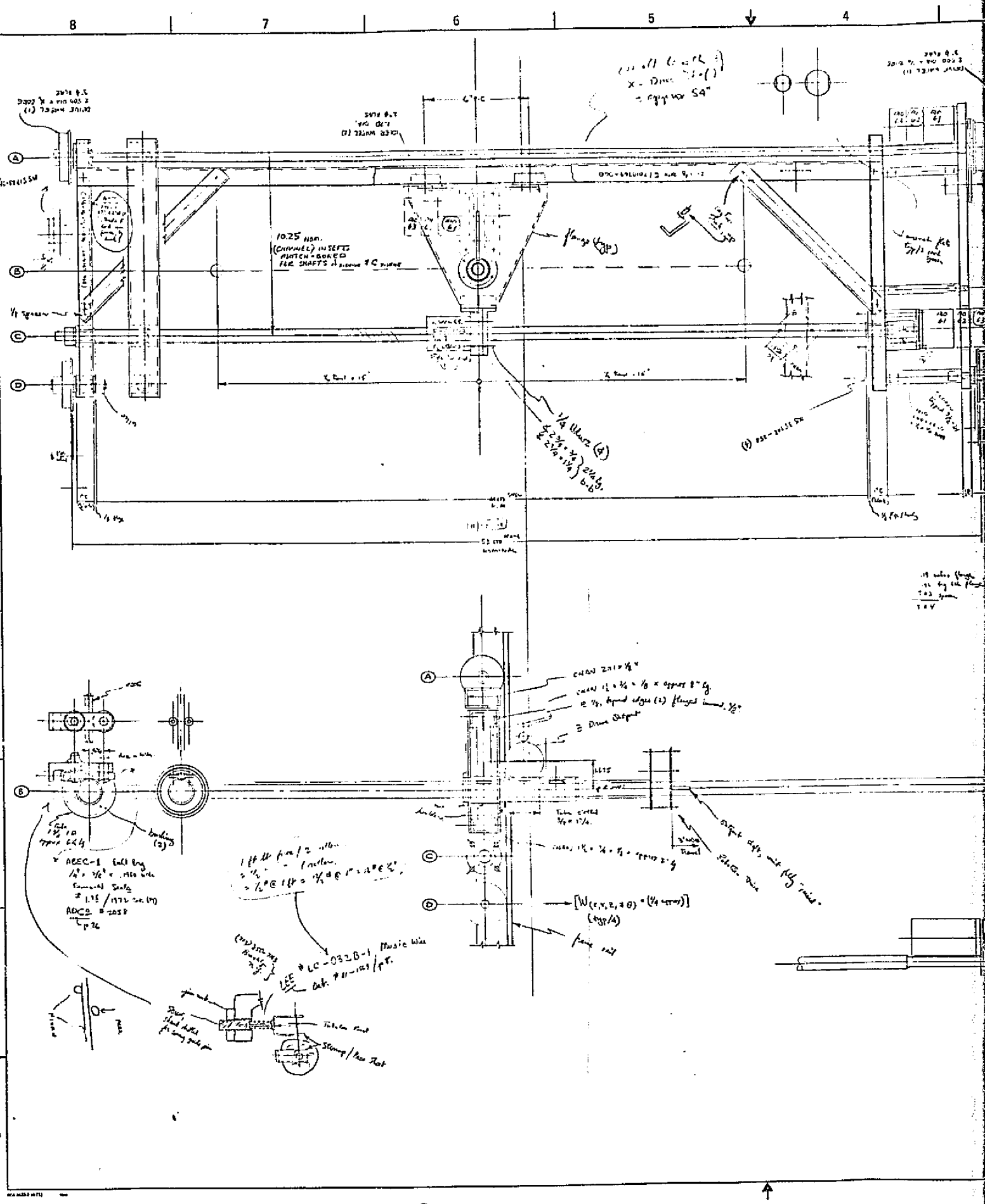
Distortion of the half field bar shall be no greater than 2 percent. That is flatness shall be adequate to maintain amplitude at leading or trailing edge of the bar to within 2 percent of the center-of-bar value.

7.4.3 Gain. The nominal low frequency gain of the video channel shall be unity, ±0.5 dB, as measured from the camera output to the Processor output. This response shall include the coax cable, line equalizer, gamma, and distribution amplifier elements of the channel. Measurements shall be made with a composite signal containing a full black-to-white transition. Gain shall be maintained for any value of gamma from unity to the lower limit.

7.4.4 Signal-to-Noise Ratio. The signal-to-noise ratio of the video channel (camera output to Processor output) shall be no less than 50 dB, peak-to-peak signal-to-rms noise. Gamma shall be set to unity for this measurement.

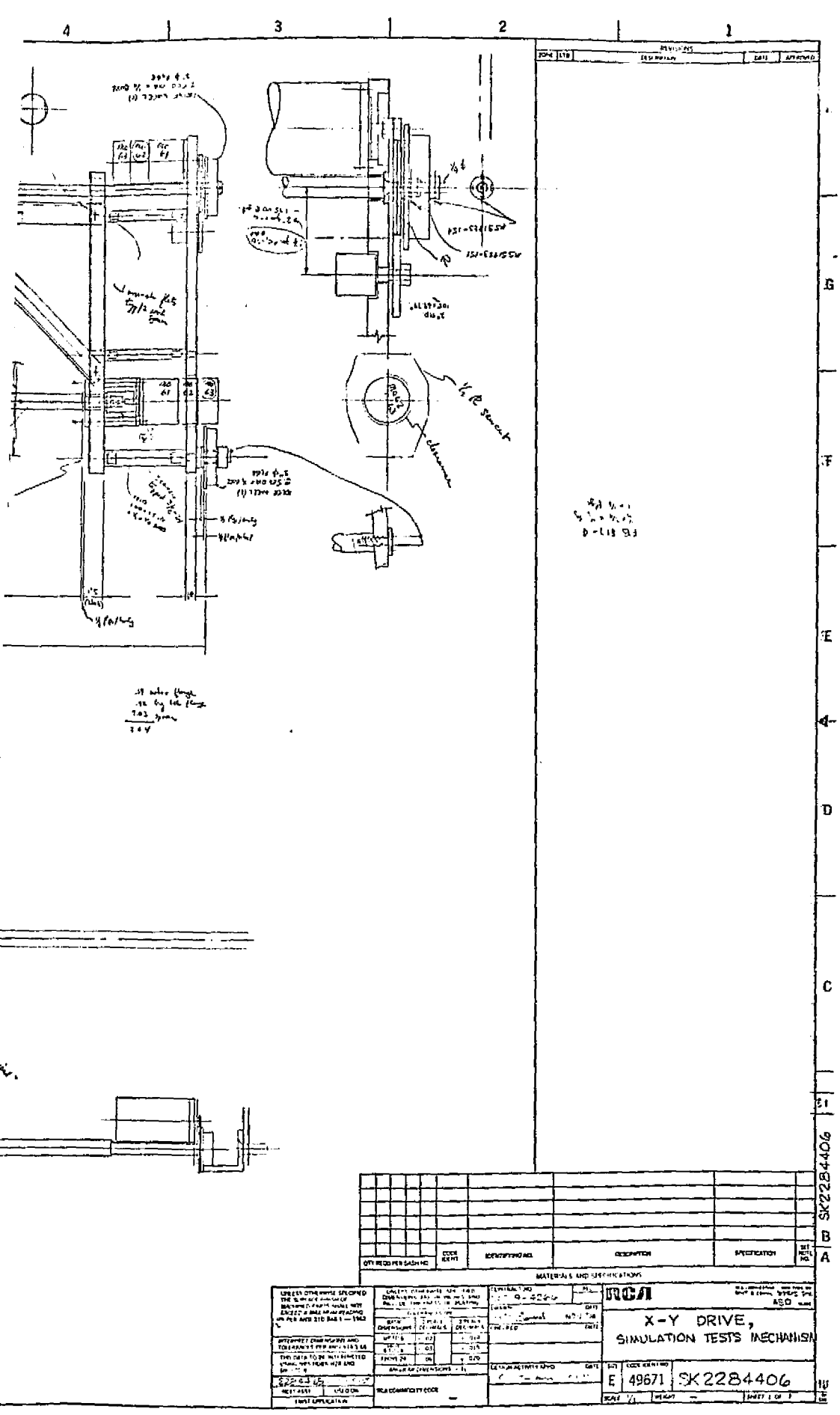
APPENDIX A

SIMULATOR MECHANICAL SKETCHES



FOLDOUT FRAME

ORIGINAL PAGE IS
OF POOR QUALITY



QTY REQD PER ASSY NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION

MATERIALS AND SPECIFICATIONS

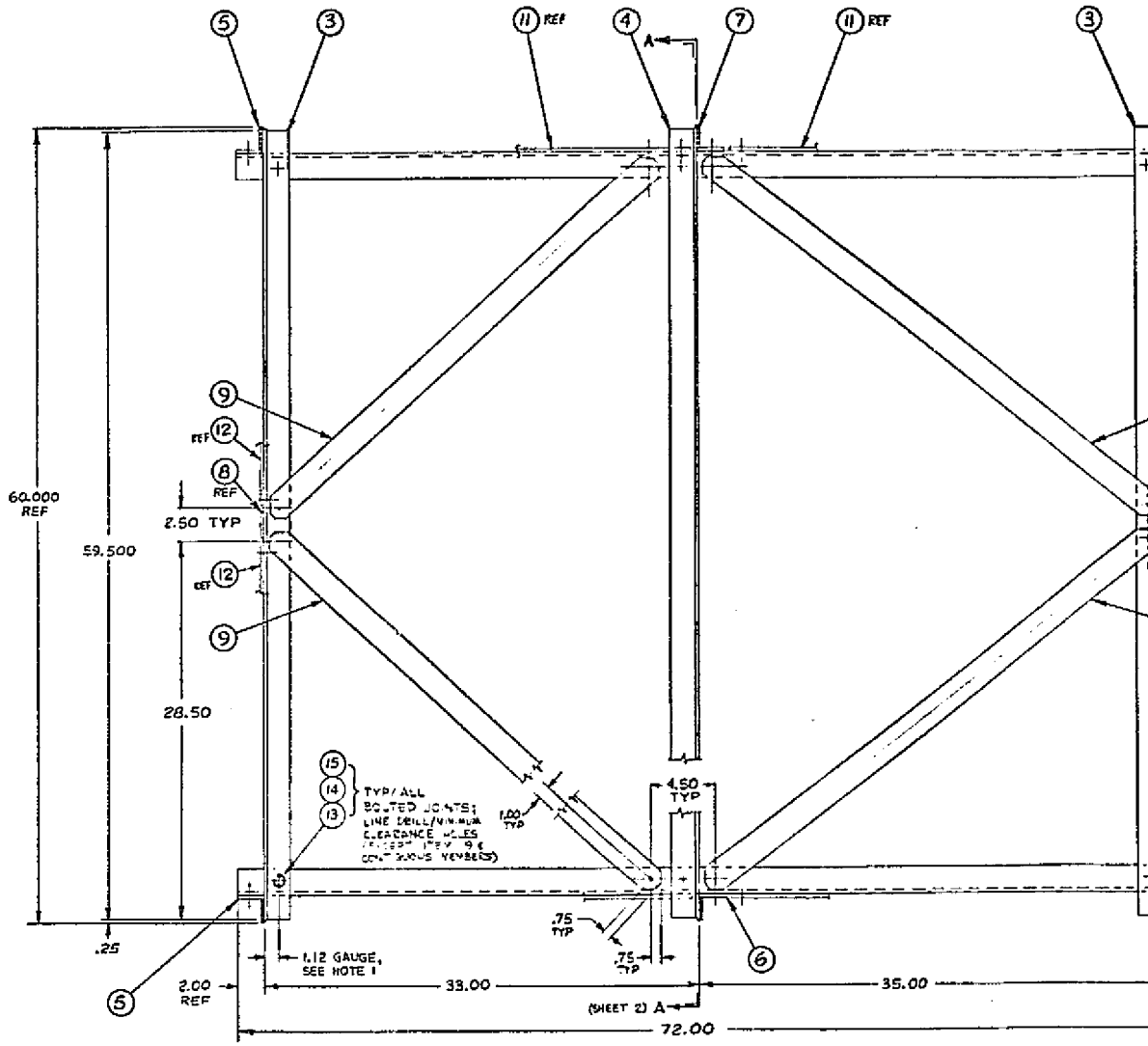
RCA

X-Y DRIVE,
SIMULATION TESTS MECHANISM

E	49671	SK2284406

SK2284406

FOLDOUT FRAME 2



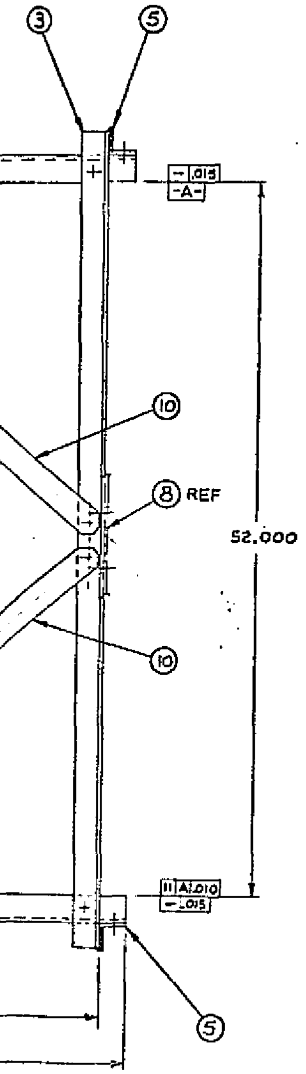
NOTES:

1. (1.12) GAUGE TYPICAL, ALL ANGLE ITEMS BOLTED.
2. SEATING AREA OF ITEMS 1 & 2 TO BE ENTIRELY FREE OF WELD MATERIAL AND/OR 'SPATTER', ETC.
3. APPLY ITEM 17 (CHEM TREAT) AFTER WELDING OPERATIONS, & BEFORE BOLTED ASSEMBLY.
4. APPLY ITEM 18 (CHROMALAZE, FLAT BLACK) AFTER ASSEMBLY.
5. ASSEMBLY MUST NEVER BE SUBJECTED TO ANY SUBSEQUENT FORCE(S) WHICH WOULD CAUSE THE BOTTOM RAILS (ITEMS 1 & 2) TO DEPART FROM DRAWING SPECS AS TO STRAIGHTNESS, FLATNESS, & TRUE RELATIVE POSITION.

(CONT'D)

6. UNIT TO BE SUPPLIED WITH SIX (6) ADDITIONAL PIECES OF ANGLE TO SAME MATERIAL SPEC. AS ITEMS 5,6,7; PIECES TO BE 54.00 LG, 2 MATCH-DRILLED (.515 DIA) WITH ITEMS 5,6, & 7 PER FIELD NOTE, SHEET 2, ZONE(S) # 3, #4; PIECES TO BE FINISHED PER ITEM 17 (CHEM TREAT) ONLY; HARDWARE COUNT SHOWN / ITEMS 13, 14, 15 INCLUDES TWO (2) SETS/EACH x 6 MEMBERS. (THE ADDITIONAL ANGLES ABOVE ARE KNOWN AS ITEM 19.)

FOLDOUT FRAME 1



ITEM	QTY	ITEM	QTY	ITEM	QTY
8	2	16	X		
7	1	15	108		
6	1	14	54		
5	4	13	54		
4	1	12	4	20	X
3	4	11	4	19	6
2	2	10	2	18	AR
1	2	9	2	7	AR

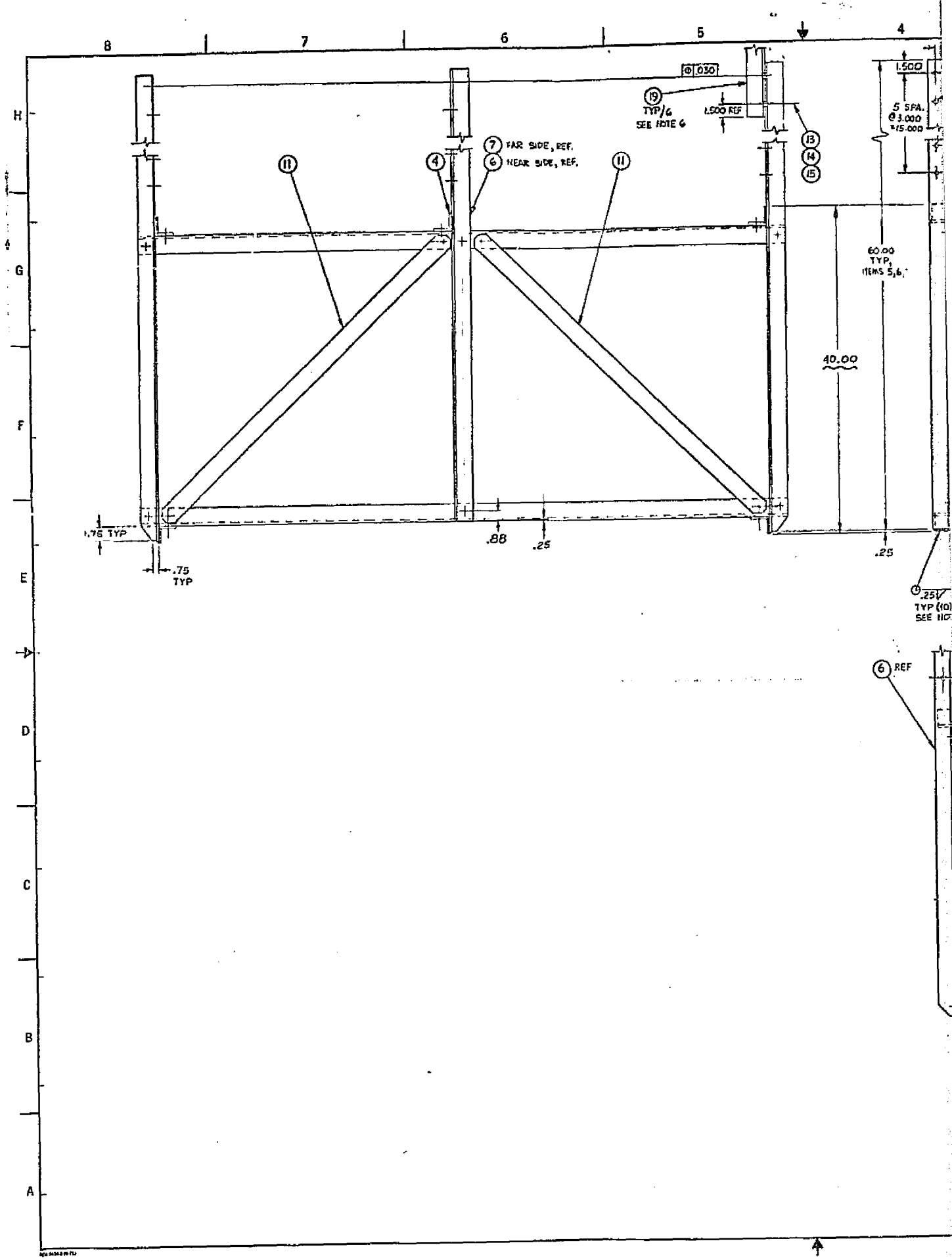
DETAIL QUANTITY

ITEM NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.
20		8030028	SPEC, WORKMANSHIP	NASA COMPLIANT	
19		2010673-936	AL ALY 6061-T6 ∠ 2×2×.250	QQ-A-225/8C	1,6
18		2026126-1	CHEMGLAZE, FLAT BLACK	(AED) GEN. USE	4
17		1980135-1	CHEM TREAT. / AL ALY	MIL-C-5541	3
16		2020747	SPEC, FUSION WELDG/AL ALY	MIL-W-8604	
15		8924401-112	WASHER, FLAT, SMALL PATTERN		
4	80205	NAS1291C8M	NUT, LOCKING		
3	96906	MS35308-411	SCREW, CAP, HEX HEAD, ¼-20×1¾		
8 thru 12		2010673-487	AL ALY 6061-T6 BAR 2×.250	QQ-A-225/8C	
1 thru 7		2010673-936	AL ALY 6061-T6 ∠ 2×2×.250	QQ-A-225/8C	1,2

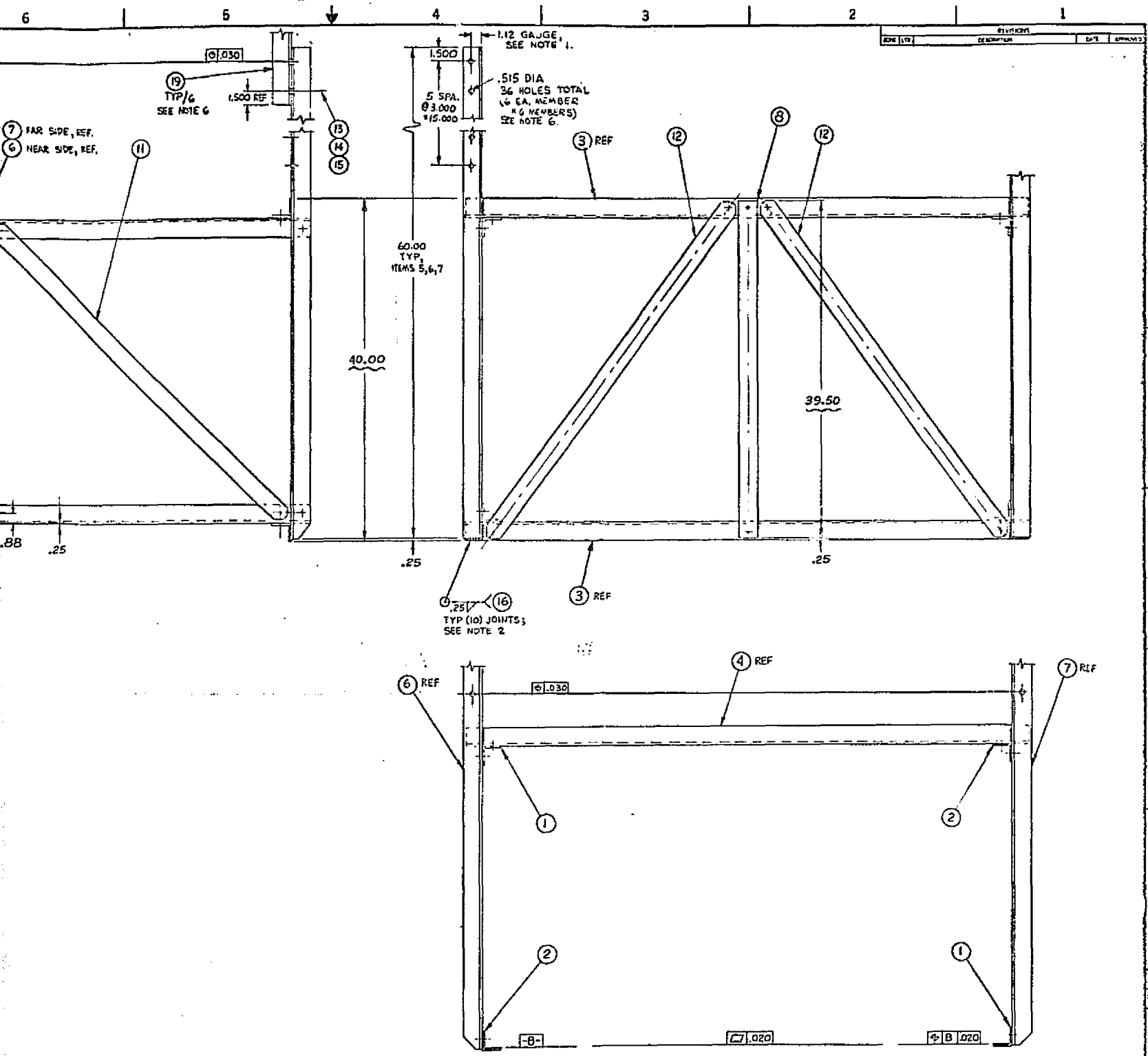
MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING OF 125 PER ANSI STD B46.1 — 1962	CONTRACT NO. NAS 9-14266	RCA AED	
INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5	DRAWN 19 NOV '74	FRAME, SIMULATION TESTS MECHANISM	
	CHECKED		
2284377 / USED ON	DESIGN ACTIVITY APPD 11-21-74	SIZE E	CODE IDENT NO 49671 / SK2284378
FIRST APPLICATION	RCA COMMODITY CODE	SCALE 1/4	WEIGHT / SHEET 1 OF 2

FOLDOUT FRAME 2



FOLDOUT FRAME



SECTION - VIEW A-A

(ROTATED 90° CW)

SIZE	CODE IDENT NO	DRAWING NO
E	49671	SK2284378

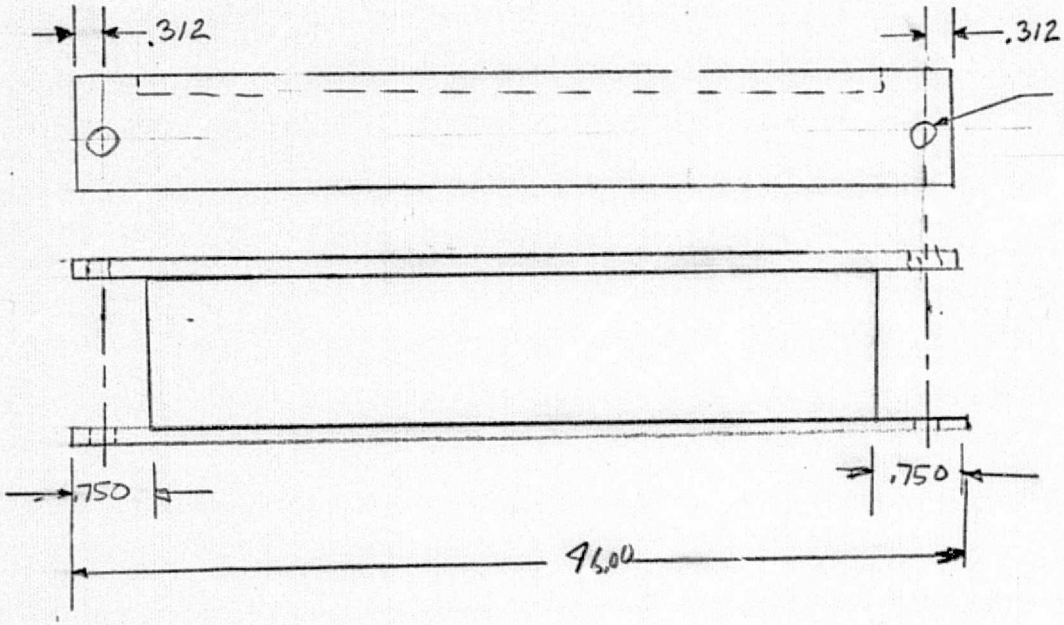
SCALE 1/4 SHEET 2

FOLDOUT FRAME

LTR | SK2273452

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	ADDED TWO HOLES	1/29/75	BMJ



MATERIAL:
ALUM ALLOY CHANNEL 6063-T5
2.00 X 1.00 X .125 (2010769-9681)

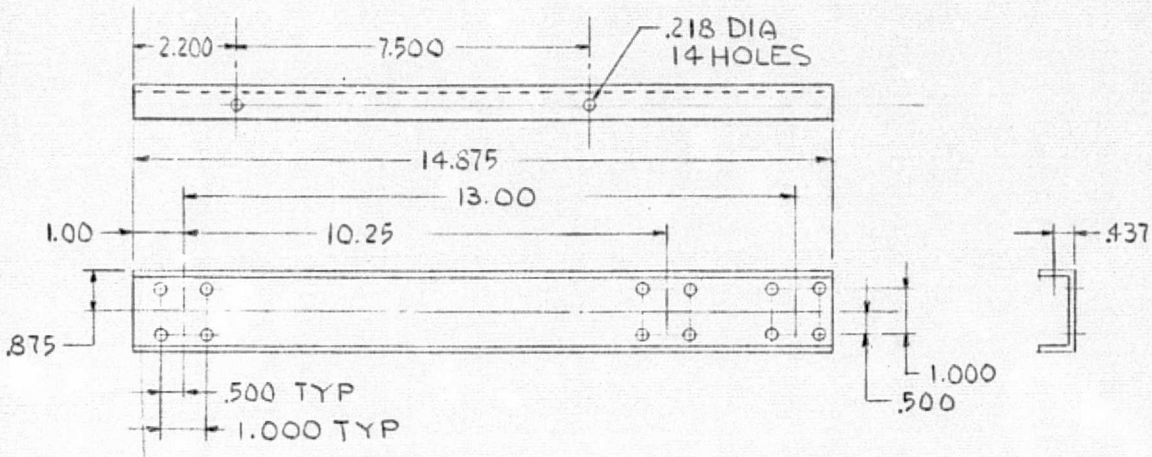
FOR REVISIONS ONLY

SKETCH

ORIGINAL PAGE IS OF POOR QUALITY

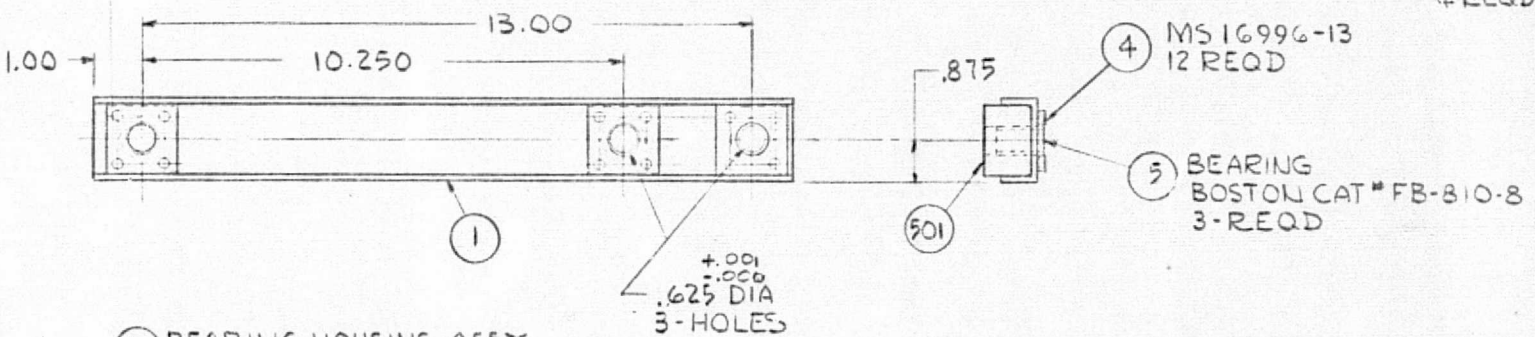
THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015; ANGULAR DIMENSIONS ± 1/2°; MATERIAL: SEE TABLE	SHOP ORDER NO. FE6008	TIE MEMBER
		NEXT ASSY: USED ON: MDEO 515		DRAWN BY: J. ZANJANI DATE	
RCA COMMODITY CODE		FIRST APPLICATION		DSGN ACTIVITY APPD: P. STRICKLAND DATE	SIZE: B; CODE IDENT NO.: 49671; SK2273452; SCALE: NONE; WEIGHT; SHEET 1 OF 1; RCA DISTR

AED 739-1 3/66

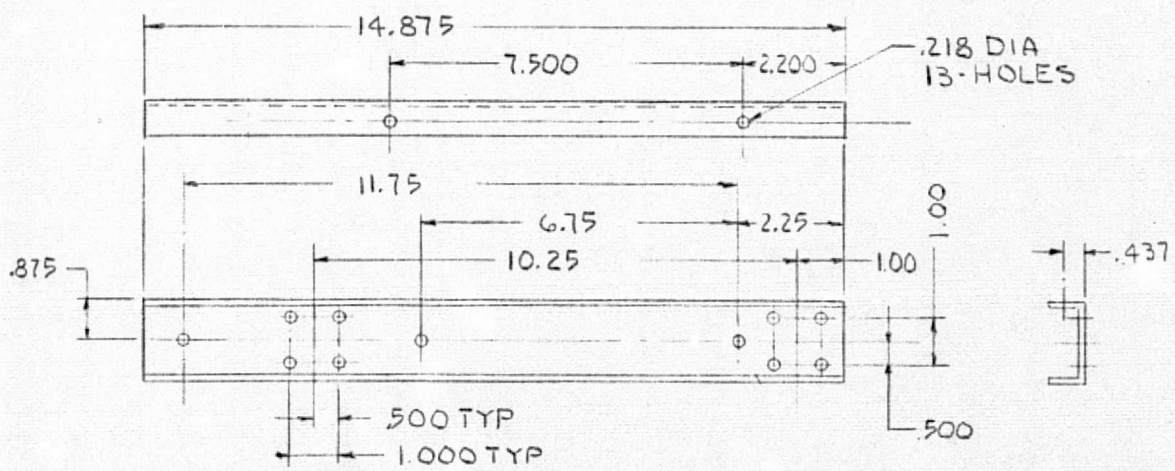


(1) BEARING CHANNEL SCALE: 2=1

MATERIAL: ALUM CHANNEL 1.75x.75x.125
2010769-965
FINISH: CHEMICAL TREATMENT FOR ALUM
AND ALUM ALLOY, 1980135-2

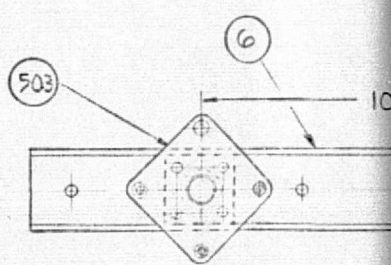


(502) BEARING HOUSING ASSY
SCALE 2=1



(6) BEARING CHANNEL SCALE: 2=1

MATL: ALUM CHANNEL 1.75x.75x.125,
2010769-965
FINISH: CHEMICAL TREATMENT FOR
ALUM & ALUM ALLOYS, 1980135-2

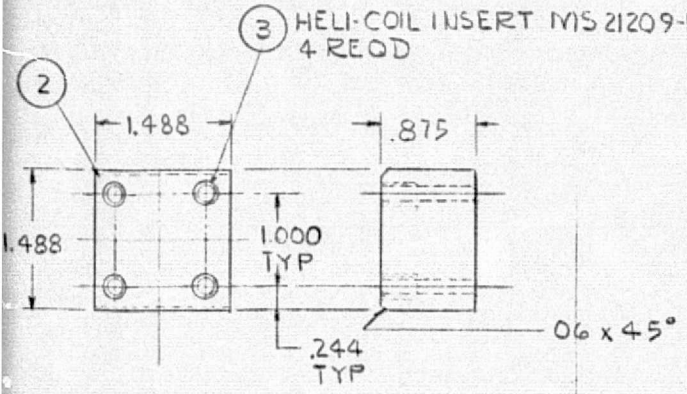


(504) BEARING HOUSING
SCALE 2=1

ORIGINAL PAGE IS
OF POOR QUALITY

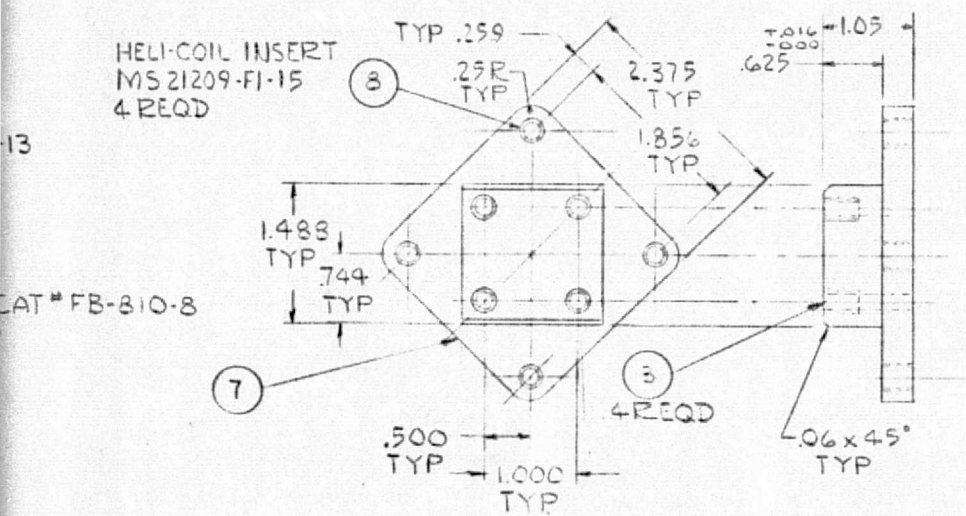
FOLDOUT FRAME

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

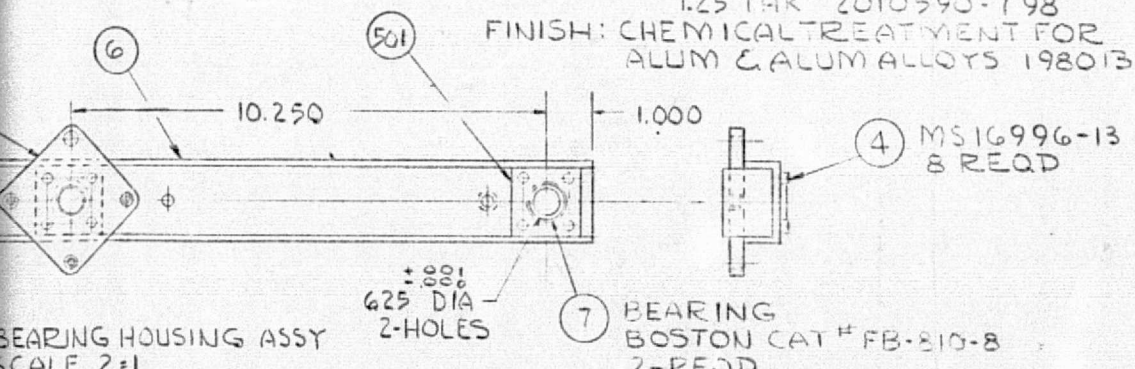


501 BLOCK ASSEMBLY : SCALE 1=1

MATERIAL: ALUM BAR 1.50x1.50
2010769-780
FINISH: CHEMICAL TREATMENT FOR
ALUM & ALUM ALLOYS 1980135-2



503 FLANGED BLOCK ASSY
SCALE 1=1
MATERIAL: ALUM ALLOY PLATE 6061-T4
1.25 THK 2010590-798
FINISH: CHEMICAL TREATMENT FOR
ALUM & ALUM ALLOYS 1980135-2



BEARING HOUSING ASSY
SCALE 2=1

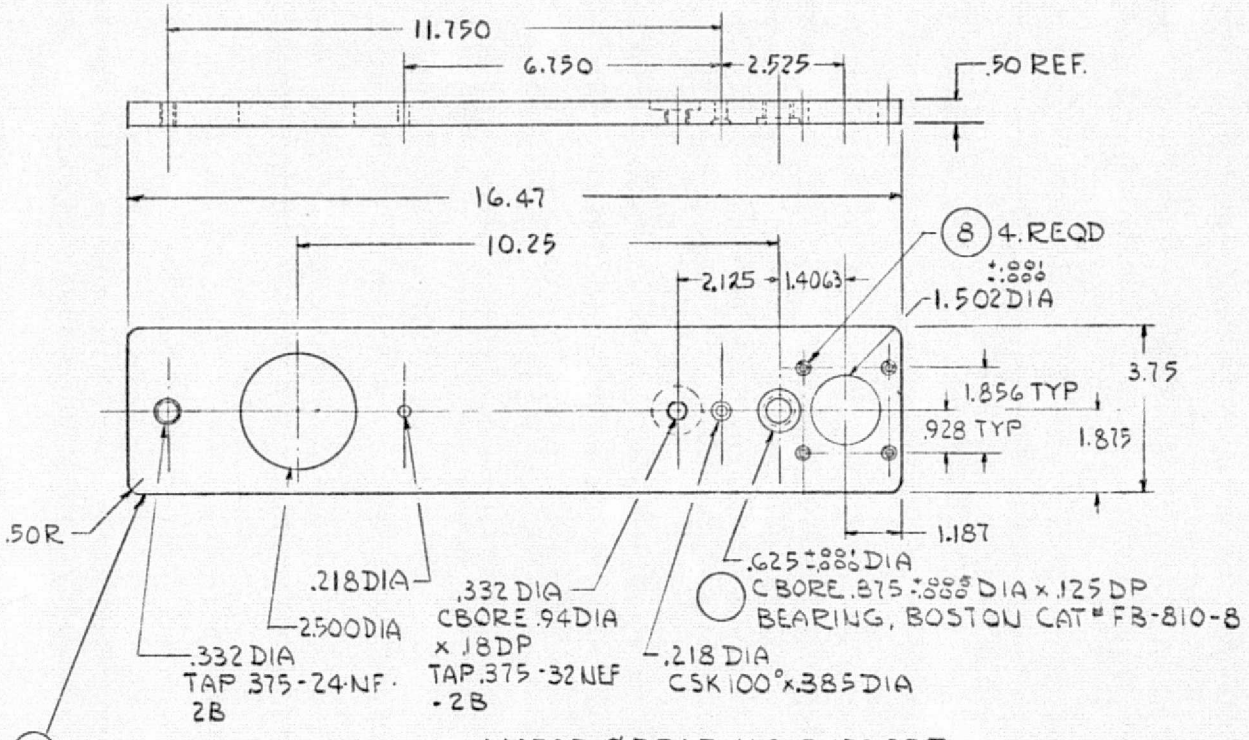
FOLDOUT FRAME 2

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. MDS-19766	REL
INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ± .02 ± .010; ABOVE 6 TO 24 ± .03 ± .015; ABOVE 24 ± .06 ± .020	DRAWN BANNARDINE 1/6/75	DATE
THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9	ANGULAR DIMENSIONS ± ½	CHECKED	DATE
NEXT ASSY / USED ON: NEXT ASSY; USED ON: MDS 375	RCA COMMODITY CODE:	CO # FE6000	
FIRST APPLICATION		DESIGN ACTIVITY APPD. P STRICKLAND 1/6/75	DATE

RCA RCA CORPORATION : NEW YORK, NY PLANT

BEARING HOUSING DETAILS

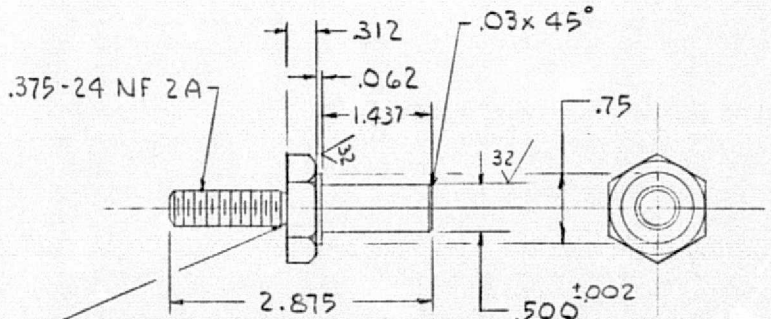
SIZE	CODE IDENT NO.	
D	49671	SK2288013
SCALE	WEIGHT	SHEET 1 OF 2



9

505 MOTOR & BEARING SUPPORT
SCALE: 1=2

MATL: ALUM ALLOY 6061-T6
.500 THK 2010590-993
FINISH: CHEMICAL TREATMENT FOR
ALUM & ALUM ALLOYS
1980135-2

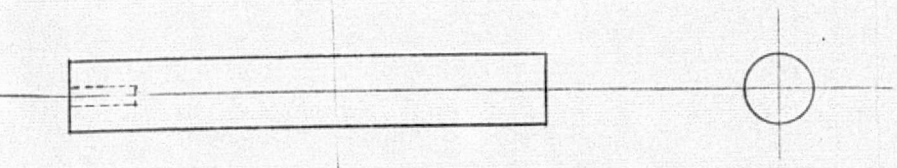


UNDERCUT LAST TWO
THREADS TO THE
MINOR DIA.

10 IDLER SHAFT

MATERIAL: STN STL 1.00 HEX BAR TYP 303
2010521-304
FINISH: PASSIVATING DIP FOR STN STL
1980032-1

ZONE	LTR	DESCRIPTION	DATE	APPROVED



FOLDOUT FRAME 2

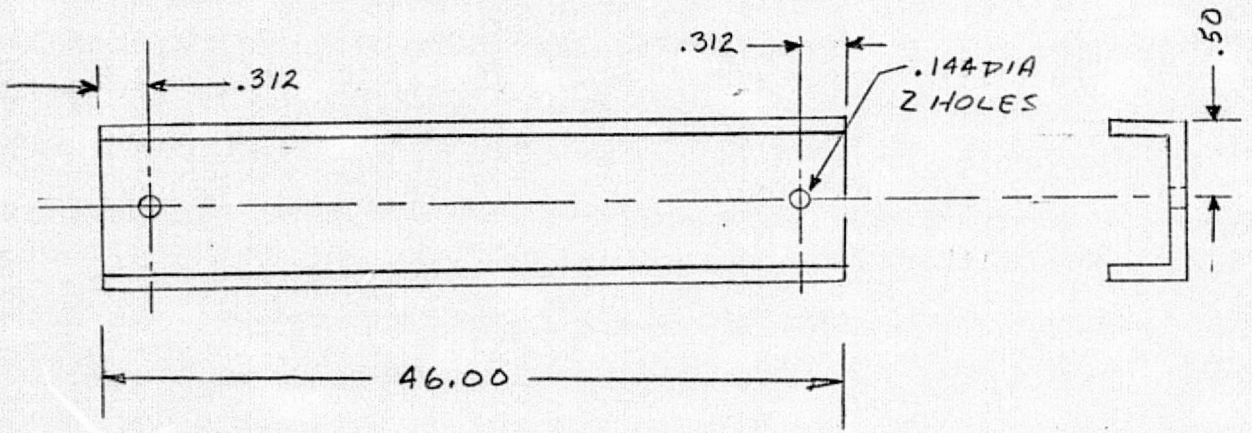
SIZE	CODE IDENT NO	
D	49671	SK2288013

SHEET 2 OF 2

SK2273451

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REDRAWN	1/29/75	BMJ 2-6-75



MATERIAL; ALUM ALLOY 6063-T5

1.50 X 0.50 X .125 ANGLE 2010769-

1 - REQ'D.

FOR REVISIONS ONLY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT	
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000	ANGLE STRUT	
		VIDEOSIS NEXT ASSY / USED ON	ANGULAR DIMENSIONS ± 1/2°	DRAWN BY J RANDRIDINE DATE	SIZE B; CODE IDENT NO. 49671; SK2273451	NF
RCA COMMODITY CODE		FIRST APPLICATION	MATERIAL: SEE TABLE	DSGN ACTIVITY APPD R STRICKLAND DATE	SCALE 2/1; WEIGHT; SHEET 1 OF 1	RCA DISTR

AED 739-1 3/66

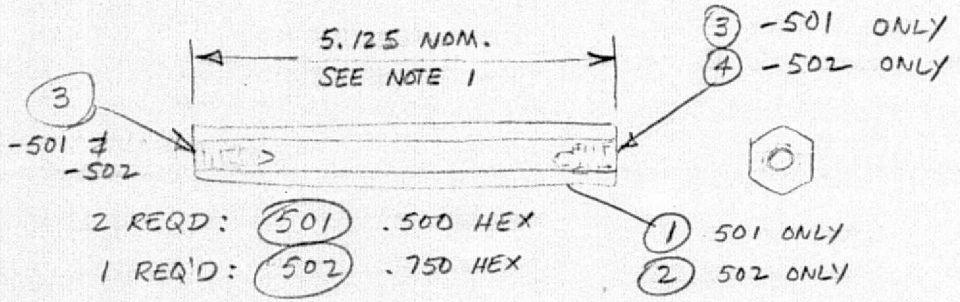
SK2273442 | LTR

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION
1	AL ALY 2024-T4 .500 HEX ROD *		*2010637-288
2	↓ .750 HEX ROD		↓ -296
3	HELICOIL INSERT, #10-32 x 2D		MS21209F1-20
4	↓ ↓ .375-24 x 1½ D		↓ F6-15
5	SPEC, MFG, HELICOIL INSERT		2020312
6	↓ , WORKMANSHIP, 8030028		NASA COMPLIANT

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

FOR REVISIONS ONLY



NOTES:
1- PRODUCE AS MATCHED SET/LENGTH, ± .001.

ORIGINAL PAGE IS OF POOR QUALITY

SKETCH

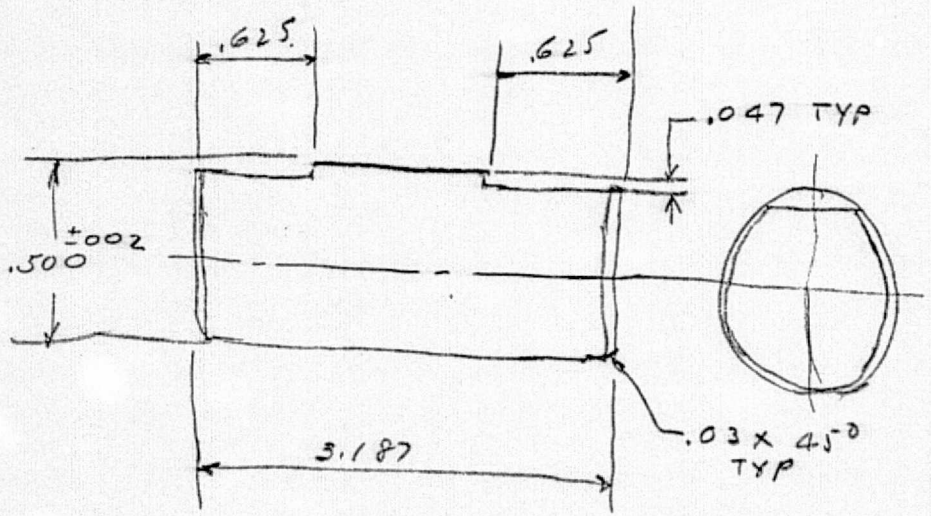
THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT	
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000	SPACERS	
		NEXT ASSY / USED ON: VIDEO SYSTEMS	ANGULAR DIMENSIONS ± 1/2°	DRAWN BY DATE 03 JAN 75	SIZE B / CODE IDENT NO. 49671 / SK2273442	NF
RCA COMMODITY CODE		FIRST APPLICATION	MATERIAL: SEE TABLE	DSGN ACTIVITY APPD DATE A. STRICKLAND	SCALE ~ / WEIGHT ~ / SHEET 1 OF 1	RCA DISTR

AED 739-1 3/66

SK2273456

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



MATERIAL STN STL BAR .500 DIA
2010 521-60

FOR REVISIONS ONLY

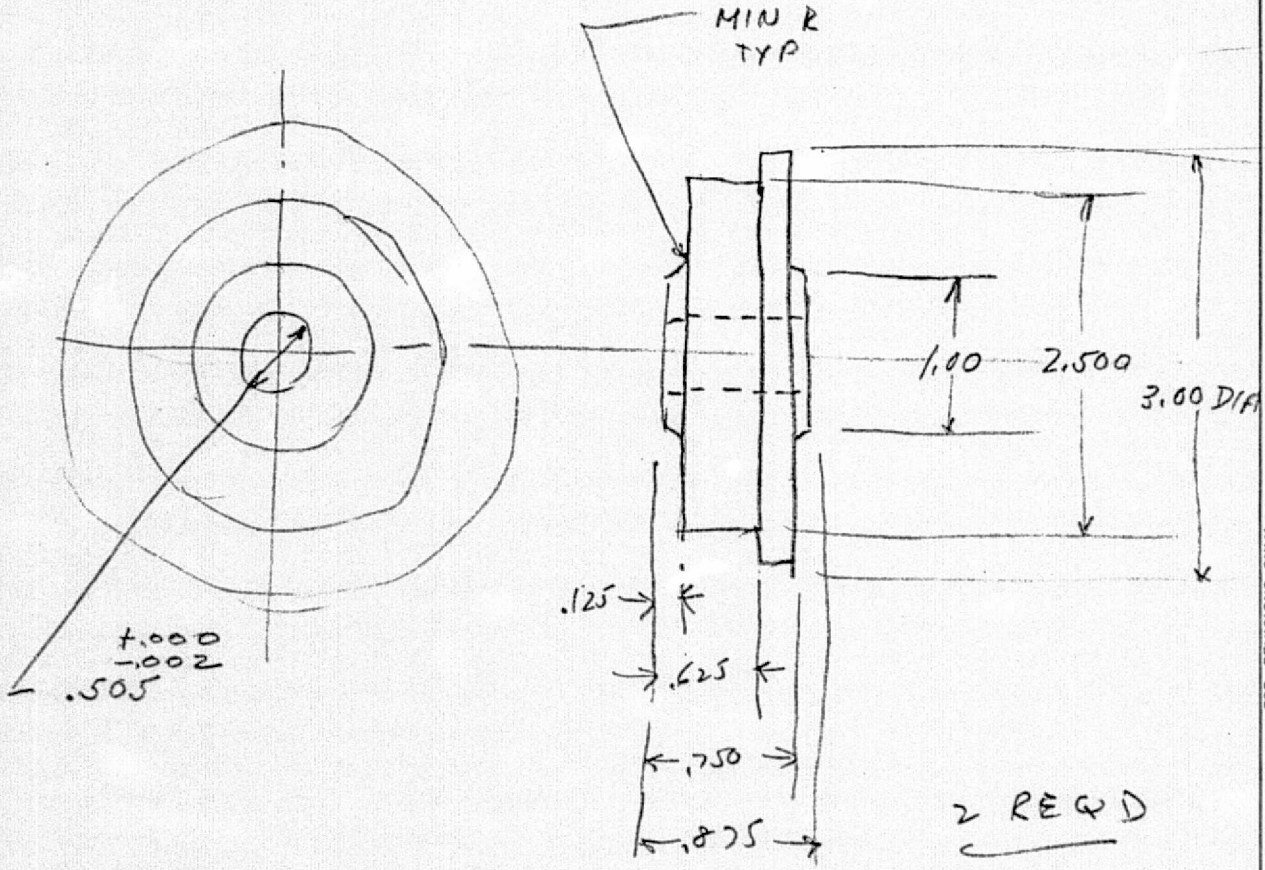
SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT	
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000	IDLER SHAFT	
		NEXT ASSY / USED ON	ANGULAR DIMENSIONS ± 1/2°	DRAWN BY / DATE J. ZIMMERDINE	SIZE B / CODE IDENT NO. 49671 / SK2273456	
RCA COMMODITY CODE		FIRST APPLICATION	MATERIAL: SEE TABLE	DSGN ACTIVITY APPD / DATE KAS.	SCALE 2X / WEIGHT / SHEET 1 OF 1	RCA DISTR

AED 739-1 3/66

SK2273455

DASH NO.	SPECIFICATION TABLE			REVISIONS			
	MATERIAL	FINISH	SPECIFICATION	LTR	DESCRIPTION	DATE	APPROVED



FOR REVISIONS ONLY

MAT'L.
NYLON

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT		
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000	IDLER WHEEL		
		VIDEO 345		DRAWN BY J. ZANNARDINE DATE			
RCA COMMODITY CODE		NEXT ASSY / USED ON	ANGULAR DIMENSIONS ± 1/2°	DSGN ACTIVITY APPD R. A. Stubbs 1/14/66 DATE	SIZE B	CODE IDENT NO. 49671	SK2273455 NF
		FIRST APPLICATION	MATERIAL: SEE TABLE		SCALE	WEIGHT	SHEET 1 OF 1 RCA DISTR

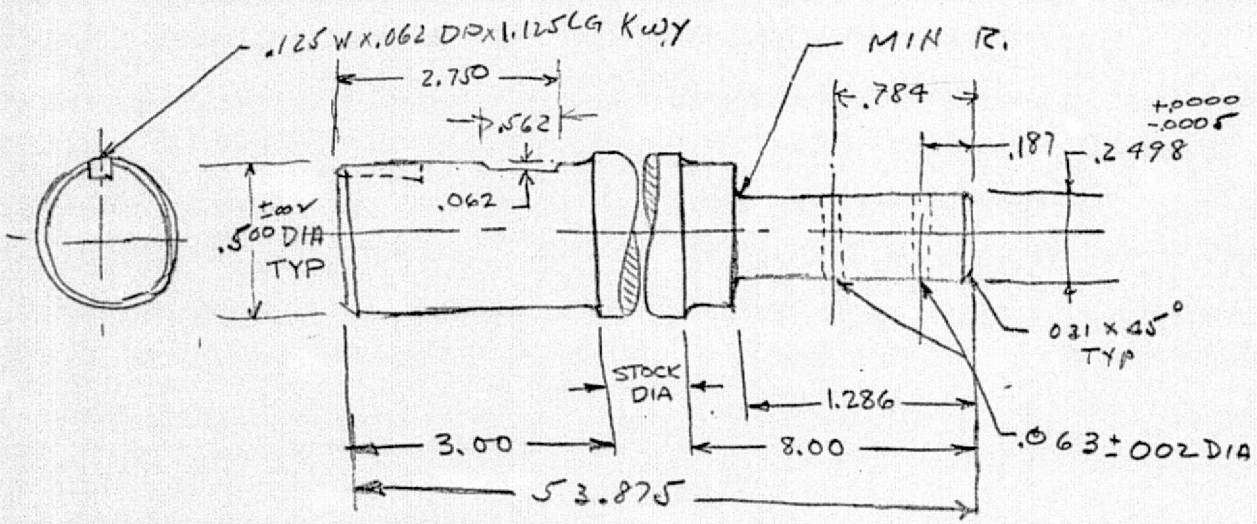
AED 739-1 3/66

SK2273450

LTR A

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	STOCK DIA WAS .500	14 JAN '75.	1/30/75



MATERIAL: STN STL BAR .563 DIA.

FOR REVISIONS ONLY

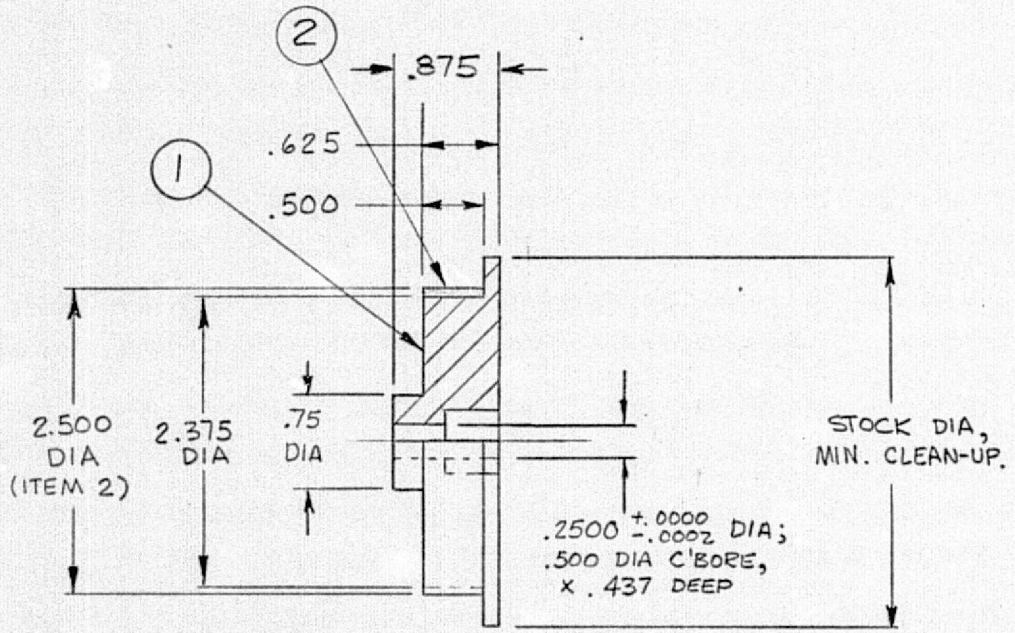
SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT	
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000.	DRIVE SHAFT	
		NEXT ASSY / USED ON: MDFO 345	ANGULAR DIMENSIONS ± 1/2°	DRAWN BY J. ZAMARDIVE DATE	SIZE B	CODE IDENT NO. 49671 SK2273450 NF
RCA COMMODITY CODE		FIRST APPLICATION	MATERIAL: SEE TABLE	DSGN ACTIVITY APPD R.Q. Strickland 1/7/75 DATE	SCALE NC WEIGHT	SHEET 1 OF 1 RCA DISTR

AED 739-1 3/66

SK2273446

DASH NO.	SPECIFICATION TABLE			REVISIONS			
	MATERIAL	FINISH	SPECIFICATION	LTR	DESCRIPTION	DATE	APPROVED
1	AL ALY 2024-T4 BAR x 3.000 DIA		QQ-A-225/6C				
2	MEDIUM HARD URETHANE (60A)		2021031 SEE NOTES 1-3.				



NOTES
1. PREPARE (URETHANE) MATL. PER SPEC, PARA. 3.3.2.
2. PREPARE SUBSTRATE PER SPEC, PARA. 3.2.2.1.
3. BOND PER SPEC, PARA. 3.2.3.3, USING PRIMER, & ADHESIVE, NOTED THEREIN.

FOR REVISIONS ONLY

SKETCH

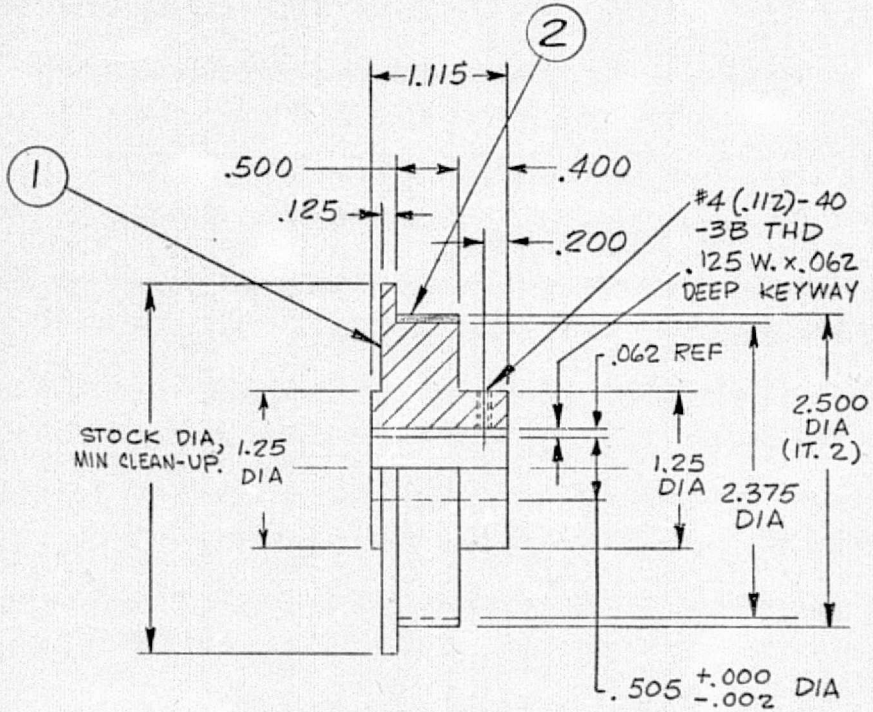
THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS 9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000	DRIVE WHEEL, MOTOR END
		VIDEO SYSTEMS		DRAWN BY [illegible] DATE 09 JAN 75	
RCA COMMODITY CODE		NEXT ASSY / USED ON	ANGULAR DIMENSIONS ± 1/2°	DSGN ACTIVITY APPD [illegible] DATE 1/2/75	SIZE B / CODE IDENT NO. 49671 / SK2273446 / NF
		FIRST APPLICATION	MATERIAL: SEE TABLE		SCALE ~ / WEIGHT ~ / SHEET 1 OF 1 / RCA DISTR

AED 739-1 3/66

SK2273447 | LTR

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION
1	AL ALY 2024-T4 BAR x 3.000 DIA		QQ-A-225/6C
2	MEDIUM HARD URETHANE (60A)		2021031 SEE NOTES 1-3

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



NOTES:
1. PREPARE (URETHANE) MATL. PER SPEC, PARA. 3.3.2.
2. PREPARE SUBSTRATE PER SPEC, PARA. 3.3.2.1.
3. BOND PER SPEC, PARA. 3.1.3.3, USING PRIMER, & ADHESIVE, NOTED THEREIN.

FOR REVISIONS ONLY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10

DIMENSIONS AND TOLERANCES PER MIL-STD-8

VIDEO SYSTEMS

NEXT ASSY | USED ON

FIRST APPLICATION

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON: BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.0.	±.015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL: SEE TABLE

CONTRACT NO. NAS 9-14266

SHOP ORDER NO. FE6000

DRAWN BY [illegible] DATE 06 JAN 75

DSGN ACTIVITY APPD [illegible] DATE 1/8/75

RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

DRIVE WHEEL, FREE END

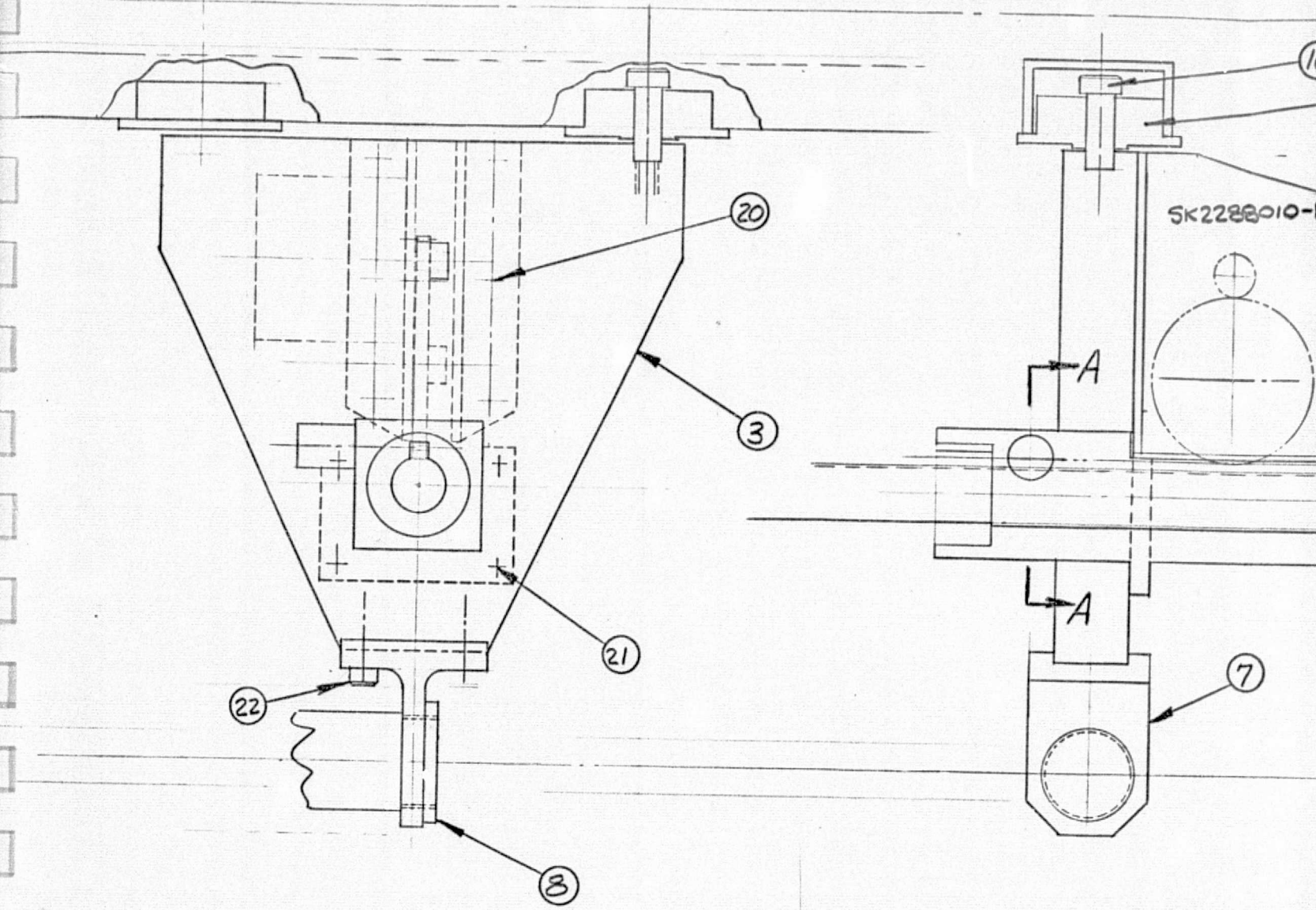
SIZE	CODE IDENT NO.	
B	49671	SK2273447

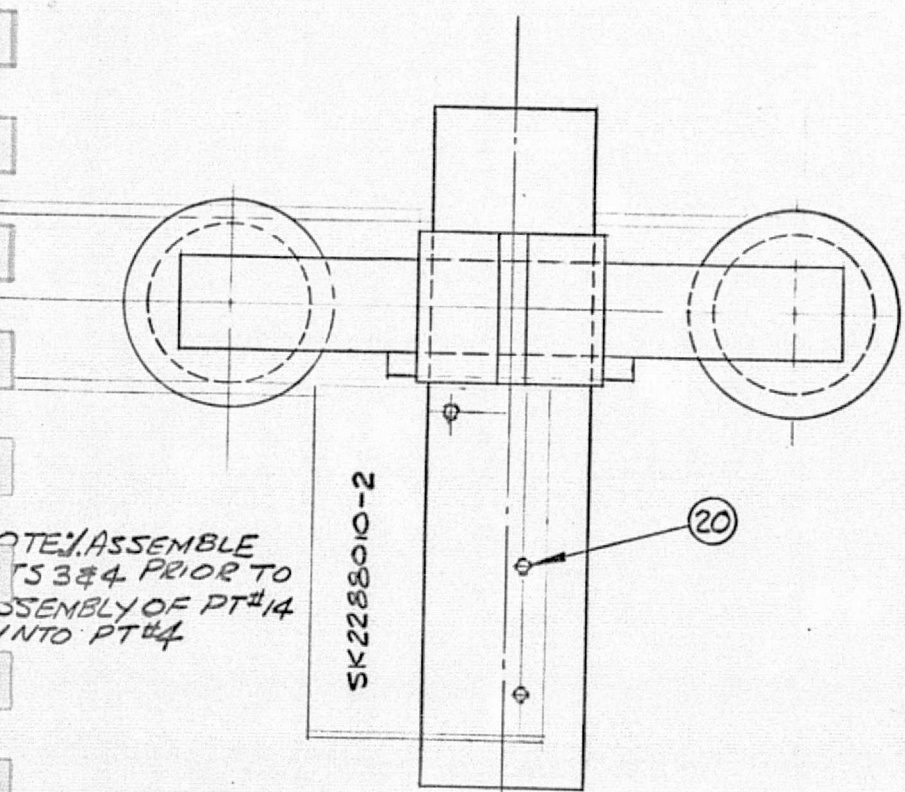
SCALE ~ | WEIGHT ~ | SHEET 1 OF 1

NF

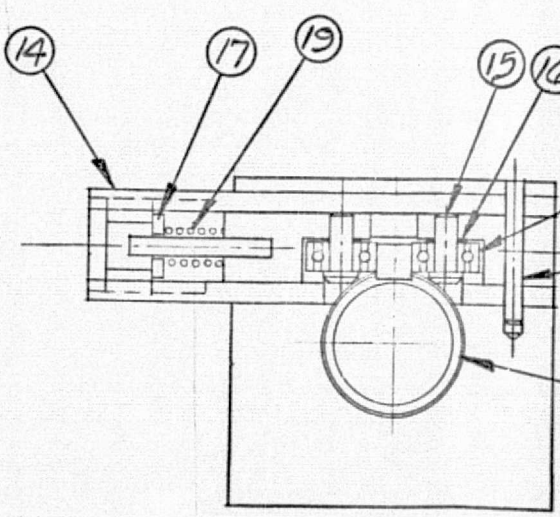
RCA DISTR

AED 739-1 3/66



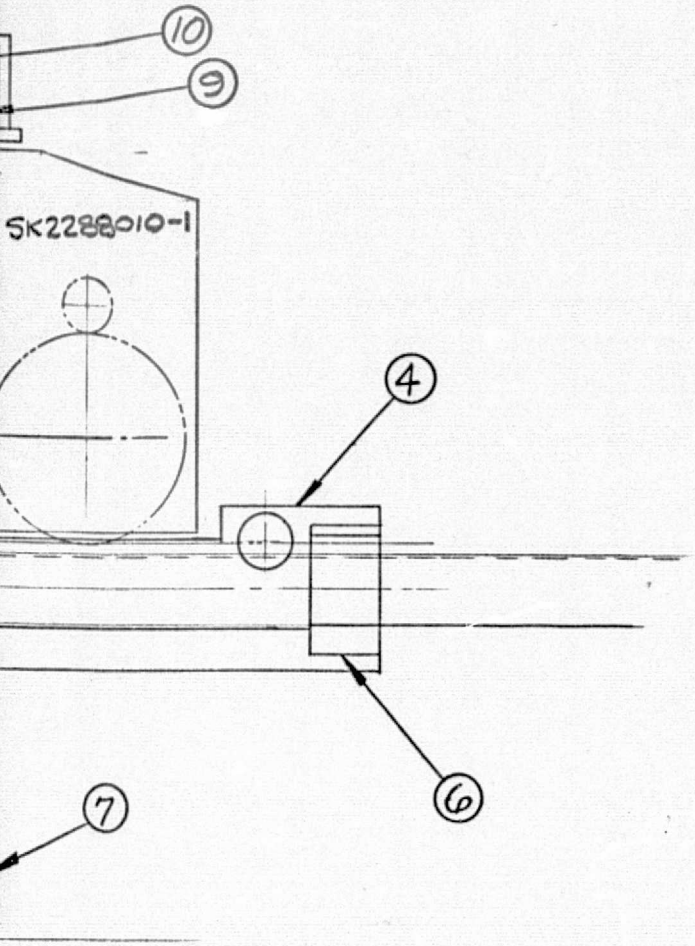


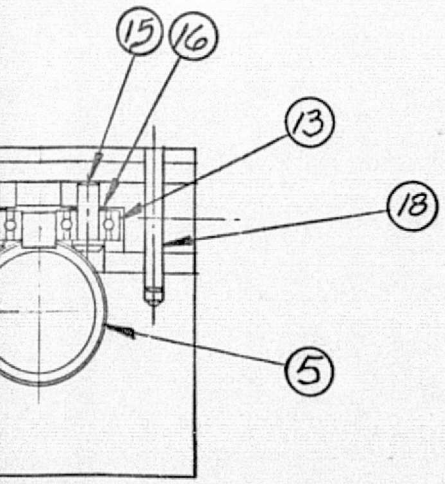
NOTE: ASSEMBLE PTS 3 & 4 PRIOR TO ASSEMBLY OF PT #14 INTO PT #4



SECTION A-A
2x SIZE

FOLDOUT FRAME





ON A-A
ZE

OR EQUIV.

PART NO	QUAN	MATERIAL	DESCRIPTION	SEE NOTE
22	2	#10-32X.62LG	SCREW, SOC. HD.	
21	4	#5-32X.50LG	SCREW, PAN HD.	
20	9	#8-32X.38LG	SCREW, PAN HD.	
19	2	LEE NO.0328-1	COMPRESSION SPRING	
18	2	.094 DIA X 1.5 LG	DOWEL PIN	
17	2	SK2273448-2	SPACER	
16	4	SK2273448-3	SPACER	
15	4	SK2273448-8	SHAFT	
14	2	SK2273448-7	HOUSING, FOLLOWER	1
13	4	SK2273448-4	BEARING	
12	2	SK2273448-6	FOLLOWER, FIXED	
11	2	SK2273448-5	FOLLOWER, ADJ.	
10	2	.375 DIA X 1.00 LG	SHOULDER SCR. SOC. HD.	
9	2	SK2273443-1	IDLER WHEEL	
8	1	SK2273444-1	JAM NUT	
7	1	SK2273445-1	BALL NUT ADAPTOR	
6	2	SK2273448-1	BUSHING	
5	1	SK2273442-1	SHAFT Z AXIS	
4	1	SK2282468-1	HOUSING, Z AXIS DRIVE	1
3	1	SK2282467-1	Y AXIS CARRIAGE	1
2	1	AMTEK NO. ML2819	NEGATOR B MOTOR	
1	1	SK2282450-54	Z AXIS DRIVE	

SKETCH

ASTRO-ELECT. DIV. RCA PRINCETON N.J.

Y AXIS DRIVE

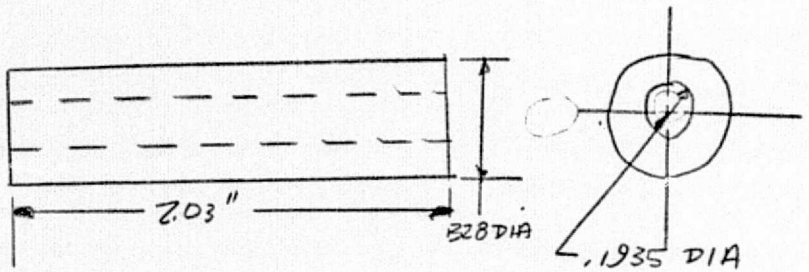
SO No.	FE 6000	ENG.	STRICKLAND
CONT NO.	NAS 5-/4266		
DWN BY	[illegible]	D	SK2288010
DATE	JAN 6, 1975		

FOLDOUT FRAME 2

SHEET 1 OF 1

SK2273454

DASH NO.	SPECIFICATION TABLE			REVISIONS			
	MATERIAL	FINISH	SPECIFICATION	LTR	DESCRIPTION	DATE	APPROVED



MATERIAL: STN:STL BAR .328 DIA

2010521-36

4- REQD.

FOR REVISIONS ONLY

SKETCH

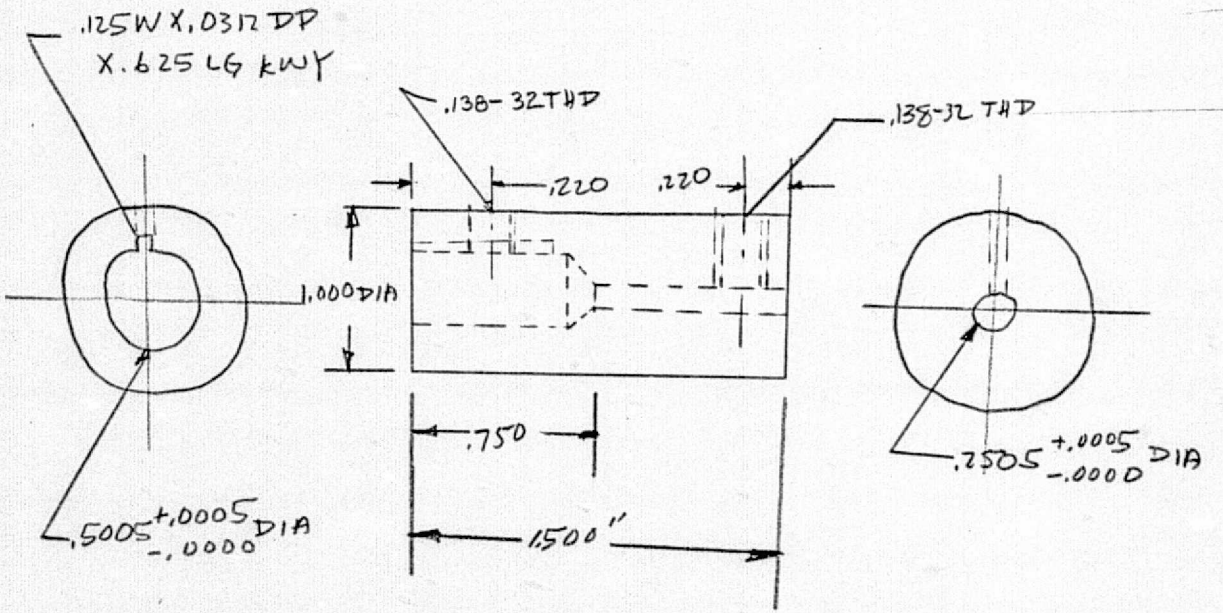
THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT	
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000	SPALER	
		NEXT ASSY: VIDEO SYS / USED ON	ANGULAR DIMENSIONS ± 1/2°	DRAWN BY J. VANARDINE DATE	SIZE B / CODE IDENT NO. 49671 / SK2273454	NF
RCA COMMODITY CODE		FIRST APPLICATION	MATERIAL: SEE TABLE	DSGN ACTIVITY APPD R. STRICKLAND DATE	SCALE NC / WEIGHT / SHEET 1 OF 1	RCA DISTR

AED 739-1 3/66

SK2273453

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



FOR REVISIONS ONLY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10 ▽

DIMENSIONS AND TOLERANCES PER MIL-STD-8

VIDEO SYS

NEXT ASSY | USED ON

FIRST APPLICATION

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON: BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL: SEE TABLE

CONTRACT NO. NAS9-14266

SHOP ORDER NO. FE6000

DRAWN BY J. ZANNARDINE DATE

DSGN ACTIVITY APPD R. STRICKLAND DATE

RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

COUPLING

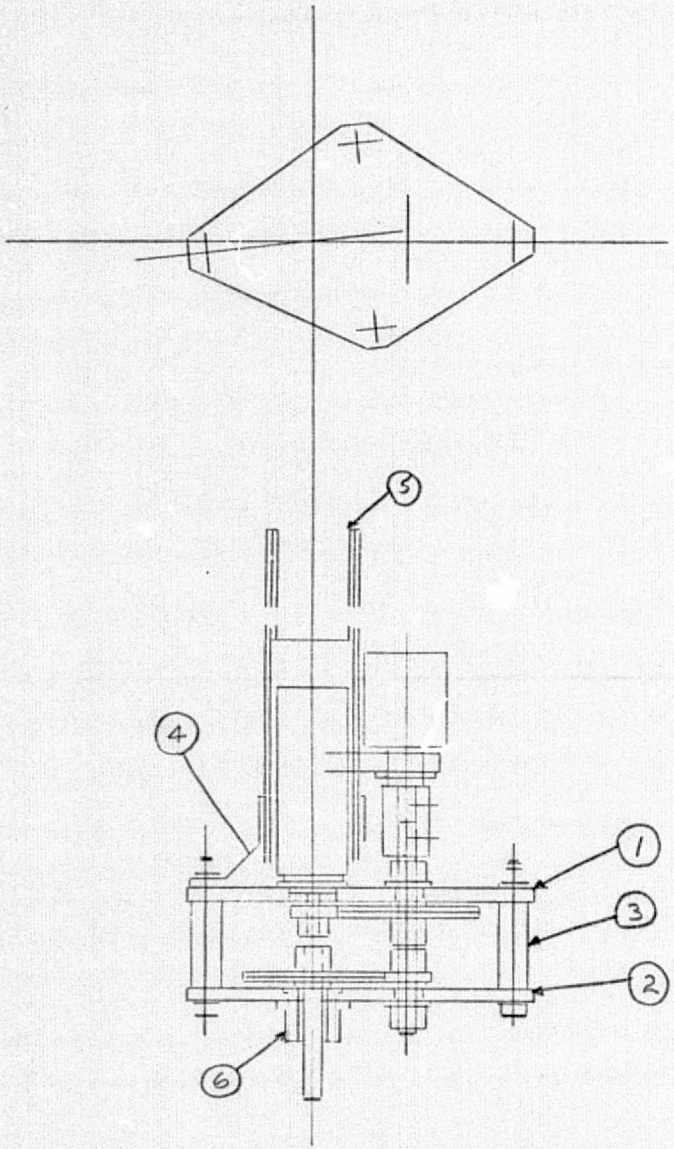
SIZE	CODE IDENT NO.	
B	49671	SK2273453

SCALE 1/1 | WEIGHT | SHEET 1 OF 1

NF

RCA DISTR

AED 739-1 3/66



REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL STD 9

SK2284377

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:		
BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE

CONTRACT NO. NAS9-14266 REL

DRAWN J. Zaccardino DATE 1-22-75

CHECKED DATE

DESIGN ACTIVITY APPD. Gaston Sobel DATE 1/30/75

RCA CORPORATION : NEW YORK, NY

PLANT

ROTATION DRIVE ASSEMBLY

SIZE	CODE IDENT NO.	
C	49671	SK2282449

SCALE — WEIGHT — SHEET 1 OF 1

NF

RCA DISTR

CA 2419-3 (4-71) 7074

PARTS LIST

RCA CORPORATION | NEW YORK, NY

ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J

REVISION DATE

PLSK2282449

REV LTR —

LIST TITLE:

ROTATION DRIVE

PREPARED BY / DATE	REL	CODE IDENT NO. 49671
W. Samuel 10 Dec 74.		SHEET 1 OF 2 SHEETS
CHECKED BY / DATE		CONTRACT NO. NAS 9-14266
DESIGN ACTIVITY APPD / DATE		
B. M. Sarteli 31 Jan 75.		

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED	LTR	DESCRIPTION	DATE	APPROVED

INTERPRET SYMBOLS USED AS FOLLOWS:

UNITS OF MEASURE (UM)	QUANTITIES	SYMBOL
A — Inches H — Barrels T — Each B — Feet J — Pounds C — Yards L — Pair D — Ounces M — Set E — Pints N — Kit F — Quarts P — Roll G — Gallons R — Box, Case	X — Applicable document O — For ref only	U — Govt or customer furnished K — Govt or customer furnished and installed * — Vendor item, See specification or source control drawing.

RCA
Astro Electronics

Next Higher Assembly No. SK2284377
Shop Order FE6000
Contract NAS 9-14266

Project VIDEO SYSTEMS
Prepared by W.E. Samuel Date 10 Dec 74.
Checked by _____ Date _____

y Number	PG	Rev	RW	OP	Shop Order	Assembly Title	PL Number	H.G.	Dup	Z	
SK 2282449		H		1		ROTATION DRIVE	SKPL2282449				1

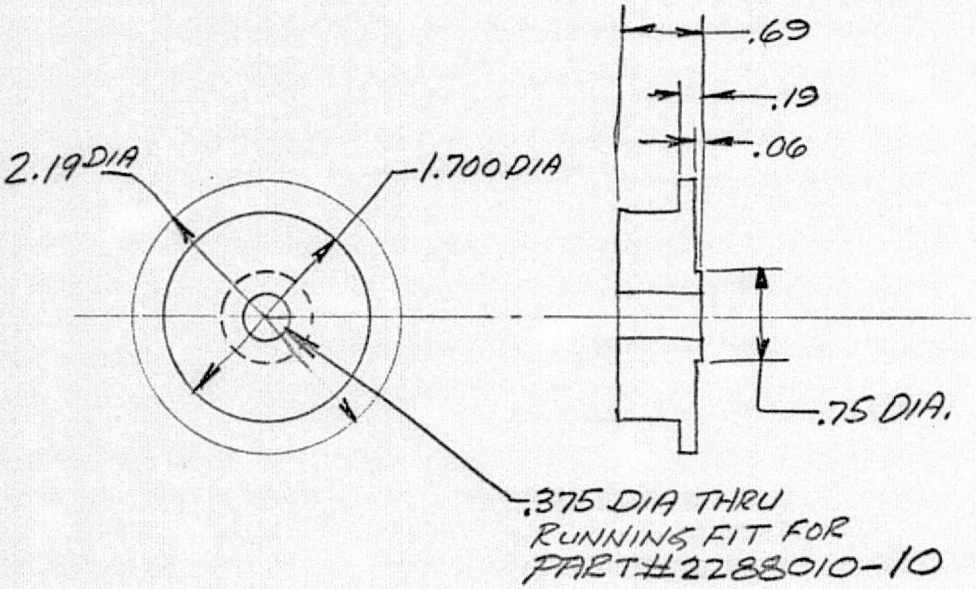
Suf (2)	Sym	Qty	C d #	Item No. (5)	Quantity Required 504 (5)	503 (5)	502 (5)	501 (5)	Type	UM (2)	Code Ident (5)	Part or Identifying Number (20)	Sym	Nomenclature or Description (48)	
	L			1				1				SK2288000-1	1	PLATE, MOTOR	2
	L			2				1				2	1	, OUTPUT	2
	L			3				4				3	1	SPACER	2
	L			4				1				4	1	MOUNT	2
	L			5				1				—	1	ADAPTER	2
	L			6				1				SK2288000-6	1	HOLDER	2
	L			7									1		2
	L			8									1		2
	L			9									1		2
	L			10									1		2
	L			11									1		2
	L			12									1		2
	L			13									1		2
	L			14									1		2
	L			15									1		2
	L			16									1		2
	L			17									1		2
	L			18									1		2
	L			19									1		2
	L			20									1		2
	L			21									1		2
	L			22									1		2
	L			23									1		2
	L			24									1		2
	L			25									1		2

7/71

LTR | SK

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



FOR REVISIONS ONLY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10

DIMENSIONS AND TOLERANCES PER MIL-STD-8

NEXT ASSY | USED ON

FIRST APPLICATION

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON: BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .06	± .015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL: SEE TABLE

CONTRACT NO.

SHOP ORDER NO. FE-6000

DRAWN BY DATE JAN 3 '75

DSGN ACTIVITY APPD DATE 1/3/75

RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

Y-AXIS IDLER

SIZE	CODE IDENT NO.	
B	49671	SK2273443

SCALE | WEIGHT | SHEET 1 OF 1

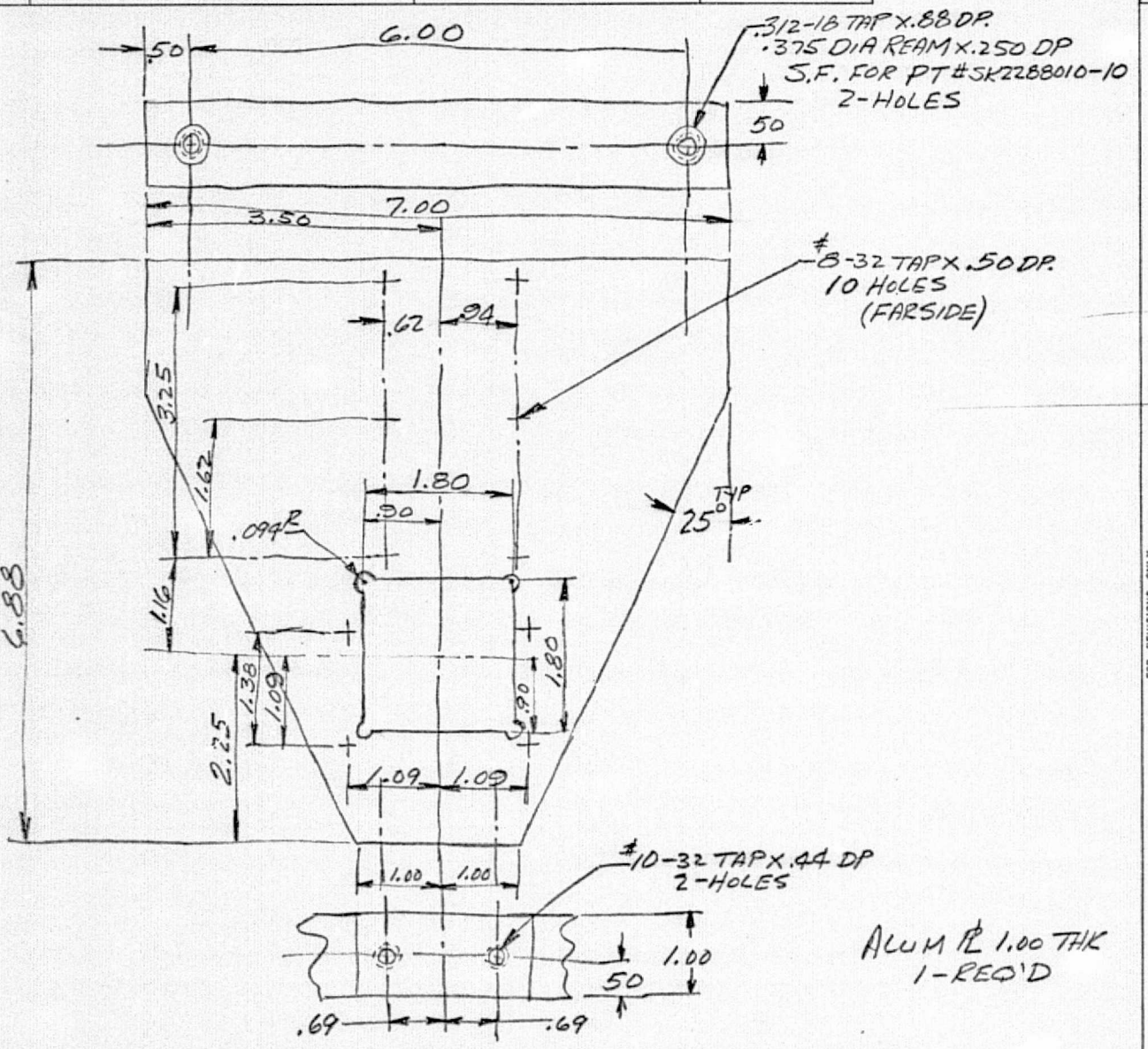
NF

RCA DISTR

AED 739-1 3/66

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



ALUM PL 1.00 THK
1-REQ'D

FOR REVISIONS ONLY

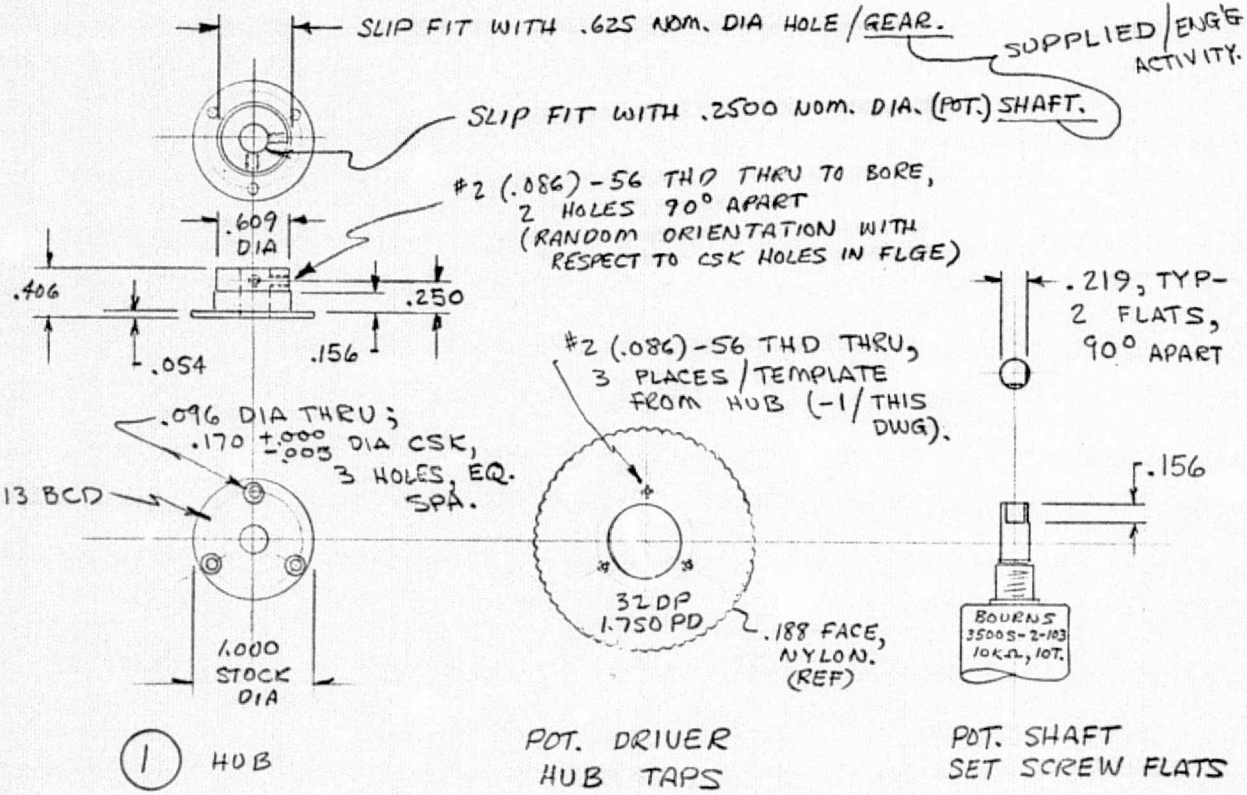
SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFI. DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ± .02 ± .005; ABOVE 6 TO 24 ± .03 ± .010; ABOVE 24 ± .06 ± .015; ANGULAR DIMENSIONS ± 1/2°	SHOP ORDER NO. FE-6000	Y-AXIS CARRIAGE
				DRAWN BY W. E. Wellington DATE 1/30/75	
RCA COMMODITY CODE		NEXT ASSY / USED ON / FIRST APPLICATION	MATERIAL:	DESIGN ACTIVITY APPD. Brian Smith DATE 1/30/75	SIZE C · CODE IDENT NO. 49671 · SK2282467 · SCALE 2X · WEIGHT · SHEET 1 OF 1 · NF · RCA DISTR

AED 739-2 3/66

SK2273458

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION
1	AL ALY 2024-T4 BAR 1.000 DIA 2010637-124		QQ-A-225/6C



LTR	REVISIONS DESCRIPTION	DATE	APPROVED

FOR REVISIONS ONLY

ORIGINAL PAGE IS OF POOR QUALITY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10

DIMENSIONS AND TOLERANCES PER MIL-STD-8

VIDEO SYSTEMS

NEXT ASSY | USED ON

FIRST APPLICATION

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON: BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .06	± .015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL: SEE TABLE

CONTRACT NO. NAS 9-14266

SHOP ORDER NO. FE6000

DRAWN BY (C.F. Samuel) DATE 14 Jan 75

DSGN ACTIVITY APPD (Burton Schaff) DATE 1/30/75

RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

POT. MOUNTING DETAILS

SIZE	CODE IDENT NO.	
B	49671	SK2273458

SCALE ~ | WEIGHT | SHEET 1 OF 1

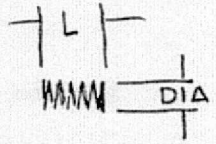
NF

RCA DISTR

AED 739-1 3/66

SK2273457 | LTR –

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION
1	MUSIC WIRE, .032 DIA, 2010045-32	–	QQ-W-470



O.D. = .180 (REF.)
I.D. = .116
DIRECTION OF WIND: OPTIONAL.
ENDS: SQUARED & GROUND.
NO./TURNS: 6
SOLID LENGTH: .19 (REF)
FREE LENGTH: .31
RATE: 122 LBS/INCH. (REF)
LOAD @ SOLID LENGTH: 12.5 LBS (REF)

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

FOR REVISIONS ONLY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION: N/A

RCA COMMODITY CODE: ~

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10

DIMENSIONS AND TOLERANCES PER MIL-STD-8

2288010	VIDEO SYSTEMS
NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:		
BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .06	± .015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL: SEE TABLE

CONTRACT NO. NAS 9-14266

SHOP ORDER NO. FE6000

DRAWN BY [signature] DATE 13 Jan 75

DSGN ACTIVITY APPD [signature] DATE 1/30/75

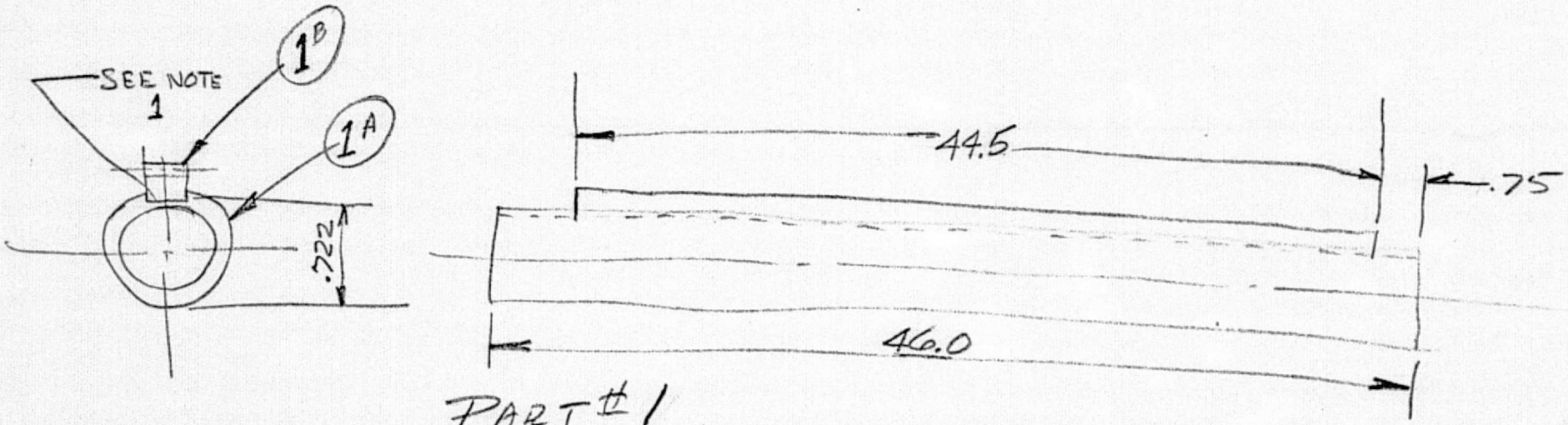
RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

SPRING, COMPRESSION, Z-AXIS SHAFT STABILIZER

SIZE B | CODE IDENT NO. 49671 | SK2273457 | NF

SCALE ~ | WEIGHT | SHEET 1 of 1 | RCA

AED 739-1 3/66



PART # 1

QUAN. 1

MAT'L: (1A) .750 DIA X .049 WALL THK STNST'L TUBING

(1B) 32 PITCH SPUR GEAR RACK

BOSTON GEAR NO. Y-32

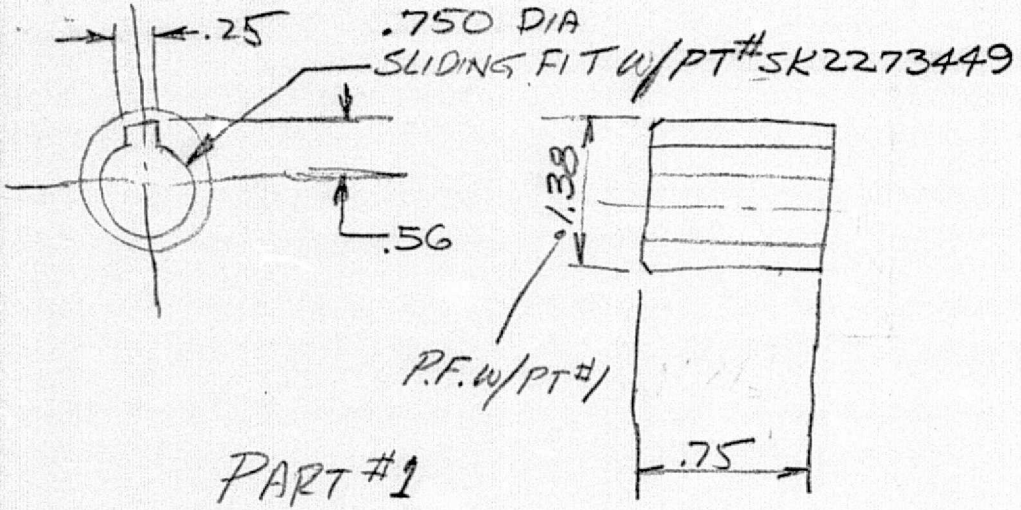
NOTE:

1. BOND RACK PT# 1B TO SHAFT PT# 1A WITH _____ APPLY PRESSURE OVER ENTIRE LENGTH OF RACK IN ORDER THAT PARELLELISM IS MAINTAINED WHILE CURRING.

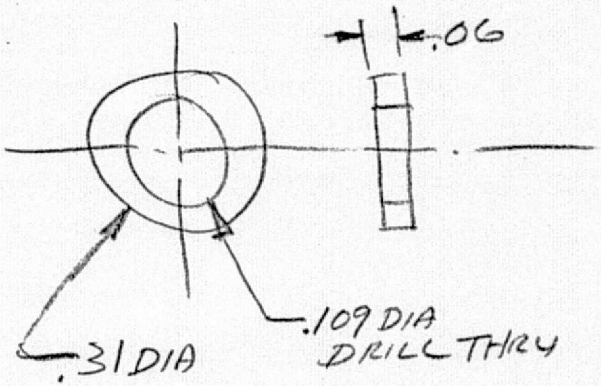
RADIO CORPORATION OF AMERICA
ASTRO DIVISION

Z AXIS SHAFT

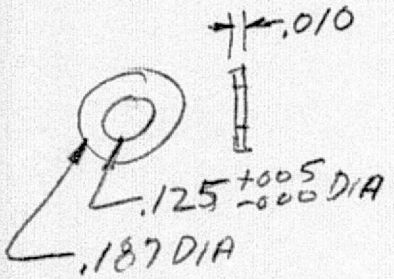
S. O. NO FE 6000 STRICKLAND
CONT. NO NAS 9-14266
DRAWN BY [illegible]
DATE JAN 6 1975 B SK2273449 NF



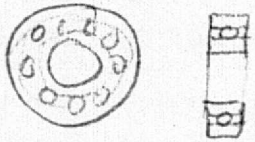
PART #1
QUAN 2
MAT'L: OILITE BRONZE
BOSTON GEAR NO. CB1024



PART # 2
QUAN 2
MAT'L: STN STL

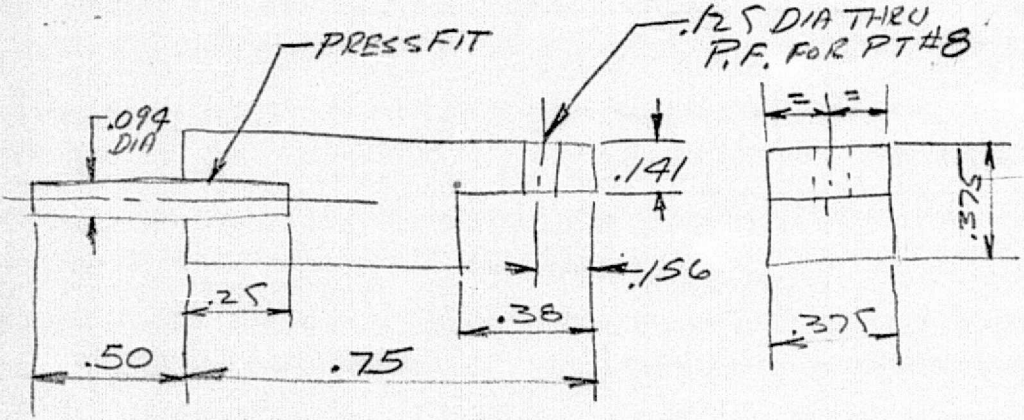


PART #3
QUAN. 4
MAT: STN ST'L
OR PIC # B4-4

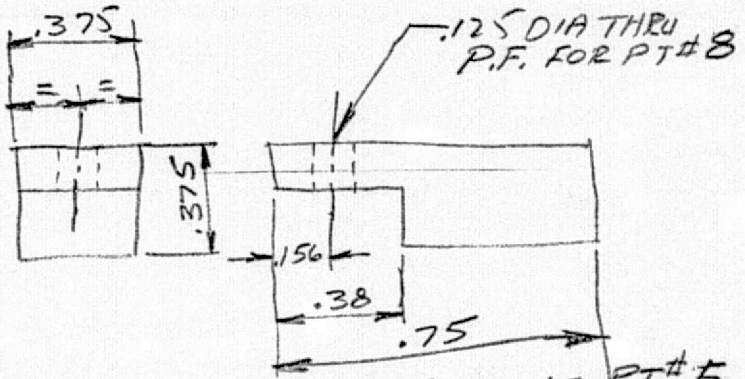


PART # 4
QUAN 4
MAT'L: BARDEN BRG
No. SR2SS

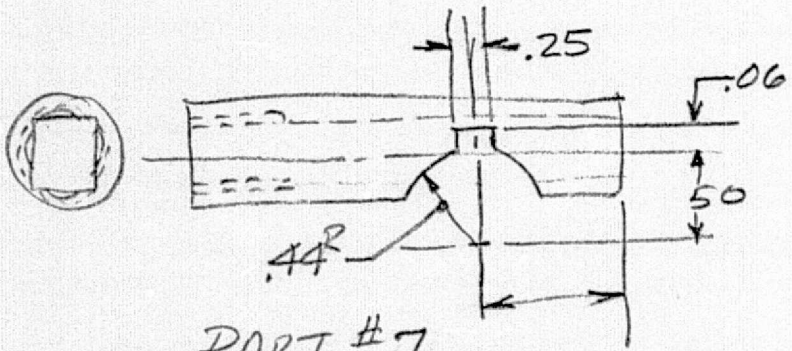
RADIO CORPORATION OF AMERICA ASTRO ELECTRONICS DIVISION SKETCH		
Z AXIS (DETAIL PARTS)		
S. O. NO FE 6000	ENG. [illegible]	
CONT. NO NAS 9-14266		
DRAWN BY: Woodmen	B	SK2273448
DATE JAN 6, 1975		



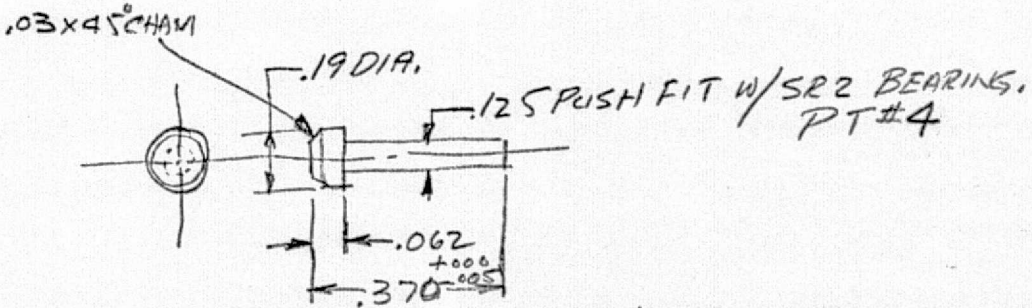
PART #5
QUAN 2
MAT'L: .375 SQ KEY STOCK



PART #6 SAME AS PT #5
(OMIT .094 DIA HOLE)
QUAN 2
MAT'L: .375 SQ KEY STOCK



PART #7
QAN 2
MAT'L: STURDY SQUARE



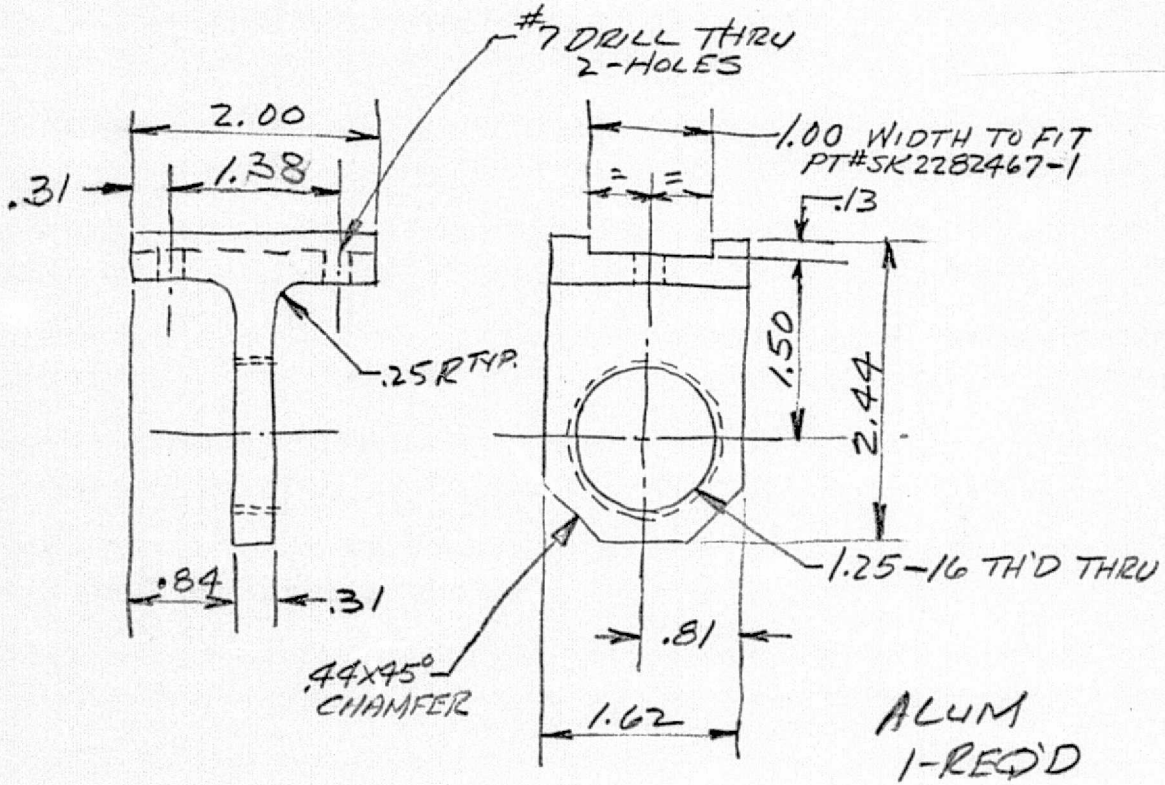
PART #8
QUAN 4
MAT'L: STN ST'L

SK2273448
SHEET 2 of 3

SK 2273445

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



FOR REVISIONS ONLY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10

DIMENSIONS AND TOLERANCES PER MIL-STD-8

NEXT ASSY | USED ON

FIRST APPLICATION

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .06	± .015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL: SEE TABLE

CONTRACT NO.

SHOP ORDER NO. FE-6000

DRAWN BY A. Charles DATE JAN 25

DSGN ACTIVITY APPD Benton Scott DATE 1/26/67

RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

BALL NUT ADAPTOR

SIZE	CODE IDENT NO.	
B	49671	SK2273445

SCALE 2/1 | WEIGHT | SHEET 1 OF 1

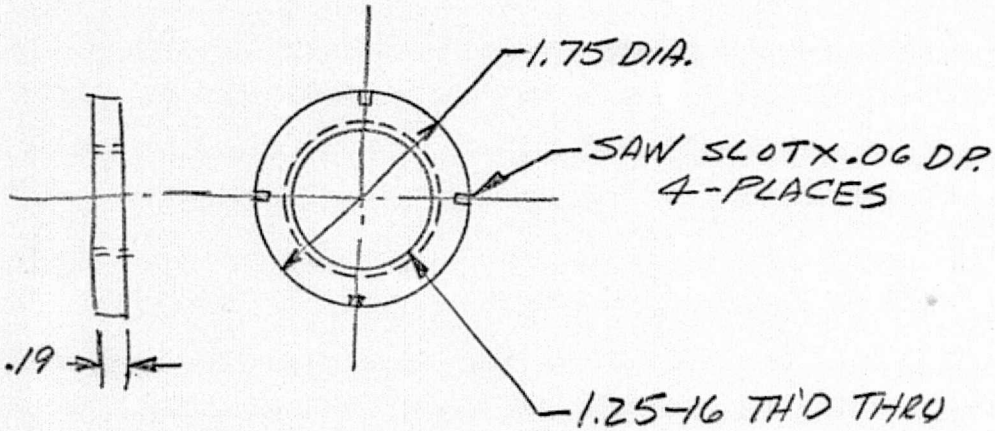
RCA DISTR

AED 739-1 3/66

LTR	SK

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



STN ST'L

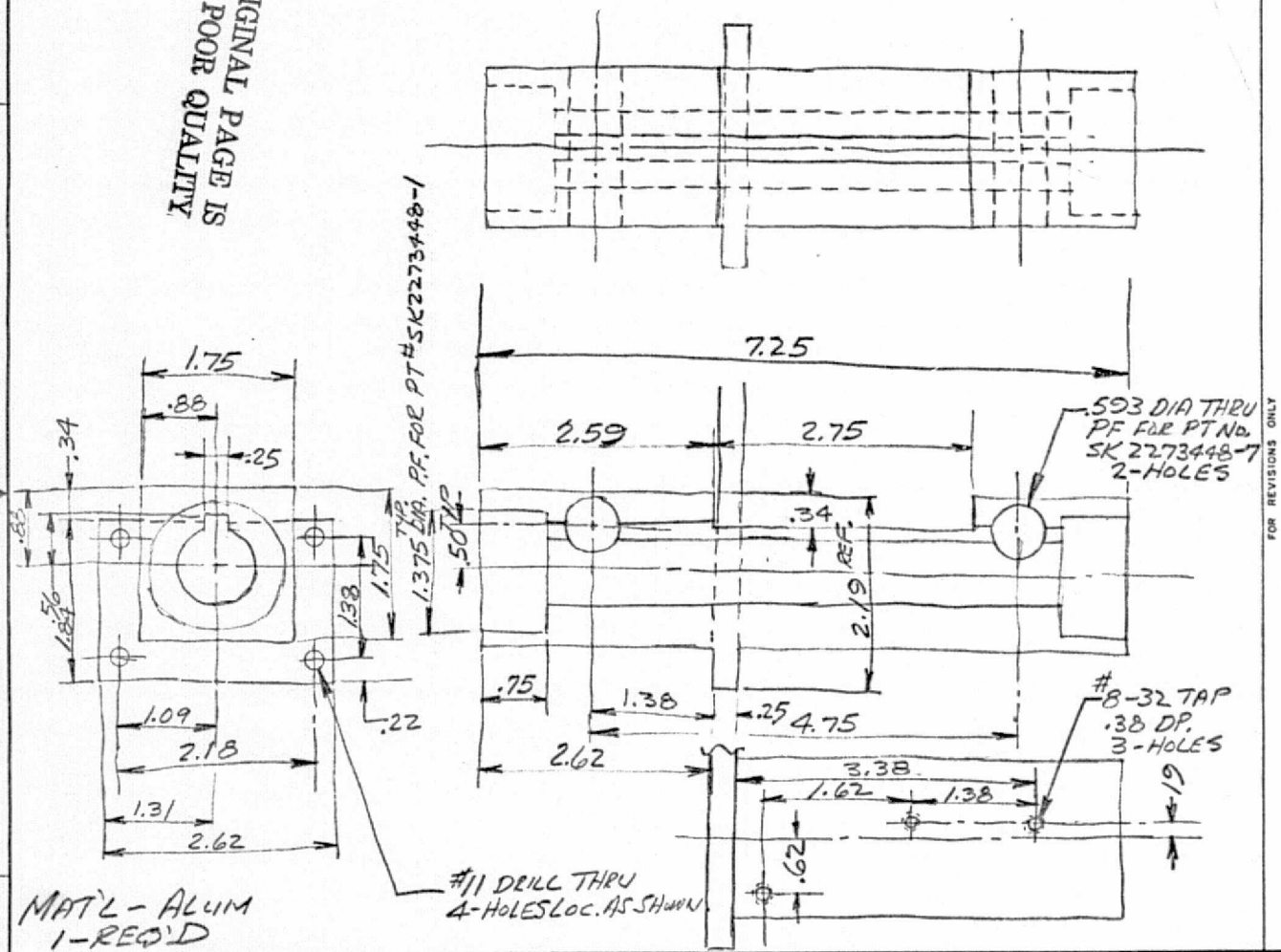
FOR REVISIONS ONLY

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO.	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT	
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO. FE6000	JAM NUT	
RCA COMMODITY CODE		NEXT ASSY / USED ON; FIRST APPLICATION	ANGULAR DIMENSIONS ± 1/2°; MATERIAL: SEE TABLE	DRAWN BY M.C. Weber DATE JAN 25; DSGN ACTIVITY APPD DATE 1/7/25	SIZE B; CODE IDENT NO. 49671; SK2273444 NF; SCALE 1/1; WEIGHT; SHEET 1 OF 1; RCA DISTR	

AED 739-1 3/66

ORIGINAL PAGE IS
OF POOR QUALITY



MAT'L - ALUM
1-REQ'D

SKETCH

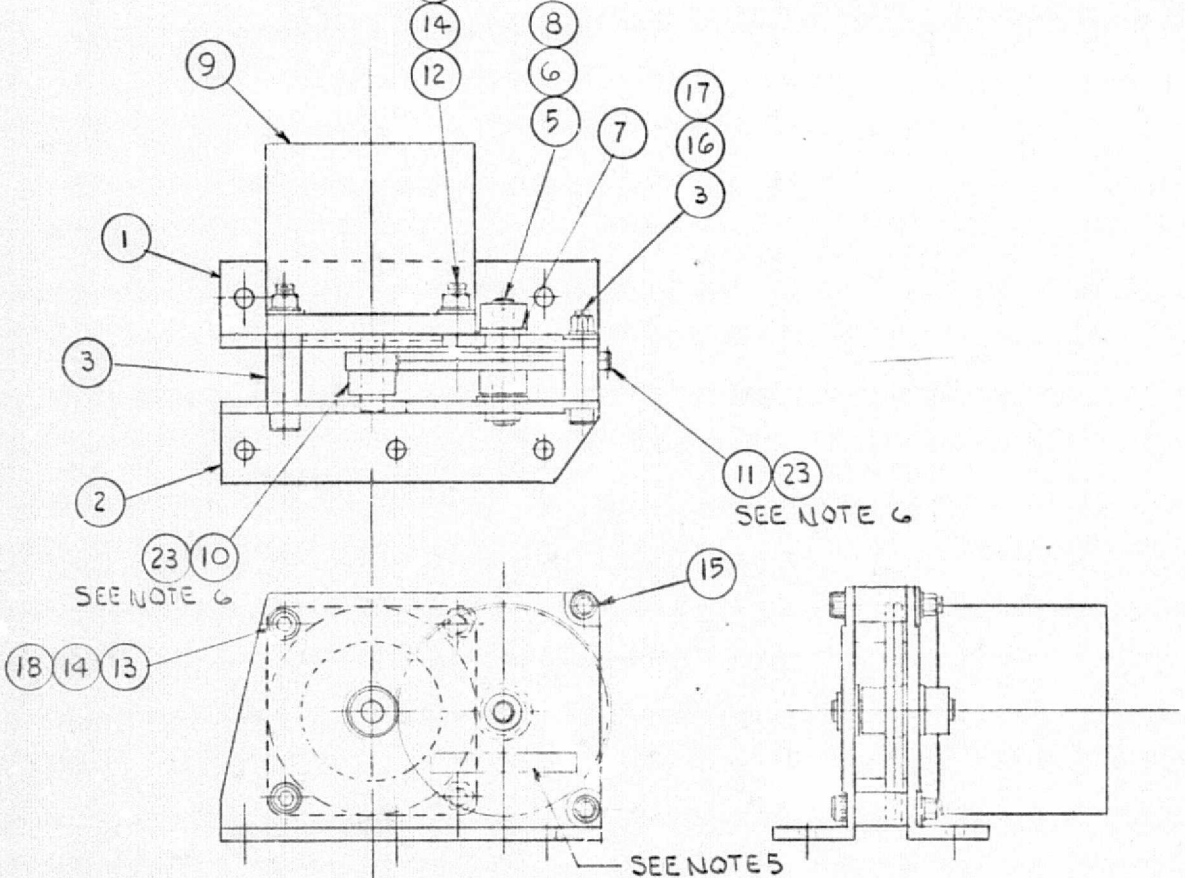
FOR REVISIONS ONLY

LTR
B
SK2282468
A

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX. READING OF 125 PER MIL STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT
		DIMENSIONS AND TOLERANCES PER MIL STD 8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 · 02 · 005; ABOVE 6 TO 24 · 03 · 010; ABOVE 24 · 06 · 015; ANGULAR DIMENSIONS ± 1/2°	SHOP ORDER NO. FE-6000	Z AXIS DRIVE HOUSING
				DRAWN BY N.C. WILLIAMS DATE Jan 3, 1975	
RCA COMMODITY CODE		NEXT ASSY / USED ON	MATERIAL	DESIGN ACTIVITY APPD DATE 1/3/75	SIZE C · CODE IDENT NO 49671 · SK2282468
		FIRST APPLICATION			SCALE n · WEIGHT n · SHEET 1 of 1

AED 739-2 3/66

NF
RCA DISTR



NOTES

1. MATERIAL: DASH 1 & 2: ALUM ANGLE 6063-T5
   RCA 2010769-918 QQ-A-200/9
   FINISH: CHEMICAL TREATMENT FOR ALUM AND ALUM ALLOYS
2. WORKMANSHIP SHALL CONFORM TO ITEM 22
3. PRIOR TO ASSEMBLE PAINT ITEM 1 (MASK ALL MTG HOLES, THREADS, BEARING), ITEM 2 (MASK ALL MTG HOLES, & BEARING) AND ITEM 3 WITH ITEM 20.
4. AFTER ASSEMBLE PAINT REMAINING ITEMS EXCEPT ITEMS 5, 6, 7, 10 & 11.
5. MARK WITH .12 STD CHARACTERS IN APPROXIMATE LOCATION "49671 ASSY 2282450-501" PER. ITEM 4, USING ITEM 25.
6. STAKE SET SCREW OF ITEM 10 & 11 AFTER INSTALLATION WITH ITEM 23.

FOR PARTS LIST SEE PL SK2282450

QTY REQD PER DASH NO	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5 66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL STD 9

SK 2284317	VIDEO SYS
NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:		
BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE

CONTRACT NO. NAS 9-14266 REL

DRAWN [illegible] DATE 12/17/74

CHECKED DATE

DESIGN ACTIVITY APPD. Burton Stott DATE 1/30/75

RCA CORPORATION · NEW YORK, NY

ASTRO ELECTRONICS DIV PRINCETON N.J. PLANT

Z AXIS DRIVE

SIZE	CODE IDENT NO.	
C	49671	SK2282450

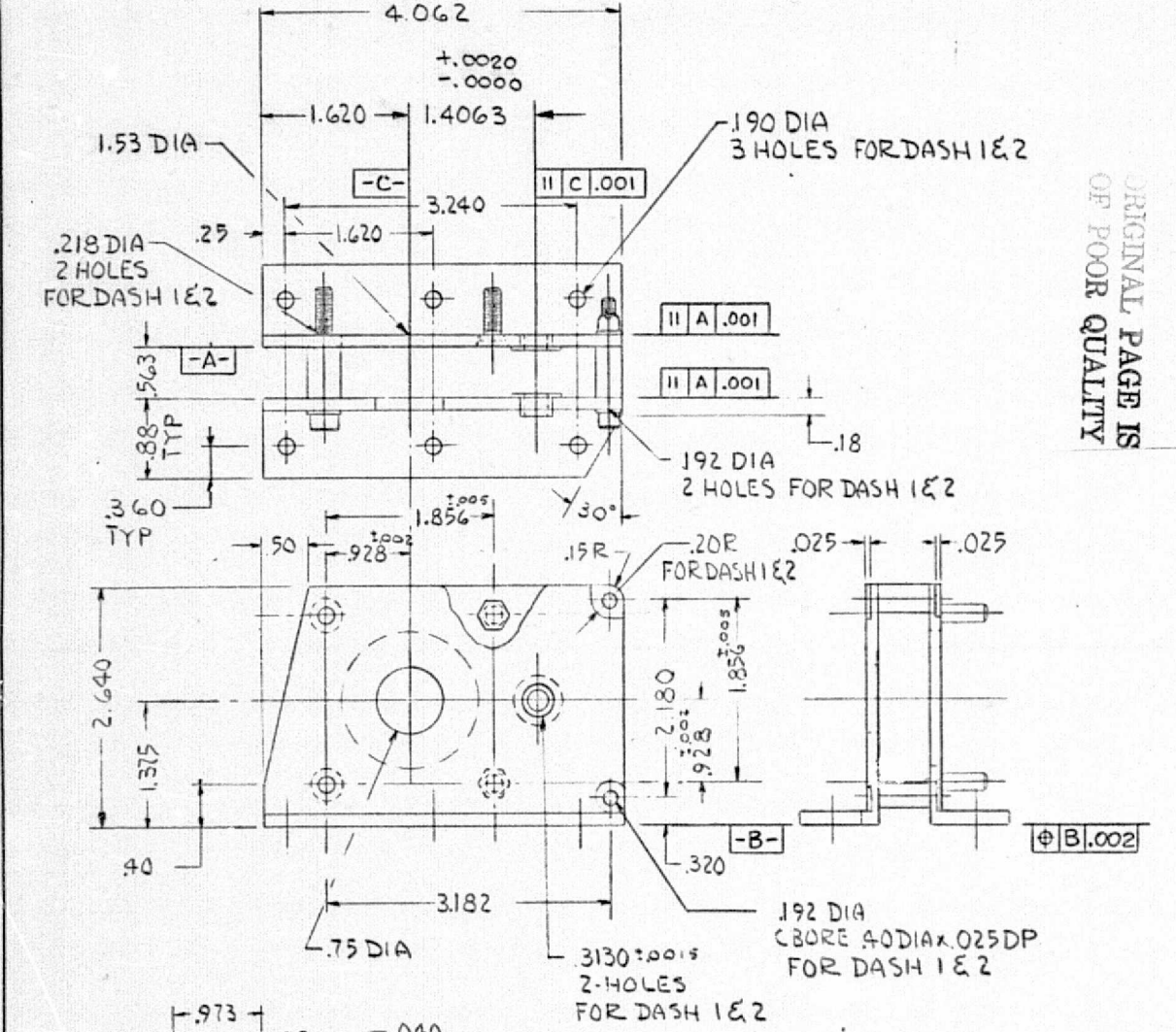
SCALE ½ WEIGHT ½ SHEET 1 OF 2

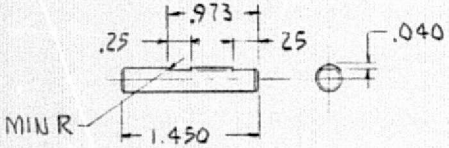
LTR: SK2282450 B A

NF

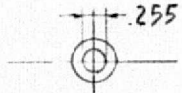
RCA DISTR

RCA 2419-3 (4-71) 7074

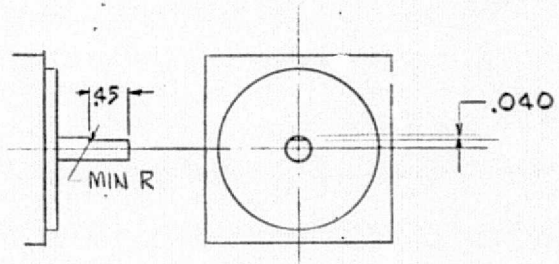




DASH 3
MATERIAL .250 DIA
PIC CAT# A8-11



DASH 4
MATERIAL: THRUST WASHER
PIC CAT# AH-2-YY



MOTOR SHAFT
ALTERATION
ITEM 9

SIZE	CODE IDENT NO	SK2282450
C	49671	
	SHEET 2	RCA DISTR

LTR | SK2282450
B
A

PARTS LIST

RCA CORPORATION | NEW YORK, NY

ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J

REVISION DATE

PLSK2282450

REV LTR —

LIST TITLE:

Z AXIS DRIVE

PREPARED BY — DATE: I.S. Earnest 15 Dec 74

CHECKED BY — DATE:

DESIGN ACTIVITY APPD — DATE: B.N. Soltoff 31 Jan 75

REL

CODE IDENT NO. 49671

SHEET 1 OF 2 SHEETS

CONTRACT NO. NAS 9-14266

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED	LTR	DESCRIPTION	DATE	APPROVED

INTERPRET SYMBOLS USED AS FOLLOWS:

UNITS OF MEASURE (UM)	QUANTITIES	SYMBOL
A — Inches H — Barrels T — Each B — Feet J — Pounds C — Yards L — Pair D — Ounces M — Set E — Pints N — Kit F — Quarts P — Roll G — Gallons R — Box, Case	X — Applicable document O — For ref only	U — Govt or customer furnished K — Govt or customer furnished and installed ✲ — Vendor item, See specification or source control drawing.

Parts List Worksheet

RCA Astro Electronics

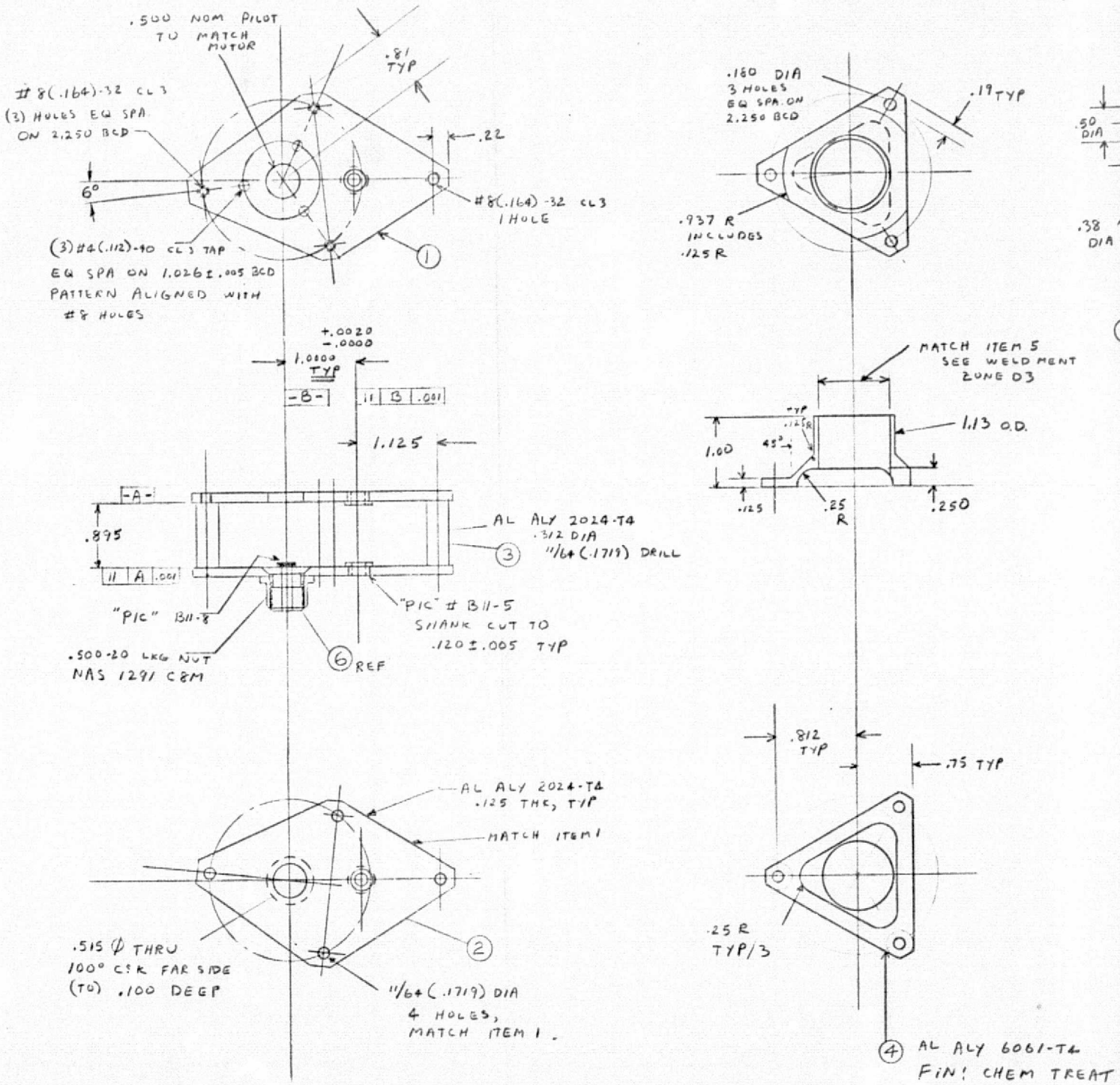
Next Higher Assembly No. SK 2284377
Shop Order FE 6000
Contract NAS 9 / U266

Project VIDEO SYSTEMS
Prepared by _____ Date _____
Checked by _____ Date _____

Assembly Number	PG	Rev	PKG	OP	Shop Order	Assembly Title	PL Number	H.G.	Dup	Z	
SK 228 2450		H		1		Z AXIS DRIVE	SKPL 2282450				1

H.G. (2)	Suf (2)		SP	Cd #	Item No. (5)	Quantity Required 504 (5)	503 (5)	502 (5)	501 (5)	Type	UM (2)	Code Ident (5)	Part or Identifying Number (20)		Sym	Nomenclature or Description (48)	
16-17	18-19	20	24	25	26-30	31-35	36-40	41-45	46-50	51	52-53	54-58	59 — 78	80	31	32 — 79	80
		L			1				1				SK 228 2450-1	1		MOUNT, MOTOR	2
		L			2				1				SK 228 2450-2	1		GEAR	2
		L			3				4				NAS 1057T-3-56	1		SPACER	2
		L			4				X				2021037	1		MATERIAL APPLICATION SPEC	2
		L			5				1				SK 228 2452-3	1		SHAFT .250 DIA	2
		L			6				2			00141	B11-9	1		BUSHING, SHOULDER	2
		L			7				1				SK 228 2450-4	1		WASHER, THRUST	2
		L			8				1			23766	EH 2-3	1		COLLAR, SHAFT	2
		L			9				1			58474	MO-61	1		MOTOR, DC STEPPING	2
		L			10				1			00141	G43-18-Q10	1		PINION, 1ST. 32 DP	2
		L			11				1			00141	P17-4-72	1		GEAR 72T. 32 DP	2
		L			12				2				8945613-78	1		STUD, CAPTIVE #10 X .500	2
		L			13				2				MS 16995-16	1		SCREW SOCKET HEAD	2
		L			14				4				NAS 1291-C3M	1		NUT LOCKING	2
		L			15				2				MS 16995-30	1		SCREW SOCKET HEAD	2
		L			16				2				NAS 1292-C08M	1		NUT, LOCKING	2
		L			17				2				8924401-5	1		WASHER	2
		L			18				2				8924401-6	1		"	2
		L			19				X				1980135-1	1		BINISA SPEC	2
		L			20				AR				2026106	1		CHEMGLAZE B/K	2
		L			21				X				2020372	1		STUD INSTALLATION SPEC	2
		L			22				X				80300028	1		WORKMANSHIP SPEC	2
		L			23				AR				2021037-5	1		STAKING COMPOUND	2
		L			24									1			2
		L			25									1			2

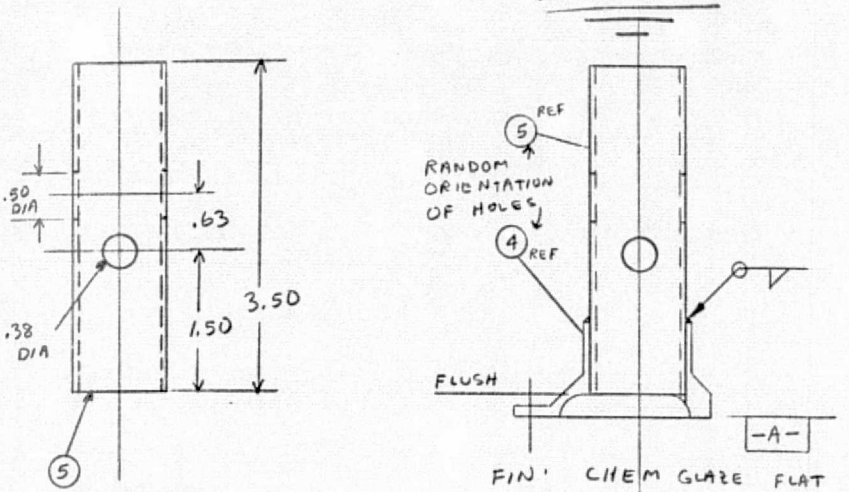
AEO 576 7/71



FOLDOUT FRAME 1

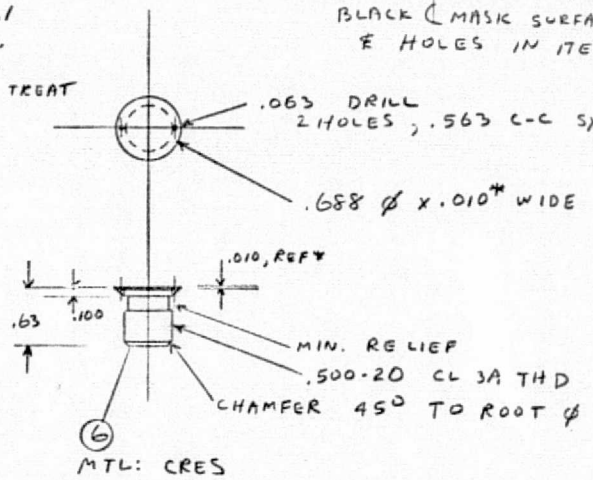
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

WELDMENT



AL ALY 6061
1.000 O.D.
.063 WALL
FIN; CHEM TREAT

FIN: CHEM GLAZE FLAT BLACK (MASK SURFACE A & HOLES IN ITEM 4)



MTL: CRES

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

NEXT ASSY | USED ON

FIRST APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½ °

RCA COMMODITY CODE:

CONTRACT NO. NAS9-14266 REL

DRAWN J. ZAWADZKI 1-24-75 DATE

CHECKED DATE

DESIGN ACTIVITY APPD. DATE 4/30/75

RCA CORPORATION · NEW YORK, NY

PLANT

ROTATION DRIVE DETAILS

SIZE D | CODE IDENT NO. 49671 | SK2288000

SCALE 1/1 | SHEET 1 OF 1

RCA DISTR

SK2288000

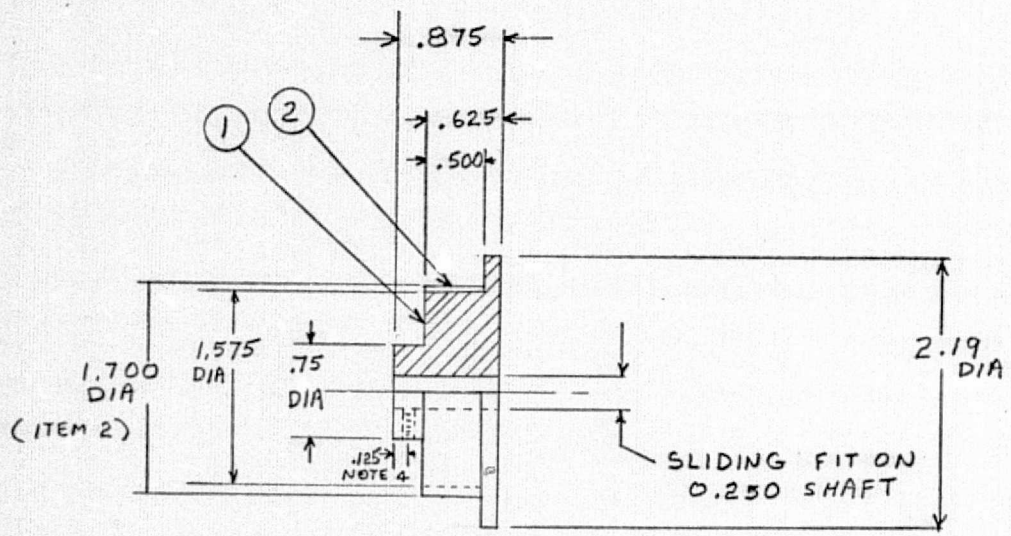
FOLDOUT FRAME 2

LTR | SK 2273471

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION
1	AL ALY 2024-T4 BAR X 3.00 DIA	———	QQ-A-225/6C
2	MEDIUM HARD URETHANE (60A)	———	202031, SEE NOTES 1 & 3

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

FOR REVISIONS ONLY



NOTES:
1. PREPARE (URETHANE) MATL. PER SPEC, PARA 3.3.2.
2. PREPARE SUBSTRATE PER SPEC, PARA 3.2.2
3. BOND PER SPEC, PARA 3.2.3.3, USING PRIMER & ADHESIVE NOTED THEREIN
4. DRILL & TAP #8-32, TWO HOLES APPROXIMATELY 90° APART

SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10

DIMENSIONS AND TOLERANCES PER MIL-STD-8

VIDEO SIM

NEXT ASSY | USED ON

FIRST APPLICATION

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:		
BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .06	± .015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL: SEE TABLE

CONTRACT NO. NAS9-14266

SHOP ORDER NO.

DRAWN BY Bert M Soltoff DATE 7/19/75

DSGN ACTIVITY APPD. Barton Soltoff DATE 7/24/75

RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

DRIVE WHEEL, Y AXIS

SIZE	CODE IDENT NO.	
B	49671	SK 2273471

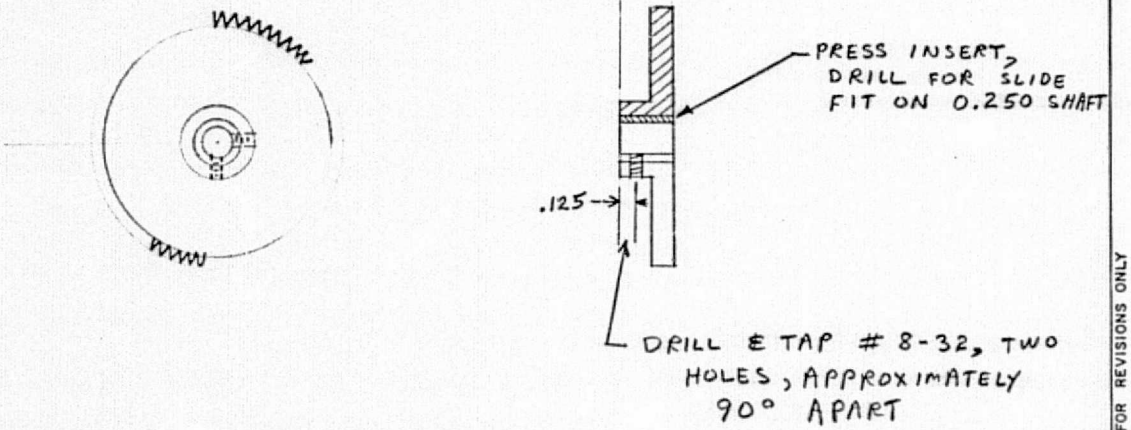
SCALE 1/1 | WEIGHT X | SHEET 1 OF 1 | RCA DISTR

AED 739-1 3/66

SK 2273472 | LTR A

DASH NO.	SPECIFICATION TABLE MATERIAL	FINISH	SPECIFICATION
1	BOSTON GEAR G-182 (64T, 32 DP)	———	
2	BOSTON GEAR G-185 (96T, 32 DP)	———	

REVISIONS LTR	DESCRIPTION	DATE	APPROVED
A	ADDED -2	2/25/75	DMd 2/25/75



NOTES:

FOR REVISIONS ONLY

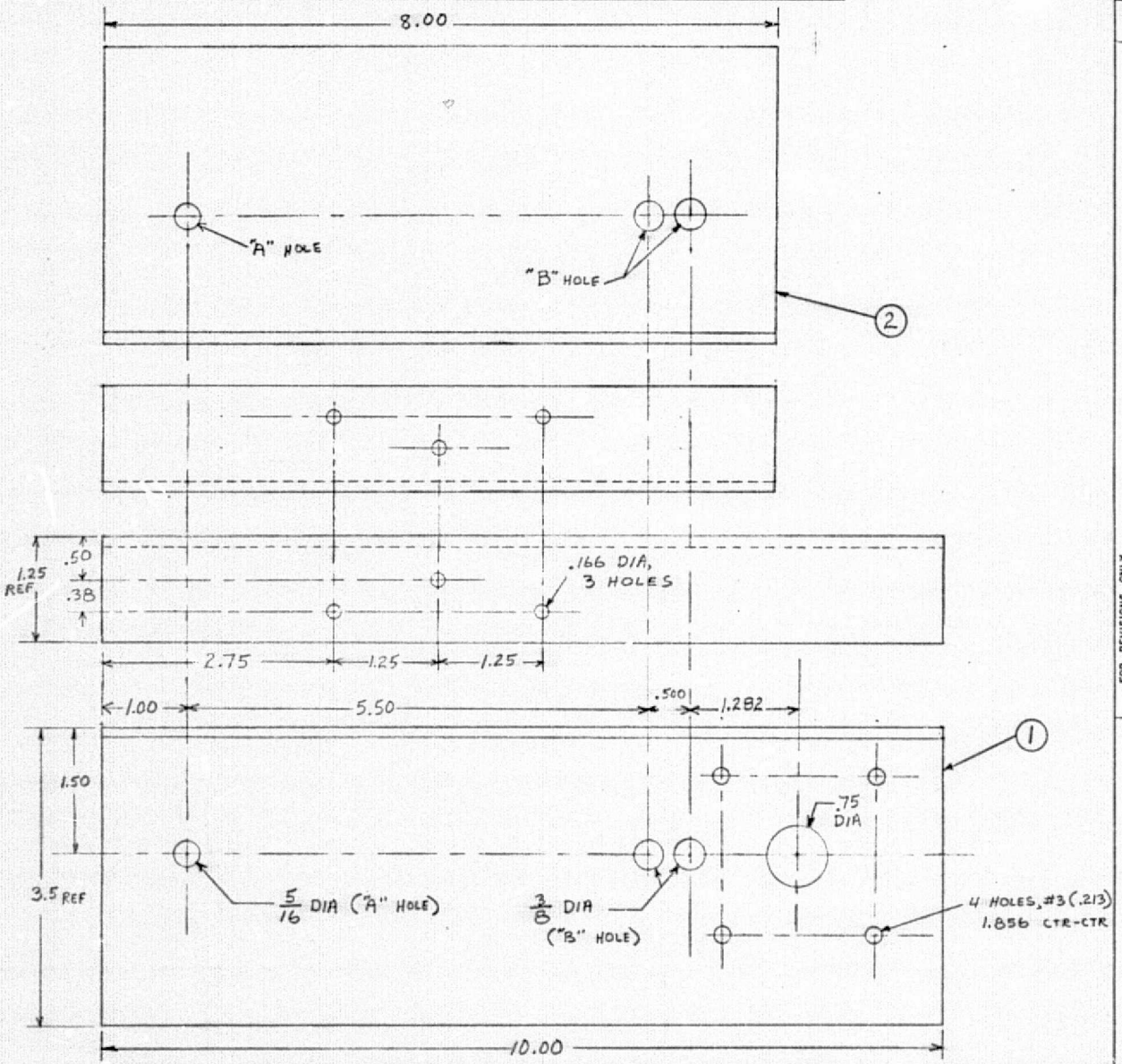
SKETCH

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9	SECURITY CLASSIFICATION	UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING	CONTRACT NO. NAS9-14266	RADIO CORPORATION OF AMERICA NEW YORK, N.Y. ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT	
		DIMENSIONS AND TOLERANCES PER MIL-STD-8	TOLERANCES ON: BASIC DIMENSIONS / 2 PLACE DECIMALS / 3 PLACE DECIMALS: UP TO 6 ±.02 ±.005; ABOVE 6 TO 24 ±.03 ±.010; ABOVE 24 ±.06 ±.015	SHOP ORDER NO.	GEAR, MODIFIED	
		VIDEO SIM / USED ON		DRAWN BY BERT SOLTOFF DATE 2/19/75	SIZE B	CODE IDENT NO. 49671 SK 2273472
RCA COMMODITY CODE		NEXT ASSY / FIRST APPLICATION	ANGULAR DIMENSIONS ± 1/2° MATERIAL: SEE TABLE	DSGN ACTIVITY APPD Boston Gottlieb 2/20/75 DATE	SCALE NL WEIGHT NL	SHEET 1 OF 1 RCA DISTR

AED 739-1 3/66

DASH NO.	SPECIFICATION TABLE		
	MATERIAL	FINISH	SPECIFICATION

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
33	A	.75 DIA WAS 5/8 DIA, ADDED LEFT "B" HOLE	2/20/75	



FOR REVISIONS ONLY

NOTES:
1. MATERIAL, ALUM ANGLE, 1.25 x 3.5 x .125
2. "A" & "B" HOLES MATCH DRILL IN ITEMS 1 & 2

SKETCH

LTR A B A

SK 2282707

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

SECURITY CLASSIFICATION

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER MIL-STD-10

DIMENSIONS AND TOLERANCES PER MIL-STD-8

	VIDEO SIM
NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:		
BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .06	± .015

ANGULAR DIMENSIONS ± 1/2°

MATERIAL

CONTRACT NO. NAS9-14266

SHOP ORDER NO.

DRAWN BY Bert Soltoff DATE 2/12/75

DESIGN ACTIVITY APPD. DATE 2/12/75

RADIO CORPORATION OF AMERICA
NEW YORK, N.Y.
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J., PLANT

Y AXIS DRIVE SUPPORTS

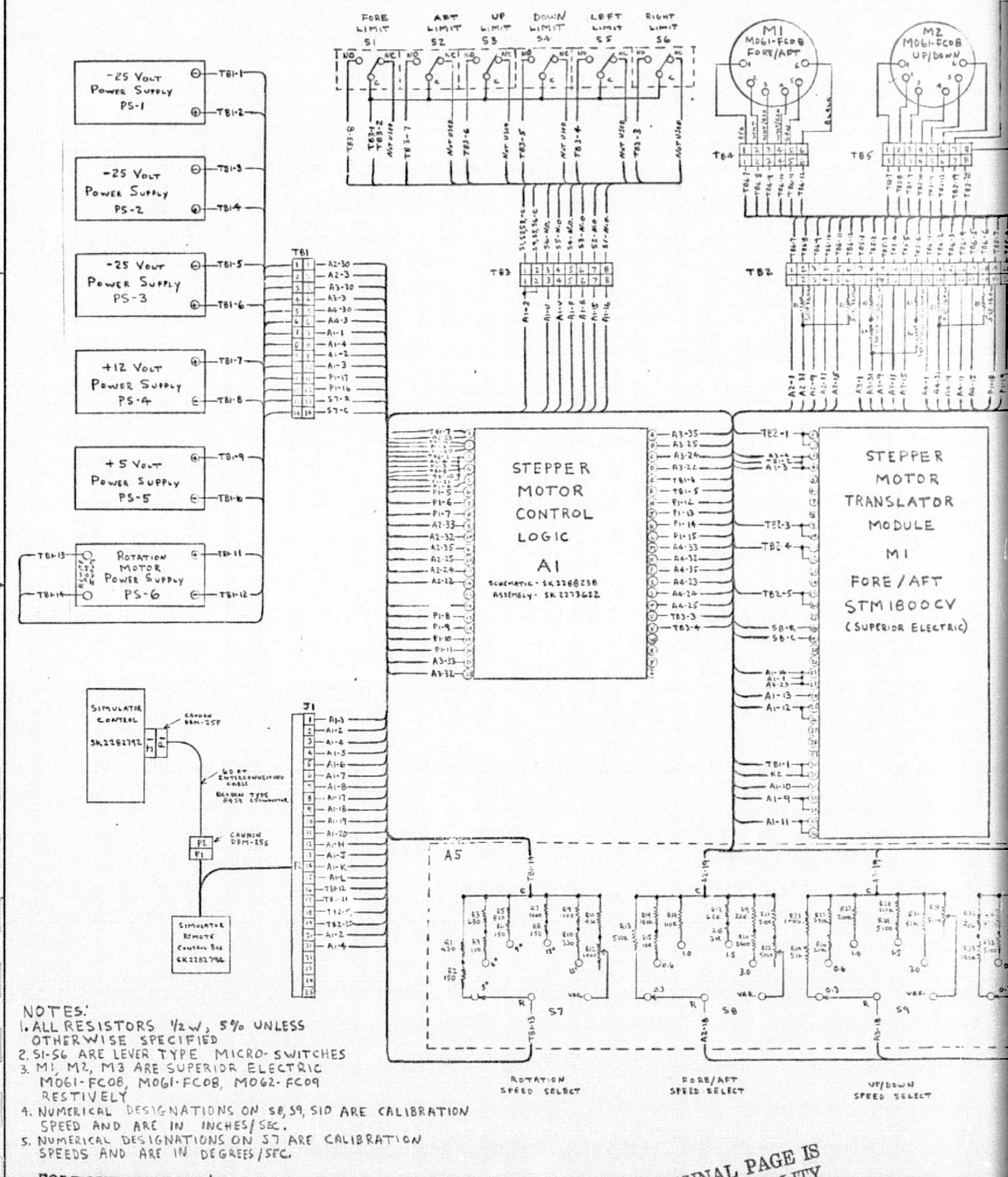
SIZE	CODE IDENT NO.	
C	49671	SK 2282707

SCALE 1/1 WEIGHT x SHEET 1 OF 1 RCA DISTR

AED 739-2 3/66

APPENDIX B

SIMULATOR APPARATUS ELECTRICAL SKETCHES



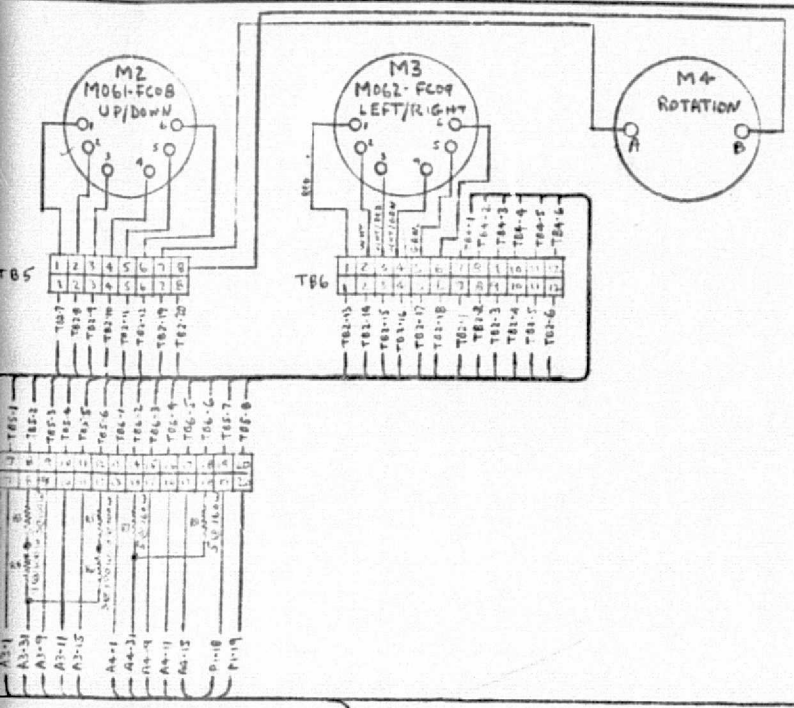
NOTES:

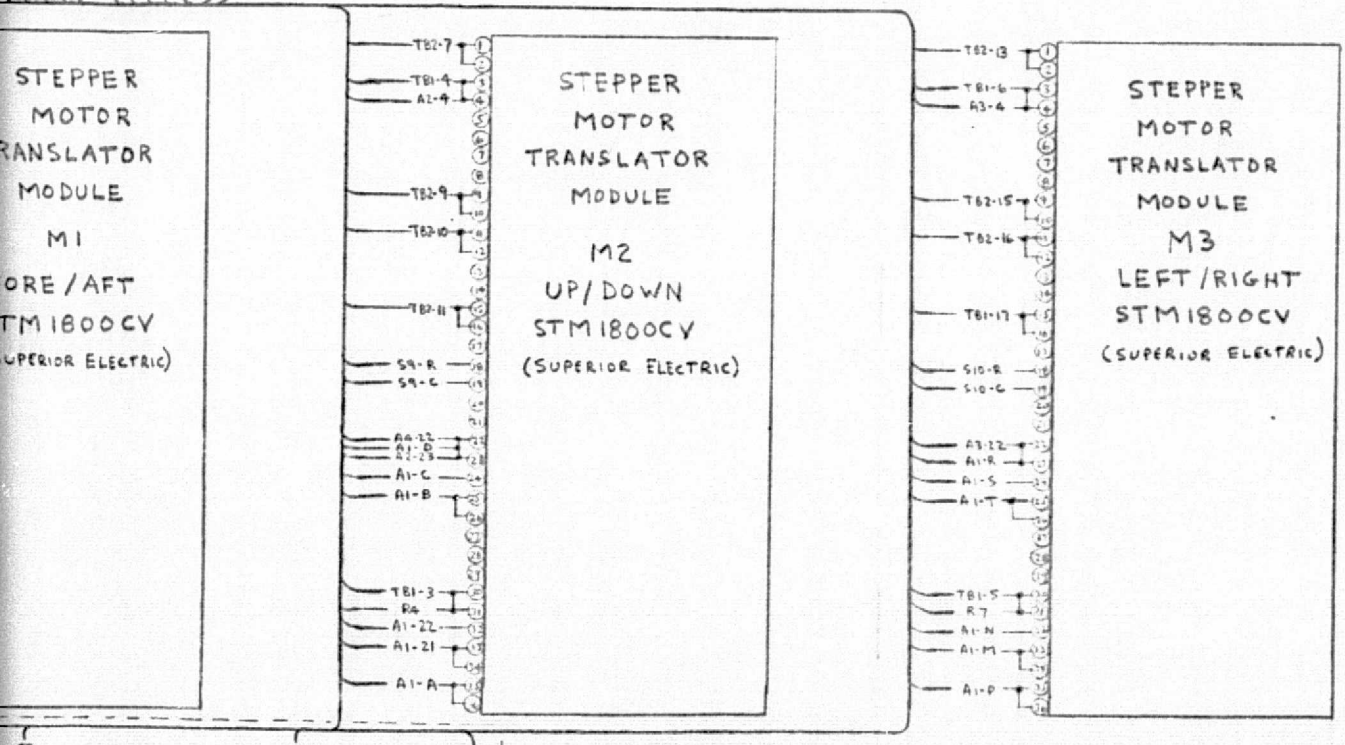
1. ALL RESISTORS 1/2 W, 5% UNLESS OTHERWISE SPECIFIED
2. S1-S6 ARE LEVER TYPE MICRO-SWITCHES
3. M1, M2, M3 ARE SUPERIOR ELECTRIC M061-FC08, M061-FC08, M062-FC09 RESTIVELY
4. NUMERICAL DESIGNATIONS ON S8, S9, S10 ARE CALIBRATION SPEED AND ARE IN INCHES/SEC.
5. NUMERICAL DESIGNATIONS ON S7 ARE CALIBRATION SPEEDS AND ARE IN DEGREES/SEC.

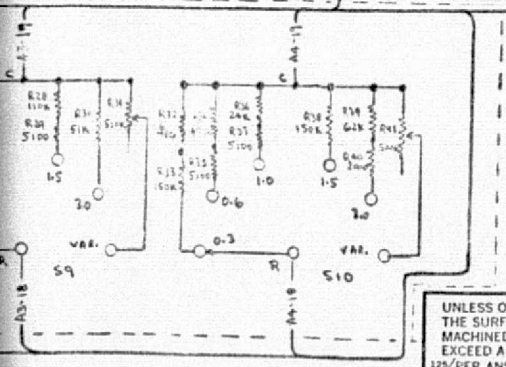
FOLDOUT FRAME 1

4 3 2 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED







UP/DOWN
EED SELECT

LEFT/RIGHT
SPEED SELECT

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125/PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE:

CONTRACT NO. NAS9-14266 REL

DRAWN E. G. HUBIT 5-15-75 DATE

CHECKED DATE

DESIGN ACTIVITY APP'D. DATE 5-15-75

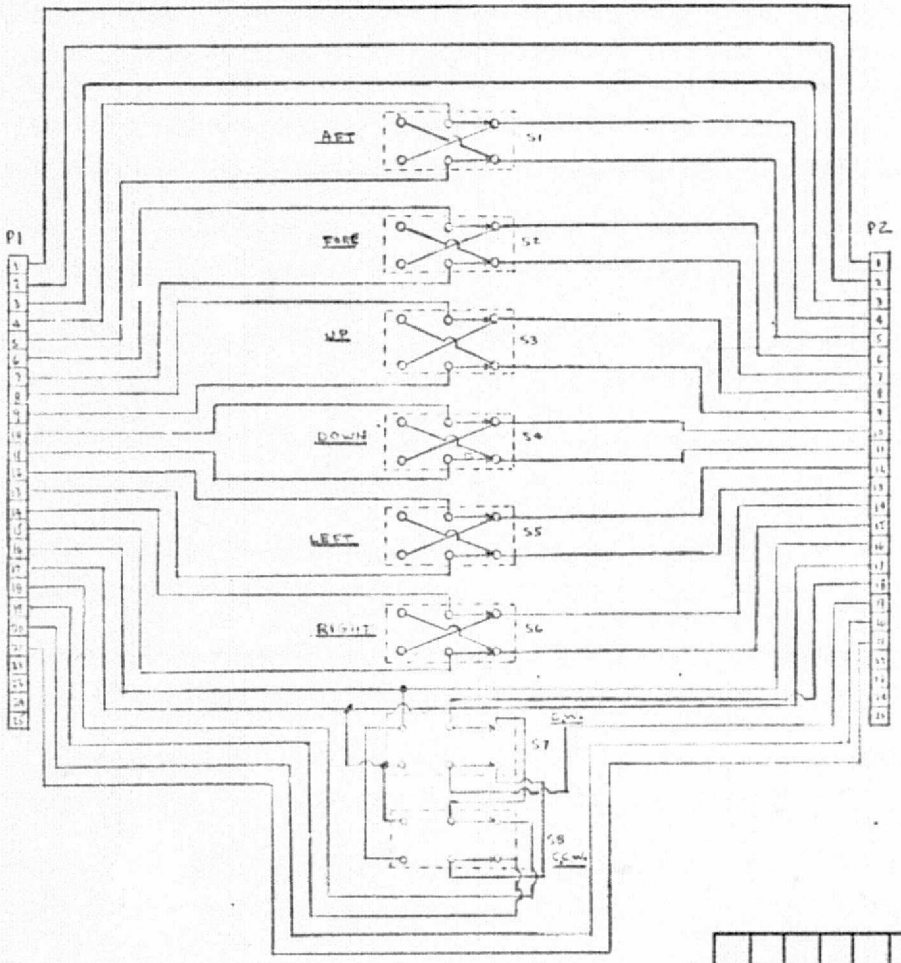
RCA CORPORATION : NEW YORK, NY
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J. PLANT

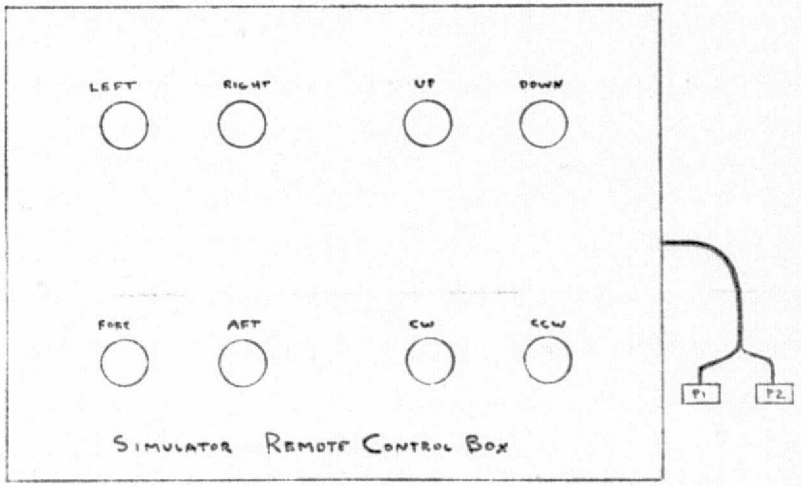
INTERCONNECTION DIAGRAM SIMULATOR

SIZE	CODE IDENT NO.	
D	49671	SK2288237

SCALE FOLDOUT FRAME SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED





QTY REQD PER DASH NO	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

NOTES!
1. S1, S2, S3, S4, S5, S6, S7, S8, ARE ALCO TYPE MSPN-206R WITH RS BUTTON
2. CONNECTOR P1 IS CANNON TYPE DBM-25P
3. CONNECTOR P2 IS CANNON TYPE DBM-25S
4. SWITCHES SHOWN IN NORMALLY CLOSED POSITION, LAMP TERMINALS NOT USED
5. CABLE IS HEWLETT PACKARD LOW VOLTAGE COMPUTER CABLE. CABLE APPROX 12 FT.

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL STD 9

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON	BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
	UP TO 6	± .02	± .010
	ABOVE 6 TO 24	± .03	± .015
	ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE

CONTRACT NO. NAS9-14266 REL

DRAWN F.G. HUBIT 5-16-75 DATE

CHECKED DATE

DESIGN ACTIVITY APPD. DATE 5-16-75

RCA RCA CORPORATION · NEW YORK, NY
ASTRO ELECTRONICS DIVISION, PRINCETON, N.J. PLANT

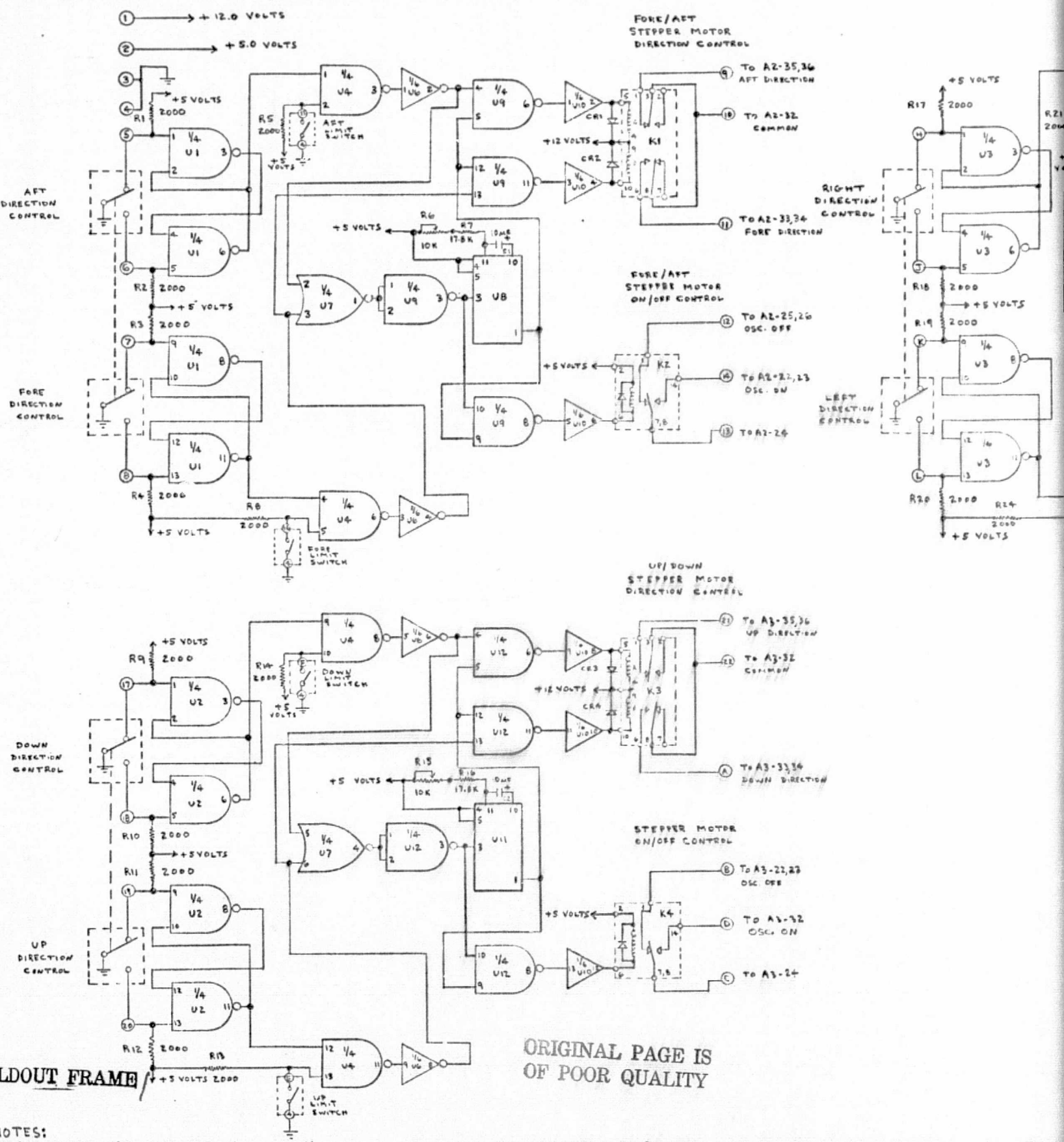
SIMULATOR REMOTE CONTROL BOX

SIZE	CODE IDENT NO.	
C	49671	SK2282794

SCALE WEIGHT SHEET 1 OF 1

RCA DISTR

RCA 2419-3 (4-71) 1074



FOLDOUT FRAME

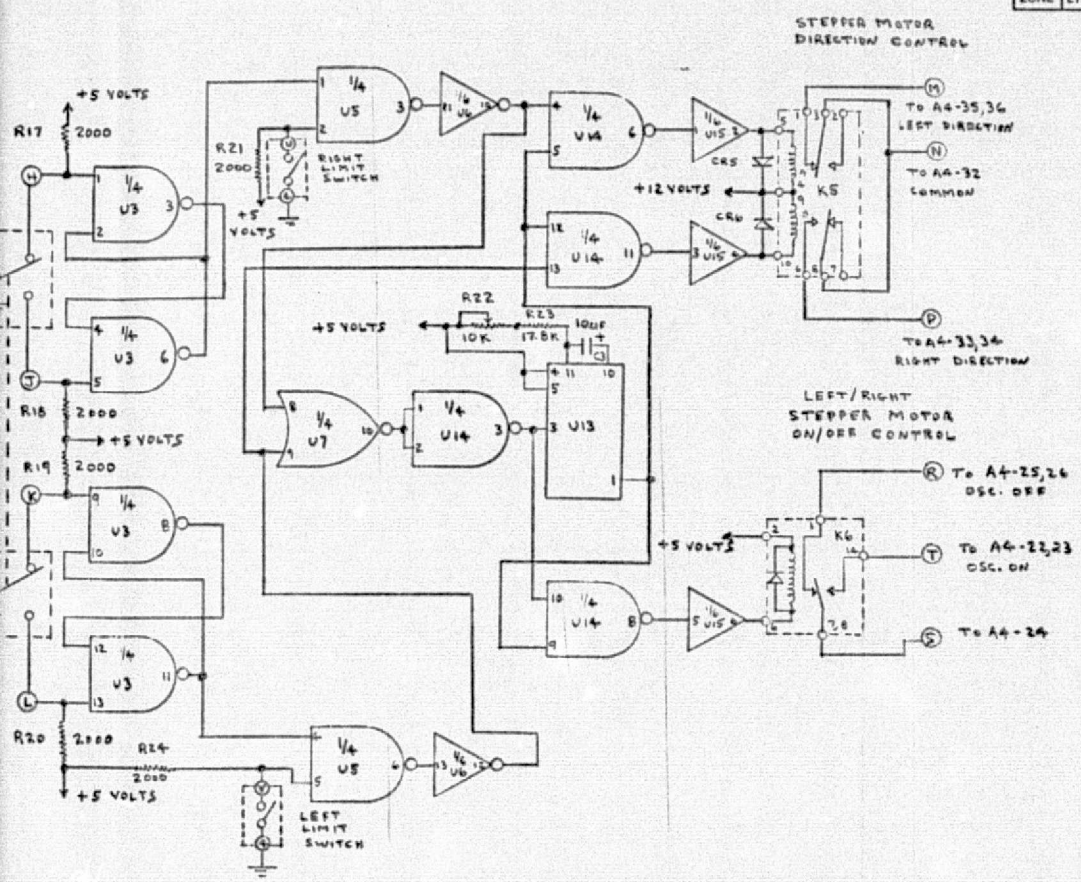
ORIGINAL PAGE IS OF POOR QUALITY

NOTES:

1. ALL RESISTORS IN OHMS, ¼W, ± 5%
2. ALL CAPACITORS IN MICROFARADS
3. ALL DIODES ARE TYPE IN645
4. U1, U2, U3, U4, U5, U9, U12, U14, ARE TYPE SN7400N
5. U6 IS TYPE SN7406N
6. U7 IS TYPE SN7402N
7. U10, U15 ARE TYPE SN7407N
8. U8, U11, U13 ARE TYPE SN74121N
10. K1, K3, K5 ARE LATCHING RELAYS TELEDYNE TYPE 422
11. K2, K4, K6, ARE TYPE GB821C-2
12. ADJUST R6 FOR 160MS, PULSE AT PIN 1 OF U8
13. ADJUST R15 FOR 160MS, PULSE AT PIN 1 OF U11
14. ADJUST R22 FOR 160MS PULSE AT PIN 1 OF U13
15. DIRECTION CONTROL SWITCHES PART OF SIMULATOR CONTROL SK 278279
16. LIMIT SWITCHES PART OF SIMULATOR
17. CONTACTS OF K1, K3, K5 SHOWN IN POSITION RESULTING FROM COIL 'A' LAST ENERGIZED

4 3 2 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



FOLDOUT FRAME 2
C, 2

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

SHOWN IN POSITION RESULTING
SIZED

CONTROL SK 2282792

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125/ PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

NEXT ASSY | USED ON

FIRST APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:	BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
	UP TO 6	± .02	± .010
	ABOVE 6 TO 24	± .03	± .015
	ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE:

CONTRACT NO. F19628-74-A-0059 REL

DRAWN F. G. HUBIT DATE 5-13-75

CHECKED DATE

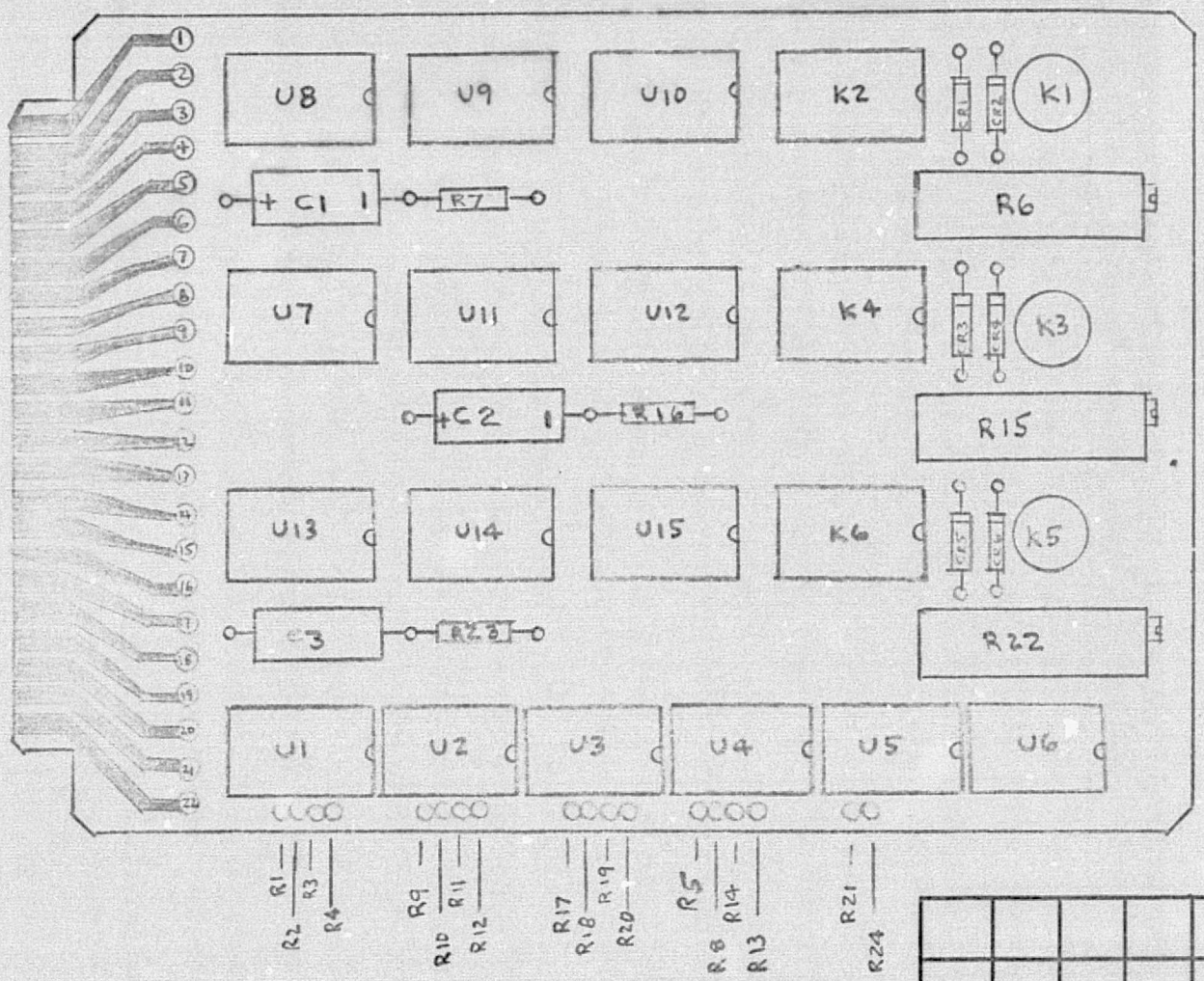
DESIGN ACTIVITY APPD. Francis G. Hubit DATE 5-13-75

RCA CORPORATION : NEW YORK, NY
ASTRO-ELECTRONICS DIVISION, PRINCETON, N.J. PLANT

STEPPER MOTOR CONTROL LOGIC

SIZE	CODE IDENT NO.	
D	49671	SK2288238

SCALE SHEET 1 OF 1



NOTES:

FOLDOUT FRAME /

QTY REQD PER DASH NO.					

REVISION STATUS WHERE MORE THAN ONE SHEET			
SH	REV	SH	REV

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

RCA COMMODITY CODE:

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS DIMENSI INCLUDE

BASIC DIMENSION

UP TO 6

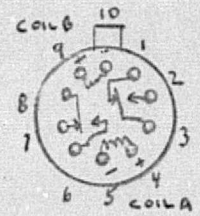
ABOVE 6 to 24

ABOVE 24

ANGULA

MATE

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



K1, K3, K5 DETAIL

FOLDOUT FRAME

QTY PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

SPECIFIED
I OF
HALL NOT
READING
.1 — 1962

SED ON

ION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 to 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½°

MATERIAL: SEE TABLE

CONTRACT NO. NAS9-14266 REL

DRAWN BY F. HUBIT DATE 5-20-75

CHECKED BY DATE

DESIGN ACTIVITY APPD Frank Hubit DATE 5-20-75

RCA CORPORATION | NEW YORK, NY

RCA ASTRO ELECTRONICS DIV. PRINCETON, N.J. PLANT

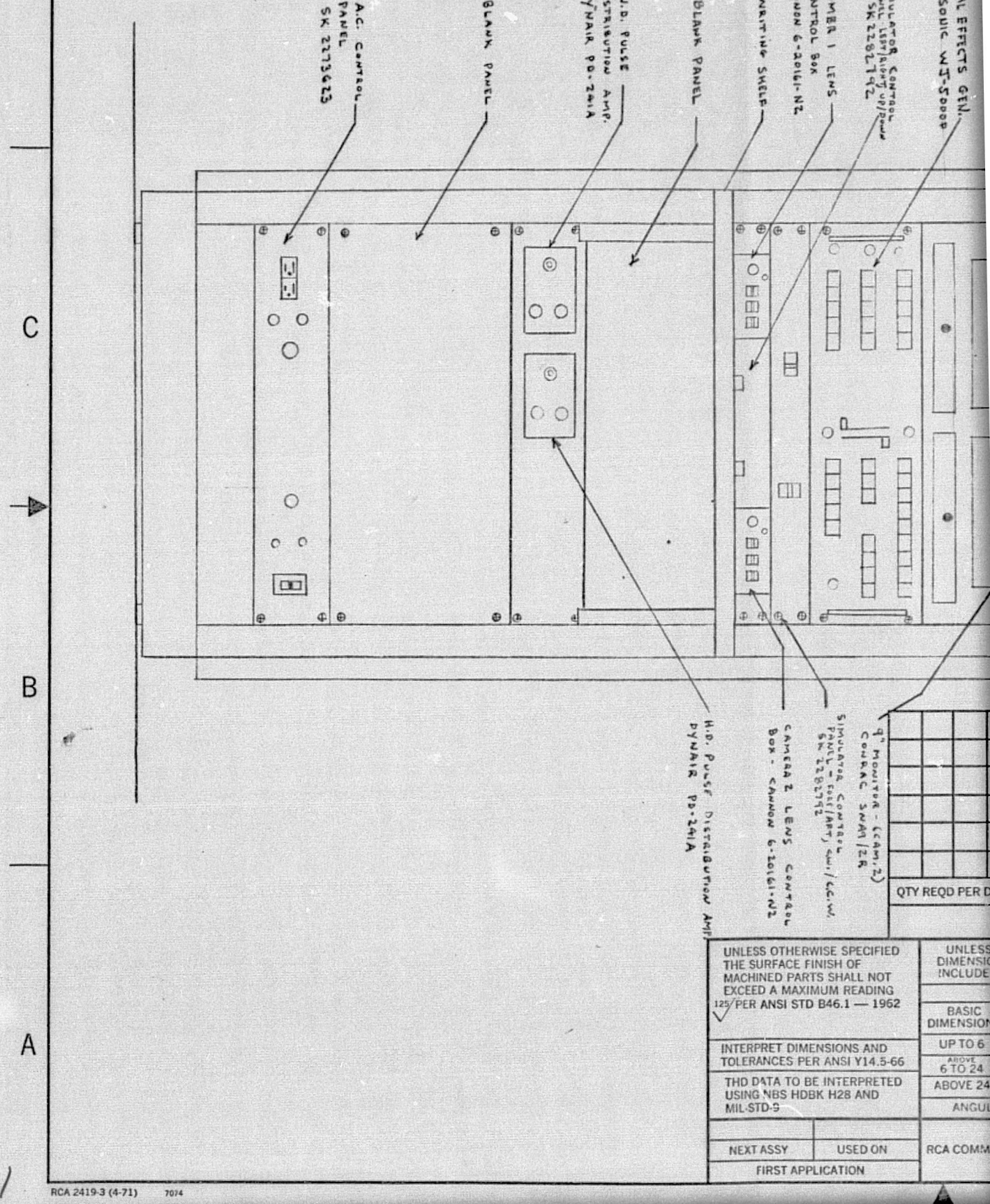
STEPPER MOTOR CONTROL LOGIC-BD. LAYOUT A1

SIZE	CODE IDENT NO.	
B	49671	SK2273622

SCALE WEIGHT SHEET 1 OF 1

APPENDIX C

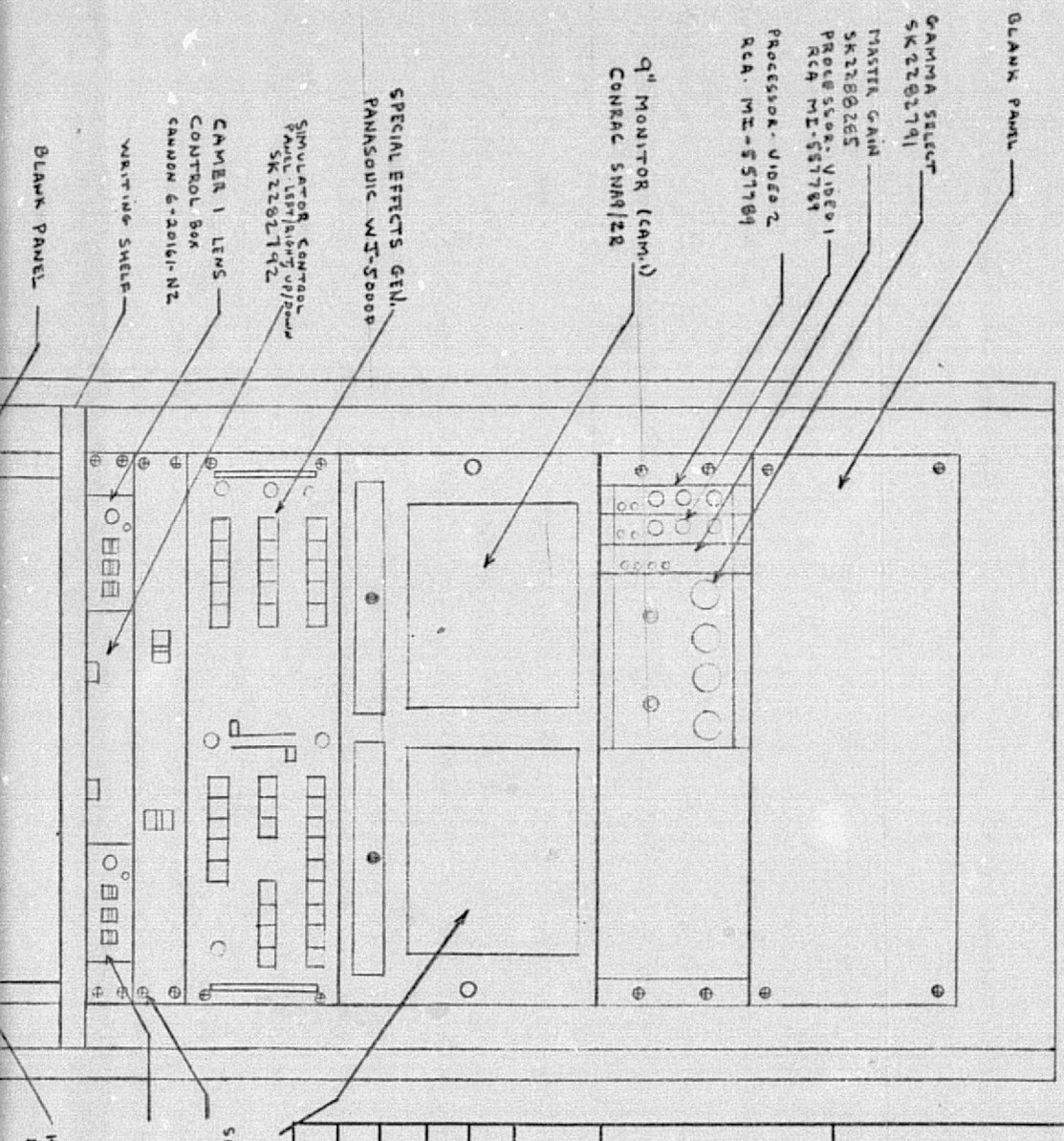
BREADBOARD TV SYSTEM DOCUMENTATION



FOLDOUT FRAME

RCA 2419-3 (4-71) 7074

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



ORIGINAL PAGE IS
OF POOR QUALITY

FOLDOUT FRAME 2

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½ °

RCA COMMODITY CODE:

CONTRACT NO. NAS9-14266 REL

DRAWN F. G. HUBIT DATE 6-23-75

CHECKED DATE

DESIGN ACTIVITY APPD. Frank G. Hubit DATE 6-23-75

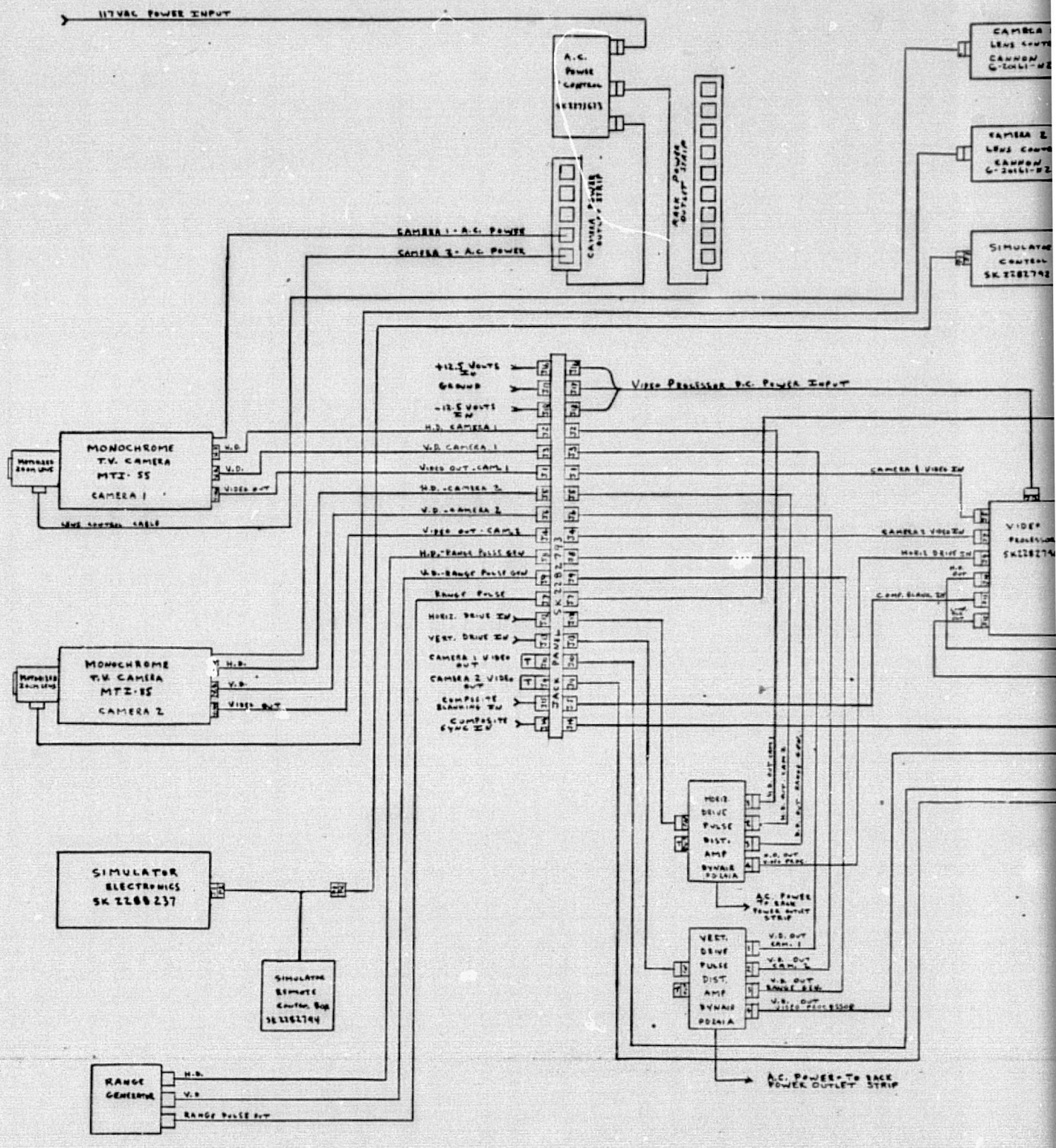
RCA CORPORATION : NEW YORK, NY

RCA ASTRO ELECTRONICS DIVISION, PRINCETON, N.J. PLANT

VIDEO SYSTEM RACK LAYOUT

SIZE	CODE IDENT NO.	
C	49671	SK2282789

SCALE | WEIGHT | SHEET 1 OF 1

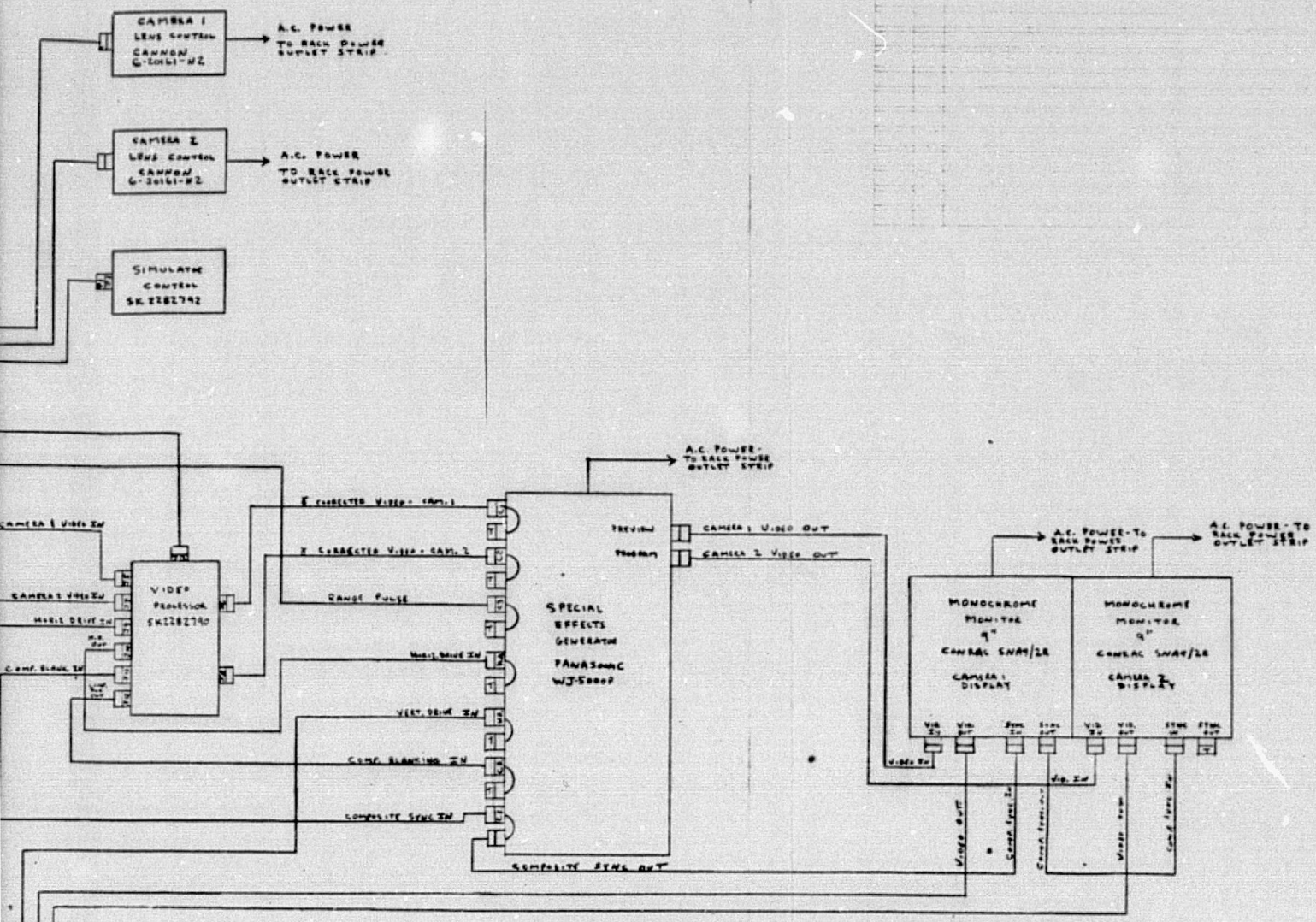


NOTES

1. VIDEO SELECT SWITCH ON MTI-55 CAMERA MUST BE IN NON-COMPOSITE POSITION
2. FOLLOWING EXTERNAL SIGNALS MUST BE SUPPLIED: HORIZ. DRIVE, VERT DRIVE, COMPOSITE BLANKING, COMPOSITE SYNC. ALL SIGNALS MUST MEET RS-170 SPECS.

FOLDOUT FRAME 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



FOLDOUT FRAME 2

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX. READING OF 125 PER USAS - B46.1 - 1962

DIMENSIONS AND TOLERANCES PER USAS Y14.5-66

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

NEXT ASSY | USED ON

FIRST APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON: BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
OVER 6 TO 24	± .03	± .010
ABOVE 24	± 1/32	± .015

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE:

CONTRACT NO. NAS9-14266 REL

DRAWN F. G. HUBIT DATE 6-27-75

CHECKED DATE

DESIGN ACTIVITY APPD. DATE 6-27-75

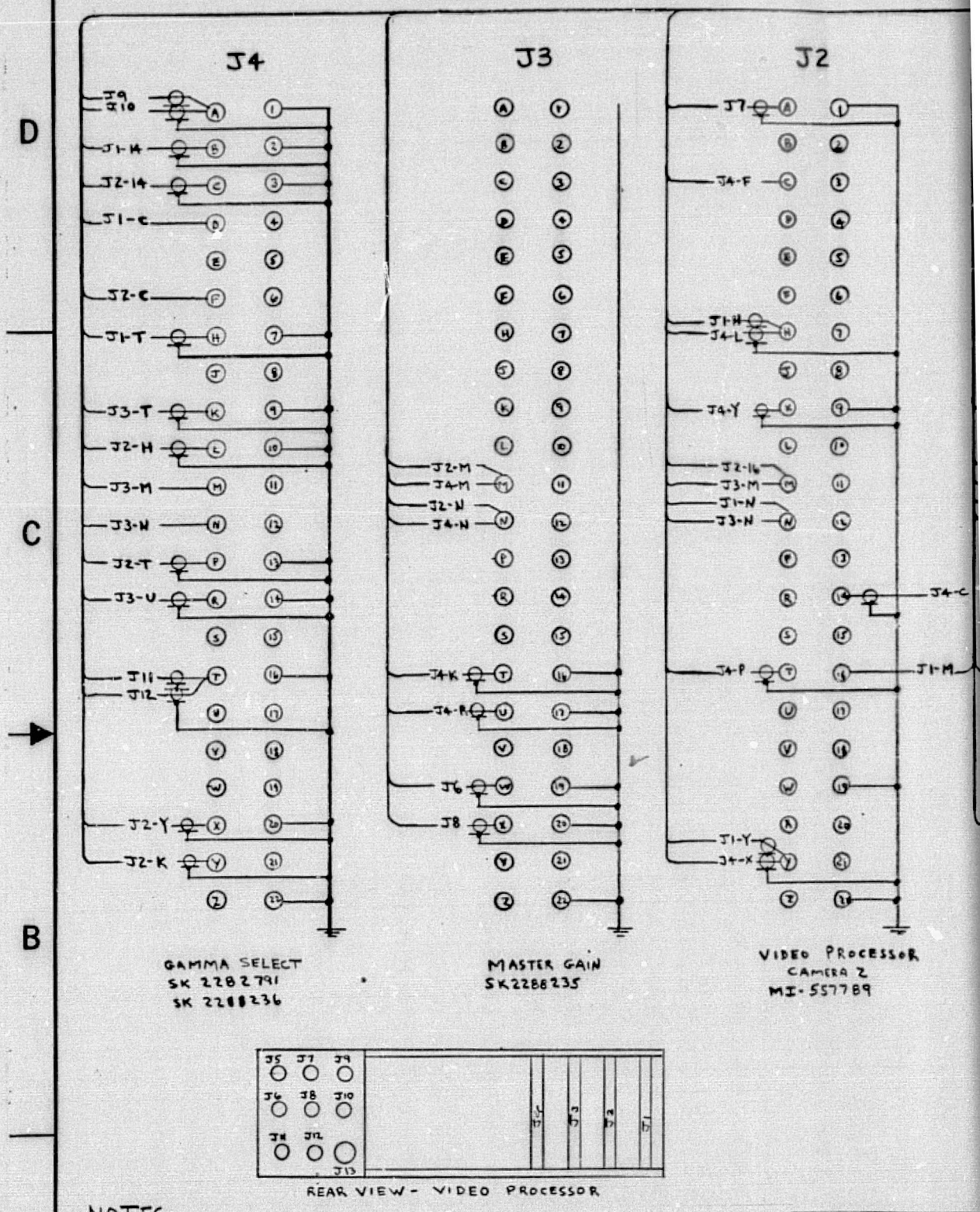
RCA RCA CORPORATION | NEW YORK, NY

ASTRO ELECTRONICS DIVISION, PRINCETON, N.J. PLANT

VIDEO SYSTEM EQUIPMENT INTERCONNECTION DIAGRAM

SIZE	CODE IDENT NO.	
D	49671	SK2288234

SCALE | WEIGHT | SHEET 1 OF 1



NOTES

1. CONNECTIONS TO J11 ARE AS FOLLOWS
   - J11-A; GROUND
   - J11-B; −12.5 VOLTS
   - J11-C +12.5 VOLTS

UNLESS OTHERWISE SPECI
THE SURF. FIN. OF MACHI
PARTS SHALL NOT EXCEE
MAX READING OF 125/PER

USAS -B46.1-196

DIMENSIONS AND TOLERAN
PER USAS Y14.5-66

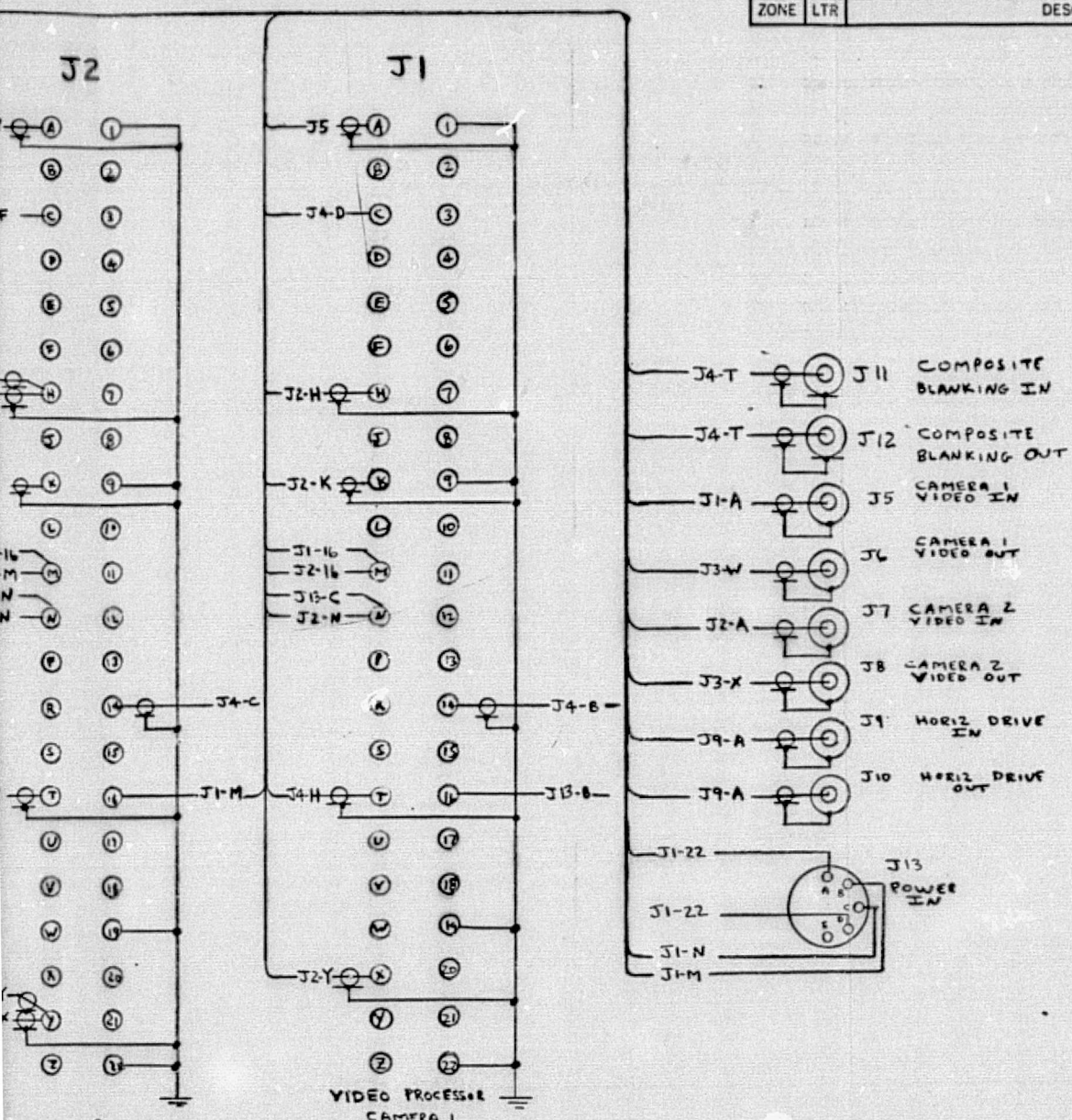
THD DATA TO BE INTERPRE
USING HNDBK H28 AND
MIL-STD-9

NEXT ASSY	USED
FIRST APPLICATION	

RCA 2419-3 (8-68)

FOLDOUT FRAME 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



FOLDOUT FRAME

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER USAS ·B46.1·1962

DIMENSIONS AND TOLERANCES PER USAS Y14.5-66

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

NEXT ASSY | USED ON

FIRST APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .06	± .015

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE:

CONTRACT NO. NAS9-14266 REL

DRAWN F.G. HUBIT DATE 5-20-75

CHECKED DATE

DESIGN ACTIVITY APPD. Frank G. Hubit DATE 5-20-75

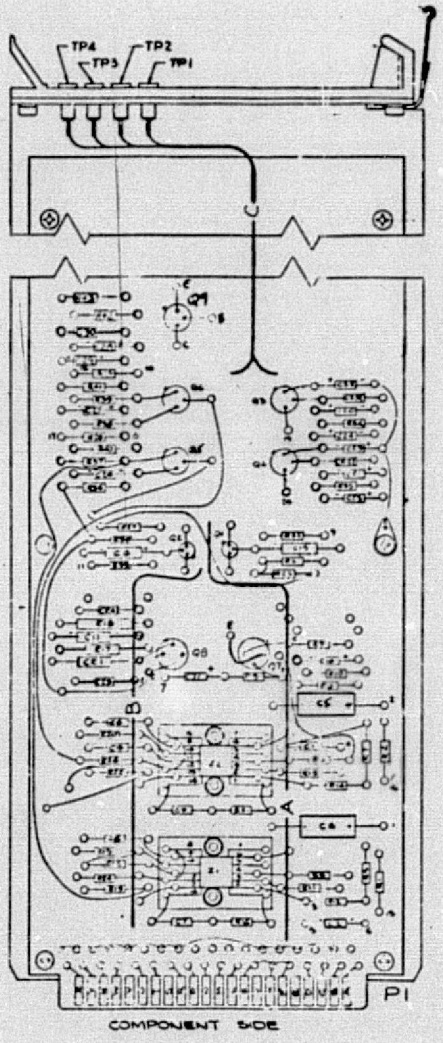
RCA RCA CORPORATION | NEW YORK, NY PLANT

INTERCONNECTION DIAGRAM - VIDEO PROCESSOR

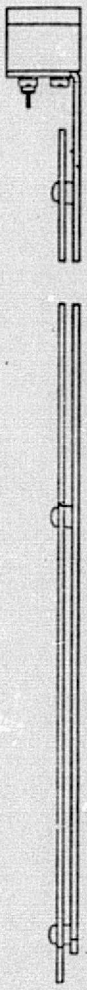
SIZE	CODE IDENT NO.	
C	49671	SK2282790

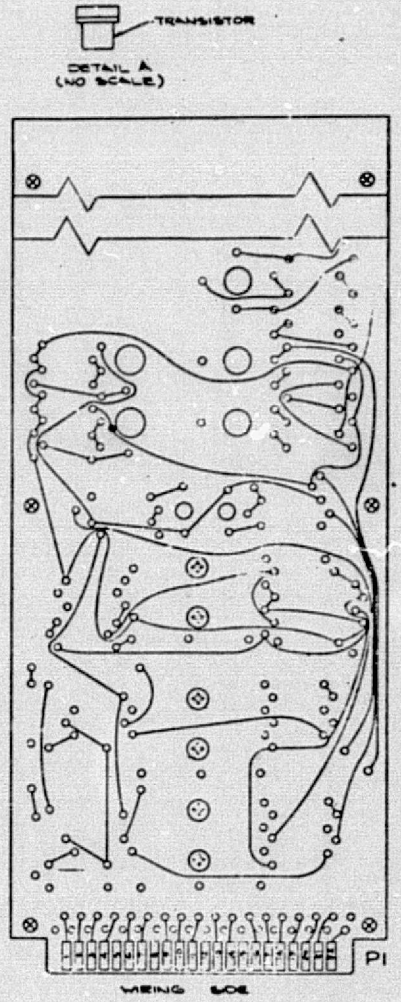
SCALE | WEIGHT | SHEET 1 OF

FOLDOUT FRAME 1



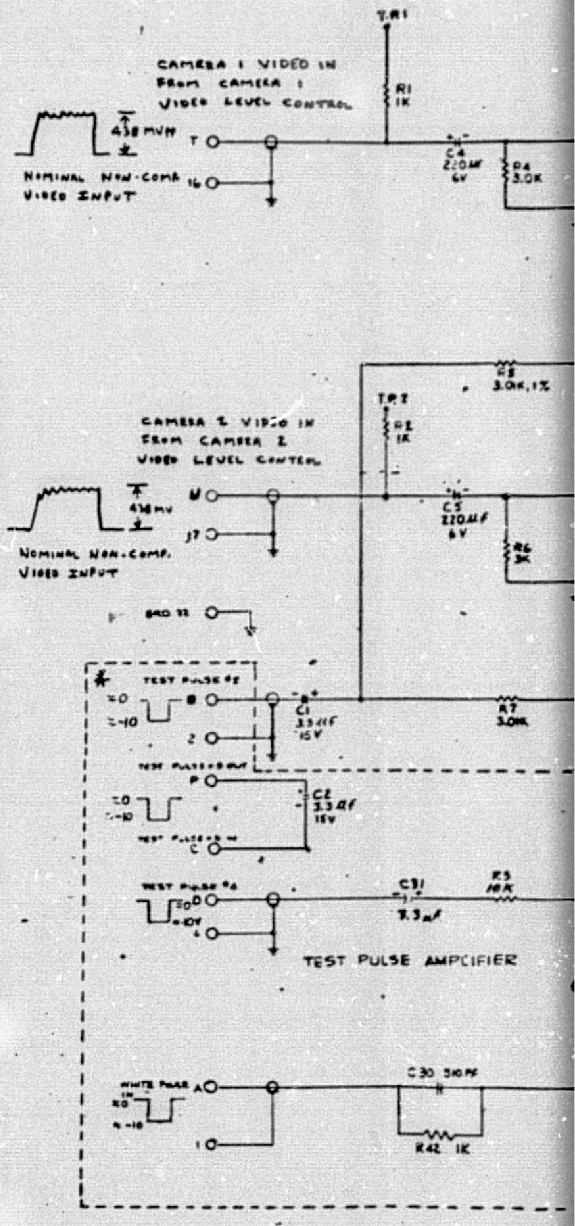
COMPONENT SIDE





DETAIL A
(NO SCALE)

WIRING SIDE

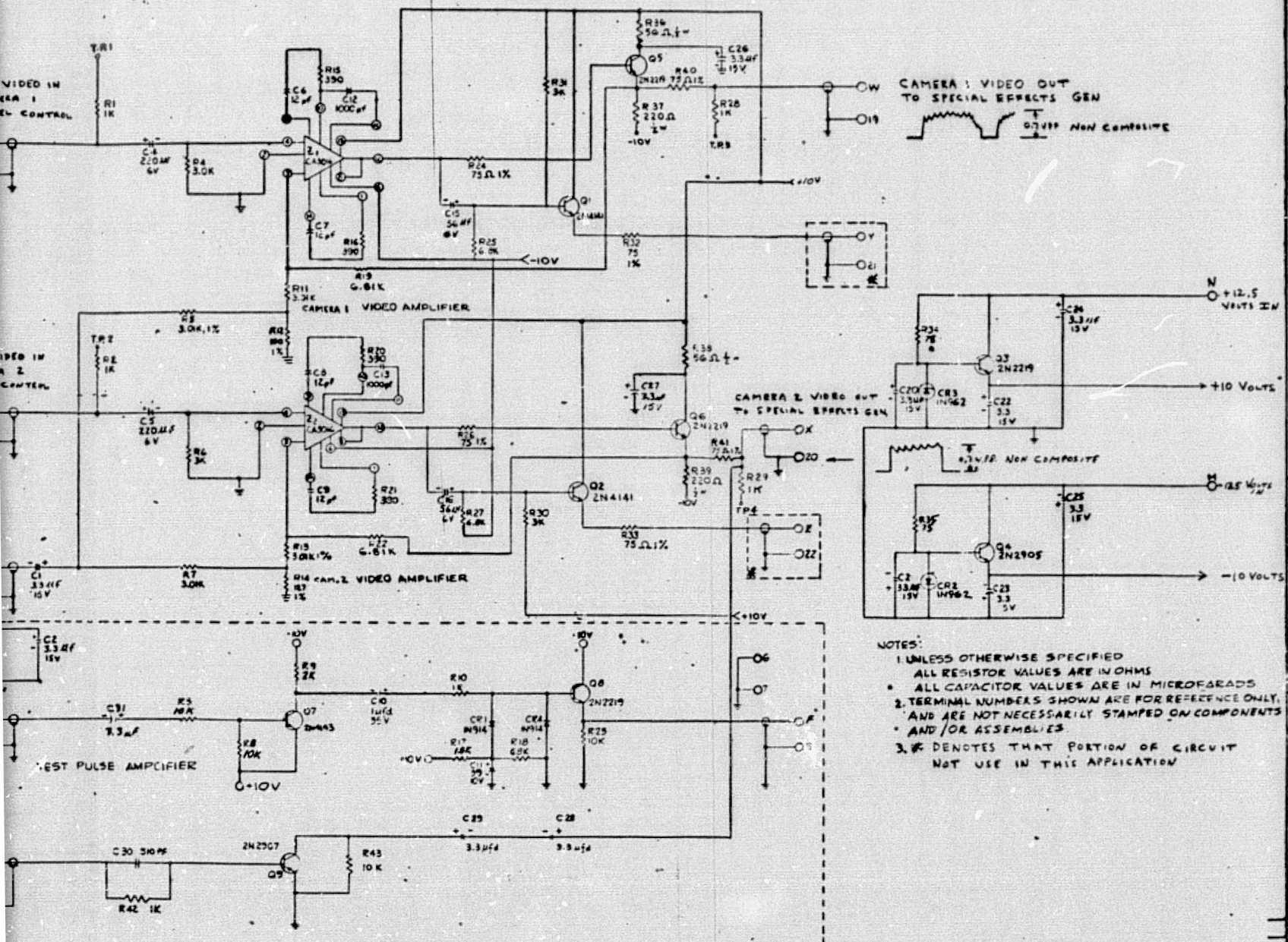


ORIGINAL PAGE IS
OF POOR QUALITY

FIRST MAD
NEXT ASS'Y

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVED

FOLDOUT FRAME



NOTES:
1. UNLESS OTHERWISE SPECIFIED
   ALL RESISTOR VALUES ARE IN OHMS
   ALL CAPACITOR VALUES ARE IN MICROFARADS
2. TERMINAL NUMBERS SHOWN ARE FOR REFERENCE ONLY; AND ARE NOT NECESSARILY STAMPED ON COMPONENTS AND/OR ASSEMBLIES
3. # DENOTES THAT PORTION OF CIRCUIT NOT USE IN THIS APPLICATION

QTY REQD 504	QTY REQD 503	QTY REQD 502	QTY REQD 501	ITEM NO.	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
							LIST OF MATERIALS

DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING. TOLERANCES ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		
BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .05	± .005
6 TO 24	± .03	± .010
ABOVE 24	± .05	± .015
ANGULAR DIMENSIONS ± 1°		
SEE RCA PURCH SPEC FOR STOCK TOL		

FIRST MADE FOR	USED ON
NEXT ASS'Y	
—	NBC

ALL EXTERNAL THREADS TO BE CLASS 2A BEFORE PLATING AND CLASS 2 AFTER PLATING. ALL INTERNAL THREADS TO BE CLASS 2B, UNLESS OTHERWISE SPECIFIED.

CONTRACT NO. NAS9-14266
COMMODITY CODE
DRAWN D. G. HUBIT DATE 6-25-75
CHECKED DATE
DESIGN ACTIVITY APPD. DATE

RADIO CORPORATION OF AMERICA
CAMDEN, N.J.
ASTRO ELECTRONICS DIVISION, PRINCETON, N.J.

COMPOSITE DRAWING COMPONENT BOARD & SCHEMATIC MASTER GAIN AMPLIFIER

CODE IDENT NO.	SIZE	
49671	D	SK2288235
SCALE —	WEIGHT —	SHEET 1 OF 1

4 3

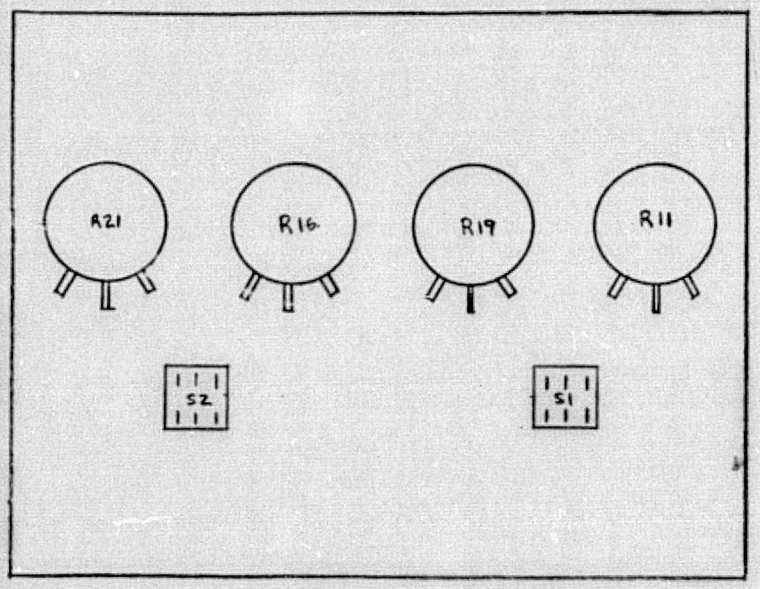
OLDOUT FRAME

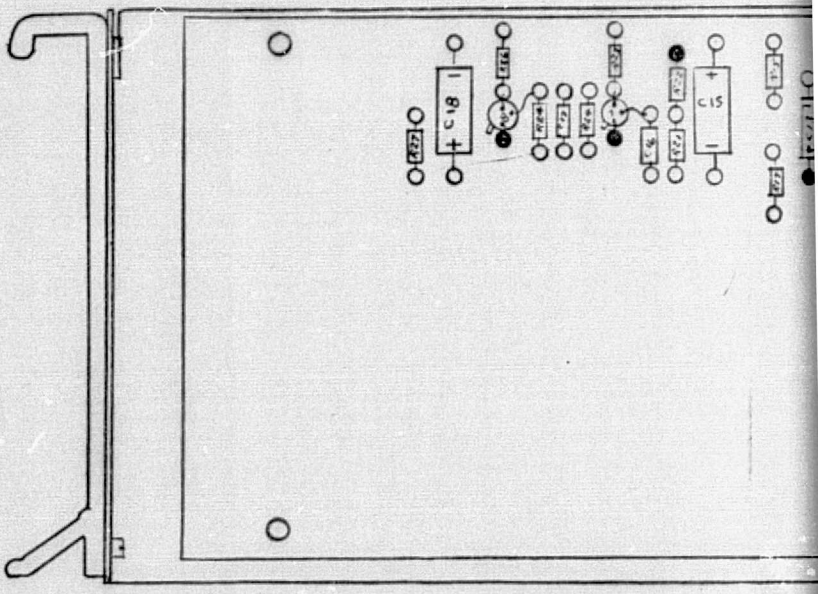
D

C

B

A





FRONT PANEL
(REAR VIEW)

QTY REQD PER DASH NO.					CODE IDENT	ID

NOTES
1. ● DENOTES CONNECTION TO GROUND PLANE

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:			
BASIC DIMENSIONS	2 PLACE DECIMALS		3 PLACE DECIMALS
UP TO 6	± .02		± .010
ABOVE 6 TO 24	± .03		± .015
ABOVE 24	± .06		± .020

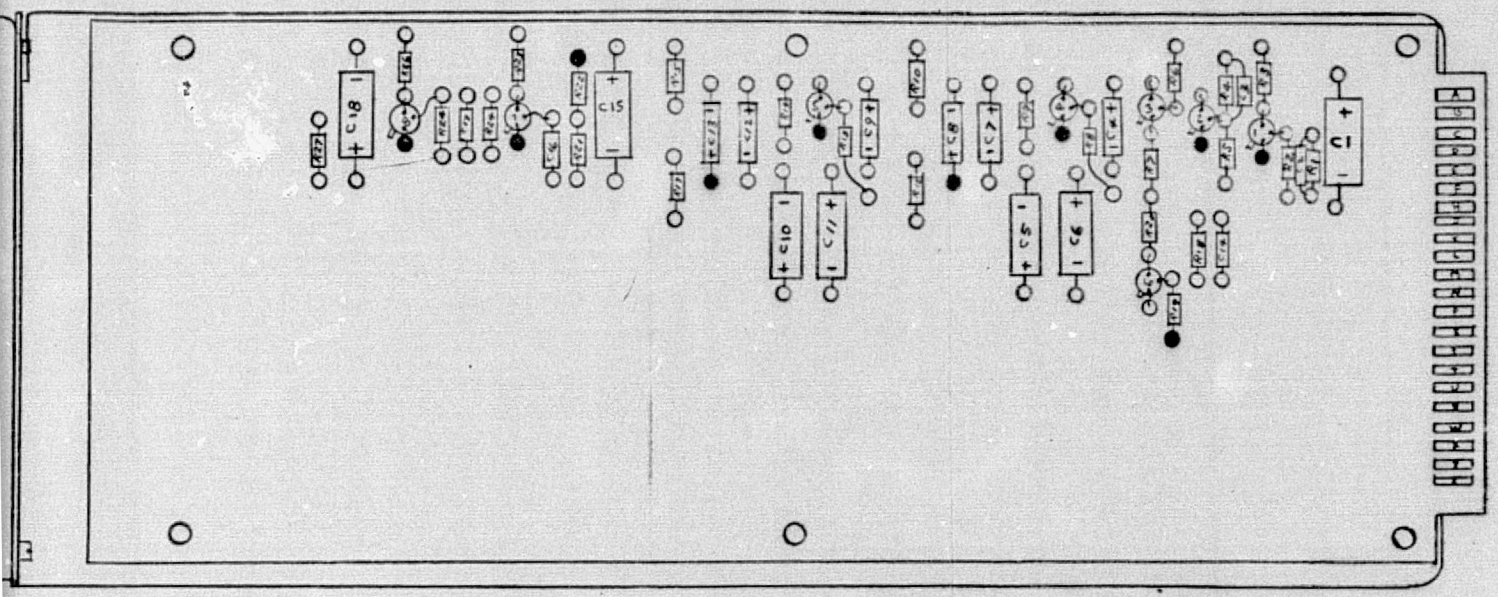
ANGULAR DIMENSIONS ± ½ °

RCA COMMODITY CODE:

3 2 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

FOLDOUT FRAME 3



QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½ °

RCA COMMODITY CODE:

CONTRACT NO. NAS9-14266 REL

DRAWN F.G. HUBIT DATE 5-20-75

CHECKED DATE

DESIGN ACTIVITY APPD. Frank Hulet DATE 5-20-75

RCA

RCA CORPORATION : NEW YORK, NY

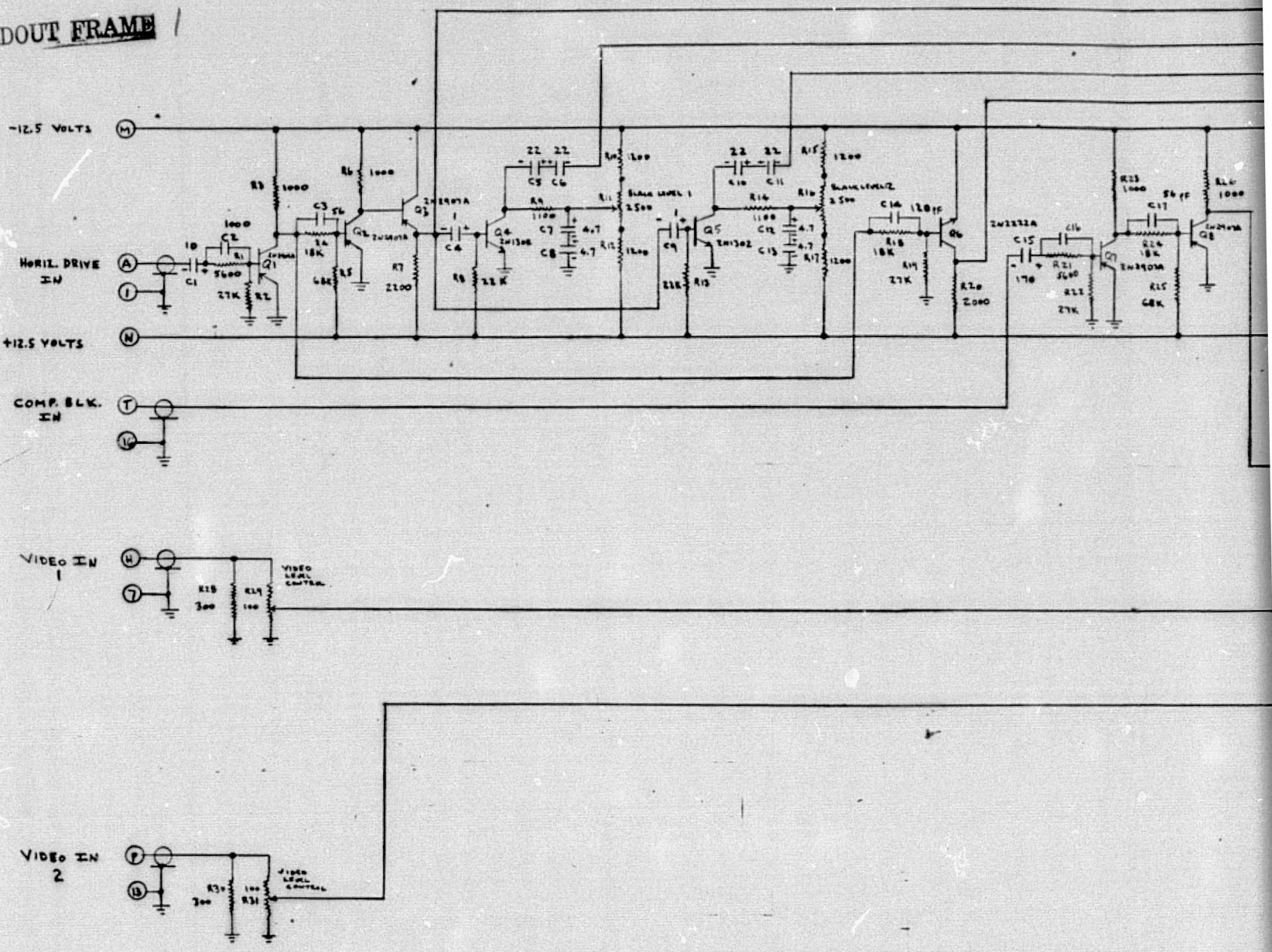
PLANT

ASSEMBLY GAMMA SELECT

SIZE	CODE IDENT NO.	
C	49671	SK228279 1

SCALE WEIGHT SHEET 1 OF 1

FOLDOUT FRAME



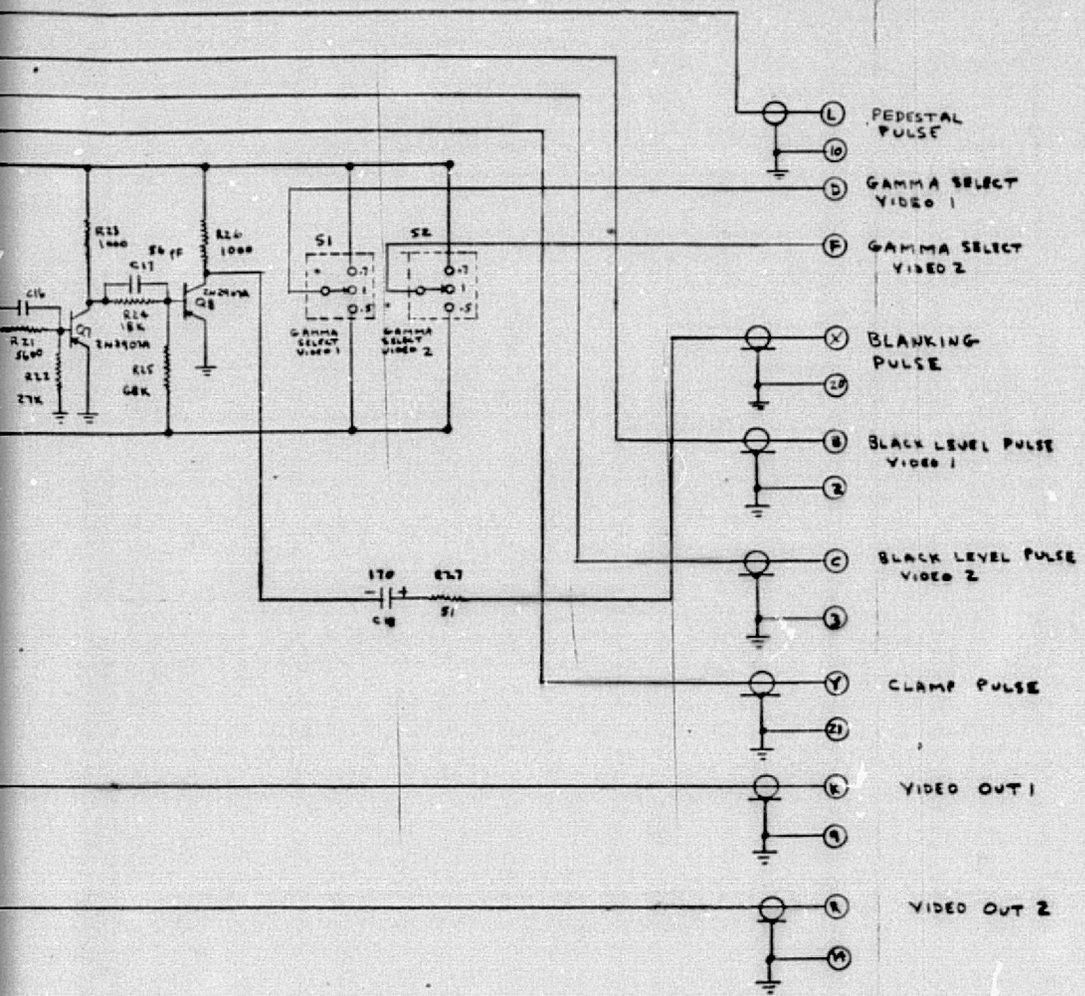
ORIGINAL PAGE IS
OF POOR QUALITY

NOTES:
1. ALL RESISTORS IN OHMS, 1/4 WATT 5% UNLESS OTHERWISE SPECIFIED
2. ALL CAPACITORS IN MFARADS UNLESS OTHERWISE SPECIFIED

4	3	2	1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

FOLDOUT FRAME 2



QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL-STD-9

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½ °

RCA COMMODITY CODE:

CONTRACT NO. NAS9 14266 REL

DRAWN F.G HUBIT DATE 6-23-75

CHECKED DATE

DESIGN ACTIVITY APPD. Frank D. Hulbit DATE 6-23-75

RCA RCA CORPORATION : NEW YORK, NY

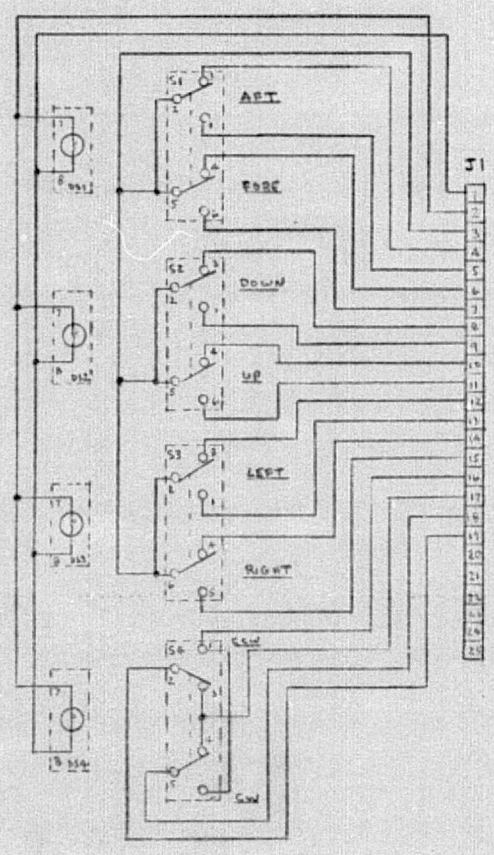
ASTRO ELECTRONICS DIV. PRINCETON, N. J. PLANT

SCHEMATIC GAMMA SELECT

SIZE	CODE IDENT NO.	
D	49671	SK 2288236

SCALE SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



SWITCH DETAIL (REAR VIEW)

NOTES:
1. S1, S2, S3, S4, SHOWN IN CENTER OFF POSITION
2. S1, S2, S3, S4 ARE SWITCHCRAFT TYPE 7312 WITH 532 ESCUTCHEON PLATE
3. J1 IS CANNON TYPE DBM-25P
4. DS1, DS2, DS3, DS4, ARE PART OF S1, S2, S3, S4 RESPECTIVELY

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125 PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5-66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL STD 9

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON: BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE:

CONTRACT NO. NAS9-14266 REL

DRAWN F.G. HUBIT DATE 5-16-73

CHECKED DATE

DESIGN ACTIVITY APPD. DATE 5-16-73

RCA CORPORATION · NEW YORK, NY
ASTRO ELECTRONICS DIVISION, PRINCETON, N.J. PLANT

SIMULATOR CONTROL

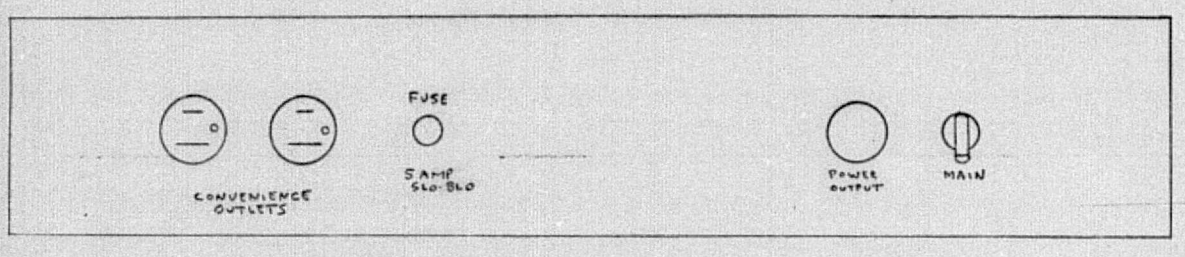
SIZE	CODE IDENT NO.	
C	49671	SK2282792

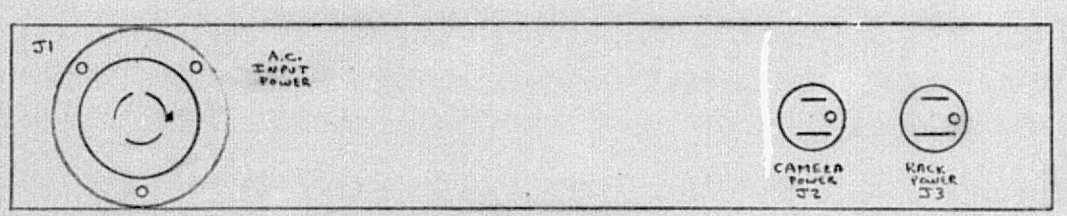
SCALE WEIGHT SHEET 1 OF 1

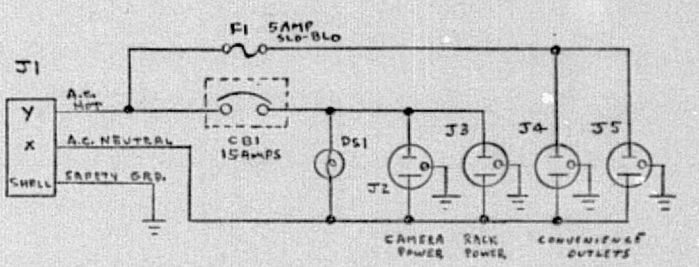
RCA DISTR

RCA 2419-3 (4-71) 7074

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED







NOTES:
1. ⏚ DENOTES CHASSIS GROUND
2. CB1 IS WOOD ELECTRIC CIRCUIT BREAKER TYPE 511-215-101
3. DS1 IS DIALCO 32-4001-431-302 LAMP IS TYPE 656, 115V.

QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

REVISION STATUS– WHERE MORE THAN ONE SHEET			
SH	REV	SH	REV

THD DATA TO BE INTERPRETED USING HNDBK H28 AND MIL-STD-9

DIMENSIONS AND TOLERANCES USAS Y14.5-66

RCA COMMODITY CODE

UNLESS OTHERWISE SPECIFIED THE SURF. FIN. OF MACHINED PARTS SHALL NOT EXCEED A MAX READING OF 125 PER USAS B46.1-1962

NEXT ASSY	USED ON
FIRST APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .010
ABOVE 6 TO 24	± .03	± .015
ABOVE 24	± .06	± .020

ANGULAR DIMENSIONS ± ½

MATERIAL: SEE TABLE

CONTRACT NO NAS9-14266 REL

DRAWN BY F.G. HUBIT DATE 6-24-75

CHECKED BY DATE

DSGN ACTIVITY APPD DATE 6-24-75

RCA CORPORATION | NEW YORK, NY

ASTRO ELECTRONICS DIVISION, PRINCETON, N.J. PLANT

A.C. CONTROL PANEL

SIZE	CODE IDENT NO.	
B	49671	SK2273623

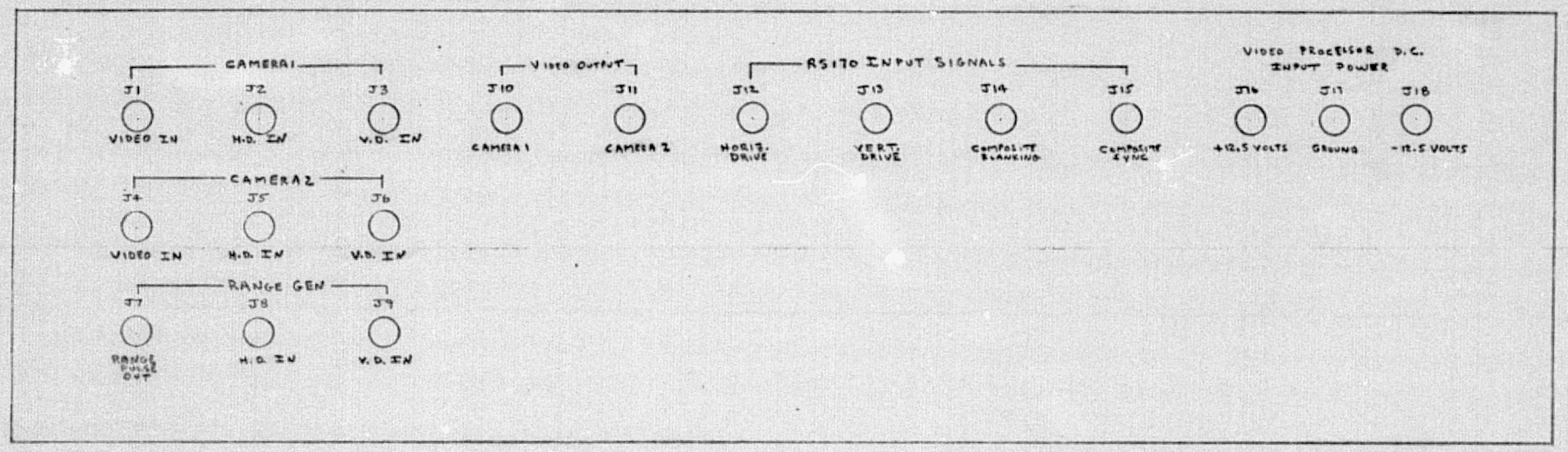
SCALE | WEIGHT | SHEET 1 OF 1

RCA DISTR

RCA 2417-3 (9-70)

ORIGINAL PAGE IS
OF POOR QUALITY

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



QTY REQD PER DASH NO.	CODE IDENT	IDENTIFYING NO.	DESCRIPTION	SPECIFICATION	SEE NOTE NO.

MATERIALS AND SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE SURFACE FINISH OF MACHINED PARTS SHALL NOT EXCEED A MAXIMUM READING 125/ PER ANSI STD B46.1 — 1962

INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5 66

THD DATA TO BE INTERPRETED USING NBS HDBK H28 AND MIL STD 9

NEXT ASSY | USED ON

FIRST APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING

TOLERANCES ON:			
BASIC DIMENSIONS	2 PLACE DECIMALS		3 PLACE DECIMALS
UP TO 6	± .02		± .010
ABOVE 6 TO 24	± .03		± .015
ABOVE 24	± .06		± .020

ANGULAR DIMENSIONS ± ½°

RCA COMMODITY CODE

CONTRACT NO. NAS9-14266 REL

DRAWN F.G. HUBIT DATE 6-25-75

CHECKED DATE

DESIGN ACTIVITY APPD. Donald Hulet DATE 6 25-75

RCA RCA CORPORATION · NEW YORK, NY PLANT

JACK PANEL ASSEMBLY

SIZE	CODE IDENT NO.	
C	49671	SK2282793

SCALE | WEIGHT | SHEET 1 OF 1

RCA DISTR

RCA 2419-3 (4-71) 7074