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TEST AND EVALUATION OF WIRE-WOUND TACTICAL AIR NAVIGATION AID (TACAN) HEATED RADOMES WITH WEATHER SENSORS

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16. Abstract

This report covers preliminary field evaluation at the Newberg, Oregon, Very High Frequency Omnirange Tactical Air Navigation Aid (VORTAC) of an engineering model wire-wound Tactical Air (TACAN) radome and weather-sensing system. The evaluation was to determine the feasibility of the weather sensors and the wire-wound radome in preventing snow and/or ice buildup. Three TACAN system outages occurred under moderate weather conditions during the 3 months of testing because of snow or ice accumulation on the TACAN radome and monitor antenna faceplace. An apparent power reduction was realized over conventional internal radome heaters; however, more stringent ON/OFF controls should be built into the heater, and production wire-wound radomes should be tested under more severe weather conditions. The results of this evaluation are inconclusive, in that weather conditions necessary to properly determine the systems effectiveness are not prevalent at this particular facility.

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PREFACE

The valuable assistance of Mr. George Reese, technician in charge of the Newberg, Oregon, VORTAC, and also the assistance of Sector and Regional personnel contributed greatly to the completion of this phase of the activity.

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INTRODUCTION

PURPOSE.

The purpose of this document is to report the effectiveness of the modified RTA-2 Tactical Air Navigation (TACAN) antenna (engineering model) in reducing weather effects due to ice and/or snow accumulation on the TACAN antenna.

BACKGROUND.

The National Aviation Facilities Experimental Center (NAFEC) in coordination with the Systems Research and Development Service (SRDS) has been testing various modified radomes to determine their effectiveness in reducing the number of outages due to the accumulation of snow and/or ice on TACAN antennas. Report No. FAA-RD-71-56, entitled "Minimize Snow and Weather Effects, VORTAC Task II TACAN Antenna," covers testing of effects on radiation patterns and prevention of snow and/or ice buildup on the SRDS-developed wire-wound radome. A wire-wound radome was fabricated, utilizing an external three-phase heater applied to the outer surface of the radome, so that most of the heater power would be dissipated on the surface where it was required. A field evaluation of 10 radomes modified at the Aeronautical Center was conducted at operational facilities selected on the basis of incidence of weather-induced outages. The field results of the effectiveness of these radomes is available at SRDS.

Consequently, because of the favorable reports received from the regions relative to the field evaluation, SRDS initiated procurement action for the development and fabrication of retrofitting and modifications to improve radiofrequency (RF) performance characteristics and minimize effects due to adverse weather conditions.

In June of 1973, NAFEC was assigned the task of evaluating embedded wire-wound deicing radomes and TACAN antenna modifications at sites jointly selected by SRDS and NAFEC. This report covers preliminary tests dealing with the wire-wound deicing radomes.

In regard to heating the radome, it is always necessary to keep snow and ice from forming on the radome to minimize the interference to signals passing through the protective dome covering the TACAN antenna. At the present time, radome heaters generally should be ON only during periods of freezing precipitation when the temperature is above 20° F. (Precipitation below 20° F will not collect on the radome.)

The function of the heater control unit evaluated during this phase of the testing may be described in the following manner:

1. Detects probability of snow and/or icing condition.
2. When snow and/or icing condition exists, provides power to radome.
3. Maintains radome temperature at a preset level until the icing threat no longer exists.
4. Provides safeguards for radome overheating conditions.

DESCRIPTION OF EQUIPMENT

WIRE-WOUND RADOME.

The engineering model wire-wound TACAN radome is mounted on a AN/GRA 120A TACAN antenna. This AN/GRA 120A TACAN antenna was developed by International Telephone and Telegraph (ITT) of Nutley, New Jersey, under an Air Force contract. The AN/GRA 120A has been modified to allow complete compatibility of the RF assemblies and the new wire-wound radome and its controls with the existing RTA-2 base and drive systems. A block diagram of the system circuitry is shown in figure 1.

The wire-wound radome is a thin-walled cylinder of wound epoxy glass, 56 inches in diameter and approximately 84 inches in height, versus a 44-inches-in-diameter radome approximately 48 inches in height on the RTA-2 radome. There are six windings of wire around the radome, which are paired and connected as three parallel windings, forming a balanced three-phase "Y" resistive load. This resistance load of the wire radiates heat when thermostats indicate the possibility of snow or ice accumulating. Six thermistors, type Y-44007, are mounted inside the radome along the circumference of the radome at its base. These thermistors monitor the surface temperature of the radome. In addition to these, there are three overtemperature thermostats installed to prevent radome overheating. These remain in the normally closed position until the radome reaches an internal temperature of 90° F, which causes them to open and remove heater power from the radome windings.

The radome is protected by a coat of white epoxy polyamide gloss enamel which contributes to the ability of the radome to withstand temperature differentials of -62° C to +71° C and relative humidity of zero to 95 percent. The protective radome is capable of withstanding wind loading of up to 120 knots with gusts measuring 150 knots.

WEATHER SENSOR UNIT.

A weather sensor unit, consisting of an outside air temperature thermostat, outside air temperature measuring device, and relative humidity sensor, is remotely mounted on the normal TACAN monitor pole (figures 2 and 3) and is exposed to the outside weather conditions.

The weather sensor assembly is constructed of aluminum and is cylindrical in general configuration. The assembly is approximately 22 inches tall as measured from the top cap to the bottom of the support, and 8 inches in diameter at its widest part.

The weather sensor illustrated in figure 3 provides continuous monitoring of environmental conditions in proximity to the RTA-2 antenna site. The device is mounted approximately 8 feet high on a cylindrical mast, approximately 4 inches in diameter, and at some distance from the TACAN antenna determined by the local conditions of the site.

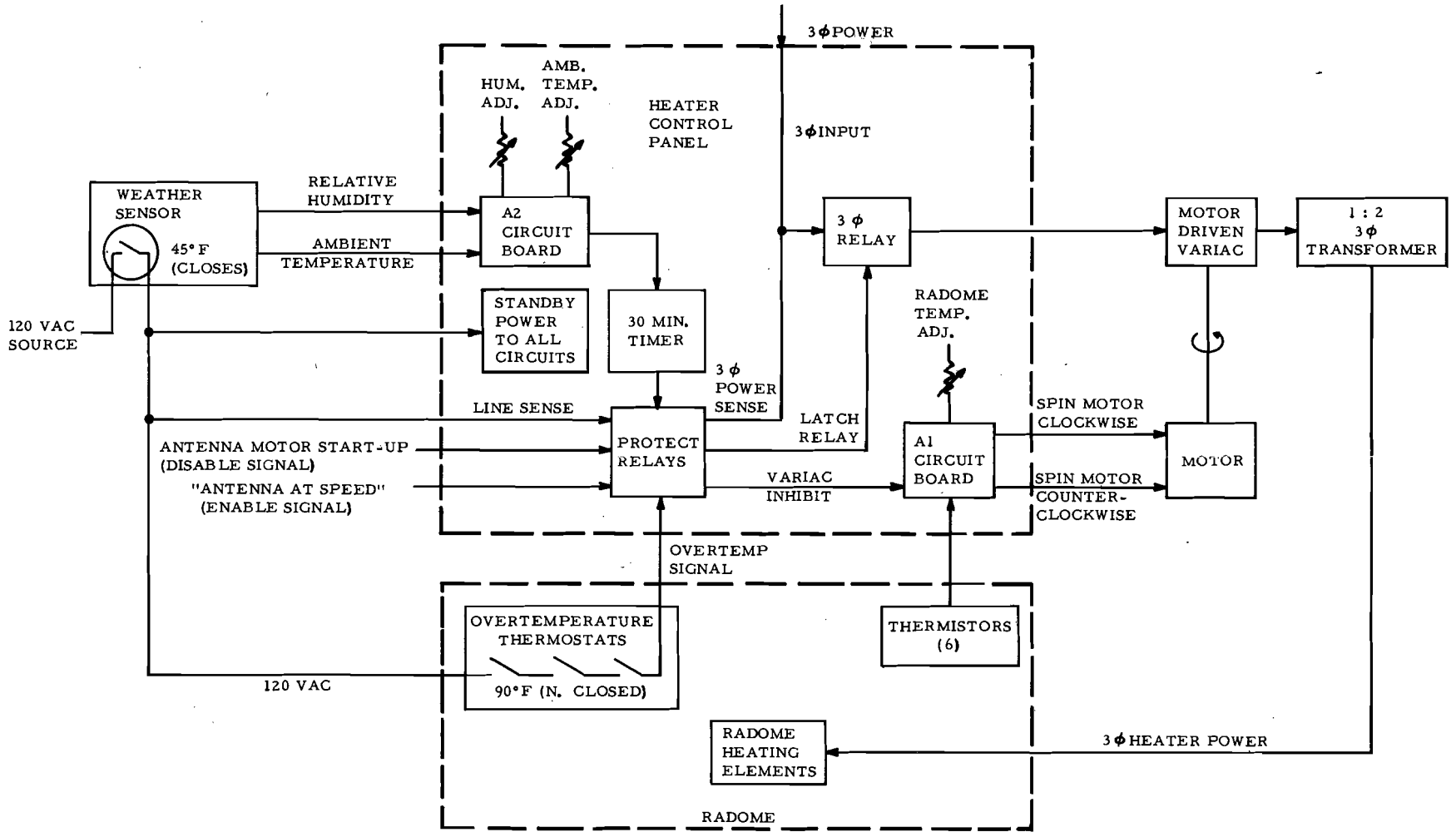

FIGURE 1. BLOCK DIAGRAM SYSTEM CIRCUITRY

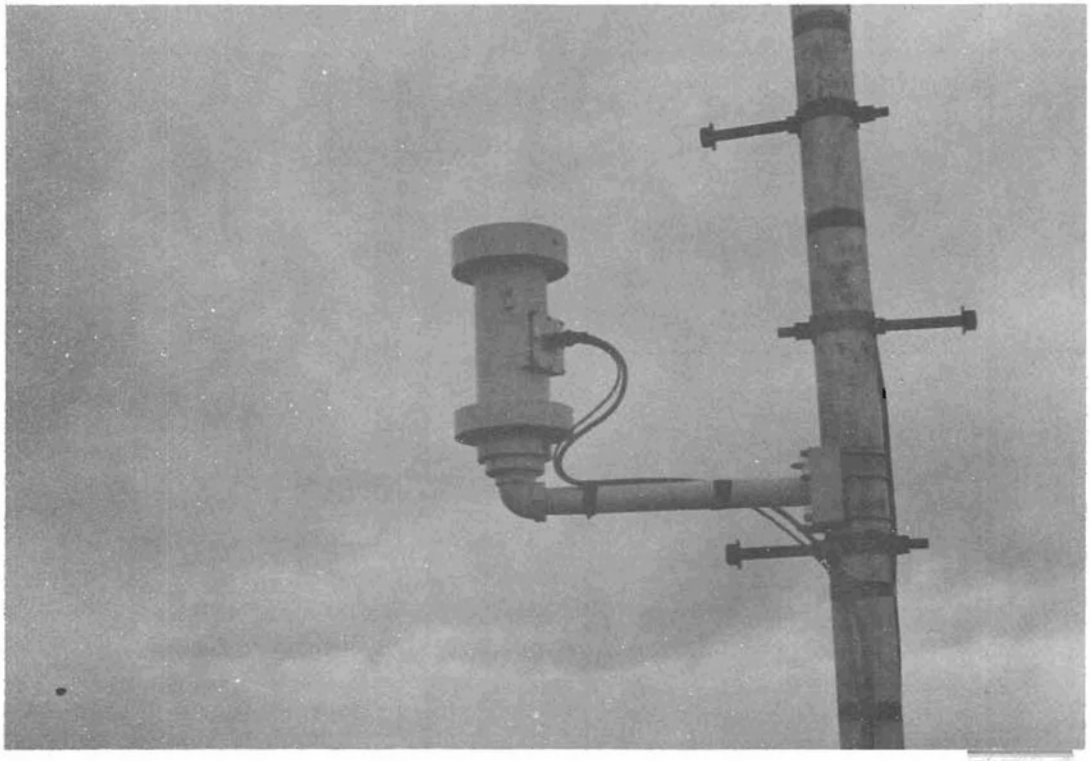

FIGURE 2. WEATHER SENSOR

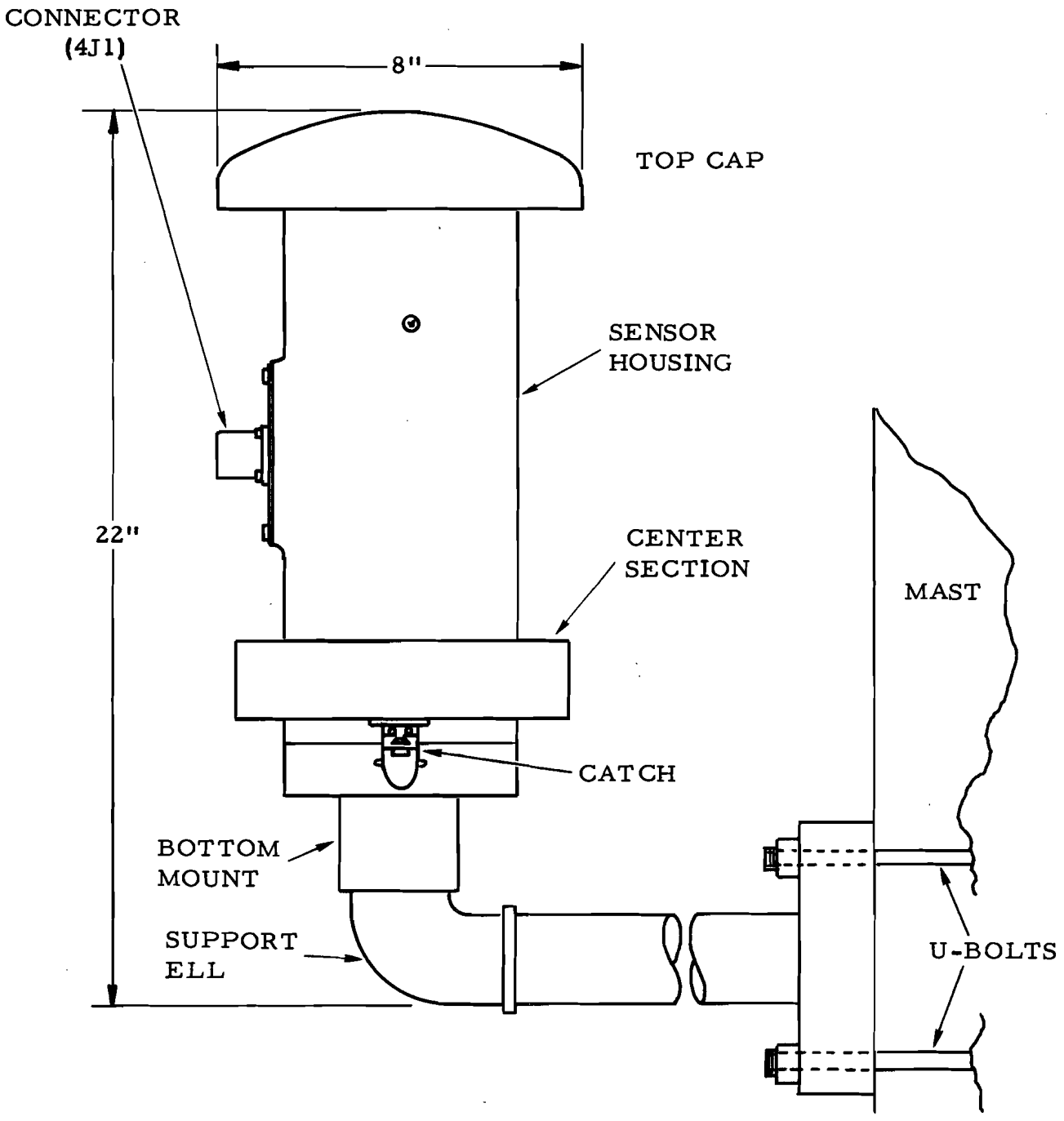

FIGURE 3. WEATHER SENSOR ASSEMBLY

The principle components of the sensor include a thermal resistor and a humidity transducer which are the basic environmental sensing devices for temperature and relative humidity. The transducer humidity sensor is a rectangular circuit-card configuration, approximately 1 3/4 by 1/8 inch thick, which senses the changes in relative humidity by changes in impedance. Electrical contact to the sensor surface is made by printed electrodes on each surface of the sensor.

The thermal resistor is a temperature sensor platinum element hermetically sealed in a glass tube. The temperature coefficient of the platinum wire is known precisely, and senses any minute change in ambient temperature. The response time is less than 1 second for a 63-percent change in temperature in moving air. These sensing components are mounted on a glass-fiber component board which also contains an electrolytic capacitor and a thermostatic switch. A mounting bracket on the component board secures the thermal resistor which is isolated from the metal bracket by rubber grommets. The transducer is secured by a rectangular-shaped rubber pad. Access to the component board is gained by removing a metal plate which mounts the electrical connector. A rubber gasket, compressed between the connector plate and the housing, seals this opening from duct and moisture.

A tubeaxial fan is located near the top cap of the cylindrical housing and is clamped to a ledge in the housing by rim-clenching clamps. The function of the fan is to draw air in through six button-shaped screen plugs spaced around the center section of the cylindrical housing of the weather sensor, thereby producing a flow of aspirated air around the sensing components. The fan is four-bladed, tubular in configuration, measures 3.750 inches in diameter, rim-to-rim, and is 1.73 inches in depth, rim-to-rim. The upflow of air around the sensors is cleansed by an air-filter assembly located near the bottom of the cylindrical housing. The filter is a metal screen approximately 3.50 inches in diameter.

The sensor assembly may be dismounted for maintenance and inspection by releasing the luggage-type snap-catches spaced around the base of the weather sensor, just above the bottom mount. The dome-shaped top cap prevents precipitation from entering the housing of the sensor and has six button-shaped screen plugs spaced around the bottom surface to expel air from the housing.

The weather sensor's prime function is to detect the probability of weather conditions that could result in the accumulation or formation of snow and/or icing on the radome. The weather sensor continuously furnishes information to a heater control panel (figure 4) located in the remotely located very high frequency omnirange Tactical Air Navigation Aid (VORTAC) building in which the controls for setting the temperature and humidity thresholds of the weather sensor are located.

The outside air temperature thermostat control closes when the outside air temperature reaches 45° F. The wire-wound radome heating system is then put into a standby condition. Under the standby condition, if the outside air

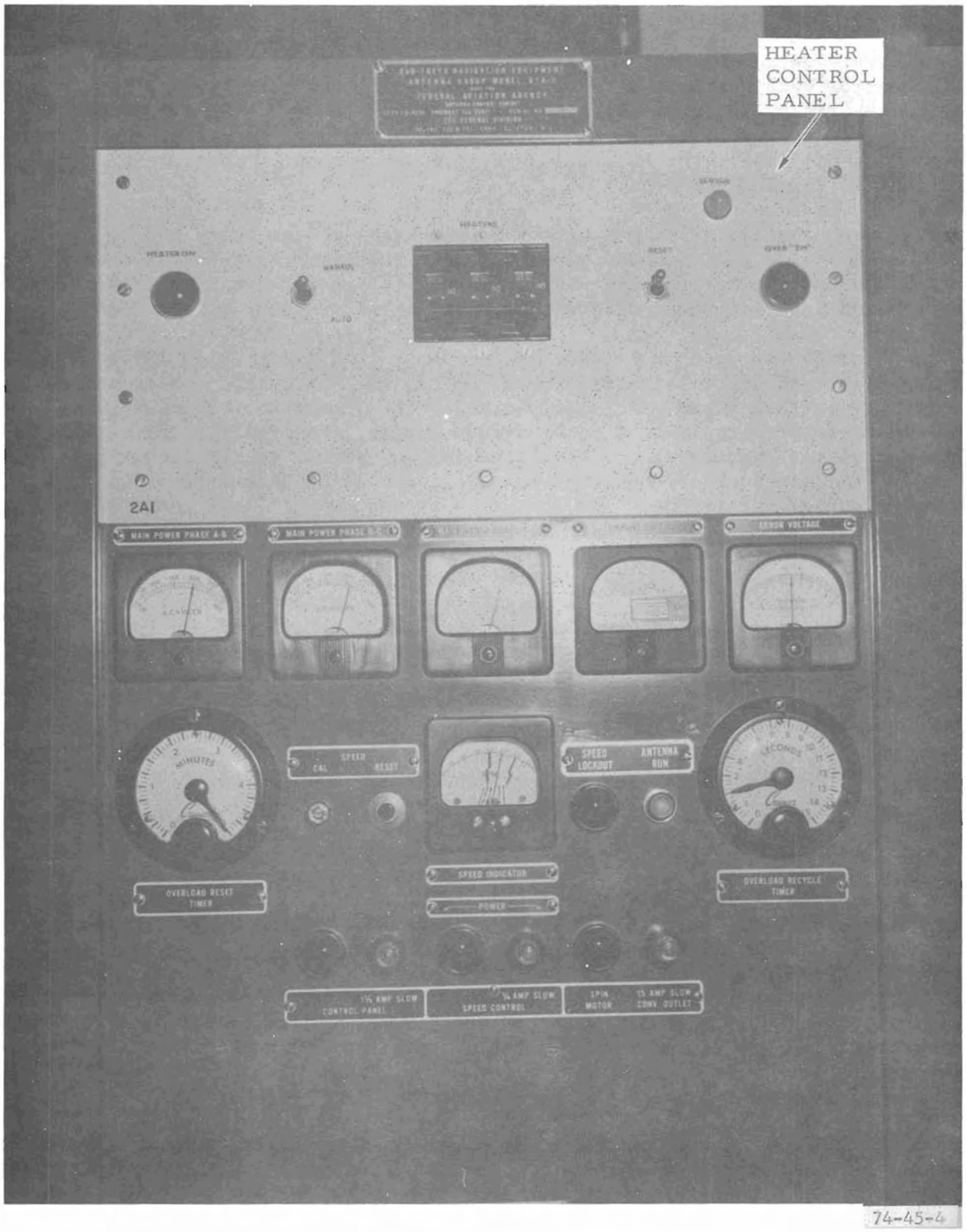

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FIGURE 4. TACAN ANTENNA CONTROL PANEL WITH MODIFIED HEATER CONTROL PANEL

temperature decreases and humidity increases to meet the requirements of the control settings in the heater control panel, the information is detected, then compared by logic circuits against a preset reference, and control is transferred to the heater control circuitry, which automatically controls the operation of three motor-controlled variacs which then control the flow of heat to the TACAN radome.

The radome heat is maintained at 40° F by the six radome thermistors. The heater is turned OFF when the weather sensor thermostat detects an above 45° F condition outside air temperature. Figure 5 is a block diagram of the total system and the instrumentation used for TACAN ice and snow elimination purposes.

When the weather sensor unit determines icing probability, a 30-minute timer is enabled, and control is transferred to circuit board A1. Heater control circuitry on this board maintains the radome at a constant temperature by providing servo signals to a motor-driven Variac (figure 6). The circuit board compares the lowest indicated radome temperature to the preset reference level. Circuit board A1 contains an adjustment which allows presetting of the temperature of the radome. The variac is slewed to null this temperature differential until a stable servo-loop condition exists.

The weather sensing and heater control circuitry provide safeguards against the overheating of the radome if normal servo operation is interrupted. Three thermostats are mounted at the base of the radome around its circumference to monitor radome temperature. Overtemperature thermostats located in the radome are normally closed. If a temperature of 90° F is sensed, an "overtemperature" signal is sent to the protect relays and three-phase power will be removed. When this occurs, the Variac will then slew counterclockwise to zero voltage. Power from the 1:2 three-phase transformer is removed from the radome heating elements. The overtemperature thermostats close again at 70° F, and automatic heater control operation may be resumed after manually resetting.

The protect relays located in the heater control panel provide protection against possible failures. Three-phase heater power may not be applied until the Variac is at zero slew position and also when line voltage (line sense) is not present. If three-phase power is interrupted, the Variac will slew to zero position. Under normal operating conditions, the Variac slews to zero before three-phase power is removed. Disable and enable signals are provided to assure that there will be no overloading condition on the three-phase power lines. The disable signal would result from an overload condition if three-phase heater power was demanded by the radome during antenna motor start-up. One of the motor phase lines is monitored by a relay and the resultant disable signal removes heater power to the radome.

In this test of the radome, a Simpson model 604 multicorder was utilized to measure one phase of the 208 volts alternating current (V a.c.) providing power to the heater circuitry to indicate when the radome heaters were ON. This indicated whether or not the heaters were furnishing heat when called for.

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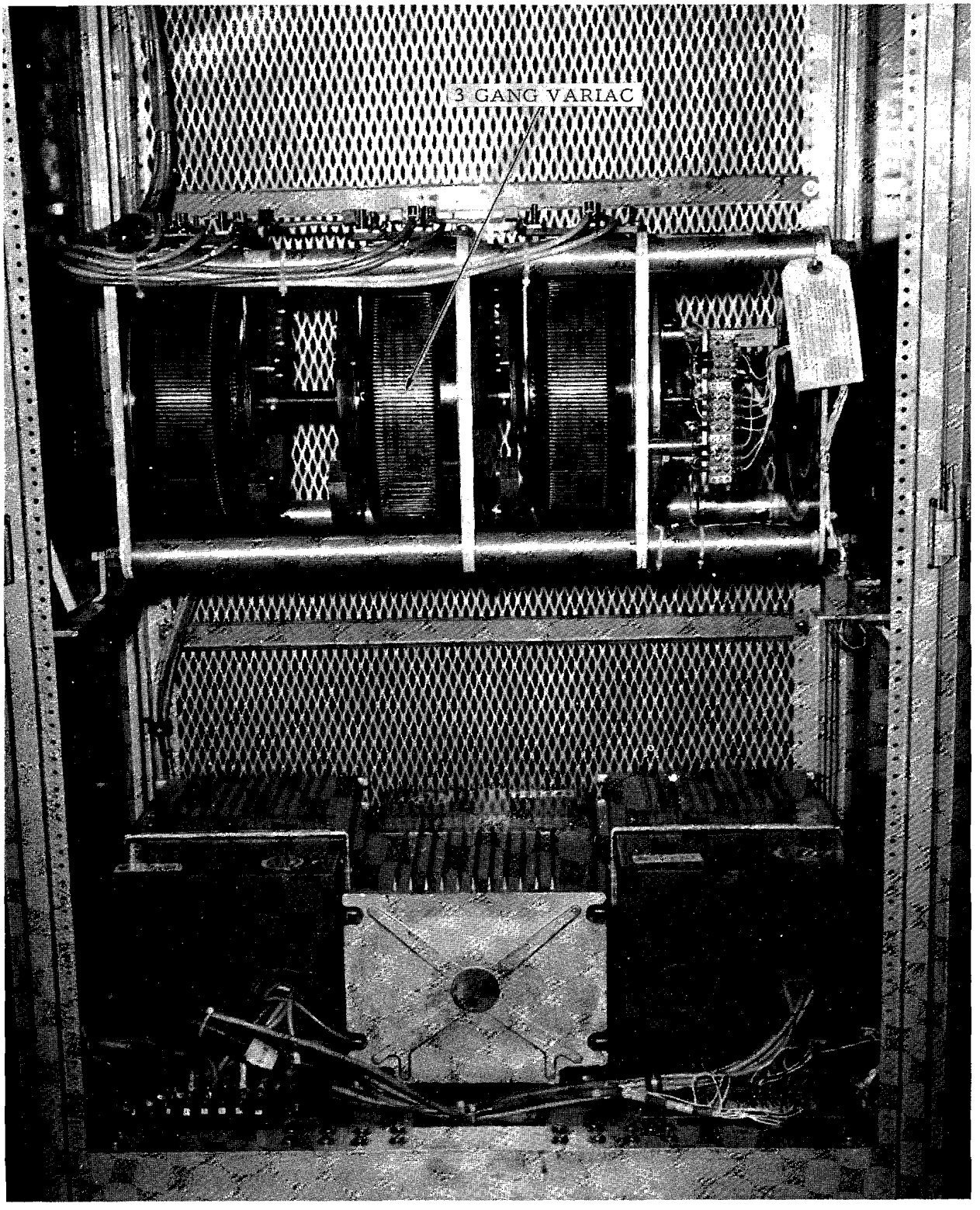

FIGURE 6. MOTOR-DRIVER VARIAC

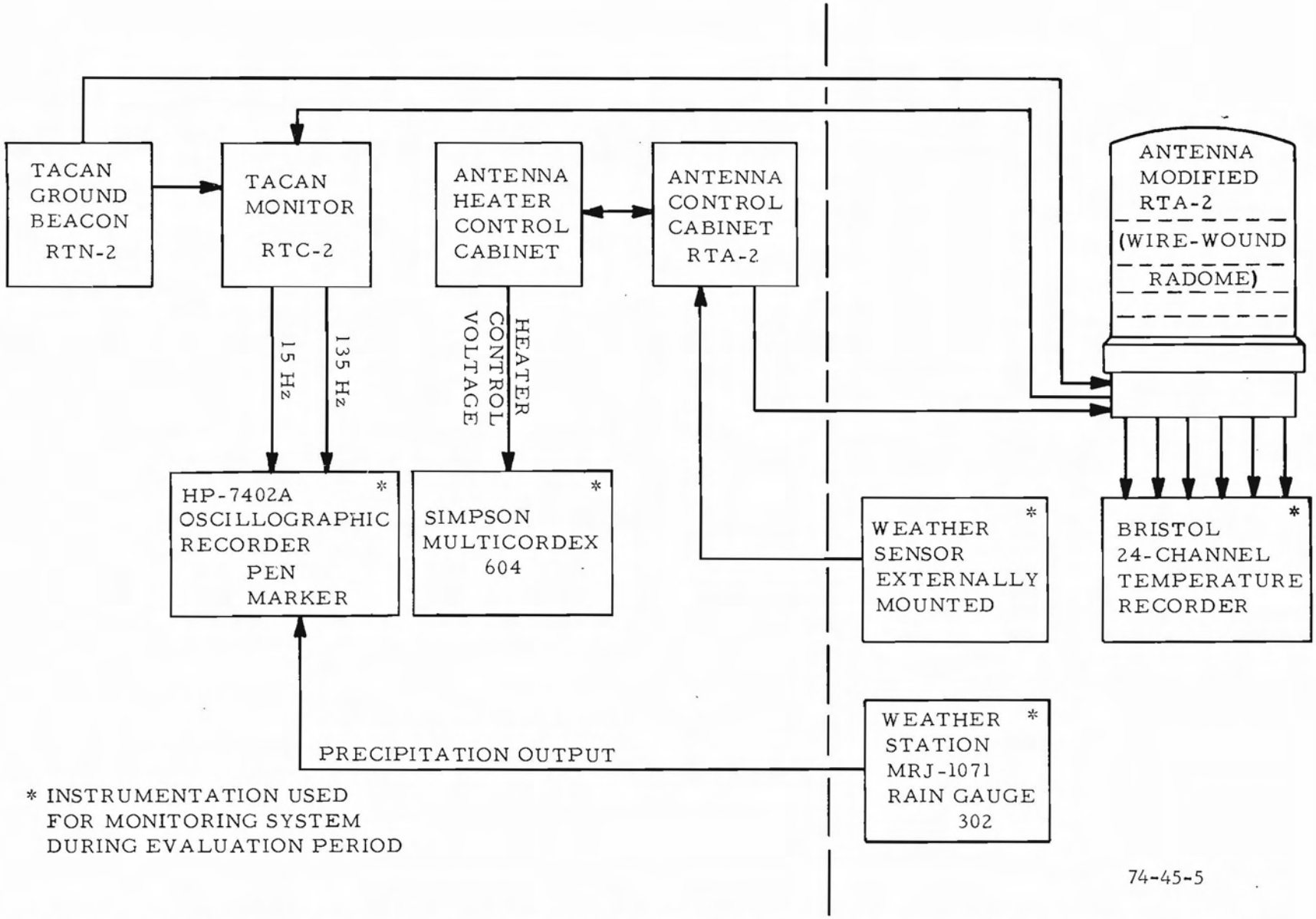

FIGURE 5. BLOCK DIAGRAM OF INSTRUMENTATION USED FOR MONITORING THE EFFECTIVENESS OF TACAN OPERATION UNDER ICE AND SNOW CONDITIONS

WEATHER STATION.

A weather station, Meteorology Research Inc., model MRI-1071 (figure 7), continuously recorded wind speed, wind direction, outside air temperature, humidity, and amounts of precipitation. The amount of precipitation was recorded using a tipping bucket, model MRI-1072. The weather station was installed as a redundant monitor of outside weather condition to check the accuracy of the weather sensor, and record the actual temperature and humidity conditions for which the wire-wound heater was turned ON or OFF.

CAMERA.

A camera, Beattie Varitron model D4-57 with a 35-millimeter (mm) lens and an Autex automatic exposure control, set to take one frame every 15 minutes, photographed the weather conditions on the TACAN radome and surrounding terrain during testing. The camera housing in relation to the TACAN monitor antenna, strobe lights, and prevailing wind direction is depicted in figure 8. Photographs taken during the data-collection period are available for viewing at the NAFEC photolab.

DISCUSSION

PRETEST.

Prior to installation at the Newberg, Oregon, VORTAC facility, several test points located in the RTC-2 TACAN monitor were recorded at the NAFEC experimental VORTAC to insure that no system degradation would occur.

The TACAN wire-wound radome and control panel were installed at Newberg during the week of December 13, 1973, and the instrumentation used to monitor the wire-wound radome was installed during the week of January 10, 1974.

Prior to removal of the RTA-2 TACAN antenna, a flight check was performed to insure proper operation of the TACAN beacon. Flight checks were also performed after installation of the modified RTA-2 TACAN antenna (engineering model), and a subsequent improvement of azimuth information was realized. The 15-hertz (Hz) and 135-Hz azimuth signals from the TACAN antenna which furnish bearing information to the pilot were greatly improved, resulting in a reduction of course roughness as noted by Flight Inspection personnel. Appendix A is a copy of the flight inspection of the RTA-2 antenna and the new modified RTA-2 TACAN antenna (engineering model) for comparison purposes.

The 15-Hz and 135-Hz azimuth signals were recorded on a dual-channel Hewlett-Packard model 7402A oscillographic recorder. Figure 9 is a partial schematic of the azimuth monitor which monitored points of the 15-Hz and 135-Hz azimuth signals to detect the effects of snow and ice buildup on the TACAN radome.

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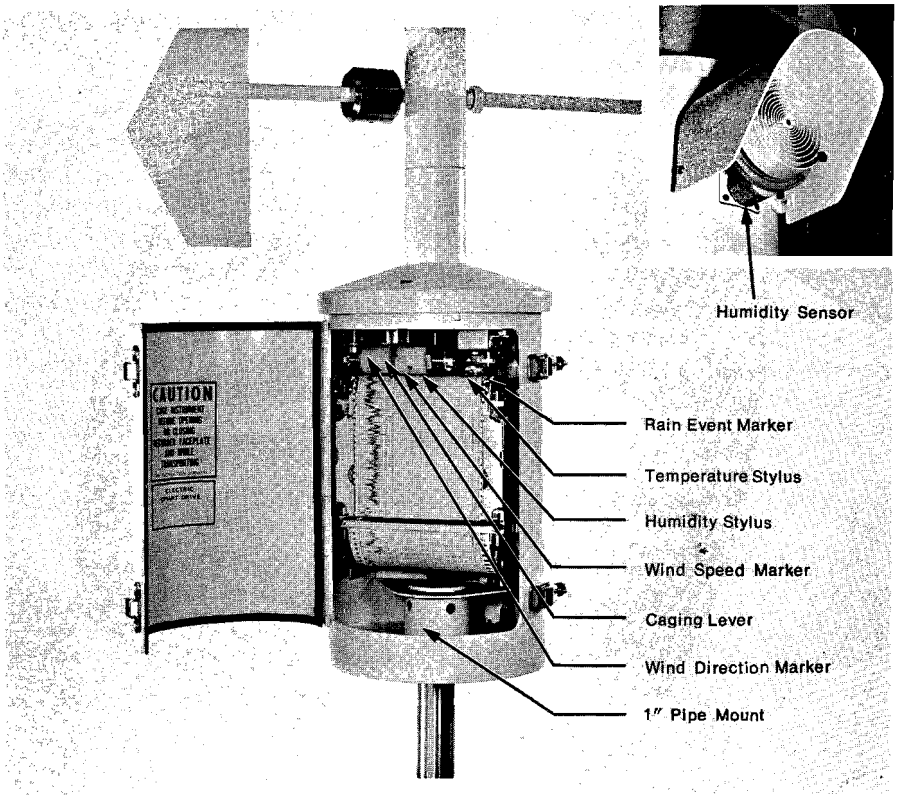
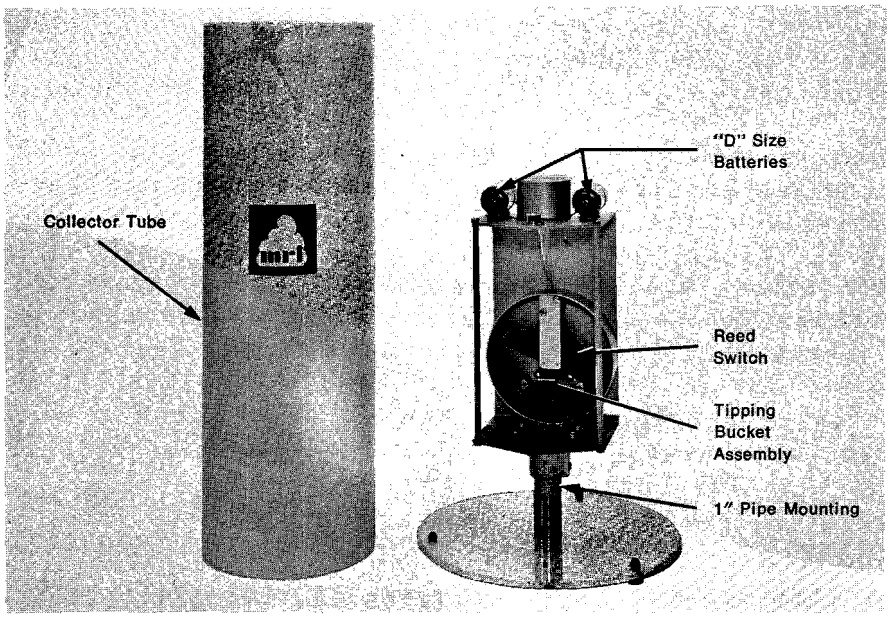


a. Weather Station Model MRI-1071



b. Tipping Bucket Model MRI 1072

FIGURE 7. WEATHER STATION AND TIPPING BUCKET

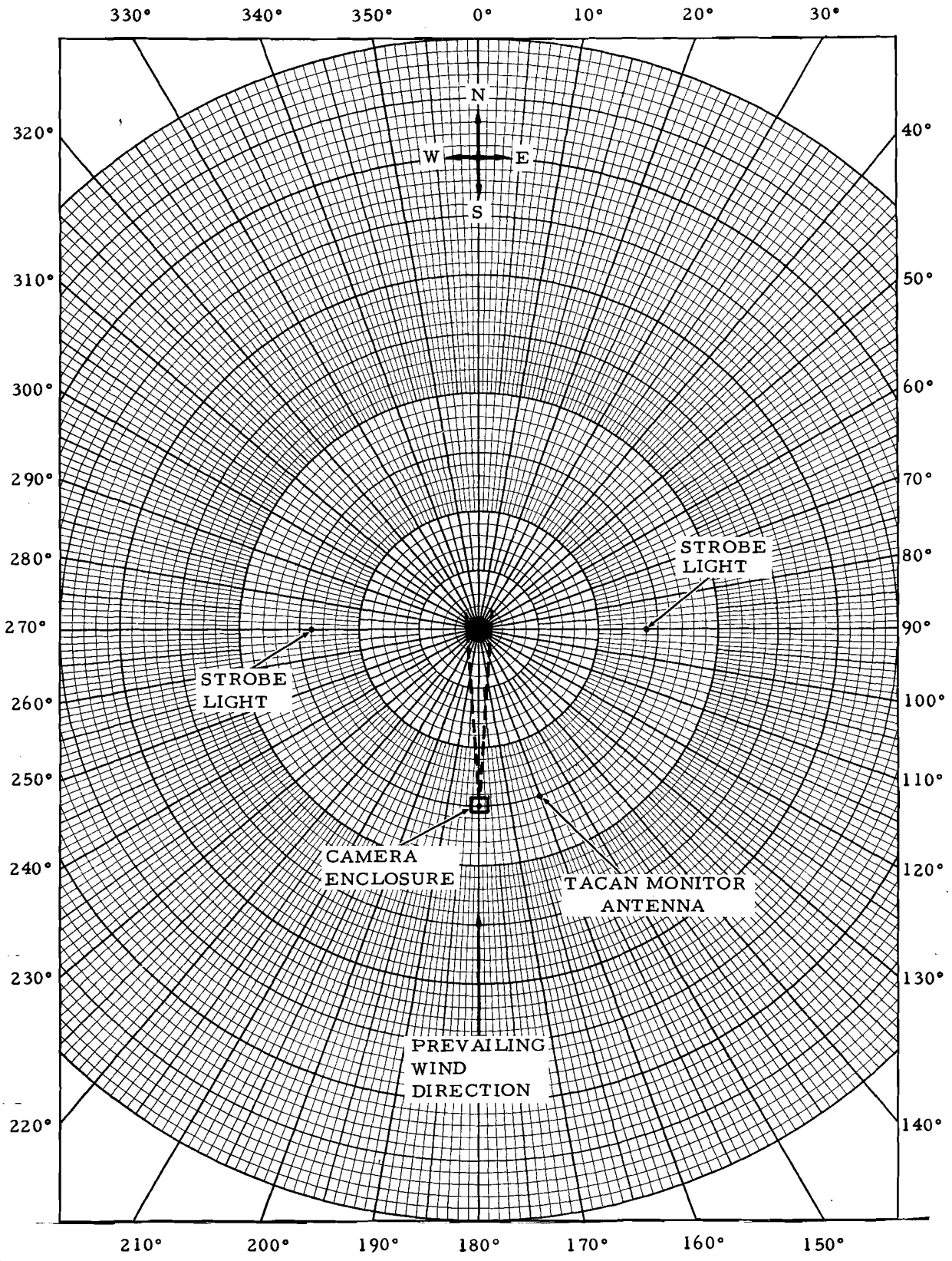
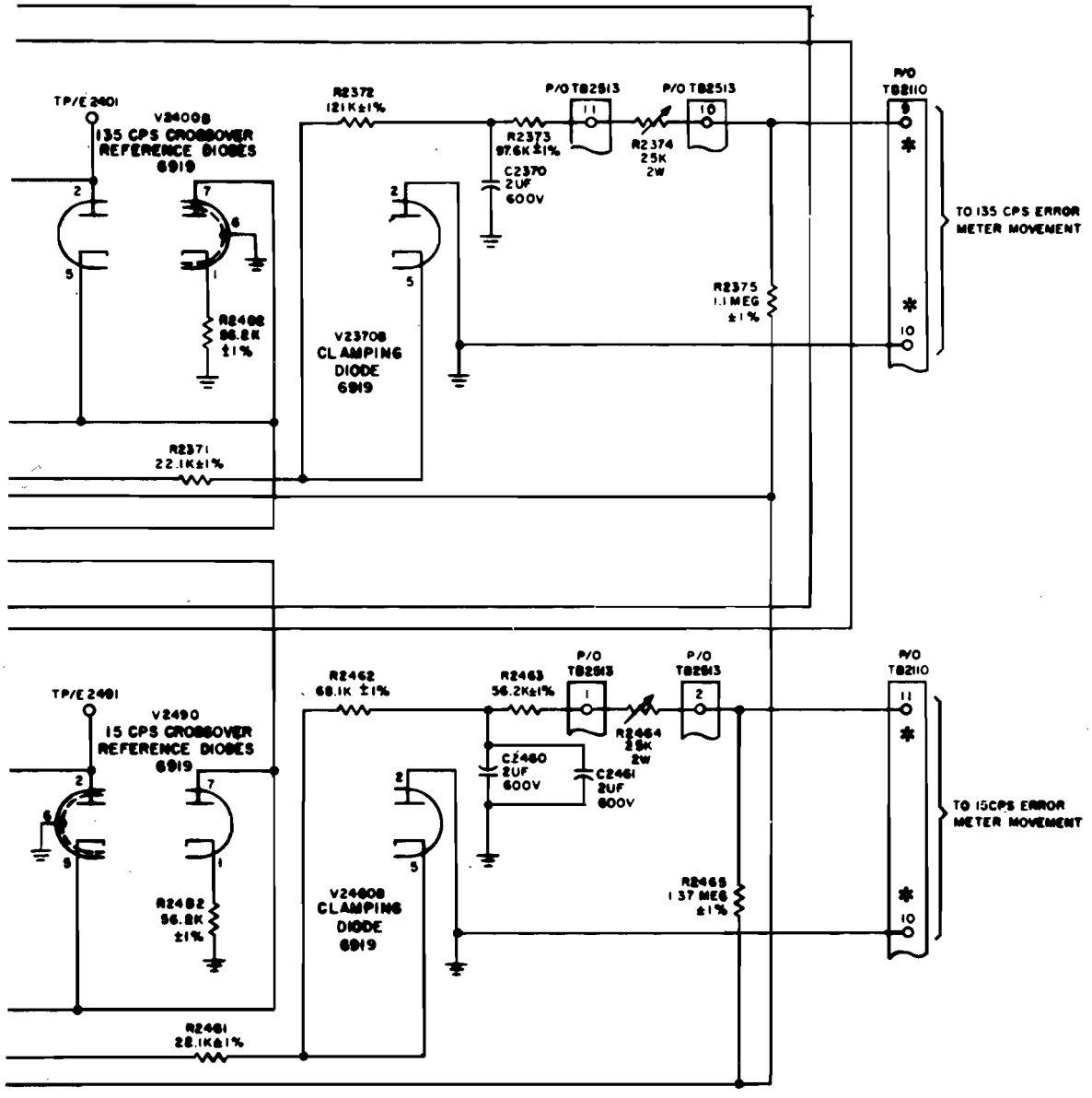


FIGURE 8. PLOT OF CAMERA LOCATION



* TEST INSTRUMENTION TIE POINTS FOR MONITORING THE 15-Hz AND 135-Hz SIGNALS.

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FIGURE 9. PARTIAL SCHEMATIC OF AZIMUTH MONITORING POINTS FOR THE 15-Hz AND 135-Hz AZIMUTH SIGNALS

The amount of ice and snow was recorded from the weather station tipping bucket, the output of which was connected to an event marker on the Hewlett-Packard HP7402A recorder and was used to correlate the amounts of ice and snow with any change in the 15-Hz and 135-Hz azimuth signals being monitored.

FIELD TEST PREPARATION.

The tests were scheduled to run from December 1973 through March 31, 1974.

Attached to the base of the radome on the exterior were six thermocouple devices, located at positions corresponding to 180°, 120°, 60°, 0°, 300°, and 240° as shown in figures 10, 11, and 12. Table 1 is a calibration of the sensors used. The purpose of the thermocouples was to monitor the heat distribution during heater ON times. The outputs of the thermocouples were connected to a Bristol 24-channel temperature recorder, located in the pit below the TACAN antenna. The recording rate was set for 9 inches of marker pen traces per hour.

The 15-Hz and 135-Hz azimuth signal errors were again recorded from TB-2110-10 and 11 for the 135-Hz azimuth and TB-2110-9 and 10 for the 15-Hz azimuth signals directly from the RTC-2 monitor error meter inputs. The error voltage across each of these meters was connected to separate inputs of the Hewlett-Packard HP-7402A dual-channel oscillograph recorder. Figure 13 is a data sample of the calibration of the 15-Hz and 135-Hz azimuth signal recordings utilizing the azimuth calibrator, which is a part of the RTC-2 monitor.

The amount of snow and ice was recorded (in melted, or water precipitation form) utilizing a MRI-1072 tipping bucket (figure 14), the output of which was connected to one of the event markers of the Hewlett-Packard HP-7402A dual-channel recorder. Figure 15 is a sample of the 15-Hz and the 135-Hz azimuth recordings and the precipitation indication. The tipping bucket consisted of a collector 24 inches high with a heating element, and a capability of recording precipitation in 0.01-inch step increments. When 0.01 inch of precipitation accumulated in the bucket, the water unbalanced the bucket, which closed a set of contacts and momentarily enabled one of the marker pen relays of the HP-7402A recorder. Therefore, the amount of ice or snowfall was indicated on the marker pen recording alongside the 15-Hz and 135-Hz azimuth signals to enable correlation of any interference effects.

A weather station capable of measuring and recording wind direction, wind speed, air temperature, and humidity, was utilized for correlation with the weather-sensing device to determine its accuracy in turning the radome heaters ON or OFF. Figure 16 is a sample of the weather recordings.

A pulse-operated Beattie Varitron model D4-57 camera was used to take pictures of the TACAN under snow and ice conditions. Magazines that were loaded with 100 feet of 35-mm color film, allowed for easy replacement by site personnel. A wide-angle lens with an Autex automatic exposure control allowed for wide-angle viewing. The automatic exposure control allowed for bright exposures

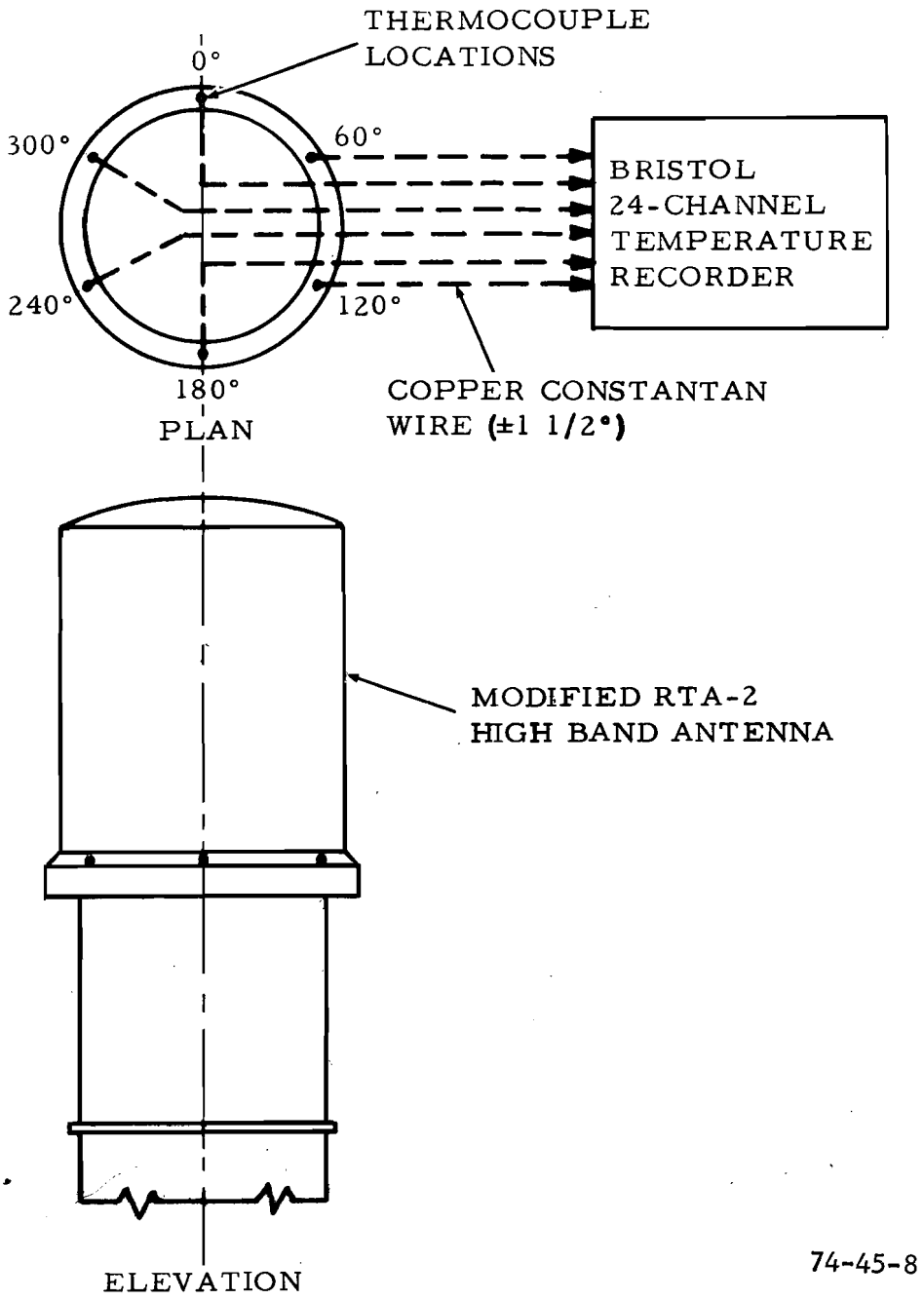

FIGURE 10. LOCATION OF THERMOCOUPLE DEVICES

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Attached to the base of the radome on the exterior were six thermocouple devices, located at positions corresponding to 180°, 120°, 60°, 0°, 300°, and 240° as shown in figures 10, 11, and 12. Table 1 is a calibration of the sensors used. The purpose of the thermocouples was to monitor the heat distribution during heater ON times. The outputs of the thermocouples were connected to a Bristol 24-channel temperature recorder, located in the pit below the TACAN antenna. The recording rate was set for 9 inches of marker pen traces per hour.

The 15-Hz and 135-Hz azimuth signal errors were again recorded from TB-2110-10 and 11 for the 135-Hz azimuth and TB-2110-9 and 10 for the 15-Hz azimuth signals directly from the RTC-2 monitor error meter inputs. The error voltage across each of these meters was connected to separate inputs of the Hewlett-Packard HP-7402A dual-channel oscillograph recorder. Figure 13 is a data sample of the calibration of the 15-Hz and 135-Hz azimuth signal recordings utilizing the azimuth calibrator, which is a part of the RTC-2 monitor.

The amount of snow and ice was recorded (in melted, or water precipitation form) utilizing a MRI-1072 tipping bucket (figure 14), the output of which was connected to one of the event markers of the Hewlett-Packard HP-7402A dual-channel recorder. Figure 15 is a sample of the 15-Hz and the 135-Hz azimuth recordings and the precipitation indication. The tipping bucket consisted of a collector 24 inches high with a heating element, and a capability of recording precipitation in 0.01-inch step increments. When 0.01 inch of precipitation accumulated in the bucket, the water unbalanced the bucket, which closed a set of contacts and momentarily enabled one of the marker pen relays of the HP-7402A recorder. Therefore, the amount of ice or snowfall was indicated on the marker pen recording alongside the 15-Hz and 135-Hz azimuth signals to enable correlation of any interference effects.

A weather station capable of measuring and recording wind direction, wind speed, air temperature, and humidity, was utilized for correlation with the weather-sensing device to determine its accuracy in turning the radome heaters ON or OFF. Figure 16 is a sample of the weather recordings.

A pulse-operated Beattie Varitron model D4-57 camera was used to take pictures of the TACAN under snow and ice conditions. Magazines that were loaded with 100 feet of 35-mm color film, allowed for easy replacement by site personnel. A wide-angle lens with an Autex automatic exposure control allowed for wide-angle viewing. The automatic exposure control allowed for bright exposures

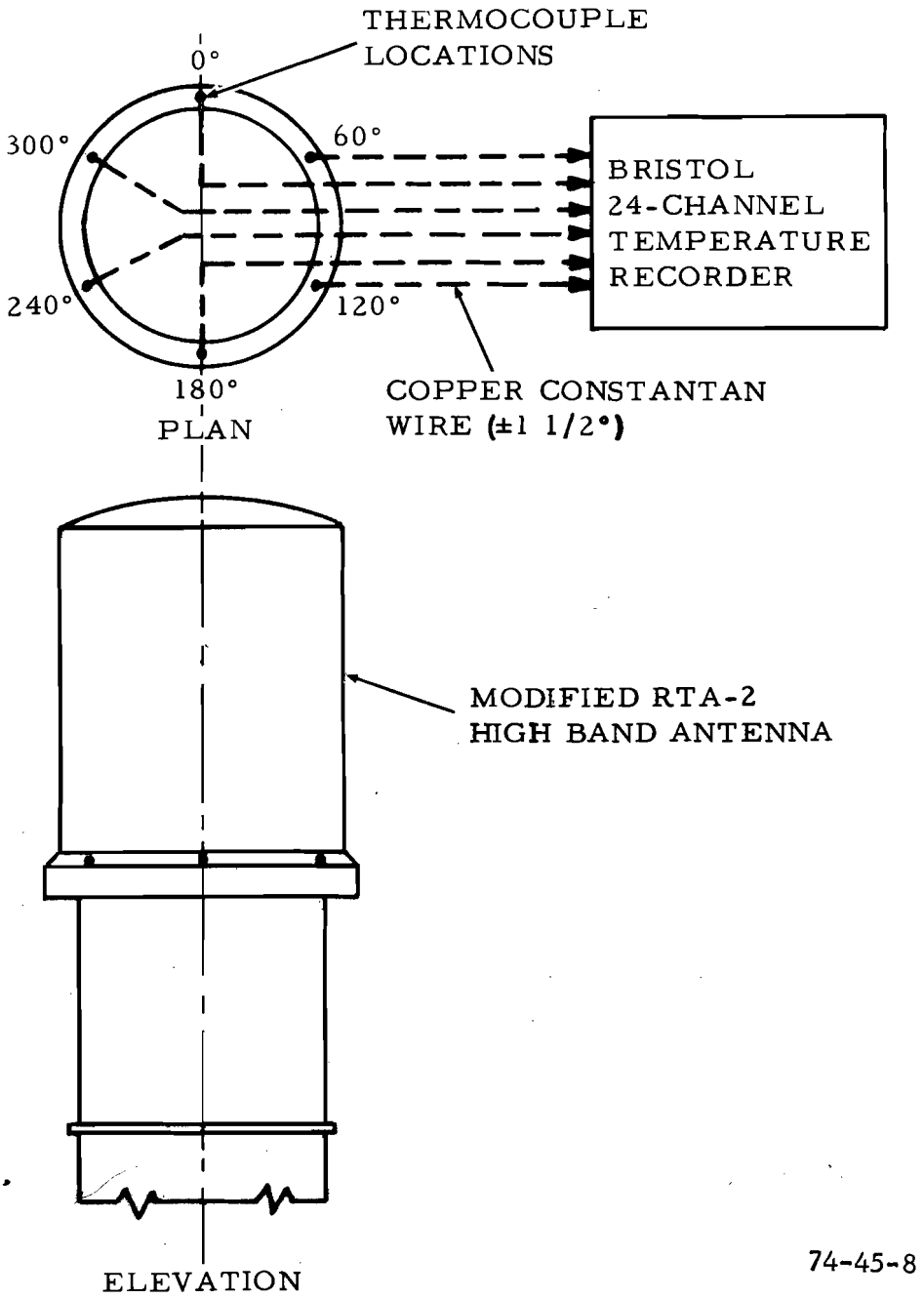

FIGURE 10. LOCATION OF THERMOCOUPLE DEVICES

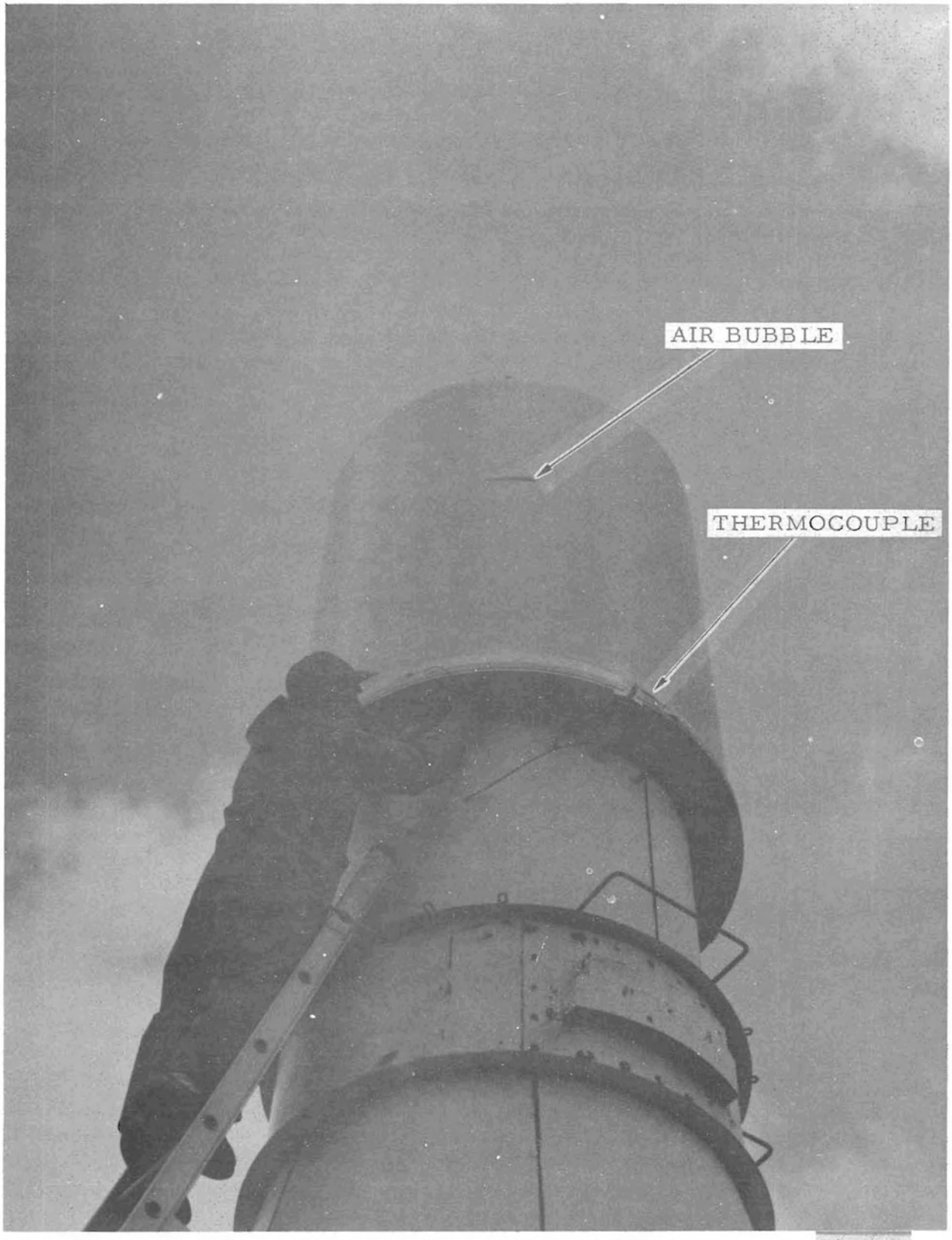

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FIGURE 11. INSTALLATION OF THERMOCOUPLE DEVICES

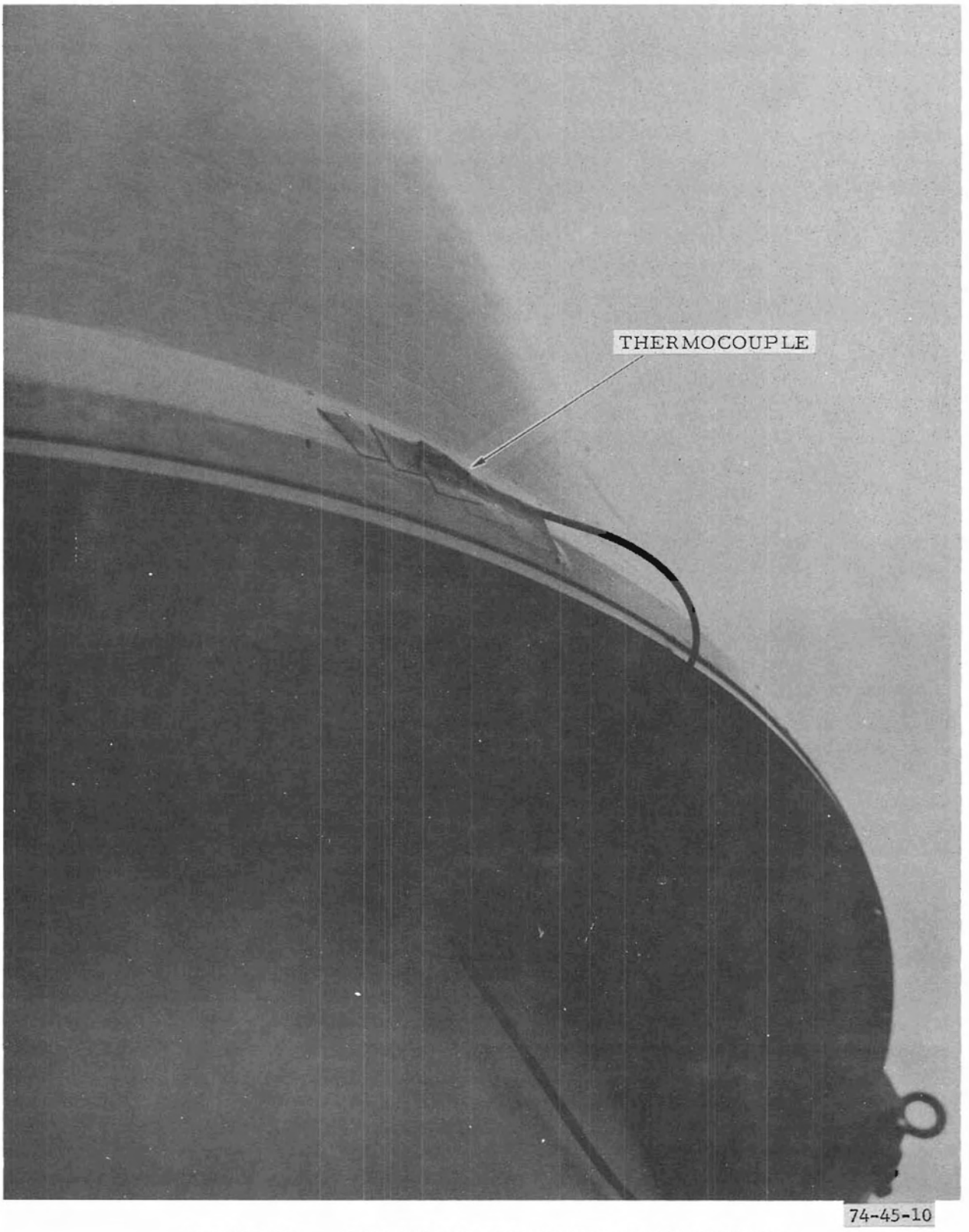


FIGURE 12. CLOSEUP OF THERMOCOUPLE INSTALLATION

TABLE 1. CALIBRATION OF THERMOCOUPLE DEVICES

Thermometer Chamber Temp.	Thermocouple	Tolerance	Time/Date
20° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	±1° F	0930/4-17-74
30° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	±1° F	1045/4-17-74
40° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	ON	1125/4-17-74
50° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	+1/2° F	1250/4-17-74
60° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	±1° F	1315/4-17-74
70° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	+1° F	1400/4-17-74
80° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	+1° F	1445/4-17-74
90° F	TC-1 TC-2 TC-3 TC-4 TC-5 TC-6	+1° F	1550/4-17-74

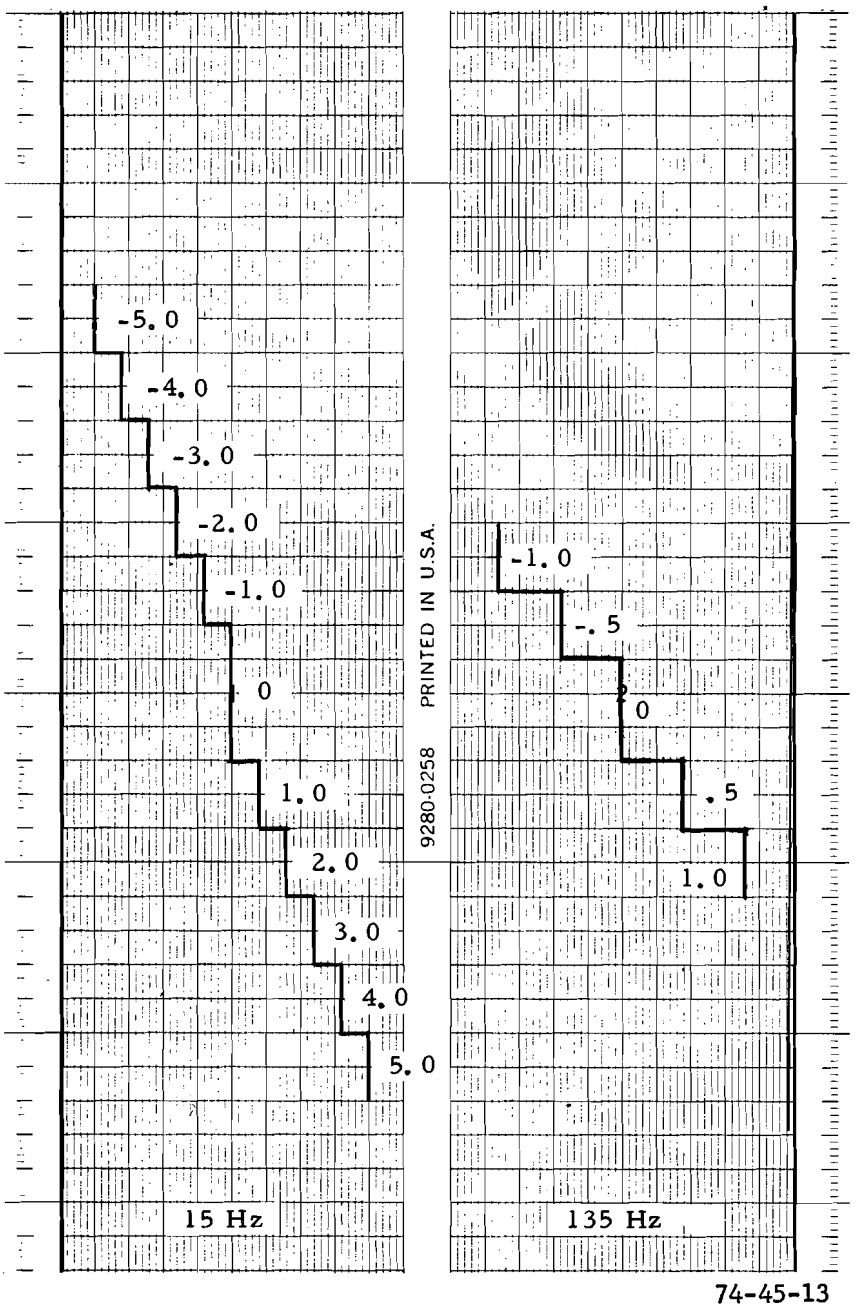


FIGURE 13. SAMPLE CALIBRATION OF THE 15-Hz AND 135-Hz AZIMUTH SIGNALS

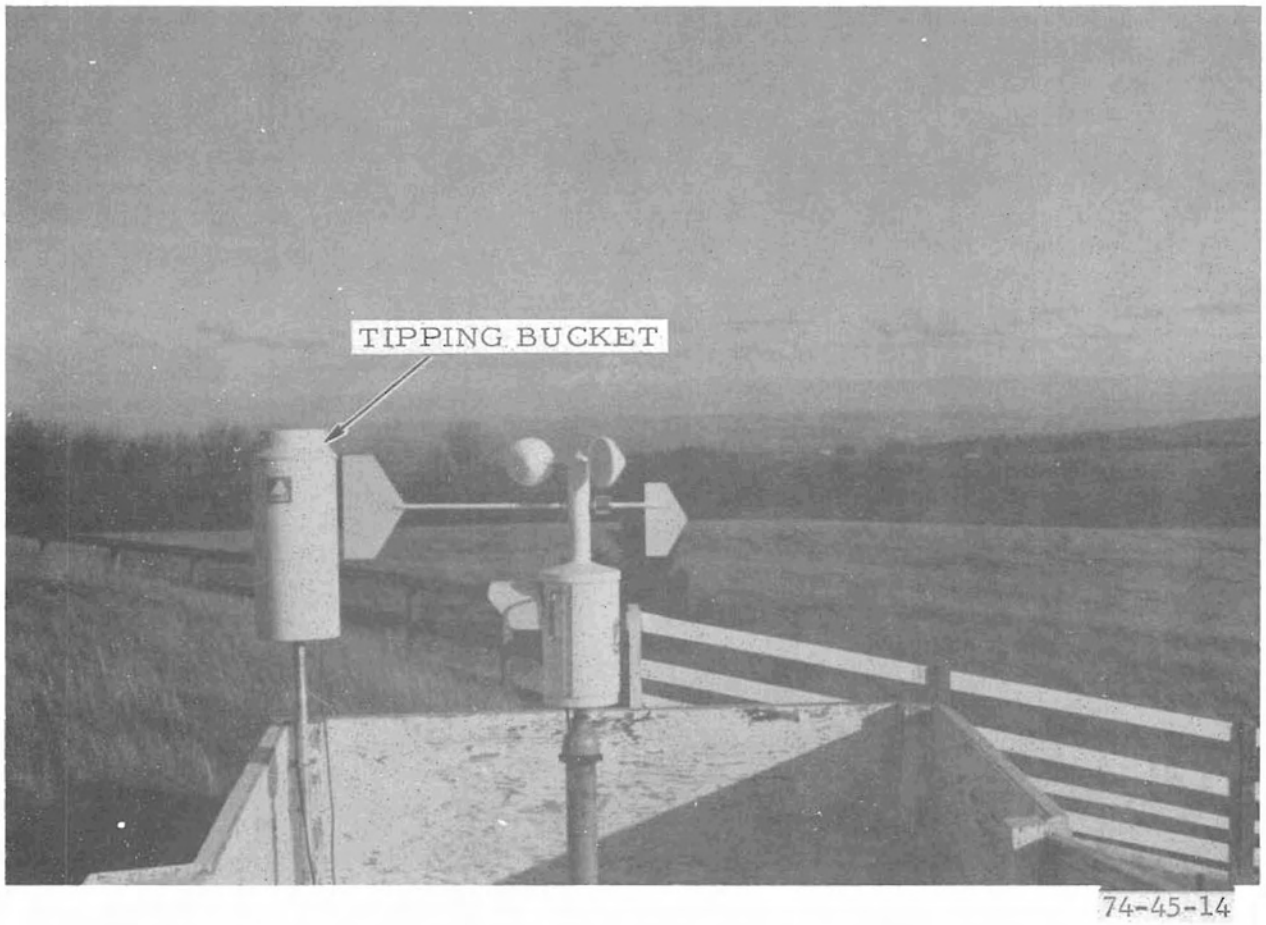


FIGURE 14. TIPPING BUCKET PRECIPITATION INDICATOR WITH WIND SPEED AND DIRECTION WEATHER STATION INSTRUMENTATION

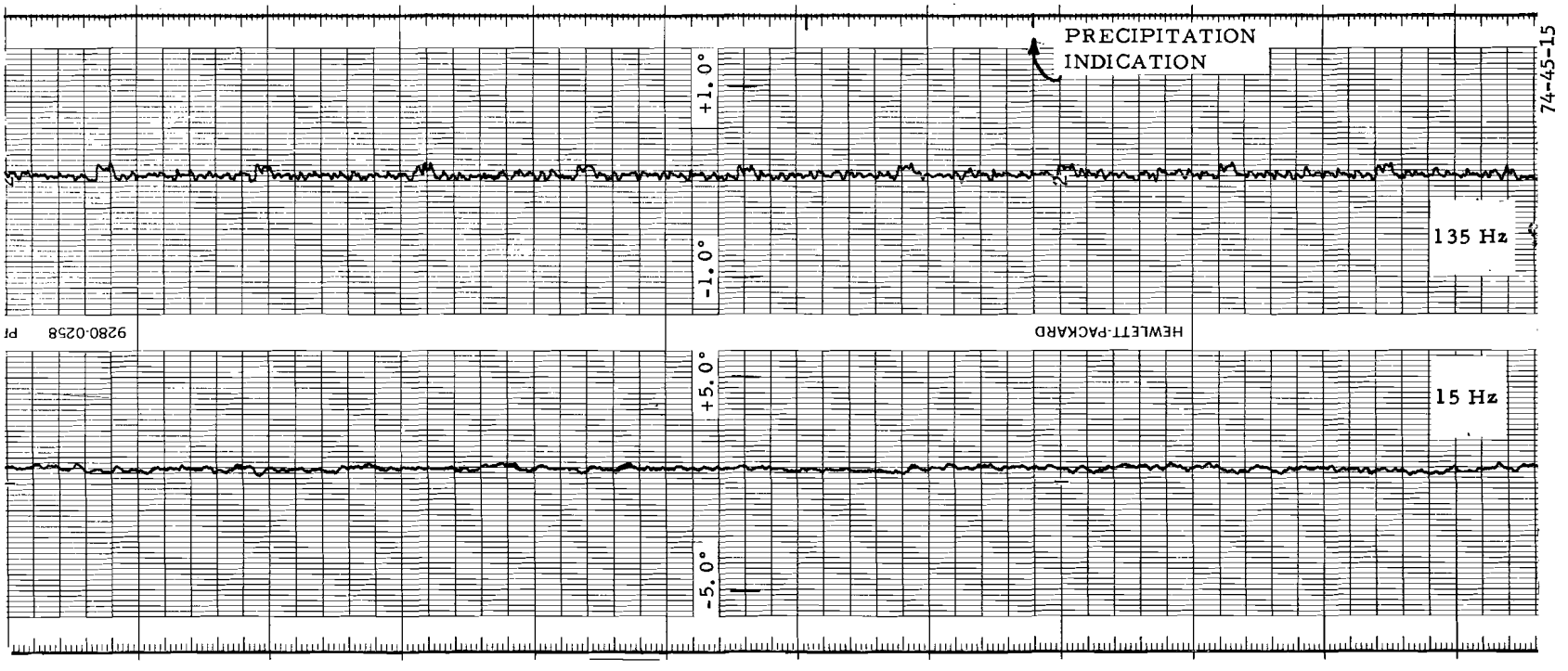
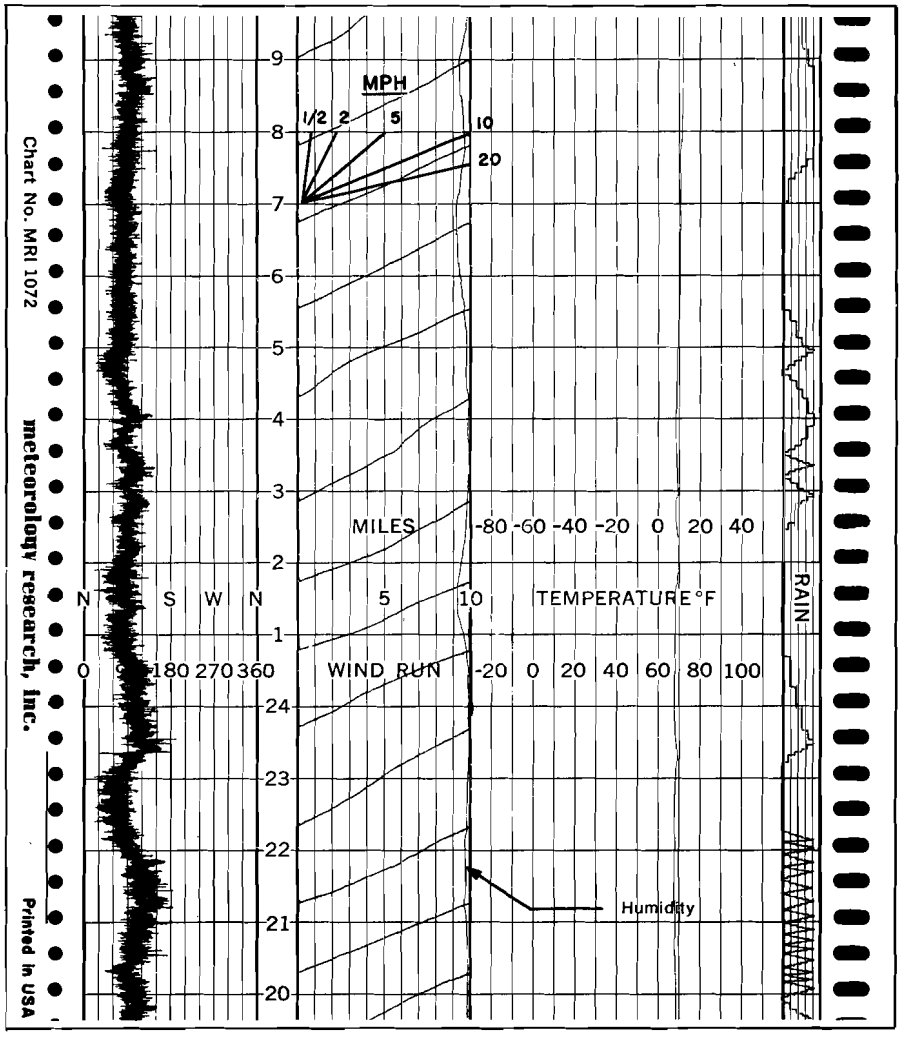


FIGURE 15. SAMPLE DATA RECORDING OF THE 15-Hz AND 135-Hz AZIMUTH SIGNALS WITH PRECIPITATION INDICATION



FIUGRE 16. SAMPLE OF WEATHER STATION RECORDING SHOWING WIND SPEED, DIRECTION, HUMIDITY, AND TEMPERATURE

and night photography. Included on the film was a frame counter, an Accutron clock, and provisions for recording the date. All of this information appeared on each frame of film taken. A locally fabricated enclosure was utilized to house the camera equipment. For increased photographic illumination, three General Radio model 1532-B Strobalunes were installed at three locations: one directly below the VOR monitor antenna (figure 17), one 180° away, and one in the front of the enclosure housing the photo equipment (figure 18). The strobes were synchronized with the shutter for illumination during nighttime operation and during periods of inclement weather when normal light conditions were poor. Installed in the shelter (figure 19) were the required power supplies, electric heaters and blowers required to prevent freeze-up of camera equipment and frosting of the window on the enclosure.

The film magazine was changed every 5 days. The recordings of the 15-Hz and 135-Hz azimuth signals were changed each 24-hour period, and weather data recordings, each week.

Calibrations of the 15-Hz and 135-Hz azimuth signal monitor meters were accomplished using the azimuth calibrator test set, which is part of the RTC-2 monitor.

Normal operation of the TACAN base-mounted radome heaters is accomplished with the procedures as outlined in paragraphs 17a and b, SMP 6780.3, Chg. 15, dated 13 June 1972, which briefly states that "the antenna heaters should be ON only during periods of freezing precipitation, when the temperature is above 20° F." With the wire-wound TACAN heated radome, proper settings of the controls will control the ON/OFF cycles of the heaters for heat only when needed, thereby effectively reducing the amounts of energy required for heater operation.

FIELD TEST RESULTS

EQUIPMENT PERFORMANCE.

RELIABILITY. No major equipment failures were experienced during the duration of the tests from December 1973 through March 1974. Some difficulty was encountered in determining the proper setting of the temperature and humidity control settings, in that they required numerous adjustments to determine and maintain proper radome and humidity settings at the preset levels.

The ability of the system to maintain radome temperature at preset levels was not consistent due to Variac instability, which was caused by the time lag difference in the radome temperature sensors in determining temperature changes, thereby creating unnecessary Variac slewing.

FIGURE 17. STROBALUNE MOUNTED BELOW VOR MONITOR ANTENNA

FIGURE 18. STROBALUNE MOUNTED ON CAMERA ENCLOSURE

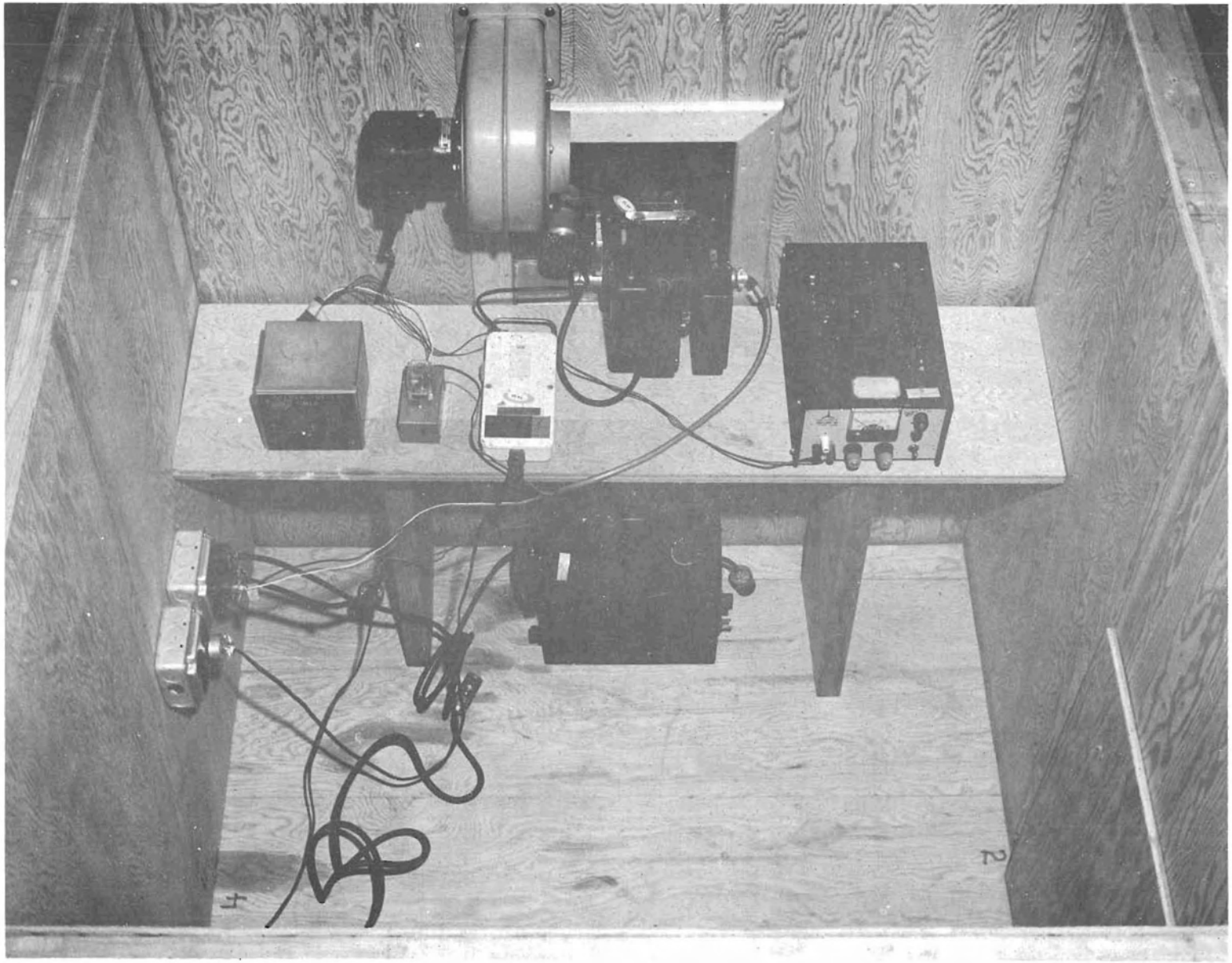


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FIGURE 19. INSIDE VIEW OF THE CAMERA ENCLOSURE

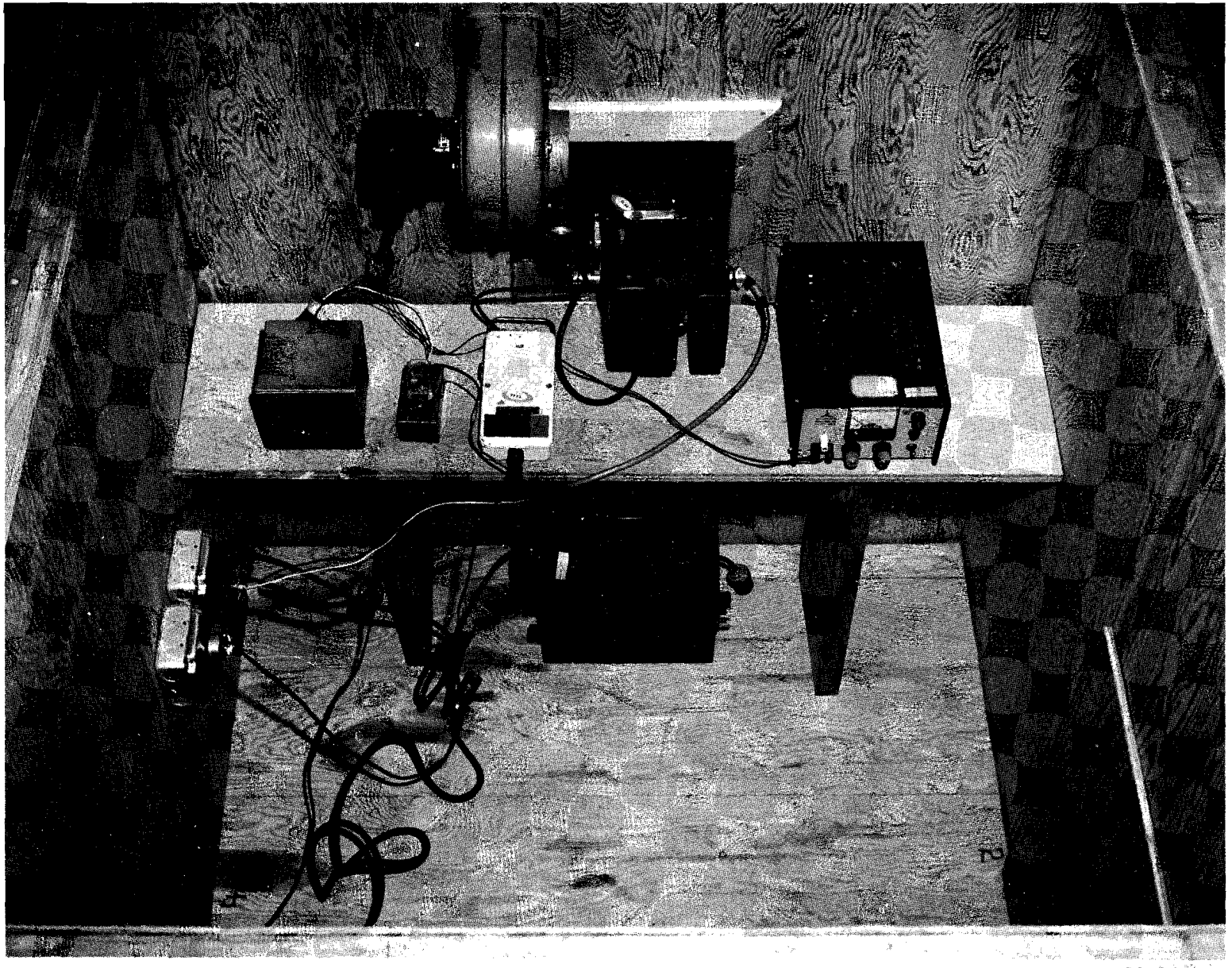

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FIGURE 19. INSIDE VIEW OF THE CAMERA ENCLOSURE

COMPATIBILITY. The modified heater control panel is physically interchangeable with the normal antenna heater-control panel in both the RTN-2 and AN/GRN-9 series beacon equipment. The high-voltage cabling part of the old heater control chassis should be lengthened to permit access to the unit without exposing personnel to the high voltage present on the terminal boards.

FIELD SERVICING. Servicing of the weather sensing equipment is good, but servicing of the heater-control panel is to be considered hazardous due to the location of the printed circuit boards A-1 and A-2 which could expose service personnel to the high voltages present on the cabinet terminal board strips.

These printed circuit boards should be relocated to permit extender boards to be utilized for servicing.

Provision for monitoring and externally measuring direct current power supply voltages and test points would greatly facilitate field servicing and remove the dangers of exposure to the high voltages present in the cabinet.

TACAN OUTAGES.

To determine the effectiveness of the heated wire-wound radome in preventing the buildup of snow and/or ice, several tests were conducted with the following results.

The number of outages that had occurred previously and during the evaluation period were compared. There were a reported 10 outages for the year 1971, 4 for the year 1972, and none reported for the year 1973 due to snow and/or icing conditions. During the evaluation period, from mid-December 1973 up to and including March 31, 1974, an unusually mild winter occurred, wherein 95-percent of the precipitation was in the form of rain. Weather station graphs (figures 20, 21, 22, and 23) for the months of December through March show average temperatures, humidity, and actual radome surface temperatures for comparison purposes. Several light snowfalls which occurred during the evening of February 21, 1974, and February 22, 1974, were the causes of the two outages during the evaluation period.

Prior to the outage on February 21, 1974, several combinations of temperature and humidity settings were tried in order to establish the most advantageous conditions to prevent outages due to snow and or ice accumulation on the TACAN radome. The thermostat located within the weather sensor unit which was mounted on the TACAN monitor pole closes at 45° F, the outside air temperature sensor was set at 35° F, the humidity control was set at 65 percent, and the radome thermistors controlling radome surface temperature were set at 37° F. It was noted however, during several light snowfalls with the radome thermistors set to maintain 37° F, that this was not sufficient to keep the radome clear of snow. The radome thermistors reference level was then set for a temperature of 40° F. At the same time, the humidity control setting was readjusted for 70-percent humidity, so that the weather sensors would not call for heat during subfreezing temperature when there was low humidity and, presumably, no chance of precipitation.

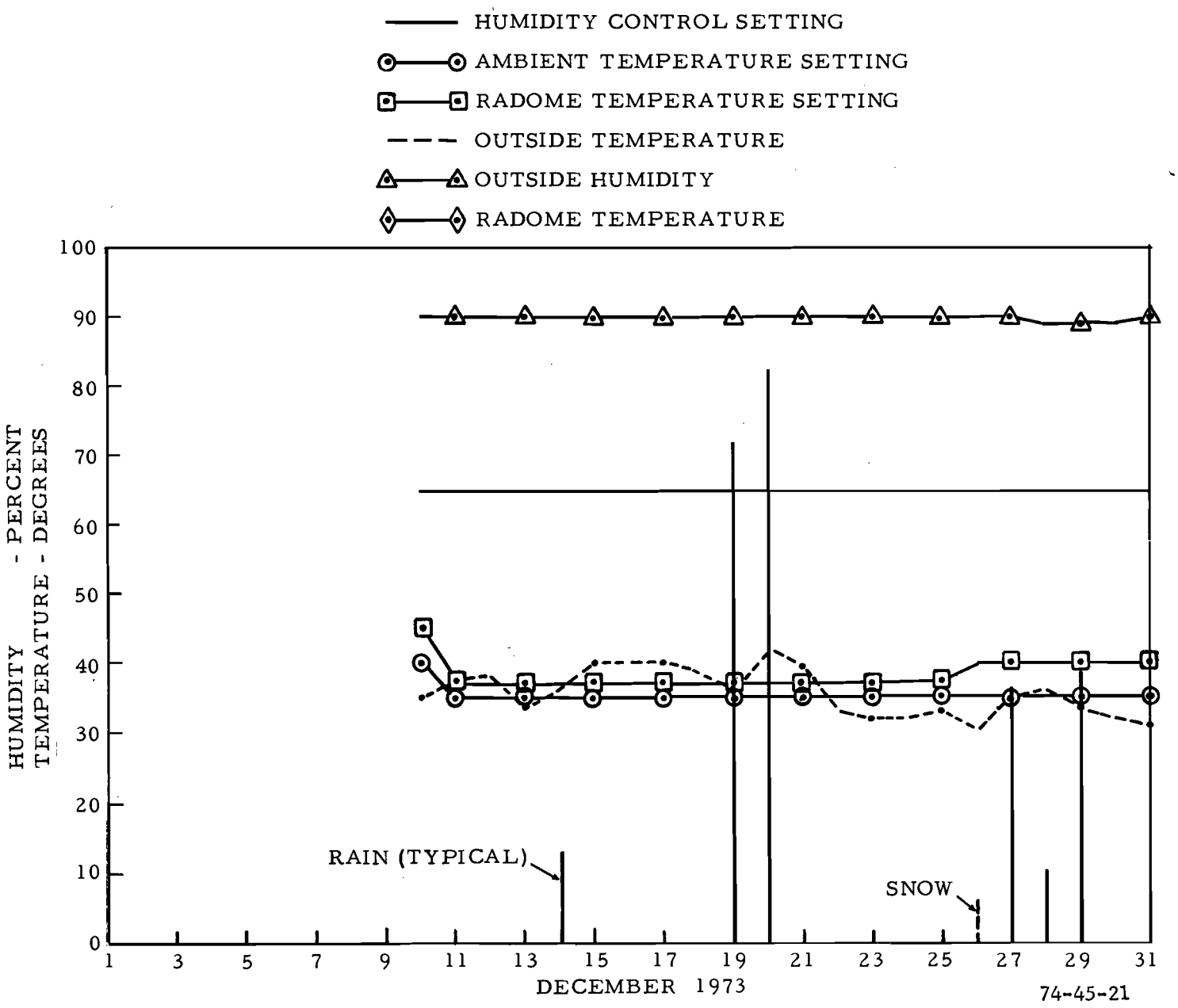

FIGURE 20. AVERAGE WEATHER CONDITIONS FOR DECEMBER

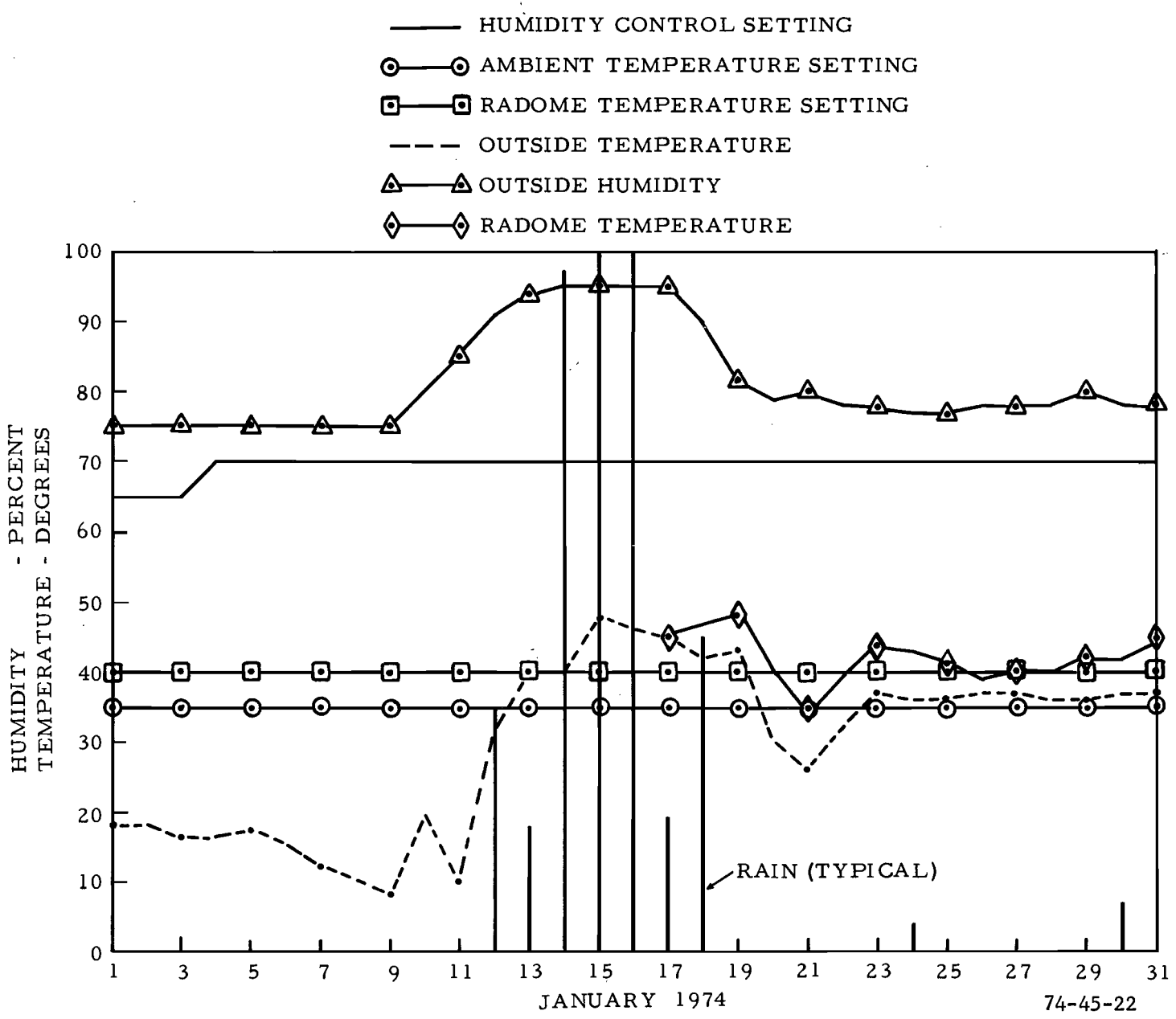

FIGURE 21. AVERAGE WEATHER CONDITIONS FOR JANUARY

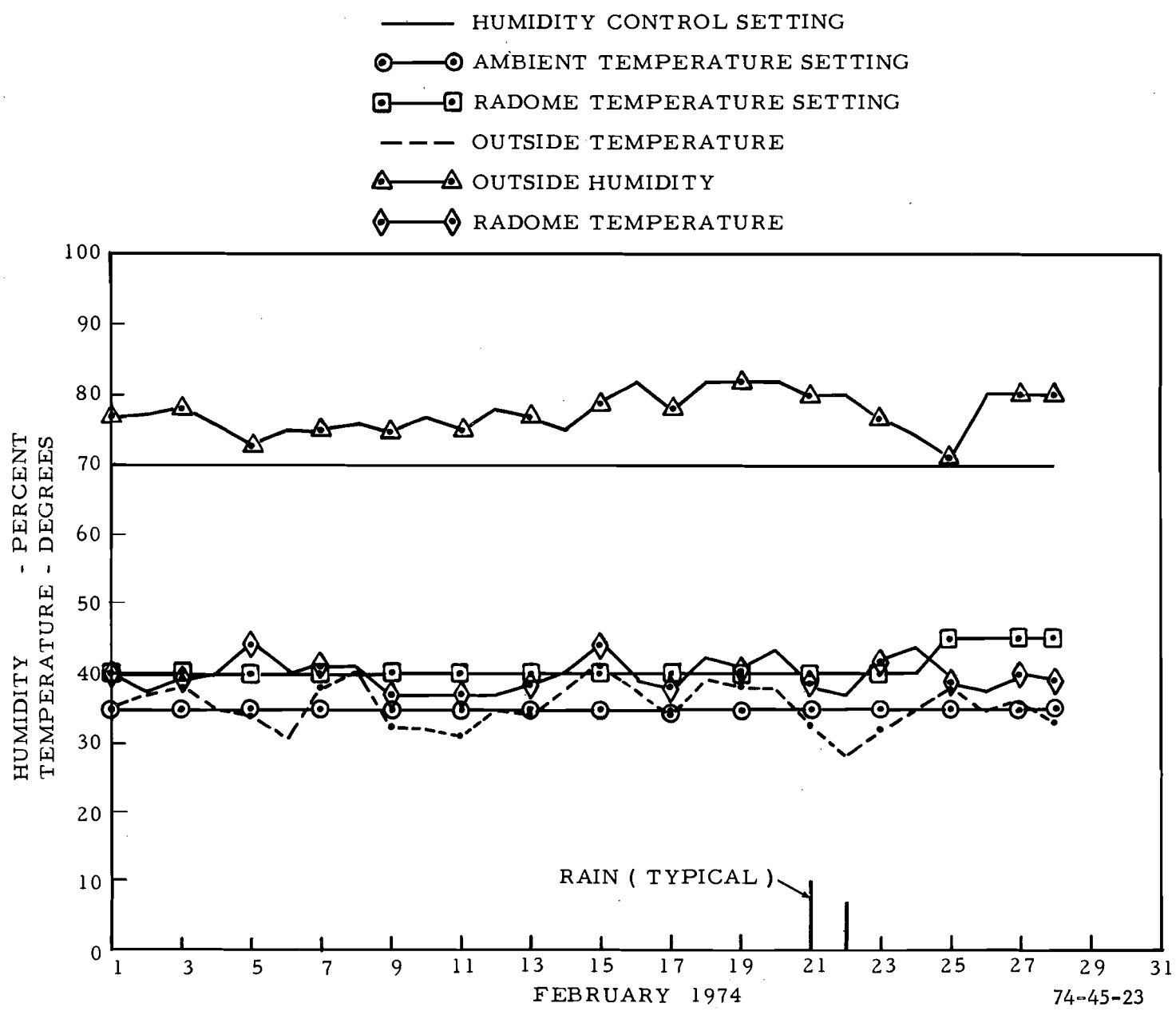

FIGURE 22. AVERAGE WEATHER CONDITIONS FOR FEBRUARY

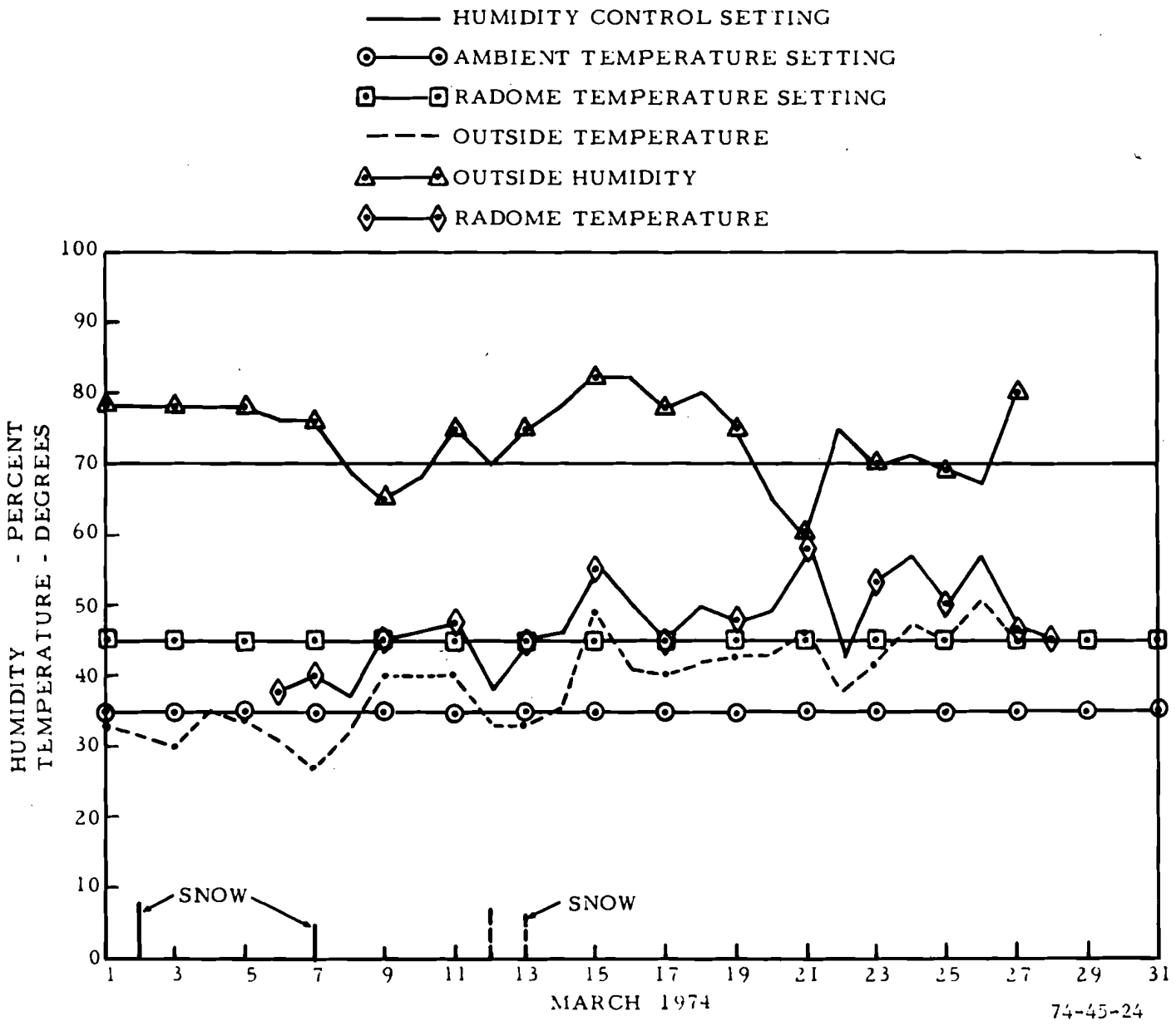

FIGURE 23. AVERAGE WEATHER CONDITIONS FOR MARCH

During the evening of February 21, 1974, a snowfall of about 1 inch occurred at approximately 2100 hours Pacific Daylight Savings Time (PDST). At 2124 hours, azimuth and average power alarms indicating a decrease in TACAN power occurred on both monitors, which resulted in the shutdown of the beacon. The Flight Service Station (FSS) which has the capability of remotely redialing the system ON, did so, and the beacon became operational again. The FSS operator noted in his logs that he had to continually transfer from the No. 1 to the No. 2 system to keep the station on the air. The site technician arrived at the facility at 2130 hours and noted the following conditions: "The weather sensor setting for outside air temperature was 35° F, humidity 70 percent, and the radome temperature setting was 40° F. It was noted that there was less than 1/2 inch of snow on the ground at the site. Both No. 1 and 2 monitors were indicating azimuth and average power alarms. The heaters were ON and had been cycling to approximately 10 amps off and on. The outside air temperature was 29° F, wind zero to 5 miles per hour (mi/h). It was noted that a narrow strip of snow approximately 10 to 12 inches wide had developed on the radome." Due to a malfunction of the strobe lights, the pictures were too dark to view the snow on the radome.

On February 22, 1974, another light snowfall occurred. Figure 24 is the recording of the 15-Hz and the 135-Hz azimuth signals prior to, during, and after the snowfall with photos showing snow buildup. The recordings were utilized to try and determine when icing conditions were developing on the TACAN radome. From the recordings (figure 24), it can be seen that the 135-Hz signal goes into alarm first, with 15-Hz signal being intermittent during outage time, and then the signals returned to normal approximately 9 minutes later. The photos show a thin line of snow extending from the base of the VOR cone to the lip of the TACAN radome, and from previous tests and film taken during this evaluation period, it was assumed that ice and snow on the VOR cone did generally extend to the TACAN antenna also. The failure of the strobe lights at this time precluded any clearer pictures. The following observations were noted by the site technician: "At 1035 hours, some ice and snow were noted on the faceplate of the top monitor antenna. The TACAN radome appears to have a light coat of snow or ice on it, from 270° to 90°. Heaters were ON, and showing 3/4 amps of current. A snowfall started at 1202 hours PDST. Heaters were OFF at this time. At approximately 1348 hours PDST, with snow still falling and an accumulation of about 1 inch of snow on the ground, the voltage at test point 3760 (average power monitor) dropped to 90 volts, the 135-Hz azimuth signal on both monitors alarmed, and the TACAN transferred. The Flight Service Station redialed, and the No. 2 monitor returned to normal first. The outside temperature was noted to be 32° F. The heavy snowfall lasted only about 5 minutes."

The test point being monitored (TP-3760) is the output of the TACAN monitor antenna where it is amplified and fed to the alarm circuitry which activates the control and transfer function during alarm conditions. The normal signal level at test point 3760 is approximately 120 volts peak, so that a drop of 30 volts, which occurred during the second snowfall, will precipitate an alarm condition, either an average power alarm or ident alarm.

The top TACAN monitor, which the site technician noted to be covered with snow, is a heated faceplate type heater, and the one directly below it is a block type heater. The top antenna goes to monitor No. 2, and the bottom to monitor No. 1. It appeared, from the information received and the data collected, that the second shutdown was caused by the snow on the TACAN monitor faceplate, which attenuated the signal to the average power monitor, thereby resulting in the shutdown.

After the second shutdown, it was decided to raise the radome temperature control setting to 45° from 40°. On February 25, 1974, the control settings were then set for an outside air temperature of 35° F, relative humidity of 70 percent, and a radome surface temperature of 45° F. After these readjustments of the temperature controls on February 25, 1974, there were several light snowfall occurrences--one on March 2, 1974, with approximately 1 inch of accumulation; one on March 7, 1974, in which snow was noted to accumulate on the radome, but was dissipated by the heat with no alarms being caused. During an early morning snowfall on March 12, 1974, alarms occurred on azimuth and average power parameters on the No. 1 monitor, and an azimuth alarm on the No. 2 monitor.

RADOME HEATER OPERATION.

The Simpson model 604 multicorder was utilized to determine whether or not the radome heaters were furnishing heat when required, as determined by the control settings. The recordings and meter readings indicated that the outside air temperature control of 35° F would turn the heaters ON at 35° F, but that heater turn-OFF varied from 38° F to 44° F. It was noted on several occasions that the heaters remained ON until the ouside temperature reached over 40° F. It was also noted that the heaters were drawing in excess of 11 amps of current with the radome thermistors set at 45°. Appendix B shows a comparison of radome heat, humidity, and temperature with actual settings and accuracy of ON/OFF times of the heaters.

RADOME PAINT.

Approximately 3 weeks after the installation of the modified RTA-2 TACAN antenna, some bubbles were noted on the radome. Investigation revealed that they were air bubbles, probably due to the nature of paint which was of a synthetic type. The size of the bubbles varied with radome surface temperature. A slight pressure on the bubbles would move them and also flatten them. Figure 11 shows the location of the bubbles. Also noted were dark areas on the radome. The reasons for this discoloration could not be determined.

RADOME POWER SAVINGS.

To determine if any savings were realized in the use of power with the wire-wound radome and the normal heater utilized in the RTC-2 antenna, a comparison was made of prior power consumption. Table 2 is a comparison of the power consumption before and after installation of the new antenna and for the periods listed.

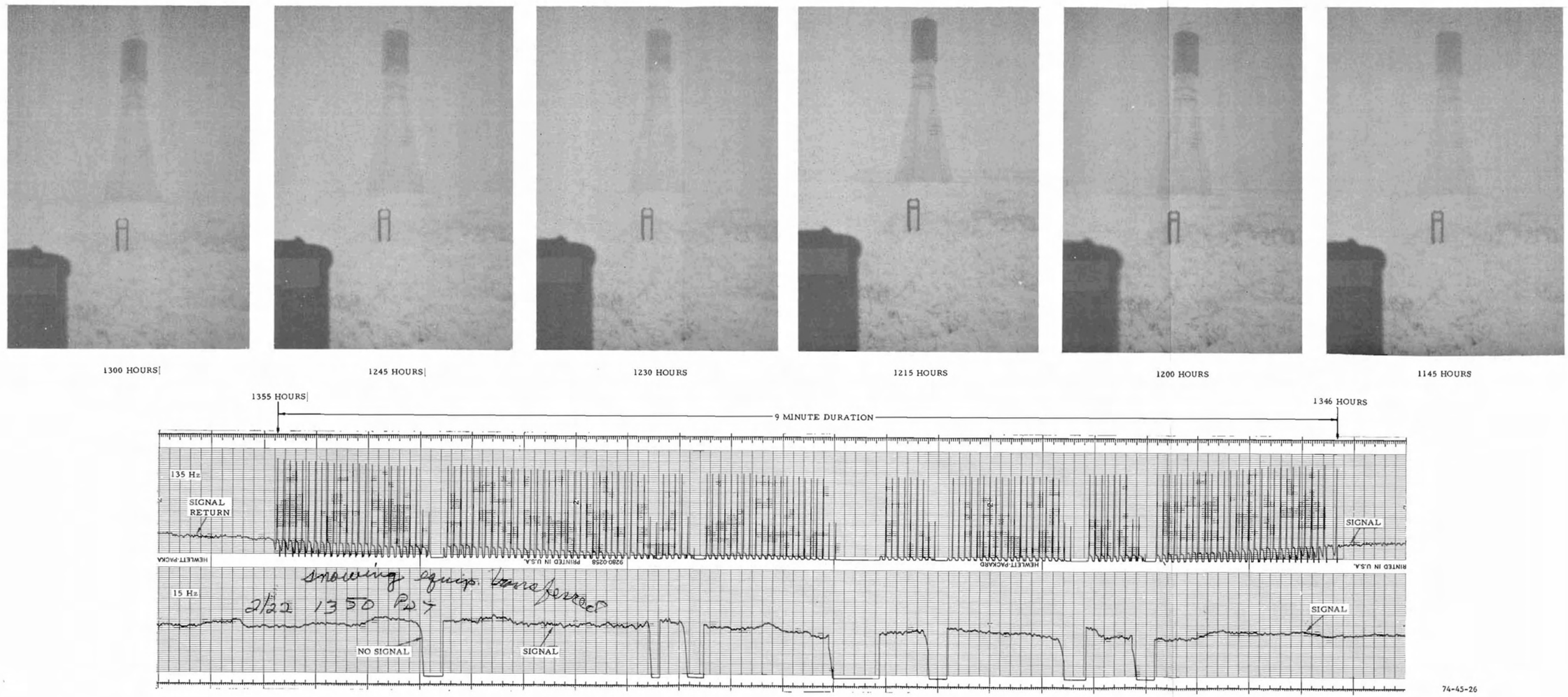

FIGURE 24. THE 15-Hz AND 135-Hz AZIMUTH SIGNAL RECORDINGS AND PHOTOS OF SNOW BUILDUP ON TACAN RADOME FOR THE FEBRUARY 22 OUTAGE

TABLE 2. RADOME POWER CONSUMPTION

Date	Power Consumption Kilowatt Hours	Antenna
December 1971	19,760	RTA-2
December 1972	18,160	RTA-2
December 1973	18,400	Modified RTA-2
January 1972	17,760	RTA-2
January 1973	17,400	RTA-2
January 1974	15,360	Modified RTA-2
February 1972	17,400	RTA-2
February 1973	16,640	RTA-2
February 1974	15,880	Modified RTA-2
March 1972	19,360	RTA-2
March 1973	17,220	RTA-2
March 1974	16,880	Modified RTA-2

For periods noted, a savings of 3,140 kilowatt hours resulted. Although the power savings, indicated from the comparison of the heater system used previously and during the test, does show a reduction in power consumption, this could not be considered as positive due to the type of weather and temperatures common to this area. A more conclusive test over a period of a year in a more realistic environment for this type of a system would be more indicative of any power savings.

FIELD TEST ANALYSIS

CALIBRATING HEATER CONTROLS.

The charts shown in appendix A represent a comparison between outside weather conditions as recorded by the weather station and radome surface temperature. The charts show the control settings versus actual weather conditions and the exact times the heaters were turned ON or OFF. The purpose of this was to determine the accuracy of the controls and the effectiveness of the heaters in preventing snow and/or ice buildup.

The charts for the month of January show very little or no heater turn-ON for the reason that the controls were being varied to determine the most advantageous settings for the particular weather condition for that area. It should be noted that in most instances the outside air temperature and the radome surface temperature were nearly the same for this period.

During the month of January 1974, almost all precipitation was in the form of rain as shown in the graph (figure 21). The graph represents the average of outside air temperatures and humidity taken from the daily recordings of the same parameters. From approximately January 20 through January 23, 1974, weather conditions, as noted by the graph, indicate that the heaters should have been ON, but were not. The cause of this was determined to be slop or backlash of gears controlling the Variacs . These gears were later replaced and adjusted to remedy this condition. A series of adjustments were made to determine the proper control settings, since the construction of the control unit was of a breadboard nature. The controls were then determined to be properly set for the following conditions:

CONTROL SETTINGS

Radome Surface Temperature	-	40° F
Outside Air Temperature Sensor	-	35° F
Relative Humidity Sensor	-	70 percent
Outside Air Temperature Thermostat	-	45° F

As can be seen from the charts in appendix B for the rest of January, proper weather conditions did not occur often enough to determine the accuracy of the settings.

From the graph for the month of February (figure 25), it can be seen that on some occasions, the heaters were ON when prevailing conditions dictated an OFF condition.

The data in appendix B shows that for the test period, the humidity was a controlling factor only during the following times and dates.

0700-0800	March 9, 1974	page B-18
0100-0300	March 22, 1974	page B-22

ELIMINATING TACAN OUTAGES.

After the outage on February 22, 1974, the radome surface temperature control was readjusted to maintain 45° of heat, when called for. From data in appendix B for the night of February 21, it can be seen that the heater had been ON since early morning and that the first alarm occurred a few minutes after midnight, as recorded by the Flight Service Station in Portland, Oregon, and corrected itself. It was assumed that the heated radome was doing its prescribed job. It then alarmed again at 0358 hours, and by continually switching back and forth between the No. 1 and No. 2 transmitter, the station was kept on the air. From recordings taken, it was seen that the 135-Hz azimuth signal drifted off, and then redialing made it operational again. This was confirmed by the fact that the level at TP-3760, which is normally 120 volts controlling the average power alarm circuits, had deteriorated to approximately 90 volts, and the coating of snow had shifted the 135-Hz azimuth signal sufficiently, ±1.5°, to precipitate an azimuth error alarm, as noted by the recordings, shortly thereafter restoring itself.

From the data collected and information furnished by site personnel, it was determined that the outage on the morning of February 22 was not caused by ice and snow on the radome, but was primarily caused by ice and snow on the faceplate of the TACAN monitor, which is a heated faceplate type in the top position. This was substantiated by the fact that during a subsequent outage on March 12, 1974, it was noted that azimuth and average power alarms had occurred in the No. 1 monitor, which was not a heated faceplate type, and only an azimuth alarm occurred in monitor No. 2, which is the heated faceplate.

During the evening of February 22, 1974, the station went into alarm at approximately 1346 hours PDST and remained off the air until 1355 hours PDST for a total of 9 minutes. As can be seen from the recordings and photos (figure 24), the 135-Hz azimuth signal alarmed first, and then, shortly thereafter, the 15-Hz azimuth signal. The 15-Hz azimuth signal became operational first. From the photo (figure 24), starting at approximately 1145 hours PDST, it can be seen that there was a thin line of snow, extending from the bottom of the VOR cone up to the TACAN radome, with some moderate buildup on the tip of the TACAN radome, which was the primary cause of the outage.

The series of photos from 1145 to 1300 hours show the conditions that existed prior to and after the snowfall. The station showed both azimuth and average power alarms, with site personnel noting that some snow was evident on the top TACAN monitor faceplate. After this outage, it was determined that the 40° radome surface temperature setting was not enough to provide sufficient heat to the TACAN radome to prevent snow and/or ice accumulation, and, accordingly, the temperature was then readjusted for a radome surface temperature setting of 45°.

It was concluded that the TACAN monitor antenna for the No. 1 system was covered with snow and/or ice and that the TACAN antenna was also partly covered with a coating of snow and/or ice which could cause an azimuth alarm, but not an average power alarm.

From the temperature recordings in appendix B for February 22, 1974, it can be seen that the radome surface temperature as recorded was averaging about 37° F, which was not quite warm enough to prevent snow and/or ice accumulation. It was then decided to raise the radome surface temperature thermistors to 45° F with all other controls set as previously stated. No further outages occurred for the month of February.

During the month of March 1974, several light-to-moderate snowfalls of short duration occurred. A snowfall of approximately 1 inch or more occurred during the morning of March 2. The data in appendix B for the second snowfall clearly shows the heaters ON and functioning and no alarms, and it was assumed at this time that raising the radome heater temperature to 45° F was clearing any snow accumulation from the TACAN radome.

A subsequent snowfall that was moderate-to-heavy on March 7, 1974, was noted at 1630 hours, with buildup starting on the radome. This snowfall lasted approximately 5 minutes, and by 1648 hours, all snow had been dissipated with no adverse effects to the ground beacon's operational capabilities. It was also noted at this time that with the outside air temperature control set for 35° F, the heaters did turn ON at approximately 35° F, but turned OFF at 44° F. Prior to the conclusion of the test, the turn-OFF variation was greater than 10° F, as can be seen from the charts in appendix B. It was determined that the outside air temperature thermostat located in the weather-sensing unit was malfunctioning and was not shutting OFF when the outside air temperature went above 45° F. The recordings for the 15-Hz and 135-Hz azimuth signals for this date and time, show a slight shift in 135-Hz azimuth recording, but not enough to cause an alarm. It was assumed that the heaters were operating and accomplishing their purpose.

During the morning of March 12, 1974, another snowfall of short duration occurred with approximately 1 inch of snow on the ground. Upon arrival of FSS personnel at the facility, it was noted that the monitors indicated the following alarms: Azimuth and average power on the No. 1 beacon, and azimuth alarm on the No. 2 beacon. The recordings show that during the late hours of March 11, 1974, some alarms did occur and were self-correcting, but these were determined not to be due to weather. The cause for these outages could not be determined.

For the night of March 12, 1974, and the early morning hours of March 13, the log from the Flight Service Station indicates a few self-correcting alarms with an eventual transfer of equipment. This was substantiated by the following recordings: At approximately 2140 hours, alarms occurred and lasted until approximately 2146 hours. This was listed as a self-correcting fault. Figure 25 is a recording of this outage. It shows the 135-Hz azimuth signal alarming, but not the 15-Hz azimuth signal. Figure 26 is a recording of another short alarm that occured at 2205 hours with no apparent effect on the operation of the system.

Figure 26 shows further alarms of 135-Hz azimuth signals, from 2229 hours until 2235 hours, with the 135-Hz azimuth signal again being the primary cause of the alarms. There were no further alarms recorded for this date.

During the early morning hours of March 13, 1974, starting at 0130 hours, further alarms occurred to the 135-Hz azimuth signal (figure 27), and again cleared themselves at 0140 hours. Further alarms occurred at 0612 hours, with the system transferring and restoring itself at approximately 0627 hours. Site personnel noted upon arrival at the facility at 0815 hours, March 13, 1974, that the system had transferred due to azimuth and average power alarms on No. 1 beacon and azimuth alarms on the No. 2 beacon.

It should be noted at this point that the primary reason for the 135-Hz azimuth signal alarming first is that the parasitic elements are nearest the TACAN radome, and first become affected due to snow and or ice accumulation on the radome. It should also be noted that site personnel again made note of the fact that one system showed different alarms than the other. The primary reason for this appears to be the TACAN monitor antennas, which are connected to different monitors. It appears that one monitor antenna heater is more effective in eliminating snow and ice accumulation than the other. Furthermore, the alarms as indicated, i.e., azimuth and average power alarms on No. 1 beacon, tend to confirm that the monitor antenna itself may have been the primary cause of one or more outages. If the beacon had its power output reduced, both monitors should have shown average power alarms.

Due to the mildness of the winter and the short duration of the snowfalls that did occur, adjustment to the sensing controls could not be made to properly determine the true effectiveness of this system.

CONCLUSIONS

It is concluded that:

1. The winter at Newberg, Oregon, was not severe enough to properly determine the true effectiveness of the weather sensing system.

2. The tolerances of the adjustments were not stringent enough to properly control the ON/OFF times for heat distribution to the TACAN radome; consequently, the wire-wound radome did not in all instances provide heat when called upon.

3. The paint used for the TACAN radome was determined to be inadequate to properly withstand severe weather conditions.

4. As a side benefit, a considerable improvement in azimuth information was realized utilizing a modified RTA-2 TACAN antenna in comparison to the normal RTA-2 antenna.

5. A slight reduction in the use of power was realized.

RECOMMENDATIONS

It is recommended that:

1. Improved nonconducting paint be used on radomes to withstand variation in temperatures and weather conditions.

2. The test locations for radome heating experimentation be situated where more severe weather conditions exist to properly determine the effectiveness of the system.

3. The tolerances in radome-heating thermostat operation be made more stringent to properly control ON and OFF times of the heater.

4. Further investigations should be started to determine to what extent the TACAN monitor antennas contribute to weather-caused outages due to snow and/or ice accumulations.

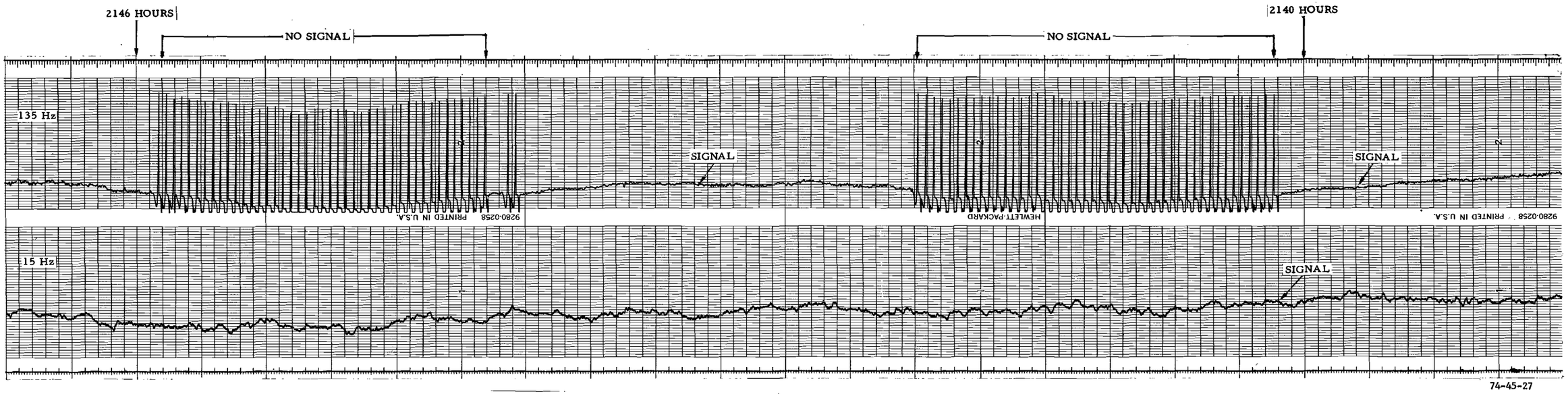

FIGURE 25. THE 15-Hz and 135-Hz AZIMUTH SIGNAL RECORDINGS SHOWING ALARMS FOR MARCH 12 FROM 2140 TO 2146 HOURS

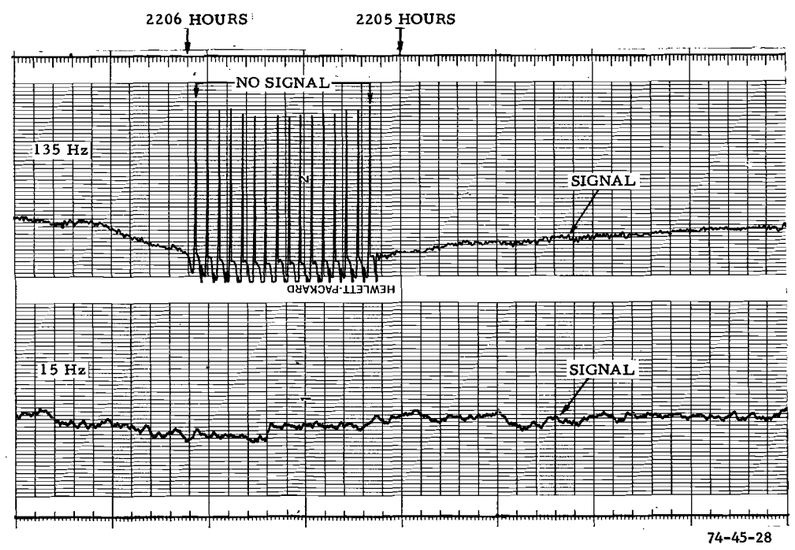

FIGURE 26. THE 15-Hz AND 135-Hz AZIMUTH SIGNAL RECORDINGS SHOWING AN ALARM ON MARCH 12 AT 2205 HOURS

APPENDIX A

FLIGHT INSPECTION REPORT

FLIGHT INSPECTION REPORT — VOR, VORTAC, TACAN, VOT

Reports Identification Symbol
FS 8071-16

1. STATION	2. LOCATION IDENT.	3. DATE/DATES OF INSPECTION
NEWBERG, OREGON	UBG	DECEMBER 6,7, 1973

4. TYPE OF INSPECTION						5. COMMON SYSTEM	
	SITE EVALUATION		PERIODIC	X	SPECIAL TAC ANT CHANGE		YES
	COMMISSIONING		SURVEILLANCE		INCOMPLETE		NO

6. OWNER					
	X	FAA		U S ARMY	PRIVATE (Indicate actual owner)
				U S NAVY	
		INTER-NATIONAL		U S A F	OTHER (Indicate actual owner)
				U S C G	

7. FACILITY/COMPONENT INSPECTED		VOR	X	VORTAC		TACAN		VOT		DME

		YN1-104	RTA-2	YN1-104	RTA-2	YN1-104	RTA-2	YN1-104	RTA-2	YN1-104	RTA-2
FACILITY SERVICE DESIGNATION		TAC	TAC	TAC	TAC	TAC	TAC	TAC	TAC		
RADIAL USE											
AZIMUTH		334	334	194	194	346	346	105	105		
TRANSMITTER(S)		1	2	1/2	1	1/2	1	1/2	1		
MSL ALTITUDE (In hundreds)		40	40	20/5.4	30/5.4	30/6	30/6	23/10.8	30/11		
DISTANCE (Nautical miles)	FROM	5	15	0	0	0	0	0	0		
	TO	41	0	11	11	12	11.1	11	11		
SENSITIVITY		-	-	-	-	-	-	-	-		
ROUGHNESS		0.5	1.4/14	0.5	0.7	0.5	1.7/10	0.5	1.1/9		
SCALLOPING		0	0	0	0	0	0	0	0		
BENDS		0	0	0	0	0	0	0	0		
POLORIZATION		0	0/22	-	-	0.2/12	-	-	-		
ALIGNMENT ERROR		-	+.09	-0.7	+0.5	-0.8	-0.9	+0.3	-0.7		
TRANSMITTER DIFFERENCE		-	-	0.5	-	0.4	-	1.0	-		
SIGNAL STRENGTH		LOCK	LOCK	LOCK	LOCK	LOCK	LOCK	LOCK	LOCK		
INTERFERENCE		0	0	0	0	0	0	0	0		

9. GENERAL	SAT.	UNSAT.
STANDBY POWER		
VOICE		
IDENTIFICATION		
DME ACCURACY		
DME COVERAGE		

10. MONITORS					
LAST DATE INSPECTED		TX	ALIGNMENT	ALARM +	ALARM -
VOR	REFERENCE RADIAL				
	CHECK POINT				
TACAN	REFERENCE RADIAL				
	CHECK POINT				

11. DISCREPANCIES AND/OR REMARKS

RTA-2 Antenna data collected 4/19/72 (334)
RTA-2 Antenna data collected 11/2//72 (346) (194) (105)

CORRECTED	
YES	NO

FACILITY CLASSIFICATION		FLIGHT INSPECTOR'S SIGNATURE	REGION
X	UNRESTRICTED		
	RESTRICTED		FIELD OFFICE
	UNUSEABLE		

FAA FORM 3485 (2-64) REPLACES FAA FORM 3195 WHICH IS OBSOLETE (8071-6040)

APPENDIX B

WIRE-WOUND RADOME HEATER OPERATION DURING VARIOUS OUTSIDE WEATHER CONDITIONS

TIME	January 17, 1974							January 18, 1974							January 19, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	ND	40	36	35	105	70	OFF	47	40	40	35	103	70	OFF	40	40	35	35	78	70	OFF*
0100-0200	↑	↑	38	↑	↑	↑	↑	45	↑	42	↑	100	↑	↑	40	↑	↑	↑	↑	↑	↑*
0200-0300			36					↑		42		100			39		↓				*
0300-0400			37							40		103			40		35				*
0400-0500			35				*			40		105			40		33				*
0500-0600			35				*			↑		↑			↑		34				*
0600-0700			35				*	↓									34				*
0700-0800			34				*	45									38		↓		
0800-0900			34				*	44		↓					↓		40		78		
0900-1000			35				*	44		40					40		40		74		
1000-1100			36					46		41		↓			43		41		74		
1100-1200			40					48		44		105			51		41		73		
1200-1300	↓		42					51		ND		ND			48		41		72		
1300-1400	ND		43					52		47		78			48		39		71		
1400-1500	46		45					51		45		↑			48		35		72		*
1500-1600	47		46					51		43					46		33		72		*
1600-1700	50		43					50		40					45		32		74		*
1700-1800	45		41					50		38					42		32		77		*
1800-1900	45		39					49		36					40		32		77		*
1900-2000	44		39					47		36					38		33		↑		*
2000-2100	46		41					44		35				*	39		31				*
2100-2200	45		40					43		33				*	38		31				*
2200-2300	45	↓	41	↓	↓	↓	↓	42	↓	33	↓	↓	↓	↓*	39	↓	30	↓	↓	↓	↓*
2300-2400	44	40	41	35	105	70	OFF	42	40	33	35	78	70	OFF*	37	40	27	35	77	70	OFF*

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	January 20, 1974							January 21, 1974							January 22, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	37	40	30	35	78	70	OFF	34	40	31	35	74	70	OFF	35	40	33	35	78	70	OFF*
0100-0200	36	▲	▲	▲	▲	▲	▲*	ND	▲	▲	▲	74	▲	▲*	35	▲	34	▲	▲	▲	▲*
0200-0300	36						*	ND				76		*	36		35				*
0300-0400	36						*	ND				76		*	36		35				*
0400-0500	37						*	33				75		*	36		35				*
0500-0600	37						*	32				75		*	37		35				*
0600-0700	35		▼				*	32				77		*	37		36				
0700-0800	36		30				*	32				78		*	37		36				
0800-0900	36		32				*	32				▲		*	37		38				
0900-1000	36		33				*	32						*	▲		▲				
1000-1100	38		34				*	30						*							
1100-1200	37		36					31				▼		*							
1200-1300	39		38					32				78		*							
1300-1400	41		33				*	32				79		*							
1400-1500	42		31				*	32				79		*							
1500-1600	50		▲		▼		*	32		▼		79		*							
1600-1700	38				78		*	33		31		78		*							
1700-1800	39				76		*	33		32		▲		*					▼		
1800-1900	34				▲		*	33		▲				*					78		
1900-2000	34						*	33		▼				*							
2000-2100	34						*	34		32				*							
2100-2200	34						*	34		33				*							
2200-2300	34	▼	▼	▼	▼	▼	▼*	35	▼	33	▼	▼	▼	▼*	▼	▼	▼	▼		▼	▼
2300-2400	34	40	31	35	76	70	OFF*	35	40	33	35	78	70	OFF*	37	40	38	35		70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	January 23, 1974							January 24, 1974							January 25, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100		40	40	35		70	OFF	41	40	40	35	79	70	OFF	43	40	39	35	77	70	OFF
0100-0200		↑	↑	↑		↑	↑	42	↑	40	↑	↑	↑	↑	40	↑	36	↑	↑	↑	↑
0200-0300								43		39					40		36				
0300-0400								43		39					40		35				*
0400-0500								42		39					39		↑				*
0500-0600								42		38					↑						*
0600-0700								42		38											*
0700-0800								41		38					↓						*
0800-0900								40		38					39		↓				*
0900-1000								41		40		↓			40		35		↓		*
1000-1100								41		41		79			42		34		77		*
1100-1200			↓					41		↑		ND			43		35		78		*
1200-1300			40					42				ND			43		36		↑		
1300-1400	43		43		78			43				ND			44		36				
1400-1500	44		43		↑			43				77			43		37				
1500-1600	44		43					43				↑			42		37				
1600-1700	45		42					44							41		36				
1700-1800	45		↑					43							40		35				*
1800-1900	44							43							↑		34				*
1900-2000	↑		↓					43		↓					↓		34				*
2000-2100			42					43		41					40		33				*
2100-2200			40					44		42					39		33				*
2200-2300	↓	↓	40	↓	↓	↓	↓	44	↓	43	↓	↓	↓	↓	38	↓	33	↓	↓	↓	↓*
2300-2400	44	40	40	35	78	70	OFF	44	40	43	35	77	70	OFF	36	40	32	35	78	70	OFF*

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	January 26, 1974							January 27, 1974							January 28, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	36	40	30	35	78	70	OFF*	38	40	33	35	78	70	OFF*	40	40	38	35	78	70	OFF
0100-0200	35	▲	29	▲	▲	▲	▲*	▲	▲	▲	▲	▲	▲	▲*	▲	▲	▲	▲	▲	▲	▲
0200-0300	36		▲				*							*							
0300-0400	38						*							*	▼						
0400-0500	37		▼				*							*	40						
0500-0600	37		29				*							*	39						
0600-0700	37		30				*	▼						*	▲						
0700-0800	38		30				*	38						*	▼						
0800-0900	38		30				*	39		▼				*	39						
0900-1000	42		31				*	39		33				*	40						
1000-1100	46		32				*	39		34				*	40						
1100-1200	47		34				*	41		35				*	41						
1200-1300	47		36					45		35				*	41						
1300-1400	43		38					47		38					42						
1400-1500	42		36					49		39		▼			▲						
1500-1600	42		35				*	43		39		78									
1600-1700	40		36					41		38		77									
1700-1800	38		34				*	▲		37		77									
1800-1900	38		33				*	▼		36		77			▼						
1900-2000	38		32				*	41		36		78			42						
2000-2100	37		▲				*	42		36		▲			41						
2100-2200	37						*	41		37					▲						
2200-2300	38	▼	▼	▼	▼	▼	▼*	41	▼	37	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
2300-2400	38	40	32	35	78	70	OFF*	40	40	36	35	78	70	OFF	41	40	38	35	78	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	January 29, 1974							January 30, 1974							January 31, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	41	40	39	35	80	70	OFF	41	40	40	35	78	70	OFF	43	40	37	35	78	70	OFF
0100-0200	40	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	42	↑	↑	↑	78	↑	↑
0200-0300	40														42				79		
0300-0400	40														42		↓		79		
0400-0500	39														41		37		79		
0500-0600	↑														41		ND		ND		
0600-0700															42		↑		↑		
0700-0800															42						
0800-0900	↓														43						
0900-1000	39							↓							43		↓		↓		
1000-1100	40		↓					41							43		ND		ND		
1100-1200	40		39					42							44		40		75		
1200-1300	41		40					43							44		40		75		
1300-1400	41		↑					↑							48		41		78		
1400-1500	42							↓							45		40		78		
1500-1600	42							43		↓					46		40		78		
1600-1700	ND							44		40					47		40		77		
1700-1800	42							↑		38					46		41		74		
1800-1900	↑									↑					44		40		72		
1900-2000	↓							↓							42		39		75		
2000-2100	42							44							40		35		79		*
2100-2200	41							43							41		33		78		*
2200-2300	41	↓	↓	↓	↓	↓	↓	43	↓	↓	↓	↓	↓	↓	40	↓	34	↓	78	↓	↓*
2300-2400	41	40	40	35	80	70	OFF	43	40	38	35	78	70	OFF	41	40	35	35	77	70	OFF*

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 1, 1974							February 2, 1974							February 3, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	40	40	40	35	78	70	OFF	37	40	33	35	75	70	OFF*	40	40	33	35	78	70	OFF*
0100-0200	▲	▲	▲	▲	▲	▲	▲	35	▲	38	▲	▲	▲	▲	▲	▲	33	▲	▲	▲	▲*
0200-0300								▲		▲							38				
0300-0400															▼		▲				
0400-0500															40		▼				
0500-0600															35		38				
0600-0700															▲		33				*
0700-0800																	38				
0800-0900												▼			▼		38				
0900-1000												75			35		38				
1000-1100			▼					▼				79			40		33				*
1100-1200	▼		40		▼			35				▲			▲		33				*
1200-1300	40		38		78			40									36				
1300-1400	45		40		75			▲									37				
1400-1500	50		42		75												▲				
1500-1600	53		42		75																
1600-1700	55		42		72																
1700-1800	50		37		▲																
1800-1900	40		38		▼					▼											
1900-2000	▲		▲		72					38											
2000-2100					75					35				*							
2100-2200					▲					▲				*							
2200-2300	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼*	▼	▼	▼	▼	▼	▼	▼
2300-2400	40	40	38	35	75	70	OFF	40	40	35	35	79	70	OFF*	40	40	37	35	78	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 4, 1974							February 5, 1974							February 6, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	40	40	38	35	78	70	OFF	40	40	33	35	75	70	OFF*	40	40	33	35	70	70	OFF*
0100-0200	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑*	40	↑	32	↑	71	↑	↑*
0200-0300														*	37		31		↑		*
0300-0400														*	35		31		↓		*
0400-0500														*	↑		29		71		*
0500-0600			↓											*			30		75		*
0600-0700			38											*	↓		29		75		*
0700-0800			34											*	35		28		75		*
0800-0900			38					↓		↓				*	40		31		77		*
0900-1000			↑					40		33				*	40		32		↑		*
1000-1100	↓							45		35		↓		*	40		35		↓		*
1100-1200	40				↓			50		40		75			48		35		77		*
1200-1300	49				78			50		42		70			50		40		72		
1300-1400	45		↓		75			56		42		↑			55		38		↑		
1400-1500	49		38		↑			59		43					52		38				
1500-1600	↑		41					60		43					45		32		↓		*
1600-1700	↓		33				*	60		43					45		34		72		*
1700-1800	49		↑				*	52		38					40		33		71		*
1800-1900	41						*	45		38					↑		↑		71		*
1900-2000	↑						*	40		35				*					72		*
2000-2100							*	↑		33				*					72		*
2100-2200							*			↑				*			↓		75		*
2200-2300	↓	↓	↓	↓	↓	↓	↓*	↓	↓	↓	↓	↓	↓	↓*	↓	↓	33	↓	75	↓	↓*
2300-2400	41	40	33	35	75	70	OFF*	40	40	33	35	70	70	OFF*	40	40	39	35	75	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 7, 1974							February 8, 1974							February 9, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	40	40	31	35	75	70	OFF*	38	40	33	35	75	70	OFF*	ND	40	38	35	72	70	OFF
0100-0200	35	▲	▲	▲	▲	▲	▲*	35	▲	33	▲	▲	▲	▲*	▲	▲	▲	▲	▲	▲	▲
0200-0300	▲						*	▲		33		▼		*			↓				
0300-0400							*			31		75		*			▼		▼		
0400-0500			▼				*			▲		77		*			38		72		
0500-0600			31		▼		*					▲		*			37		78		
0600-0700			28		75		*							*			33		▲		*
0700-0800	▼		28		77		*	▼		↓				*			33				*
0800-0900	35		28		▲		*	35		▼				*			33		▼		*
0900-1000	37		31		▼		*	48		31		▼		*			35		78		*
1000-1100	46		33		77		*	48		33		77		*			38		72		
1100-1200	47		33		73		*	47		38		75					45		▲		
1200-1300	48		38		▲			52		38		75					49				
1300-1400	48		38		▼			ND		43		72					45				
1400-1500	52		43		73			▲		43		▲					50				
1500-1600	56		42		72					45							42				
1600-1700	57		42		▲					45							▲				
1700-1800	56		40							45											
1800-1900	56		38							43											
1900-2000	46		35				*			43							▼				
2000-2100	40		35		▼		*			43							42				
2100-2200	▲		35		72		*			43							38				
2200-2300	▼	▼	33	▼	75	▼	▼*	▼	▼	42	▼	▼	▼	▼	▼	▼	38	▼	▼	▼	▼
2300-2400	40	40	33	35	75	70	OFF*	ND	40	42	35	72	70	OFF	ND	40	38	35	72	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 10, 1974							February 11, 1974							February 12, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	ND	40	35	35	78	70	OFF*	ND	40	28	35	72	70	OFF*	40	40	35	35	78	70	OFF*
0100-0200	▲	▲	▲	▲	▲	▲	▲*	▲	▲	▲	▲	▲	▲	▲*	▲	▲	▲	▲	▲	▲	▲*
0200-0300					▼		*							*							*
0300-0400					78		*							*							*
0400-0500			▼		75		*							*							*
0500-0600			35		▲		*							*							*
0600-0700			31				*							*							*
0700-0800			31		▼		*							*							*
0800-0900			26		75		*					▼		*							*
0900-1000			26		78		*					72		*							*
1000-1100			28		▲		*			▼		78		*	▼		▼				*
1100-1200			28				*			28		▲		*	40		35				*
1200-1300			33		▼		*			33				*	47		38				
1300-1400			38		78					▲				*	40		▲				
1400-1500			42		72			▼						*	40						
1500-1600			42		▲			ND						*	45						
1600-1700			38		▼			40		▼				*	45		▼				
1700-1800			33		72		*	▲		33				*	40		38				
1800-1900			28		78		*			35				*	35		33				*
1900-2000			▲		▲		*			▲				*	▲		▲				*
2000-2100							*							*			▼				*
2100-2200							*							*			33				*
2200-2300	▼	▼	▼	▼	▼	▼	▼*	▼	▼	▼	▼	▼	▼	▼*	▼	▼	31	▼	▼	▼	▼*
2300-2400	ND	40	28	35	78	70	OFF*	40	40	35	35	78	70	OFF*	35	40	31	35	78	70	OFF*

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 13, 1974							February 14, 1974							February 15, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	35	40	28	35	78	70	OFF*	38	40	38	35	78	70	OFF	43	40	40	35	78	70	OFF
0100-0200	↑	↑	↑	↑	↑	↑	↑*	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
0200-0300							*														
0300-0400							*														
0400-0500							*								↓						
0500-0600							*								43						
0600-0700							*								44						
0700-0800			↓				*								44						
0800-0900			28				*	↓							44		↓				
0900-1000			33				*	38							45		40				
1000-1100	↓		33				*	45							↑		42				
1100-1200	35		33		↓		*	49		↓		↓					42				
1200-1300	40		35		78		*	45		38		78					44		↓		
1300-1400	↑		↑		75		*	54		46		72					44		78		
1400-1500					75		*	52		↑		↑					42		79		
1500-1600					75		*	52									↑		↑		
1600-1700					80		*	51		↓							↓				
1700-1800					↑		*	45		46							42				
1800-1900							*	↑		38							44				
1900-2000			↓				*			38							↑		↓		
2000-2100			35				*	↓		43							↓		79		
2100-2200			36					45		↑					↓		44		80		
2200-2300	↓	↓	36	↓	↓	↓	↓	48	↓	↓	↓	↓	↓	↓	45	↓	42	↓	80	↓	↓
2300-2400	40	40	36	35	80	70	OFF	48	40	43	35	72	70	OFF	40	40	42	35	80	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 16, 1974							February 17, 1974							February 18, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	40	40	38	35	80	70	ON**	40	40	33	35	78	70	ON	38	40	38	35	82	70	OFF
0100-0200	↑	↑	↑	↑	↑	↑	↑**	↑	↑	↑	↑	↑	↑	↑	38	↑	↑	↑	↑	↑	↑
0200-0300							**	↓							40						
0300-0400							**	40							↑						
0400-0500	↓						**	38													
0500-0600	40						**	↑													
0600-0700	38					↓	**														
0700-0800	↑					80	**														
0800-0900						82	**														
0900-1000						↑	**	↓							↓		↓				
1000-1100	↓						**	38							40		38				
1100-1200	38						**	40							45		40				
1200-1300	40						**	40							45		↑				
1300-1400	40						**	38							48						
1400-1500	40						**	↑							45						
1500-1600	45						**			↓				↓	↑						
1600-1700	48						**			33				ON							
1700-1800	40						**			39				OFF							
1800-1900	↑		↓				**			↑				↑	↓						
1900-2000			38				**								45						
2000-2100			X												40						
2100-2200			X												↑						
2200-2300	↓	↓	X	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
2300-2400	40	40	X	35	82	70	ON	38	40	39	35	78	70	OFF	40	40	40	35	82	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 19, 1974							February 20, 1974							February 21, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	38	40	38	35	82	70	OFF	40	40	38	35	82	70	ON**	45	40	35	35	80	70	OFF*
0100-0200	38	▲	▲	▲	▲	▲	▲	38	▲	▲	▲	▲	▲	▲**	45	▲	35	▲	▲	▲	ON/OFF
0200-0300	38							▲						**	40		35				ON/OFF
0300-0400	40													**	40		33				ON/OFF
0400-0500	▲													**	38		▲				ON/OFF
0500-0600														**	▲		▼				ON
0600-0700								▼						**			33				▲
0700-0800								38						**			35				
0800-0900	▼							45						**	▼		▲				
0900-1000	40							45		▼				▼**	38		▼				
1000-1100	46							50		38				ON**	40		35				
1100-1200	47							▲		40				OFF	▲		33				
1200-1300	48							▼		▲				▲			35				
1300-1400	50							50							▼		35				
1400-1500	45							45							40		34				
1500-1600	45							▲		▼					35		34				
1600-1700	40									40					40		31				
1700-1800	▲									38					42		▲				
1800-1900										▲				▼	35						
1900-2000										▼				OFF	35						
2000-2100										38				ON**	35						
2100-2200										36				ON/OFF	34						
2200-2300	▼	▼	▼	▼	▼	▼	▼	▼	▼	36	▼	▼	▼	ON/OFF	36	▼	▼	▼	▼	▼	▼
2300-2400	40	40	38	35	82	70	OFF	45	40	36	35	82	70	ON/OFF	35	40	31	35	80	70	ON

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 22, 1974							February 23, 1974							February 24, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	37	40	28	35	80	70	ON	35	40	ND	35	ND	70	ND	40	40	ND	35	ND	70	ND
0100-0200	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
0200-0300																					
0300-0400																					
0400-0500	▼																				
0500-0600	37							▼													
0600-0700	35							35							▼						
0700-0800	37							33							40						
0800-0900	37							34							43						
0900-1000	38							38							50						
1000-1100	▲							45							48						
1100-1200	▼							55							45						
1200-1300	38							61							47						
1300-1400	35							63							48						
1400-1500	42							55							50						
1500-1600	45							55							48						
1600-1700	40							54							48						
1700-1800	40		▼		▼			50							46						
1800-1900	35		28		80			45							45						
1900-2000	▲		ND		ND			43							▲						
2000-2100			▲		ND			▲							▼						
2100-2200					ND			▼							45						
2200-2300	▼	▼	▼	▼	ND	▼	▼	43	▼	▼	▼	▼	▼	▼	44	▼	▼	▼	▼	▼	▼
2300-2400	35	40	ND	35	ND	70	ON	40	40	ND	35	ND	70	ND	42	40	ND	35	ND	70	ND

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 25, 1974							February 26, 1974							February 27, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	40	45	ND	35	ND	70	ON	40	45	38	35	80	70	OFF	35	45	33	35	80	70	ON
0100-0200	↑	↑	↑	↑	↑	↑	↑	↑	↑	38	↑	↑	↑	OFF	↑	↑	↑	↑	↑	↑	↑
0200-0300										38				ON**							
0300-0400								↓		34				↑							
0400-0500								40		↑				↓	↓						
0500-0600								38						ON	35						
0600-0700								↑						ON/OFF	40						
0700-0800								↓		↓				ON	↑						
0800-0900								38		34				ON/OFF			↓				
0900-1000								37		33				ON/OFF			33				
1000-1100	↓							38		↑				ON/OFF	↓		38				**
1100-1200	40							↑						ON/OFF	40		38				**
1200-1300	45						↓	↓						ON/OFF	45		38				**
1300-1400	46		↓		↓		ON	38						ON/OFF	48		40				**
1400-1500	53		ND		ND		OFF	37						ON	48		40				**
1500-1600	54		42		70		↑	36						↑	48		40				**
1600-1700	50		42		72			35							45		38				**
1700-1800	50		40		71			↑							40		↑				**
1800-1900	45		40		70										39						**
1900-2000	42		38		70										40						**
2000-2100	40		38		72										↑						**
2100-2200	↑		35		73		*														**
2200-2300	↓	↓	35	↓	75	↓	↓*	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓**
2300-2400	40	45	35	35	79	70	OFF*	35	45	33	35	80	70	ON	40	45	38	35	80	70	ON**

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	February 28, 1974							March 1, 1974							March 2, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	35	45	41	35	80	70	ON **	ND	45	34	35	80	70	ON	ND	45	33	35	82	70	ON
0100-0200	↑	↑	41	↑	↑	↑	↑ **	↑	↑	↑	↑	↑	↑	↑	↑	↑	33	↑	↑	↑	↑
0200-0300			41				**										33				
0300-0400			38				**										32				
0400-0500			38				**										32				
0500-0600			38				**					↓					31				
0600-0700			33									80					↑				
0700-0800			↑							↓		82									
0800-0900										34		↑					↓				
0900-1000	↓		↓							37				**			31				
1000-1100	35		33							37		↓		**			33				
1100-1200	40		36				**			37		82		**			↑				
1200-1300	45		36				**			34		81									
1300-1400	50		38				**			↑		↑					↓				
1400-1500	50		38				**										33		↓		
1500-1600	45		↑				**										38		82		**
1600-1700	45						**										38		80		**
1700-1800	40						**			↓							33		↑		
1800-1900	↑						**			34							33				
1900-2000			↓				**			27							31				
2000-2100			38				**			↑							31				
2100-2200			35														31				
2200-2300	↓	↓	35	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	28	↓	↓	↓	↓
2300-2400	40	45	32	35	80	70	ON	ND	45	27	35	81	70	ON	ND	45	28	35	80	70	ON

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 3, 1974							March 4, 1974							March 5, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	ND	45	28	35	80	70	ON	ND	45	34	35	81	70		ND	45	35	35	80	70	ON
0100-0200	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	ON	↑	↑	↑	↑	↑	↑	↑
0200-0300														↑							
0300-0400																					
0400-0500																					
0500-0600										↓											
0600-0700										34											
0700-0800										35											
0800-0900										35											
0900-1000			↓							35											
1000-1100			28							37				**							
1100-1200			30							37				**							
1200-1300			31							37				**							
1300-1400			33							38				**							
1400-1500			↑							↑				**			↓				
1500-1600														**			35				
1600-1700										↓				**			34				
1700-1800										38				**			34				
1800-1900										38				**			33				
1900-2000										35							33				
2000-2100										↑							32				
2100-2200																	32				
2200-2300	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	31	↓	↓	↓	↓
2300-2400	ND	45	33	35	80	70	ON	ND	45	35	35	81	70	ON	ND	45	31	35	80	70	ON

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 6, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	ND	45	28	35	80	70	ON
0100-0200	↑	↑	↑	↑	↑	↑	↑
0200-0300							
0300-0400							
0400-0500							
0500-0600							
0600-0700							
0700-0800							
0800-0900			↓				
0900-1000			28				
1000-1100			33				
1100-1200			32				
1200-1300			32				
1300-1400			33				
1400-1500	↓		30				
1500-1600	ND		33				
1600-1700	47		30				
1700-1800	47		33				
1800-1900	40		32				
1900-2000	36		31				
2000-2100	34		31				
2100-2200	33		28				
2200-2300	33	↓	28	↓	↓	↓	↓
2300-2400	33	45	28	35	80	70	ON

TIME	March 7, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	33	45	28	35	80	70	ON
0100-0200	↑	↑	↑	↑	↑	↑	↑
0200-0300	↓						
0300-0400	33						
0400-0500	34		↓				
0500-0600	35		28				
0600-0700	33		23				
0700-0800	33		23				
0800-0900	50		23		↓		
0900-1000	50		32		80		
1000-1100	51		35		79		
1100-1200	53		↑		↑		
1200-1300	54		↓				↓
1300-1400	52		35				ON
1400-1500	52		39		↓		OFF
1500-1600	53		41		79		OFF
1600-1700	42		37		72		ON**
1700-1800	40		33		72		↑
1800-1900	40		33		75		
1900-2000	35		28		74		
2000-2100	34		↑		↑		
2100-2200	↑						
2200-2300	↓	↓	↓	↓	↓	↓	↓
2300-2400	34	45	28	35	74	70	ON

TIME	March 8, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	34	45	28	35	75	70	ON
0100-0200	↑	↑	28	↑	↑	↑	↑
0200-0300	↓		28				
0300-0400	34		26		↓		
0400-0500	33		26		75		
0500-0600	32		25		78		
0600-0700	32		25		↑		
0700-0800	31		25				
0800-0900	31		25				
0900-1000	33		28				
1000-1100	35		28				↓
1100-1200	39		30		↓		ON
1200-1300	40		33		78		OFF*
1300-1400	45		38		72		↑
1400-1500	47		42		70		
1500-1600	48		↑		70		
1600-1700	48		↓		69		
1700-1800	43		42		69		
1800-1900	42		38		68		
1900-2000	↑		↑		↑		
2000-2100							
2100-2200							
2200-2300	↓	↓	↓	↓	↓	↓	↓
2300-2400	42	45	38	35	68	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 9, 1974							March 10, 1974							March 11, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	42	45	38	35	68	70	OFF	49	45	45	35	68	70	OFF	43	45	40	35	90	70	OFF
0100-0200	↑	↑	↑	↑	↑	↑	↑	49	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
0200-0300	↓							48													
0300-0400	42							47		↓		↓									
0400-0500	40							47		45		68					↓				
0500-0600	39		↓					47		40		72			↓		40				
0600-0700	40		38		↓			44		↑		75			43		39				
0700-0800	39		35		68			43		↓		78			42		↑				
0800-0900	38		↑		72		*	↑		40		80			43						
0900-1000	39		↓		↑		*	↓		39		↑			46						
1000-1100	40		35		↓		*	43		39					48						
1100-1200	43		40		72			44		39					56						
1200-1300	47		40		68			46		40					57						↓
1300-1400	49		45		↑			47		↑					59						off/ON
1400-1500	50		↑					48							58						ON
1500-1600	52							47							54		↓				↑
1600-1700	50							46							54		39				
1700-1800	51							47							50		41				
1800-1900	51							47							46		↑				
1900-2000	50							45							45						
2000-2100	↑							45							44						
2100-2200	↓							45							42						
2200-2300	50	↓	↓	↓	↓	↓	↓	44	↓	↓	↓	↓	↓	↓	39	↓	↓	↓	↓	↓	↓
2300-2400	49	45	45	35	68	70	OFF	44	45	40	35	90	70	OFF	38	45	41	35	90	70	ON

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 12, 1974							March 13, 1974							March 14, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	38	45	35	35	90	70	off**	35	45	30	35	90	70	ON	38	45	30	35	82	70	ON
0100-0200	37	↑	↑	↑	↑	↑	↑*	35	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
0200-0300	38		↓				*	34													
0300-0400	39		35				*	34													
0400-0500	39		32				*	35													
0500-0600	37		34				*	35							↓						
0600-0700	37		↑				*	ND							38						
0700-0800	38						*	↑							39						
0800-0900	37						*								39						
0900-1000	37		↓				*								39						
1000-1100	38		34				*			↓					40		↓				
1100-1200	39		35				*			30					42		30				
1200-1300	42		38		↓		↓	↓		37				**	45		33				
1300-1400	42		39		90		off	ND		37				↓**	45		33				
1400-1500	40		37		82		ON**	50		42				ON**	47		42				**
1500-1600	37		32		↑		↑	52		↑				off	48		↑				**
1600-1700	37		↑					49		↓				off	48		↓				**
1700-1800	38							46		42				off	49		42				**
1800-1900	39							44		33				ON	47		38				**
1900-2000	37				↓			43		↑				ON/off	↑		↑				**
2000-2100	35				82			42						ON			↓				**
2100-2200	35				90			41						↑	↓		38				**
2200-2300	34	↓	↓	↓	90	↓	↓	39	↓	↓	↓	↓	↓	↓	47	↓	32	↓	↓	↓	↓
2300-2400	35	45	32	35	90	70	ON	39	45	33	35	90	70	ON	49	45	32	35	82	70	ON

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 15, 1974							March 16, 1974							March 17, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	49	45	42	35	82	70	ON**	54	45	40	35	82	70	off	40	45	35	35	78	70	ON
0100-0200	48	↑	↑	↑	↑	↑	↑**	53	↑	40	↑	↑	↑	off	39	↑	↑	↑	↑	↑	↑
0200-0300	48		↓				**	↑		40				off	39						
0300-0400	48		↓				**	↓		46				ON**	39						
0400-0500	49		42				**	53		↑				↑**	38						
0500-0600	50		45				**	52						**	38						
0600-0700	50		↑				**	51						**	38						
0700-0800	50						**	↑						**	40		↓				
0800-0900	51						**	↓						**	41		35				
0900-1000	51		↓				**	51						**	52		40				**
1000-1100	52		45				↓**	52						**	45		40				**
1100-1200	55		50				ON**	52		↓				**	51		42				**
1200-1300	56		50				OFF	53		46				**	55		45				**
1300-1400	58		50				↑	52		50				**	55		45				**
1400-1500	63		55					52		48				**	55		45				**
1500-1600	66		↑					52		48				**	58		50				**
1600-1700	63							51		47				**	57		49				**
1700-1800	63							52		45				**	54		47				**
1800-1900	62							50		38				**	49		42				**
1900-2000	60		↓					45		↑				**	45		40				**
2000-2100	59		55					44		↓				**	43		40				**
2100-2200	59		50					43		38				**	↑		39				**
2200-2300	57	↓	50	↓	↓	↓	↓	42	↓	35	↓	↓	↓	↓	↓	↓	39	↓	↓	↓	↓**
2300-2400	56	45	50	35	82	70	OFF	41	45	35	35	82	70	ON	43	45	39	35	78	70	ON**

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 18, 1974							March 19, 1974							March 20, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	43	45	37	35	80	70	ON**	44	45	40	35	75	70	ON**	42	45	37	35	70	70	OFF
0100-0200	42	↑	37	↑	↑	↑	↑**	43	↑	40	↑	↑	↑	↑**	40	↑	35	↑	↑	↑	↑*
0200-0300	41		37				**	43		40				**	38		35				*
0300-0400	40		36				**	43		38				**	37		35				*
0400-0500	40		36				**	42		38				**	37		32				*
0500-0600	40		35					41		35					37		↑				*
0600-0700	39		↑					39		↑					38		↓				*
0700-0800	39		↓					38		↓					39		32				*
0800-0900	40		35					45		35					45		35				*
0900-1000	41		40				**	48		38				**	48		37				
1000-1100	50		40				**	48		42				**	48		38		↓		
1100-1200	62		40				↓**	53		42				**	54		46		70		
1200-1300	60		42				ON**	58		49				↓**	58		50		62		
1300-1400	65		50				ON/OFF	61		50				ON/OFF	58		52		62		
1400-1500	64		50				↑	62		50				↑	61		55		62		
1500-1600	64		52					67		55					61		↑		61		
1600-1700	65		53					67		55					61		↓		↑		
1700-1800	65		53				↓	66		53					62		55				
1800-1900	65		53				OFF	62		50					62		53				
1900-2000	55		50				ON**	51		45					56		50				
2000-2100	49		42				OFF/ON	48		42					52		50				
2100-2200	47		42				ON/OFF	46		40					50		47				
2200-2300	47	↓	40	↓	↓	↓		44	↓	40	↓	↓	↓	↓	48	↓	47	↓	↓	↓	↓
2300-2400	46	45	40	35	80	70		43	45	40	35	75	70	OFF	47	45	45	35	61	70	OFF

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 21, 1974							March 22, 1974							March 23, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	47	45	41	35	60	70	OFF	43	45	40	35	60	70	ND	44	45	35	35	75	70	ON
0100-0200	47	↑	↑	↑	↑	↑	↑	39	↑	35	↑	60	↑	↑	43	↑	↑	↑	↑	↑	↑
0200-0300	46		↓					39		↑		60			↑						↓
0300-0400	45							40		↓		70			↓		↓				
0400-0500	44							39				75			43		35				
0500-0600	45							39				↑			41		33				
0600-0700	46		↓					39				↓		↓	41		33				
0700-0800	50		41					43		↓				ND	43		33				
0800-0900	59		47					46		35				ON	62		42		↓		**
0900-1000	60		48				↓	48		40				↑**	61		42		75		**
1000-1100	59		50				OFF	52		↑		↓		**	58		43		70		**
1100-1200	73		60				ND	49		↓		75		**	61		45		70		↓**
1200-1300	75		↑				↑	46		40		70		**	60		47		70		ON**
1300-1400	75							50		42		↑		**	63		47		68		ND
1400-1500	69							50		42				**	64		51		↑		↑
1500-1600	70							48		40				**	65		↑				
1600-1700	73		↓					48		↑		↓		**	65						
1700-1800	74		60					46				70		**	64		↓				
1800-1900	68		55					45				75		**	63		51				
1900-2000	57		50					45				↑		**	56		45				
2000-2100	51		50					47						**	51		↑				
2100-2200	48		45					45						**	50		↓				
2200-2300	47	↓	45	↓	↓	↓	↓	45	↓	↓	↓	↓	↓	↓**	50	↓	45	↓	↓	↓	↓
2300-2400	47	45	43	35	60	70	ND	43	45	40	35	75	70	ON**	48	45	42	35	65	70	ND

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 24, 1974							March 25, 1974							March 26, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	48	45	40	35	62	70	ND	53	45	50	35	62	70	ND	52	45	48	35	72	70	ON**
0100-0200	48	↑	↑	↑	↑	↑	↑	54	↑	48	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑**
0200-0300	47				↓			54		↑					↓						**
0300-0400	47				62			54		↓		↓			52						**
0400-0500	46				75			52		48		62			51						**
0500-0600	45				↑			49		40		70			50						**
0600-0700	44							47		↑		75			50						**
0700-0800	48		↓					48				↑			51		↓				**
0800-0900	53		40					47							53		48		↓		↓**
0900-1000	55		45					↑		↓					57		55		72		ON**
1000-1100	58		45					↓		40				↓	59		↑		65		ON/OFF
1100-1200	63		55		↓			47		45		↓		ND	62		↓		↑		OFF
1200-1300	68		55		75			50		45		75		OFF/ON	65		55				↑
1300-1400	72		60		80			52		45		80		ON**	60		57				
1400-1500	75		60		80			53		50		80		↑**	63		57				
1500-1600	73		62		80			54		↑		75		↓**	68		60				
1600-1700	70		62		75			55				75		ON/OFF	70		63				
1700-1800	64		60		↑			56		↓		72		OFF	74		63				
1800-1900	62		55					58		50		↑		OFF	65		55				
1900-2000	57		50					52		45				ON**	63		55		↓		
2000-2100	55		↑					50		↑				↑**	57		53		65		
2100-2200	56							52						**	52		50		72		↓
2200-2300	57	↓	↓	↓	↓	↓	↓	51	↓	↓	↓	↓	↓	↓**	52	↓	50	↓	72	↓	OFF
2300-2400	56	45	50	35	75	70	ND	51	45	45	35	72	70	ON**	52	45	50	35	72	70	ON**

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF

TIME	March 27, 1974						
	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100	50	45	45	35	80	70	OFF
0100-0200	49	↑	↑	↑	↑	↑	↑
0200-0300	49						
0300-0400	48						
0400-0500	48						
0500-0600	48						
0600-0700	47						
0700-0800	48						
0800-0900	48						
0900-1000	49						
1000-1100	49						
1100-1200	48						
1200-1300	↑						
1300-1400	↓						
1400-1500	48						
1500-1600	47						
1600-1700	↑						
1700-1800	↕						
1800-1900	↓		↓				
1900-2000	47		45				
2000-2100	46		40				
2100-2200	44		↑				
2200-2300	43	↓	↓	↓	↓	↓	↓
2300-2400	43	45	40	35	80	70	OFF

TIME	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100							
0100-0200							
0200-0300							
0300-0400							
0400-0500							
0500-0600							
0600-0700							
0700-0800							
0800-0900							
0900-1000							
1000-1100							
1100-1200							
1200-1300							
1300-1400							
1400-1500							
1500-1600							
1600-1700							
1700-1800							
1800-1900							
1900-2000							
2000-2100							
2100-2200							
2200-2300							
2300-2400							

TIME	Radome Surface Temp. °F	Radome Temp. Cont. Set °F	Outside Air Temp. °F	Outside Temp. Cont. Set °F	Outside Air Humidity %	Humidity Control Set %	Radome Heater ON/OFF
0000-0100							
0100-0200							
0200-0300							
0300-0400							
0400-0500							
0500-0600							
0600-0700							
0700-0800							
0800-0900							
0900-1000							
1000-1100							
1100-1200							
1200-1300							
1300-1400							
1400-1500							
1500-1600							
1600-1700							
1700-1800							
1800-1900							
1900-2000							
2000-2100							
2100-2200							
2200-2300							
2300-2400							

ND = No Data
* = Radome Heater Should Be ON
** = Radome Heater Should Be OFF