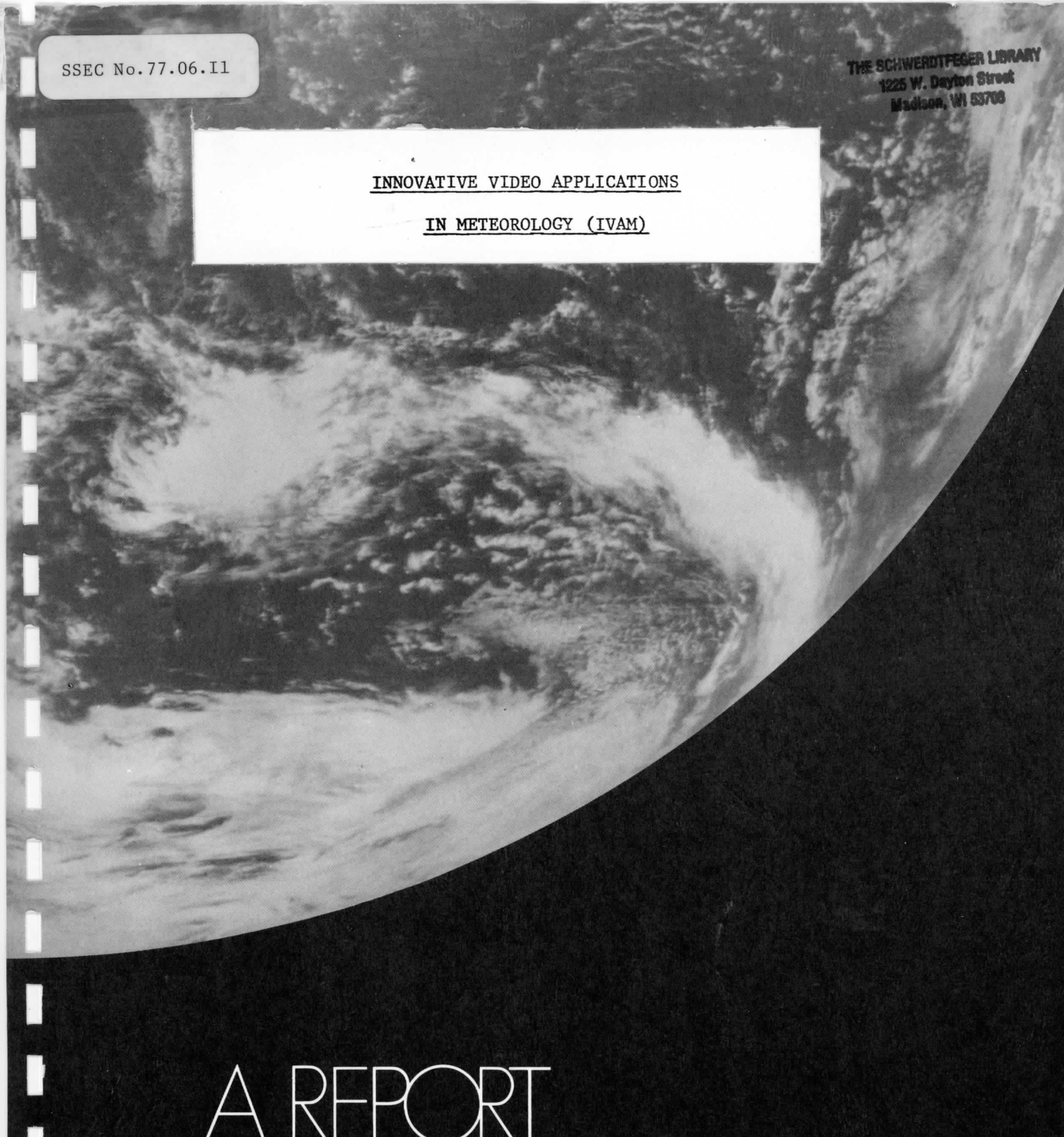
# INNOVATIVE VIDEO APPLICATIONS IN METEOROLOGY (IVAM)



A REPORT

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madison, wisconsin

# INNOVATIVE VIDEO APPLICATIONS

# IN METEOROLOGY (IVAM)

An Annual Report

Contract 3-35156

Period 1 August 1976 - 1 June 1977

Submitted to:

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## APPENDICES

# I. INTRODUCTION

## A. Scope of this Report

This is the third annual progress report on the study program "Innovative Video Applications in Meteorology (IVAM)" sponsored by NOAA on DOC Contract 5-35156. This report covers the work performed by SSEC on IVAM from 1 May 1976 to 1 May 1977. This is the last progress report and will be followed by the final IVAM study report in December 1977.

A brief synopsis of the IVAM program objectives and work completed prior to 1 May 1976 follows for those unfamiliar with IVAM. More complete information can be found in the two previous progress reports.

## B. Background Information

The purpose of the IVAM program is stated succinctly in the contract statement of work and is quoted here:

### The Problem

> The National Oceanic and Atmospheric Administration would achieve a significant gain in keeping the public advised of changing weather conditions if effective, automated methods of delivering video segments of weather information to TV outlets could be devised. Although this is known to be a technologically possible accomplishment, the methods needed to make it economically feasible have not been developed.

### Solution

> The National Weather Service and the National Environmental Satellite Service jointly undertake the funding of a study to develop a state-of-the-art capability to efficiently deliver quality video presentations of weather information to the public at acceptable cost.

### Study Objective

> This study will be directed toward the development of formats and techniques designed to maximize the effectiveness of the TV presentation of weather information to the public. Program content and organization will be addressed, as well as the conceptual design of the communications methods and systems that would allow

the presentations to be economically delivered from NOAA sources to various redistribution terminals. The objectives of the study are to develop techniques and formats that are characterized by:

High information content in an interesting and understandable presentation

A maximum employment of automated presentation formatting, in order to keep staffing levels reasonable

The maximum utilization of existing or planned NOAA facilities, methodologies, and communication systems

Modest NOAA implementation costs and modest-to-low cost for media, public, or private acquisition

Quality and utility coefficients that generate media and public enthusiasm and demand.

The IVAM program is organized in five major tasks described below. The correspondence of the five major tasks to the ten tasks specified in the contract work statement is indicated by the lettered task designations in parenthesis which refer to the work statement.

Task 1 - Software Development (Tasks E, J)

This is the major development effort in the IVAM program. If the objectives as described by NOAA above are to be achieved, the software system must be as efficient and as flexible as the state-of-the-art allows. Early in the program we conducted a series of very thorough and very critical reviews of several possible routes we could have pursued. We chose to start at the very beginning, and to defer any actual software development until we had produced a sound software system concept which we were confident could support a development program capable of meeting the NOAA objectives. During the first nine months we achieved our initial goal and the software system concept document was submitted with the 1 May 1976 report. The software development task was about 30% completed during the first year with the completion of the ccncept document and the existing McIDAS software which we have drawn upon for specific purposes.

The software design philosophy which has been adopted is based on the following considerations and decisions:

1) The system to be developed is a production system. The output is a large number of graphic images, properly sequenced, meeting high aesthetic standards, complying with NTSC standards, and coming off the line at 30 frames per second. This is the first time such a system has been attempted.

2) The system must be automatic. To meet output requirements it must work at high speed and must not depend upon human interaction. At the same time, full system control must be available to the WSFO forecaster.

3) Software will be organized to operate in a basic net structure to provide an efficient, fast response operating system.

4) Software will be completely modular with standard module-to-module and module-to-net interfaces to decrease development time and to permit modification at low cost. This approach will trade memory size for software and maintenance economy.

5) A multi-processor, multi-memory hardware design will be used to implement the system to obtain least cost in hardware, low maintenance costs, and high processing rates.

6) Integration with AFOS will be a principal objective to eliminate function redundancy and hold implementation and operation costs to the minimum.

During the past year major portions of the software have been completed and are operating in the development hardware. This year we are able to demonstrate video graphics produced by the IVAM system. We are now in the final phase of refinement and tuning of the video graphics generation portion of the software set, and major work remains only on the control and segment assembly portions. These portions cannot be completed because NOAA has decided not to proceed with development of the output portion of the IVAM system.

Task 2 - Presentation Content Studies (Tasks A, B)

Starting with an extensive review of previous work at SSEC and in the literature, users' needs for weather information were assembled and tabulated. This voluminous data set was consolidated through a series of carefully defined steps to a tabulation of users' needs listed by parameters which can be used as decision bases by the IVAM control processor. These parameters are season, time of day, weather situation, TV medium, emergency status, past and present or predicted, and spatial scale. The minimum set (about 220) of presentation segments have been determined which are uniquely identified by the seven parameters and which meet all important users' needs. A representative portion of these segment specifications have been translated into video storyboards to define system performance requirements.

A new task was added to the IVAM program this year to develop the capability to reduce satellite images to graphic format automatically and to evaluate the information content and viewer acceptability of these images. We expect to complete this task before 1 October 1977.

Task 3 - Hardware Concept Studies (Tasks E, F)

Hardware definition was purposely deferred until the system and software concepts were well developed. We view hardware as just the means of implementing IVAM and have tried to avoid having hardware decisions determine system performance.

As we proceeded to purchase the equipment for the prototype of the first half of the system the validity of this approach was fully confirmed. The problem we faced was not to find a set of equipment capable of the IVAM task but to select from among many alternatives. Thus we were able to optimize the equipment selection for low cost, maintainability, flexibility, suitability of system software, etc.

Only the hardware for the front end of the IVAM prototype has been procured. Specification of the remainder of the system has been completed during the past year and the IVAM design is complete at the system level. In May 1977 NOAA decided not to fund the completion of the IVAM prototype, but to end the program with software defined and partially completed; hardware defined on paper only; and system flexibility demonstrated on the development facility consisting of the McIDAS with a part of the IVAM prototype hardware.

Concepts for distribution of the IVAM products to broadcast and cable TV stations were developed during the first phase of the program and were reported two years ago. Briefly, it is feasible to distribute presentation segments via network facilities during the half-hourly station break periods when the network is normally "black." Further inquiries during the past two years have confirmed the feasibility of this concept. For cable distributors the plan is not as easy to define since each cable company presents a different set of circumstances. During the past two years we have confirmed the unanimous enthusiasm of cable system operators for the IVAM product. Operators of systems located near WSFO's to be equipped with IVAM foresaw no significant difficulty in obtaining the output. those located at greater distances expressed interest in the possibility of obtaining an automatically updated presentation via telephone lines. A possible design for such a capability is discussed in this report.

Task 4 - Program Test and Evaluation (Task C)

During the first year we produced two test video tapes, one of a possible IVAM presentation for broadcast stations and one for cable outlets. The tapes were made from films of graphics designed to simulate IVAM images. Technically the tapes differed from and were inferior to the expected IVAM product because of the limitations of filmed graphics. Nevertheless, the tapes have proven to be of great value in demonstrating IVAM and in obtaining answers to important system design questions. Last year we made two filmed simulations of IVAM outputs to test specific presentation concepts of importance in determining system design. In May 1977 we assembled portions of three segments on video tape using only IVAM software. We will be producing such test video segments in greater quantity during the remainder of the program.

The IVAM Weathercasters Advisory Panel was organized and met first in February 1976. Five of the nation's top TV weathercasters make up the panel. This group has met regularly at six month intervals to consider a broad range of IVAM design problems. Their advice has been of great value to the program and the system design includes numerous improvements which they have contributed.

Task 5 - Final Program Development (Tasks D, I)

This task was planned to start only after NOAA is satisfied that the implementation of IVAM is feasible, and that when implemented, IVAM will meet the NOAA objectives. This is the effort required to wrap-up the software development, complete the prototype IVAM hardware design, fabrication and assembly, install and interface IVAM to an AFOS installation, and place the system in full operation for test purposes. NOAA has decided not to implement this task.

C. Program Status

The IVAM program was delayed approximately six months in the summer of 1975 because of unanticipated slowness in receiving funding authorization for the second year effort. This matter was reviewed in detail in the FY-76 progress report. Except for this delay, the program has proceeded very nearly as projected in the original proposal. Program goals have been met or exceeded and contract obligations will be met fully when the program is terminated on 31 December 1977.

The decision by NOAA not to carry IVAM to full prototype test and evaluation comes at a time when:

1) The program is highly successful and all objectives are being met. The feasibility of IVAM has been established.

2) As discussed in last year's report, many leaders in NOAA, NASA, and NSF are becoming increasingly aware of the national needs for effective mesoscale weather service, and of the potential of satellites, radar, laser sounders, and other new sensing capabilities to provide this service. Interest in SESAME and PROFS is strong and the example of the British Meteorological Office shows that such a service is practical. The IVAM capability is necessary to a NOWCASTING/Mesoscale service.

3) The IVAM development team at SSEC has achieved mastery of the program. The toughest part is past, morale is high, and we are confident that the prototype IVAM can perform to meet full operational requirements.

In August 1977 we will start to dissemble the IVAM development team.

Some will be transferred to other work; some will leave. By December 1977, the program will be dead and buried in a final report and a software documentation package. Revival will be difficult and expensive, if possible. It is probable that most of NOAA's investment in IVAM will be lost.

With the need for IVAM, the feasibility of the concept, and the success of the current program all more firmly established than ever before, it is most regrettable that work must stop only 20% short of completion.

## II. PRESENTATION CONTENT DEVELOPMENT AND EVALUATION

Most of the past 12 months involved refinement of the TV output segments and storyboarding of representative examples. Types of images were categorized, and the structural outline of segment organization was defined to accomodate orderly assembly under automatic control.

An output specification has been written which includes all segment output information. It is included as Appendix A of this report. The reader is referred to Section III and Section IV of Appendix A for definition of terms discussed in this section.

### A. TV Output Segments

Activity during the previous year reduced the number of segments from over 500 to about 200, including both cable and broadcast TV. Approximately 150 segment header sheets have been written. The segment header sheet describes the parameters that apply to the particular segment, the time and space range, major users of segments, and verbal descriptions of segment format.

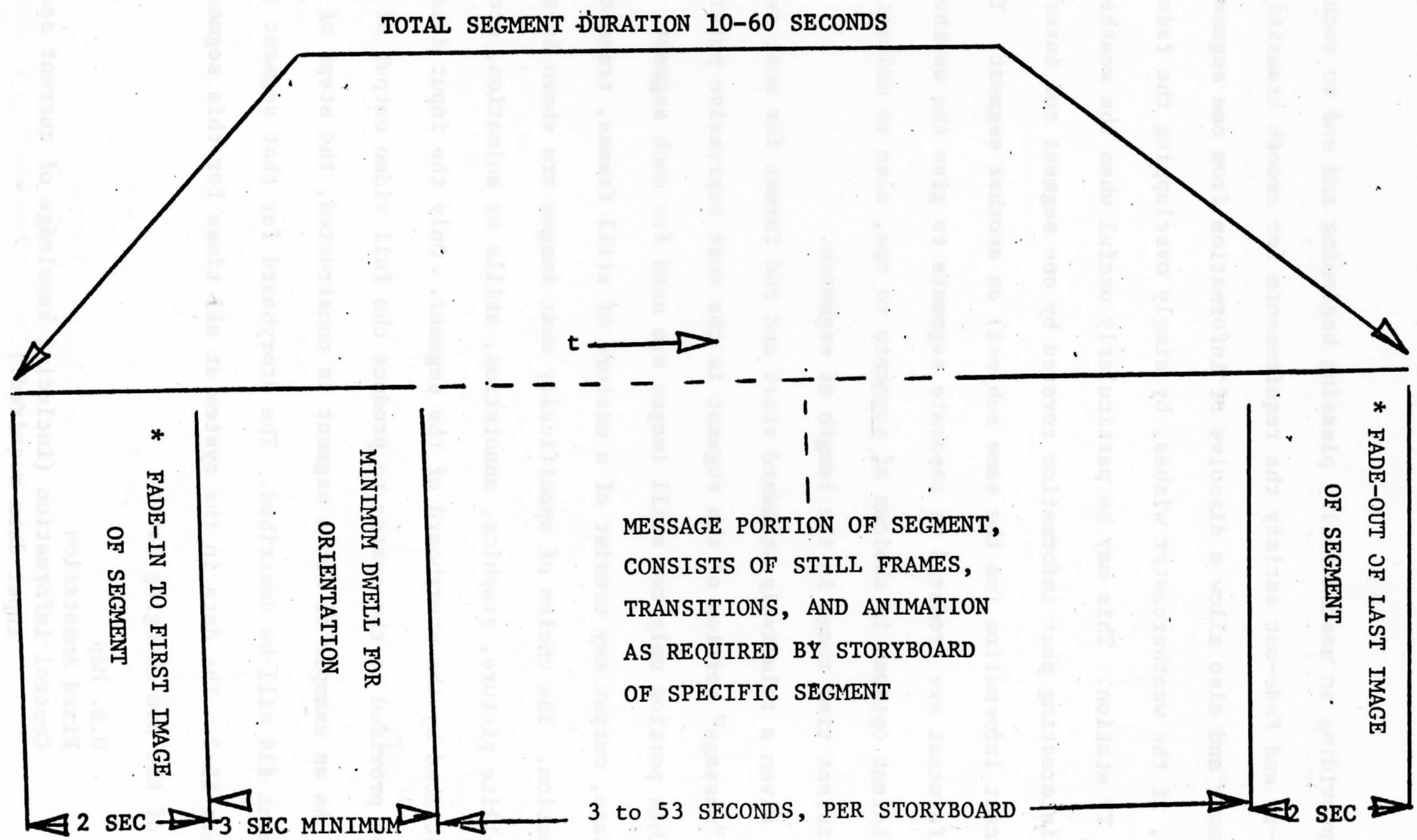
The storyboard is a pictorial description of frame-by-frame TV output, indicating size, shape, timing, color, etc. The storyboard is the ultimate description of detailed IVAM output. It is what the programmers use as requirements for creating graphics output. There are currently about 30 segments storyboarded. The current set of header sheets and storyboards is included in Appendix A of this report.

At this point in the program, the effort to identify more segments, or to storyboard them, is being phased down. The requirements of the contract have been met in terms of determining the range of video weather presentations, formats, and presentation techniques. The ultimate set of segments available at an IVAM installation will be determined by locally established needs. As a study, the last word in segment identification cannot be written because of the necessary differences of local style and values, specific uses of weather information, and local constraints of transmission and timing. The study has approached the description of segments from two standpoints: (1) identifying what is needed, and (2) identifying what is possible with available data. The answers to the two questions are changing rapidly with time and technology. A further complexity is the fact that the answer to the question, "What is needed?" is undesirably,but clearly, affected by knowledge or expectation of what is possible. The parameters of weather are often thought of in terms of their measuring device, rather than the weather effects or the weather element, itself. We look at the radar, not at the rainfall; we look at the satellite picture, not at the clouds or temperatures. The real meaning of weather information (as opposed to weather data) will be an area of great growth as the capability and usefulness of meteorological measurement become known and appreciated by the non-meteorologist.

The output presentations defined at this point provide the basis for handling any new segment or new information identified in the future. The operational structure of handling segments as output product modules allows any TV output which can be defined to be handled by the IVAM system.

The segments are constructed of a basic sequence of images according to Figure II-1. A start-up and an ending hold provide orientation for the viewer. Effective communication to the non-meteorologist requires adequate time for the viewer to realize the subject and context of the weather message. In addition, there is the practical consideration of interfacing segments

* The Fade-In/Fade-Out Requirements Are Waived for Emergency Segments




BASIC SEQUENCE OF SEGMENT IMAGES

FIGURE II-1.

and providing an aesthetically pleasing beginning and end to each segment. Fade-in and Fade-out satisfy the requirements for smooth transitions between segments and also allow a dissolve of information from one segment to the next, if the weathercaster wishes, by simply overlapping the fades at the user TV station. This may be particularly useful when the weather subject has interesting past information covered by one segment and interesting forecast information (on the same subject) on another segment. The past and forecast are produced as separate segments to give the weathercaster sufficient options in choices of segments to use, also to maintain a more consistent time range in the length of segments.

Given a relatively standard start and end format for most segments, the "message" portion of the segment is the most expressive portion. Outside of this portion only two still images are used for each segment. Within the message, output may consist of a mixture of still frames, transitions, and animation. The choice of specifically what images are shown in terms of satellite picture, graphics, annotation, stills or animation, etc., is prescribed by the storyboard of the segment. Only the input data values need to be provided to the system to produce the full video output of the segment.

As an example of how a segment is constructed, the steps of producing Segment #14 will be described. The Storyboard for that segment is shown in Figure II-2. The data in the system at all times for this segment includes all of the non-changing data:

U.S. Map
Fixed Annotation
Control information (including knowledge of current season and input data required.)

SHEET

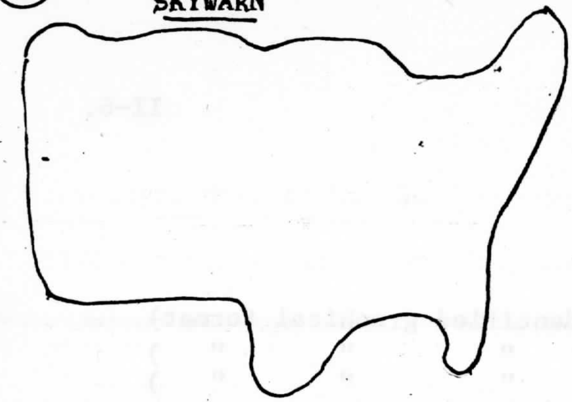
Segment 4

PROD.

DATE 12/1/76
Variable Length Segment
Nominal 30 Secs.

1

**SKYWARN**

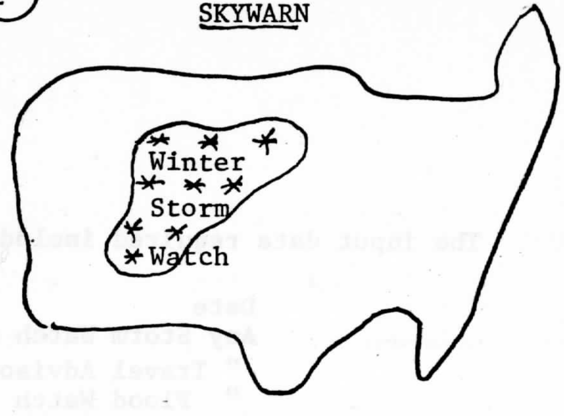


Tuesday, Dec. 6, 1976

Advisory, non-emergency type map for general indication of areas expected to have heavy weather of many types --- use U.S. grid with lt. grey background and blue state borders- lt. blue outside map.
HOLD 3 SECS.

2

**SKYWARN**

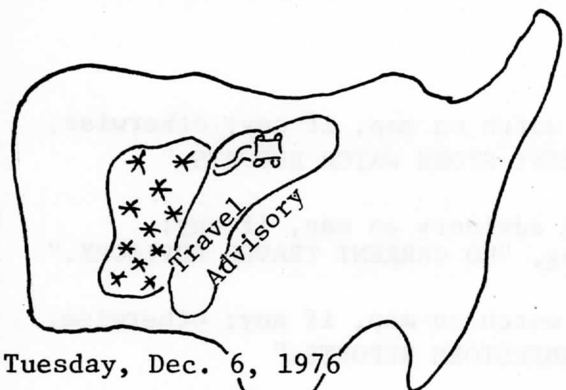



Tuesday, Dec. 6, 1976

Add in first watch or warning from west, winter snow watch, storm warning, etc. - Use flakes within yellow for watch areas, red for warning areas.
HOLD 5 SECS.

3

**SKYWARN**

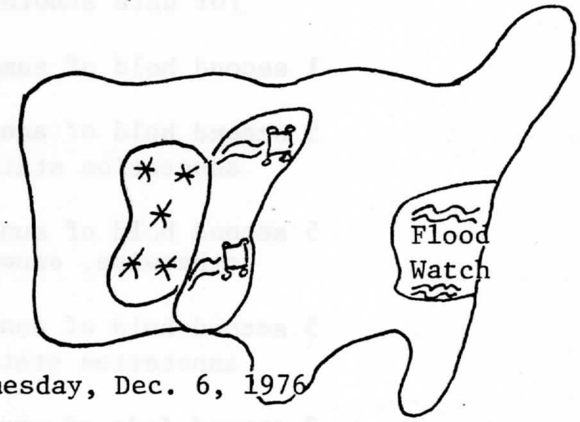



Tuesday, Dec. 6, 1976

Dissolve out annotation of first problem, leaving symbols behind (✳) as next area from west appears. Annotate, words, + symbol.
HOLD 5 SECS.

4

**SKYWARN**



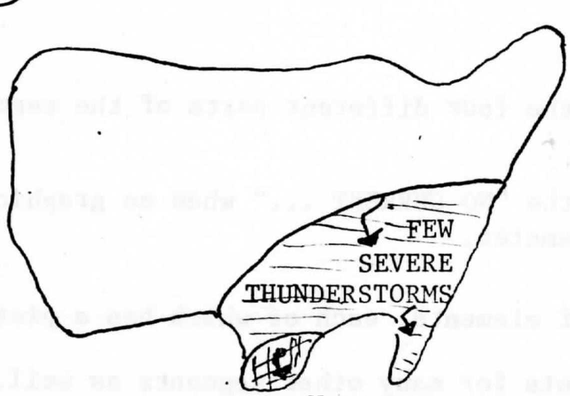

Tuesday, Dec. 6, 1976

Add in next east area and annotate as before

HOLD 5 SECS.

5

**SKYWARN**




Tuesday, Dec. 6, 1976

Dissolve out previous wx problems as severe storm forecast from sels dissolves in. (This stands alone for impact.) Use single yellow hatching for scat. areas; double hatch red "numerous" areas. HOLD 12 SECS.

**KEY**

Travellers Advisory: use skidding car symbol within area.

Snow Watch & Warning: Use flakes ✳.

Tornado Watch/Warn: Use Twister

Thunderstorm Watch/Warn: Use lightning (blinking?)

Flood Areas: Use Water (etc.)

SEGMENT LENGTH WILL VARY WITH NUMBER OF AFFECTED AREAS IN U.S.

The input data required include:

| | | |
|---|---|---|
| Date | | |
| Any Storm Watch data | (in identified graphical format) | |
| " Travel Advisory " | ( " " " " ) | |
| " Flood Watch " | ( " " " " ) | |
| " Thunderstorm " | ( " " " " ) | |

When the decision is made by the system that the segment is to be produced, the system already knows, without considering input data:

1) The timing of the segment will be 30 seconds total, comprised of:

 2 second fade-in of U.S. grid with annotation SKYWARN and location for date annotation

 1 second hold of same

 5 second hold of annotated storm watch on map, if any; otherwise, annotation stating, "NO CURRENT STORM WATCH REPORTS."

 5 second hold of annotated travel advisory on map, if any; otherwise, annotation stating, "NO CURRENT TRAVEL ADVISORY."

 5 second hold of annotated flood watch on map, if any; otherwise, annotation stating, "NO THUNDERSTORM REPORTS."

 2 second fade of previous picture.

2) Which data is needed (4 graphical image inputs), how to display them, and in what order.

3) Which symbols to display (snowflakes, lightning, etc., if needed).

The input data, however important, occupies a small portion of the output "volume." It determines:

1) The graphical area display in the four different parts of the segment
2) The date information
3) The decision basis to display the "NO CURRENT ..." when no graphical input exists for that parameter.

By comprising the segment as a number of elements, each of which has a pictorial meaning, the system can use those elements for many other segments as well.

This is true of both input-determined elements, such as the flood watch outline, and preprogrammed elements such as the map grid. The system need not store these for each segment in which they are needed, but may call them from a common element storage as needed.

B. Program Content Evaluation

The evaluation of program content is a highly subjective activity and without careful control could become an indeterminate set of opinions. To avoid such a pitfall we have limited our evaluation efforts to activities with the IVAM Weathercaster Advisory Panel. As reported a year ago, members of the panel are TV weathercasters of different geographical locations who meet at the University of Wisconsin twice each year to review IVAM output content.

The first meeting during the reporting period was held on August 29. The major item on the agenda was review of the segment header sheets for the 104 broadcast TV segments developed earlier. The meeting included not only the review of segment content, but provided an opportunity to judge the effectiveness of segment descriptive terminology and categories. Review comments could be categorized into the areas of (1) additional information needed, (2) legal implications of statements, and (3) presentation style.

Specific additional information was recommended for certain segments. In general, the group felt it to be more important to compare current data with last year, last week, or yesterday, as appropriate, rather than with "normal". The weathercasters find that typical TV viewers do not relate to "normal", but more value is derived by comparing with data from weather the viewer remembers or has experienced. When appropriate, the river stages should be included in segments covering flooding. Precipitation "total for year to date" was identified for some precipitation segments. Wind chill is covered in some segments, but the question was raised whether a better indicator could not be developed which included relative humidity—along with temperature and wind.

Needs for segments beyond the 104 was discussed, specifically to include boating, hurricanes, upper air/jet stream information, dew point, historical and climate information, and tutorial and informational segments which could be provided for the season or fed on particularly "slow" days for weather information.

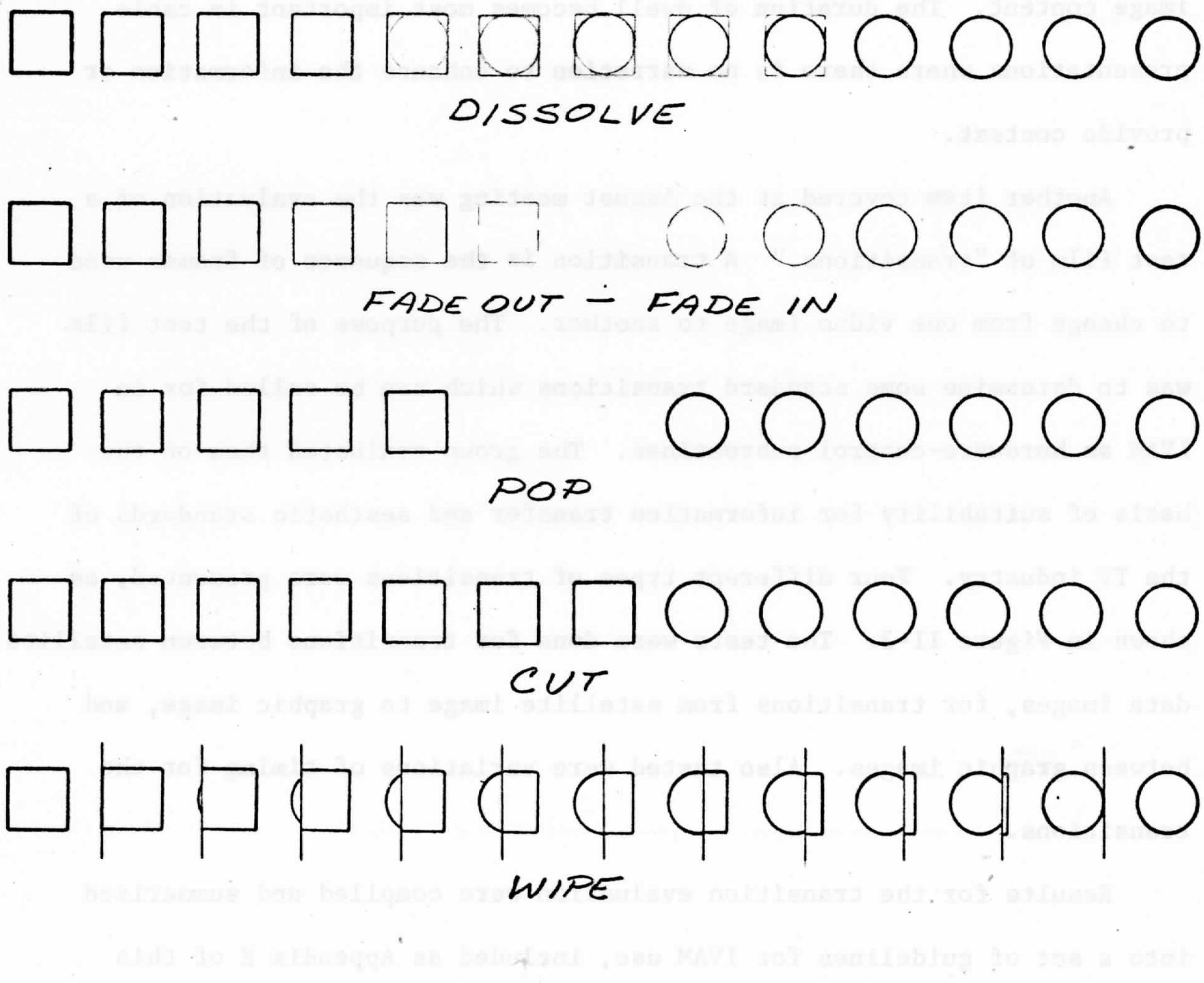
Questions of legal implications of statements about weather identified the need for a category between the EMERGENCY and NON-EMERGENCY segments, such as ALERT or CRITICAL, for instance. It was felt that certain segments, while not deserving the priority received by EMERGENCY, should receive attention above the usual. (The terms WATCH and WARNING have deliberately been avoided to reserve the applications of those values solely to NWS.) The use of language which presents consequences of weather, rather than just weather, brings about questions of legal responsibility and terms such as "use extreme caution" or "poor driving" or "hazardous conditions" must be reviewed. Indeed, as the information presented becomes more immediately useful to the viewer, the meaning of weather data has greater impact and consequence.

Discussions of the advisory group on presentation style covered such things as split screen programming for some segments and consideration of the weathercaster's position on the screen during "chromakey" use. Highlight techniques such as blinks, stars, and arrows were suggested, and record high and low values of parameters can be used for labeling the extremes for graphical displays. Use of "hash marks" for forecasts should be made without an outline because outlines imply more precision than available. Considerable discussion centered around the issue of timing. It was generally agreed that any weather subject, no matter how simple, should be presented with at least five seconds of dwell before changing the image content. The duration of dwell becomes most important in cable presentations where there is no narration to enhance the information or provide context.

Another item covered at the August meeting was the evaluation of a test film of "transitions." A transition is the sequence of frames used to change from one video image to another. The purpose of the test film was to determine some standard transitions which can be called for in IVAM as hardware-control subroutines. The group evaluated them on the basis of suitability for information transfer and aesthetic standards of the TV industry. Four different types of transitions were presented, as shown in Figure II-3. The tests were done for transitions between satellite data images, for transitions from satellite image to graphic image, and between graphic images. Also tested were variations of timing for the transitions.

Results for the transition evaluation were compiled and summarized into a set of guidelines for IVAM use, included as Appendix E of this report.

The second advisory meeting was held February 26-27, also attended by all committee members. Major items on the agenda were to review storyboarding and general program content, also to evaluate quality of several limited animation techniques presented on test film.




IVAM TRANSITION TYPES
FIGURE II-3

Each member of the review committee was requested to storyboard six segments and present them for discussion at the meeting. A number of guidelines can be established from the discussion and comments of the storyboards.

1) Viewers of TV weather programs expect a standard use of colors to be able to understand more quickly (and feel comfortable with) the presentation.
2) Use of animated sequences does not pose a problem for the weathercaster in terms of his timing and pace.
3) There was interest in the group in presenting more meaningful terms, such as gallons of fuel oil or dollars, rather than degree-days.
4) When possible, use shading or crosshatch without outline to avoid implying too much accuracy in location of weather.
5) General consensus was not to use counties to define WATCH areas.
6) There should be a segment which lists all current WARNINGS and their times of start and end.
7) Location of certain information, like WARNING, etc., should be in standard place on picture.

The storyboard for segment 82 was produced on film for testing the suitability of various types of animation. Two rates of motion were tested, with several frame repeat rates within each. Also tested were several different dissolve-dwell techniques to provide animation. The aesthetic quality drops off very quickly as the animation is changed from single frame to repeat frame mode. The consensus was that single frame animation is clearly most desirable, with double-framing acceptable for slow moving images.

All other animation techniques tested were considered marginal or unacceptable, including dissolve-dwell sequences. The conclusion for animation quality is that little compromise exists and that animation must be very well done, or not at all.

C. Cloud Graphics

As a part of both the IVAM and McIDAS programs, SSEC has developed a sizable body of software for the generation of video graphics. In a preliminary test we converted a series of GOES satellite images to graphics to study the relationship between information content and data volume reduction. The preliminary test interested NWS and NESS representatives, and in May 1977 we received direction to proceed with a more complete study including production of video tapes of several different weather situations for evaluation. The reduction of GOES images to graphics is of interest to NWS and NESS because if sufficient information can be retained with large reductions in bandwidth, it might be possible to distribute satellite derived cloud information via the AFOS system.

The purpose of the cloud graphics project is to demonstrate the feasibility of exacting useful information from a satellite image or sequence of images in such a way that the bandwidth necessary to transmit a useful image over a data link is much less than that necessary for the complete image. The method used in our initial trials involved two steps. First, the total amount of data was reduced by averaging the satellite image pixels to grid points in a regular array. Secondly, this grid point array was converted into a graphic image by use of a data contouring program.

This procedure has been tried on a time sequence of five 2-mile resolution images of a spring frontal system over the eastern U.S. some strong thunderstorm activity was present. The values of grid point spacing tried corresponded to averaging over 8 x 8, 16 x 16, or 32 x 32 pixel boxes. From this grid of averaged brightness values the data contouring program created an image at the same scale as the original. In the contoured image the number of brightness levels was reduced from the 64 levels available from SMS/GOES visible data to 16 levels. The results were quite promising for the higher resolution grids, expecially the 8 x 8 pixel average. Major patterns of cloudiness and cloud motion were retained and the area of strong thunderstorm activity was still distinguishable. One feature of a time sequence of satellite images was largely lost; that is the distinction of cloud layers that can be visually separated because of vertical wind shear. We found that a combination of visible data with infrared data by color mixing recovered most of this information. The image produced by averaging over a 32 x 32 pixel area still retained gross features of cloudiness and cloud motion but tended to merge one weather system into the next, leaving little useful information.

The reduction in data volume was considerable. For the case of averaging over an 8 x 8 pixel area for each grid point and reducing the number of brightness levels from 64 to 16 the reduction is a factor of 256. For a McIDAS (TV) size display image this represents a reduction from $2 \times 10^6$ bits to $8 \times 10^3$ bits of data. If infrared and visible data are combined, the reduction factor is less but factor of 50-100 should yield good results.

Two different contouring programs were tried. One generated contour lines at each brightness level one level at a time. The interval between each contour line was then filled in by scan lines. The second one produced a shaded-in contour for all levels simultaneously and worked from the top to the bottom of the image. The first method produced a smoother contour but the algorithm for filling in occasionally produced a small area with incorrect levels. The second method inherently eliminated this problem but produced rough edges on the contours. The problem has since been resolved by using the second method with improved contour smoothing.

Now that we have shown the basic feasibility of cloud graphics generated from satellite images, we are now involved in producing a video tape of cloud graphics images created for six different weather situations. A preliminary video tape should be ready by early July 1977 for an initial evaluation by NWS. A final video tape will then be produced based on the evaluation of the preliminary video tape.

Presently work is being done to improve the software for contouring the grid point data. The problems that occurred in the earlier versions seem to have been eliminated. We are collecting a set of fairly recent data for the test data sets.

D. Output Demonstration Tapes

Two segments were video taped for test purposes, #54 and #43. Both are produced for cable TV and represent typical cable TV format. Segment #43 is provided in two different test formats. In addition, the test tape includes a demonstration of how elements are used to construct an image.

Creation of the video was made by the same steps that are used for the eventual automatic operation of IVAM; i.e., storage of elements, smooth, scan convert, prepass, link, sort, pack, and fill-in, as required. The major differences between production of these test segments and automatic operation are two: (1) The test segments are produced by manually stepping through the control functions, and (2) the McIDAS digital is used for output assembly with its attendant limit of four colors total and slow communication path.

Conventional TV equipment was used to provide fade transitions and alphanumerics, since IVAM does not have the hardware required to produce such effects. However, the production sequence is still the same as that of IVAM in the sense that the segments are assembled in a serial fashion from data stored in files controlled by the software.

Segment #54 for cable TV represents an X-Y graphical display of temperature information. Data used for creation of the segment is actual Service A data from May 4, 5, and 6. Times of interest for temperature were identified as: driving times to and from work, noon, and prior to bedtime. Data used for the forecast curve is not currently available in ready-to-use format, but can be derived straightforwardly from the data available.

Segment #43 is produced from a series of radar echoes over Jacksonville, Florida, and was recorded on May 8 and 9. The sequence depicts highly local information, and in test #1 uses a state map to orient the viewer to the area of coverage. Contours of accumulated rainfall were calculated via the uniform grid method from data supplied from point measurements in the Jacksonville area. Use of McIDAS equipment limited the choice of color combinations available, so two tests were made, each using different color sets.

Also included is a sequence of images which demonstrate the assembly of an output image. The sequence is produced by simply letting the video tape recorder run while the picture is being drawn, one element at a time. Manual control is used only to call files or initiate control functions. The rate of fill-in and line drawing is limited by the McIDAS communication channel used as output.

Actual rate of image assembly for the final IVAM configuration would be two to three orders of magnitude faster than demonstrated. The six elements used to construct the demonstration picture used less than 5K words of storage.

## III. SOFTWARE DEVELOPMENT

At the time of the annual report, a year ago, the PDP 11/40 had just arrived. It was stated that the next year would be spent on the interface to the DEC software and the resolution of the video issues involved in the IVAM problem. Then the IVAM System Directory was to be implemented, followed by the IVAM Operating System which would control the parallel processing environment.

The software effort during the past year followed this plan fairly closely. There have been four major themes within the software effort. The first emphasis was on taking control of the development hardware and software purchased for IVAM. The most important aspect of this step was the application of the RSX-11M operating system purchased from DEC. The second area of emphasis was the software input to hardware design and the software support of hardware implementation and debugging. Decisions made in the system studies had a dramatic impact on the design of the IVAM software. The third area of focus was on the solution of the video issues to meet the requirement to produce a wide variety of filled-in color video graphics. The final thrust was in the design and on-going implementation of the IVAM System Directory and the IVAM Controller which executes from it. This directory is more powerful than the construct described last year. Its responsibilities have been expanded significantly, and its implementation has led to a number of important decisions which will be detailed in a later section.

### Development System

This system is comprised of the following elements: a 32K PDP 11/40 with memory mapping, two small system disks, two floppy disks, a Decwriter, a data tablet, and the RSX-11M operating system. This system was to be interfaced to the McIDAS CPU and to the McIDAS Digital Terminal. The Digital Terminal is a color display with a two bit 525 x 672 bit map refresh memory and a digital disk capable of refreshing 12 five bit video images.

RSX-11M

As stated last year, the RSX-11M operating system was purchased with the purpose of assisting the implementation effort and allowing us to make up some of the time lost because of the delay in funding during the previous year, and the subsequent delivery delays. RSX-11M is a powerful multitasking operating system with a variety of file structures and software development tools. Our first effort was to investigate this operating system and to determine to what extent it would support the IVAM implementation.

Like most operating systems, RSX-11M takes control of all physical resources in the system and provides services to user tasks which allow them to request the use of these resources. The fact that the user requests rather than demands services means that while the machine has an operating system, the user task does not. RSX-11M provides several ways for separate tasks to interact. One task may initiate another. Scheduling, synchronization, and communication mechanisms also facilitate the interaction of one task with another. Most important is the ability to declare code or data areas common to several tasks simultaneously. This ability allows utility functions to be centralized both in core and on the disk. The result is that IVAM will not lose a significant percentage of its system disks to multiple copies of FORTRAN I/O routines and commonly-used utility routines.

The existence of these features is motivated by a limitation in the PDP-11 and RSX-11M; since the PDP-11 has only a 16 bit address bus, and is byte-addressable, it is limited to a 32K address space. On the 11/40 this problem is circumvented by a memory mapping unit which expands the total address space to 128K. However, this full space is never available to a single task because RSX-11M has control of the mapping registers and has chosen not to change them during the execution of a single task. Since the user is unable to reference these registers because of the 11/40's protection features, he must use the intertask features to create a group of tasks which interact to create a larger whole.

RSX-11M Interface

The interface to RSX-11M has been designed to meet the following criteria: The logic of the Ivam system should not be distorted to adopt to RSX-11M; RSX-11M dependent code should be segregated wherever possible. The IVAM Control Program should be in command of the system and use RSX-11M for a small set of utility functions; it should be possible to specify exactly what functions would have to be provided if RSX-11M were to be removed.

The function of RSX-11M then is to provide utility support and to allow the definition of the IVAM processes on top of this support. Since RSX-11M has no concept of a task superior to itself, the latter requirement is quite difficult. Once the utility functions are defined, one would like RSX-11M to disappear and to have the IVAM controller control both the 11/40 and the Crosspoint System, which the RSX-11M knows nothing about. The implementation of the utility functions will be discussed here, while the larger systems issues will be discussed in a later section which discusses the Directory and the Controller.

Utility Functions

The services which RSX-11M must provide include: device drivers, file structures, the ability to load and initiate a program, the ability to communicate between programs, the ability to schedule by time of day, and the ability to synchronize events in separate programs.

The basic approach has been to define a series of trap functions which provide these services. These traps define the two level interface to RSX-11M that was described in last year's annual report. One level is the code within the trap function which effects the actual interface to RSX-11M and the other level is the trap-call within the IVAM code. Thus it is possible to change the nature of the trap function without changing the IVAM code. Thus the RSX-11M interface could be removed and the trap functions redefined without disturbing the IVAM code. This logical division between the function and the IVAM request for the function also means that there is no direct software linkage between the two; e.g., a subroutine call. Therefore, there only has to be one copy of the traps on the IVAM system disk. However, there is one burden the traps put on the system. Because of the way the PDP-11 memory mapping is implemented, the trap routines subtract memory space from any tasks which request their services. Thus, the traps have been placed in a common partition which is linked to each of the other partitions which may run tasks requesting trap services.

The most important functions defined according to this convention are the file primitives. These provide the IVAM Controller and other Control Processor processes access to all of the RSX-11M file functions. RSX-11M offers a variety of file mechanisms including block, record, and index files which allow the user direct access to a particular block in a file without reading those preceding it. These file types are subordinate to a directory structure which permits the existence of different versions of the same file, protects the file from unauthorized users, and restricts the operations that can be performed on it.

The IVAM system makes extensive use of all these file structures, both for supporting programming, and by embedding them into the implementation of the production system. Placing these file mechanisms at the run-time disposal of the IVAM System required a sophisticated systems effort on the part of the IVAM group. The reason this was difficult was that while RSX-11M does support very flexible file usage, it requires the programmer to set aside space for a variety of housekeeping purposes. The programmer must create space for the buffer, file header, and file descriptor block which describes the file and the use that this program will make of it to the system. Thus the user program is providing work space for the operating system. In a system which uses a small number of files this requirement is no great burden; space can be permanently set aside for the file being used. However, in IVAM, where a large number of files will be used and where the number of currently active files will vary greatly, it is not possible to set aside space for every file in the function that requested it. It is not even desirable to set aside a pool of memory which is dynamically allocated for file use because there will be many times when much of that space would be idle and yet lost to the system for other purposes. Therefore, the IVAM file system was developed to fit within the following guidelines: First, file access should be centralized within the system. Only the file primitives can make a file request of RSX-11M. This means that all code that deals with the operating system is localized and need not be repeated throughout the system. Memory space needed for file transactions will be allocated dynamically by the system. However, this space is allocated from a general memory pool where it can be reclaimed for other uses when the particular transaction for which it has been created is completed. Space can be provided by the requesting task if it is in an overlay area or it is more typically provided by the centralized memory allocation system that controls the allocation of crosspoint memory for all processors in the system.

The file primitives as currently defined provide IVAM with the run-time capability for opening and closing, creating and destroying, as well as reading and writing any of the file types described. The file system has no knowledge of file use or significance; it is strictly a utility that provides the more intelligent parts of the IVAM system with the services they require.

Next, effort was concentrated on a series of device drivers and I/O routines which had to be fitted into RSX-11M. There are two levels at which external devices can be inserted into the RSX-11M. Either they can be defined at the user level, or formally defined as part of the RSX-11M. The former alternative has the advantage that it is easy to implement and the disadvantage that is subtracts 4K unnecessarily from the requesting task. The 4K is for the entry in the memory mapping register that addresses the I/O page. Defining a device as a DEC driver makes the full support of RSX-11M available, but is much more difficult to implement. The difficulty arises from the fact that insertion of the device driver is a SYSGEN procedure which means that each step in debugging the driver requires another SYSGEN. The next version of RSX-11M, which is now overdue, promises to allow the insertion of I/O drivers to be much easier. Therefore, the decision was made to postpone the formal definition of these drivers until the new version of the operating system is released.

The devices affected include the Adds Terminal, the data tablet, the Medium Speed Interface to McIDAS and the Remote Terminal and Control Board for the Cross-point System.

Above the actual device level are a series of subsystems which define the functions associated with the device. For instance, the Adds Terminal has a limited graphic capability which provides a low cost way of testing some of the IVAM functions. A series of plotting and graphic functions have been defined to make use of it. The data tablet was purchased as a means of inputting graphic data, and has been the basis of a development system that will be described in a later section. The interface to McIDAS to be provided first through RS232 and later through the Medium Speed Interface required the definition of a simple packet system for communication between the two systems. These packets are comprised of a transaction code or destination, a word count, a message, and a check sum. Currently defined packets include those required to request Service-A data, Uniform Grids, Map files, satellite pictures, or arbitrary files. Another series of similar packets are used to communicate to the Digital Terminal. Before the direct interface between IVAM and that terminal was completed it was necessary to define a more indirect path that routed control packets destined for the Remote Terminal through McIDAS which had a direct connection. IVAM packets were sent to the McIDAS CPU which sent them on to the Digital Terminal, which generated an acknowledging return packet which it sent back to the McIDAS CPU, which relayed it finally to IVAM.

The packets defined included those to load the disk, write into the semiconductor refresh, move the cursor, change the color enhancement tables, and to select the output source or erase the screen.

Hardware and Software

The IVAM software effort was tied more closely to the hardware effort than originally expected for two reasons. First, hardware planning required considerable software output and hardware decisions, once made, had considerable impact on software design. Second, hardware implementation requires significant support during the test and debugging stage.

The Video Assembler design considered a range of hardware and software options, discussed here only so far as it affects software design and implementation. One of the major issues was whether to store finished frames or assemble the images in real-time from image elements. Once the decision was made to store finished frames on a disk, the operation of the IVAM system was divided into two disjoint modes. The image preparation and the presentation periods would not overlap because the assembler resources would be totally committed during the display period. This means that either there is no image element preparation during the presentation period, or that image elements once generated must be stored on the disk until the assembler is free to assemble them into completed frames. This means that during the assembly process a large percentage of the data flow is from disk to the assembler, rather than from a processor to the assembler. Several other dependent factors also decrease the importance of this flow. First, the Assembler will include hardware and firmware to assist in the fill-in process, which means that the path from disk to Assembler can be direct. Second, the IVAM storyboards specify a significant percentage of "story frames" where the part of the content is stored, rather than generated. Again, these elements can be ready for assembly without further processing. This flow of data from disk to the assembler during the assembly process suggested that the 11/40 should be interfaced to the Asembler as well as one of the subordinate processors.

Even more important than the decision to store frames was the realization that the output process virtually dictated the use of several bit-map refresh memories, both for refresh while the disk heads were moving, and for dissolving or wiping from one frame to another. The existence of several such powerful resources in the system suggested that they be applied to software needs as well as the refresh problem. In evaluating the effect of these memories on the software several opportunities were recognized. First, the merge process could be eliminated. (The merge process is the one which takes a number of image elements defined in terms of a scan ordered list of the intersect points which define them and combine them into a single ordered list which is the complete skeleton for the final filled-in image.) The Merge Process was considered troublesome for a number of reasons. First, it was the only process that appeared likely to overflow the resources of a single processor. While the overflow is easy to deal with in conceptual terms, there is a significant price in system overhead, and the development price paid is the same whether it happens routinely or infrequently. An additional factor arguing for the elimination of the merge process was the fact that the disk on the Digital Terminal failed catastrophically and was to be out of commission for five months while it was refurbished. Therefore, given the fact that a bit map based assembly system does not require a merge process, and that the disk required would not be available during much of the IVAM development, the decision was made not to develop the Merge Process and to emphasize bit map based methods instead.

The bit map based design presents a number of powerful options. By designing the software to continually overwrite elements into the bit map, the elements can be written into the memory in order of ascending priority. Therefore, the higher priority elements occlude the lower priority ones by the simple expedient of overwriting them.

Another significant feature is that the software need not be as concerned with the constraints of the raster. It is possible to plot lines directly into the bit map according to their coordinates. On a disk based system, the same act of plotting a curve would require two disk accesses per point, one to read what was currently on the line, and another to rewrite the line with the new point inserted. Therefore, on disk based systems one must sort points into scan order and merge them with other elements in order to avoid excessive disk transfers.

IVAM must fill-in domains after they are outlined. Since the fill-in process requires tracing the curve along scan lines to assure that every point is filled-in, it would appear that scan ordering or a similar process would still be required. However, the bit map memory suggests that a curve can be written into the bit map in the connected order in which it was defined, and then read back in scan order by scanning the memory. If the curve were written out according to the proper discipline, it is possible for an external, very simple processor to scan it and fill in the domain it defines. Multiple curves which do not cross each other, such as contours, can be filled in simultaneously by this method if two bit maps are available; one for the curves and one for the filled-in image.

Another problem simplified by the bit map is alphanumeric placement. While the computer generates all of the elements of an image it knows very little about the image. It is difficult for the computer to determine from the one dimensional arrays how the curves interact in two dimensions and where they leave room for the aesthetic placement of alphanumerics in the vicinity of the feature they label. However, by allowing the computer to read back the two dimensional image the problem becomes much more tractable and, in fact, can be partly implemented in firmware.

A final feature of the assembler design which has software implications is the ability to store separate elements in the different bit planes of a single frame. Thus Bit One could be one element and Bit Two another. This would be useful for animation where often only a single element is moving. Five steps in the animation could be stored in a single frame, while the static information would be stored in a separate bit map. This technique is also useful for storing alphanumeric fonts. A number of different fonts and sizes of characters will be stored in a single frame and then written into the bit maps under firmware and software control.

Tablet System

As identified in the annual report last year, one of the priorities for this year was to be the development of a testbed within which to develop modules which solve the video graphic problems. For this purpose the tablet system was developed. TABSYS provides a very simple structure within which the programmer can generate images. The system is interactive with the programmer generating both input data and commands through the data tablet and receiving prompting from the Adds Terminal and having the option of creating images on either the Adds or the Remote Terminal. The data tablet surface is divided into two areas, one for control input and the other for data input. The control area is further divided into a large number of control blocks, each of which is assigned a unique function. When the programmer touches one of these blocks, he is indicating his desire to execute a particular chain or routines. The system responds with a series of prompts which ask him to specify the arrays to be used, the parameters to be passed to the modules, and the device which is to display the output. The data area of the tablet is divided differently at different times, depending on the function to be executed. In one case it is used to input the points of a curve.

At another, it is used to specify colors.

The Tablet System has provided a context within which to implement the Video Chain Modules. These are the modules required to translate an abstractly defined image element into filled in points on the television screen.

The input to this process is a general image element, such as would be generated by contouring, received from AFOS, or input through the data tablet. These points may be defined in any arbitrary coordinate space and are in no way specific to the raster characteristics of the output display. These points are stored in a single array of alternating Y and X points with the Y points first. The reason we chose to represent these points this way is that a single input is much easier for our dynamic memory allocation to deal with. Within this space there are a number of modules which can be applied to manipulate the element before it is placed within the output space. It can be moved, scaled, rotated, smoothed, or mapped.

An element defined in an input space has no relationship to the display device on which it is to be shown. Therefore, once a device has been chosen, the element must be converted into a form which is consistent with the device characteristics. The module that performs this function is called the Scan Conversion Module. It computes the intersections of the input curve with the output scan lines. Where adjacent input points are widely separated it interpolates the intervening points so the curve cannot cross a scan line without intersecting it. This module also insures that points which scan convert off the screen are deleted from the curve.

The next module, called Prepass, is a very complex one which prepares the curve for the fill-in process. Since the fill-in process proceeds horizontally along scan lines, it is ignorant of whether the curve is turning up or down when it encounters an intersect. Therefore, it is necessary to encode the information about the direction the curve is turning while connected points are still adjacent in the input array. The purpose of Prepass is to preserve connectivity information so that the fill-in routine knows whether it is entering or leaving the domain when it encounters an intersect.

The Prepass function presented a large range of options for the processing and storage of "fill-in ready"image elements. The fact that the assembler cannot be loaded during a presentation means that elements must be stored on disk before they are filled. Therefore, the amount of space required to store an element on the disk becomes important. Our working decision has been to minimize the disk space. Therefore, a decision was made not to force every domain to be defined by a closed curve. With a closed curve the first and the last point would be the same. An example of an open curve would be one which starts and ends at different points along the edge of the screen. One could force it to be closed by creating new points along the edge joining the first and last points. This practice would greatly increase the number of points in any open curve. Another decision was not to include points along horizontal sections of a curve. By saving only the first and last point along a horizontal segment additional storage was saved. Also, a decision was made to try to represent a curve and the domain within it by the same construct. In fact, the curve and the domain are effectively different elements with different priorities in an image. Usually the curve is a higher priority than the domain it encloses. Also, the curve is handled differently during the fill-in process. The curve must be widened both horizontally and vertically during the fill-in process. It must be widened horizontally because the color bandwidth of NTSC video is so low that no color will be seen unless it is several pixels wide. It must be widened vertically because a single horizontal line is refreshed only 30 times a second and appears to flicker. (Two adjacent horizontal lines are integrated by the eye and appear to be refreshed 60 times a second instead of 30.) Since the curve and the domain are filled in differently, they could be represented by different storage formats, doubling the storage required. The decision was made to store only the domain representation and to define a line widening algorithm which could operate on it. It was further decided to allow a single representation to be used whether the fill-in was to be inside the curve or outside the curve. Given all these requirements, PREPASS required some very tricky case logic.

After the PREPASS module has encoded the curve trends at each intersect, it is necessary to order the intersects according to the raster order that will be used during the fill-in. The module which accomplishes this is called LINK SORT which uses link lists to sort the intersects along each scan line. Since there is a separate linked list for each scan line, these lists are very short and can be sorted very quickly, much more quickly than if all of the points were sorted together according to their line and pixel intersects.

Once the intersects are sorted the links are removed by a module called PACK which reduces the space required to half of that required by LINK SORT. The output of PACK is the standard element storage construct which will be used to fill in domains and to widen lines during the assembly process.

After the elements are in PACKED format the FILL-IN module is used to fill in the area enclosed by the curve. This module will ultimately be reduced to hardware or firmware in the output assembler. It receives the PACKED array which has the line intersects in scan order and the information about whether to fill in the curve or the domain encoded at each intersect. The FILL-IN module simply scans through the intersects. At each point it consults the encoded curve information and decides whether to reverse the sign of its domain indicator. When this indicator is positive it fills in until the next intersects; otherwise, it skips the intervening points. By changing the initialization of the domain indicator, the Fill-in routine will fill in all of the points outside the curve, rather than those inside it.

This chain of modules within the Tablet System provides the context required to work on a variety of video image problems. Using the tablet system it is possible to generate a number of image elements, to fill them in with different pixel values, and to widen lines to arbitrary dimensions. It is also possible to select an element on the screen and then change its color assignment by moving the stylus around a color wheel defined on the data tablet. By using the data tablet to generate test data it is possible to subject the modules to worst case inputs and to correct errors that might slip by if we did not consciously try to make them fail.

In order to gain the most realistic experience with commercial video, the IVAM programmers do not see the RGB video their programs generate. Instead, the RGB signals generated by the Digital Terminal are NTSC encoded and RF modulated and then fed into standard commercial black and white and color television sets. This feedback to the IVAM programmers allows observation of the limitations of NTSC video and the problems of black and white compatibility. It vividly portrays the greater luminance bandwidth of green information, the greater chrominance bandwidth of the red. It has also dramatized the need for the pixel clock to be a phaselocked integral multiple of the color subcarrier; otherwise, there is a very annoying color crawl on the screen.

Directory

With the Video Chain problems solved and the modules that implement it completed, the major remaining problem is the definition of the control structures required to coordinate the processing of the IVAM system. In last year's report it was mentioned that the descriptor nets of the previous year had been generalized to include the operation nets and structure nets. It was also mentioned that these descriptors would reference data through the System Directory which was to serve as the point of interface between the Physical and Semantic Operating Systems. This year the decision was made to implement the Directory in terms of the structures that would be required to implement the descriptors. Then the descriptors would just be a part of the Directory. In fact the decision was made to put all IVAM control information in the System Directory.

The Directory includes pointers to all information known to the IVAM System. In general it is implemented as a free structure, although it can also become a directed graph. The Directory has references to all modules in the IVAM system. It knows within which task images the modules are found and on which processors these task images can run. It also has a pointer to the control sequence associated with the module. It has pointers to all permanent and temporary data sets in the system, whether they reside on disk or in crosspoint or dedicated memory. The part of the Directory associated with each of the subordinate processors is subordinate to a single processor node; therefore, to shift its attention from one processor to another it is only necessary to change a single node. Below that node is all of the information pertinent to the instantaneous state of the processor, including the map of its memory showing the distribution of code, data sets, and tree storage.

The Directory is implemented as a large index file where each block can be accessed directly. Each entry in the Directory is defined as an eight word node. The first word indicates the type of node and the last is a LINK which points to associated nodes. The most important node types currently defined are LINK nodes, prompt nodes, and string nodes. The LINK nodes allow a single node to have a number of nodes subordinate to it. For instance, since a task image will contain several modules, a task image node may have several module subordinate nodes. String nodes are used to contain the text used for labelling images and for prompting the user.

Like the Tablet System, the Directory can be interactive; however, unlike the Tablet System it can also operate automatically. Prompt nodes are used initially to request control information from the operator. The text of the request will appear on the ADDS screen and the operator will indicate what module, data set, file, parameter, or processor he desires. However, the prompt nodes can make their request internally. One part of the system can ask another for control information. In this way distinction between interactive and automatic does not exist in the system. At this time the system is completely interactive. However, the interaction will be used to change the Directory to create new prompt nodes which define higher functions in terms of chains of modules. Storyboards are tested and tuned in just this way. Some data sets will be stored in the Directory, whereas others will be discarded at the end of each session.

The Directory, itself, is just a passive entity. It is actually operated on by a relatively small piece of code called the IVAM Controller. The Controller is a simple process which interprets the prompt nodes as code and performs the functions the prompts indicate. The only functions associated with interaction are the command to display a prompt text and the command to read the tablet. All the other functions are internal. Internal prompts place values in the parameter block associated with the processor currently being serviced, or they invoke internal functions which place values into the parameter block. One of the prompt functions causes the execution of a module. It transfers the parameter block into the crosspoint memory associated with the processor and then notifies the processor through the serial line. Part of the parameter block may not be sent. Instead it will be used for communication between prompt nodes that chain a number of modules.

Given the design of the IVAM controller and Directory, the decision was made to divide the IVAM task into a number of completely independent processes, each of which would proceed according to a task queue or task tree stored in the Directory. In each case making a problem into a separate process isolates certain issues which cannot be completely resolved at the moment, and allows progress on those which are completely defined. The first process is the Weather Determination Process which runs at the beginning of each presentation period and uses a small number of weather values to determine which segments should be generated. Making this a separate process allows the implementation to focus on the problem of generating a presentation given a list of segments.

The next process is the AFOS Data Request process which requests pertinent AFOS products as they are scheduled to arrive. The list of products requested does not depend on the current weather situation, but includes all products of conceivable interest to IVAM during the current season. The reason the request list is not dependent on the weather is to allow IVAM to start requesting data as soon as it arrives and not wait until IVAM needs it in order to minimize the load that IVAM places on AFOS. Current data may not be needed during the next presentation, but used later in the day to generate a segment which is appropriate then. The AFOS Request Process leaves AFOS data temporarily on the IVAM disk in AFOS format. This is done to keep the requesting process active and (second) to isolate the Request/reply logic so that its implementation could be postponed until the two systems were physically interfaced.

When a product is received its presence is noted in the Reformatting Queue in the Directory. The Request Process then translates each of the AFOS products into IVAM formats and stores them in IVAM file structures. By making this a separate process it allows the definition of a number of very simple reformatting modules, each of which is specific to one AFOS and one IVAM format.

As the AFOS data is entered in the IVAM Directory the Element Generation Process creates the tree which represents the segments which are to be generated for this presentation and which modules must be applied to which data sets to achieve this. By representing this processing as a tree structure, different processors can work on different elements and elements whose input data has not yet arrived can be postponed while others are processed. The result of this process is a number of image elements in packed format on the disk.

The Assembly Process operates from the Assembly Tree associated with each segment and each frame. As the elements required to produce a particular frame become available the assembly process can start reading them from the disk into the assembler, one element at a time, in order of ascending priority. With each element the Assembler is given instructions to fill it in or to widen the line or both. When the graphic elements are filled in, the alphanumerics are written over them and the completed frame is stored on the Assembler Disk.

The final process is the Display Process which controls the retrieval of frames from the disk, their storage in the refresh RAM's, their colorizing, and special effects for transition between two images.

Subordinate Processors

A Subordinate Processor is either a physical processor such as the LSI-11 or it is the 11/40 running in a separate partition. The implementation of these Subordinate Processors involved many important systems decisions and will be detailed below.

The goal of the Subordinate Processor design is to minimize the overhead associated with the execution of a given task. This overhead takes a number of forms: the time for the Subordinate Processor to stage the execution of a module, the time required for the communication of control information between the Subordinate Processor and the Control Processor, and the space required for the control code resident on the Subordinate Processor. Of comparable importance is the development time required to implement the control code and to inteface any new modules.

The design of the Subordinate Processor software is defined by a number of decisions.

First, the decision was made not to use RSX-11S, the core-only version of the DEC operating system which we acquired from DEC as part of the IVAM Development System. While this system is designed to be code compatible with RSX-11M, its use with the crosspoint system would require more effort than would be saved by its use. "S" assumes the existence of standard system storage and input devices. It is not easily prepared to accept blocks of code which appear suddenly in its memory as is the case with the crosspoints. Also, when the minimum version of "S" was Task Built it required 4K. An additional 2K would be required to provide the device drivers for the DLV-11 serial interface, the output interface and the functions that introduced tasks to the operating system. Since the dedicated memory on the LSI's is 12K the loss of 6K would be significant, especially since 2-4K more would be required for Fortran Library subroutines on those processors running FORTRAN. Finally, experience interfacing to RSX-11M showed that it would be difficult to estimate the time required to incorporate use of RSX-11S.

Therefore, the decision was made to take a path with fewer unknowns. The initiation of modules on the subordinate processors is effected by a very simple controller which relates to the IVAM modules as FORTRAN subroutines and involves them by standard calls. The space required for this controller is on the order of 1K.

The control of I/O devices other than the DLV-11 is considered to be the responsibility of the module using the device.

Communication of control information over the serial line is limited to a single byte, called the Command Byte, which identifies the module to be executed.

This convention minimizes the time delay associated with interprocess or communication. The data and code are to be segregated. The control processor dynamically allocates the data space but not the code space. The reasons for this will be discussed later.

A new entity was created, the Virtual Processor. Because of the nature of RSX-11M it is currently impossible to create a task which requires more than 32K resident memory. However, it is possible to create larger functions by having several tasks communicate with each other through system messages and common partitions. Therefore, the decision was made to divide the IVAM system on the 11/40 into the following entities: The Controller which controls all the IVAM operations, the System Traps which provide the interface to the RSX-11M utilities (particularly the file system), the Virtual Processor which can execute modules, and the Common Partition which is the only part of memory accessible to the others. Communication between the first three entities is extremely restricted, being limited to traps and 13 word system messages. In fact, the relationship between tasks is sufficiently distant as to be analagous to that between separate processors. Given that similarity and the fact that software would be required to effect the intertask communication on the 11/40, the decision was made to make the parallel between a task running on the 11/40 and a task running on an LSI-11 as close as possible. This allows the development and test of LSI-11 images on the 11/40 before the crosspoint hardware is ready and would mean that only one system context has to be created.

The code running on a subordinate processor is a single task image produced by the task builder. It consists of several modules, the IVAM controller code, FORTRAN subroutines, and a few simple utility routines. The operation of the subordinate processor is exceedingly simple. The Control Processor tells it what to do, it does it, and notifies the Control Processor when it is done. It makes no requests of its own, and in no sense is viewed as a user in the system. It is a minion of the Control Process which knows what it is doing and how long it should take. Its operation is broken down into bootstrap, module staging, calling sequence, and module return. While the modules are the same and the operation of the Virtual Processor is exactly parallel to that of an LSI 11, there are differences in implementation which will be detailed later.

The code to run on the LSI-11 will be loaded into crosspoint memory modules and attached to the processor. Included in that code is a block move module which is capable of copying the code from the crosspoint memory into resident memory and transferring control to the controller once it has been moved. This bootstrap code is invoked by a series of characters sent through the DLV11. These characters consist of a BREAK character, followed by the characters of the "GO" command to the microcode version of ODT running on the LSI. At this point the code is copied, a completion character returned, and the LSI is awaiting command. It is in a WAIT state until one is received.

Module Staging

When the Control Processor wants the Subordinate Processor to execute a module, it allocates space in that processor for the input and output data sets and, if necessary, packs the memory to make room for them, using the block move module mentioned above. It also sets aside space for the parameter block to be used in the FORTRAN call. A pointer to this parameter block is stored at a fixed address, the lowest address in either of the crosspoint modules. This pointer contains the relative offset of the parameter block from the address of the pointer, i.e.:

Pointer = Parameter block Address - Pointer Address

The format of the Parameter Block is also in terms of relative offsets from the pointer.

| base of parameter block → | # of parameters |
|---|---|
| | offset of 1st parameter |
| | " " 2nd " |
| | " " " |
| | : |
| | " " Nth " |

Call by value parameters will immediately follow the parameter list and are considered part of it by the Controller.

Once the Parameter Block has been created in the crosspoint, the Control Processor transfers a single byte to the Subordinate. Upon receiving this Command Byte which is the identifier of the module to be executed, the Subordinate controller stores it in its Active Module Variable. It then gets the Parameter Block Pinter from its permanent location and uses it to access the number of parameters stored in the first entry of the Parameter Block. Then for each of the parameter offsets, it adds the address of the Parameter Block Pointer to the parameter offset to compute the physical address of the parameter. The contents of the Parameter Block are now those of the standard FORTRAN call. Since the IVAM modules are either FORTRAN subroutines or assembly routines observing the same conventions, it remains for the Subordinate Controller to generate the actual CALL. It does this by using the module identifier byte as an index into a table of module entry points and going through the standard FORTRAN calling Macro CAL$ - which transfers control to the module.

During its execution the module does not communicate with the Subordinate Controller. Upon completion it returns to the calling point through a standard FORTRAN RETURN. Its communication with the Control Processor is limited to the values that it returns as values in the parameter block. However, this communication is unknown to the Subordinate Controller. All it knows is that the module being executed has run to completion and the Control Processor must be notified of that fact. Notice is served by transmitting the module identifier byte back to the Control Processor. If the byte is other than that expected the Controller knows that an error has occurred.

The knowledge of the module identifier byte is found in the Directory under the node specific to the module, processor and task image. The fact that all of the code running on the Subordinate Processor was bound together by the Task Builder means that all of the linkages between the Subordinate Controller and the IVAM modules are resolved by standard use of the DEC software and represent no development effort. The only issue is the determination of the absolute address of the task image entry which is needed by the bootstrap process.

The Virtual Processor is a software task which resides on the Control Processor and relates to the Controller as an LSI-11. The internal representation of the modules and the calling sequence are exactly the same as with the LSI-11's. In fact the use of relative offsets in the Parameter Block Pointer and the Parameter Block itself is motivated by the constraints of RSX-11M. On the virtual Processor the data area which corresponds to the crosspoints on the LSI-11's is viewed as a Common Partition by RSX-11M. This status allows this memory to be accessed by the Controller, the System Traps, and the Virtual Processor and circumvents the restriction that no single task can occupy more than 32K. However, due to the nature of the Task Builder and the Memory Mapping Unit, it is not possible to guarantee that this Common Partition will occupy the same address space in each of the sharing tasks. Therefore, it is necessary to communicate in terms that have the same meaning to both processors. Each processor knows the address of the Parameter Block Pointer within its own task image. This was provided by the Task Builder. Thus, while each task may have a different opinion about the address of this pointer, they can both reference it and locations a fixed distance from it with confidence.

Since the Virtual Processor is a task which operates in its own partition, RSX-11M provides the tools for bootstrapping it. When the controller wants to execute a particular module in the Virtual Processor, it issues a RUN command which loads the appropriate task image and starts it. When the task image gets control it issues a SEND directive which tells the Control it is running, followed by a RECEIVE directive through which it will receive its Command Byte from the Controller.

After the Command Byte is received, the calling sequence is exactly the same as that used on the LSI-11.

When the module returns to the Virtual Processor Subordinate Controller, it issues a SEND directive which returns the Command Byte to the Controller. It then issues a RECEIVE directive which will accept its next command.

There are several small utility modules on the Subordinate Processors which can be invoked by the Control Processor for housekeeping purposes.

The ECHO Module is simply an "Are you there?" function which the Controller can call to determine the status of the Subordinate Processor. If the ECHO Command Byte is returned, the processor is in a wait state. If another byte is sent back, it is the identifier of the module then running. If no byte is returned in a few milliseconds, the processor is in an illegal state and must be rebooted.

The Block Move module is used to load the dedicated memory of the LSI's and to pack the crosspoint memory in all subordinate processors when it becomes regimented.

The Exit module is used only on the Virtual Processor. It is part of the bootstrap procedure for a new task image. Before RSX11M can run a new task image in the Virtual Processor Partition it must first issue an EXIT to the task that is currently running there. The alternative to this practice would be to have the Virtual Processor EXIT after each module. Then each module execution would require a RUN command and the concomitant disk access. In would also be impossible to group a number of related modules into a single task image. This grouping is one important way of tuning system performance.

Memory allocation for all processors is done by the Controller. The actual moving of data within a Subordinate Processor is done by that Processor using the Block move module, but only under the direct supervision of the Controller. The Subordinate does not know that it is packing memory. It only does what it is told.

Currently the code areas of the Subordinate Processors are not dynamically allocated. It is possible to change LSI code only by loading a different task image. The reason for this constraint is that FORTRAN task images produced by RSX11M are not relocatable and so dynamic allocation is much more difficult. Also, such dynamic allocation does not appear necessary at the present.

However, IVAM is already prepared to allocate memory dynamically and several levels of dynamic allocation are provided for in the current design and will be activated if necessary. First, infrequently used code can be task built to execute from a crosspoint module. Second, the code area of each processor can be partitioned at Task Built time. Thus, the code running in one partition can be replaced by any other code which can run in that space. Fortran code can run only in the space for which it is Task Built. However, by Task Building the same FORTRAN code for several different partitions, it would be possible to get the effect of dynamically assigning partitions. The third level would be to dynamically allocate the assembly code which is relocatable.

Maps

A final issue is the handling of maps within the IVAM system. To the extent that maps are simply overlaid on satellite pictures or plotted as background in graphic images their use in IVAM is very similar to that in McIDAS. IVAM has the ability to request an arbitrary latitude-longitude window from the U.S. grid and to display it on the screen. However, all points on IVAM grids are 2x2 pixels to reduce flicker. In addition, IVAM has the desire to fill in state and national areas as well as to color lakes and oceans differently. Therefore, IVAM is creating a series of state map files. Each of these files will include the points needed to plot the boundary of a single state. These points will be ordered so the boundary is a single connected line. all rivers and lakes will be stored in a separate file. Also, all detail which might confuse the fill in algorithms is edited out. The fill in process cannot fill in a curve which crosses itself. The maps for the U.S. outline are being separated first and will be followed by a few of the states. The lakes and rivers will be done last.

Software Status

| | % Completed |
|---|---|
| RSX11/M Interface | 100% |
| IVAM Modules | 90% |
| Video Chain | 90% |
| Directory | 30% |

# IV. HARDWARE CONCEPT STUDIES

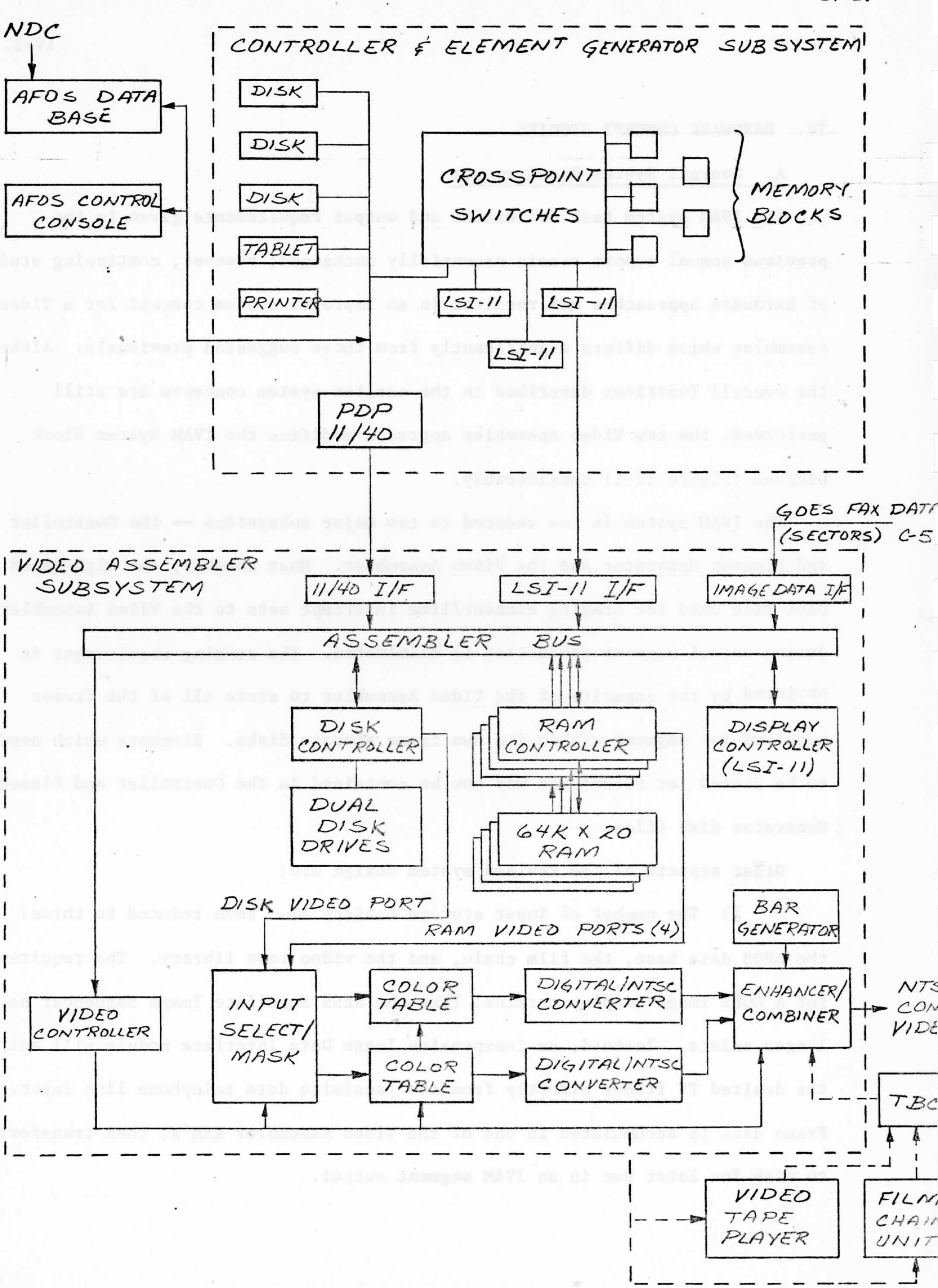
## A. Overall System Requirements

The IVAM system task definition and output requirements given in the previous annual report remain essentially unchanged; however, continuing study of hardware approaches has resulted in an improved system concept for a Video Assembler which differs significantly from those suggested previously. Although the overall functions described in the earlier system concepts are still performed, the new Video Assembler approach modifies the IVAM System Block Diagram (Figure IV-1) considerably.

The IVAM system is now reduced to two major subsystems -- the Controller and Element Generator and the Video Assembler. Most notably, the high-speed Disk File used for staging element/line intercept sets to the Video Assembler during actual segment production is eliminated. The staging requirement is obviated by the capacity of the Video Assembler to store all of the frames required for segment within its own frame storage disks. Elements which need to be stored for future use may now be contained in the Controller and Element Generator disk files.

Other aspects of the revised system design are:

1) The number of input storage devices has been reduced to three: the AFOS data base, the film chain, and the video tape library. The requirement for a GOES image display terminal like the NESS Satellite Image Sequencer no longer exists. Instead, an inexpensive Image Data Interface module will extract the desired TV frames directly from the facsimile data telephone line input. Frame data is accumulated in one of the Video Assembler RAM's, then transferred to disk for later use in an IVAM segment output.




IVAM SYSTEM BLOCK DIAGRAM

FIGURE IV - 1

2) The PDP-11/40 Controller need not perform real-time (i.e., frame-by-frame) control of the Video Assembler operation during segment presentation. Functions such as element combining and prioritizing, line widening, fill-in, and alphanumeric insertion are all performed in advance of the segment display, so that all frames required for the segment are fully assembled and "ready-to-go" from disk. Instructions for the segment presentation sequence, prepared by the 11/40 System Controller, are transferred to, and executed by the Display Controller.

3) The Video Assembler subsystem has two distinct and mutually exclusive operating modes -- assembly and display. In the assembly mode, it is controlled by the IVAM Controller and its RAM's and RAM controllers are utilized to assemble frames in the following manner:

a) Image elements are loaded to RAM from the Element Generator.

b) The RAM controllers, containing bit-slice processors, rapidly execute simple algorithms to perform the functions of element translation, line widening, fill-in, and combining, usually in the course of RAM-to-RAM transfers. For simple graphics, such as would be used for image data overlays, the RAM's may be operated as independent bit-plane memories so that up to five such graphics may be stored in a single RAM or disk frame.

c) Alphanumeric fonts, stored on the Video Assembler disks, are transferred to RAM and characters from the font are combined, in the same manner as any other image element, to a frame being assembled. Alternately, a separate alphanumerics frame may be composed for instances where the same alphanumerics are displayed over several different image data or IVAM-generated graphics frames. For variable location alphanumerics, the RAM area of interest is first read to the System Controller, so that the placement algorithm may be applied before characters are inserted into a frame.

d) Upon completion of frame assembly, or the ingestion of a frame of image data, the frame is transferred to disk. The System Controller maintains the directory of the Video Assembler disk contents.

e) A color table (the assignment of colors to pixel values in the frame data) is written to disk in the vertical interval of the first frame of a segment, using the table. Alternatively, and principally useful during system development, the color tables may be written to and applied from the Display Controller memory.

f) The instructions for display of the prepared segment are loaded to the Display Controller memory. These instructions are executed on command from the System Controller.

In the display mode, the contents of all RAM's and the addressed disk frame are always available to the Input Selector as time-base corrected digital video. The operations performed during the display made are:

a) Transfer data from disk to any selected RAM. This operation may be performed concurrently with displaying data from the disk.

b) Select video port inputs to each video channel and mask bits.

c) Load color tables

d) Select new disk frame address

e) Select video source to Enhancer/Combiner

f) Initiate fade-in, fade-out, cross-fade or wipes by Enhancer/ Combiner, or keyed wipes by counter-driven inputs to the Color Table memories

g) Apply VTR and Film Chain control signals.

Operations a) through e) may be performed on a frame-by-frame basis, which provides an extremely powerful set of display capabilities, including: (1) animation on a frame-by-frame basis, (2) crossfades between indefinitely long sequences of image data frames (each with its individual graphic overlay) as fast as 15 frames per second, (3) texturing, scintillations, and keyed wipes.

B. Input Interfaces

The IVAM system is planned to interface with up to four input data sources -- AFOS, CDDS Sectorizer lines, a video tape player, and a film chain. AFOS will interface with the System Controller; the other sources will be interfaced to the Video Assembler.

1. AFOS Interface

Of the several hardware interface possibilities considered for AFOS in the previous report, the method of choice is the interface with the AFOS graphics bus. This interface, simulating an AFOS display terminal, provides adequate bandwidth for IVAM needs. If coupled with a "request only" mode of IVAM operation, this interface should introduce a negligible impact on AFOS system operation or software in the initial stages of IVAM Development Prototype testing. No development work has yet been undertaken for a PDP-11/40 interface module which meets the AFOS graphics bus specifications.

2. CDDS Interface

The CDDS line, providing sectorized GOES image data in facsimile format, will interface to an Image Data input module on the Video Assembler bus.

The capability of the Video Assembler disks to store over 800 frames of TV data affords the capacity to store all of the image data required for segment productions. An external system to provide storage and TV output of satellite image data is no longer needed. Other advantages which result from this approach are:

a) A simpler interface, consisting of the telephone fax line only. There are no problems of synchronization and control of an external image data TV display terminal.

b) The image data is always accessible to the IVAM Controller and, therefore, allows generation of cloud graphics from the data.

The Image Data interface is a low-cost, microprocessor-controlled module which receives, demodulates and digitizes the image data, and resectorizes the data to a 512 x 512, 5-bit pixel format for TV display. It is functionally similar to the Fax Receiver and Sectorizer subsystems of the Satellite Image Sequencer developed for NESS, but the system design has been improved to: (1) allow multiple TV frames with the same or different resolutions to be extracted from each sector input, (2) provide continuous AGC control, and (3) provide more accurate lock to the fax data line starts to yield improved frame-to-frame data registration.

3. Tape Recorder and Film Chain Interfaces

Film and tape pre-recorded video will be fed directly to the Enhancer/Combiner output module of the Video Assembler to be directly outputted without processing by the IVAM system. A single time-base corrector is used to correct the video from either of these sources.

Both the film and tape units must be capable of single-frame edit, so these outputs may be merged precisely with IVAM-generated video. Control signals for these units will be supplied from the Video Controller, in the video output section of the Video Assembler.

C. System Configuration Design

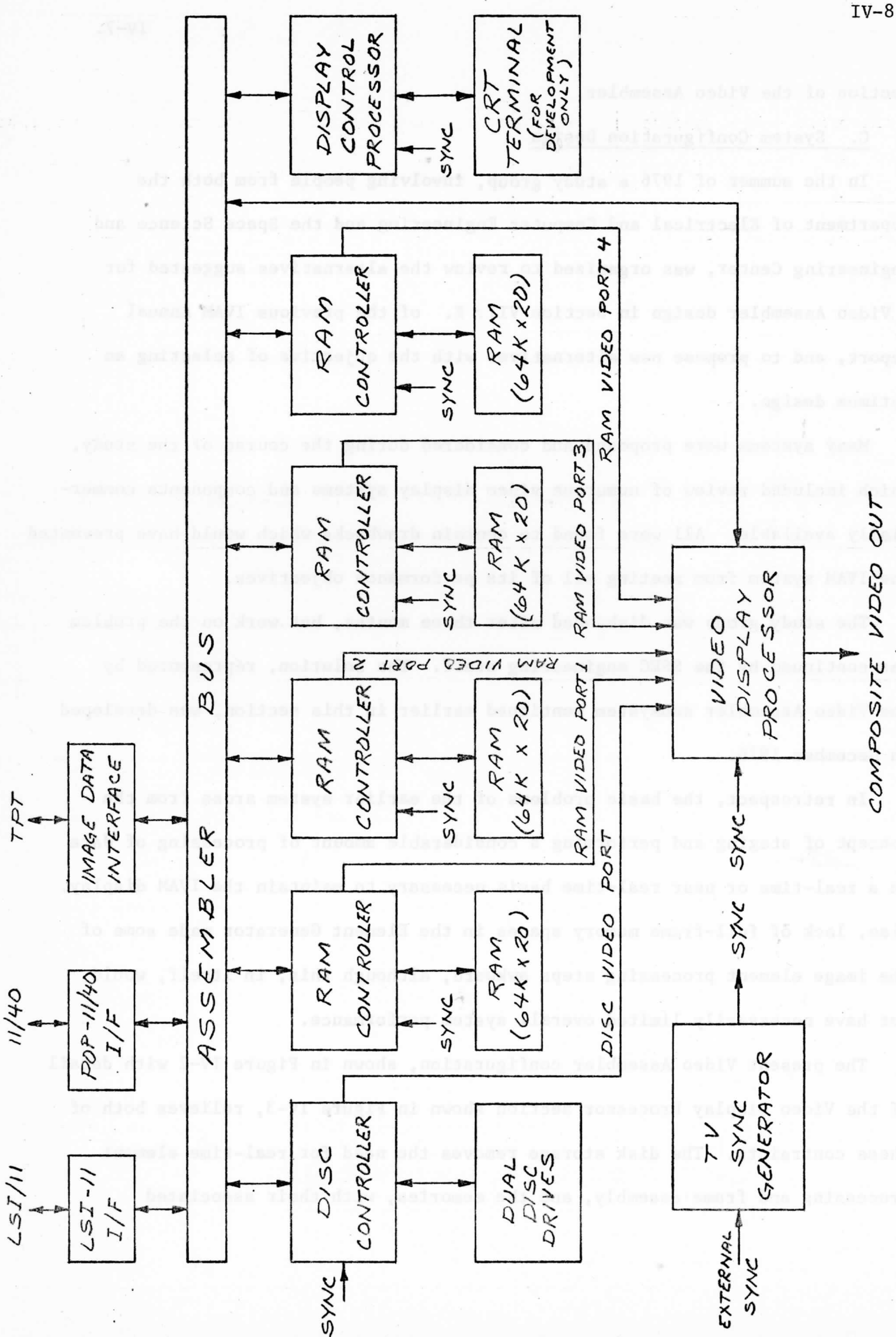
In the summer of 1976 a study group, involving people from both the Department of Electrical and Computer Engineering and the Space Science and Engineering Center, was organized to review the alternatives suggested for a Video Assembler design in Section VII. E. of the previous IVAM Annual Report, and to propose new alternatives with the objective of selecting an optimum design.

Many systems were proposed and considered during the course of the study, which included review of numerous video display systems and components commercially available. All were found to contain drawbacks which would have prevented the IVAM system from meeting all of its performance objectives.

The study group was disbanded after three months, but work on the problem was continued by the SSEC engineering staff. The solution, represented by the Video Assembler subsystem mentioned earlier in this section, was developed in December 1976.

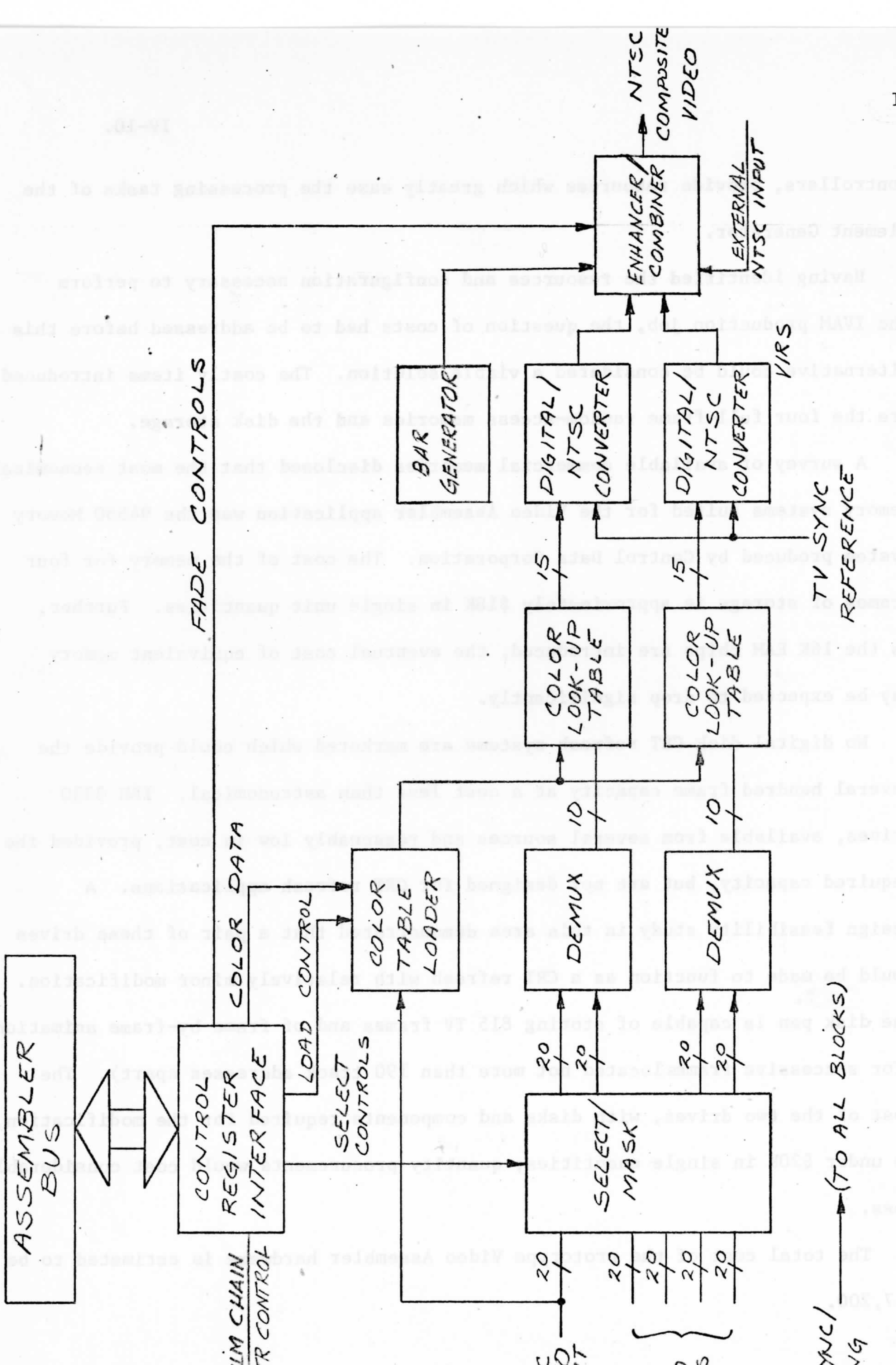
In retrospect, the basic problems of the earlier system arose from the concept of staging and performing a considerable amount of processing of data on a real-time or near real-time basis necessary to maintain the IVAM display. Also, lack of full-frame memory spaces in the Element Generator made some of the image element processing steps awkward, although this, in itself, would not have necessarily limited overall system performance.

The present Video Assembler configuration, shown in Figure IV-2 with detail of the Video Display Processor section shown in Figure IV-3, relieves both of these contraints. The disk storage removes the need for real-time element processing and frame assembly, and the memories, with their associated




IVAM VIDEO ASSEMBLER BLOCK DIAGRAM

FIGURE IV-2




IVAM VIDEO ASSEMBLER

VIDEO DISPLAY PROCESSOR BLOCK DIAGRAM

FIGURE IV-3

controllers, provide resources which greatly ease the processing tasks of the Element Generator.

Having identified the resources and configuration necessary to perform the IVAM production job, the question of costs had to be addressed before this alternative could be considered a viable solution. The costly items introduced are the four full-frame random-access memories and the disk storage.

A survey of available commercial memories disclosed that the most economical memory systems suited for the Video Assembler application was the 94550 Memory System produced by Control Data Corporation. The cost of the memory for four frames of storage is approximately $18K in single unit quantities. Further, as the 16K RAM chips are introduced, the eventual cost of equivalent memory may be expected to drop significantly.

No digital disk CRT refresh systems are marketed which could provide the several hundred frame capacity at a cost less than astronomical. IBM 3330 drives, available from several sources and reasonably low in cost, provided the required capacity, but are not designed for CRT refresh applications. A design feasibility study in this area demonstrated that a pair of these drives could be made to function as a CRT refresh with relatively minor modification. The disk pan is capable of storing 815 TV frames and of frame-by-frame animation (for successive frames located not more than 190 track addresses apart). The cost of the two drives, with disks and components required for the modification, is under $20K in single quantities; quantity procurements would cost considerably less.

The total cost of the prototype Video Assembler hardware is estimated to be $57,200.

## D. Development System Configuration

The IVAM Development System, shown in Figure IV-4, is intended for software development and demonstration. The categories of equipment indicated in the figure are:

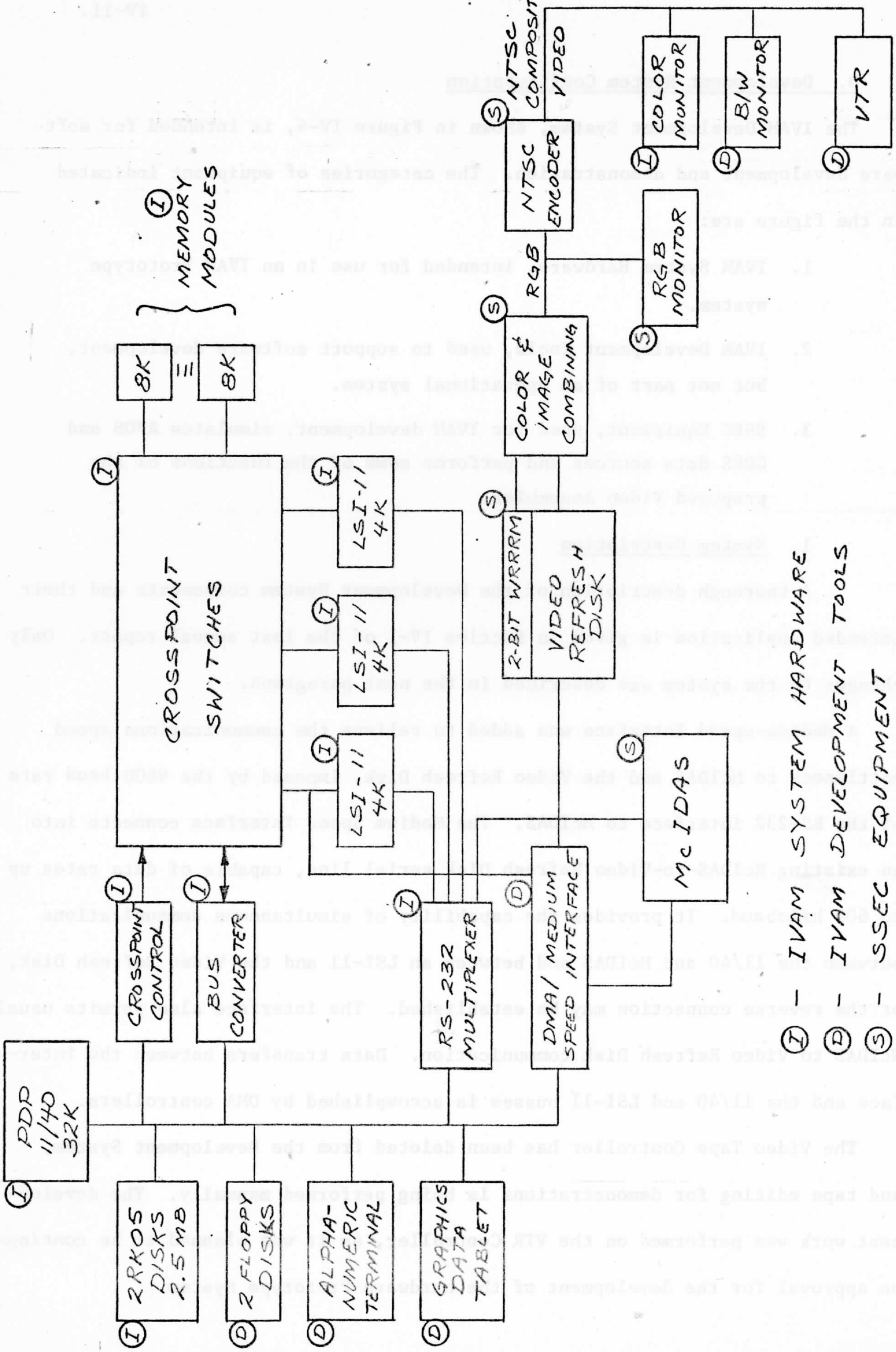
1. IVAM System Hardware, intended for use in an IVAM Prototype system.
2. IVAM Development Tools, used to support software development, but not part of an operational system.
3. SSEC Equipment, used for IVAM development, simulates AFOS and GOES data sources and performs some of the functions of the proposed Video Assembler.

### 1. System Description

A thorough description of the Development System components and their intended application is given in Section IV-I of the last annual report. Only changes to the system are described in the next paragraph.

A Medium-speed Interface was added to relieve the communications speed bottleneck to McIDAS and the Video Refresh Disk, imposed by the 9600 baud rate of the RS-232 interface to McIDAS. The Medium Speed Interface connects into an existing McIDAS-to-Video Refresh Disk serial line, capable of data rates up to 600 kilobaud. It provides the capability of simultaneous communications between the 11/40 and McIDAS and between an LSI-11 and the Video Refresh Disk, or the reverse connection may be established. The interface also permits usual McIDAS to Video Refresh Disk communication. Data transfers between the interface and the 11/40 and LSI-11 busses is accomplished by DMA controllers.

The Video Tape Controller has been deleted from the Development System, and tape editing for demonstrations is being performed manually. The development work was performed on the VTR Controller, as it was planned to be contingent on approval for the development of the hardware Prototype System.




IVAM DEVELOPMENT SYSTEM

FIGURE IV-4

2. <u>System Status</u>

The Development System depicted in Figure IV-4 is fully assembled and operational, except for the crosspoint system, which requires plug-in and checkout of the Crosspoint Controller and Crosspoint Switching cards. It is expected that this work will be completed before August 1977. Crosspoint Memories, however, are being used to increase the 11/40 memory resources in the interim.

Defects are present in the video outputs of both the Video Refresh Disk and WRRRM. Work is in progress to correct the Disk System defects which should be completed before June 15. Correction of the WRRRM defects is contingent upon receipt of replacement memory IC's.

## V. OUTPUT DISTRIBUTION STUDY

Prior to last year's annual report, IVAM's distribution was based on approximately 24 WSFO's for feeding the media. During the last year there has been discussion of more WSFO's with IVAM installation, possibly all of them. A greater number of IVAM installations relaxes problems in several respects; it allows more hook-ups and provides the capacity for more locally specific programming, which is particularly helpful for cable TV.

### A. Broadcast Network Distribution

The need to refine the selection of WSFO's for IVAM distribution has been relaxed by the likely increase of installations. For broadcast network TV, distribution of IVAM data was feasible but constrained with 24 stations. Now, with roughly one per state, the distribution is better in two ways. First, programming at an installation is required for only half the populace (on the average) and the reduced geographical coverage provides both more specifically useful segments and narrower area of interest. Second, transmission via network channel feeds (as described in previous reports) can be made much simpler in routing and timing.

Interconnections for video transmission are growing rapidly within metropolitan areas, and make generous use of a mixture of coaxial cable, microwave relay, and satellite relay. The possibility of more IVAM installations, increased broadband communication, and motivation for using the IVAM product as demonstrated by the advisory weathercaster committee will provide a straightforward solution to the distribution applications for network broadcast TV.

B. Cable TV Distribution

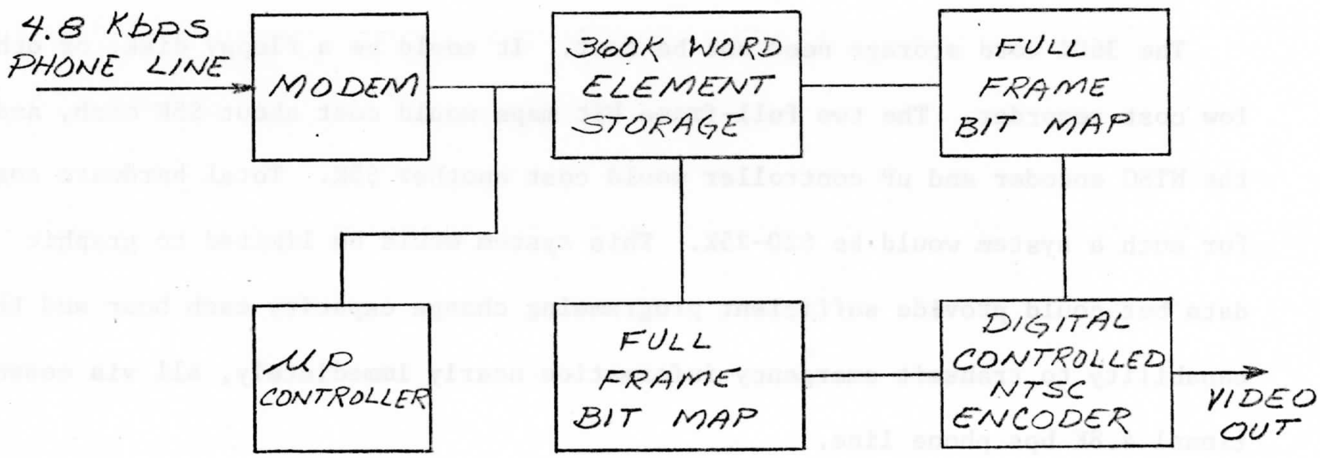
Inter-city connection of cable companies continues to grow, as well as cable "networks" who are hungry for programming. Microwave and satellite links are continuing to multiply and interconnection of cable companies is beginning to be much more of an industry than isolated instances of local solutions. The specific plan for each locale and sometimes each station must still be addressed individually, but patterns are beginning to develop for general classes of interconnection.

The second great step in technology growth, data manipulation, provides a great variety of new capabilities, having to do mainly with storage and processing of data at the receiving end of data transmission. This, of course, allows significant use of "low bandwidth" transmission. The content and format of data as it is processed through the IVAM video assembler suggests certain specific modes for low bandwidth transmission.

C. Low Bandwidth Transmission

The most compact format of graphical data in IVAM exists as "image elements" in the video assembler. A typical image element is typically 2K words in size. An image may consist of up to about 10 elements, half of which are data dependent. (The other half are "constant" for the picture and may consist of map data, annotation of titles, other basic format data.)

Assuming a 5 element picture x 2K/el = 10K words, or 160K bits, this means that all data required for a picture (or picture update) could be sent in 30 seconds on a 4.8K bps typical phone line. This scheme, of course, would require a certain amount of "smart" processing at the receiving end. See Figure V-1.




BLOCK DIAGRAM OF RECEPTION SCHEME FOR LOW BANDWITH TRANSMISSION

FIGURE V-1

Assuming three minutes of a five minute cyclical program must be updated each hour and that each frame has an average dwell of 10 seconds, 18 frames total would need to be handled. Element storage, at 10 elements per frame, would amount to 180 elements or 360K words. Of the 180 elements, only 90 are dependent on changing data, which means a complete update of all segment information can be done in 45 minutes. This scheme is not restricted to updating only new data information, but new segments can be programmed directly. In addition, during emergency conditions, alphanumeric data can be transmitted within seconds for warning.

The 360K word storage need not be fast. It could be a floppy disk, or other low cost recorder. The two full-frame bit maps would cost about $5K each, and the NTSC encoder and μP controller would cost another $5K. Total hardware cost for such a system would be $20-25K. This system would be limited to graphic data but could provide sufficient programming change capacity each hour and the capability to transmit emergency information nearly immediately, all via conventional 4.8K bps phone line.

Additional engineering work may reveal a better approach, but a distribution system for cable TV outlets <u>anywhere in the country</u> with adequate capacity and reasonable cost is feasible at this time.

# VI. FUTURE IVAM EFFORT

## A. Introduction

The major area of effort for the balance of the contract will be completion of the software. Scheduling of the video modules, directory system, and the general operating system are the key items, followed by a thorough documentation package.

The second major task will be to expand and complete the study of distribution to cable TV. The total range of data communication bandwidth from video to ordinary phone line will be covered.

While the hardware system configuration has been designed and its feasibility determined, a more complete determination of system details is needed to define the reliability-cost options and complete the system performance specification.

The organization of presentation content has been well established and effort in that area will consist mainly of documentation and determination of constraints and considerations for automatic selection of presentation contents by the system. Also included will be completion of the suitability of graphically-presented satellite pictures.

## B. Software Development

The immediate goal of the IVAM software development is completing the implementation of the IVAM System Directory and the IVAM Controller which operates on it.

The Directory is being implemented in two phases. The first is a bootstrap phase which sketches all system functions at a rudimentary level. This level is limited to core only operation; however, it provides the tool which will be used to implement additional features during the second phase of development.

The Directory will initially have knowledge of modules, data sets and command chains which are preloaded into core. It will be capable of allocating space for temporary data sets which it creates. The Directory will require the implementation of a Subordinate Controller to run on the Virtual Processor. It will be used to bootstrap expanded capabilities and to extend its scope to include disk information and multiple processors. The first such extension will be to create a large repertoire of module task images which can be run on the Virtual Processor at the Controller's request. Then permanent and dynamically created disk files will be added.

The Directory is defined in terms of very flexible structures which will be used to implement the control structures used by the other IVAM processes. Among these structures will be the IVAM time-of-day schedule, the AFOS request Queue, the Reformatting Queue, the Element Generation Dependency Structure, and the Assembly Queue. In addition, the Image Formats, Segment Definitions, and IVAM Data Files will be described using the Directory.

These structures will be used to support the operation of the IVAM processes, first on a single processor and then on a multiprocessor basis. All memory allocation and process status will be expressed in tree structures defined under the Directory. After these features are running the IVAM System will be complete.

The System will be documented at several levels. At the lowest level the IVAM modules will be described in terms of input and output data formats and calling parameters. The operation of the module will be described, along with its function within the system. Flowcharts will be provided where the complexity of the algorithm requires their use for explication. In all cases heavily commented listings will be included in the documentation. A description of the operating system and device primitives upon which our implementation rests will be provided.

The Directory and Controller will be documented, both according to how they are implemented and how they are used to provide more complex functions. Each of the IVAM processes described in the software effort will be detailed according to their input and output formats as well as flow of control.

The IVAM data structures will be described, as well as the reformatting modules required to translate AFOS products into their IVAM representation. This will complete the documentation of the IVAM System as required under contract. In addition, a discussion of field implementation alternatives will be included. This section will consider the steps required to implement IVAM on another processor and the impact of differing modes of system operation and output assembler designs on IVAM processing flow. Finally, there will be a discussion of the procedures required to SYSGEN on IVAM installation for a specific locale.

C. Distribution System

Effort for IVAM distribution to broadcast network TV stations has been well identified in the past, and some possibilities for distribution to cable TV have been discussed. Effort, for the balance of the contract, will be to identify as specifically as possible the range of options available for dissemination of IVAM data to the cable TV companies. Less-than-video bandwidth will be studied in conjunction with formats of data and images available at different stages within the IVAM assembler subsystem. A set of several representative cable companies will be contacted, and distribution problems they would have will be examined in detail.

D. Hardware Design

Functional requirements of the system blocks and the System Performance Specification will be completed. Choices of hardware for implementation are dependent on a rapidly changing state-of-the-art and cannot be optionally determined until a go-ahead is directed for fabrication. However, a trade-off of cost-performance-reliability will be made, based on current device capabilities and costs.

E. Presentation Content and Evaluation

The concept of segment determination of TV weather presentation has been well established during the last two years of IVAM study. The range of contents and issues of presentation have been identified and defined in the output segment specification. Plans for the completion of this task will include the continued production of representative segments for evaluation by the IVAM Weathercasters Committee and refinement of the segment list. Classification of weather situations and the automatic selection of segment process, based on the situation, will be a significant portion of this task.

Work will also be completed on effects of graphical representation of satellite pictures and demonstration video tape will be delivered to NWS and NESS for evaluation.

F. Program Wrap-up

A final report will be delivered, which will include results of all studies performed during the entire contract period. All specifications written during the contract will be delivered. In addition, work will begin in late calendar 1977 to prepare all software documentation required in the work statement, including: narrative description of programs, functional flowcharts, source listings with comments, and test programs. All studies and software development are expected to be complete by January 1, 1978, with documentation complete by March 31, 1978.

IVAM ANNUAL REPORT

JUNE 1977

APPENDIX A

Output Segment Specification

REVISIONS

| LTR. | DESCRIPTION | DATE | APPROVED |
| --- | --- | --- | --- |
| | | | |

THE UNIVERSITY OF WISCONSIN

SPACE SCIENCE & ENGINEERING CENTER

MADISON, WISCONSIN

TITLE

IVAM Output Segment Specification

| SCALE | DRAFTSMAN DATE | CHECKER DATE | ENGINEER DATE |
| --- | --- | --- | --- |
| NEXT HIGHER ASSEMBLY | PRODUCT ASSURANCE DATE | PROJECT APPROVAL DATE | |
| PROJECT NO. | SIZE | SHEET OF | DRAWING NO. 3100-0008 |

Dwg No. 3100-0008

# IVAM Output Segment Spec

## I. Scope

This document describes the output of the IVAM system as segments required and descriptions of segments in terms of:

Header Sheets
Story Boards
Elements Used
Data Sources Required

## II. Applicable Documents

tbd

III. Definitions

The following terms and definitions will apply to this document and all other documents describing IVAM output.

Segment - The basic unit of TV output from IVAM, lasting for approximately 15-30 seconds, and conveying a complete message of weather information for the end user.

Image - A complete TV picture, including all lines, curves, A/N's, colors, etc.

Element (Image Element) - A line or set of lines which represents one color in an image. An element is analogous to the outline of a figure on a single-color acetate overlay as used in film animation.

Scan Line (TV line) - A horizontal line of modulated color and luminance value used to "draw" a TV picture. IVAM will produce 512 scan lines per TV picture.

Pixel (Picture Element) - A single "mosaic" unit which is used to describe an IVAM TV picture. Each scan line is a horizontal row of 512 pixels. The "physical display shape" of each pixel is represented by a horizontal dimension which is approximately 4/3's the size of a scan line. This is necessary to preserve element aspect ratio within the 4:3 aspect ratio of the conventional TV display raster.

Frame (TV frame) - A TV frame is a complete set of scan lines which represents an IVAM image. A TV frame is produced approximately every 1/30 second, and is comprised of 512 scan lines each made up of 512 pixels, or $(512)^2$ pixels per frame.

Dissolve (cross-fade) - A dissolve is the combining of two images in successive frames, one decreasing in dominance and the other increasing in dominance, such that the result is a transition from the first image to the second.

Fade-in - A succession of frames from a neutral or background image to a new image by increasing the dominance of the new image. The fade-in may be used for the entire image or only certain elements of it.

Fade-out - The reverse of a fade-in.

Cut - An abrupt change from one image to another image for frames adjacent in time. A cut may apply to elements of the image or the whole image.

Pop - A cut which includes one or more frames of neutral or background between images.

Header Sheet - A form which lists the parametric needs of a segment.

Storyboard - The visual description requirements of a segment.

## IV. Segment Standards

### IV-1. Segment Formats

All segments shall have a standard format outline which consists of the sequence shown in the timing diagram, Figure IV-1.

#### IV-1.1. Beginning-of-Segment Fade-in

Each segment shall begin with a two (2) second duration of fade-in from neutral to full image. The image used for this fade-in shall be the same image used for the following dwell. Note: The Fade-in is NOT REQUIRED FOR EMERGENCY SEGMENTS.

#### IV-1.2. Orientation Dwell

A dwell of at least three (3) seconds duration is required to orient the viewer to the segment message.

#### IV-1.3 Message Portion

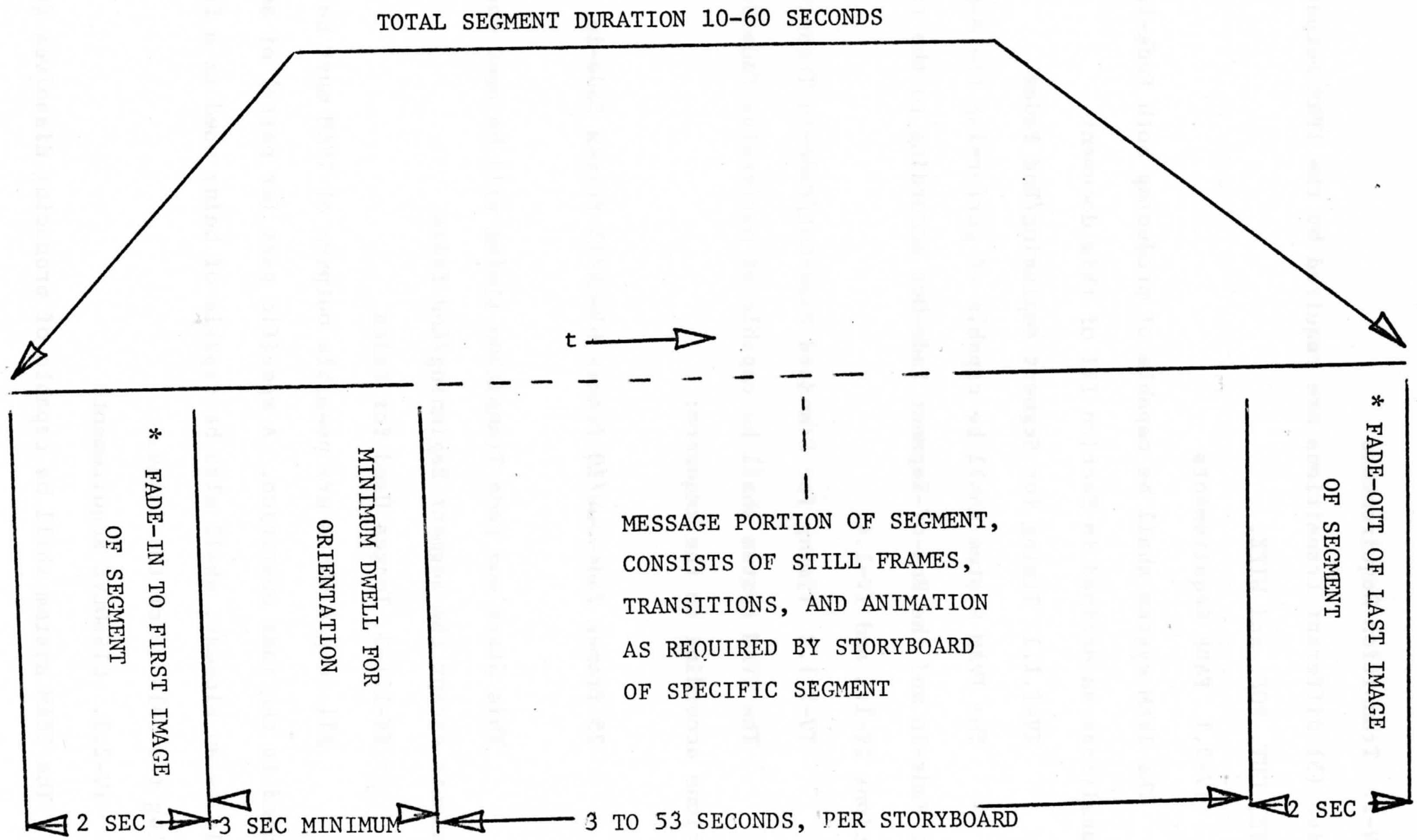
The storyboard of each segment completely describes the message portion of the segment in terms of timing and visual format. The only variation in the segment output is that which is due to the value of source data. For example, a segment showing contours of temperature <u>will always</u> show temperature contours, the only variation being the location of contours depending on the value of input temperature data.

#### IV-1.4 End-of-Segment Fade-Out

Each segment shall end with a two (2) second duration fade-out of the last message image to neutral background. Note: The End-of-Segment Fade-Out is NOT REQUIRED FOR EMERGENCY SEGMENTS.

#### IV-1.5 Segment Overlap Requirements

Luminance values of the Beginning-of-Segment Fade-in and End-of-Segment Fade-out shall be such that, by apprpriate recording at a receiving TV studio, those two fades can be overlapped for the purpose of creating a dissolve between different segments.




SEGMENT TIMING DIAGRAM

FIGURE IV-1.

* The Fade-In/Fade-Out Requirements Are Waived for Emergency Segments

IV-2. Transition Requirements

Five (5) different transitions are required by the IVAM output: FADE, DISSOLVE, CUT, POP, and WIPE.

IV-2.1 FADE Requirements

The IVAM system shall be capable of producing both Fade-In and Fade-Out transitions as defined in Section III of this document.

IV-2.1.1 Timing for Segment Beginning/End Fades

The IVAM System shall be capable of performing the Beginning-of-Segment Fade-In and the End-of-Segment Fade-Out according to the timing specified in Sections IV-1.1 and IV-1.4.

IV-2.1.2 Timing for Standard Fade-Out/Fade-In Transitions

The IVAM system shall be capable of performing Fade-Out/Fade-in transitions according to the sequence:

25 frames fade-out/10 frames blank/25 frames fade-in

This Start and Fade Transition timing will be used for all fade requirements except the Segment Beginning/End fades.

IV-2.1.3 Images Used for Fades

All images which are possible outputs of IVAM must be capable of being used in the fade operation. A specific part (or parts) of an image, identifiable as an element, shall also be capable of being used as a fade, without affecting the balance of the image.

IV-2.2. DISSOLVE Requirements

The IVAM system shall be capable of producing dissolves (cross-fades) as defined in Section III.

IV-2.2.1 Dissolve Timing

The IVAM system shall be capable of producing a standard dissolve, which requires 60 frames (2 seconds) for a complete transition.

IV-2.2.2 Images Used in Dissolves

All images which are possible output of IVAM must be capable of being used for beginning and/or ending images of a dissolve transition.

IV-2.3 CUT Requirements

The IVAM system shall be capable of producing CUT's as defined in Section III.

IV-2.3.1 Images Used in Cuts

The IVAM System shall be capable of producing a CUT between any two images available as IVAM output. The system shall also be capable of providing cuts between individual elements of an image.

IV-2.4 POP Requirements

The IVAM system shall be capable of producing POP's as defined in Section III.

IV-2.4.1 Timing for POP Transitions

The IVAM system shall be capable of producing the standard POP, as described by:

Image/10 frame blank/Image

IV-2.4.2 Images used for POP Transitions

All images which are possible outputs shall be capable of being used in POP transitions. The system shall also be capable of producing POP's of elements within an image without affecting the balance of the image.

IV-2.5 WIPE Transitions

The IVAM system shall be capable of providing WIPE transitions as defined in Section III.

IV-2.5.1 WIPE Styles

The standard WIPE for the IVAM system shall be the straight horizontal wipe of a vertical line from left to right.

IV-2.5.2 WIPE Timing

The standard WIPE between images shall have a time duration of one second (30 frames) for a full transition.

V. Segment Description

This section lists all specific details of each segment. Data is organized in a group for each segment, according to the following order:

Segment Header Sheet

Storyboard

Element List, indicating order, timing, data source

The segments are listed in numerical order. The number of each segment is used for identification purposes only. It has no significance such as frequency of use or importance.

VI. Element List

This section includes the list of all elements used or needed by IVAM, element number, description, projection, scale, data source, and time range of data.

TABLE VI-1 ELEMENT LIST

| | No. | DESCRIPTION | PROJECTION | SCALE | DATA SOURCE | TIME RANGE | |
|---|---|---|---|---|---|---|---|

SEGMENT HEADER

SEGMENT NUMBER 1

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X Broadcast X Both X

SEASON Winter X Spring X Summer ______ Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS (ALL) This is an optional use segment (nonessential information) used by discretion of weathercaster.

WEATHER PARAMETER(S) Degree-Days -- HEATING

TIME REFERENCE Past (incl. present) 24-72 hrs. Prediction ______

SCALE National ______ Regional ______ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Probably not fed in SE or SW states

***************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) General public, oil dealers - for energy consumption accounting

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique segment -- also rather complex for general understanding, and should, therefore, be used alone; not in combination.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Previous degree-day totals: 1, 2, and 3 days past (number of degrees -- mean temperature of day in question is under $65^{o}$)

FORMAT OF SEGMENT (scale, background, foreground, duration, etc) Bar graph with days of week at bottom of bars; degree days vertically. Space bars, and add annotation for seasonal total and monthly total. Bars should be solid (filled in) and could appear on screen in sequence, oldest first. Segment length is probably about 15 seconds

See future degree days (segment probably to run back to back with this one) and also growing degree days for agriculture. ALSO see cooling degree days segment.

***************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Archived fax and teletype data on high and low temperatures last 72 hours. Computer to take mean temperature and subtract from $65^{o}$ before displaying data.

SHEET ①

PROD.

DATE 11/1/76

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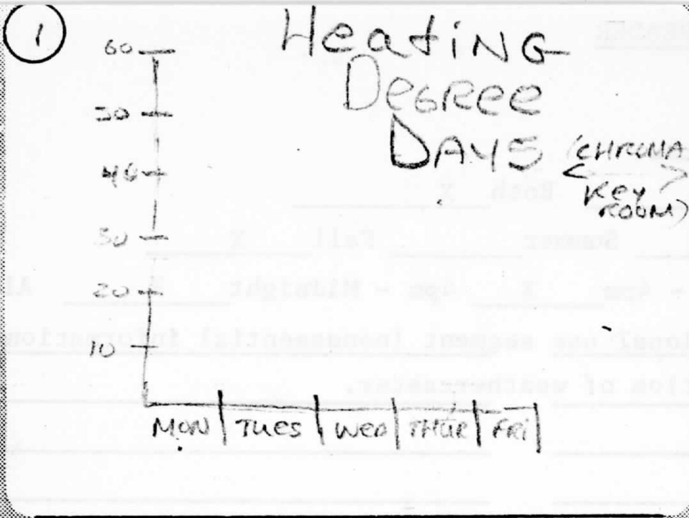
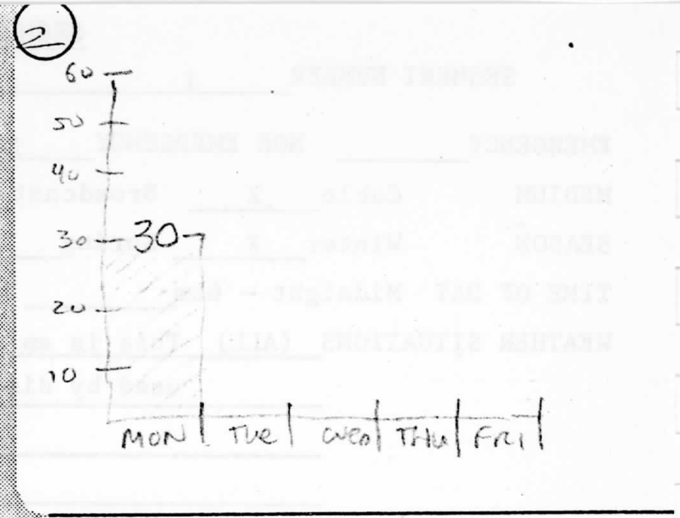
①



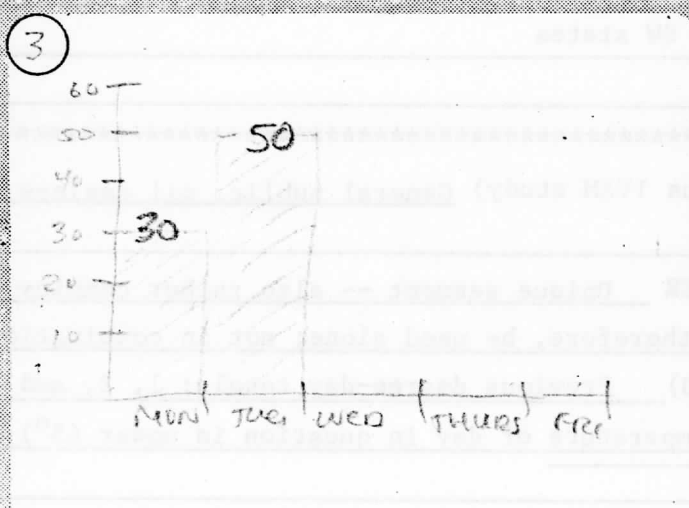

Colors: LIGHT PINK BG, PURPLE GRAPH AND ANNOTATION, RED TITLE. FADE UP ON THIS FRAME FOR 3 sec.

②



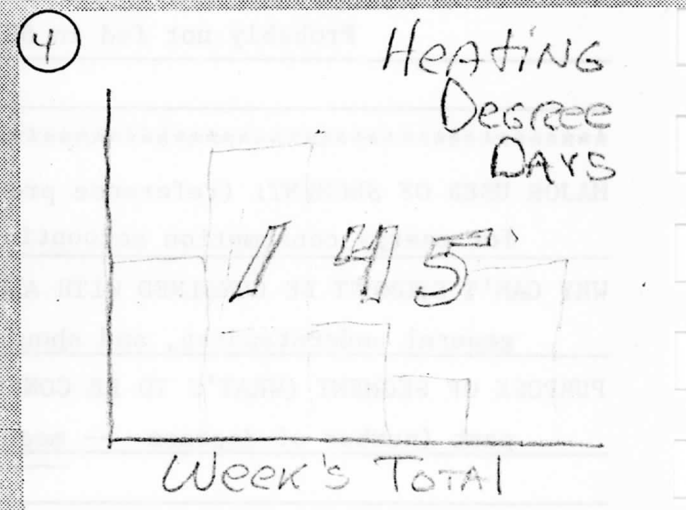

DISSOLVE to 1st DAYS BAR, IN RED, WITH TOTAL IN LARGE PURPLE #S AT TOP. (3 sec) REST FRAME SAME AS ①

③




DISSOLVE ON NEXT BAR (3 sec) THEN EACH OF THE NEXT 3 @ 3 sec EACH. REST FRAME HOLDS SAME AS ①

④




DISSOLVE OUT: X-Y ANNOTATION AND INTERIOR OF SHADING, LEAVING AXES AND OUTLINES OF DAILY TOTALS (1 sec). DISSOLVE IN "WEEK'S TOTAL" AND LARGE #S, HOLD FOR 5 sec. THEN FADE BLACK.

→ Seq length = 25 sec

SEGMENT HEADER

SEGMENT NUMBER 2

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable ________ Broadcast ________ Both X

SEASON Winter X Spring X Summer ________ Fall X

TIME OF DAY Midnight - 6am ________ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS ALL - 1 x week

WEATHER PARAMETER(S) Degree Days - Heating

TIME REFERENCE Past (incl. present) 24-72 hrs Prediction ________

SCALE National ________ Regional X State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Probably year round on cable, but only late fall → early spring for broadcast. Varies by geographic area.

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, UT, MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) For energy awareness, fuel planning, utility consumption, oil and gas delivery schedules — users and suppliers must keep track of consumption through use of Degree Days.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

1. Regional Map - colored bands every 5 degree days, showing DD total for preceding day midnight to midnight
   Date and Heading Annotation. Use Zones BG?
2. Dissolve to regional map for seasonal totals. May be placed in bands or mini-Bar Graph form. Annotate.
3. Overlay "last 7 days were ---% colder/warmer than normal"

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Max/Min temp Records: on fax chart and state WX-wire weather summaries. Computation necessary, base 65°.

**SHEET**
Seg #2

**PROD.**
Regional Heating Degree Days

**DATE**
11/10/76
TK

Total Time 30 sec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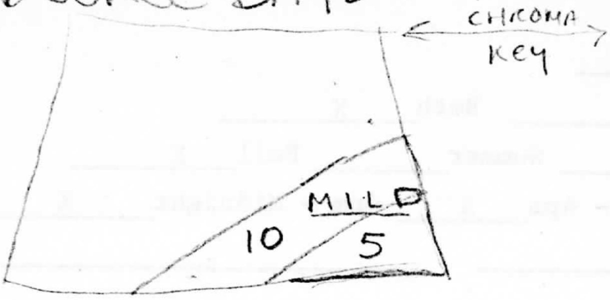
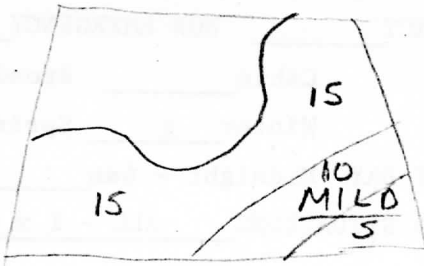
(1) DEGREE DAYS




WEEK'S TOTAL
(DATES)

USE REGIONAL MAP, OFFSET FOR KEY. TITLES: DARK BLUE. BACKGROUND: LIGHT BLUE. INSIDE REGIONAL MAP: NEUTRAL COLOR WITH DARK BLUE STATE OUTLINES + A FEW MAJOR CITIES. OVERLAY "MILD" BANDS OF D. DAYS (INTERVALS OF 5) AND LABEL "MILD". USE PASTEL WARM COLOR. COMPUTER SHOULD SMOOTH DATA HEAVILY. HOLD FRAME 5 SEC.

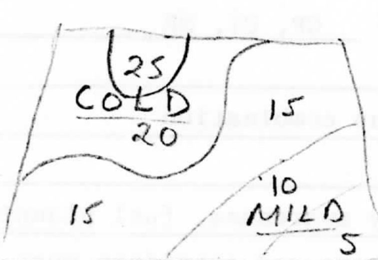
(2) DEGREE DAYS




WEEK'S TOTAL
(DATES)

ADD BAND(S) WHERE D-DAYS ARE NEAR 7-DAY SEASONAL NORMAL AND LABEL. HOLD 5 SEC. "NORMAL" AREAS SHOULD BE OUTLINE ONLY — NO SHADING WITHIN — BG COLOR SHOWS THROUGH.

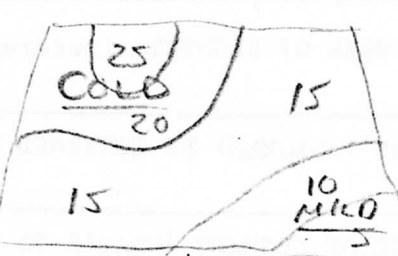
(3) DEGREE DAYS




WEEK'S TOTAL
(DATES)

DISSOLVE IN "COLD" BANDS (D-DAY TOTAL SIGNIF. GREATER THAN NORMAL) IN PASTEL "COLD" COLOR (MED. BLUE ?) AND LABEL. HOLD 5 SEC.

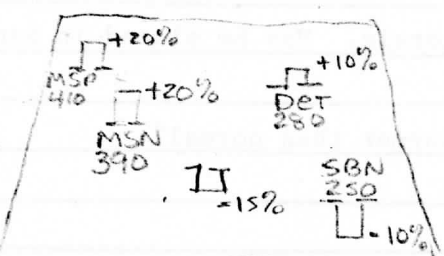
(4) DEGREE DAYS




LAST 7 DAYS —
AVERAGED __ % (COLDER) THAN NOR...

Dissolve in % computation and hold 3 sec.

(5) DEGREE DAYS




SEASONAL TOTAL —
SINCE JULY 1

DISSOLVE TO NO MORE THAN 10 MAJOR CITY. SEASONAL BARS — BAR EXTENDS ABOVE OR BELOW "0 LINE" DEPENDING ON WHETHER + OR − FROM SEASONAL NORMAL. TOTAL, % DEPARTURE, AND CITY ABBREVIATION GIVEN. (LEAVE STATE OUTLINES ON)

NOTES:

1) D-DAY BAND INTERVALS USED will vary depending on region, as will departure from Normal used as the gate to define "cold" & "mild" areas.

2) as with all fill-in maps, no more than 5 BANDS ON MA.?

3) IF LARGE DIFFERENCES OVER MA..., MAY HAVE TO GO TO 10 DD SPAC...VG

4) SHOULD CONSIDER ADDING MAJ. CITY TOTALS DISPLAYED IN BLACK?

SEGMENT HEADER

SEGMENT NUMBER 3

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter ______ Spring ______ Summer ______ Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS ALL (perhaps 1 x weekly)

WEATHER PARAMETER(S) Degree Days: Cooling

TIME REFERENCE Past (incl. present) 24-72 hrs. Prediction ______

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Probably only for effective use in southern latitudes of US -- perhaps infrequent or monthly usage in other areas.

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, UT, MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a user group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) For energy use planning and awareness, total cooling loads experienced helps to determine fuel bills and plan future cooling procedures

FORMAT OF SEGMENT (scale, background, foreground, duration, etc) Similar to heating degree day segment preceding, but must be differently labeled and must be computed using the $72^{o}$ mean temperature cooling base

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) MAX/MIN FAX temp records

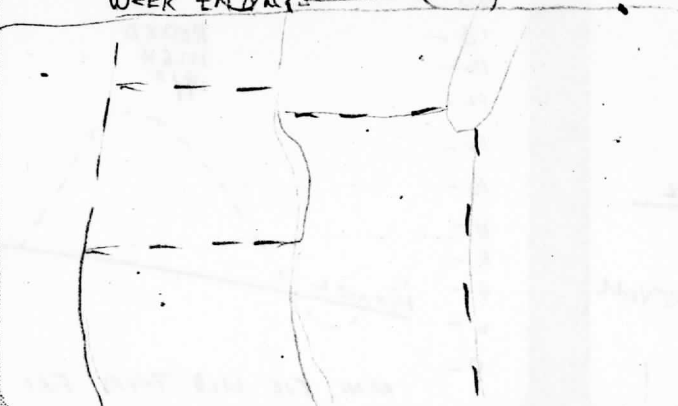
SHEET
SEG 3.

PROD.
REGIONAL COOLING DEG. DAYS

BASE 72°F

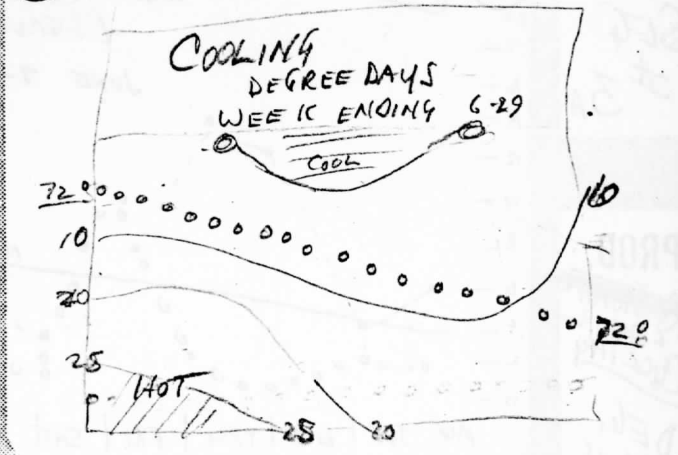
DATE
2/1/77

(BAM)
COOLING ← (BLUE)
DEGREE DAYS (WHITE)
WEEK ENDING ——— (BLACK)



BUFF BACKGROUND STATE OUTLINES NARROW BLACK
"COOLING" = BLUE "DEG. DAYS" = WHITE

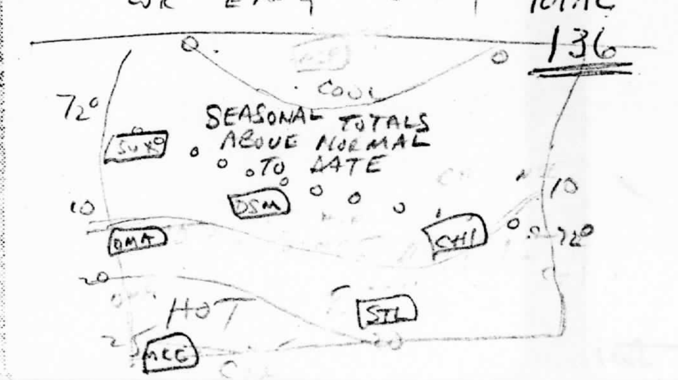
(1)




"HOT" IN RED "COOL" IN BLUE,
WIPE L-R 72° ISO-THERM: oooooo (BLACK) FOR PERIOD
AND HOLD 2 SEC.
(2) THEN WIPE IN EACH THRESHOLD LINE AT 1 SEC INTERVALS AND HOLD CUMULATIVE PIC FOR 10 SEC.
(3) SHADE >25 IN PASTEL PINK 1 SEC
" <0 IN " BLUE 1 SEC
FILL "HOT" (PINK) 1 SEC
FILL "COOL" (BLUE) 1 SEC

20 SEC

(2)
COOLING
DEG DAYS
WK ENDG 6-29
WEEK'S TOTAL 136




DISSOLVE IN: CITIES AND TEXT 1 SEC
DISSOLVE OUT: HOT, COOL, ISO-LINES. 1 SEC.
HOLD 5 SEC.

(3)

CD

Notes:

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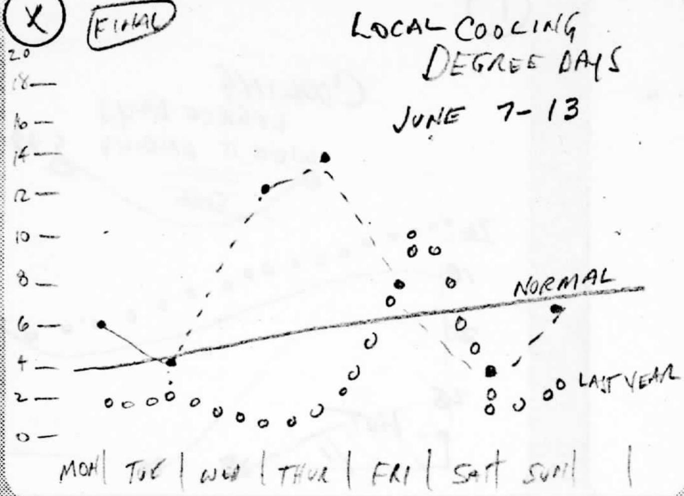
SHEET SEG #3A

PROD. ~~REGIONAL~~ LOCAL COOLING DEG. DAYS.

BASE 72°F

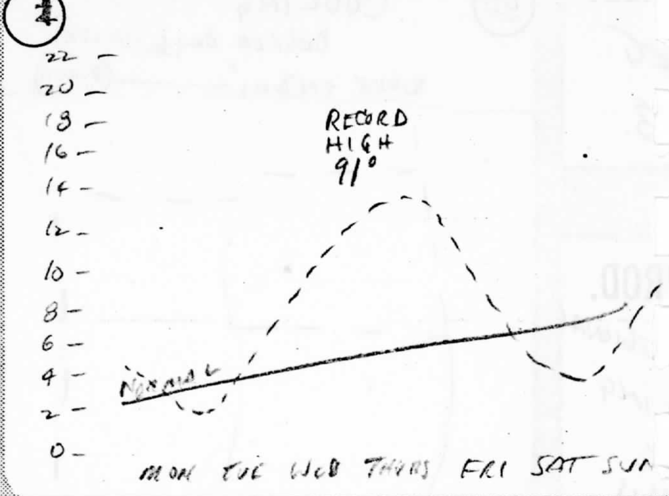
DATE 2/15/77

X (FINAL)




BUFF BACKGROUND
X-Y LABELING = BLACK
"NORMAL" BASE LINE BLACK
ACTUAL AND LAST YEAR "RED" ABOVE & "BLUE" BELOW

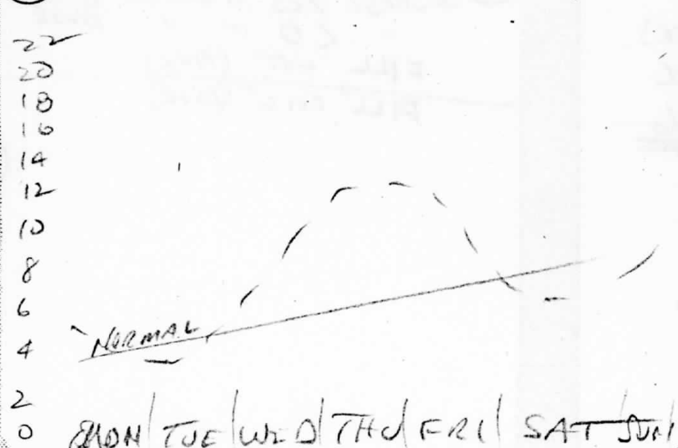
1




USE "WIPE" FROM L-R
AUDIO OVER & PSBL "CK" POINTER to HILITE UNUSUAL EVENTS.

10 SEC

2 (OPTIONAL)




"WIPE" LAST YEAR GRAF ON L-R.

10 SEC.

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SEGMENT HEADER

SEGMENT NUMBER 4

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer ____ Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS ALL - occasional use

WEATHER PARAMETER(S) Degree Days (Heating)

TIME REFERENCE Past (incl. present) ____ Prediction 24-72 hrs

SCALE National ____ Regional X State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) See preceding sheet

*****************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, IZ, GPZO, UT, MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER See preceding sheet

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See preceding sheet

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See preceding -- but annotate "FORECAST"

Then Dissolve in: "Next 7 days will be ---% warmer/colder than normal.

Possibly add normals?

Animation possibilities here?

Possibly combine with "past" segment recording?

*****************************************************************************

DATA SOURCE (if non-existent, describe probable source) NWS State forecasts and extended outlooks (weather wire); NAFAX computer MAX/MIN PROGS. Compute to take mean and total of next -

SEGMENT HEADER

SEGMENT NUMBER 5

EMERGENCY ______ NON EMERGENCY ______

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter ______ Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS ALL - possibly (1 x week)

WEATHER PARAMETER(S) Degree Days (cooling)

TIME REFERENCE Past (incl. present) ______ Prediction 24-72 hours

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Primarily in southern U.S. latitudes

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, UT, MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User - group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See preceding segments

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See preceding segment (forecast of heating DD)

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) See preceding segment

SEGMENT HEADER

SEGMENT NUMBER 6

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable ________ Broadcast ________ Both X

SEASON Winter X Spring X Summer ________ Fall X

TIME OF DAY Midnight - 6am ________ 6am - 4pm X 4pm - Midnight X All ________

WEATHER SITUATIONS Days when mean temperature falls below $65^{\circ}$ - optional use segment (not used every day)

WEATHER PARAMETER(S) Degree Days (Heating)

TIME REFERENCE Past (incl. present) ________ Prediction 24-72 HRS

SCALE National ________ Regional ________ State ________ Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

Probably not fed in S.E. or S.W. states - Major metropolitan area use only.

Others use state/regional segment

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) General public, and/or dealers.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter, and too complex for combination.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Expected degree day totals next 1, 2, 3 days.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Bar graph - days at bottom, degree days vertical. Space, bars and shade in color. Overlay each bar with large numerals indicating number of D-Days on that day. Perhaps dissolve in each day separately (1 + 2 + 3)

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Fax forecast of temperatures; NWS zones forecasts and extended outlooks. Computer to perform calculation required.

FIGURE II-3

SEGMENT HEADER

SEGMENT NUMBER 7

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter ______ Spring X Summer X Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Growing Degree Days (or "Heat Units")

TIME REFERENCE Past (incl. present) ______ Prediction 12-72 plus current total

SCALE National ______ Regional ______ State X Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) For use only in heavily agricultural areas of U.S.

*******************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG 19, AG 20

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This will be a combination of past/future.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Modern agriculture depends on heat unit totals for all phases of planting, spraying and fertilizing timing, and harvesting schedules. Many crops can lose a whole quality grade in 1 or 2 days with substantial heat unit totals if not harvested on schedule.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) State map with zones:

Main Heading: "Growing Degree Days"

Sub Headings: "Base $50^{o}$" (in color #1, with cornstalk ahead of it)

"Base $40^{o}$" (in color #2, with bean plant ahead of it)

Sub Heading: "Season Total through ____" (date)

Totals placed in zones in same 2 colors relating to base 50/Base 40.

2. Dissolve to forecast segment. Annotate "Forecast - next 30 days" in bold red letters. Leave Base 50 + 40 annotation and color arrangement the same.

*******************************************************************************

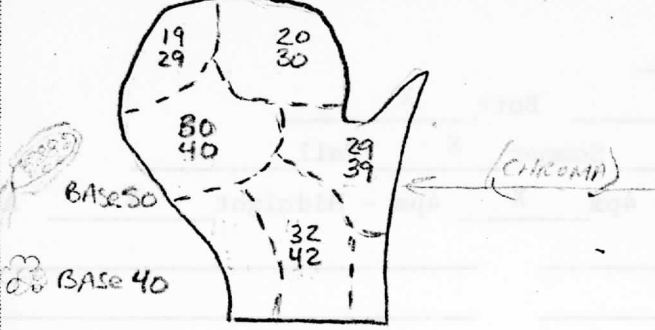
DATA SOURCE (if non-existent, describe probable source) 1. For totals to date, use MAX-MIN Data (NAFAX, State Summaries) and compute using appropriate base. 2. For forecast use Zone Forecasts, extended outlooks (NOAA - Wire) and NAFAX Temperature PROGS.

SHEET Seg 7

PROD.

DATE 11/16/76

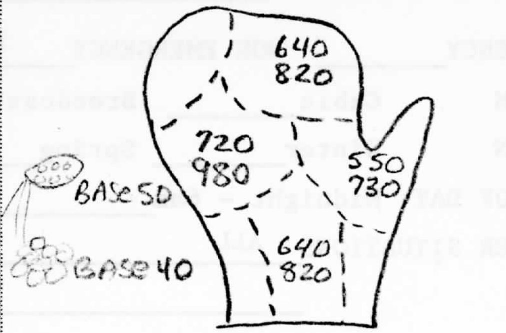
① GROWING DEGREE DAYS




...YESTERDAY...

STATE MAP WITH STANDARD NWS ZONES OVERLAYED. CORN COB WITH KERNALS VISIBLE: WORDS "BASE 50" AND BASE 50 TOTALS IN ZONES IN MAIZE COLOR. WORDS "BASE 40" NEXT TO BEAN PLANT - BOTH IN GREEN - AND BASE 40 TOTALS IN ZONES. USE SHADES OF GREEN WITH YELLOW LETTERING. TIME 10 SEC.

② GROWING DEGREE DAYS

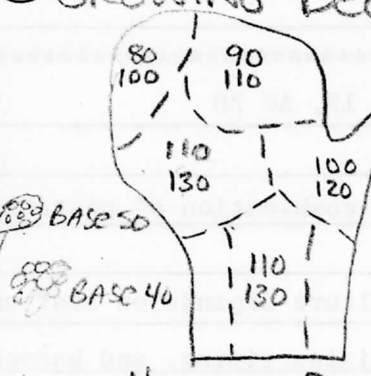



...SEASON...

Dissolve to seasonal totals - BLINK "SEASON" 3 times, then hold steady. Use same color schemes. Time: 10 sec

③ GROWING DEGREE DAYS

FORECAST




...NEXT 3 DAYS...

DISSOLVE TO FORECAST FOR NEXT 3 DAYS. BLINK "FORECAST" + "NEXT 3 DAYS" 3 TIMES IN UNISON, THEN HOLD STEADY. USE SAME COLOR FOR BOTH. USE SAME COLOR SCHEME REST OF MATERIAL. 10 SEC, [illegible]

1) Notes: ag interests will focus in on zone of their own interest. Even though these transitions are too rapid to read all the numbers, they will see & comprehend their own zonal totals -

2) Either state's Standard NWS forecast zones OR ag Zones (which differ) may be used depending on which totals are easier to access.

3) Perhaps MAJOR cities shaded in lightly with identifiers would aid in locating zone of interest to each individual...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SEGMENT HEADER

SEGMENT NUMBER 8

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable ________ Broadcast ________ Both X

SEASON Winter ________ Spring X Summer X Fall ________

TIME OF DAY Midnight - 6am ________ 6am - 4pm X 4pm - Midnight X All ________

WEATHER SITUATIONS ALL (1 x or 2 x weekly)

WEATHER PARAMETER(S) Growing Degree Days

TIME REFERENCE Past (incl. present) ________ Prediction 5-7 Days

SCALE National ________ Regional X State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) For use in heavily agricultural areas of U.S.

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique need - computed factor.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Extended outlook to follow preceding segment a) at ocl. intervals or b) where major temperature shifts are expected in the longer time pattern. This is a planning segment; preceding is an action segment for agriculture.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)
If similar format to preceding is too cumbersome at this regional scale, go to contours (MAX = 4) and shading of DD zones of forecast. Annotation and explanation will be similar

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Computed from MAX/MIN PROGS; NAFAX + WSFO extended 5 day outlooks.

SHEET

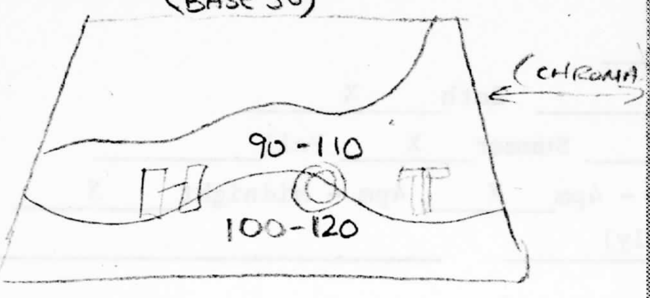
SEG 8

PROD.

Total TIME: 20 sec

DATE 11/15/76

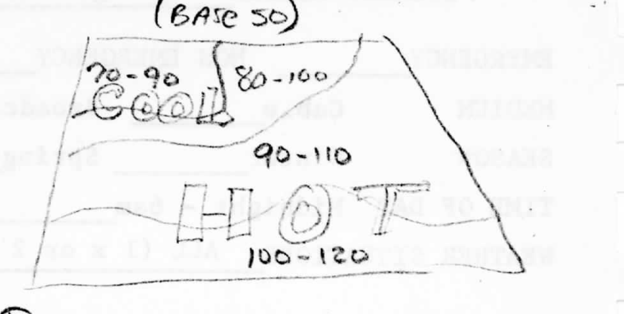
① GROWING DEGREE DAYS (BASE 50)




FORECAST...
NEXT 5 DAYS

USE BASE 50 as most useable base - add warmest bands - DISSOLVE IN "WARM" OR "HOT". USE RANGE OF EXPECTED DEG. DAYS (Probably range of 20-300'S AS ABOVE) TIME: 10 sec

② GROWING DEGREE DAYS (BASE 50)




FORECAST...
NEXT 5 DAYS

DISSOLVE ON COOLER FORECAST TOTAL AND WORD "COOL". USE SAME RANGE OF DEGREE DAYS. HOLD 10 SEC - FADE BLACK.

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SEGMENT HEADER

SEGMENT NUMBER 9

EMERGENCY X NON EMERGENCY

MEDIUM Cable Broadcast Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All X

WEATHER SITUATIONS Pollution concentrations exceed or are forecast to exceed alert standards

WEATHER PARAMETER(S) Pollution alert

TIME REFERENCE Past (incl. present) Prediction 1-6 hrs

SCALE National Regional State Local X

COMMENTS ON DESIGNATORS (i.e., use in ___ area only, etc)

Primarily major urban use

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP 3; utilities; MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Warning segments must stand alone for impact and for individual use

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) City name predominantly at bottom. Horizontal cross-section of city skyline with smoke curling in air

- Annotation: time of segment - time alert is valid 'til - phrases "avoid unnecessary activity or overexertion, especially elderly and small children"
- Annotate with outlook: "Improving by ______ " or "little change"

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NOAA wire, ?

SHEET
Seg 9

PROD.
Pollution Alert (Emergency)

Time 30sec

DATE
11/19/76

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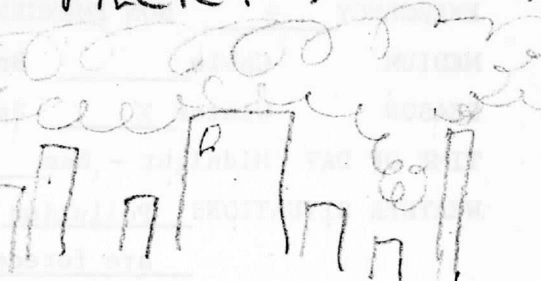
1

POLLUTION ALERT!

FLASH RED LETTERS ON DARK BACKGROUND - ADD AUDIO TONE - (@1/sec flashes)
TIME: 5sec

2 Pollution ALERT!



FOR MILWAUKEE AREA - IN EFFECT 6AM-6PM

ANIMATE! SMOKE CURLING OUT OF STACKS OVER CITY SKYLINE - GRADUALLY FILLING SKY OVER CITY. ADD LOWER ANNOTATION - "IN EFFECT ETC" IN RED, FLASHING (TO MATCH TITLE COLOR)
TIME 10 SEC

3 Pollution ALERT!

- AVOID STRENUOUS ACTIVITY
- WATCH CHILDREN + ELDERLY
- ETC.

FOR MILWAUKEE AREA - IN EFFECT 6AM-6PM

FADE CITY BACKGROUND + SMOKE AND DISSOLVE OVERLAY OFFICIAL PRECAUTIONS TO BE TAKEN, ONE AT A TIME, IN YELLOW.
(10 sec)

4 Pollution ALERT!

IMPROVEMENT FORECAST BY: 6PM TONIGHT

DISSOLVE TO THIS FRAME - SLOWLY CLEAR SMOKE AWAY AS "IMPROVEMENT" ANNOTATION APPEARS - FADE BLACK
TIME: 5sec

Note Full screen segment - Not chroma

SEGMENT HEADER

SEGMENT NUMBER 10

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS Stagnant conditions causing or expected to cause pollutant accumulation to pre-set levels.

WEATHER PARAMETER(S) pollution alert (air stagnation advisory)

TIME REFERENCE Past (incl. present) ______ Prediction 1-6 hours

SCALE National ______ Regional ______ State X Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP 3 and utilities; MR; AG in certain instances (tobacco, etc.); GR (same)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Impact needed for emergency situation segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas to be alerted to significant pollution buildups; time and duration of buildups and alert.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with major metropolitan areas & labelled

Flashing "Pollution Alert" or "Air Stagnation Advisory"

Area Affected - shade in red

Annotate over or near red line of onset and duration of alert

List, one-by-one, with each added bright and faded to dim, cautions and precautions to take: "Avoid strenuous exercise," etc.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Forecast and alert products of air stagnation center → NOAA - wire forecasts

SHEET 1

SEG 10

PROD.

TOTAL SEG. TIME 30 SEC

DATE 2/1/76

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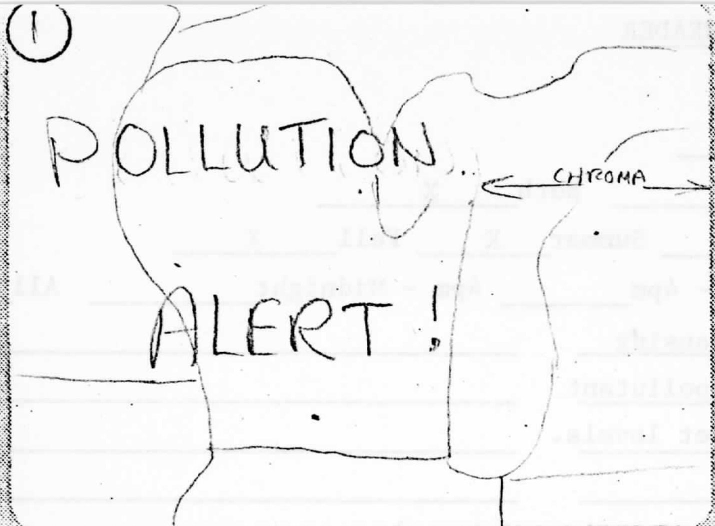
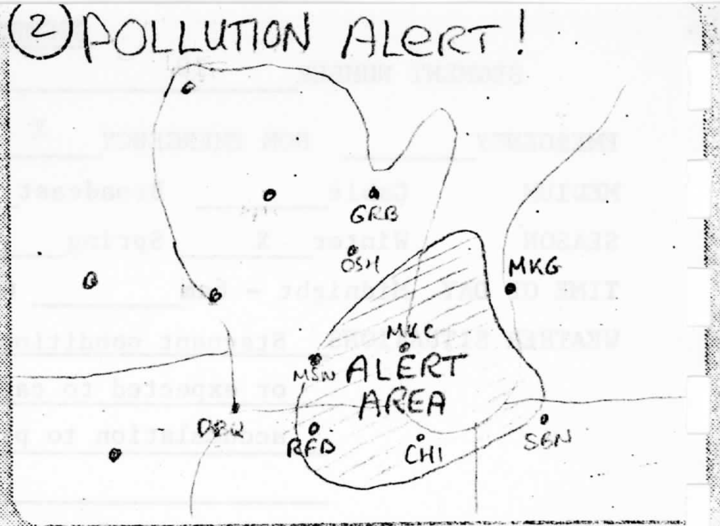
(1)



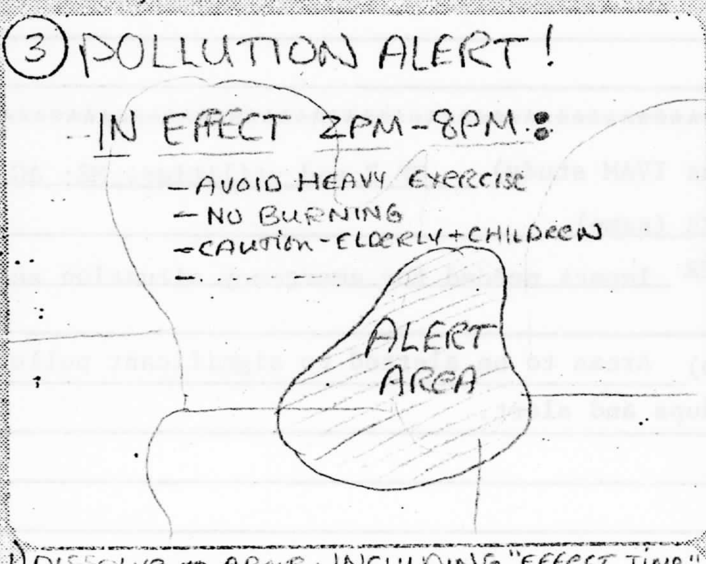

Fade up on state-sized map (include parts of overlap area) and red, large, flashing annotation. Audio tone should be added to attract attention. Flash at 1/sec for 5 sec. or alternate annotation: "Air stagnation advisory", or "Air quality alert" as NWS wishes.

(2)




Dissolve to above, shading or hatching alert area in pink or pastel red. Dots appear for major cities - annotate those in or close to alert area. Hold 10 secs.

(3)




1) Dissolve to above, including "effect time" (3 sec)
2) Add in standard cautions as worded by NWS, one at a time. (each 3 sec)
3) Add each in bright + bold; fade down + hold.

This portion - total time 15 sec -

(4)

(Could add panel annotating wind dispersion speed + direction, as a forecast; and a dissipation and/or improvement of conditions time, if desired by NWS)

→ Should include "Air Quality Index" in those areas appropriate.

( )

( )

SEGMENT HEADER

SEGMENT NUMBER 11

EMERGENCY X NON EMERGENCY

MEDIUM Cable Broadcast Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All X

WEATHER SITUATIONS stagnant conditions causing or expected to cause pollutant accumulation exceeding pre-set levels (air stagnation advisory)

WEATHER PARAMETER(S) Pollution alert

TIME REFERENCE Past (incl. present) Prediction 3-18 hours

SCALE National Regional X State Local

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, UT, MR, AG (some), GR (some)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Impact needed for emergency situations.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

Longer term advisory map to those preceding. Indicates areas where conditions are forecast or may be forecast to have pollution alert levels.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map with state outlines and major cities

Yellow shaded areas for possible trouble zones; add times

Red flashing shaded areas for current or imminent problems

List precautions

List valid times

Use wind arrow for movement (?)

List pollutants and concentrations (current and forecast) (?) (UT benefit)

**************************************************************************

DATA SOURCE (if non-existent, describe probable source) Forecast and alert products of air stagnation center and local zones + NOAA wire forecasts.

SHEET

SEG 10

PROD.

DATE 12/1/76

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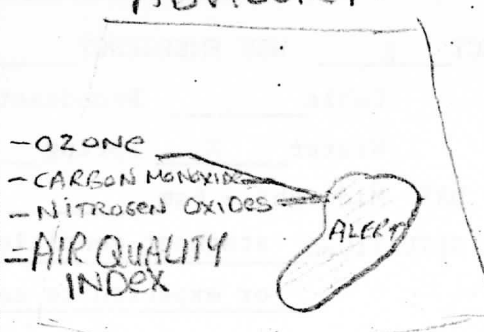
(1) AIR QUALITY ADVISORY...


TIME: ___

REGIONAL MAP WITH STATE CONTOURS. ANNOTATE TIME OF MAP, AND AIR QUALITY ALERT AREAS DISSOLVE IN AND FLASH 1/SEC IN RED. TITLE IN YELLOW, AS IS TIME.
HOLD FOR 8 SECS.
ADD MAJOR CITIES WITHIN

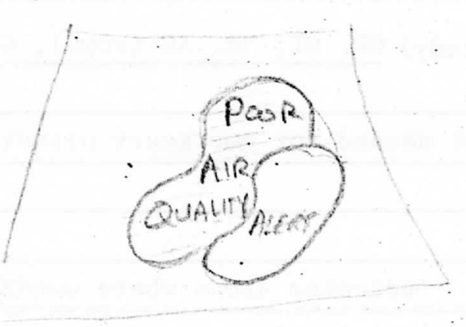
(2) AIR QUALITY ADVISORY...




TIME: ___

ADD IN POLLUTANTS AND CONCENTRATION, ONE AT A TIME IN BOLD, BRIGHT LETTERS THEN FADE BACK TO LESS INTENSE AS NEXT POLLUTANT APPEARS. AFTER THOSE SIGNIFICANT CONCENTRATIONS, ADD IN "AIR QUALITY INDEX —" IN BOLDER. TIME: 8S

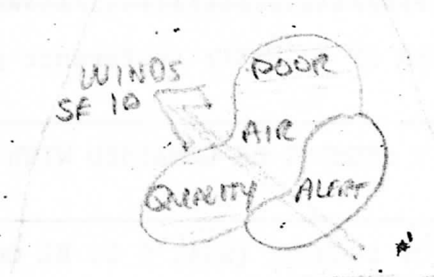
(3) AIR QUALITY ADVISORY...




TIME ___

DISSOLVE OUT PREVIOUS - AND SHADING IN ALERT AREAS - AS MARGINAL QUALITY AREAS DISSOLVE IN SHADED YELLOW OR LIGHT ORANGE ... HOLD 3 SECS...
ADD MAJOR CITIES WITHIN --

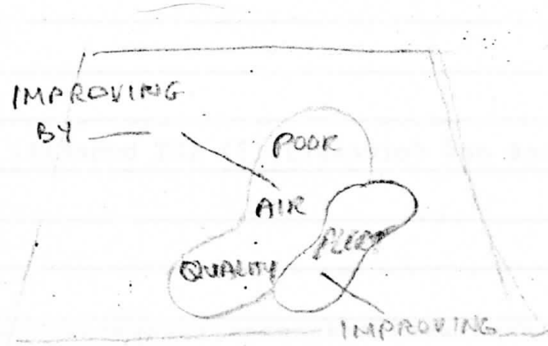
(4) AIR QUALITY ADVISORY...




TIME ___

OVERLAY WIND DIRECTION ARROW AND ANNOTATE. HOLD. 5 SECS.

(5) AIR QUALITY ADVISORY...




DISSOLVE TO OUTLINES OF AREAS - DISSOLVE OUT CURRENT TIME AS "IMPROVING BY" — APPEARS. HOLD 6 SECS, FADE BLACK.

( )

SEGMENT HEADER

SEGMENT NUMBER 12

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable ________ Broadcast ________ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ________ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS Moderate or greater pollution concentrations possible or forecast in region

WEATHER PARAMETER(S) Pollution Index

TIME REFERENCE Past (incl. present) ________ Prediction 3-18

SCALE National ________ Regional X State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

**********************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) UT, AG, GP, MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER No suitable combination found

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of region possible to be or forecast to be under pollution constraint or with high concentrations of any particular pollutant. Also, precautions as necessary should be listed.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Regional Map with states/Major metropolitan areas

Use pictorial factories in shaded pollution advisory areas

Annotate type and quantity of pollutant in plain language

Give time of effect of advisory

**********************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Air Stagnation Group NWS.

SHEET

Seg 12

PROD.

AIR POLLUTION 3-18 HR

DATE

2/77

Winterle

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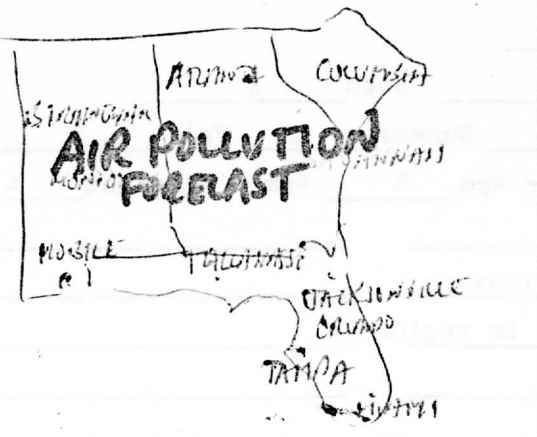
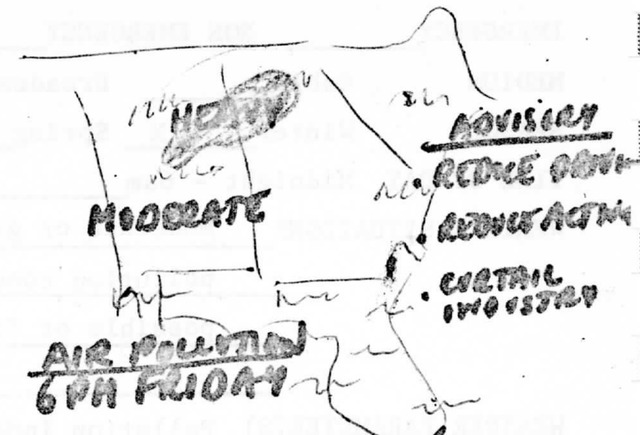
1



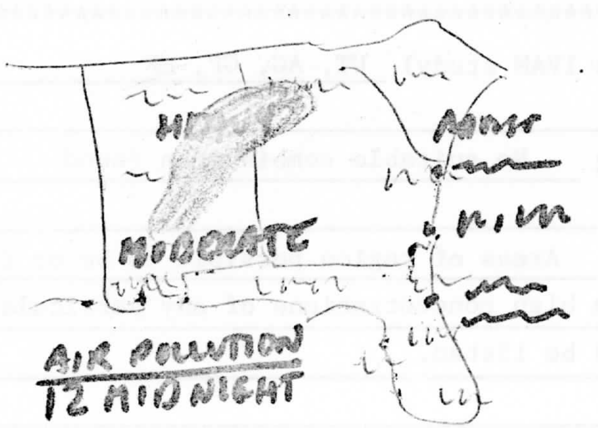

ON A WHITE, OR LIGHT GRAY SCREEN WITH A BLACK MAP + CITIES, OVERLAY BOLD TITLE "AIR POLLUTION FORECAST" FOR 3 seconds, THEN FADE OUT

2



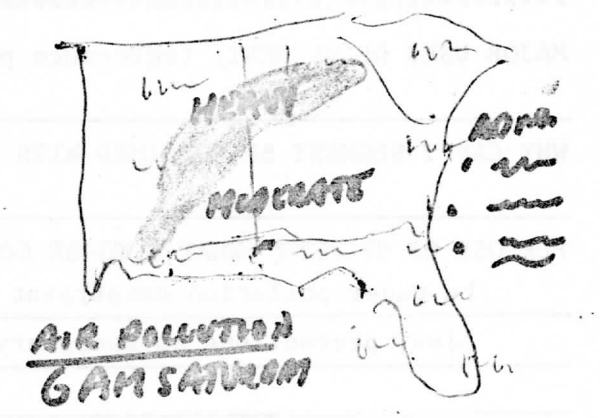

AT 5 SECONDS, COLOR MODERATE POLLUTION AREA LIGHT-MEDIUM BLUE, HEAVY POLLUTION RED AND LABEL AREAS, PLUS TIME OF PREDICTION. AT 12 SECONDS, LIST ADVICES TO RIGHT

3

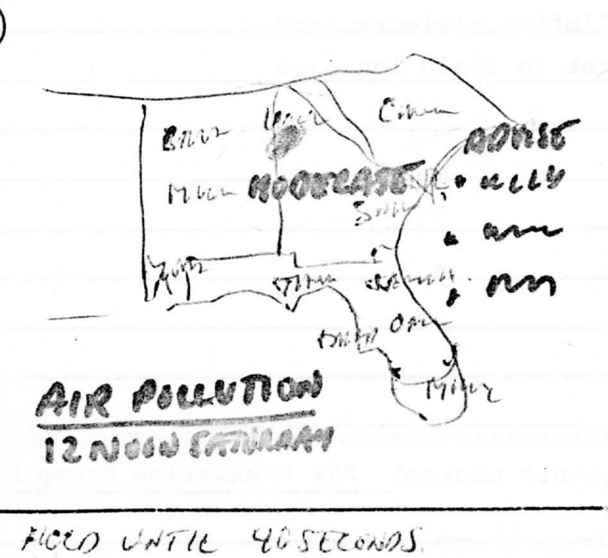



AT 20 SECONDS, DISSOLVE TO NEXT FORECAST PERIOD, AT 24 NEXT PERIOD, AND AT 27 FINAL PERIOD

4




5




HOLD UNTIL 40 SECONDS.

NOTE: FACTORIES MAY CLUTTER, BUT IF SYMBOLS ARE USED, "AUTOMOBILES WITH SMOKE" + "HOMES WITH SMOKE" SHOULD GET "EQUAL TIME".

SEGMENT HEADER

SEGMENT NUMBER 13

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS Moderate or greater pollution in concentrations possible or forecast in U.S.

WEATHER PARAMETER(S) Pollution Index

TIME REFERENCE Past (incl. present) ______ Prediction 12-72

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) UT, AG, GP, MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER No suitable combination found. This is a "sky warn" type segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See preceding segment.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See preceding segment

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Air Stagnation Group, NWS

SHEET

Seq 13

PROD.

DATE 12/1/76

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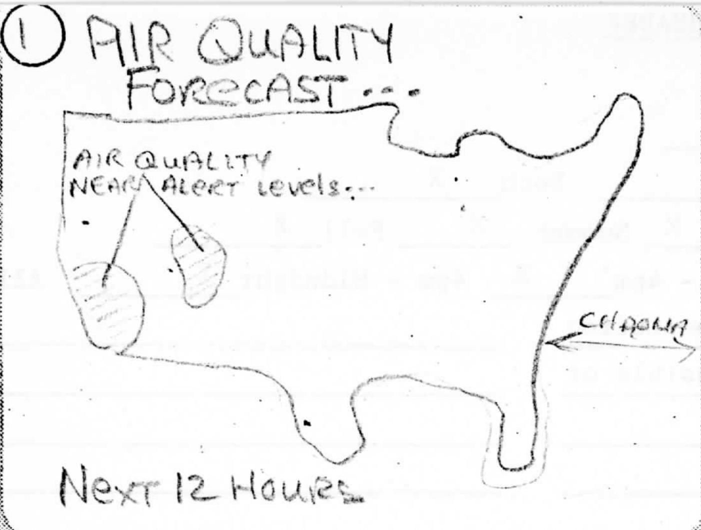
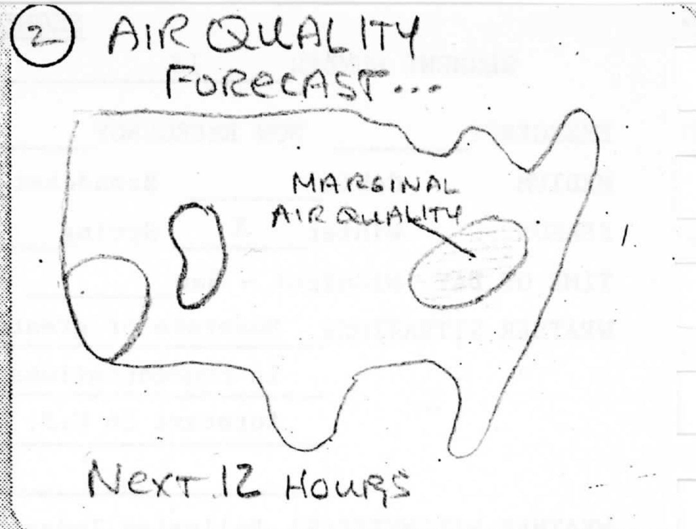
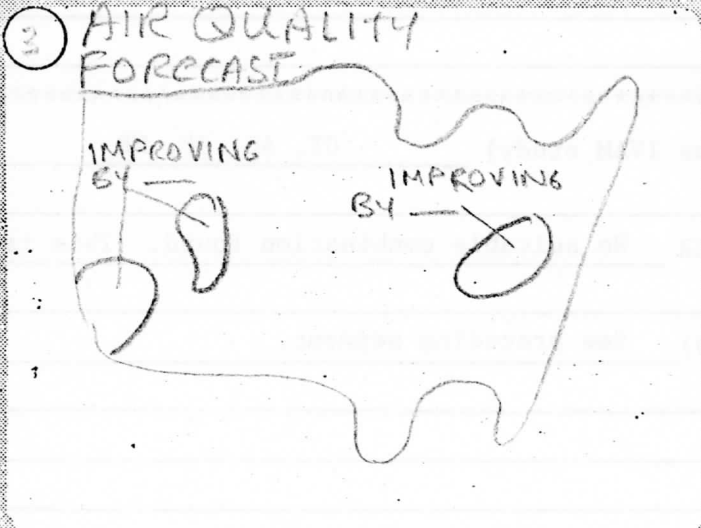
① 


US MAP ANNOTATED AS ABOVE, WITH STATE OUTLINES, TAN MAP, BLUE SURROUNDING U.S. DARK TAN STATE OUTLINES, DARK BLUE ANNOTATION. SHADE POSSIBLE ALERT AREAS RED. TIME 10 SEC.

② 


Dissolve to outlines only, of Alert areas, as marginal quality forecast appears in yellow shading.
Hold 5 secs.

③ 


DROP SHADING, LEAVE OUTLINES ONLY. DROP "NEXT 12 HOURS". ADD "IMPROVING BY" AND FORECAST TIMES.
Hold 5 Secs - FADE BLACK

SEGMENT HEADER

SEGMENT NUMBER 14

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Severe Weather Alert

TIME REFERENCE Past (incl. present) ______ Prediction 3-24 hours

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a unique "summary" type segment

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

This is envisioned to be similar to the "Today" Show's successful "Skywarn" map. Advisory and non-emergency in character. This would be a segment designed to shade areas of the country with forecast or possible heavy weather problems later in the day.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

This should be national scale, with several shading types for different, expected weather events — and annotations of states and expected times of occurrences.

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) National SVRWX Prog and RAWARC.

SHEET

Seg 14

PROD.

DATE 12/1/76

Variable Length Segment

Nominal 30 secs

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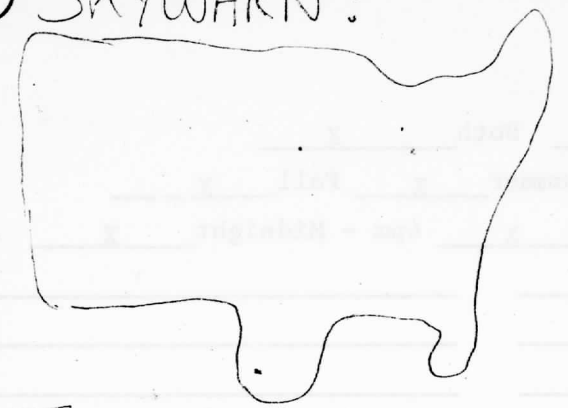
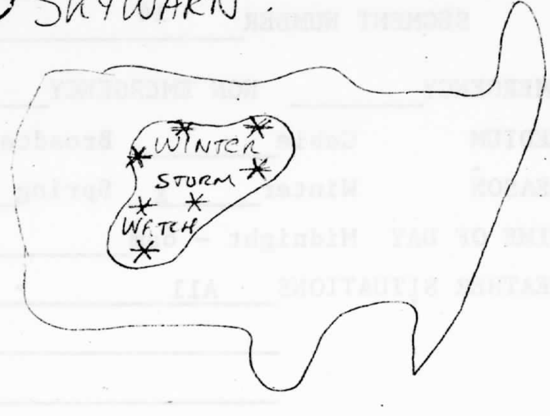
1 SKYWARN!



Tuesday, Dec 6, 1976

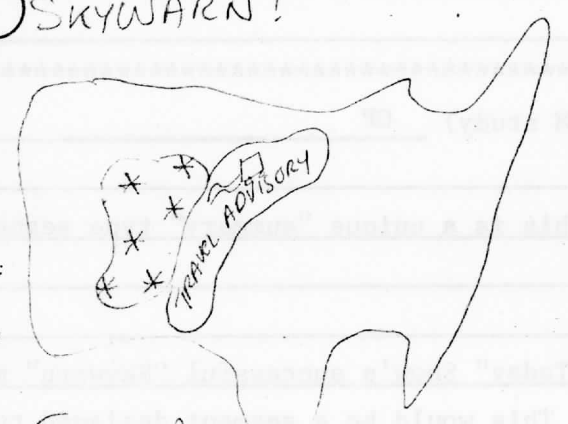
ADVISORY, NON-EMERGENCY TYPE MAP FOR GENERAL INDICATION OF AREAS EXPECTED TO HAVE HEAVY WEATHER OF MANY TYPES... USE U.S. GRID WITH ~~??~~ LT GREY BACKGROUND AND BLUE STATE BORDERS - LIGHT BLUE OUTSIDE MAP. Hold 3 secs

2 SKYWARN!




ADD IN FIRST WATCH OR WARNING ~~OR ADVISORY~~ FROM WEST. WINTER SNOW WATCH, STORM WARNING, ETC - USE FLAKES WITHIN. Yellow FOR WATCH AREAS, RED FOR WARNING AREAS. Hold 5 secs

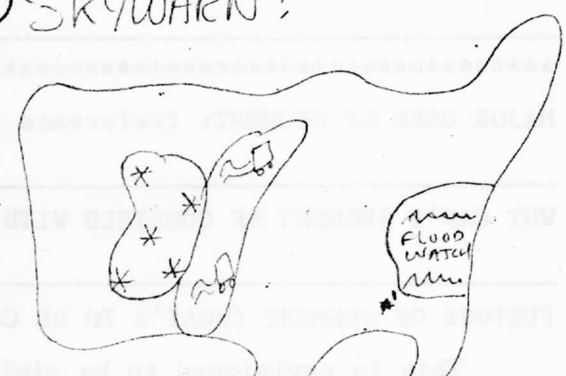
3 SKYWARN!




Tuesday Dec 6, 1976

DISSOLVE OUT ANNOTATION OF FIRST PROBLEM LEAVING SYMBOLS BEHIND (*), AS NEXT AREA FROM WEST APPEARS. ANNOTATE, WORDS + SYMBOL. Hold 5 secs.

4 SKYWARN!




Tuesday Dec 6, 1976

ADD IN NEXT EAST AREA AND ANNOTATE AS BEFORE - Hold 5 secs...

5 SKYWARN!


Tues. Dec 6, 1976

DISSOLVE OUT PREVIOUS WX PROBLEMS AS SEVERE STORM FORECAST FROM SELS DISSOLVES IN. (THIS STANDS ALONE FOR IMPACT) USE SINGLE YELLOW HATCHING FOR SCAT. AREAS, DOUBLE HATCH RED "NUMEROUS" AREAS : Hold 12 secs.

Key

Travellers Advisory: use SKIDDING CAR SYMBOL WITHIN AREA.

SNOW WATCH + WARNING : USE FLAKES *

TORNADO WATCH/WARN : USE TWISTER

THUNDERSTORM WATCH/WARN : USE light (blinking?)

FLOOD AREAS : USE WATER (ETC)

SEGMENT LENGTH WILL VARY WITH NUMBER OF AFFECTED AREAS IN U.S.

SEGMENT HEADER

SEGMENT NUMBER 15

EMERGENCY X NON EMERGENCY

MEDIUM Cable Broadcast Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All X

WEATHER SITUATIONS Severe Thunderstorms or Tornado watches

WEATHER PARAMETER(S) Severe WX alert

TIME REFERENCE Past (incl. present) Prediction 1 - 6 hours

SCALE National Regional State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

********************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP 1 (and basically all users)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs impact of standing alone. Must be used instantly, day or night, without regard to segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

Areas to be affected by severe weather event listed above

Time and duration of these events

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

For tornado/thunderstorm, see map sequence developed previously on film

********************************************************************************

DATA SOURCE (if non-existent, describe probable source) SELS watches/warnings; RAWARC circuit and NOAA wire; zone and local information and warnings.

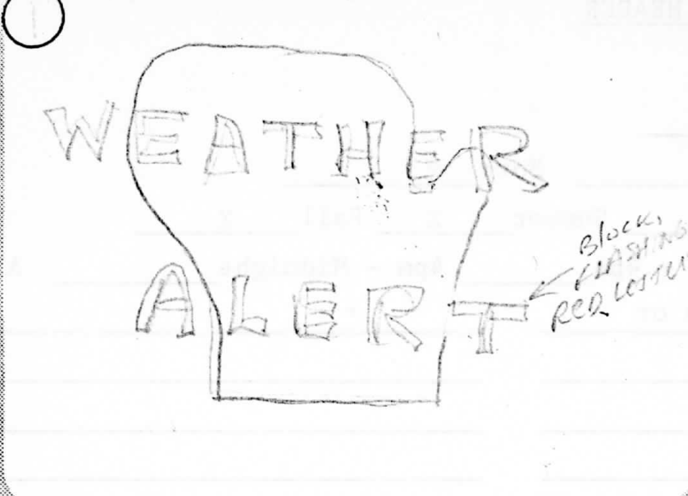
**SHEET** Seg 15

**PROD.** Severe WX Alert
"Weather Watch"
Emergency

**DATE**

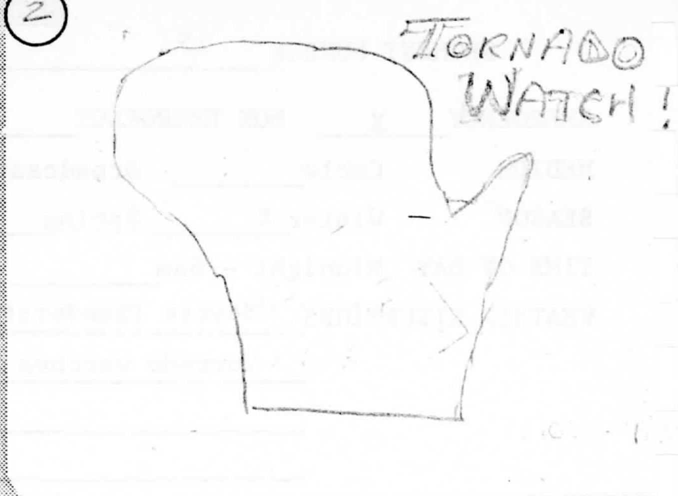
Committee on Educational Media
Mathematical Association of America
P. O. Box 2310 - San Francisco - California 94126

(1)



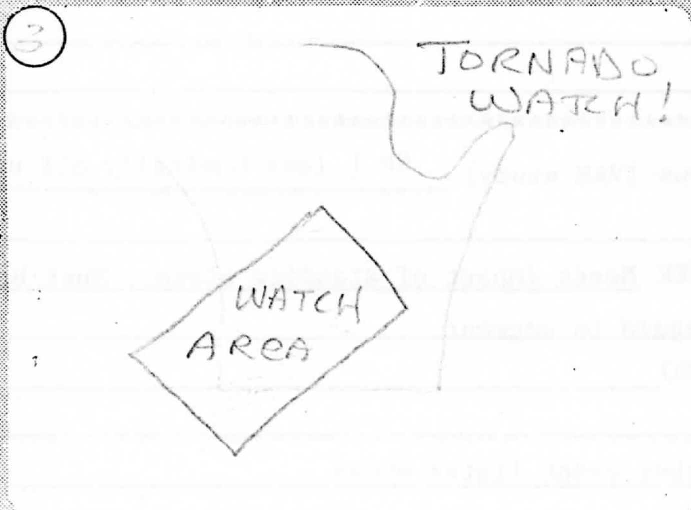

TIME: 5 SECONDS SOUND: TONE
Colors: MEDIUM BLUE BG
PALE YELLOW INSIDE WIS
DARK BLUE ~~BLACK~~ STATE EDGE

(2)



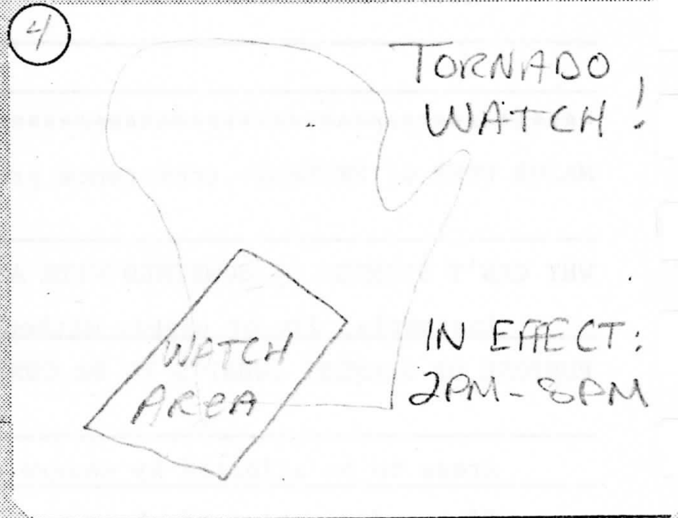

TIME: (TOTAL) 3 Sec
TRANSITION FROM (1): SLOW ~~WIPE~~ DISSOLVE
(2) USE BLOCK RED LETTERS AND FLASH @ 1/SEC

(3)



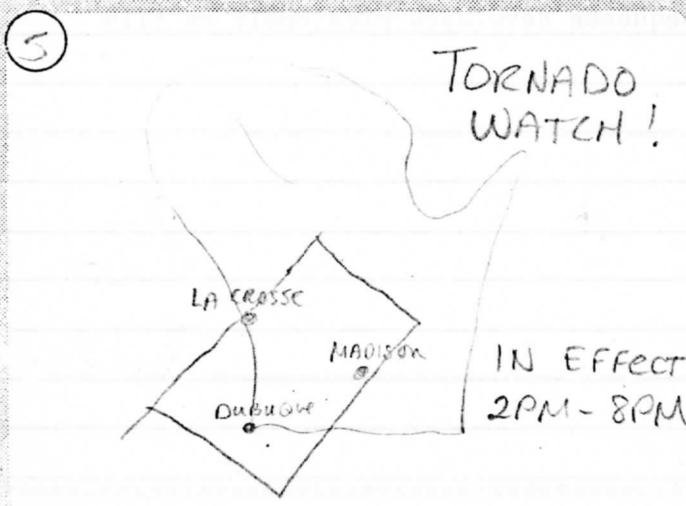

TIME: 3 Sec  Hold TOP "WATCH" STEADY FLASH "WATCH AREA"
TRANSITION FROM (2): DISSOLVE IN BOX AREA (SHADED RED) AND ~~BLACK~~ RED "WATCH AREA" LETTERS

(4)



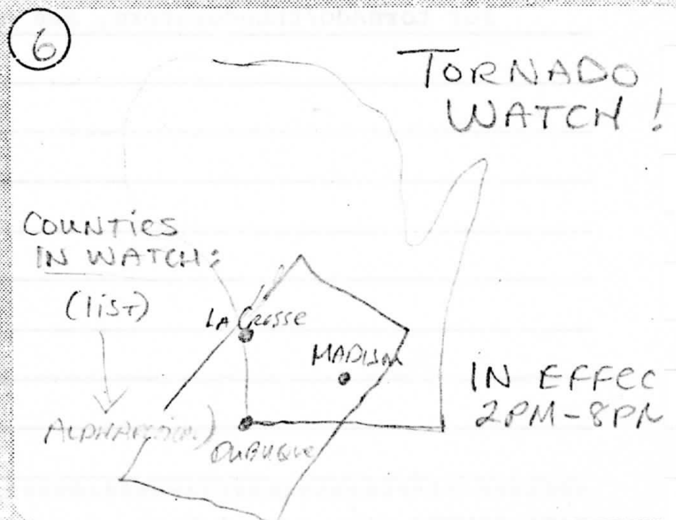

TIME: 3 Sec
TRANSITION FROM (3): DISSOLVE IN NEW INFO - HOLD (2) AND (3) INFO SOLID: FLASH NEW ANNOTATION (YELLOW

(5)




5) Dissolve TO OPEN (LINED) BOX; WHILE DISSOLVING IN MAJOR CITIES IN WATCH; COLOR RED AND ADD CITIES AT ONE PER SECOND (MAXIMUM 5) BY SIZE OF CITY. TOTAL TIME: 5 Sec

(6)




DISSOLVE ON NEW ANNOTATION; ADD COUNTIES @ 1/SECOND
TIME OF SEG: ABOUT 15 SEC

SEGMENT HEADER

SEGMENT NUMBER 16

EMERGENCY X NON EMERGENCY

MEDIUM Cable Broadcast Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All X

WEATHER SITUATIONS Severe thunderstorm warnings

WEATHER PARAMETER(S) Severe Wx alert

TIME REFERENCE Past (incl. present) Prediction 0-1 hour

SCALE National Regional State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP (basically all users)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs emergency impact

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Counties and city areas subject to imminent severe thunderstorm passage

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Audio Tone: "Wx Bulletin"

State Map

Counties affected by warning should flash in red with black outlines. Annotate major cities within area

"In effect from now until ---" (Annotate)

Possibly overlay radar - indicated storm positions and movement (arrow)

List in sequence results of possible severe TS: HAIL, HIGH WINDS, HEAVY RAINS, FREQUENT LIGHTNING.

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) RAWARC Warnings; NOAA- Wire warnings; radar data from WSR - 57 dial-ups.

SHEET

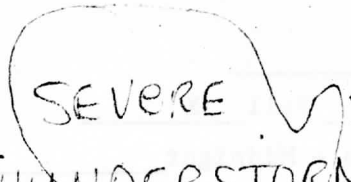
SEG 16

PROD.

DATE 2/1/76

TIME 30 secs

1




NO CHROMA?

FADE UP ON STATE MAP - USE AUDIO TONE & FLASHING RED ANNOTATION.
Hold 5 secs.

2 SEVERE THUNDERSTORM WARNING!


must divide up into 10 secs total for image each time

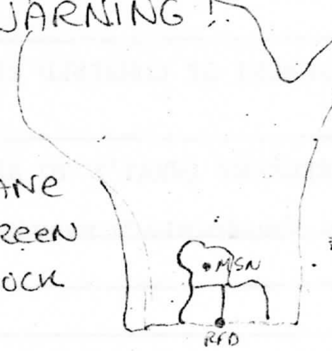
OUTLINE COUNTIES INVOLVED. LIST 1ST COUNTY AT LEFT, AS IT APPEARS BOLD & SOLID, THEN ADD NEXT COUNTY NAME AS IT APPEARS SOLID. (3 SECS FIRST COUNTY, 2 SECS EACH ADDITIONAL.

3 SEVERE THUNDERSTORM WARNING!


IN EFFECT UNTIL 12:30AM

Hold COUNTIES STEADY - ADD IN EFFECT TIME FOR COUNTIES, IN YELLOW.
Hold 5 secs.

4 SEVERE THUNDERSTORM WARNING!




Be Alert For:
— STRONG WINDS
— HAIL
— HEAVY RAINS
— INTENSE LIGHTNING

IN EFFECT UNTIL 12:30 AM

DROP TO OUTLINE OF COUNTIES. ADD IN MAJOR CITIES AND "ALERT FOR" CAUTION.
Hold FOR 11 secs, fade Black.

5

Notes:

— PROVISION FOR STAR * INSERT FOR ALREADY REPORTED SEVERE T's?

— IF COUNTY VALID TIMES DIFFER PERHAPS TIMES SHOULD BE INSERTED INSIDE COUNTIES, OR ATTACHED BY ARROW THERETO.

— PROBABLY FULL-SCREEN, NO CHROMA SE...

SEGMENT HEADER

SEGMENT NUMBER 17

EMERGENCY X NON EMERGENCY ____

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All X

WEATHER SITUATIONS Tornado warnings

WEATHER PARAMETER(S) Severe Wx Alert

TIME REFERENCE Past (incl. present) ____ Prediction 0-1 hour

SCALE National ____ Regional ____ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

**********************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP (but all users, too)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs impact of emergency use

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas subject to tornado warning - counties and city areas

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) ____

Audio Tone over "Wx Bulletin" or "Tornado Warning"

Rest similar to preceding "Severe Thunderstorm Warning"

**********************************************************************************************

DATA SOURCE (if non-existent, describe probable source) See preceding segment

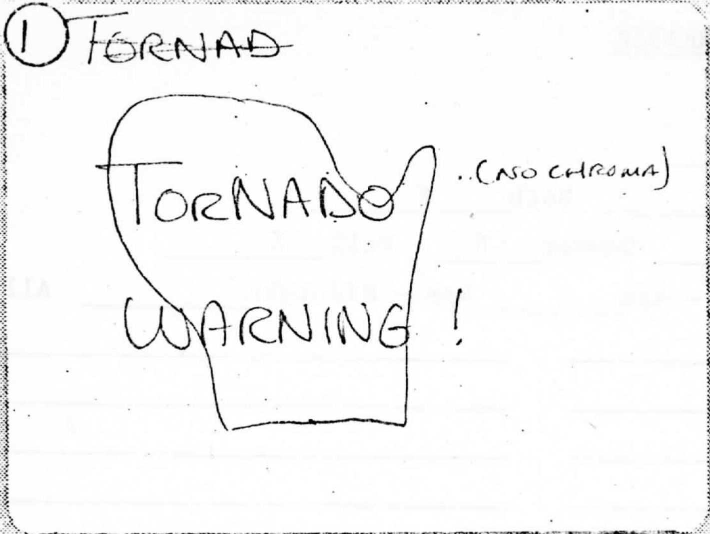
SHEET

SEG #17

PROD.

DATE 12/1/76

30 SECS

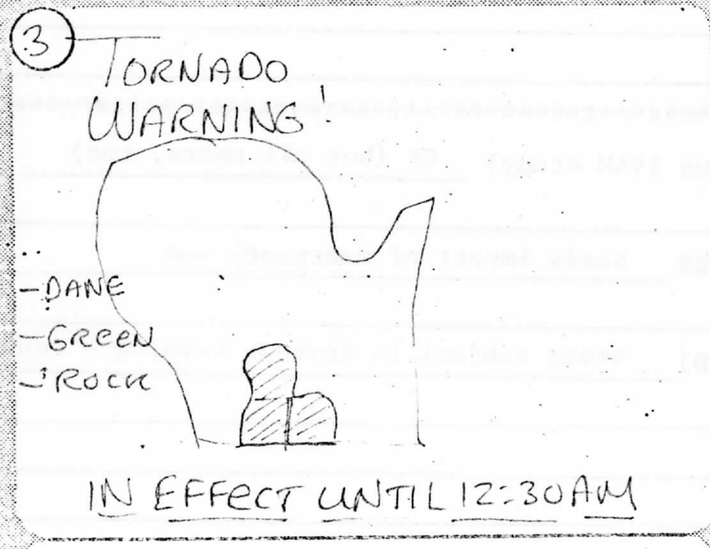



(SAME AS PRECEDING SEGMENT)

5 SECS

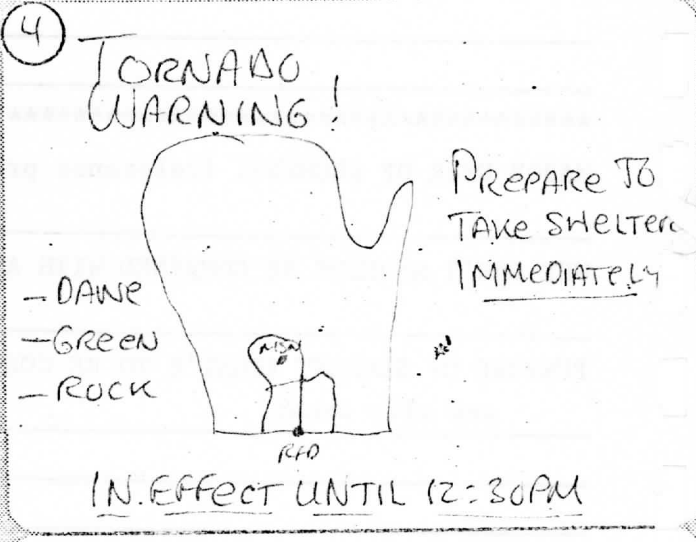

(SAME AS PRECEDING SEG)

3 SECS/COUNTY




(SAME AS PRECEDING SEGMENT)

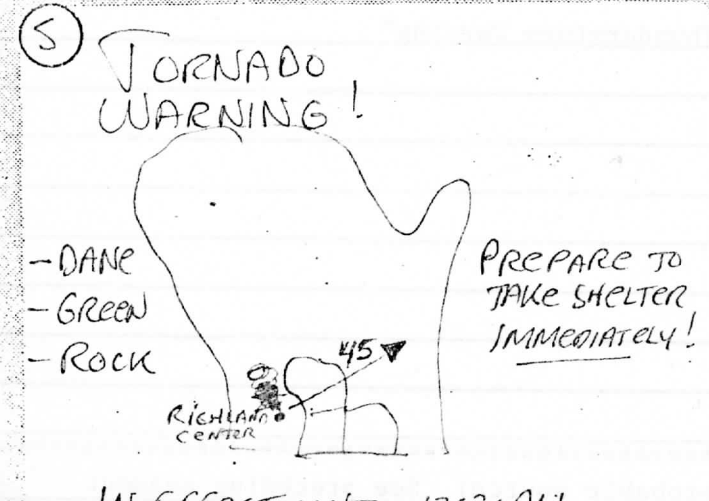
5 SECS




(SAME AS PRECEDING SEG, WITH DIFFERENT ANNOTATION)

- FLASH "IMMEDIATELY"

6 SECS




Reduce counties to outlines - ADD IN

SEGMENT HEADER

SEGMENT NUMBER 18

EMERGENCY X NON EMERGENCY

MEDIUM Cable Broadcast Both X

SEASON Winter X Spring X Summer Fall

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All X

WEATHER SITUATIONS Forecast of winter storm

Watch for area

WEATHER PARAMETER(S) Severe Weather alert

TIME REFERENCE Past (incl. present) Prediction 3-24 hours

SCALE National Regional X State Local

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas subject to wintry weather

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, TR, CO, UT - all users.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs impact of standing alone.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas for which a winter storm watch has been issued.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map

Shade areas subject to "watch" and annotate with "watch ..." and valid times

Insert storm center, or hatch radar area of significant precipitation. Add movement arrow.

List possible winterstorm results, i.e.: Possibly heavy rain, poor travel conditions, etc.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones forecast by state; regional coordination messages on RAWARC circuit.

SHEET

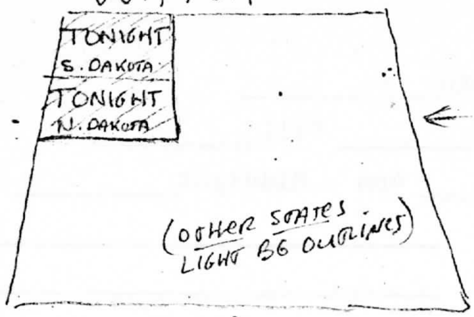
SEG 18

PROD.

DATE 2/1/76

30 secs

1 WINTER STORM WATCH



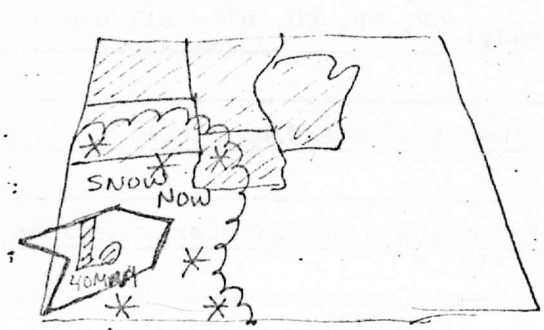

START WITH FIRST REGIONAL STATES FROM WEST, LABEL WITH STATE NAMES (SMALL BLACK) AND SHADE LIGHT BLUE WITH DARK BLUE OUTLINES... ADD IN VALID PERIOD ("TONIGHT") OR ("THURSDAY") AND SHADE. HOLD 4 SECS.

2 WINTER STORM WATCH


SHADE IN NEXT STATES OR TIME PERIODS TO EAST, LABEL AS BEFORE..

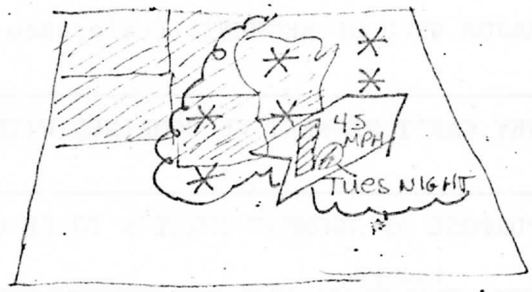
Hold 6 secs.

3 WINTER STORM WATCH!




DISSOLVE OUT NAMES + TIMES, AS STORM CENTER, MOTION + SPEED ARROW APPEAR. SCALLOP EDGE OF RADAR AREA, INSERT FLAKES AND LABEL "SNOW NOW", USE TRANSPARENT WHITE FOR SNOW AREA, RED FOR STORM + ARROW. Hold 4 secs

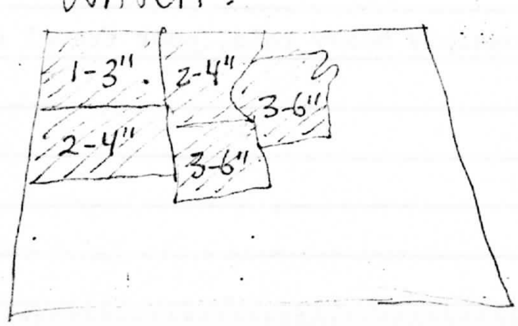
4 WINTER STORM WATCH!




STORM FORECAST - 6AM

ANIMATE STORM + RADAR FORECAST SNOW AREA SMOOTHLY TO 24 HOUR FORECAST POSITION, STOPPING 5 secs at 12 HR FORECAST POSITION. Hold 5 secs. (+ 5 sec ANIMATION)

5 WINTER STORM WATCH!




FORECAST - SNOW AMOUNTS, ENDING TUES. NIGHT.

OPTIONAL ADDITIONAL PANEL IF DESIRED. TIME: 10 SECS.

SEGMENT HEADER

SEGMENT NUMBER 19

EMERGENCY X NON EMERGENCY ____

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer ____ Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All X

WEATHER SITUATIONS Winter Storm warning" issued

WEATHER PARAMETER(S) Severe Weather Alert

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hours

SCALE National ____ Regional ____ State X Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas subject to wintry weather.

**************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) All users have an interest

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs impact of standing alone

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas for which a winter storm warning has been issued.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Similar to "Winter Storm Watch" segment with different annotation; and this is state rather than regional in scale.

Annotate precautions to be taken and expected severe weather: Heavy Snow, Glaze, Poor travel, etc.

**************************************************************************

DATA SOURCE (if non-existent, describe probable source) zones forecast; RAWARC circuit coordination messages

SHEET

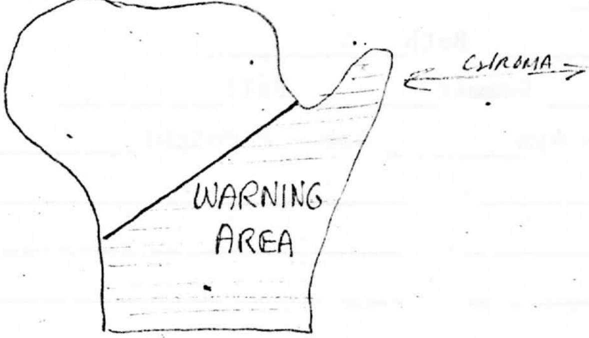
SEG
19

PROD.

DATE
12/1/76

20 sec

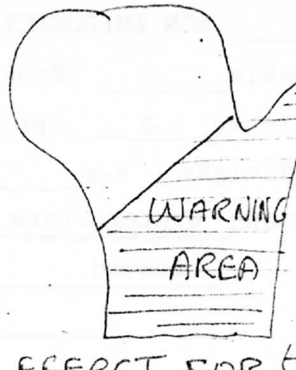
① WINTER STORM WARNING!




"Dissolve up on above with "WARNING AREA" FLASHING, THEN HOLDING. SHADE AREA PINK OR LIGHT RED.

TIME: 5 Sec

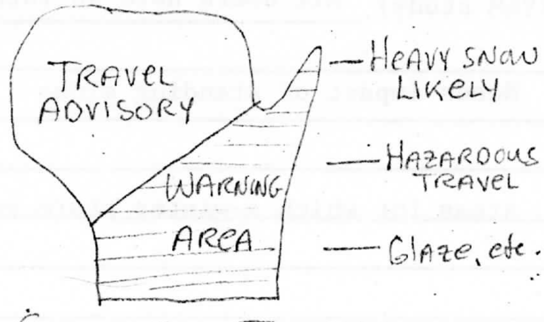
② WINTER STORM WARNING!




IN EFFECT FOR (TONIGHT) AND (TOMORROW)

DISSOLVE IN EFFECTIVE TIME AND HOLD FOR 5 SECONDS.

③ WINTER STORM WARNING!

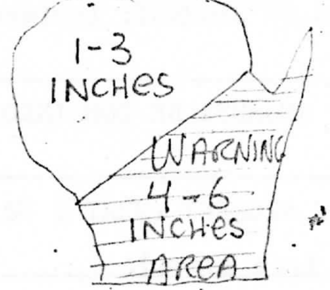



IN EFFECT FOR TONIGHT AND TOMORROW

ADD IN "TRAVEL ADVISORY" AREA IF APPLICABLE, ADD ADD IN CAUTIONS ONE AT A TIME AS REQUIRED.

5 secs

④ WINTER STORM WARNING!




LIKELY SNOW AMOUNTS
... BY TUESDAY MORNING ...

DISSOLVE OUT PREVIOUS. DISSOLVE IN SNOW AMOUNTS IN DARK BLUE. HOLD FOR 5 secs - cut to black.

○

○

Notes: If possible, include MAJOR ROUTES BG IN TAN (INTERSTATES, ETC)

SEGMENT HEADER

SEGMENT NUMBER 20

EMERGENCY X NON EMERGENCY

MEDIUM Cable Broadcast Both X

SEASON Winter X Spring X Summer Fall

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All X

WEATHER SITUATIONS "Travelers' Advisory" issued

WEATHER PARAMETER(S) Severe Weather Alert

TIME REFERENCE Past (incl. present) Prediction 3-24 hours

SCALE National Regional State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Since the "Travelers' Advisory" can be issued for fog or gusty winds in addition to winter weather, this segment will be for nationwide availability.

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, TR, GR ... and lesser impact on all other users.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs impact of standing alone

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas where difficult or impossible travel conditions are expected or existing due to : snow, glaze, frost, fog, blowing snow, winds.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Very similar to setup of previous warning segments.

State scale, with major routes and cities marked

Travelers' advisory area shaded

Annotate list of precautions and valid times.

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones forecasts and RAWARC circuit coordination messages

HEET

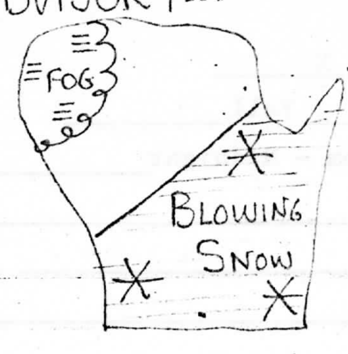
SEG 20

ROD.

DATE 1/1/76

20 Seconds

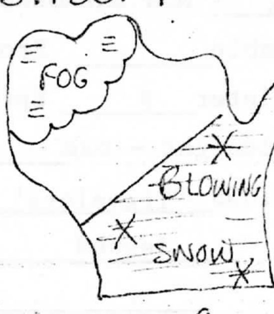
① TRAVELERS' ADVISORY...




Fade up on ADVISORY AREAS - see NOTES BOTTOM RIGHT. Use colors denoted BOTTOM RIGHT. MARK MAJOR ROUTES BG ON MAP.

TIME: 7sec.

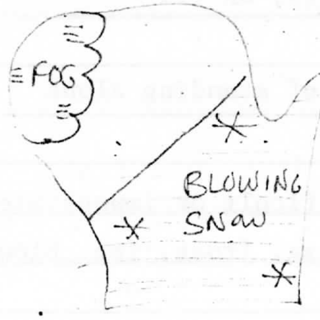
② TRAVELERS' ADVISORY...




IN EFFECT (TONIGHT) UNTIL ———

Dissolve in effective time.
Hold 5 sec.

③ TRAVELERS' ADVISORY




CAUTIONS
SLICK TRAVEL
LOW VISIBILITY
(etc)
DRIVE SAFELY!

IN EFFECT TONIGHT UNTIL ———

ADD CAUTIONS AS APPROPRIATE, Also restrictions if applicable (like, "No trailers permitted over passes"; "CHAINS REQUIRED" etc. AS APPROPRIATE to region. Hold 8 sec.

○ Note: This segment CAN apply to all areas of country, because travel advisories are issued for:

- SNOW
- GLAZE
- FOG
- DUST
- HIGH WINDS

- Use appropriate color key: TAN FOR DUST + WIND, GREY FOR FOG, WHITE FOR SNOW OR GLAZE etc.

Mathematical Association of America
P.O. Box 2310 · San Francisco · California 94126

SEGMENT HEADER

SEGMENT NUMBER 21

EMERGENCY X NON EMERGENCY ____

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All X

WEATHER SITUATIONS Forecast heavy rains exceeding flash flood guidance amounts.

WEATHER PARAMETER(S) Severe weather alert

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hours

SCALE National ____ Regional X State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) TP, TR, GR, AG ... and all others to a lesser degree

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs emergency impact.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas determined to be potentially threatened by local or widespread flooding

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map

Flashing "Flash Flood Watch"

Stationary valid time

Overlay major waterways and rivers

Shade flash flood watch area

Annotate waterway areas most threatened ("Souris Basin" etc.)

If possible, add county names (list form) affected

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones forecasts and RAWARC WSFO coordination messages.

**SHEET**

SEGMENT 21

**PROD.**

FLASH FLOOD WARNING

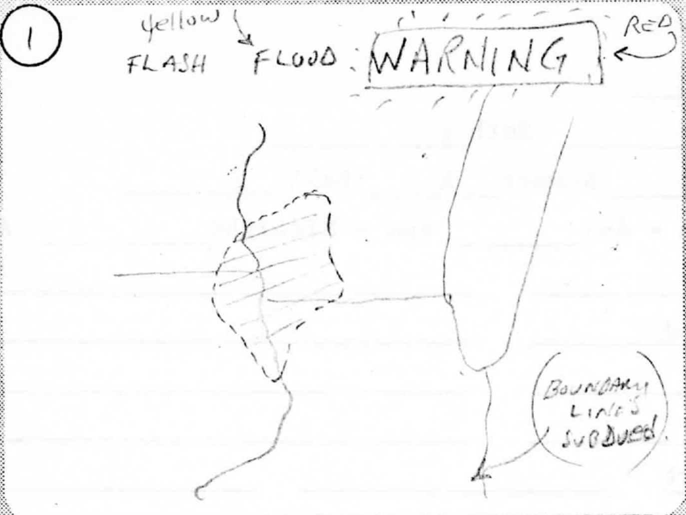
CABLE = B
BCST = A

TE :20

**DATE**

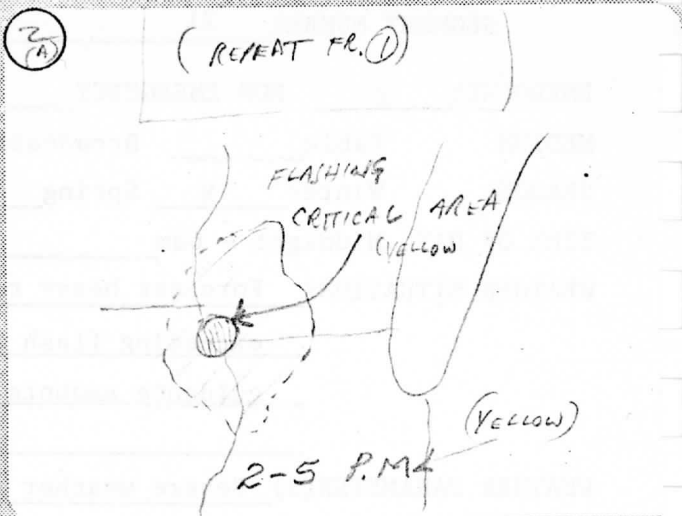
2/4/77

① 



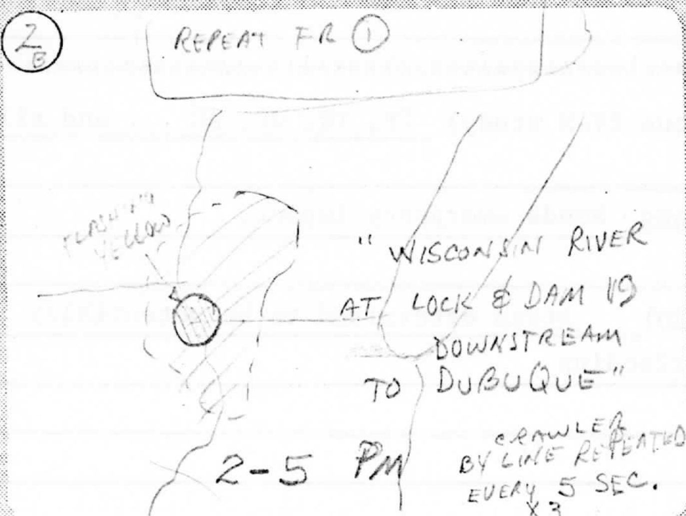

~~[illegible]~~ LIGHT BLUE BACKGROUND
SHADE AREA INVOLVED IN RED HATCHING.
(USE AUDIO ALERT TONE)
OUTLINE SHADED AREA (BROKEN WHITE LINE
TE :05

2 (A)




AUDIO: BRIEF DESCRIPTION OF EXACT POINT IN DANGER, ADDING V.T.
TE :15

2 (B)

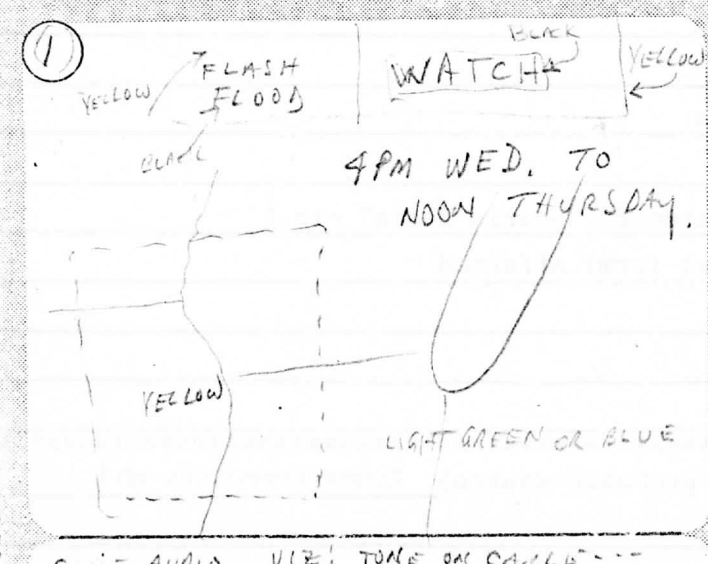



CABLE AUDIO = ALERT TONE REMAINS UP FOR ENTIRE SEQUENCE.
TE :15

REPEAT EVERY 5 MINUTES FOR FIRST 15 MIN, THEN EVERY 15 MIN NEXT HOUR

AS UPDATES ARE ISSUED MAKE NEW SEGMENTS AND USE IN ADDITION TO OR IN COMBINATION, USING PROGRAM PRE-EMPT.

①




SAME AUDIO, VIZ: TONE ON CABLE --- TEXT ON BCST AFTER ALERT TONE

C.D.

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SEGMENT HEADER

SEGMENT NUMBER 22

EMERGENCY X NON EMERGENCY

MEDIUM Cable Broadcast Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All X

WEATHER SITUATIONS Flash flooding imminent or in progress

WEATHER PARAMETER(S) Severe Weather alert

TIME REFERENCE Past (incl. present) Prediction 0-6 hours

SCALE National Regional State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*********************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, TR, AG ... and all other users to a lesser degree

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Needs emergency impact of standing alone

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas affected by current or imminent flooding

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map. Annotate major waterways and cities.

Shade area valid for warning

Annotate valid times

Try to list creeks, streams, rivers affected, as well as metropolitan areas subject to warning, if possible

*********************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones forecasts; NOAA - wire flood warnings; RAWARC warnings and coordination

SEGMENT HEADER

SEGMENT NUMBER 23

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) 5 day review and outlook: Temps. and precipitation

TIME REFERENCE Past (incl. present) 5 days + Prediction 5 days

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP 18/19; agriculture; industrial; utilities; shippers

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a combination of past 5 days with forecast 5 days -- as well as temps. and precip. info.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

Overview of past 5 days average weather in broad scale

Overview of 5 day forecast mean weather in broad scale

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

National Map (U.S. + southern Canada)

Past: Shade cooler than normal region light blue (label "cool")

Shade warmer than normal region light orange (label "warm")

Fade in cross hatching of wetter than normal area and label

Annotate: "Weather last 5 days"

Future: Same format, but Annotate: "Forecast next 5 days"

Consider adding preceding frame showing contours of normal temps.

Consider adding "IX$^{o}$" in cool or warm centers ...

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX extended outlook progs (daily transmission) for next 5 days; state center extended outlooks.

SHEET

SEG 28

PROD.

5 DAY Review AND OUTLOOK (NATIONAL)

TIME: 1 MIN.

DATE 12/11/76


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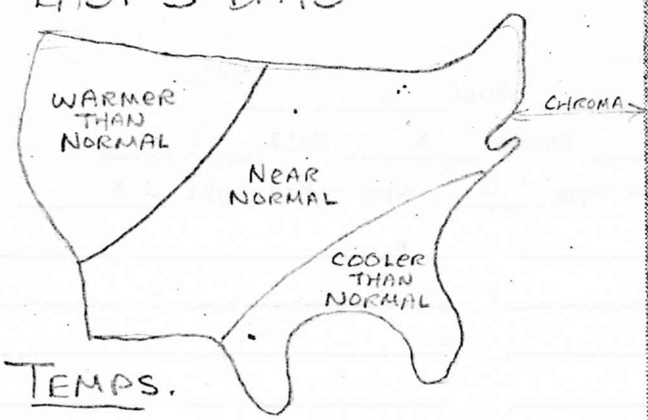
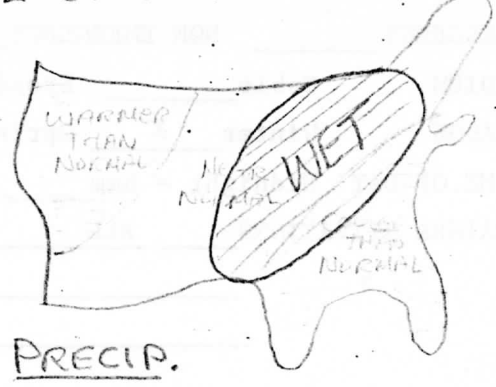
(1) WEATHER-
LAST 5 DAYS




TEMPS.

U.S. MAP with state outlines. Shade cooler than normal areas light blue, warmer than normal areas light orange + label with same color (black outlined + darker shade). SMOOTHING SHOULD BE LARGE-
TIME 10 Sec

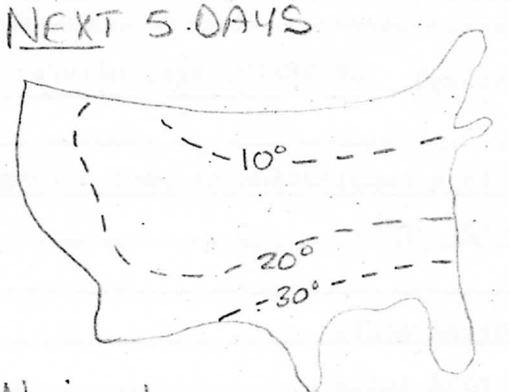
(2) WEATHER-
LAST 5 DAYS




PRECIP.

FADE DOWN SHADING AND ANNOTATION TO BACKGROUND AS FADE-UP ON NEW TITLE AND DIAGONALLY HATCHED AREAS. HATCHING + TITLES IN GREEN, FOR WETTER THAN NORMAL AREAS.
TIME 10 SEC

(3) WEATHER-
NEXT 5 DAYS




NORMAL HIGH TEMPS.

U.S. with state outlines. Dissolve to this FRAME, SHOWING NORMAL HIGH TEMPS FOR NEXT 5 DAYS, IN 10° LINES. MATCH NEW TITLE TO COLOR OF LINES (Yellow?)
TIME: 10 Sec

(4) WEATHER-
NEXT 5 DAYS


FORECAST TEMPS

Fade "NORMAL" lines to BACKGROUND AS FORECAST ABOVE/BELOW AREAS DISSOLVE IN OVERLAYED. USE LIGHT BLUE = COOL, light ORANGE = WARM. USE BANDS EVERY 5° BUT NO MORE THAN 4 or 5 PER MAP.
HOLD 15 SEC.

(5) WEATHER-
NEXT 5 DAYS


FORECAST PRECIP.

DISSOLVE TO THIS PRECIP FORECAST. USE SHADED GREEN FOR WET FORECAST.

SEGMENT HEADER

SEGMENT NUMBER 24

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS 1st and 15th day of ea. month

WEATHER PARAMETER(S) 30 day review plus 30 day weather outlook

TIME REFERENCE Past (incl. present) 30 days Prediction 30 days

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*************************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP 18/19; Agriculture; industrial; utilities.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a combination of past and future and of temp and precip 30 day information

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

See previous (5 day) segment

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

See previous (5 day) segment (except different annotation)

*************************************************************************************************

DATA SOURCE (if non-existent, describe probable source) 30 day "Average monthly weather outlooks" and NWS publication "Verification of Average Monthly Weather Outlook"

SEGMENT HEADER

SEGMENT NUMBER 25

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Every two weeks (1st and 15th)

More often if data permits

WEATHER PARAMETER(S) Wet-Dry spells

TIME REFERENCE Past (incl. present) ______ Prediction 30 days following

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GRIS, GP 18, Agriculture

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter; also long scale forecasting inappropriate for combination with other elements.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of 48 states expected to be drier or wetter than normal for next 30 days.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

1. U.S. map - state outlines, part of Canada, Mexico
2. Add shaded area in green for area forecast wetter than normal. Annotate
3. Add light tan shading for drier than normal areas. Annotate.
4. Annotate "normal" areas in between

Segment time: 30 seconds

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX 30-day "Average Monthly Weather Outlook"

SEGMENT HEADER

SEGMENT NUMBER 26

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All ______

WEATHER SITUATIONS Every 2 wks. (1st or 15th)

More often if data permits.

WEATHER PARAMETER(S) 30 day temp. outlook

TIME REFERENCE Past (incl. present) ______ Prediction Next 30 days

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) ALL - particularly GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Possibly combine with 30 day precipitation outlook

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas cooler than, warmer than normal in U.S. Forecast for next 30 days, averaged.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

U.S. Base map - show position Canada and Mexico. Shade areas in blue tone and annotate "cooler (or colder) than normal"; Shade areas in warm color and annotate "warmer than normal" Then add words, "Near Normal" to remainder of unshaded areas.

*****************************************************************************************

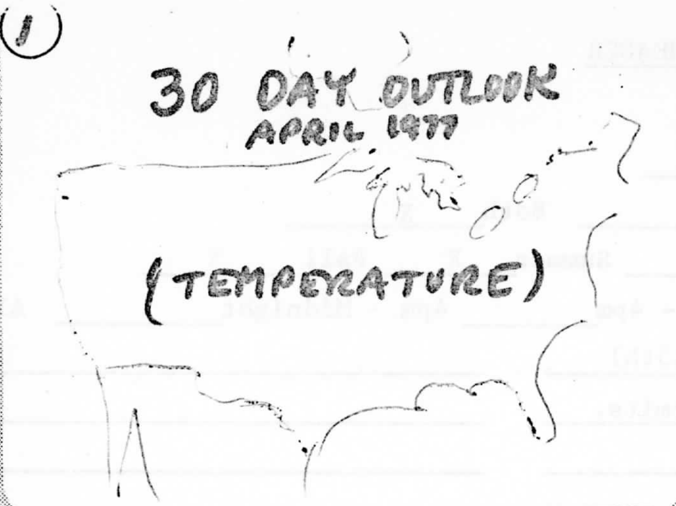
DATA SOURCE (if non-existent, describe probable source) "Average Monthly Weather Outlook" (FAX and TT transmission)

SHEET
Seq 26

PROD.
30 DAY TEMP-PCPN

DATE
2/77
G. Winterling

(1)

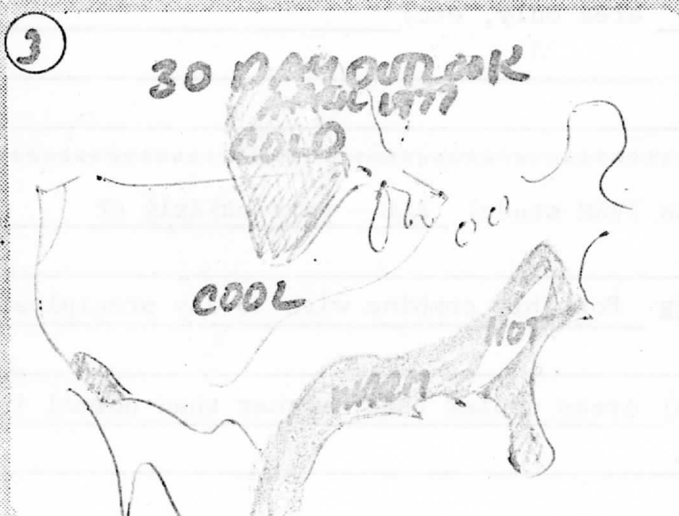



U.S. Map - part Canada - part Mexico label across top "30 DAY OUTLOOK" + period "April 1977". 3 seconds in flash "Temperature" 2 seconds

(2)

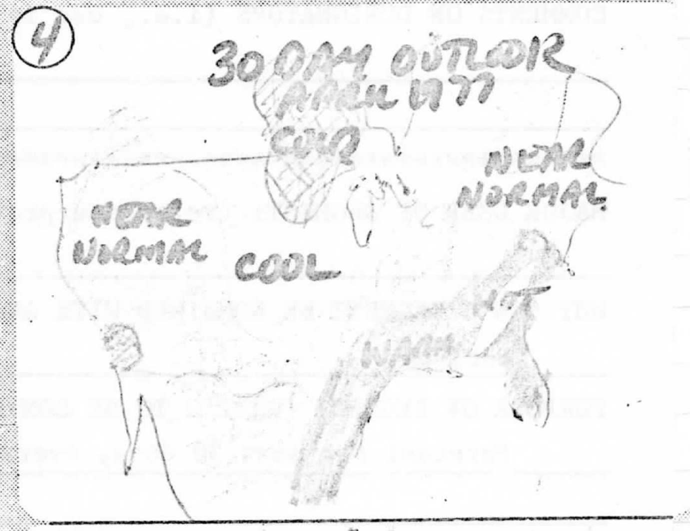

AS "Temperature" fades out, bring in COLDEST area in winter months & fall (WARM area in summer & spring). If extreme (hot), at 8 seconds place this in yellow with label

(3)



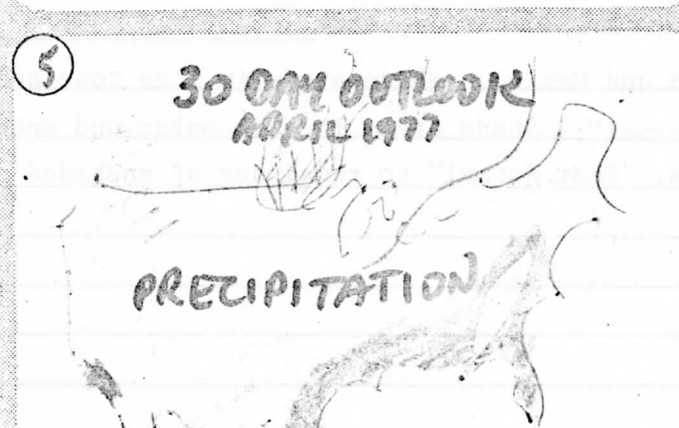

At 10 seconds add cooler cold area (medium blue) at 13 seconds add cold extreme - dark blue

(4)



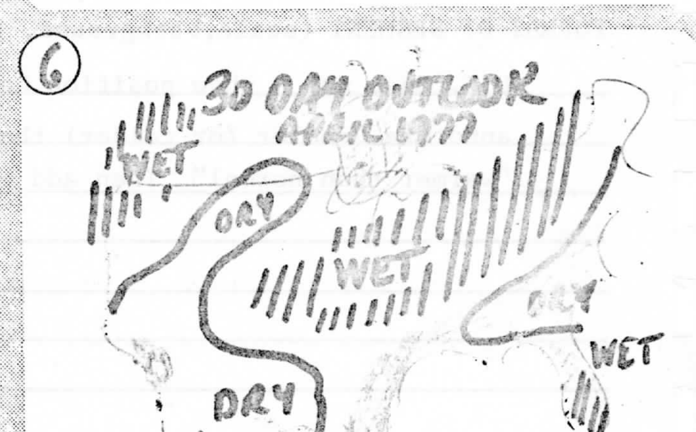

At 15 seconds - fade in purple for near normal areas

(5)




At 15 seconds Drop cool, warm, etc labels and dissolve in "Precipitation" w/o colors

(6)




AT 20 SEC DROP "PRECIPITATION" + DISSOLVE IN HASH AREAS FOR ABOVE NORM PCPN. AT 25 SECONDS OUTLINE DRY AREAS WITH WORD "DRY" INSIDE

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SEGMENT HEADER

SEGMENT NUMBER 27

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS All - ocl. use

WEATHER PARAMETER(S) 5 day temp. outlook

TIME REFERENCE Past (incl. present) ______ Prediction 5 days

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG, MR, UT, GR, TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User group combination of needs met here.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Closer view and quantitative departures from temperature normals forecast for the next 5 day period.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Probably use max temps forecast - could use means, but don't have much comprehension

Start with regional map with state outlines

Add dashed lines for normal max temp contours ($5^{o}$ intervals)

Overlay shading for forecast cooler/warmer areas (blue; yellow-red)

Label "$5^{o}$ cooler than normal," etc.

Shading at $5^{o}$ intervals

Label unshaded areas: near normal

Label valid dates and "forecast"

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) 5 day FAX forecasts (NWS long range prediction group); state extended outlooks (NOAA wire)

SHEET
seg 27

PROD.
5 DAY Temps Regional

DATE

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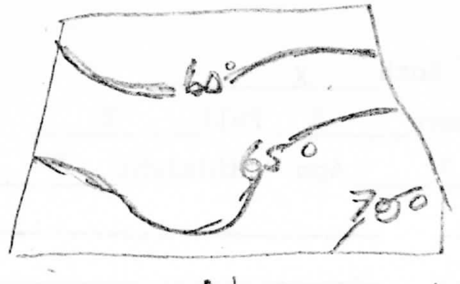
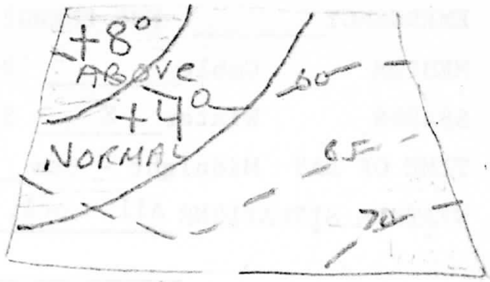
1 5 DAY OUTLOOK:




NORMAL HIGHS

REGIONAL MAP - STATE OUTLINES DARK GREY BORDER - LIGHT GRAY INTERIOR OF STATES - YELLOW STATE OUTLINES. WORDS "NORMAL HIGHS" AND DASHED LINES BOTH IN RED, "5 DAY OUTLOOK" IN YELLOW. USE 5° CONTOURS, ~~DASHED~~ SOLID, FOR 5 DAY NORMAL HIGH TEMPS, THICK LINE, LARGE NUMBERS —
— TIME: 10 SECONDS

2 5 DAY OUTLOOK:

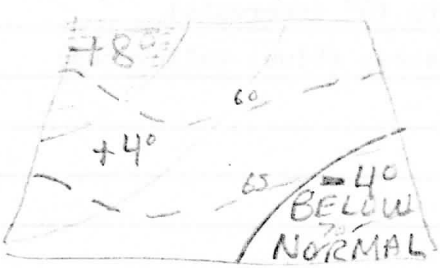



FORECAST-
TUES - SAT

WIPE (2 SEC SLOW) TO SAME MAP + BG COLORS, SAME TOP TITLE - NEW BOTTOM TITLE —

— SHADE ABOVE NORMAL FORECAST AREA (4° OR MORE)
— DOUBLE SHADE 8° + area
— LABEL "ABOVE NORMAL" DARK OR
— SHADING - ORANGE
— TIME: 10 SECONDS
— NORMAL LINES - BACK OFF TO DASHED, THINNER LINES WITH SMALLER NUMBERS

3 5 DAY OUTLOOK:




FORECAST-
TUES - SAT

2 SEC SLOW
— WIPE TO ABOVE FRAME
— "BELOW NORMAL" IN DARK BLUE,
— SHADING LIGHT BLUE
— TIME: 10 SECONDS

Note: TRY DARK GREY STATE OUTLINES OR DROP NORMAL TEMPS LINES completely after FRAME 1 IF NUMBER OF LINES BECOMES CONFUSING

SEGMENT HEADER

SEGMENT NUMBER 28

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable ________ Broadcast ________ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ________ 6am - 4pm X 4pm - Midnight X All ________

WEATHER SITUATIONS All - for occasional use

WEATHER PARAMETER(S) 5 day precipitation outlook

TIME REFERENCE Past (incl. present) ________ Prediction 5 days

SCALE National ________ Regional X State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG, MR, UT, GR, TR and others

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User group combination of needs are met here.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Closer regional view of weather outlook for planning purposes. Areas forecast to receive more than normal, normal, less than normal precip. indicated.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map

Dissolve on most likely rain day(s) over area

Dissolve to shading of areas expected to receive above/below amounts during period

Label, and label intervening area "near normal"

Find some way to indicate the general (smoothed) normal amount from climatological records for the 5 day period, for comparison

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) 5 day FAX forecasts, 1 showing rain chances each day, others show forecast departure from normal on a national scale.

SEGMENT HEADER

SEGMENT NUMBER 29

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast X Both ____

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS Significant, organized storm forecast or in progress

WEATHER PARAMETER(S) Storm Track

TIME REFERENCE Past (incl. present) ____ Prediction 0-48 hrs.

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) More for use in winter due to significant number of organized areas

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) ALL

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Basic building block -- helps explain all others

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

See regional storm track segment

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See regional storm track segment

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) See regional track segment

## SEGMENT HEADER

SEGMENT NUMBER 30

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast X Both ______

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS Significant organized storm forecast or occurring

WEATHER PARAMETER(S) Storm track

TIME REFERENCE Past (incl. present) ______ Prediction 0-24 hrs.

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Probably more for use in winter, since storms are better organized

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) ALL

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Basic building block; helps explain all other segments.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Movement, timing, speed and area affected by significant storm systems.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Regional map with state outlines

Insert current storm position as dot labeled "Storm center " or as "L"

Insert precipitation area as shading. Divide frozen/unfrozen precip. & label "snow," "rain," showers," etc.

Fade "L" down, while annotating to 6 hour forecast position. Label line.

Box "L" with direction arrow

Keep brightest "L" as one being shown; leave others behind as a dimmer, labelled "trail," showing track of storm.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX, 12, 24, 36, 48 hr; SFC PROGS.

SHEET

Seg 30

PROD.

Regional storm track, clouds and precip areas

DATE 12/16/76

1 MIN TOTAL

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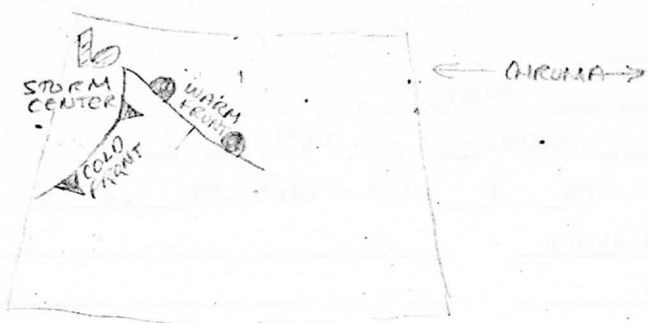
① STORM TRACK




CURRENT POSITION : NOON

REGIONAL MAP WITH STATE OUTLINES. USE NEUTRAL BACKGROUND COLORS. NOTE FOR ALL REGIONAL SEGMENTS: PERHAPS FILL WHOLE FRAME WITH STATES, LET BROADCASTER PICK CHROMA OFFSET SIDE. WARM FRONT + LOW IN RED, COLD FRONT IN BLUE. TIME: 10 SEC

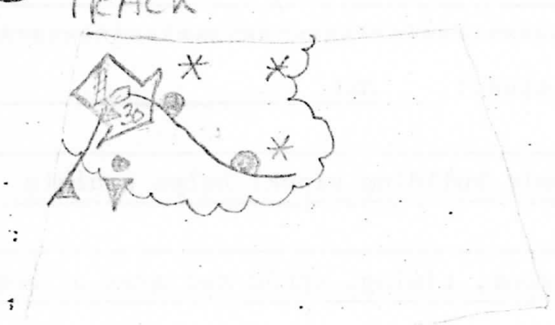
② STORM TRACK


CURRENT Weather : NOON

DISSOLVE IN NEW INFO + TITLES, CLOUDS FROM SATELLITE IMAGERY, WITH DARK CONTRASTING WX SYMBOLS AND WORDS OVERLAYED (FROM RADAR DATA)

TIME: 10 SEC

③ STORM TRACK

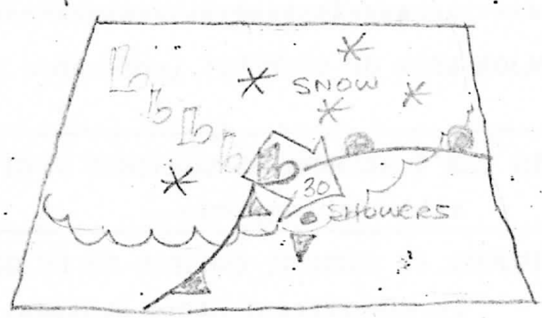



CURRENT Weather : NOON

DISSOLVE TO STYLIZED GREY CLOUDS AND DISSOLVE ON ARROW + SPEED OVER STORM CENTER. LEAVE ALL ELSE (DROP PRECIP ANNOTATION)

5 SEC

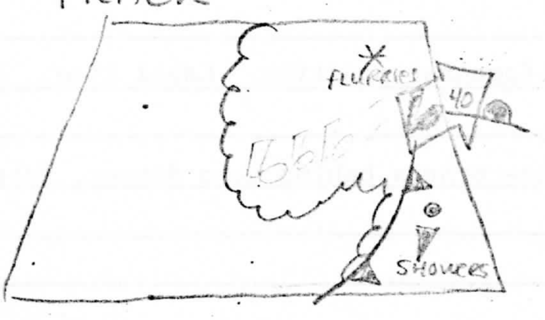
④ STORM TRACK




FORECAST: MIDNIGHT

ANIMATE ALONG FORECAST STORM TRACK WITH EACH 3 HOURLY POSITION SOLID + BRIGHT, THEN FADE TO BACKGROUND. LEADING LOW CENTER HAS ARROW + SPEED. STOP AT 12 HOUR FORECAST. ADVANCE CLOUD AREA FRONT AND PRECIP BUT DROP PRECEDING ONES AS NEW APPEAR. 15 SEC (5 SEC ANIMATE, 10 SEC HOLD. ADD PRECIP TITLES IN HOLD ONLY MOD)

⑤ STORM TRACK




FORECAST: NOON TOMORROW

REPEAT FOR 2ND 12 HOURS AS IN ④

5 SEC ANIMATE, 15 SEC HOLD.

Note: Probably hatch precip area, overlayed on clouds in all these frames.

2) Satellite projection to be used --

SEGMENT HEADER

SEGMENT NUMBER 31

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast X Both need basic info., but formats will be different

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Macro weather presentation

TIME REFERENCE Past (incl. present) 0-24 Prediction ______

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Should relate to segments 1 and 2. This is a basic segment.

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP - all viewers

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER It might replace 1 when temperature information is mostly contained in this segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) 1 The macroscale weather situation: fronts, air masses, clouds, precip., severe weather, etc. This is the big picture which ties all the rest together.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc) Whole U.S. with enough of the surround to show big storms over the Pacific, cold air over Canada, hurricanes, typhoons off the West Coast, etc. The area covered need not be exact by the same day-to-day. Projection should be satellite view. Keep the map relatively simple - use motion animation for fronts, etc. Overlay satellite pictures for clouds. Because of satellite positions this segment will probably be different for east and west halves of nation. Perhaps duration should be different for different weather situations -- Does this lead to "sub-segments" or can we handle differing duration in same segment?

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Satellite pictures, surface and upper air observations, Facsimile maps for 24 and 12 hrs. past.

SEGMENT HEADER

SEGMENT NUMBER 32

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable ________ Broadcast X Both ________

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ________ 6am - 4pm ________ 4pm - Midnight ________ All X

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Macro weather presentation

TIME REFERENCE Past (incl. present) ________ Prediction 12-48

SCALE National X Regional ________ State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) This is basic national forecast presentation -- should relate in format, etc., with segment #3.

************************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP - all viewers

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Might replace Segment 2 when temperature forecast is apparent from this segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) The general weather forecast for nation. The big pictures for all viewers.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc) Same scale and map as 3, but since forecast will contain fewer numbers than past data and intervals will be greater (12-24-48 hrs) it may be necessary to use stop action instead of motion. Satellite cloud cover will be missing so different cloudiness; presentation is needed, but should be similar to picture. Probable duration is about the same as 3, and may vary with weather situation.

************************************************************************************************

DATA SOURCE (if non-existent, describe probable source) National forecast which will probably be in conographic or facsimile form.

SHEET

SEG 32

PROD.

"MACRO" WX PRESENTATION (BROADCAST)

DATE

2/5/77

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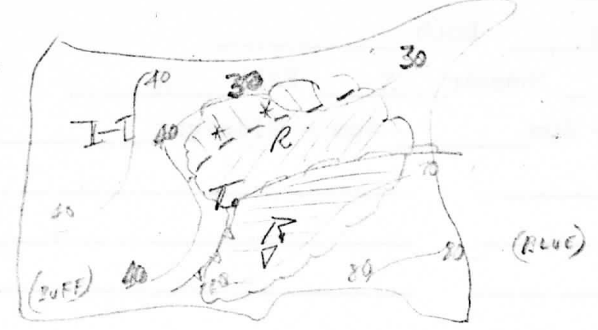
C 10

(1) TONIGHT (06Z)




STATE BOUNDARIES = SUBDUED THIN BLUE

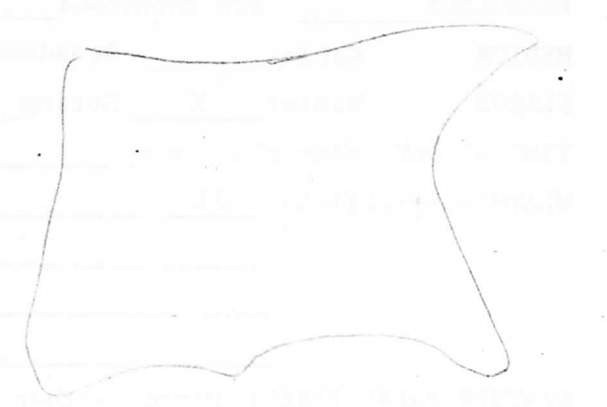
(H)(L) FRONTS SUBDUED IN NORMAL COLORS.

SCALLOPED CLOUDS
SHADED PRECIP & SYMBOLED

5 SEC

5

(2) TONIGHT (12Z)

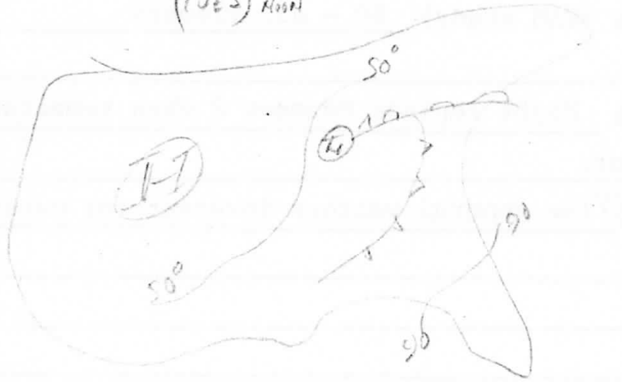


VERY SLOW DISSOLVE FM (1) to 3-hr EXTRAPOLATION (2 SEC.)

5-SEC.

12

(3) TOMORROW (18Z)
(TUES) NOON

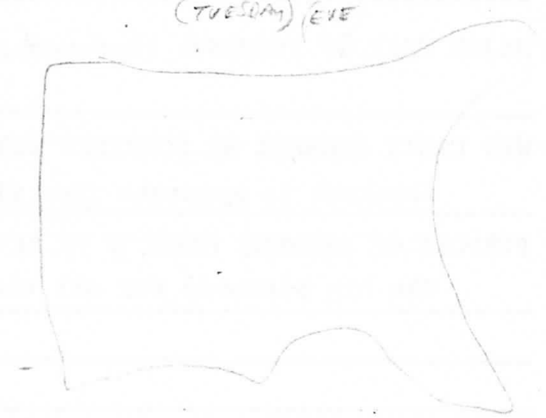



SAME SLOW DISSOLVE

5 SEC

19

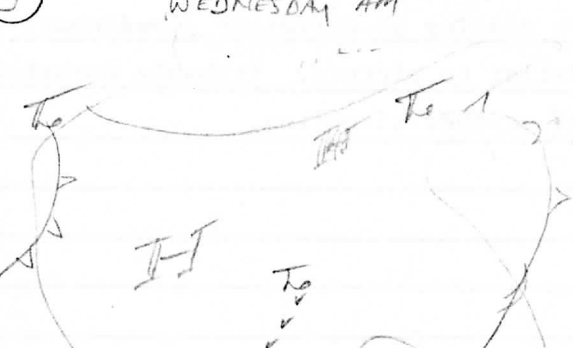
(4) TOMORROW (24Z)
(TUESDAY) EVE



5 SEC

26

(5) WEDNESDAY AM

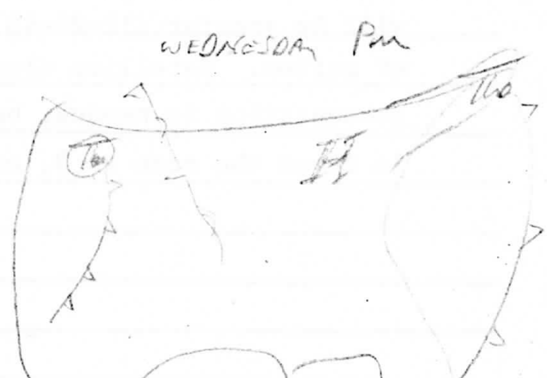



NOTE!
(H) ONLY DEPICTED.

2+3 SEC.

31

(6) WEDNESDAY PM




2+3 SEC

(36)

SEGMENT HEADER

SEGMENT NUMBER 33

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am X 6am - 4pm X 4pm - Midnight X All X

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Clouds, pressure, front (general segment), and winds.

TIME REFERENCE Past (incl. present) 0-48 hrs Prediction ____

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study)

General public and, secondarily, to all other users as an overview

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Already combines several elements too complex to combine further.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Overall weather picture - national. Brings viewer's understanding up-to-date and lays ground for specific weather elements, and forecast.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1. U.S. map with some Canada, Mexico and ocean area showing
2. Overlay highs, lows and fronts
3. Shadecool air blue, warm air pink or orange. Add 2 or 3 wind arrows
4. Animate from 48-72 hrs part to present (smooth dissolves)
5. Drop shading and arrows. Overlay satellite clouds.

Inter-changeable

TOTAL segment time: 1 minute; try 45 seconds

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Satellite data, fax surface charts.

SEGMENT HEADER

SEGMENT NUMBER 34

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All X

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Clouds & Precipitation

TIME REFERENCE Past (incl. present) 0-24 Prediction ____

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP 7 and all users

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a basic building block.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Basic understanding of current and forecast weather (to follow in next segment) must be based on understanding of past wx; speed of movement; and dynamic development of systems. Overlaying several parameters aids the understanding of the interrelationship between weather elements.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

National Map. Use satellite format with SMS overlay. Stationary on past; then remove time; advance to present.

1. Add high and low centers and front
2. Add wind arrows
3. Remove 1 and 2; dissolve on shaded areas of precipitation with annotation of type. Possibly arrow for movement.
4. Add severe Wx boxes if appropriate (flashing with times)

******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SMS pictures; national radar summaries (RAWARC and FAX); NAFAX surface analysis.

SEGMENT HEADER

SEGMENT NUMBER 35

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS all

WEATHER PARAMETER(S) Clouds & precipitation

TIME REFERENCE Past (incl. present) ______ Prediction 0-48 hrs.

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*********************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR 1, GP 6, GR 2, GP 7, GP 5.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a building block. It is, however, a combination of times: 1-6, 3-18, 12-72 future segments.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Continuation of preceding past/present segment: an overview of weather systems.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

National Map

1. Use present stationary SMS and fronts + hi/lows
2. Dissolve into stylized format of SAME information
3. Advance time (animate) stopping at Noon, 6 pm, mid, 6 am ...
4. At each stop, add precipitation shading and words
5. Use animated wind arrows
6. Severe Wx boxes?

*********************************************************************************

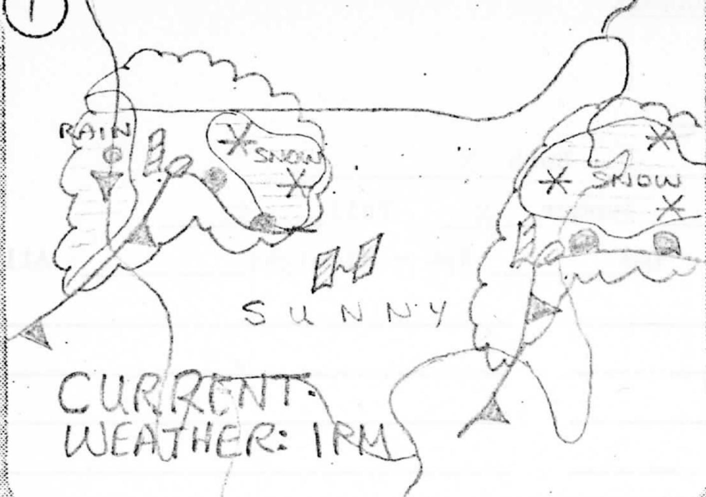
DATA SOURCE (if non-existent, describe probable source) NAFAX 0-48 hr SFC PROG.

SEG 35

PROD. Natl. Clouds & Precip Forecast up to 90 sec

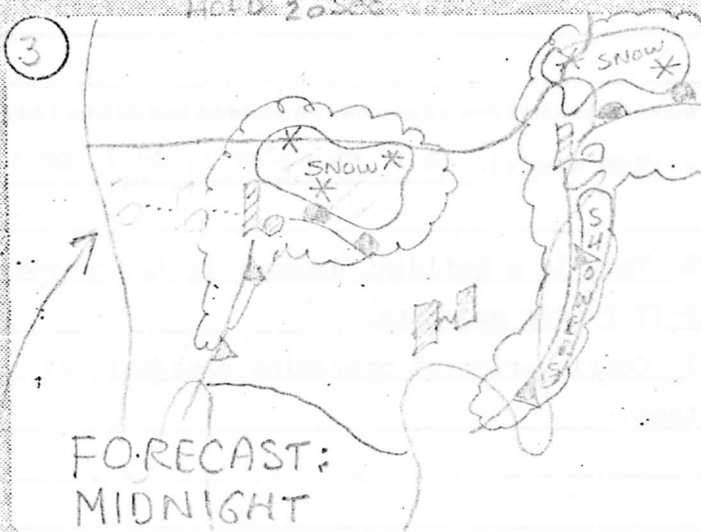
DATE 2/11/76

TK

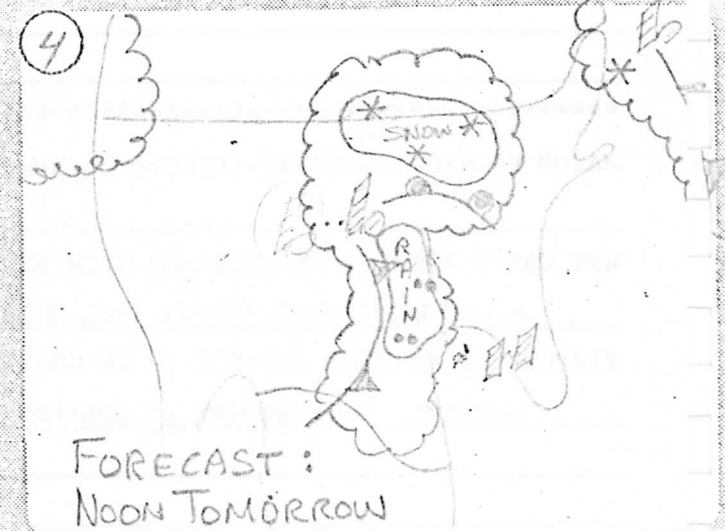



US MAP AND SRN CANADA AND MEXICO, SOME OCEAN. CENTER MAP (CHROMA POSSIBLE EITHER SIDE). STATE OUTLINES, MAJOR LAKES AND OCEANS. USE SATELLITE PROJECTION. OVERLAY SMS CLOUDS, SFC FRONTS IN RED + BLUE, LOW CENTERS IN RED, HIGH CENTERS BLUE. HOLD 20 SEC

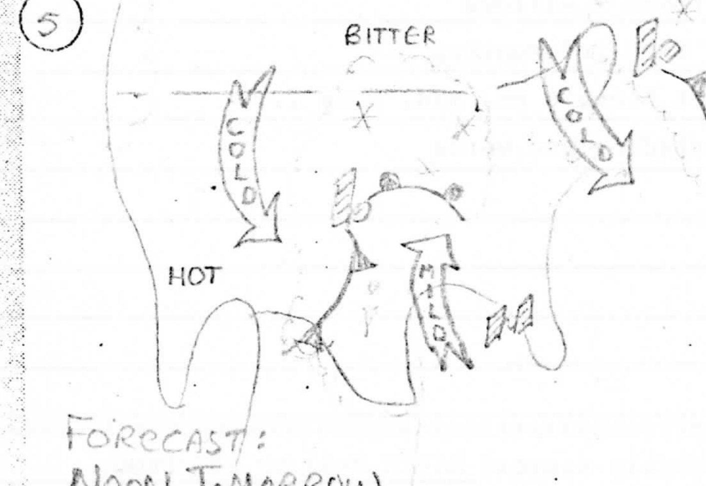

SLOW DISSOLVE TO CURRENT WX WITH STYLIZED CLOUDS, THEN ADD ARROWS OVER PRESSURE SYSTEMS. USE OFFWHITE FOR STYLIZED CLOUDS, ARROW COLORS SAME AS LOW/HIGH COLORS. 5 SEC




TWO DISSOLVES @ 1 PER 2 SEC: 1ST TO 12 HOUR FORECAST, 2ND TO 24 HR FORECAST - NO STOP AT 12 HR; HOLD FOR 15 SEC AT 24 HR. LEAVE FAINTLY VISIBLE H AND L AT PRECEDING DISSOLVE POINT (TO SHOW MOVEMENT CONTINUITY). INCLUDE OVERLAYED, SHADED, FORECAST PRECIP. 10 SEC




ADVANCE TO 24 HOURS AS IN (3). Hold 15 sec




FADE CLOUDS & PRECIP TO BG - LEAVE LOWS, HIGHS, FRONTS STRONG. AT SAME TIME DISSOLVE IN WIND + TEMP INFO FORECAST. BLUE SHADED ARROWS + LETTERS FOR COLD, ~~RED~~ LIGHT ORANGE FOR WARM. WORD TEMPS CAN BE ADDED.

(6) REPEAT (4) AND (5) FOR 48
(7) HOUR FORECAST MAPS

Notes

1) SMOOTHING OF FORECAST CLOUD & PRECIP AREAS AND ESPECIALLY CURRENT RADAR AREAS (1) IS ESSENTIAL TO AVOID CLUTTER.

2) TOO LONG FOR SINGLE SEG - BUT CAN BE PICKED UP BY BROADCASTERS AS CURRENT ONLY, FORECAST ONLY, 24 HR FORECAST ONLY, ETC.

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SEGMENT NUMBER 36

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am X (cable) 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS ALL - Basic Segment

WEATHER PARAMETER(S) Clouds & precipitation (+ fronts, highs & lows)

TIME REFERENCE Past (incl. present) ______ Prediction 0-48 hrs

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP 7, 6, TR 7, GR 3, GP 5, GR 5, AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Basic building segment

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Used as "either/or" with preceding segment to allow flexibility to use clds & precip. forecast to be national or regional in scale, or both. One could use (1) past natl. → future national, (2) past national → future regional, (3) future regional → future national or (4) past regional → future regional.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc) Zoom from national SMS

Regional map with state outlines & colored BG neutral color

Use satellite for current, then transition to stylized data

Step or Dissolve sequence to 48 hrs.

Should be able to be terminated prior to 48 hrs forecast if desired

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zone forecasts and NAFAX 24, 48 hr progs.

SHEET
36
see precip & pressure map pattern
or regional handled same way

PROD.

DATE
2/77
F. Norman

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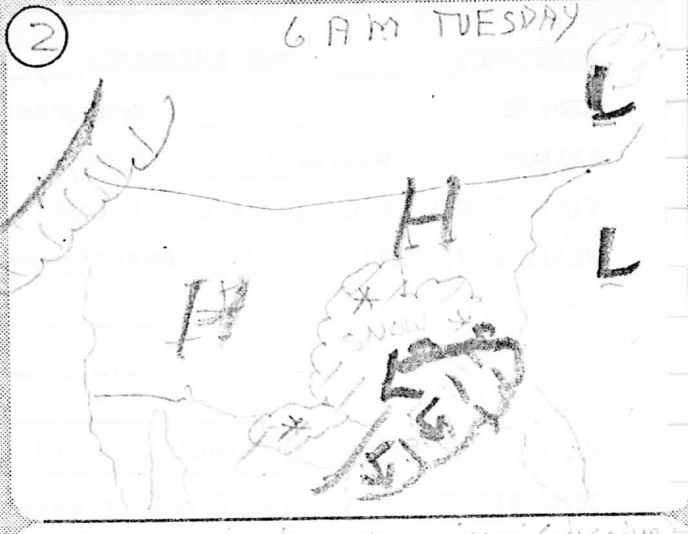
1


always standard

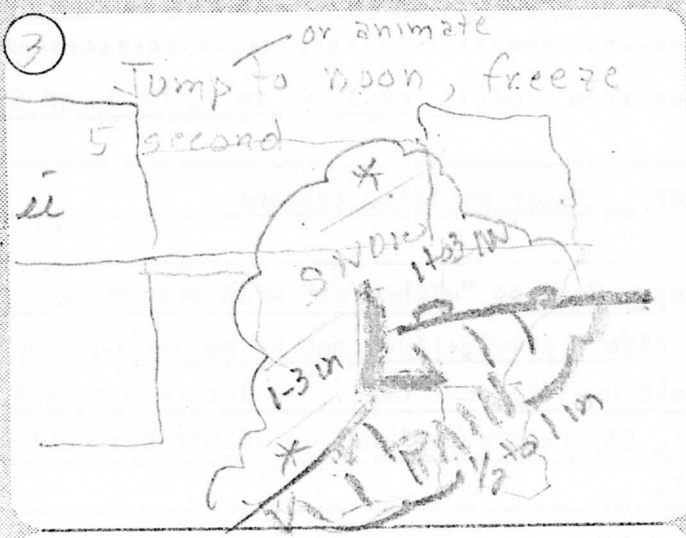
rain slashed green lines NW - SE
snow slashed white SW - NE
(5 sec) (2 sec animat)

2



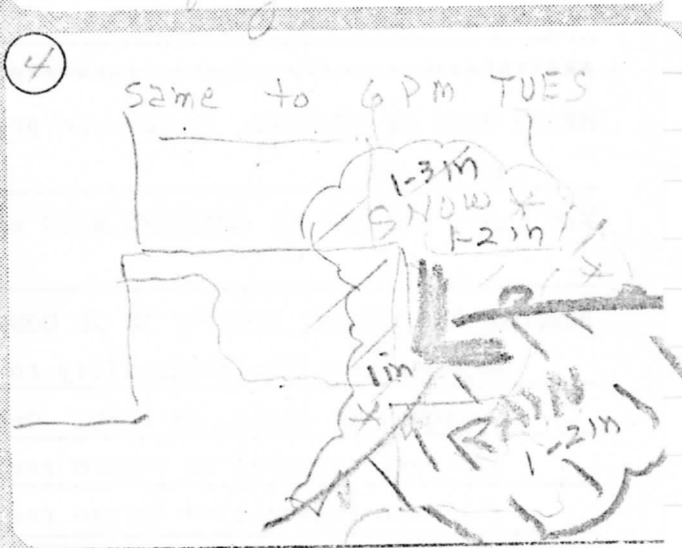

→ animate, or jump (dissolve) weather to 6 AM tomorrow, then freeze (5 seconds)
red lighting bolts

3




small areas, just snow flake or rain slashes ... no words

4




synoptic movement is most ideal place for animated movement

(amounts would drop out during animation

time 1 to 2 including 5 second frz 2 sec animation
Jump to 3 5 sec more
animate to 3 7 " "
Jump to 4 same

(3 time shots next day or 24 hrs
only 2 time shots day after tomorrow or 24-48 hrs)

then to 6 AM Wed
~~total~~ then to 6 pm Wed

total time
fully animated 48 hrs 42 sec
using jumps only 30 sec
prefer animation for both

Fred Norman OKC

for noon weathercast
move entire format up 6 hrs.

some cable or broadcast ... cable 42 seconds

SEGMENT HEADER

SEGMENT NUMBER 37

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am CABLE 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS ALL- Basic Segment

WEATHER PARAMETER(S) clouds & precip. (+ fronts, highs & lows)

TIME REFERENCE Past (incl. present) 0-24 Prediction ______

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

**************************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, TR, AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Basic building segment

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See preceding segments

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Zoom from national SMS to regional with state outlines

Shade or hatch precip. areas

Animate or step from 24 hr past to present

Stop on present

Severe wx. boxes and lines (?)

**************************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Archived SMS; NAFAX

Composite radar reports

SEG 39

PROD. Regional Wx Review Past 24 HRS

40sec

DATE 12/26/76 TK

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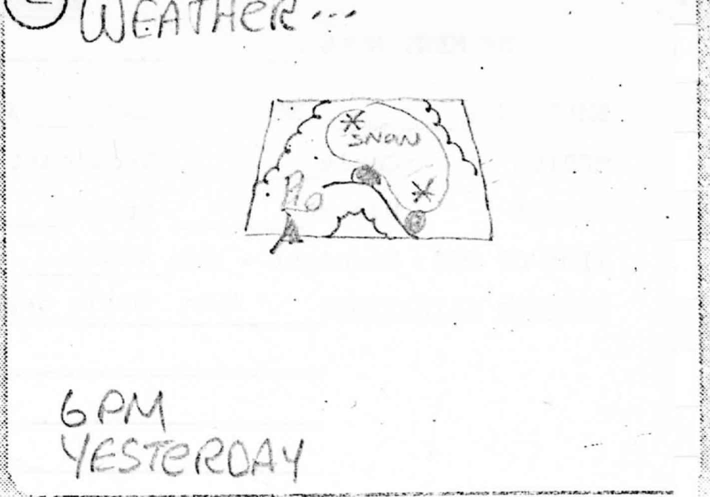
(1)


SMS PROJECTION AND CLOUDS FOR 24 HRS PAST. OVERLAY, SHADE AND LABEL RADAR PRECIP AREAS (SMOOTHED). COLORS AS IN SEG 35.

Hold 10 sec.

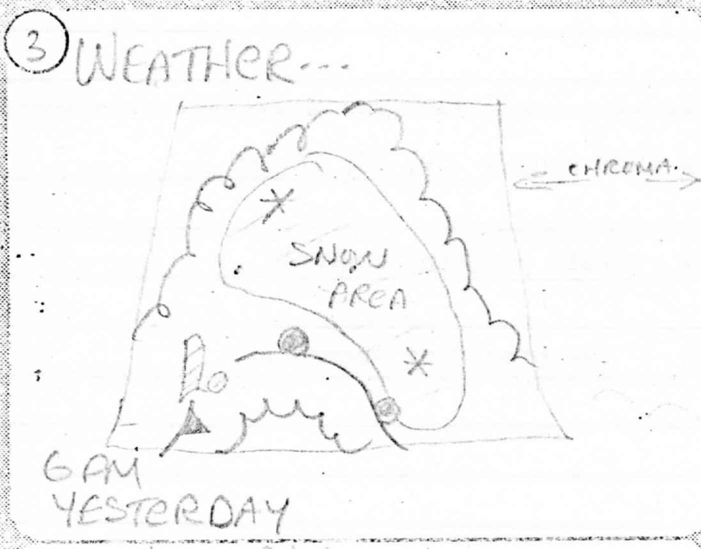
(2) WEATHER...




BOX IN TARGETED ZOOM AREA, FADE REST OF SCREEN TO BG COLOR.

1 sec

(3) WEATHER...



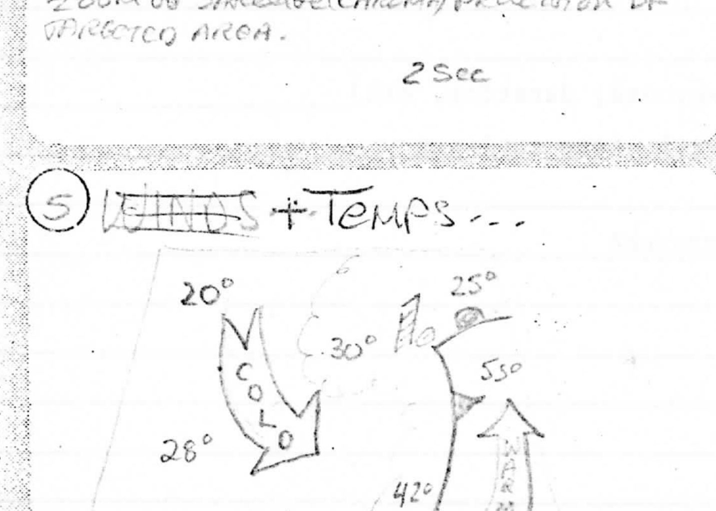

ZOOM to Satellite (CHROMA) PROJECTION OF TARGETED AREA.

2 sec

(4) WEATHER...


ANIMATE SMOOTHLY, OR IF ANIMATION NOT FEASIBLE, DISSOLVES AT 1 HOUR | 1/2 sec THROUGH PAST 24 HOURS, CHANGING TITLES AS IT GOES FROM HOUR TO HOUR AND "YESTERDAY" TO "TODAY." HEAVY SMOOTHING ON PR... STOP AT CURRENT WX - HOLD 7 SEC - TOTAL 19 S...

(5) ~~WINDS~~ + TEMPS...




FADE CLOUDS + PRECIP TO BG, AS WIND ARROWS + TEMPS FADE UP STRONG. USUAL COLORS FOR WIND ARROWS, USE NO MORE THAN 1 DOZEN TEMPS.

Hold 8 sec.

NOTES

1) SHOULD BE SOME WAY TO INPUT SURFACE PRECIP REPORTS TO ADD TO RADAR REPORTS IN DETERMINING PRECIP AREAS...

2) SHOULD REGIONAL AREAS HAVE A BACKGROUND BORDER, OR RUN STATE LINES + WX OFF EDGES?

3) Run state lines off screen; clouds + weather too.

SEGMENT HEADER

SEGMENT NUMBER 38

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All X

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Clouds & temperatures

TIME REFERENCE Past (incl. present) X Prediction ____

SCALE National ____ Regional ____ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) ALL

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a parameter combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Integrated view of 2 important weather elements, interrelated for public understanding.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with cities (county lines BG?)

Dissolve on cloud conditions 24 hrs past; frontal or press. systems

Dissolve in actual temps. at major locations for that time.

USE SATELLITE CLOUDS

Dissolve out temps., animate cloud pattern to 12 hr past

Add in 12 hr past temps.

Dissolve out temps, animate to current cloud conditions (& front)

Add on current temps

Overlay wind arrow (direction and speed, average for state)

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SUC A DATA; satellite archives

See preceding combinations

SHEET
Seg 38

PROD.
STATE
clouds
+
Temps
24HRS PAST to PRESENT

DATE
TK

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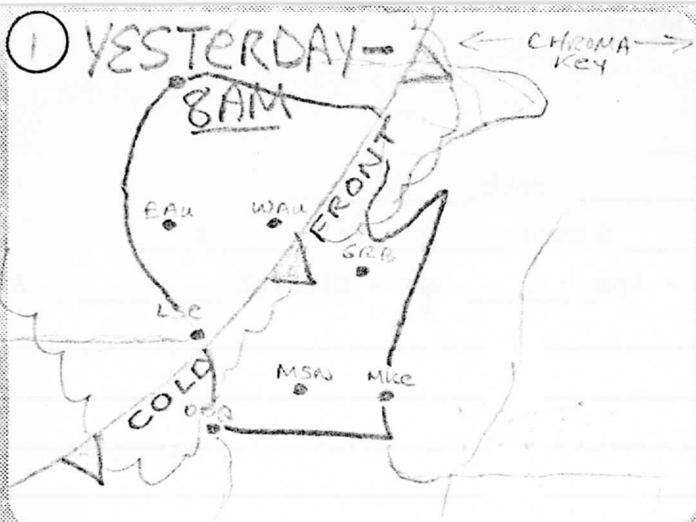
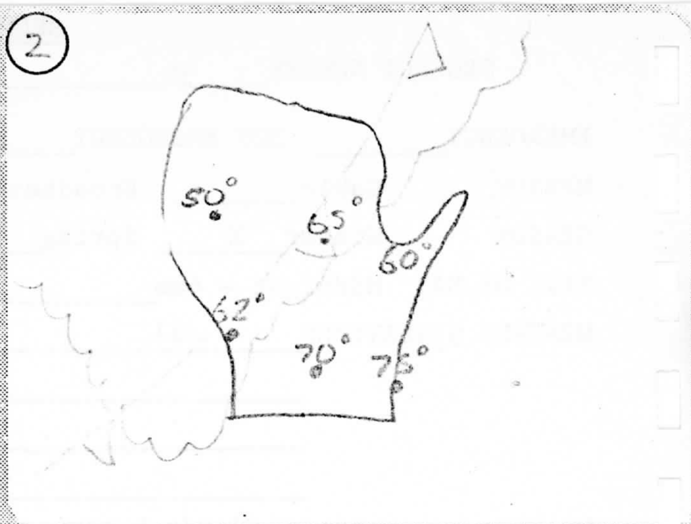
1




COLORS: WISC. MED BLUE WITH DARK BLUE STATE OUTLINE + CITIES. OTHER STATES LIGHT BLUE. COLD FRONT BLACK - "YESTERDAY 8AM" YELLOW. OVERLAY WITH SATELLITE CLOUD PHOTO. USE [illegible] THE PROJECTION MAP. HOLD FOR 5 SEC.

2

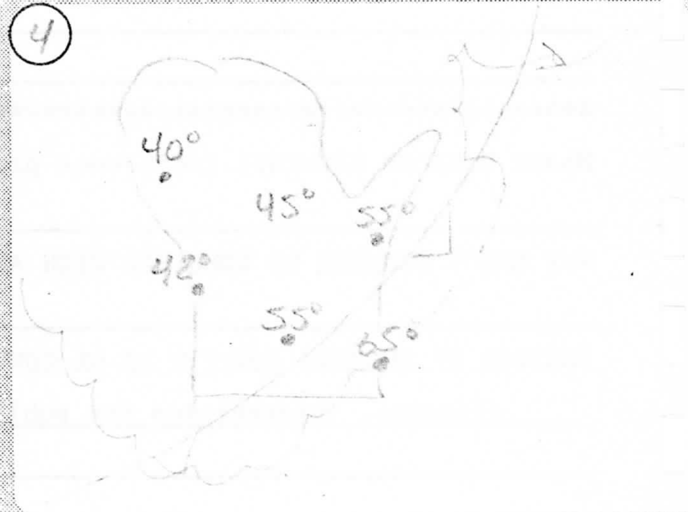



SAME FRAME - DISSOLVE OVER TEMPS IN RED NUMBERS, FOR CITIES. HOLD 6 SEC, DISSOLVE TEMPS OUT.

3

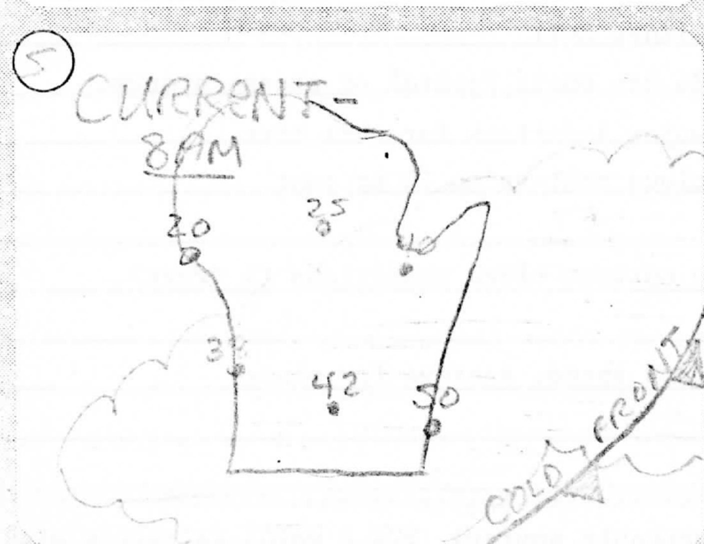

ANIMATE, OR DISSOLVE, TO 12 HOURS PAST SATELLITE PHOTO + FRONTAL POSITION. HOLD FOR 3 SEC.

4




DISSOLVE ON TEMPS IN RED, AS IN ② ABOVE. REST HOLDS SAME FRAME AS ③, HOLD TEMPS FOR 6SEC, DISSOLVE OFF.

5




ANIMATE OR DISSOLVE TO CURRENT SATELLITE CLOUDS + ANALYZED FRONTAL POSITION AND CURRENT TEMPS. HOLD 10 SEC, FADE BLACK

6

→ TOTAL Segment time: 30sec

SEGMENT HEADER

SEGMENT NUMBER 39

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All X

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Clouds & Temps

TIME REFERENCE Past (incl. present) ____ Prediction 0-24 hrs

SCALE National ____ Regional ____ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) ALL

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a parameter combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Integrated view of two important weather elements which are interrelated

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

~~State map with cities marked and labelled~~

~~Show current clouds with latest satellite data; overlay temps~~

Dissolve to current clouds in stylized form: Broken or Better cloud reports = cloudy (disregard "Thin Broken Lowest")

Extend to 24 hour forecast as indicated in preceding segment.

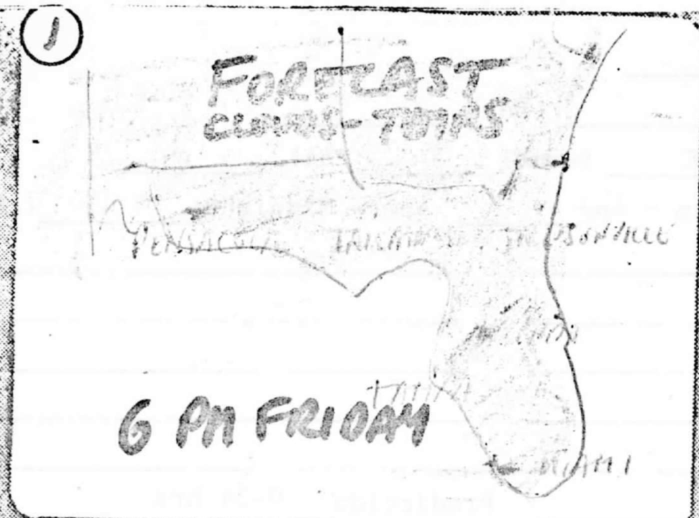
************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones forecasts (NOAA wire); NAFAX temp progs; SFL PROGS - NAFAX.

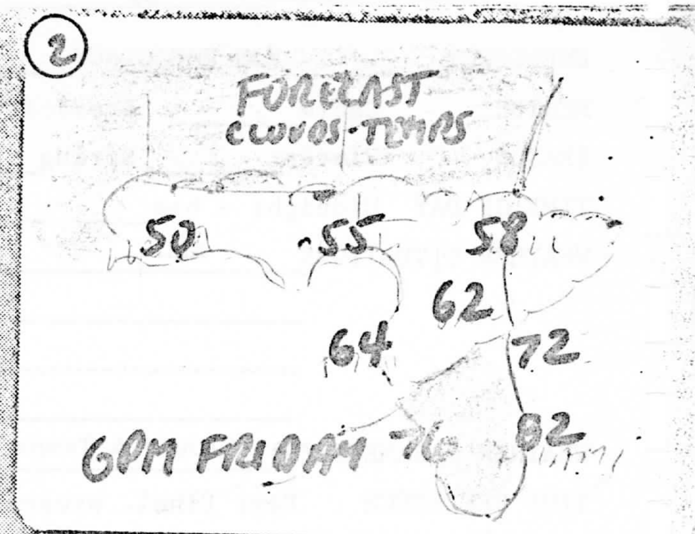
SHEET SEG 39

PROD. 24HR FCST CLDS TEMPS

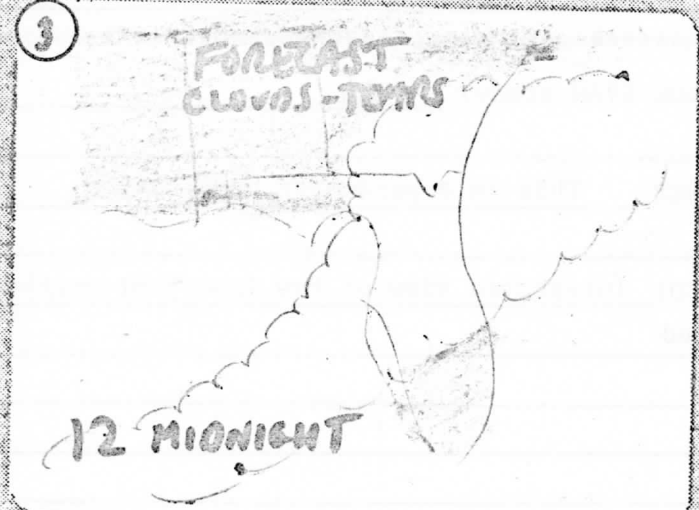
DATE G. Intaling 2/77



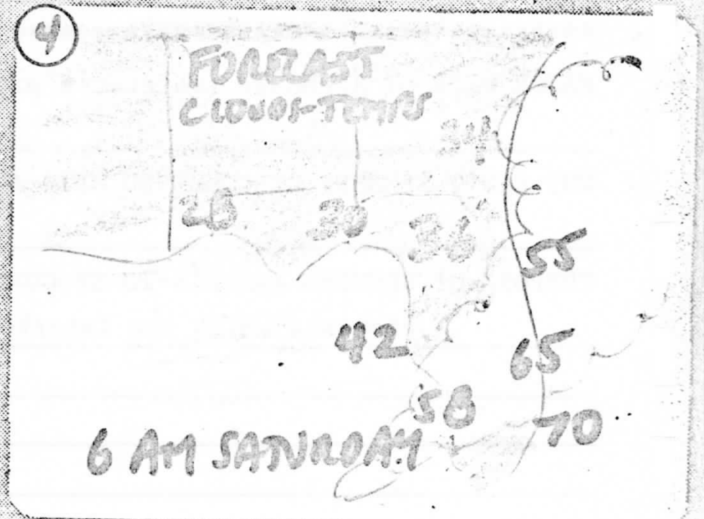

BLUE WATER - GREEN LAND WITH BLACK TITLE + CITIES. AT 2 SECONDS, PLACE TIME/DAY AT BOTTOM LEFT



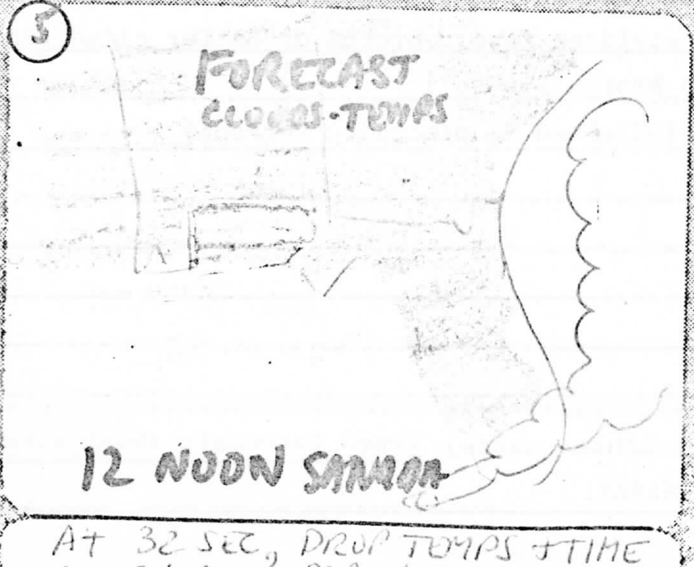

AT 5 SECONDS ADD CLOUDS - WHITE OR LIGHT GRAY. AT 8 SEC ADD TEMPS



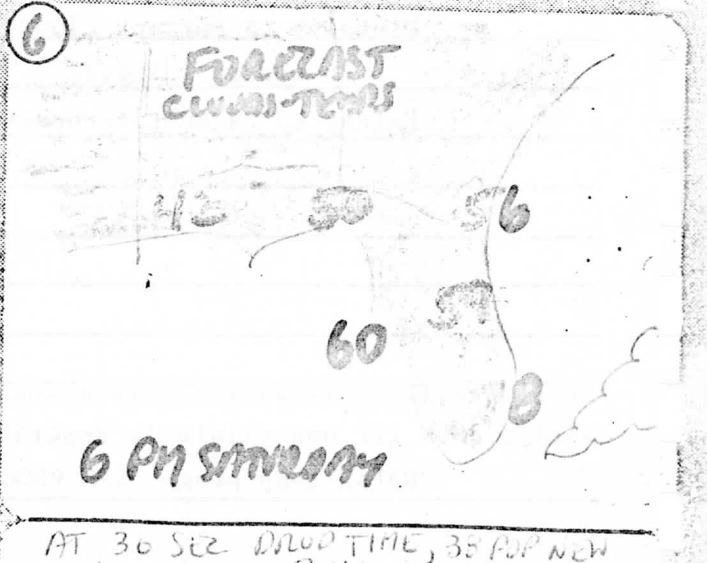

AT 12 SECONDS DROP TEMPS + TIME
AT 14 SECONDS CHANGE TIME
AT LOWER LEFT TO NEXT INTERVAL
AT 16 SECONDS, DISSOLVE FCST. CLDS




AT 15 SEC, CHANGE TIME, LOWER LEFT
AT 20 SEC DISSOLVE TO FCST CLD
AT 24 SEC, OVERLAY TEMPS




AT 32 SEC, DROP TEMPS + TIME
AT 34 SEC, POP IN TIME
AT 35 SEC DISSOLVE CLOUDS IN




AT 30 SEC DROP TIME, 35 POP NEW TIME, 39 SEC DISSOLVE CLOUDS
AT 42 SEC, POP FCST TEMP OR FCST. MIAMI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SEGMENT HEADER

SEGMENT NUMBER 40

EMERGENCY____ NON EMERGENCY X

MEDIUM Cable____ Broadcast X Both____

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am____ 6am - 4pm X 4pm - Midnight X All____

WEATHER SITUATIONS When broken or better clouds exist or are forecast; or precip. exists or is forecast

WEATHER PARAMETER(S) Clouds, winds, precip.

TIME REFERENCE Past (incl. present) X Prediction____

SCALE National____ Regional____ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) All

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a parameter combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) For public understanding of the weather; integration of the important interrelated weather elements

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Similar to #38 preceding, except outline radar precip. areas, overlay on satellite data, and advance as before, either keeping or dropping radar data during animation process, as looks best.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A; satellite archives, WSR Radar dial-ups.

SEGMENT HEADER

SEGMENT NUMBER 41

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All X

WEATHER SITUATIONS When broken or better clouds exist or are forecast; or precip. exists or is forecast

WEATHER PARAMETER(S) Clouds, winds, precip.

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hrs.

SCALE National ____ Regional ____ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ALL

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) ALL

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a parameter combination.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Integrated view of three important weather elements which are interrelated.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Similar to #39, except forecast precip. areas outlined and hatched and displayed over clouds at each step of animation

*****************************************************************************************

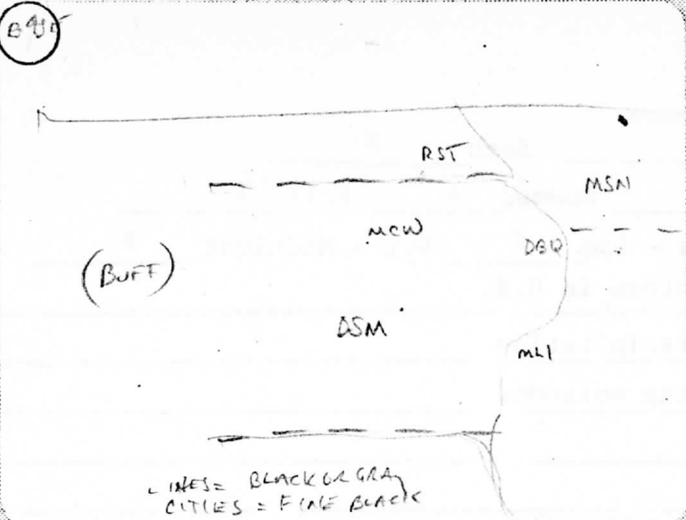
DATA SOURCE (if non-existent, describe probable source) Zones forecast (NOAA wire) State forecasts (RAWARC); SFC PROGS - NAFAX; MAX/MIN NAFAX progs.

SHEET
Se G
1

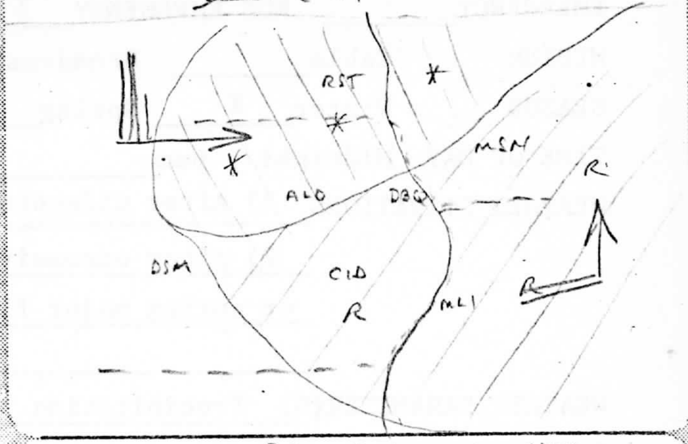
PROD.
CLOUDS
PRECIP
WINDS
(CST)

DATE
2/20/77

Mathematical Association of America
P. O. Box 2310 - San Francisco - California 94126

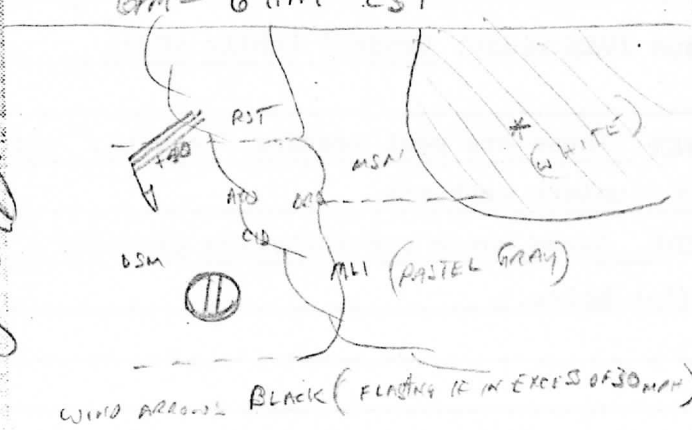



(1) 3-HR FORECAST ENDING
9PM CST



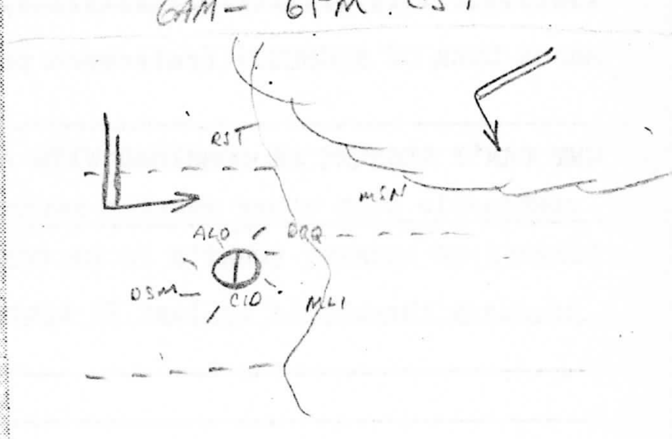

1A DISSOLVE IN SNOW HATCHING IN WHITE
1B " " RAIN " " GREEN
1C " " WIND DIR/VEL (BLACK
6 SEC

(2) 12 HR FORECAST ENDING
6PM - 6 AM CST



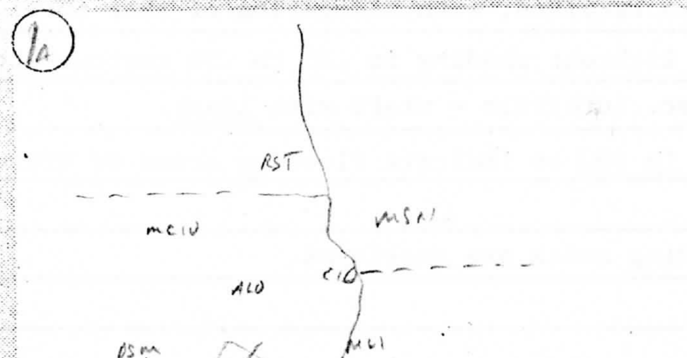

DISSOLVE FROM 1 - 2 (SLOWLY - 2 SEC)
CREATING "FEEL" OF MOVING WX.
HOLD FOR 6 SEC.
BRING IN WIND ARROWS 1 SEC AFTER DISSOLVE

(3) 12 HR FORECAST ENDING
6AM - 6PM. CST




DISSOLVE FROM 2-3 SLOWLY (2 SEC)
HOLD FOR 6 SEC.
BRING IN WIND ARROWS 1 SEC. AFTER DISSOLVE

(1A)




Notes: ① SCALE & COVERAGE OF BASE MAP DEPENDENT ON ADI COVERAGE + 30% TO ACCOMMODATE TRAVEL.

② APPROPRIATE PORTION OF A WATCH BOX COULD BE SUPERED IN STIPPLED MAGENTA. WITH V.T. AS REMINDER.

SEGMENT HEADER

SEGMENT NUMBER 42

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS 1) After widespread storm in U.S.

2) After excessive precipitation

or during major flooding episodes

WEATHER PARAMETER(S) Precipitation

TIME REFERENCE Past (incl. present) X 12-72 hrs Prediction ______

SCALE National X Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) General Public (GPA)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER These are past weather "results," not combinable with other weather parameters - unique emphasis.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas where precipitation exceeded a boundary threshhold in last 72 hours. (See below.)

FORMAT OF SEGMENT (scale, background, foreground, duration, etc) National map with state outlines. Contours of precipitation (not to exceed 4 contours) beginning at .25", then .50", 1.0", then year contour for maximum received, with annotation of that total within contour. Within contour to be shaded - lightest shading in .25 to .50 contour etc. Probably add areas one at a time at 5 sec. intervals - start with least. Should be provision to overlay hatching in red to indicate flooding areas or states.

Duration: 20 sec. plus 10 sec. if flooding areas are overlayed.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Fax precip. maps, teletype data; flood forecast and report on rawarc circuit and weather wire.

FIGURE II-2

SEGMENT HEADER

SEGMENT NUMBER 43

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS When precip. has occurred in last 12 hrs; significant local amount or signif. amt. in state

WEATHER PARAMETER(S) ____

TIME REFERENCE Past (incl. present) 3-24 hrs Prediction ____

SCALE National ____ Regional ____ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, AG, CO and others

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User group combination. Also, this segment and national segment preceding should eliminate need for regional totals.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas receiving significant precipitation last 24 hrs; amount of that precipitation at reportable centers.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with cities marked and annotated

Shade area with measurable precip.

Shade area with precip ≥ preset boundary (1/4"?)

Annotate major reporting center totals over shading

Annotate cooperative observer or excessive amounts as possible
with larger annotation or flashing total for large amounts

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) State weather records; state weather summaries (NOAA - wire), Service C precip totals (6 hrly.)

SEGMENT HEADER

SEGMENT NUMBER 44

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS Whenever precipitation is indicated to begin within 6 hours.

WEATHER PARAMETER(S) Precipitation alert

TIME REFERENCE Past (incl. present) ____ Prediction 1-6 hrs.

SCALE National ____ Regional ____ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) CO, (GP), GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Immediate warning to crews, companies doing wet-sensitive work (concrete, etc.) of the imminent advent of precip.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with major cities (and counties?)

Precipitation Alert: annotate

Radar echo areas shaded for current precip (label "current")

Animate by hours at 5 seconds each to 6 hour forecast, changing time as it goes

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Local and Dial-up Radar access system; NAFAX and WX-Wire and RAWARC Radar Info.

SEGMENT HEADER

SEGMENT NUMBER 45

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS Forecast precipitation in area between current and 72 hours

WEATHER PARAMETER(S) Precipitation amounts

TIME REFERENCE Past (incl. present) ______ Prediction 3-48 hours

SCALE National ______ Regional ______ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a user group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Quantitative precipitation forecast, cumulative by time periods

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) State and local maps and cities

Animation stopping at 6 hrs, 12 hrs, 24 hrs, and 48 hrs

Shaping .10", .25", .50", 1.00" + forecast areas.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) QPF Hand PROGS on NAFAX or RAWARC teletype circuit.

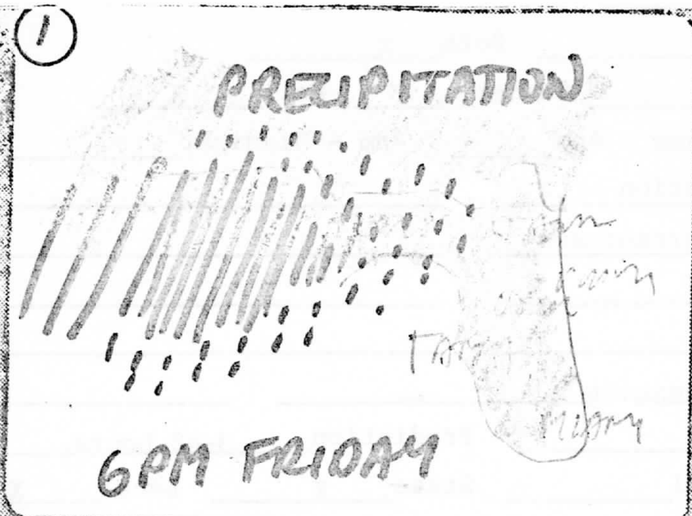
SHEET SEG 45

PROD. PCPN FCST

DATE 2/77

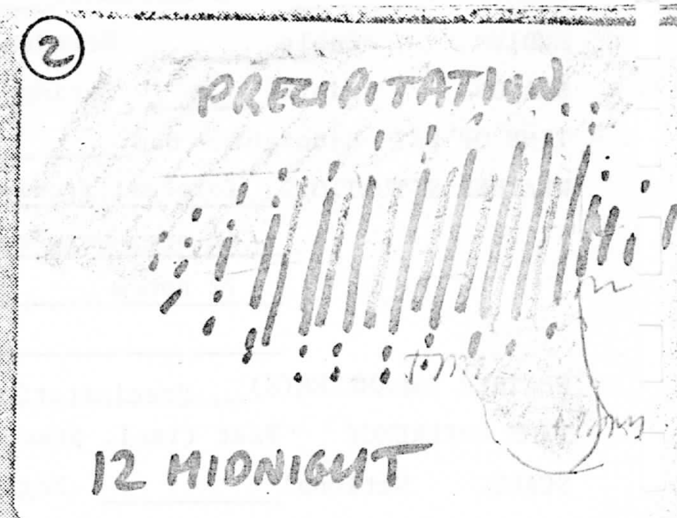
Committee on Educational Media
Mathematical Association of America
P.O. Box 2310 · San Francisco · California 94126

(1)



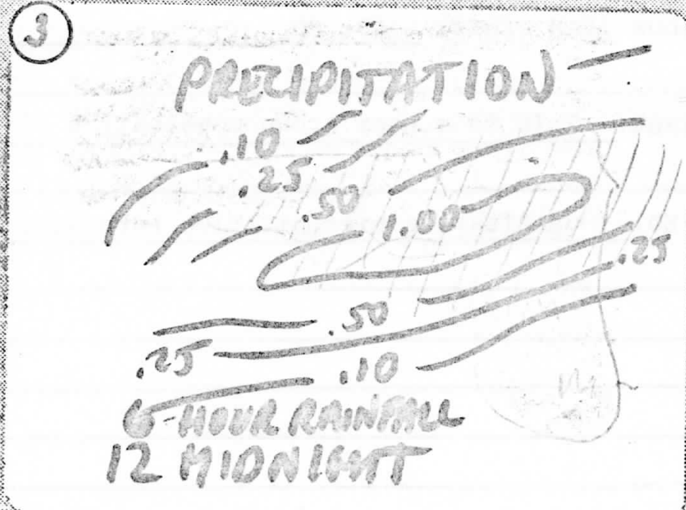

AT 3 SECONDS PLACE DAY/TIME LOWER LEFT, AT 5 SECONDS FADE IN HASHED PRECIP FCST. SOLID CONTINUOUS, DASHED SHOWERS

(2)




AT 8 SECONDS DROP TIME — AT 9 SECONDS ADD NEW TIME AT 10 SECONDS DISSOLVE HASHED PRECIP TO NEW TIME.

(3)

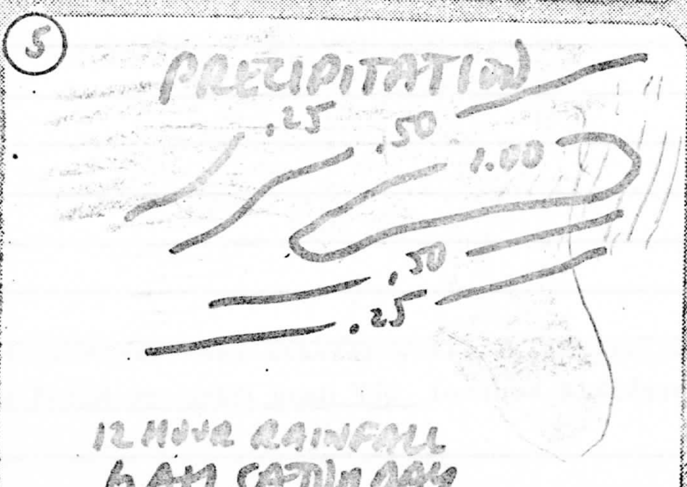



AT 12 SECONDS FADE HASH PCPN TO LIGHT GRAY — ADD "6HR RAINFALL" ABOVE TIME LABEL, AT 14 SEC ADD FCST TOTALS,

(4)


AT 18 SECONDS DROP TOTALS ~~LIGHT GRAY~~ AND TIME, AT 20 SECONDS POP TIME, FADE IN PCPN HASH

(5)




AT 24 SEC FADE PCPN HASH

REPEAT FOR
24 HOUR
36 HOUR
48 HOUR

SEGMENT HEADER

SEGMENT NUMBER 46

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS ______

WEATHER PARAMETER(S) Precipitation amounts

TIME REFERENCE Past (incl. present) ______ Prediction 3-48 hrs

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Planning - by all user groups

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Useful to all groups; no suitable combination available

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of region forecast to receive measurable precipitation in the next 2 days

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Similar to preceding state segment

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) QPF hand progs on NAFAX; coordinates of precip. area forecasts on RAWARC /C.

SEGMENT HEADER

SEGMENT NUMBER 47

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X Broadcast ______ Both ______

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS ______

WEATHER PARAMETER(S) Probability of precipitation

TIME REFERENCE Past (incl. present) ______ Prediction 6-48 hrs

SCALE National ______ Regional ______ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) CO (all other users would probably also be interested)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) time vs. probability graph of precipitation forecast for new scheduling; assessment of weather risk in pouring concrete and other CO operations

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Graphical representation (Y axis: probability of precipitation ≥ .01. X axis: Time and Date: 3 hrs. 6 hrs. 12 hrs. 24 hrs. 48 hrs. 72 hrs future).

Make provision for shading lightly probabilities over 25%; shading darker over 50%

Animate to add each time period and shading in turn.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) POPS chart (NAFAX)

Zone forecasts (NOAA - wire)

SHEET

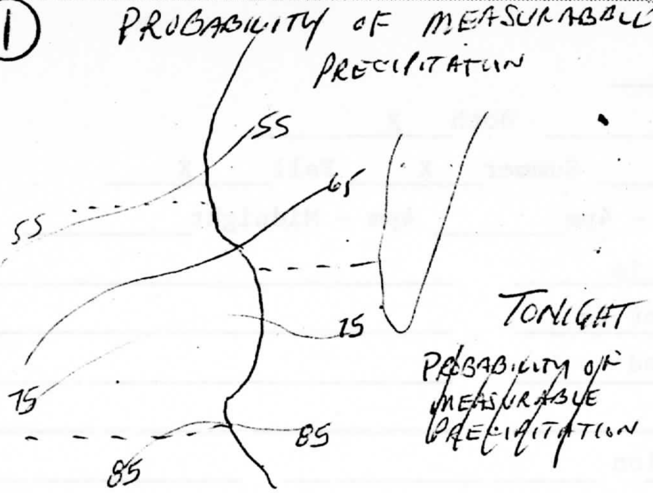
SEG. 7

PROD.

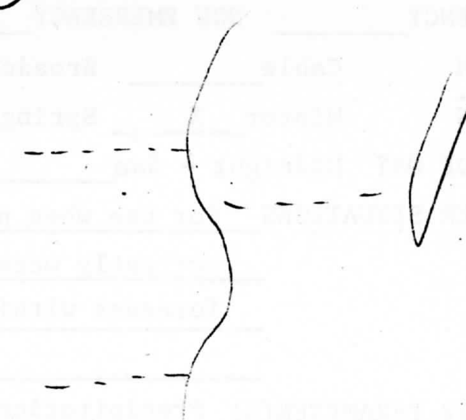
PRECIP
, 21B

DATE

1




2



SEGMENT HEADER

SEGMENT NUMBER 48

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS For use when precip. is currently occurring or is forecast within period

WEATHER PARAMETER(S) Precipitation-duration

TIME REFERENCE Past (incl. present) ______ Prediction 0-48 hrs

SCALE National ______ Regional ______ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) All

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User group combination. Also, this is a unique, single-segment parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

Time of onset of precipitation

Duration of measurable precip.

Indication of intermittent/continuous and intensity (?)

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

State map with major cities

Time lines advance through state, stopping every 3 hrs. with shaded area for indication of precip. following

Annotate time lines each 3 hrs.

In body of shading, annotate "intermittent" or "continuous" and "light", "moderate", "heavy", and type ("rain", etc.)

Add outside map "Duration ----- hrs"

Add "May Redevelop" (if necessary) outside map

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones forecast (NOAA - wire); QPF progs (RAWARC, C, FAX)

SEGMENT HEADER

SEGMENT NUMBER 49

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS All - of general interest

WEATHER PARAMETER(S) High and Low Temperatures

TIME REFERENCE Past (incl. present) 12-24 hr. Prediction ____

SCALE National ____ Regional X State X Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) General public GP 11A, GP 12; agriculture

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a combined segment showing both regional and state temperatures.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Maximum and minimum temperatures over the region for preceding period 0 to 24 hours past.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1. Regional map background with state boundaries. Overlay initial frame with contours at 5° or 10° intervals (self-select to insure not more than 5 contours on map). Shade two coldest bands blue; shade two warmest bands a warm color; leave band in between at background. Annotate with numbers (ISSEC)
2. Zoom down to state required. As zoom occurs, individual city highs or lows appear on state map - bands remain but band annotation vanishes (hold for ISSEC)
3. Possibility here to add normal temps. for comparison (?)

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX + TT past data

SEGMENT HEADER

SEGMENT NUMBER 50

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temps + wind arrows (add fronts)

TIME REFERENCE Past (incl. present) 12 and 24 h. Prediction ____

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG, GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a combination of 2 past temp segments: "Highs" and "Lows" (12 and 24 hr past)

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Indicates MAX/MIN temps and U.S. (should be separatable by meteorologist into either/or (highs or lows)

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

~~National map with state outlines~~

~~$10^o$ bands of smoothed temperatures with blue for 2 coolest bands, yellow or light orange for 2 warmest.~~

Provision for computer to add signficant temps.: all records and major stations; nation's or region's highest/lowest temp., etc.

Dissolve in wind arrows (≈ 3 or 4 per map) or word "calm")

Annotate "highs" or "lows"

Dissolve or step to other 1/2 segment

Consider option of frontal boundary to show contrast (?)

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX MAX/MIN temp charts, Service C temps., RAWARC record reports ...

SHEET

50

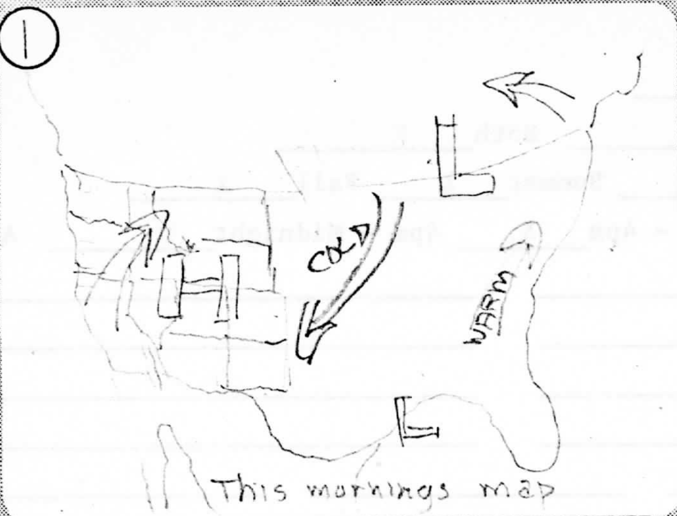
PROD.

WIND arrows & today's highs & lows

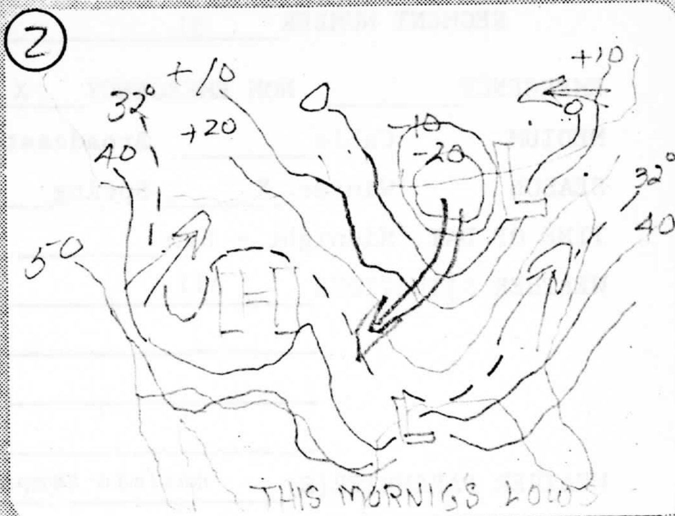
DATE

/77

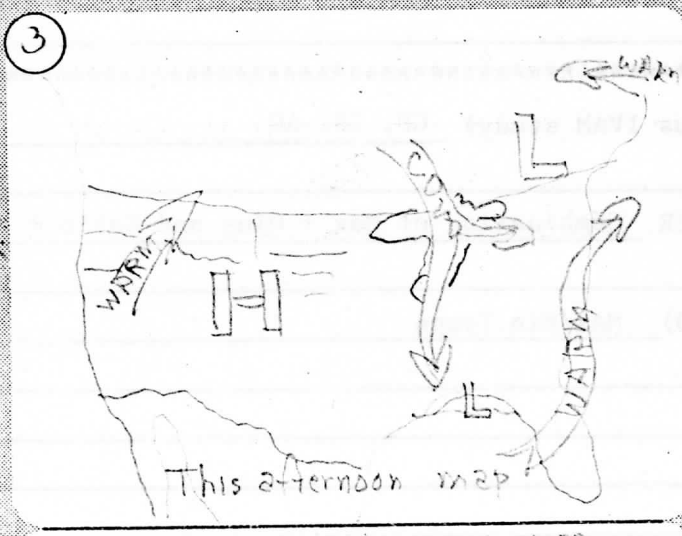
F. Norman



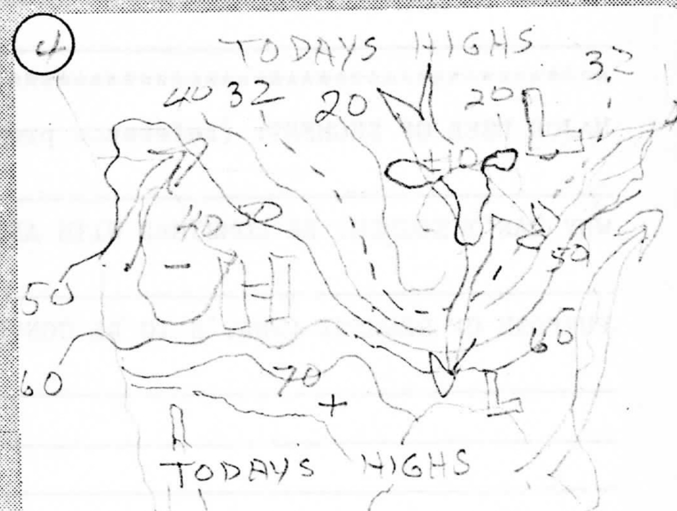

WIND FLOW 4 sec
states narrow black
H blue L red warm arrow red
cold arrows blue




TEMP LINES added 6 sec
temp lines white. drop cold & warm words




Quick disolve to new map
5 sec 3 sec




add white temp lines
drop warm & cold words 7 sec

natural follow up would be tomorrows forecast handled exactly the same way
total time each segment 20 seconds — both 40 seconds

question - can we still frame?

This one same cable or broadcast

Fred Norman OKC

SEGMENT HEADER

SEGMENT NUMBER 51

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight ✓ All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) max/min temps

TIME REFERENCE Past (incl. present) 12 & 24 hr. Prediction ______

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Combination of Max + Mins and Cable + broadcast

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Max/Min Temps

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See preceding segment, but use regional map

Add more individual temps.

Use fewer wind arrows (1 or 2)

This is different -- uses individual temps. Preceding regional temps uses broad bands

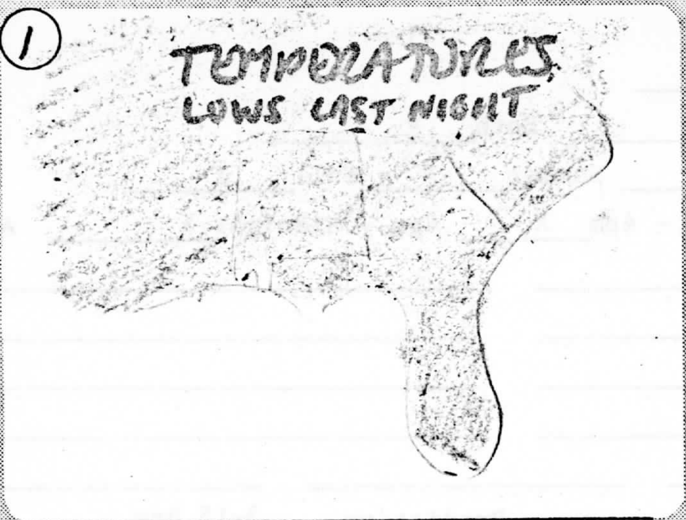
*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Same as previous segment

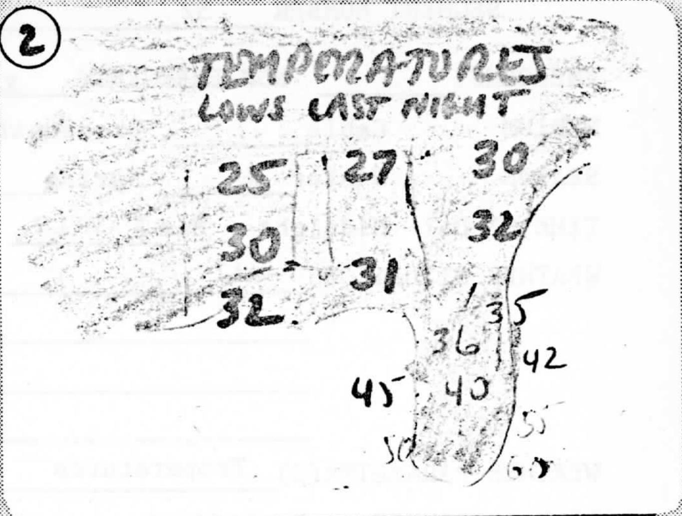
SHEET
seq
1

PROD.
max/
min
temps

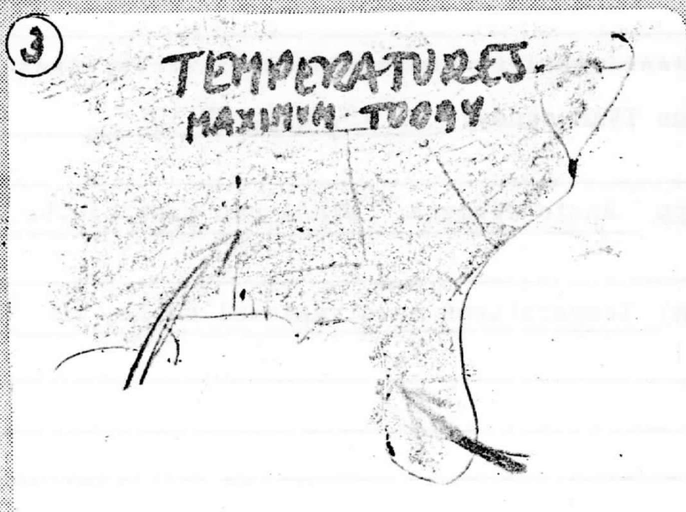
DATE
6
Wintching
2/77



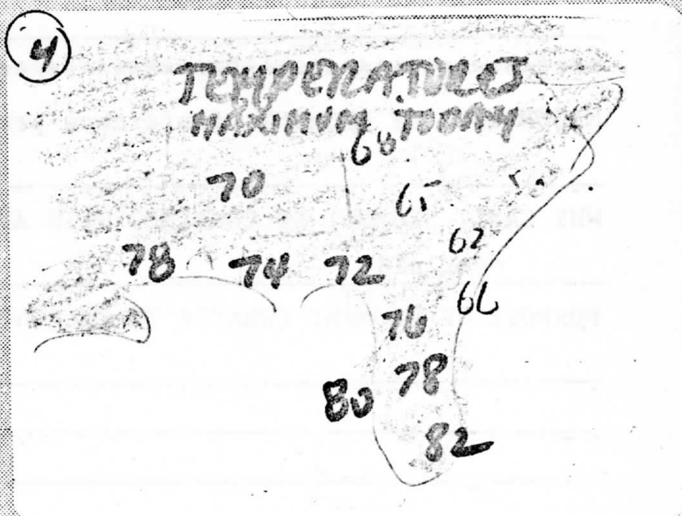

ADD "LOWS LAST NIGHT" AT 2 SEC. FADE IN WIND MOVEMENT AT 3 SECONDS, OUT BY 5 SECONDS




AT 6 SECONDS POP IN LOWEST TEMPS (FREEZING + BELOW IN WINTER) USUALLY LOWEST 10° F (5°C). AT 9 SECONDS MIDDLE RANGE, AT 12 SECONDS WARMEST 10° F RANGE




AT 15 SECONDS DROP TEMPS + DROP LABEL "LOWS". AT 17 SECONDS ADD "MAXIMUM TODAY" AT 18 SECONDS DISSOLVE WIND ARROWS — OUT BY 20 SEC.




AT 21 SECONDS POP IN TEMPS UPPER 10° RANGE, SUCH AS 70° F (21°C) OR HIGHER. AT 24 SEC POP MIDDLE RANGE TEMPS, AT 27 SECONDS POP LOWER TEMPS


... Mathematical Association of America
P. O. Box 2310 • San Francisco • California 94126

SEGMENT HEADER

SEGMENT NUMBER 52

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am X CABLE 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temperatures

TIME REFERENCE Past (incl. present) ____ Prediction 3-18 hrs

SCALE National ____ Regional X State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

*******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG 13, GR6, GP 10

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Basic segment. Winds can probably be overlaid

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Temperatures on a regional scale.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map with state outlines. Water areas shaded.

Add temperatures in major cities

Overlay with shaded bands at $5^{\circ}$ or $10^{\circ}$ intervals (no more than 4 bands)

Overlay wind arrow as city temperatures are dropped

Probably use warm color for warmer bands; cool temps = cool color

Time of forecasts should be selected to indicate high or low temperatures (depending on time of broadcast)

*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX hi/low list; Zones

SEGMENT HEADER

SEGMENT NUMBER 53

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Forecast temps

TIME REFERENCE Past (incl. present) ______ Prediction 6, 12 and 24 hours

SCALE National ______ Regional ______ State X Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG, GR and others

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Basic segment. This is a combination of time scales and cable + broadcast.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

Expected temperatures: short term; following min; following max.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with city identifiers

Dissolve in light blue area for "cooler than today" and light orange for "warmer than today" (past temps) areas

Dissolve on short term temp forecasts and label (for noon broadcast would be ≈ 3 pm highs, for 6 pm would be late evening temps., etc.)

Dissolve to "lows" or "highs"

Dissolve to "highs" or "lows"

Feature word "forecast" and time

Add wind arrow. Consider an option with clouds and temperatures

******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zone forecasts (NOAA - wire); NAFAX max/min PROGS.

SEGMENT HEADER

SEGMENT NUMBER 54

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Local (short term) temperatures

TIME REFERENCE Past (incl. present) ______ Prediction 3-18 hrs.

SCALE National ______ Regional ______ State ______ Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) CO, GP, GR, MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a user group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Local forecast short-term temps.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Graphical format - x axis = time; y axis = temp.

Fill and shade areas under curve

Line for freezing, zero

Annotate highs and lows and time stops

Animate & fill curve: Stop on 3 hrs, 6 hrs, 12 hrs, 18 hrs.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zone forecast (NOAA)

SEGMENT HEADER

SEGMENT NUMBER 55

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Local temps

TIME REFERENCE Past (incl. present) ______ Prediction 12-72 hrs.

SCALE National ______ Regional ______ State ______ Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, MR, GR, CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a user group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Summation of local temps when required

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Graphical projections. Animate to shade each 12 hr period at 10 sec/first period, then 5 sec each following period. Label highs and lows X-axis: days of week, Y-Axis: temperature. Show freezing line.

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Max/Min FAX progs; zone forecast; extended state outlooks on NOAA wire.

SEGMENT HEADER

SEGMENT NUMBER 56

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast X Both ____

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temperatures

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hrs

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*******************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, TR, and all to an extent

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is (1) a general advisory segment that aids understanding of the weather, and (2) a user group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

General temperature pattern of Max/Min temperatures forecast on a national scale next 24 hrs.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

National map with state outlines

Contour bands (shaded) starting with coldest band in winter, warmest in summer (use $10^{o}$ bands. Label temps "70's" within bands. Use blue = cold temps, orange = warm; neutral color in between)

Annotate record highs/lows and location

Dissolve to clean map for 2nd section (max or min)

Label each half "forecast highs," "forecast lows."

Use freeze + zero lines?

*******************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX computer temp. progs (12 and 24 hours)

SEGMENT HEADER

SEGMENT NUMBER 57

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X Broadcast ______ Both ______

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Area/weather (aviation)

TIME REFERENCE Past (incl. present) ______ Prediction 1-6 + 3-18 hrs.

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*********************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AV

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a combination of five scales: 1-6 and 3-18.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Overview of aviation weather highlights.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map with state outlines and cities

SMS clouds for current line on map

Shade red areas IFR; shade pink MVFR areas and label weekly

Add front and "sigmet" or "airmet" areas and label

Zoom this down to 1/4 of a quad split (upper left)

Add stylized forecasts; upper right is +3 hours; lower left is +6 hours, lower right is +12 hours.

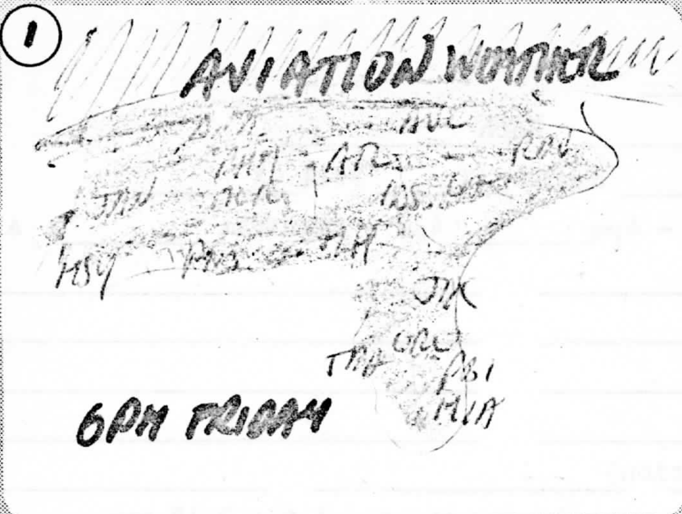
*********************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A aviation wire: sigmets and airmets. Cloud depiction and 12/24 hr NAFAX progs for VFR/IFR areas and frontal positions.

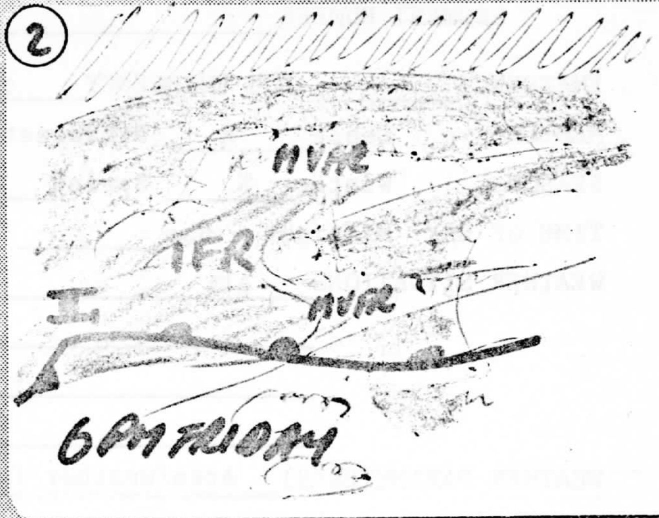
SHEET 57

PROD. AVN WX FCST

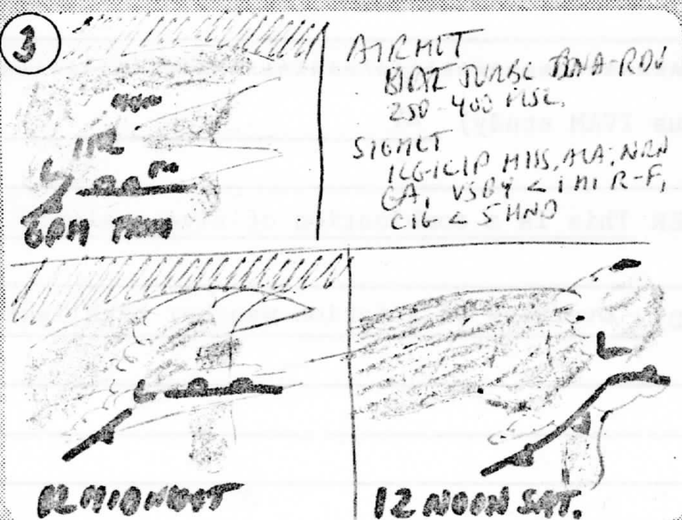
DATE 2/77 G. Winterling

① 


MAP WITH CITIES FOR 3 SECONDS AT 2 SECONDS PLACE TIME OF SATELLITE PIX COMING UP IN LOWER LEFT

② 


AT 5 SECONDS OVERLAY SATELLITE PICTURE CLOUDS AT 8 SECONDS COLOR IFR AREAS RED + LABEL "I.F.R." AT 12 SEC PURPLE MVFR AT 13 SEC. ADD FRONTS, LOWS, HIGH

③ 


ZOOM TO 1/4 PANEL, OTHER 3/4 BLACK OR DARK BLUE. PRINT AIRMET, SIGMET UPPER LEFT. ADD 6HR FCST LOWER LEFT AT 30 SEC. AT 40 SEC ADD FCST LOWER RIGHT

SEGMENT HEADER

SEGMENT NUMBER 58

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X Broadcast ______ Both ______

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS All with ceilings or visibilities less than 3000 and 5 miles in state within 12 hrs.

WEATHER PARAMETER(S) Enroute weather section

TIME REFERENCE Past (incl. present) ______ Prediction 1-6 and 3-18 hrs.

SCALE National ______ Regional ______ State X Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AV

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a combination of time scales 1-6 and 3-18

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Vertical cross section of forecast weather on major routes for aviation interests.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Quad split. State map with 3 major routes in upper left corner and cities on those routes marked. Clouds and IFR areas also on map as previous segment.

Other 3/4: vertical section of these routes. Cities across bottom line: height of clouds labelled vertically

Hatch or flash IFR. Use slanted lines from clouds for precip. areas. Add flight visiibility. Shade for MVFR/IFR areas

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Aviation wire (SVCA) and 12/24 hr NAFAX surface progs.

SEGMENT HEADER

SEGMENT NUMBER 59

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable X Broadcast ________ Both ________

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ________ 6am - 4pm ________ 4pm - Midnight ________ All X

WEATHER SITUATIONS All, with ceilings or visibilities
in state forecast to be less
than 3000 and 5 miles within
12 hours

WEATHER PARAMETER(S) Terminal weather

TIME REFERENCE Past (incl. present) ________ Prediction 3-12 hrs

SCALE National ________ Regional ________ State X Local X

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AV

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a combination of time scales

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Weather forecast for pilots at major terminals in state.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Quad split of 4 major cities selected. 3 have forecast weather in vertical presentation. Use city skyline and heights for clouds.

Dissolve to forecast ≈ 6 to 9 hrs ahead at these same locations

Use trend word: "Improving" or "Deteriorating" (etc.)

Include Temp/DP/wind/VIZ/precip/ceiling height

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVCA wire, NAFAX

SEGMENT HEADER

SEGMENT NUMBER 60

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X Broadcast ______ Both ______

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Winds & Temps aloft

TIME REFERENCE Past (incl. present) ______ Prediction 3-12 hrs

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AV

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER combination of time scales 1-6 and 3-18

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) winds and temperatures aloft at several levels of atmosphere

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Quad split of regional map

Shade freezing level bands (SFC, 4000, 8000, 12000 feet) or shade areas on each split below freezing

Use about 8 vector arrows and speed annotation dispersed evenly on map

Use 3000, 6000, 9000, 12000 ft. for splits

Dissolve to 12 hr. forecast of same

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Winds aloft forecasts on SVC A teletype

SEGMENT HEADER

SEGMENT NUMBER 61

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X Broadcast ______ Both ______

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS All which require flight precautions issuance for region

WEATHER PARAMETER(S) Flight precautions

TIME REFERENCE Past (incl. present) ______ Prediction 1-12 hrs.

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AV

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Combination of 1-6 and 3-18 scales

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas which are under flight precaution advisories, and the reason for advisory

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map

Add precaution areas for icing, turbulence, T-storms, IFR, others

For Airmet precautions use pink

For SIGMET precautions areas use red and flash

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SUC A teletype (avation forecasts and sigmets + airmets)

SEGMENT HEADER

SEGMENT NUMBER 62

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast X Both ______

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight ______ All ______

WEATHER SITUATIONS For occasional use between first and last freeze of year

WEATHER PARAMETER(S) Frost depth

TIME REFERENCE Past (incl. present) present Prediction ______

SCALE National ______ Regional ______ State X Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas subject to more than slight frost penetration in soil

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture (field prep); construction (outside activities in general; cement work)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER ______

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) How deep the soil is frozen and a general trend for the next 5 day period

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with cities

Continued bands of frost depth. 0-1"= background color; 2-6"= light shading; 6-12" = dark shading; 12+" = dark shading

Annotate title and date

Dissolve of cross section of earth (stylized farms, rabbit at bottom of hole hibernating)

Frost crystals with vertical scale of inches. Add new crystal depth slowly if deepening frost expected; melt old crystals if warming is expected and annotate

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) State frost depth reports (Dept. of Agriculture); 5 day temperature outlooks (FAX and zone extended outlooks).

SEGMENT HEADER

SEGMENT NUMBER 63

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable X Broadcast ________ Both ________

SEASON Winter X Spring X Summer ________ Fall ________

TIME OF DAY Midnight - 6am ________ 6am - 4pm X 4pm - Midnight ________ All ____

WEATHER SITUATIONS Whenever frost depth occurs in forecast area

WEATHER PARAMETER(S) Frost depth

TIME REFERENCE Past (incl. present) ________ Prediction 24-72 hrs.

SCALE National ________ Regional ________ State X Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) CO 6, 7; AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User group combination; time scale combination of CO 6 and CO 7.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Trend of frost depths for construction or agricultural planning purposes

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) ________

~~State map with current frost depths~~

Overlay cross section line (N-S) and cities on line

Dissolve to x-section showing frost below ground and depth

Dissolve to 24, 48, 72 hour forecasts

Use frost crystals below ground

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ?

SEGMENT HEADER

SEGMENT NUMBER 64

EMERGENCY X NON EMERGENCY ______

MEDIUM Cable ______ Broadcast X Both ______

SEASON Winter ______ Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All X

WEATHER SITUATIONS Expected or actual temps. below 32° - all such days between 15 days before normal last frost and until hard freeze occurs in the fall.

WEATHER PARAMETER(S) Frost and Freeze (28° and 32° contours)

TIME REFERENCE Past (incl. present) ______ Prediction 1-6 HRS

SCALE National ______ Regional ______ State X Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Emergency segment - impact required. Large dollar losses possible from frost.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) The areas of state or region which are currently, or will be within time frame, below freezing.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) State map with temperature contours every 4° beginning at 32° and extending lower. Higher temperatures are extraneous and should not be recorded. Area between 32° and 28° contour to be colored yellow; area less than 28° to be colored red. Possibly overlay wind arrow (with speed included) but detailed wind information is not desirable - too complex.

*****************************************************************************

DATA SOURCE (if non-existent, describe probable source) Local and zone forecasts on weather wire; fax computer chart of min. temps. is secondary (not as good) info.

FIGURE II-4

SEGMENT HEADER

SEGMENT NUMBER 65

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable X Broadcast ____ Both ____

SEASON Winter X Spring X Summer ____ Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS Temp below 32$^o$ expected,
along with light winds,
T $\rightarrow$ $T_o$, or other frost -
producing situations

WEATHER PARAMETER(S) Frost

TIME REFERENCE Past (incl. present) ____ Prediction 1-6 hrs

SCALE National ____ Regional ____ State X Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Travel or transportation -- forsty or icy bridges and streets (safety)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Possibly combine with temperature forecast

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of state expected to have frosty highways or bridges

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map -- city locaters and interstate routes background

Hatch area in red expected to have frosty conditions

Segment time: 10 seconds

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX temp fcst, NWS zones and city forecasts; state road reports (weather wire)

# SEGMENT HEADER

SEGMENT NUMBER 66

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast ______ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am cable 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS Frost formation on roads and bridges (T≤ 32, wind speed low, humidity high)

WEATHER PARAMETER(S) Frost

TIME REFERENCE Past (incl. present) ______ Prediction 3-18 hrs.

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) only in areas which receive T≤ 32°

*******************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Important warning segment

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas with current frost or expected frost and runoff ice formation on roads and bridges.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map

Major routes and cities marked (I-system plus)

Shade areas for frost and runoff glaze

Annotate time and duration

*******************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zone forecasts; NAFAX temp progs;

SEGMENT HEADER

SEGMENT NUMBER 67

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable ______ Broadcast X Both ______

SEASON Winter ______ Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS Forecast temps below $32^{o}$

WEATHER PARAMETER(S) Frost

TIME REFERENCE Past (incl. present) ______ Prediction 6-72 hrs

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Use in winter, too, in southern latitudes

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture; construction

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Has been user group combined. Also is combination of 3-18 and 12-72 scales.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas with anticipated frost and freezing temperatures, next 3 days. Does not replace short term emergency segment for agriculture for updated frost warning on a state-by-state scale.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map with state outlines (+ major cities?)

Use 6-72 scale to select min temps for following 2-3 nights in area

Shade areas forecast below $32^{o}$ pink and label with flashing annotation

Shade areas with forecast freeze $28^{o}$ red and flash annotations.

Dissolve to next 1 or 2 nights, labelling dates and times

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX temp progs; frost/freeze warnings (forecast centers on NOAA wires)

SEGMENT HEADER

SEGMENT NUMBER 68

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter x Spring x Summer ____ Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS Temp. is ≤ 35°

Wind is ≥ 10 m.p.h.

WEATHER PARAMETER(S) Windchill

TIME REFERENCE Past (incl. present) present Prediction ____

SCALE National ____ Regional ____ State ____ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only for use in areas meeting wx situation criteria above.

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP,GR,CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) What the current temperature feels like when wind is taken into account.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Table Format: Across top: Temps. in 5° intervals
Down left : Wind speed in 5 m.p.h. intervals

Circle current temperature in red. Animate vertical arrow downward on chart as windspeed is circled. Then circle windchill as number enlarges and flashes.

Shade "danger zone" with chill factors below -20° or so.

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Computed by standard formula from current temperature and windspeed.

SEGMENT HEADER

SEGMENT NUMBER 69

EMERGENCY ________ NON EMERGENCY x

MEDIUM Cable ________ Broadcast ________ Both x

SEASON Winter x Spring x Summer ________ Fall ________

TIME OF DAY Midnight - 6am ________ 6am - 4pm ________ 4pm - Midnight x All ________

WEATHER SITUATIONS Temp. ≤ 35° ] forecast
Wind ≥ 10 m.p.h.

WEATHER PARAMETER(S) Windchill

TIME REFERENCE Past (incl. present) ________ Prediction 3 - 24 hrs.

SCALE National ________ Regional ________ State x Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

****************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP, (ski and outdoor recreation)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Aerial representation of areas where temperature does not accurately project the actual outside conditions due to wind factor.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

--State Map

--Temps. Bands Forecast (5°)

--Wind Arrow and Speed Forecast: Overlay

--Dissolve to Windchill Banded Countours (5°)

****************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zone forecast; NAFAX 12-24 Hr. Progs. of temps.

SEGMENT HEADER

SEGMENT NUMBER 70

EMERGENCY ________ NON EMERGENCY x

MEDIUM Cable ________ Broadcast ________ Both x

SEASON Winter x Spring x Summer ________ Fall ________

TIME OF DAY Midnight - 6am ________ 6am - 4pm x 4pm - Midnight x All ________

WEATHER SITUATIONS Temp. ≤ 35° Forecast

Winds ≥ 10 m.p.h. Forecast

WEATHER PARAMETER(S) Windchill

TIME REFERENCE Past (incl. present) ________ Prediction 12-72 hrs.

SCALE National ________ Regional ________ State x Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas subject to wx situation criteria above.

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP, CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique need--but this is a user group combination.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Expected chill factor next two days for planning of winter recreation, construction needs and scheduling, general public activities.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

--Graphical format

--Annotate "Windchill"

--Chill temperatures on Y-axis

--Time on X-axis (of forecast)

--Start with current. Stop every 6 hrs. and label to 12 hrs.; then go 24, 48, 72 hrs.

--Shade under curve as each segment is completed.

--Flash chill factors which lie in danger area ≤ -20°F.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Compute from NAFAX MAX/MIN PROGS and zones winds forecasts (NOAA - wire).

SEGMENT HEADER

SEGMENT NUMBER 71

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter x Spring x Summer ______ Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight ______ All ______

WEATHER SITUATIONS Whenever ≥ 1 inch of snow cover exists in any part of forecast area.

WEATHER PARAMETER(S) Snow cover

TIME REFERENCE Past (incl. present) ______ Prediction 12-72 hrs. and present

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas subject to snowfall.

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture--field prep., spraying; harvesting (fall). And gen.pub. recreation

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User group combination here. Also combines present and future information.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of state with existing and forecast snow cover for the next 72 hrs.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

--State map with cities

--Contoured bands of current snow cover. None = background color; 1" = light shading, 4"+ = med. shading, 8"+ = dark.

--Label "current snow depth"

--Forecast 24, 48, 72 hrs. by dissolving. Add "forecast" and annotate time and day.

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Present: NAFAX snow cover map (facsimile). Future: NAFAX QPF PROG; zone forecasts.

SEGMENT HEADER

SEGMENT NUMBER 72

EMERGENCY ___ NON EMERGENCY x

MEDIUM Cable ___ Broadcast ___ Both x

SEASON Winter x Spring x Summer ___ Fall ___

TIME OF DAY Midnight - 6am ___ 6am - 4pm x 4pm - Midnight x All ___

WEATHER SITUATIONS When snow cover exists in region--usually after storms.

WEATHER PARAMETER(S) Snow cover

TIME REFERENCE Past (incl. present) current Prediction ___

SCALE National ___ Regional x State ___ Local ___

COMMENTS ON DESIGNATORS (i.e., use in ___ area only, etc) Only in regions where snow cover existence occurs.

************************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, AG, TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User-group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Current depth of snow around region.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

(Similar to other snow cover segments)

************************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX snow cover map; State weather summaries (NOAA-wire).

SEGMENT HEADER

SEGMENT NUMBER 73

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter x Spring x Summer ____ Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS Whenever snow cover ≥ 1" is expected to exist, or does exist in state.

WEATHER PARAMETER(S) Snow cover

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hrs.

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas subject to snowfall.

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) TR 1, GR 12, GP 3

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Probably can be combined with 12-72 hour forecast of snow cover.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Area covered by more than 1" of snow or forecast to be within 18 hrs.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with cities marked and titled. Shaded bands (white?) should appear as follows:

≥ 1"

≥ 4"

≥ 8"

≥ 12"

each overlayed on the last in an animated dissolve technique. Add individual city amounts within reason.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Snow cover fax map plus snow QPF forecast (FAX) and terminals and zones (NOAA-wire).

SEGMENT HEADER

SEGMENT NUMBER 74

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring x Summer ______ Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All x

WEATHER SITUATIONS Forecast or existing snow on ground

WEATHER PARAMETER(S) Snow cover

TIME REFERENCE Past (incl. present) ______ Prediction 3-24 hrs.

SCALE National ______ Regional ______ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only areas receiving normal snowfalls.

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Manufacturing and retailing (MRS).

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Some chance to combine with TR, but emphasis is different here...

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas with snow on ground or expected; emphasis on snow on walks/streets/highways and forecast condition thereof.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)
Similar to #73

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) QPF NAFAX progs; zones forecasts.

SEGMENT HEADER

SEGMENT NUMBER 75

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring x Summer ______ Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Forecast or existing snow cover on ground.

WEATHER PARAMETER(S) Snow cover

TIME REFERENCE Past (incl. present) ______ Prediction 12-72 hrs.

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) MR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Probably should be combined with other snow cover segs (TR, GP,).

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas forecast to have snow cover next 3 days; affects retail purchasing, marketing, production schedules, manufacturing.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)
Similar to #73

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) QPF snow progs; zones forecasts (wx wire).

SEGMENT HEADER

SEGMENT NUMBER 76

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Weather Index: temp., humidity, winds.

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hrs.

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Manufacturing/retailing (MR 2).

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER See previous segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Index of factors affecting sales, production, distribution to allow business planning use.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

(to be formatted)

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ____

SEGMENT HEADER

SEGMENT NUMBER 77

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Weather Index: sun/clouds; precip.; fog.

TIME REFERENCE Past (incl. present) ______ Prediction 12-72 hrs.

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Manufacturing/retailing

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER See previous segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See previous segment. Longer range planning for business lead time here.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

(to be formatted)

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source)

## SEGMENT HEADER

SEGMENT NUMBER 78

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Weather Index; temps.; humidity; winds.

TIME REFERENCE Past (incl. present) ____ Prediction 12-72 hrs.

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

*******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Manufacturing/retailing (MR 4).

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER see previous segment

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) see previous segment

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

(to be formatted)

*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ____

SEGMENT HEADER

SEGMENT NUMBER 79

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Weather Index: sun/clouds; precip.; fog.

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hrs.

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Manufacturing/retailing (MR 1).

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is an index combination of several weather elements for specific purpose.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Gives overview of the combination of wx parameters most likely to affect sales and/or production levels. For planning use by industry and business.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

(to be formatted)

*****************************************************************************************************

DATA SOURCE (if non-existent, describe probable source)

SEGMENT HEADER

SEGMENT NUMBER 80

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Primarily for weekend use as a recreational and public safety presentation

WEATHER PARAMETER(S) ice thickness

TIME REFERENCE Past (incl. present) latest available info Prediction ______

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Recreation-General public (GR 22).

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is not really a wx parameter as such although relationship is obvious. Should stand alone for safety reasons, too.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Thickness of ice on inland lakes and waterways; used for ice fishing, skating, ice boating, etc.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with boundaries and major lakes identified. Either use contours to show average ice thickness over state or put specific annotation figures on or in major lakes.

2) Hatch areas in red in which ice thickness is less than or equal to predetermined safety value (6"?) or where expected weather ( high winds, rapid warming) may cause dangerous conditions to occur.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ? Do not know at this time.

SEGMENT HEADER

SEGMENT NUMBER 81

EMERGENCY ________ NON EMERGENCY x

MEDIUM Cable ________ Broadcast ________ Both x

SEASON Winter ________ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ________ 6am - 4pm x 4pm - Midnight x All ___

WEATHER SITUATIONS All, when boating forecast is to be given.

WEATHER PARAMETER(S) Wave height

TIME REFERENCE Past (incl. present) ________ Prediction 3-24 hrs.; future

SCALE National ________ Regional ________ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) major lakes, Great Lakes, and coastal regions only.

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR 21 (recreation).

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Better, more specific weather information cited by over 65% of boaters as an important need.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Height of waves; choppiness of water; secondarily, wind speed and gusts in knots.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Animation or stylized graphic--use vertical cross-section with landmarks on left and right side, i.e. Sheboygan to Sturgeon Bay along Lake Michigan. Put in wave heights with vertical arrows:


Use split frame, with this information top half and horizontal view with wind arrow and speed in knots on bottom half. Include valid times and annotation in red for "warnings" if seas or winds expected to exceed threshold levels for safety.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Lakes forecasts on NOAA-wire. Winds from zones and terminals.

SEGMENT HEADER

SEGMENT NUMBER 82

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter ______ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All, during periods of rapid fall or rapid rise of barometer; or, high or low pressure--during recreational weather show.

WEATHER PARAMETER(S) Barometric pressure

TIME REFERENCE Past (incl. present) ______ Prediction 3-24 hrs.

SCALE National ______ Regional ______ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR 19 (fishing)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Stylized segment, for specific need.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Fish apparently bite better with certain pressure regimes.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Stylized, animated segment: fisherman on bank of pond, with line in water. Pressure, in inches, appears in annotation--large numbers--with the words "high" or "low" followed by a dash, and then "rising" or "falling". Use word"barometer", not pressure.

Animate fish in lake and fisherman so that he pulls out fish after fish in rapid order during favorable pressure regime; during unfavorable regime will sit sleeping on bank of pond.

**************************************************************************

DATA SOURCE (if non-existent, describe probable source) fax forecasts of pressure system movements.

SHEET

Seg 82

PROD.

BARO PRESSURE FOR RECREATION (FISHING)

DATE

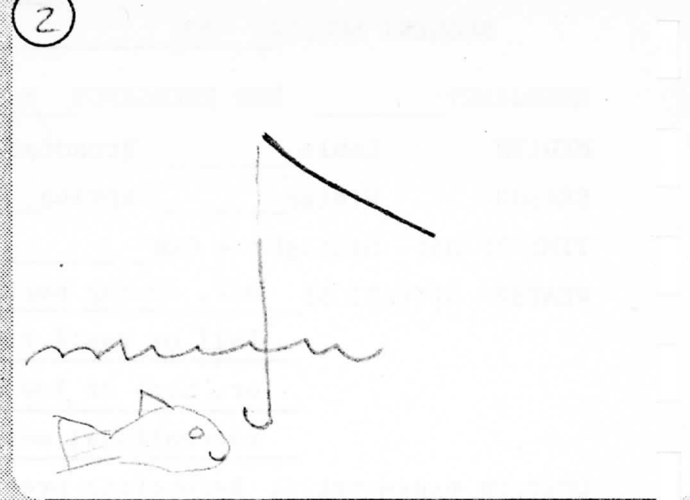
11/1/76

Committee on Educational Media
Mathematical Association of America
P. O. Box 2310 • San Francisco • California 94126

1


STILL FRAME - time 5 sec.
Colors: water MED. blue. GROUND light GREEN, TREE DARK GREEN/light green; pole + trunk BROWN; HOOK + LINE RED AS IS TITLE; ARMS + FACE FLESH; clothing DARK BLUE + SKY LIGHT BLUE.

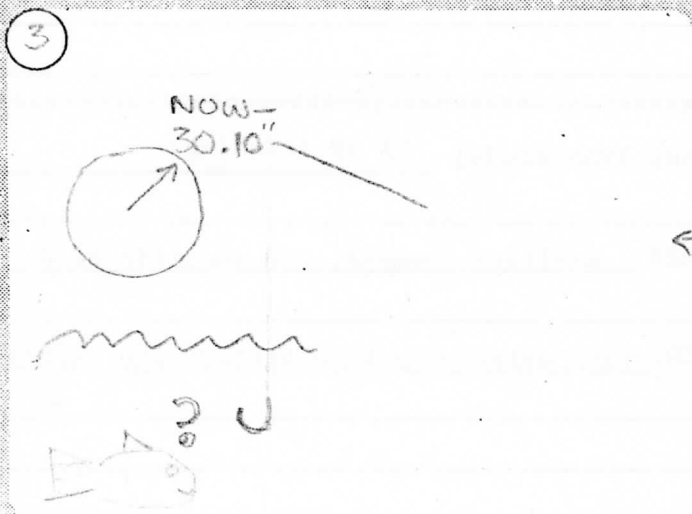
2



SAME FRAME + colors. ANIMATE FISH IN FROM STAGE LEFT AS POLE, line, HOOK AND ARMS MOVE Vertically up + DOWN. FISH = Yellow or silver TIME: 3 sec.

DECISION BRANCH 1

3



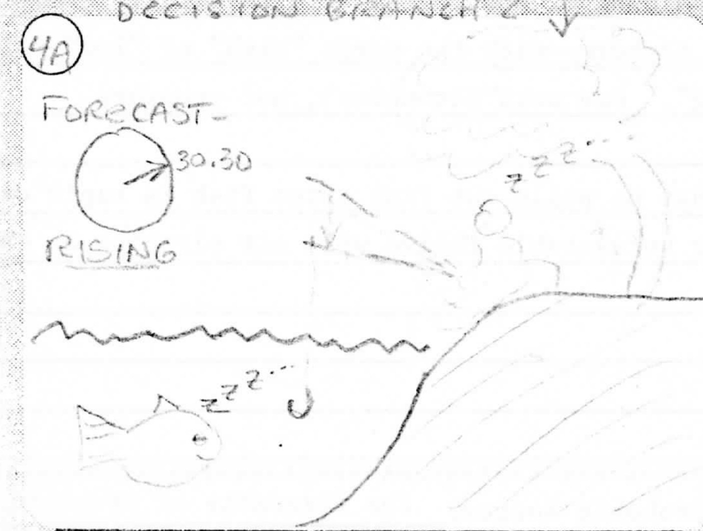

CONTINUE HOOK MOVEMENT. DISSOLVE IN DIAL, POINTER, CURRENT READING, QUESTION MARK OVER FISH. USE RED, TO IDENTIFY WITH TITLE, ABOVE (1). TIME: 5 sec.

4


DISSOLVE OUT "NOW-30.10" AND DISSOLVE IN "FORECAST-FALLING" (3 sec) THEN ANIMATE FISH ON TO LINE, ARMS START TO PULL FISH FROM WATER, NEW FISH APPEARS AS MARKER FALLS TO NEW READING ON BAROMETER TIME: 3 sec

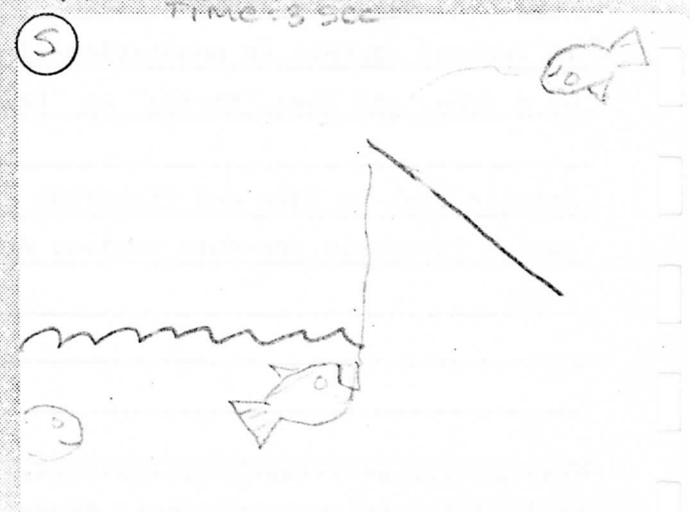
DECISION BRANCH 2

4A




DISSOLVE OUT "NOW-30.10" AND DISSOLVE IN "FORECAST-RISING" (3 sec). THEN ANIMATE FISH + MAN'S EYES TO CLOSE, "Z's" TO RISE FROM BOTH, FISH POLE TO DROOP. CONTINUE FOR 5 sec, FADE BLACK.

5



SAME FRAME - REPEAT FISH ON TO HOOK, PULLED FROM WATER FLIES OFF SCREEN TOP, NEXT FISH FROM LEFT ON TO HOOK (1 PER 1/2 SEC) REPEAT FOR 3 sec; dissolve to Black

SEGMENT HEADER

SEGMENT NUMBER 83

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Outdoor activity restrictions

TIME REFERENCE Past (incl. present) ____ Prediction 0-24 hrs.

SCALE National ____ Regional ____ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR--UT, CO, AG, GP to an extent.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique need and parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Summation of seasonal sports or activities "outdoor quality".

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

--State map with cities marked

--Areas of significant "weather detractors" from outside activities should be outlined, shaded, annotated.

--For example, if part of state forecast to have high winds and cold, should be annotated "windchill less than -20°" and shaded.

--summer annotations will be different than winter seasons.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) "Judgment" segment, or computer program to add cautions when a parameter or combination of parameters exceeds a threshold value.

SEGMENT HEADER

SEGMENT NUMBER 84

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Outdoor activity restrictions

TIME REFERENCE Past (incl. present) ____ Prediction 12-24 hrs.

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

**********************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR--CO, UT, AG, GP to an extent.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique need and parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Summation of seasonal sports or activities "outdoor quality"

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See preceding segment

**********************************************************************************

DATA SOURCE (if non-existent, describe probable source)

See preceding segment

SEGMENT HEADER

SEGMENT NUMBER 85

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter ____ Spring ____ Summer x Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS Temp. $\geq$ 85

Humidity $\geq$ 40%

(Dew Point $\geq$ 60°)

WEATHER PARAMETER(S) Temp.-Humidity Index

TIME REFERENCE Past (incl. present) present Prediction ____

SCALE National ____ Regional ____ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas where THI is frequently high.

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP,GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) The feeling of the weather during potentially uncomfortable or debilitating weather conditions.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

************************************************************************************

DATA SOURCE (if non-existent, describe probable source)

SEGMENT HEADER

SEGMENT NUMBER 86

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter ______ Spring ______ Summer x Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Temp. ≥ 85

Dew Point ≥ 60

WEATHER PARAMETER(S) Temp.-Humidity Index

TIME REFERENCE Past (incl. present) ______ Prediction 12-24 hrs.

SCALE National ______ Regional ______ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas where THI is frequently high.

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This a parameter combination.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) What the weather feels like--sort of a summer "windchill index" idea.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX and zones temp. forecast. Currently moisture forecasts are not made but should be.

SEGMENT HEADER

SEGMENT NUMBER 87

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter ____ Spring ____ Summer x Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS Temp. ≥ 85

Dew ≥ 60

WEATHER PARAMETER(S) Temp.-Humidity Index

TIME REFERENCE Past (incl. present) ____ Prediction 12-24 hrs.

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas where THI is frequently high.

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP,GR.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER See preceding segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See preceding segment.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) ____

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ____

See preceding segment.

SEGMENT HEADER

SEGMENT NUMBER 88

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temps.

TIME REFERENCE Past (incl. present) ______ Prediction 1-6 hrs.

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG (Spraying)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Large costs and potential losses make this a unique segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Short-term forecast and temperatures for spraying purposes.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

--Contours at 2° intervals (or 5° intervals if more than four 2° bands)

--Annotate and label

--Use state map

--Shade warmest to coolest

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A current data, extrapolated using zone forecasts and max/min progs.

SEGMENT HEADER

SEGMENT NUMBER 89

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Winds

TIME REFERENCE Past (incl. present) x Prediction ____

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, TR, CO, AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Multi-user group interest

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Wind speed and direction (averages) over the region at time of map.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

--Possibly try streamlines?

--Insert hi/low centers and fronts for easy explanation

--Annotate with shading over streamlines for speed gradients.

--If streamlines not used, add shading of speeds first, then appropriate direction arrows

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A current data

SEGMENT HEADER

SEGMENT NUMBER 90

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast x ____ Both ____

SEASON Winter ____ Spring x ____ Summer x ____ Fall x ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm x ____ 4pm - Midnight x ____ All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Winds

TIME REFERENCE Past (incl. present) ____ Prediction 1-6 hrs.

SCALE National ____ Regional ____ State x ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Spraying needs are high-cost, unique needs.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas with wind speeds forecast less than critical thresholds to allow spray application.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

--State map

--Color areas (green?) with wind speed forecasts of 0-5 m.p.h.

ADD --Color areas (yellow?) with wind speed forecasts of 5-10 m.p.h.

--Insert annotation remaining area of state indicating average windspeed

--Overlay direction arrow (average for state)

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Current weather and winds, plus zones forecast and pressure gradient forecasts. This will probably be a subjective forecast requiring forecaster selection.

SEGMENT HEADER

SEGMENT NUMBER 91

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast X Both ____

SEASON Winter ____ Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Winds

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hours

SCALE National ____ Regional X State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Spraying segment: high cost, unique need

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas with forecast winds less than 10 mph and less than 5 mph

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Regional map with annotation

Rest of segment similar to preceding short-term forecast

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) See preceding segment

SEGMENT HEADER

SEGMENT NUMBER 92

EMERGENCY ________ NON EMERGENCY X

MEDIUM Cable ________ Broadcast ________ Both X

SEASON Winter X Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ________ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS ALL

WEATHER PARAMETER(S) Winds

TIME REFERENCE Past (incl. present) ________ Prediction 12-72 hours

SCALE National ________ Regional X State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) G

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG, CO, UT, GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Planning segment for many user groups.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Wind speed and general direction expected over region next 3 days.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Similar to other wind segments

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX SFC PROGS, 6-12-24-36-48 hours. Zones forecast and extended outlook (WX wire)

SEGMENT HEADER

SEGMENT NUMBER 93

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable X (CO) Broadcast X (AG) Both ____

SEASON Winter X (CO) Spring X (AG+CO) Summer X (AG+CO) Fall X (AG+CO)

TIME OF DAY Midnight - 6am X (CO) 6am - 4pm X (AG+CO) 4pm - Midnight X (AG+CO) All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Drying Index

TIME REFERENCE Past (incl. present) ____ Prediction 3-24 hours

SCALE National ____ Regional ____ State X Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only in areas with significant crop and hay drying needs; but might be CO-useful nationwide.

*********************************************************************************************

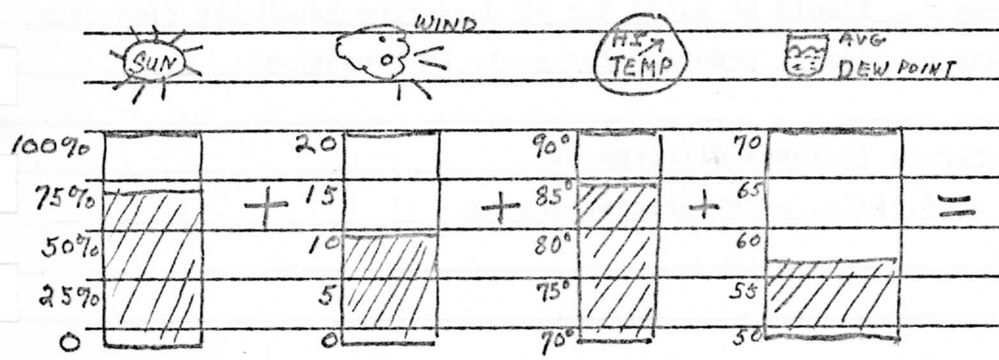
MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture (AG); Construction (CO)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER This is a user-group combination

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Effects of several weather parameters on evaporation situation. Input parameters include temps, winds, sky cover, humidity/dew point, soil moisture.

This 3-18 hr forecast should be valid same day for AM forecast; following day for PM or eve. forecast

FORMAT OF SEGMENT (scale, background, foreground, duration, etc) Add ea. bar in turn; flash check mark result; shade bottom 1/2 bar red; shade top 1/2 bar green




Excellent

Good DRYING

Fair CONDITIONS

Poor

*********************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX + Zones information on each parameter; must be computed.

SEGMENT HEADER

SEGMENT NUMBER 94

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X CO Broadcast X AG Both ______

SEASON Winter X CO Spring X AG,CO Summer X AG,CO Fall X AG, CO

TIME OF DAY Midnight - 6am X CO 6am - 4pm XAG,CO 4pm - Midnight X AG,CO All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Drying Index

TIME REFERENCE Past (incl. present) ______ Prediction 24-48 hours

SCALE National ______ Regional X State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG, CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique need segment

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See preceding 3-18 hour "Drying Index" Segment

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Similar to preceding segment. Should be valid for +2 days from broadcast time (day after tomorrow for evening broadcast, tomorrow for early AM broadcast).

Map format here to accommodate Regional differences

Contour areas with exc, good, fair, poor forecast drying.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX + Zone info + PROGS; Computes must be done

SEGMENT HEADER

SEGMENT NUMBER 95

EMERGENCY ______ NON EMERGENCY X

MEDIUM Cable X CO Broadcast X AG Both ______

SEASON Winter ______ Spring X Summer X Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm X 4pm - Midnight X All ______

WEATHER SITUATIONS All - used as planting guide

WEATHER PARAMETER(S) Soil Temperatures

TIME REFERENCE Past (incl. present) Y Prediction ______

SCALE National ______ Regional ______ State X Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG, CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique need

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Two inch and five inch soil temperatures from a half-dozen representative state locations. Used in determining planting schedules, germination rates, appropriate spraying times for agricultural needs.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1. State map with exploded arrow to first location; annotate "Soil Temperatures" and city name (or area) next to arrow in state

2. Other half of frame (or 3/4 frame) stylized vertical soil section with grass at top. Ruler along one side reading 0-6 inches; two thermometers with round gauges at top - one inserted to 2"; the other 5". Temperatures appear in sequence in gauge.


************************************************************************

DATA SOURCE (if non-existent, describe probable source) None currently from NWS: Use state data (experimental farms systems; etc.)

SEGMENT HEADER

SEGMENT NUMBER 96

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable X CO Broadcast X AG Both ____

SEASON Winter ____ Spring X Summer X Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight X All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Soil Temperatures

TIME REFERENCE Past (incl. present) ____ Prediction Next 72 hours

SCALE National ____ Regional ____ State X Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

*******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture, Construction

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique need

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) 3 day forecast of soil temperature trends. Generally for use immediately following current soil temperature segment preceding. Used for planning planting, growing, spraying needs.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Similar to segment, "Current Soil Temperatures"

*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Experimental farms; State Climatologist

# SEGMENT HEADER

SEGMENT NUMBER 97

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter ____ Spring X Summer X Fall X

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight ____ All ____

WEATHER SITUATIONS For occl. use as desired

(updated once weekly)

WEATHER PARAMETER(S) Palmer Index

TIME REFERENCE Past (incl. present) X Prediction ____

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of drought or wetness in nation, as shown by NWS Palmer Index Map (smoothed)

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Smoothed version of NAFAX map, colored and shaded.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX (once a week)

SEGMENT HEADER

SEGMENT NUMBER 98

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable ____ Broadcast ____ Both X

SEASON Winter ____ Spring X Summer X Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm X 4pm - Midnight ____ All ____

WEATHER SITUATIONS For occl. use as desired
(updated once weekly)

WEATHER PARAMETER(S) Crop Moisture Index

TIME REFERENCE Past (incl. present) X Prediction ____

SCALE National X Regional ____ State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

*******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Crop moisture rating and change during last 7 days (wetter, drier)

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Smoothed version of NAFAX map, colored and shaded

*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX "Crop Moisture Index" once weekly

SEGMENT HEADER

SEGMENT NUMBER 99

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter ______ Spring x Summer x Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight ______ All ______

WEATHER SITUATIONS For ocl. use as desired
(upadated once weekly)

WEATHER PARAMETER(S) Crop moisture index

TIME REFERENCE Past (incl. present) x Prediction ______

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Crop moisture rating and change in rating during last 7 days.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Blown-up segments of NAFAX map, smoothed, colored and shaded.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX "crop moisture Map" once weekly.

SEGMENT HEADER

SEGMENT NUMBER 100

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS Fog exists or is forecast
(Visibility ≤ 1 mile)

WEATHER PARAMETER(S) Fog

TIME REFERENCE Past (incl. present) ____ Prediction 0-12 hrs.

SCALE National ____ Regional ____ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

************************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) TR, GP, CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER User-group combination; needs impact.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See preceding segment.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) ____

--State outlines with major cities and routes marked.

--Process same as regional segment preceding.

--Then display in bold color major city(s) within fog area or major route and explode dissolve to fog photo or time lapse of appropriate road visibility conditions. Label; "visibility--feet(miles)" and "improving by--AM/PM".

************************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ____

See preceding segment.

SEGMENT HEADER

SEGMENT NUMBER 101

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Fog exists or is forecast
(visibility ≤ 1 mile)

WEATHER PARAMETER(S) Fog

TIME REFERENCE Past (incl. present) ______ Prediction 0-24 hrs.

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) TR, GP, CO

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER 1) User-group combination; 2) Needs impact for TR alert process.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas currently, or forecast, to have visibilities less than 1 mile in fog.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

--Regional map, state outlines, major cities, major routes.

--Label "current fog areas", and dissolve in grey shading for fog areas at latest available information.

--Dissolve to "forecast fog areas"; Annotate time (each 6 hrs.) and shade as before.

--Overlay visibilities over fog area.

--If less than 1/4 mile, add blinking "use extreme caution"

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones forecasts; SVC A visibility reports; temp./DP forecasts.

SEGMENT HEADER

SEGMENT NUMBER 102

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All x

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Humidity

TIME REFERENCE Past (incl. present) present Prediction ______

SCALE National ______ Regional ______ State ______ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG, all to an extent

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Basic moisture segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Current local humidity at surface.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) Annotate city name.

2) Use horizontal bar graph. Label 0-100% on x-axis.

3) Bring bar across (animation) to current humidity and label.

4) Add insert of man in sauna (summer), frost crystals (winter), etc. if over 80%. If under 30%, add insert of desert with palms, etc.

******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A data (computed) or NOAA-wire data (direct data).

SEGMENT HEADER

SEGMENT NUMBER 103

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter ______ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Dew point

TIME REFERENCE Past (incl. present) ______ Prediction 0-36 hrs.

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Primarily in eastern 2/3 of nation where large dew point changes affect agriculture and activities.

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG, GR (snowmaking)

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER 1) Basic moisture segment; 2) User group combination here.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) General contrast of dew point temperatures over region as a measure of moisture in the air. Adversion areas can be used in the forecast to show changes.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

--Contoured bands over regional map. Show major cities.

--Label "current dew points"

--Shade areas excessively moist or dry.

--Add wind arrow

--Animate to 12 hr. forecast.

--Animate to 24, 36 hr. forecasts.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A (current data); do not know future data source at this time!

SEGMENT HEADER

SEGMENT NUMBER 104

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Dew Point

TIME REFERENCE Past (incl. present) ____ Prediction 0-24 hrs.

SCALE National ____ Regional ____ State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Primarily in eastern 2/3 of nation where large dew point changes affect agriculture and activities.

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER (See preceding segment)

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) (See preceding segment)

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

(see preceding dew point segment)

--Format here will be different though--probably use slide of sun on dew as background to a graph showing dew point current, 12, 24 hrs. averaged over state.

--Shade or line off graph into "dry", "moderate", "moist" areas by dew points.

Example: 50° or less in summer, in dry zone; 60° or less in moderate; 60-70° in moist zone.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ? SVC A = current data.

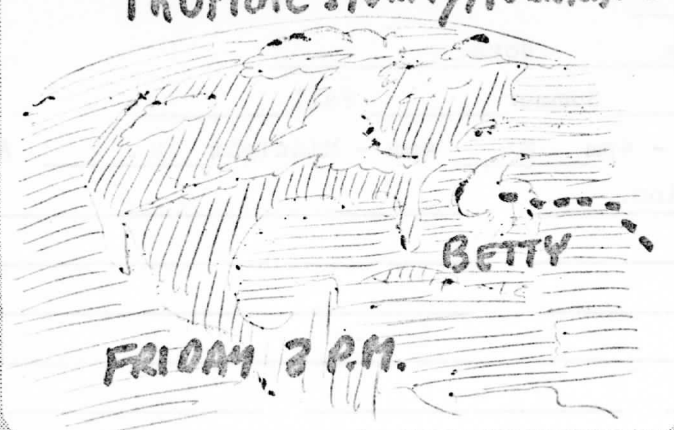
SHEET
~~A ...~~
201

PROD.
TROP. STORM / L...

DATE
2/77
...

Mathematical Association of America
P.O. Box 2310 • San Francisco • California 94126

(1) TROPICAL STORM/HURRICANE

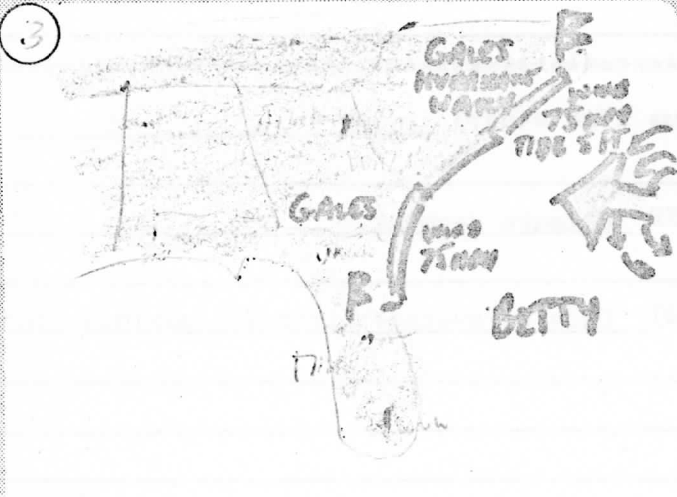



SATELLITE PICTURE OF U.S. + TROPICAL WATERS + TROP. STORM OR HURCN. 2 SECONDS IN ADD TIME. 4 SECONDS IN ADD NAME OF STORM UNDER CLOUD MASS. 7 SECONDS DASH (OUT) PREVIOUS POSITIONS

(2)


AT 10 SECONDS, DISSOLVE TO REGIONAL COASTAL AREA WITH GRAPHIC STORM REPRESENTED. AT 13 SECONDS ADD (SWEEP) BROAD ARROW OVER STORM FOR MOVEMENT. AT 19 SECONDS COLOR COAST RED FOR HURRICANE WARNING WITH LINES AT BOUNDARIES

(3)




AT 25 SECONDS, ADD GALE AND/OR HURRICANE WATCH AREA IN YELLOW OR ORANGE. AT 30 SECONDS, ADD WIND, STORM SURGE INFO OFF COAST.

(4) AT 10 SECONDS, ADD PEAK WINDS, STORM SURGE BETWEEN HURRICANE + WARNING

HURRICANE WARNING
SAVANNAH
BEAUFORT
CHARLESTON
MYRTLE BEACH
ALL INTERMEDIATE COMMUNITIES

PRECAUTIONS:
1) STAY INDOORS
2. EVACUATE BEACHES + LOW FLOOD-PRONE AREAS
3. LEAVE MOBILE HOMES + WEAKER STRUCTURES
4. STORE DRINKING WATER
5. BATTERY RADIO + FLASHLIGHT
6. FILL GAS TANK

AT 35 SECONDS ZOOM MAP TO 1/4 SCREEN AND ADD PRECAUTIONS. UPPER RIGHT, LIST CITIES IN HURCN WARNING AREA. BOTTOM AT 42 SECONDS, ADD PRECAUTIONS ACROSS BOTTOM.

(5) SAME AS #4
except HURRICANE WATCH CITIES + PRECAUTIONS

AT 65 SECONDS, CHANGE 3/4 SCREEN TO HURRICANE WATCH TOWNS + PRECAUTIONS.

(6) SAME AS #4 + #5, EXCEPT
GALE WARNINGS

AT 1:20 SECONDS, GALES WARNINGS

SEGMENT HEADER

SEGMENT NUMBER 202

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter ______ Spring x Summer ______ Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS At forecaster discretion.

WEATHER PARAMETER(S) First 70° day

TIME REFERENCE Past (incl. present) x Prediction ______

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Climate segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Date of average first 70° maximum temperature in spring.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

--Regional map with lines (3-5 only) of dates (solid lines).

--Label on the lines with dates.

--Have computer draw lines on map from earliest date first to latest date last.

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Climatic information for each stat

SEGMENT HEADER

SEGMENT NUMBER 203

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast x Both ____

SEASON Winter ____ Spring x Summer x Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS At forecaster discretion

WEATHER PARAMETER(S) First 80° day

TIME REFERENCE Past (incl. present) x Prediction ____

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**********************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Climate segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average date of first 80° maximum temperature in spring.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

(See preceding segment)

**********************************************************************

DATA SOURCE (if non-existent, describe probable source) State climatic information.

SEGMENT HEADER

SEGMENT NUMBER 204

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter x Spring x Summer ______ Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS At forecaster*s discretion

WEATHER PARAMETER(S) Snowfall, compared to normal.

TIME REFERENCE Past (incl. present) past Prediction ______

SCALE National ______ Regional ______ State ______ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**********************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Climate segment--unique timespan.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Snow totals for local area compared to normal monthly snowfall.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Bar graph outlines (snow in inches = vertical scale) in purple on light blue background. (Start with october, go through April). Then add in solid blue bars, one month at a time for actual snow amounts--over the purple outlines of "normal". Label.

**********************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Local climate data for normals; precip. or snowfall records for actuals.

SEGMENT HEADER

SEGMENT NUMBER 205

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast x Both ____

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS At discretion of forecaster

WEATHER PARAMETER(S) Cumulative rainfall totals.

TIME REFERENCE Past (incl. present) past Prediction ____

SCALE National ____ Regional ____ State ____ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique timespan.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Visual indication of local rainfall total vs. normal; shows drought and wet spells.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) Bar graph (inches of precip. vertical scale) in shades of green and tan. Dash in heavy line for normal rainfall. Last 12 months (perhaps should be only 6 months?) Add bars 3 at a time first nine months. Then one at a time last 3 months. If a bar total is less than normal, shade it tan. If more than normal, shade it green. Annotate above each bar the total in inches. Above bars, add total last 2 months, compared to normal.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX precip. and state and local climate summaries.

SEGMENT HEADER

SEGMENT NUMBER 206

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast ____ Both x

SEASON Winter ____ Spring ____ Summer ____ Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS At forecaster discretion, as an outlook map.

WEATHER PARAMETER(S) Dates of average first frost.

TIME REFERENCE Past (incl. present) past Prediction ____

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Only areas subject to frost/freeze.

******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average dates of first frost in contour style, for AG/garden planning and care.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map, with contours (blue) of frost dates (label within) or dates labeled at major cities with contours toned down background.

30 seconds

******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Climate data for each state.

SEGMENT HEADER

SEGMENT NUMBER 207

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter ______ Spring x Summer ______ Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS At forecaster's discretion as an outlook map.

WEATHER PARAMETER(S) Dates of last frost

TIME REFERENCE Past (incl. present) past Prediction ______

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average dates around state of last spring frost (32°).

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) (See previous segment)

*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Climate data for each state.

SEGMENT HEADER

SEGMENT NUMBER 208

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All; used at forecaster's discretion.

WEATHER PARAMETER(S) Upper air winds

TIME REFERENCE Past (incl. present) present Prediction 12-24 hrs.

SCALE National x Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) An idea of the upper air windflow; useful in explaining storm tracks, temperature patterns, rainfall amount and severe weather.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Alternate 1: U.S. map with state outlines. Start at left (west) of screen; animate upper air contours (smooth 500 mb map and reduce to maximum of six representative contours) across screen slowly. Use arrow at head of each line. Label closed lows and ridges. Dissolve to forecast 12, 24 hrs.

Alternate 2: White on black background, no state grid, no animation. Use to super over other national maps for explanatory purposes. Dissolve to 12 and 24 hour forecast. No more than six contours, smoothed.

Time: 45 sec.

(Both alternatives should be available).

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Current 500 mb map and LFM forecast of 500 mb flow, 12 and 24 hrs.

SEGMENT HEADER

SEGMENT NUMBER 209

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All x

WEATHER SITUATIONS All with gale watches/storm watches, or warnings in effect.

WEATHER PARAMETER(S) Wind watches and warnings

TIME REFERENCE Past (incl. present) present AND Prediction 12-24 hrs.

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Coastal areas only

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of coastline under gale/storm watches or warnings.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)
See George Winterlind's hurricane segment for format.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source)

SEGMENT HEADER

SEGMENT NUMBER 210

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast ______ Both x

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Within 2 or 3 days of beginning of month.

WEATHER PARAMETER(S) Monthly climate graph

TIME REFERENCE Past (incl. present) x Prediction ______

SCALE National ______ Regional ______ State ______ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

****************************************************************************************

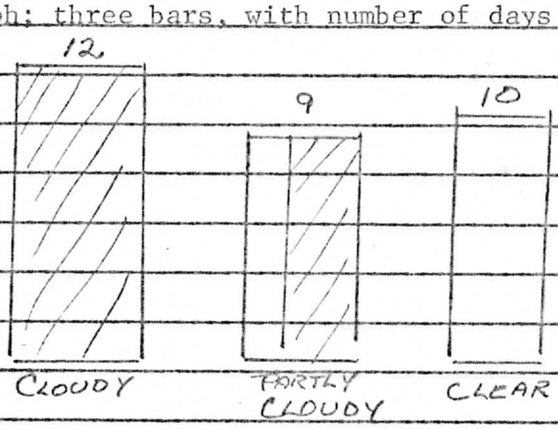
MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, AG

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter combination and presentation.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Number of clear, cloudy, partly cloudy days in each month.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Bar graph; three bars, with number of days vertical axis.




(EXAMPLE)

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Climatic records for each major city.

SEGMENT HEADER

SEGMENT NUMBER 211

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All, at forecaster discretion

WEATHER PARAMETER(S) Frontal systems, pressure centers overlay.

TIME REFERENCE Past (incl. present) present AND Prediction 12-24 hrs.

SCALE National ______ Regional x State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique visual treatment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Frontal boundaries, high and low pressure centers--to put over other segments (supers).

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

--No grid, but match size to national grids of other segments.

--Frontal boundaries over black background (red=warm front; blue=cold front).

--Add motion arrows.

--Add pressure centers.

Time=30seconds

--Animate fronts to 12 and 24 hr. position and hold.

Time=30 seconds

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NAFAX surface map.

SEGMENT HEADER

SEGMENT NUMBER 212

EMERGENCY ________ NON EMERGENCY x

MEDIUM Cable ________ Broadcast x Both ________

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ________ 6am - 4pm x 4pm - Midnight x All ________

WEATHER SITUATIONS Forecaster discretion--wx front or pressure center within state boundary.

WEATHER PARAMETER(S) ________

TIME REFERENCE Past (incl. present) present AND Prediction 12-24 hrs.

SCALE National ________ Regional ________ State x Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

************************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique visual.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Frontal boundaries, high and low centers; to overlay (super) on other segments.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) (See previous regional segment)

************************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ________

SEGMENT HEADER

SEGMENT NUMBER 213

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable ______ Broadcast x Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS ______

WEATHER PARAMETER(S) Temp. overlay

TIME REFERENCE Past (incl. present) ______ Prediction 12-24 hrs.

SCALE National x Regional ______ State ______ Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER See previous

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See previous

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

1) Forecast of key cities temps., with no grid, black background--to overlay (super) over other segments. See previous segments.
2) Hold 12 hr. forecast (highs or lows) for 15 sec; dissolve to 24 hr. (high or lows) forecast for 15 seconds.

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX forecasts--national temps.

SEGMENT HEADER

SEGMENT NUMBER 214

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast x Both ____

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS ____

WEATHER PARAMETER(S) Temp. overlay

TIME REFERENCE Past (incl. present) ____ Prediction 12-24 hrs.

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ____

**********************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER See previous

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See previous--regional scale.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Same as previous national segment, on a regional scale.

**********************************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX forecasts; state collectives on teletype.

SEGMENT HEADER

SEGMENT NUMBER 215

EMERGENCY ________ NON EMERGENCY x

MEDIUM Cable ________ Broadcast x Both ________

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ________ 6am - 4pm x 4pm - Midnight x All ________

WEATHER SITUATIONS All, forecaster discretion.

WEATHER PARAMETER(S) Temp. overlay

TIME REFERENCE Past (incl. present) present Prediction ________

SCALE National x Regional ________ State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique visual design.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Temperatures of key cities which can be overlayed on any key map desired.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Black background; white numbers of current temperatures of about 20 cities over nation. No grid. Forecaster can overlay (super) this frame over cloud map, wind map, or pressure map, etc.

******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A; NAFAX surface maps.

SEGMENT HEADER

SEGMENT NUMBER 216

EMERGENCY ________ NON EMERGENCY x

MEDIUM Cable ________ Broadcast x Both ________

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ________ 6am - 4pm x 4pm - Midnight x All ___

WEATHER SITUATIONS Temperature overlay.

WEATHER PARAMETER(S) Temp. overlay.

TIME REFERENCE Past (incl. present) present Prediction ________

SCALE National ________ Regional x State ________ Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, TR etc.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique visual design.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See previous national segment.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See previous segment (same design, regional scale).

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) See previous.

SEGMENT HEADER

SEGMENT NUMBER 217

EMERGENCY x NON EMERGENCY

MEDIUM Cable x Broadcast ? (some areas) Both

SEASON Winter Spring x Summer x Fall x

TIME OF DAY Midnight - 6am 6am - 4pm x 4pm - Midnight x All

WEATHER SITUATIONS Once a week; or after significant rains; or during extended droughts.

WEATHER PARAMETER(S) River stages

TIME REFERENCE Past (incl. present) present Prediction

SCALE National Regional State x Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Height of rivers/streams, and comparison with flood stage as required.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

--State map with rivers/streams indicated. Add river stages, key points.

--Highlight or spotlight area, if potential or present danger.

--Zoom down to that highlighted area, with more detailed information.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) NWS flood guidance (RAWARC) and river stage list (NOAA-wire) and QPF forecasts.

SEGMENT HEADER

SEGMENT NUMBER 218

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast x Both ____

SEASON Winter x Spring ____ Summer ____ Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS At forecaster's discretion.

WEATHER PARAMETER(S) Number of 0° days

TIME REFERENCE Past (incl. present) x Prediction ____

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Climate segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average number of seasonal days when the minimum temperature is less than or equal to 0°F.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

Contours (every 5 zero days) progressing from light blue to dark blue; label and annotate on state map with major cities marked.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Climate of the states information.

SEGMENT HEADER

SEGMENT NUMBER 219

EMERGENCY____ NON EMERGENCY x

MEDIUM Cable____ Broadcast x Both____

SEASON Winter____ Spring____ Summer x Fall____

TIME OF DAY Midnight - 6am____ 6am - 4pm x 4pm - Midnight x All____

WEATHER SITUATIONS At forecaster discretion

WEATHER PARAMETER(S) Number of 90° days.

TIME REFERENCE Past (incl. present) x Prediction____

SCALE National____ Regional x State____ Local____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Climate segment

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average number of summer days with maximum temperature of 90° or more.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

See preceding segment.

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) State climate information.

SEGMENT HEADER

SEGMENT NUMBER 220

EMERGENCY______ NON EMERGENCY x

MEDIUM Cable______ Broadcast x Both______

SEASON Winter______ Spring x Summer x Fall______

TIME OF DAY Midnight - 6am______ 6am - 4pm x 4pm - Midnight x All______

WEATHER SITUATIONS At forecaster discretion

WEATHER PARAMETER(S) Average thunderstorm days

TIME REFERENCE Past (incl. present) x Prediction______

SCALE National______ Regional x State______ Local______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Climate segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average number of days in the year when thunderstorms occur.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

--Contour map with shading. Label between contours. Use no more than 5 contours on map, smoothed.

--Regional map with state outlines.

--Annotate and title.

--Use lightning sumbols of increasing density, toward greatest area on map.

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Climates of the states.

SEGMENT HEADER

SEGMENT NUMBER 221

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable ____ Broadcast x Both ____

SEASON Winter ____ Spring x Summer x Fall ____

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS At forecaster discretion.

WEATHER PARAMETER(S) Average number of days with hail.

TIME REFERENCE Past (incl. present) x Prediction ____

SCALE National ____ Regional x State ____ Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GA

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Climate segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average number of days with hail reported at each area during season.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

(See preceding segment)

*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Climate of the states.

SEGMENT HEADER

SEGMENT NUMBER 301

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temperature and moisture index.

TIME REFERENCE Past (incl. present) present AND Prediction 0-12 hrs.

SCALE National ____ Regional ____ State ____ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique, localized segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Temperature and moisture (dew point) to be expected in local area, for recreational uses.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) Graphical format. Times (present at left) across base; temps running vertically.

2) Hold current temp., marked and annotated, at left edge. Slide smooth curve across to right, stopping every 3 hrs. to 24 hrs. (Shade under graph as temp. line advances).

3) Annotate above curve after graph completion: "Moisture level - (——) tonight"; "—— tomorrow" (high, moderate, low) based on dewpoint and forecast temperature.

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones, NAFAX temp. progs, SVC A (current).

SEGMENT HEADER

SEGMENT NUMBER 302

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temp. and rainfall

TIME REFERENCE Past (incl. present) ____ Prediction 5 Days

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*******************************************************************************************

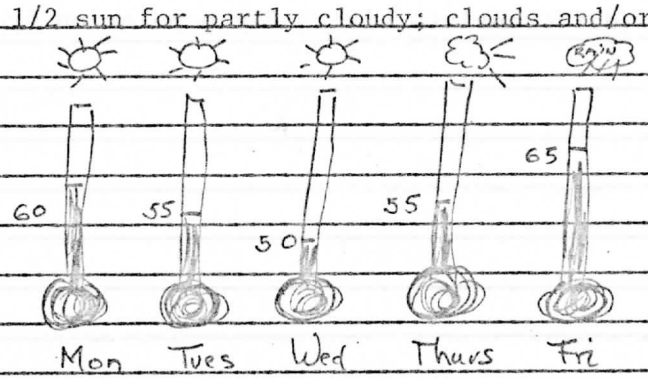
MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Simplified, localized combination of temperature and precip. outlooks for recreational use.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED)

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Use pictorial format of 5 thermometers, showing red up to forecast temp. for each day. Sun above for sunny; 1/2 sun for partly cloudy; clouds and/or precip. slashes for rain forecast. Sample:




*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) 5 day outlooks: state forecast offices; NAFAX 5 day progs.

SEGMENT HEADER

SEGMENT NUMBER 303

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) "Pest problems"

TIME REFERENCE Past (incl. present) present Prediction ____

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) Useful only in areas with regular pest survey reports and data.

******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter, for GR use and comfort (weather influenced).

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Public and recreational alert of levels of fly and mosquito annoyance populations.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with heavy mosquito population areas shaded and labeled.

2) Dissolve to fly data (differentiate biting fly population from house flies).

******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Cooperative state pest surveys; wind and temp. forecasts.

SEGMENT HEADER

SEGMENT NUMBER 304

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter ______ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All, when no widespread precip. is occurring.

WEATHER PARAMETER(S) Water temperatures.

TIME REFERENCE Past (incl. present) present Prediction ______

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

****************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique recreational parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Water temperatures of major bodies of water used for recreation.

FORMAT OF SEGMENT (scale, background, foreground, duration, etc)

1) State map with major lakes and rivers in light blue (oceans too).
2) Where actual readings are available, insert in white lettering on the blue water surface. Hold 10 seconds.
3) Dissolve to bands indicating average water temps. to be expected in smaller lakes around the state.

****************************************************************************

DATA SOURCE (if non-existent, describe probable source) Lake reports?

## SEGMENT HEADER

SEGMENT NUMBER 305

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter ______ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Winds and wave heights.

TIME REFERENCE Past (incl. present) present & Prediction 0-12 hrs.

SCALE National ______ Regional ______ State ______ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique recreational combination of parameters.

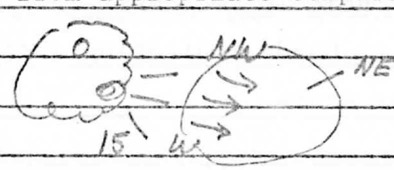
PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Local metropolitan or recreational area version of previous data, for GR planning.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) Similar to sun/clouds local segment, use city skyline at base.

2) Instead of sun, fill screen with simple compass

3) Show wind as a stylized cloud blowing wind from appropriate compass direction. Label with speed.




4) Show forecasts every 3-6 hrs.

5) Show gusts flashing.

6) Dissolve skyline at base to water as seen in cross-section. Label lake.

7) Show exaggerated wave height with vertical measuring stick in feet.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ______

SEGMENT HEADER

SEGMENT NUMBER 306

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter ______ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Winds and wave heights

TIME REFERENCE ~~Past~~ (incl. present) present ✓ Prediction 0-12 hrs.

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter combination for recreational uses.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average windspeed over state; gustiness; and wave heights expected at key locations (large lakes only).

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with lakes and rivers and cities (major).

2 Dissolve on big arrow from wind direction, with speed labeled inside arrow, and gusts below arrow ( annotate "gusts").

3) If speed or direction expected to change next 12 hrs, dissolve to such forecast.

4) Probably will need to use simplified front with 2 separate arrows for days with frontal zone in state.

5) Could, instead, use individual city arrows and drop fronts.

6) Annotate major lakes with forecast wave heights.

******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones; lake forecasts; SFC progs.

SEGMENT HEADER

SEGMENT NUMBER 307

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring x Summer ______ Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All x

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temps., winds, windchill

TIME REFERENCE Past (incl. present) present Prediction 12 hrs.

SCALE National ______ Regional ______ State ______ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*****************************************************************************************

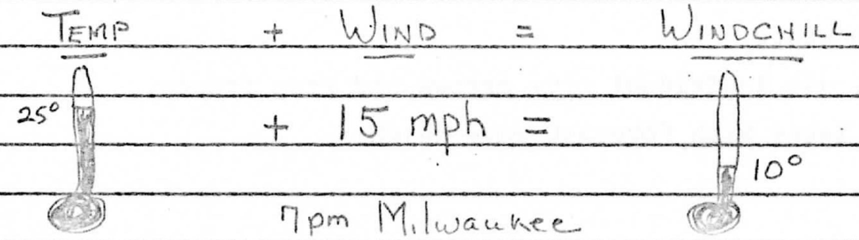
MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter combination.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Local version of state segment, for major metro areas.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) Start at frame left, with red thermometer pointing to current reading.
2) Wipe to right as wind and speed is shown in center. Use "+" sign.
3) Wipe to right with "=windchill" in a thermometer on right (blue).
4) Flash windchill title and total in red with words "danger zone" below -35° windchill.
5) Wipe off and repeat with 12 hr. forecast.




*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ______

SEGMENT HEADER

SEGMENT NUMBER 308

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter x Spring x Summer ____ Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temps., winds, windchill

TIME REFERENCE ~~Past (incl. present)~~ present ~~+~~ Prediction 12 hrs.

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR,GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Parameter combination.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) The feeling of what outdoor activities will be like.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with major cities marked.
2) Begin with current temperatures at a dozen locations and label.
3) Dissolve on wind arrow, vectorized so that longer=faster, and label speed within arrow (state average wind).
4) Annotate (3) with "temps. + winds".
5) Dissolve to computed windchill temperatures as title becomes: "temps. + winds = windchill" (with = and "windchill" in bolder, dark blue.)
6) Repeat sequence with 12 hr. forecast.

Total Time: $\pm$45 seconds.

*****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) SVC A current data; zone forecasts and computer temperature guidance from NAFAX.

SEGMENT HEADER

SEGMENT NUMBER 309

EMERGENCY ____ NON EMERGENCY X

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter x Spring x Summer ____ Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS Whenever winter watches or warnings are issued or in effect.

WEATHER PARAMETER(S) Winter warnings.

TIME REFERENCE ~~Past (incl. present)~~ present & Prediction 0-36 hrs. as appropriate

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**********************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GP, GR, TR, UT.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Should stand alone for impact.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of state subject to possible storm hazards due to snow or ice.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

State map with areas hatched in red for travelers' advisory; solid red for winter storm warnings or heavy snow warnings; yellow for winter storm watches. Annotate with effective times and forecast snow or ice amounts and major cities for reference.

**********************************************************************************

DATA SOURCE (if non-existent, describe probable source) NWS RAWARC coordination and zones forecasts of watches/warnings/advisories.

SEGMENT HEADER

SEGMENT NUMBER 310

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring x Summer ______ Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All x

WEATHER SITUATIONS Whenever snow or ice covers any portion of state roadways.

WEATHER PARAMETER(S) Road conditions

TIME REFERENCE ~~Past (incl.~~ present) present Prediction ______

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP, TR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of state with road conditions affected by weather conditions.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with major routes and cities marked. Dissolve on red shaded area for major problems ("snow covered and slippery", etc.) and annotate. Dissolve on red outlined areas for caution or marginal areas.

2) Dissolve to travelers' advisory, winter storm warning etc. as appropriate and list time improvement of conditions is expected.

*****************************************************************************

DATA SOURCE (if non-existent, describe probable source) NWS RAWARC and zones for advisories and warnings; state coordination and state patrol for current roads.

SEGMENT HEADER

SEGMENT NUMBER 311

EMERGENCY ________ NON EMERGENCY x

MEDIUM Cable x Broadcast ________ Both ________

SEASON Winter x Spring x Summer ________ Fall x

TIME OF DAY Midnight - 6am ________ 6am - 4pm x 4pm - Midnight x All ________

WEATHER SITUATIONS All, when lakes in area have cover.

WEATHER PARAMETER(S) Ice thickness

TIME REFERENCE Past (incl. present) present Prediction ________

SCALE National ________ Regional ________ State x Local ________

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ________

************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Average thickness of ice cover on state lakes and waterways; danger zone areas; and, trends toward warmer or colder weather which may affect ice safety.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with major lakes and waterways in light blue. Include major city points for reference.
2) Treat major bodies of water first: show ice thicknesses below 2-3" in red and include "thin" (flashing).
3) Then dissolve on isolines of average ice thickness on smaller lakes. Use red for thin or danger areas, white for safe areas.
4) Dissolve on annotation of "Trend: Warming, melting" or "Trend: Below freezing" as appropriate.

************************************************************************************

DATA SOURCE (if non-existent, describe probable source) ?

SEGMENT HEADER

SEGMENT NUMBER 312

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring ______ Summer ______ Fall ______

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Whenever > 1" of snow cover exists in at least a portion of the state area.

WEATHER PARAMETER(S) ______

TIME REFERENCE Past (incl. present) present Prediction 24 hrs.

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ______ area only, etc) ______

****************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Oriented specifically toward winter recreational users.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of state with snow cover suitable for hunting, cross-country skiing, snowmobiling, etc.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with major and medium cities marked. Blue background.
2) Using three intensities of off-white (whitest=deepest snow) overlay 1", 3", and 6" snow cover areas and annotate and label.
3) Dissolve on 8 to 10 reporting station exact snow depths.
4) Fade down and dissolve on hatched area for "new" snowfall. (≤ 24 hrs.)
5) Dissolve to forecast of snow amount expected next 24 hrs (cumulative total).

****************************************************************************************

DATA SOURCE (if non-existent, describe probable source) State weather summaries; state climate roundups (weather-wire); surface progs and zone forecasts.

SEGMENT HEADER

SEGMENT NUMBER 313

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All, when enough dryness of vegetation exists for any state area to be listed as a fire-prone area.

WEATHER PARAMETER(S) Fire danger areas

TIME REFERENCE Past (incl. present) present Prediction 0-12 hrs.

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

*****************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR (hunters, boaters etc. using state and parkland areas; campers, etc.).

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter (weather influenced).

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of state with moderate, high or extreme levels of fire danger as determined by the state DNR or other appropriate agency.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map. Outline and shade areas pink with moderate or high danger, and label. Add, in shaded red, areas of extreme fire danger and/or those areas closed or restricted due to fire danger, and label.

2) Dissolve on wind arrow and average high temperature expected over state. Add: "Trend: Improving" or "Trend: Continued Danger" etc, as appropriate.

*****************************************************************************

DATA SOURCE (if non-existent, describe probable source) State agencies (DNR) plus NWS zones forecasts.

SEGMENT HEADER

SEGMENT NUMBER 314

EMERGENCY x NON EMERGENCY

MEDIUM Cable x Broadcast Both

SEASON Winter Spring x Summer x Fall x

TIME OF DAY Midnight - 6am 6am - 4pm 4pm - Midnight All x

WEATHER SITUATIONS Severe storm or squall warnings by NWS or sels.

WEATHER PARAMETER(S) "Stormwarn"

TIME REFERENCE Past (incl. present) present Prediction

SCALE National Regional State Local x

COMMENTS ON DESIGNATORS (i.e., use in ___ area only, etc)

*****************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Primarily oriented toward boating and recreational users...

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Warnings of severe thunderstorms, hail, lightning, tornadoes and high winds for local major metro areas.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) City skyline, with slide of severe storm background. Water in foreground.
2) "Stormwarn" annotation, with type ("Tornado Warning") flashing in red.
3) List precautions one by one ("Small craft remain in harbor") etc.
4) Show vertical wave scale with feet marked, for storm surges and squall wave height.

*****************************************************************************

DATA SOURCE (if non-existent, describe probable source) SELS, local wx wire; marine warnings.

SEGMENT HEADER

SEGMENT NUMBER 315

EMERGENCY ___ NON EMERGENCY x

MEDIUM Cable x Broadcast ___ Both ___

SEASON Winter ___ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ___ 6am - 4pm ___ 4pm - Midnight ___ All x

WEATHER SITUATIONS All in which serious visibility problems due to fog, or storm problems due to squalls, are currently in effect or are forecast in the next 6 hrs.

WEATHER PARAMETER(S) "Boating hazards" (fog and storms)

TIME REFERENCE Past (incl. present) present Prediction 0-6 hrs.

SCALE National ___ Regional ___ State x Local ___

COMMENTS ON DESIGNATORS (i.e., use in ___ area only, etc)

*******************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Specially designed segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas subject to hazard for recreational boaters.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map; overlay foggy areas in grey--then overlay storm or squall areas in red, with movement arrows.

2) Dissolve to six hour forecast showing forecast fog and squall areas.

*******************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Radar data; SVC A data; NAFAX; SELS forecasts.

SEGMENT HEADER

SEGMENT NUMBER 316

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Extended outlook

TIME REFERENCE Past (incl. present) ____ Prediction 24-48 hrs.

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**********************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Simplified version of other extended outlooks, designed for use without explanation of meteorologist.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Outlook for recreational use, next 48 hrs.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with major cities and lakes.
2) Label "Tomorrow's Forecast" with scalloped shading for cloudy/mostly cloudy; sunny for p/c or sunny. Dissolve on forecast high temperatures. Annotate precip. areas.
3) Dissolve to 48 hr. forecast, label with day of week.

**********************************************************************************

DATA SOURCE (if non-existent, describe probable source) FAX progs (temps.) and NAFAX surface progs. (clouds); or zones.

SEGMENT HEADER

SEGMENT NUMBER 317

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter ______ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Barometric pressure.

TIME REFERENCE Past (incl. present) present Prediction 0-12 hrs.

SCALE National ______ Regional ______ State ______ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

********************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique--although this segment is identical to broadcast barometric pressure.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Pressure trends, for fishing.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

(See segment designed for broadcast).

********************************************************************************************

DATA SOURCE (if non-existent, describe probable source)

SEGMENT HEADER

SEGMENT NUMBER 318

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm ____ 4pm - Midnight ____ All x

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Temperature and moisture index

TIME REFERENCE Past (incl. present) present Prediction 0-12 hrs.

SCALE National ____ Regional ____ State x Local ____

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique simplified user design. Temps. portion probably similar or identical to other state temp. segments.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Current and forecast state temperatures along with corresponding idea of moisture content of air.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map with cities and lakes and rivers (major).
2) Insert actual major temps. over 5° or 10° temp. shaded bands.
3) Dissolve in "moisture level"--"dry", "moderate", "high", "sticky".
4) Dissolve to forecast highs or lows (depends on broadcast time) and forecast moisture level.
5) Dissolve to next time period high or low.

**************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Computer prog. (temps.); zones; SVC A.

SEGMENT HEADER

SEGMENT NUMBER 319

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm ______ 4pm - Midnight ______ All x

WEATHER SITUATIONS All

WEATHER PARAMETER(S) Sun; clouds

TIME REFERENCE Past (incl. present) present Prediction 0-12 hrs.

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ___ area only, etc) ______

*************************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Series of uniquely simplified segments.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Areas of state forecast to be cloudy or rainy next 12 hrs., for GR use and planning.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

1) State map--include major lakes, rivers, cities.
2) Shade cloudy areas grey; label "cloudy" (includes broken and overcast clouds).
3) Shade p/c areas with stippling or hatching (label "partly cloudy").
4) Overlay rain/S areas in green and label. (or snow)
5) Dissolve to forecast = 6 hrs.
6) Dissolve to forecast = 12 hrs.
7) Labels: "Recreational Weather".

*************************************************************************************

DATA SOURCE (if non-existent, describe probable source) Six and twelve sfc. progs. NAFAX, SVC A data; zones forecasts.

SEGMENT HEADER

SEGMENT NUMBER 320

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter ______ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS All

WEATHER PARAMETER(S) ______

TIME REFERENCE Past (incl. present) present Prediction 0-12 hrs.

SCALE National ______ Regional ______ State ______ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc) ______

*******************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR, GP

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique local segment.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) See previous segment. This is a localized version for major metropolitan areas use.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Skyline of city across bottom of frame. Large transparent clock face over frame, begins at 6 a.m. (one hand only, pointing to 6 a.m.). Have clock face be the sun, with rays radiating out (color yellow-orange). Advance hour hand three hour per 5 seconds (after 5 second initial pause at 6 a.m.) and light each hour boldly as hand points to it. If sunny, leave space surrounding sun blue and annotate "sunny" in middle of sun. If p/c forecast, move in, or dissolve in, clouds over 1/2 sun and sky. If cloudy, move in grey over entire frame and leave clock outline only. If precip. occurring or forecast, show slashes out of clouds towards city and annotate.

*******************************************************************************

DATA SOURCE (if non-existent, describe probable source) Zones and local forecasts; SFC progs.; SVC A (current weather).

SEGMENT HEADER

SEGMENT NUMBER 321

EMERGENCY ______ NON EMERGENCY x

MEDIUM Cable x Broadcast ______ Both ______

SEASON Winter x Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ______ 6am - 4pm x 4pm - Midnight x All ______

WEATHER SITUATIONS Precipitation is forecast or occurring.

WEATHER PARAMETER(S) Precipitation onset and duration.

TIME REFERENCE Past (incl. present) ______ Prediction 0-6 hrs.

SCALE National ______ Regional ______ State x Local ______

COMMENTS ON DESIGNATORS (i.e., use in ___ area only, etc)

*******************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) Agriculture, construction, utilities, general public.

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) These industries need advance information on when precipitation will begin and how long it will last in a given location, for field work and spraying (agriculture); concrete laying and crew scheduling (construction); and repair work/storm crew scheduling (utilities). GP has numerous needs.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc) (Full screen)

1) State map format, major cities indicated with identifiers.
2) Title "Precipitation areas-current" and show hatched areas for rain, bolts for thunder, ** areas for snow as per current state radar. Hold 8 seconds.
3) Dissolve to one hour forecast. Relabel "----forecast for---a.m."; hold 5 seconds.
4) Dissolve to 2, 3, 4, 5, 6 hour forecasts in turn. Hold 2, 3, 4, 5 -- 3 seconds each; 6 hours hold 5 seconds. Fade black.

Time: 30 seconds.

*******************************************************************************

DATA SOURCE (if non-existent, describe probable source) QPF forecasts; zone forecasts; interpolation of surface progs. on FAX circuit.

CABLE SEE BLOWUP

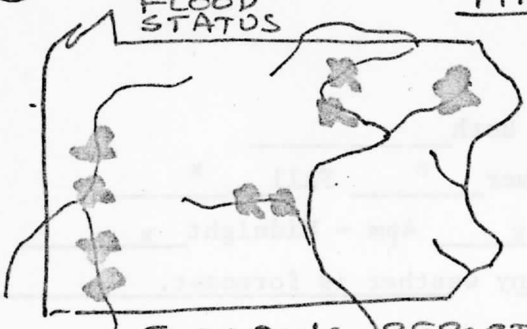
SHEET Cable 2

PROD.

DATE 77 Abrams

1

FLASH FLOOD STATUS TIME

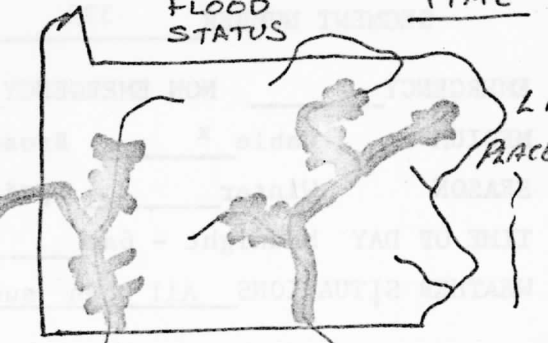


FLOODING REPORTED AT: LIST PLACES AND STAGES

15 SEC - 30 SEC SHOWING AREAS WHERE FLASH FLOODING HAS BEEN REPORTED

2

FLASH FLOOD STATUS TIME



LIST PLACE STA

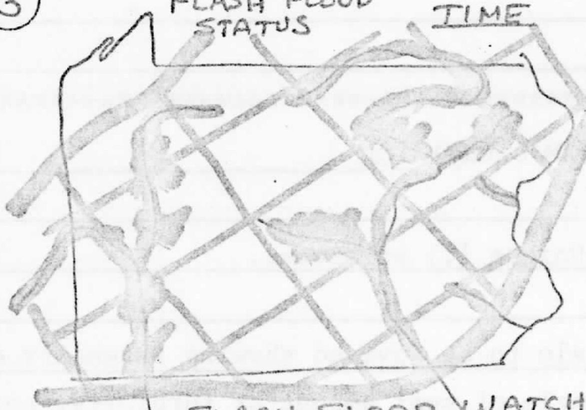
FLASH FLOOD WARNINGS IN EFFECT UNTIL ___

LIST STREAMS/RIVERS AFFECTED

LOCATIONS FROM FRAME 1 SHOULD FLASH ON AND OFF. FLASH FLOOD WARNING AREAS AND PREDICTED STAGE CAN BE LISTED BESIDE MAP 30 SEC TO 1 MIN

3

FLASH FLOOD STATUS TIME



FLASH FLOOD WATCHES AND WARNINGS IN EFFECT UNTIL

15-30 SEC

COMPOSITE OF ACTUALS, WARNINGS WATCHES

4

ADDITIONAL FRAMES COULD SHOW PREDICTED ADDITIONAL RAIN AND ENDING TIMES OF RAIN AND/OR FLOODING

5

FLOOD SAFETY RULES

FLOOD SAFETY RULES

SEGMENT HEADER

SEGMENT NUMBER 322

EMERGENCY ____ NON EMERGENCY x

MEDIUM Cable x Broadcast ____ Both ____

SEASON Winter ____ Spring x Summer x Fall x

TIME OF DAY Midnight - 6am ____ 6am - 4pm x 4pm - Midnight x All ____

WEATHER SITUATIONS All when sunny or partly sunny weather is forecast.

WEATHER PARAMETER(S) Sunburn forecast ("bikini index")

TIME REFERENCE Past (incl. present) ____ Prediction 0-12 hrs.

SCALE National ____ Regional ____ State ____ Local x

COMMENTS ON DESIGNATORS (i.e., use in ____ area only, etc)

**********************************************************************************

MAJOR USER OF SEGMENT: (reference previous IVAM study) GR

WHY CAN'T SEGMENT BE COMBINED WITH ANOTHER Unique (!) parameter.

PURPOSE OF SEGMENT (WHAT'S TO BE CONVEYED) Scale to be devised showing intensity and likelihood of sunburn. Scale to include: angle of sun; amount of turbidity; amount of moisture; amount of cloudiness; etc--basically an index of forecast solar radiation.

FORMAT OF SEGMENT (scale,background, foreground, duration, etc)

Probably use animation similar to "Coppertone" ad in which dog pulls girl's bathing suit with teeth. Three possibilities result:

1) Red flashing skin, as annotation "rapid sunburn possible".
2) Pink or tan skin, as annotation "moderate tanning/burning".
3) White skin, as annotation, "little tanning/burning".

**********************************************************************************

DATA SOURCE (if non-existent, describe probable source) ?

IVAM ANNUAL REPORT

JUNE 1977

APPENDIX B

System Specifications

| REVISIONS | | | |
|---|---|---|---|
| LTR. | DESCRIPTION | DATE | APPROVED |
| | | | |

THE UNIVERSITY OF WISCONSIN

SPACE SCIENCE & ENGINEERING CENTER

MADISON, WISCONSIN

TITLE

IVAM System Specifications

| | | | | | |
|---|---|---|---|---|---|
| SCALE | DRAFTSMAN | DATE | CHECKER | DATE | ENGINEER | DATE |
| NEXT HIGHER ASSEMBLY | PRODUCT ASSURANCE | DATE | PROJECT APPROVAL | DATE | |
| PROJECT NO. 3100 | SIZE | SHEET 1 OF | DRAWING NO. 3100-0006 | | |

| SHEET NO. | DATE OF LATEST REVISION | | | | | | | | | | | | | | | | | | | | | |
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# DRAWING REVISION STATUS TABLE

| | | | |
|---|---|---|---|
| | REVISION | DRAWING NO. 3100-0006 | SHEET 1 |

IVAM System Specification

Table of Contents

IVAM System Specification

# I. GENERAL

## I-1. Scope

This specification describes the performance requirements of the system being developed at the Space Science and Engineering Center, University of Wisconsin, Madison, by contract to the National Weather Service (NWS) and the National Environmental Satellite Services (NESS). The program and the system are called IVAM (Innovative Video Applications in Meteorology).

## I-2. Applicable Documents

AFOS Manual - tbd

NTSC Television Standard - tbd

IVAM Input Interface Specification, SSEC Dwg 3100-0007 Rev .

IVAM Output Segment Specification, SSEC Dwg 3100-0008 Rev .

IVAM Alphanumerics Specification, SSEC Dwg 3100-0009 Rev .

## I-3. General System Requirements

The overall function of the IVAM system is to produce full-color TV image weather information from numerical and graphic input data supplied by the AFOS system and other data sources of the National Weather Service. One IVAM installation will be located in each of several Weather Service Forecast Offices (WSFO) and will provide output pertinent to local area, state-size area, several state-size regional areas, and national area. Each installation then will provide output specific to its own area.

II. INPUT REQUIREMENTS

II-1. General Input Requirements

There are four data source inputs: Local AFOS installation, CDDS (Satellite Data), Video Cassettes, and 16 mm film clips.

II-2. AFOS Input

All input to IVAM from AFOS shall be via the ABF Interface per Section IV-2.1.1

II-2.1 Formats

Three different formats of AFOS data are used as source data input to IVAM: numerical data, graphic data, and message data.

II-2.1.1 Numerical data

AFOS Numerical data to the IVAM system shall be represented in ASCII form, and meet requirements as specified in SSEC Dwg 3100-0007, IVAM Input Interface Specification.

II-2.1.2 Graphic data

Graphic data from the AFOS system shall include all curve identifier information with the graphics representation. Detailed requirements are contained in SSEC Dwg 3100-0007, IVAM InputInterface Specifications.

II-2.1.3 Text

Occasional inputs to the IVAM system may be made via non-standard worded format to be used for special requirements or for NWS Forecaster input to IVAM. Detailed requiredments <u>tbd</u>.

NOTE: Only FIXED-FORMAT Message data will be used by IVAM for automatic operation. Text data will not be <u>analyzed</u> by the IVAM system.

II-2.2 Hardware Interface

The AFOS to IVAM interface will be via the Graphics Display Bus as specified in Section IX of SSEC Drawing 3100-0007, IVAM Input Interface Specification.

II-3. CDDS Input, Satellite Picture Data

The IVAM system must be capable of ingesting satellite data from the CDDS line and storing it for use as required by the output. Satellite data will be fully navigated prior to feed to the IVAM system. The detailed interface will be as specified in SSEC Dwg 3100-0007, IVAM Input Interface Specification. Storage of CDDS data will be in digital format with a pixel-value resolution of 5 bits.

II-4. Video Cassette Interface

The IVAM system shall accommodate the input of pre-recorded video, on standard 3/4" video cassette, for occasional direct feed to the output, as required. IVAM shall provide start/stop instructions to the tape player by specifying video frame numbers. The video cassette I/F is intended for presenting tutorial and informational segments where content does not change with the values.

II-5. Film

The IVAM system shall accommodate input from a standard 16 mm film chain, and provide control to the film chain via start/stop signals. Format of control signals <u>tbd</u>.

## III. OUTPUT SPECIFICATIONS

### III-1. General

The output of the IVAM system will be full-color, black and white compatible, broadcast quality video to be used as visual aids for television stations and/or their weathercasters for presentation to the public. The IVAM output will be appropriate for use by network broadcast stations, independent broadcast stations, and cable television stations. IVAM will produce no audio output.

IVAM video output is described in units called segments. Each segment is a fifteen to thirty second sequence of TV images which comprise a complete set of information about a particular weather parameter, condition, or use. Detailed descriptions of each segment are specified in SSEC Dwg 3100-0008, IVAM Output Segment Specification.

Each IVAM installation will prepare a set of segments and output them according to a schedule determined by the local needs, the weather situation, and the time of day. Choice of segments will be determined by requirements specified in Section VI-tbd of this document.

### III-2. Output Frame Sequencing

The IVAM video output consists of a full TV frame every 1/30 second. The sequence of frames which comprise a segment is described as being one of three different modes:

a) still frames
b) animation frames
c) transition frames

The IVAM system shall be capable of switching between these three modes to produce a continuous 30 frames per second output as specified for each output segment.

III-2.1 Still Frames

A still frame is defined as an output image which is repeated at least twice (three consecutive frames without changing). Typical still frames are used three seconds duration or more.

The IVAM system shall be capable of producing a still frame output of up to 30 seconds duration.

The IVAM system shall be capable of producing up to 100 different still frames, as required in IVAM Output Segment Specifications SSEC Dwg No. 3100-0008, and the Weather Situation Decision requirements of Section VI-tbd of this document.

III-2.2 Animation Frames

Animation frames are used to imply motion by sequencing through a number of frames in which every frame or every second frame changes.

The IVAM system shall be capable of outputting up to 20 seconds (600 frames) of frame-by-frame animation within every 1/2 hour.

III-2.3 Transition Frames

The IVAM system must be capable of producing transitions between adjacent still frames, using techniques of FADES, DISSOLVES, CUT, POP, and WIPE defined in SSEC Dwg No. 3100-0008.

III-3 Output Timing Requirements

The IVAM system shall be capable of producing up to ten minutes of video output every half hour, with a schedule determined by the TV distribution requirements and the segment selection control of section VI-tbd of this document.

# IV. SYSTEM FUNCTIONAL REQUIREMENTS

## IV-1. General

The functional block diagram of the system is shown in Figure IV-1. Of the four inputs, three of them are in pictorial format and not modified by the system; only the AFOS input is acted on by the system for any function beyond image combining. Video cassette input and film chain input will be fed directly to the output section for feed to the media. The CDDS data can be used for combining with other images from CDDS or from the image generating system.

## IV-2. Input Subsystem

### IV-2.1 AFOS Input Buffer and Reformatting Process

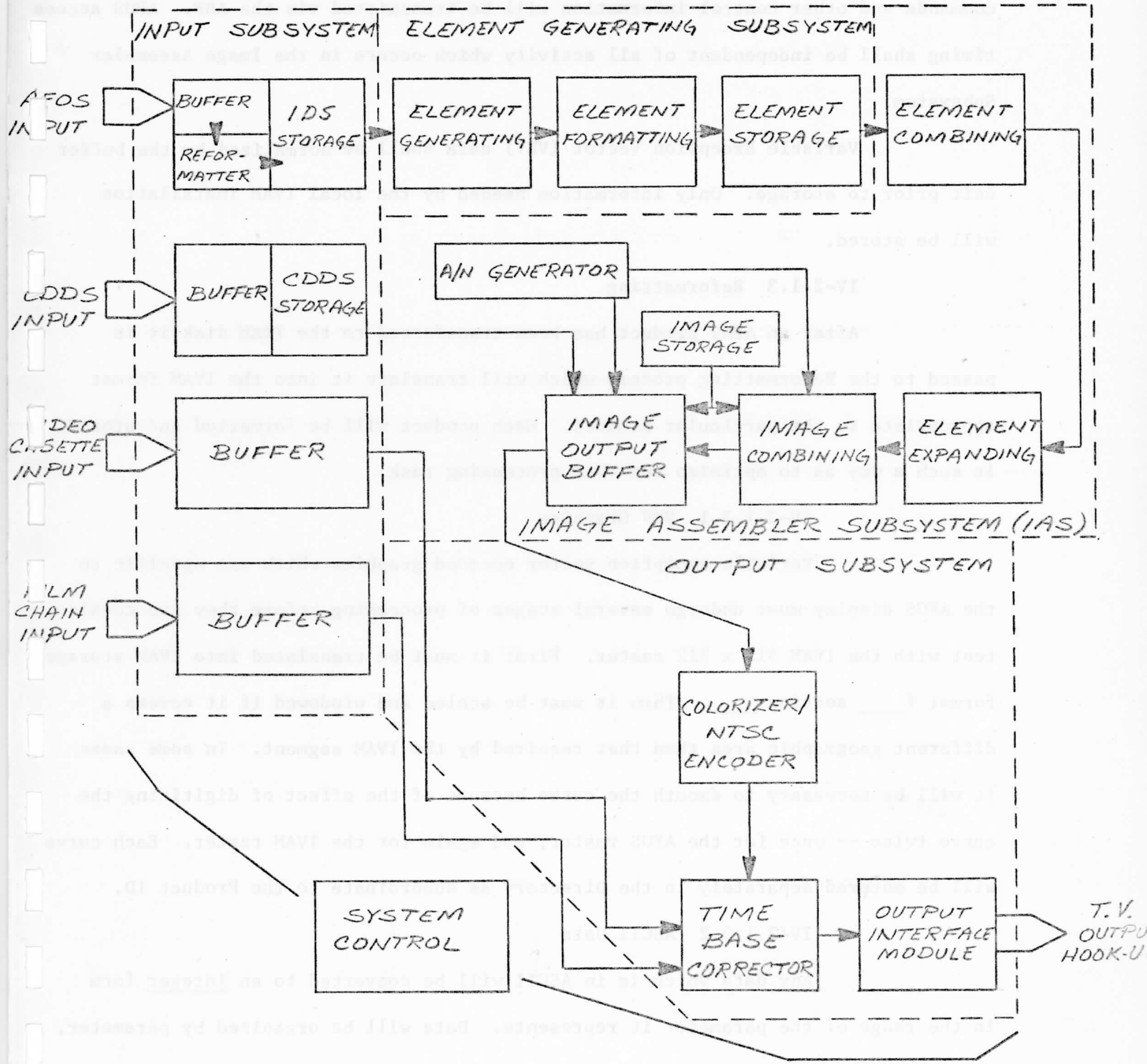
The AFOS Input Buffer interface will be the sole means of data transfer from AFOS to IVAM. The transfer of data will be disk to disk to minimize the IVAM memory permanently dedicated to this function. When the transfer of a product is complete, it is left in the Input Buffer pool on the disk. It is then queued in the formatting and storage process which translates the data into IVAM formats, stores it in the IVAM data structures, and records its presence in the Directory, as specified in Tbd. The Input process and the reformatting process run asynchronously with respect to one another.

#### IV-2.1.1 AFOS/IVAM Hardware Interface

The connection of the IVAM system to the AFOS for data transfer will be via the Graphics Display Bus conventions, as specified in SSEC Dwg No. 3100-0007. Control and request/reply information will be passed through the tbd following the conventions used for the AFOS console, as specified in the AFOS Doc. TBD. To the extent possible, IVAM will appear to be another graphics terminal to the AFOS system. Exceptions to this convention will be noted where they apply.

#### IV-2.1.2 Data Rate/Capacity

The Input Subsystem must be capable of handling all data from the AFOS Graphics Bus line. All data will be packed before transfer to storage. Request




FUNCTIONAL BLOCK DIAGRAM

FIGURE IV - 1

commands and other control information will be transmitted via the ABF. AFOS access timing shall be independent of all activity which occurs in the Image Assembler Subsystem.

Variable Exception Vector (VEV) data shall be normalized by the buffer unit prior to storage. Only information needed by the local IVAM installation will be stored.

IV-2.1.3 Reformatting

After an AFOS product has been transferred to the IVAM disk it is passed to the Reformatting process which will translate it into the IVAM format appropriate to the particular product. Each product will be formatted and stored in such a way as to optimize the IVAM processing task.

IV-2.1.3.1 VEV Graphics

Variable exception vector encoded graphics which are specific to the AFOS display must undergo several stages of processing before they are consistent with the IVAM 512 x 512 raster. First it must be translated into IVAM storage format #____ section ____. Then it must be scaled and windowed if it covers a different geographic area than that required by the IVAM segment. In some cases it will be necessary to smooth the curve because of the effect of digitizing the curve twice -- once for the AFOS raster, and again for the IVAM raster. Each curve will be entered separately in the Directory as subordinate to the Product ID.

IV-2.1.3.2 ASCII Data

Any data which is in ASCII will be converted to an <u>integer</u> form in the range of the parameter it represents. Data will be organized by parameter, time and station.

IV-2.1.3.3 Text

Data which is transmitted in man-worded format will be stored as it is received and can be displayed only in that format. IVAM will not analyze any product which is not in a fixed format.

IV-2.2 Input Storage

IV-2.2.1 IDS Storage

The IDS storage shall provide storage of all information from the Graphic Display Bus Interface. Past data from the AFOS is stored in IDS as long as needed to meet output segment requirement of SSEC Dwg 3100-0008, IVAM Output Segment Specification.

IV-2.2.1.1 IDS Storage Data Format

The AFOS data will be buffered into IVAM formats. It will be translated by the processes described in Section IV-2.1.3 into the formats to be stored in the IDS disk.

IV-2.2.1.2 IDS Disk Storage Capacity Requirements

| | |
|---|---|
| AFOS Buffer | .2 megabytes |
| Maps | .5 |
| Unscanned Curves | .6 |
| Packed Elements | 2.0 |
| Point Data | .7 |
| ASCII | .1 |
| Module Task Images | 1.5 |
| RSX11M | 2.0 |
| IVAM System | 1.0 |
| | 15 mbytes |

IV-2.2.1.3 Unscanned Curves

Curves which are to be processed before they are displayed are stored in unscanned format. Examples are maps, AFOS curves, and any image elements which are to be moved, scaled, or rotated before display. The format requires a single array of alternating Y-X-Y-X values of adjacent points on a curve. There is no provision for discontinuous curves. The number of points the coordinate system used and any offsets are stored in the Directory entry pointing to the curve.

IV-2.2.1.4 Point Data

Point Data such as temperature, pressure, etc., from regular data products such as Service-A will be stored in structured files organized by parameter, time, and station. The values themselves will be stored as binary integers.

The units, offsets, and scale factors associated with each parameter will be stored in the Directory.

IV-2.2.1.5 Text

Text received as input from AFOS will be stored in ASCII as it is received. Its length will be recorded in the Directory. Character information such as station identifiers which may accompany some of the data are not stored as they are received. Rather, they are permanently stored as part of the system and used for decoding input or labelling output.

IV-2.2.2 CDDS Buffer Storage

The CDDS storage unit shall accept all data from the CDDS line, pack it into pictorial format, and store all satellite picture data needed for output.

IV-2.2.2.1 CDDS Buffer Storage Capacity

The CDDS buffer shall be a 5 bit per pixel resolution device capable of accumulating one digital satellite image at 512 x 512 resolution and storing 100 full images. The mapping parameters derived from the navigation process and required to map data onto the satellite image will be sent through AFOS as a product, per para tbd of the IVAM Input Interface Spec, Dwg 3100-0007.

IV-2.2.3 Video Cassette Input Buffer

The IVAM system shall be capable of controlling, via Frame ID number, input from a standard 3/4" cassette recorder for direct playback to the TBC input of the system. The tape input will not be processed by the IVAM system, but used only for direct output.

IV-2.2.3.1 Video Cassette Control

See Section VI

IV-2.2.4 Film Chain Input Buffer

The IVAM system must be capable of controlling, i.e., providing start/stop signals, input from a standard TV studio film chain for direct playback to the TBC input of the system. The film input will not be processed by the IVAM system but will be used only for direct playback.

IV-2.2.4.1 Film Chain Control

See Section VI

IV-3. Image Generator Subsystem (IGS)

The IGS creates the basic building blocks, called elements, of the IVAM graphic images. An image is assembled from elements in the same fashion that conventional graphics are assembled, by overlaying individual color layers in a predetermined order. Pre-formatted data is read from ISD storage, converted to two-dimensional information in outline form, and formatted for element storage. As needed, the element outlines are retrieved from storage, combined, and the outlines are filled in with pixel value information in the element expander. The expansion is the last step in the preparation of a single image.

IV-3.1 Element Generation

IV-3.1.1 Element Generating - Contours

The element generation process creates contours from point data according to the following steps:

1. select station data
2. compute uniform grid
3. determine parameter value at upper left corner of screen and whether parameter increases or decreases along top and left edges as you move away from the upper left corner. This information is required during the fill in process
4. contour one curve and pass it through the mapping, smooting and Video Chain Modules
5. register the location of the curve, the number of points, and whether it is closed, or is bounded by the left edge in the director.
6. repeat steps 4 and 5 until all curves have been found
7. impose a priority structure on the curves that make up the contour field.

IV-3.1.2 Element Generating - Labels and Alphanumerics

Labels and alphanumerics are created from point data, identification data for VEV-coded data, and data stored in ASCII format. Labelling is done only as indicated by the storyboards. The text of the label will be spelled out in the segment, provided with AFOS input, or derived from computed quantities such as average temperatures. The size and font of each label will be part of the segment format as will its method of placement on the screen. The position of a label will be explicitly fixed in the specification, or will be placed as close to the feature to be labelled as the surrounding information allows. The exact methods of context sensitive placement are TBD. All text information is stored in string nodes in the Directory Format. Up to 12 ASCII characters can be stored in a single node and longer strings are formed by linking nodes.

The actual alphanumeric fonts are part of the assembler. Only text and control are handled by the software.

IV-3.1.3 Element Generating - Plots and Curves

Plots and curves will be generated from point data or AFOS graphics. When the computation has progressed to the point where it is in the format described in IV-2.2.1.3 it is ready for processing by the element manipulation and Video Chain Modules. Curves will be generated from point data, converted from AFOS formats, or stored permanently as unchanging image elements.

IV-3.1.4 Element Manipulation

An element in unscanned format can be moved, scaled, rotated, or replicated before its final preparation.

IV-3.2 Element Formatting - Video Chain

A curve in the unscanned format is not ready for display. It must first undergo the following processes:

a. Scan conversion - computes the intersection of the curve with the digital Video raster.

b. Prepass - encodes the information about the direction the curve is going that will be lost in the next step.

c. Sorting - the scan line intersections must be sorted into the order in which they will appear in the output scan.

d. Packing - the scan order curve must then be packed into a format which is efficient for both storage and expansion.

IV-3.3. Element Storage

Elements ready for expansion will be stored in Packed Format. Each intersect is encoded into one word as follows:

| | |
|---|---|
| bits 0-8 | horizontal pixel coordinate |
| 9-12 | trend bits |
| 14 | vertical discontinuity |
| 15 | increment line count |

The minimum and maximum line numbers and whether or not the curve includes the origin are stored in the Directory.

IV-3.4 Element Combining

Element combining is accomplished during the Expansion Process by expanding elements in order of ascending priority. Higher priority elements will overwrite lower priority elements in The Image Assembler Subsystem.

IV-3.5 Element Expansion

Two functions are performed by the expansion step:

solid fill-in
line widening

IV-3.5.1 Solid Fill-in

The fill-in step consists of assigning values to every pixel in the 512 x 512 matrix of an image. The input to this block is a combined set of elements which describe the <u>boundaries</u> of each region in the image. The pixel values can be referenced to color assignment by the colorizer function.

The pixel value shall be represented by a four bit code.

IV-3.5.2 Line Widening

Elements are described by single-pixel-wide boundaries. Elements that represent lines in the image must be widened to meet bandwidth constraints of NTSC encoding and R.F. modulation. There are TBD line-widening algorithms which are used.

All lines which appear in the image must be at least 2 x 2 pixels. The horizontal width is required because of the bandwidth limitations of the chrominance information in an NTSC encoded signal and the vertical dimension because a line appearing on only one scan line is refreshed only thirty times a second and presents a disturbing flicker. The system will be capable of wider lines as required by the storyboards.

IV-4. Image Assembler Subsystem (IAS)

The IAS receives pixel-value encoded images from the IGS subsystem and full-image satellite picture data from the CDDS storage block. As required by the segment format, data of the expanded elements, satellite picture, and alphanumeric generator are overlaid according to image priority assignment. If the fully-combined image is not needed for immediate output, it is transferred to the output buffer/storage block. When needed, the image is transferred through to the TV output at video rates (once per 1/30 second), with the colorizer assigning color to each pixel value. System control determines which images are required, order of images, and image repeat requirements.

IV-4.2. Image Combiner

The image combiner must be capable of assembling an image by combining any two images from CDDS storage, expanded elements, or the alphanumerics generator. Combination shall be accomplished by sequential assignment of value for each pixel in the image, in order of increasing priority.

IV-4.2.1. Pixel Resolution

The image combiner shall be capable of maintaining 5 bit pixel resolution for the CDDS data. Both expanded element data and alphanumeric data will be represented by four bit value.

IV-4.2.2. Image Combining Cycles

A combining cycle is defined as the assignment of pixel values from one image onto the pixel values of another image of lower "priority." Any number of combining cycles shall be possible up to the maximum number of images available.

IV-4.3. Alphanumeric Generator

The IVAM system shall provide a set of alphanumerics for appropriate labeling of output image information. A variety of font styles and sizes shall be available, as specified in SSEC Dwg No. 3100-0009, IVAM alphanumerics specification.

IV-4.3.1 A/N Placement

IVAM shall provide two types of A/N placement, fixed location and variable location.

IV-4.3.1.1. Fixed Location A/N

Certain segments, as defined in SSEC Dwg 3100-0008, shall have images with fixed locations for A/N information under all conditions.

IV-4.3.1.2 Variable Location A/N

Certain segments, as defined in SSEC Dwg 3100-0008, shall have images which have label locations dependent on the image composition. The variable labels shall consist of the words:

CLOUDY
RAINY
T'STORMS
HEAVY SNOW
.
.
.
Tbd

An algorithm shall be designed which identifies the area of interest within the picture, tests it for sufficient size to apply the label within it, and locates the label such that it obscures no other labels. If the label cannot meet those requirements, a smaller font size is tested, or the label is applied to a reserved title area.

IV-4.4 Image Storage

Sufficent image storage capacity must be available to meet the output conditions specified in Section III of this document. Access and timing must also be compatible with the output timing requirements.

IV-4.4.1 Storage Capacity/Partition

A storage of 750 frames, 512 x 512 pixels, 4 bit/pixel shall be provided by the system. The 750 frames shall be partitioned as follows:

600 frames for animation sequences (min 20 seconds output @ single frame update rate)
100 frames for still-frames output segments
50 frames for "basic" frame storage such as maps, bar graphs, fixed format info., etc.

IV-4.4.2 Access/Read Rate

Any of the frames stored for animation shall be accessible such that they can be read out to the image output buffer at 30 frames per second, in a predetermined order, for up to five seconds duration (i.e., a 150 frame sequence). All other frames must be capable of being accessed within 100 m sec. and read out into the output buffer within 1/30 second.

IV-4.5 Image Output Buffer

Output segment staging is determined by the control function, specified in Section VI of this document. The Image Output Buffer shall provide the preparation and staging of all output frames as required in Section III of this document.

V. OUTPUT SUBSYSTEM

V-1. General

Full image data, with coded pixel value is transferred from the image output buffer to the colorizer/NTSC encoder. The function of the colorizer is to assign a color to the pixel value and convert it to NTSC color representation.

Time base stability is required according to tbd . The system clock may provide sufficient stability of the output signal without a separate time base corrector. In such case a separate TBC is only needed if video tape or film chain inputs are used.

The output interface module provides whatever specific interface parameters are required to couple with the four TV networks, local independent stations, and local cable TV companies.

V-2. Colorizer/NTSC Encoder

Data fed to the colorizer/encoder is in 5 bit format. Color value is applied to the picture according to control functions as specified in Section VI - tbd.

## VI. CONTROL

### VI-1. General

The IVAM System shall be capable of operating on an automatic basis subject to manual override by the AFOS operator in the event of severe weather.

All functions within the IVAM system shall be controlled by the IVAM Control Processor. The Subordinate Processors and the Assembler Subsystem are all subject to the direct control of the Control Processor.

There shall be four levels of control:

1. Process
2. Control Processor Operating System
3. IVAM Controller
4. Subordinate Controllers

### VI-2. Processes

The IVAM system shall be capable of controlling the following independent processes:

1. Time of Day Scheduling
2. AFOS Request/Reply
3. Data Formatting and Storage
4. Segment Selection
5. Element Generation
6. Image Assembly
7. Display Control

Control of each of these processes shall be accomplished by the IVAM Controller. Each of these processes will receive an input queue of work to be done and register its results in a similar queue which serves as the input queue for the next process. These queues shall be serviced on a First-in, First-out basis. All such queues shall be represented in the Directory. The Controller shall determine the relative priority of these processes dynamically.

VI-2.1. Time of Day Scheduling

The IVAM System shall be aware of the time of day, the day of the week, and the date. The system shall be capable of scheduling events which occur only once at a particular time/date, events which are to occur periodically, and sequences of events which occur at fixed intervals relative to each other. IVAM shall request scheduled AFOS data, prepare segments for scheduled presentation periods, and change its segment definitions to reflect the seasons.

VI-2.2. AFOS Request/Reply

IVAM shall be capable of requesting specific products from the AFOS System. AFOS products will be read into the IVAM System, stored on the IVAM disk, and entered into the Reformatting Queue. IVAM also shall permit the AFOS operator to direct the operation of the IVAM System in the event of severe weather. The exact protocols are tbd.

VI-2.3. Reformattting Process

The Reformatting Process shall be active whenever the Reformatting Queue is not empty. In this process AFOS products will be translated into IVAM formats and stored inthe IVAM data structures. The presence of the new data shall be noted in the Director. Reformattting will be done by specialized modules which accomplish the tranlation of one AFOS format into its IVAM equivalent.

VI-2.4. Weather Determination and Segment Selection

At the beginning of each presentation period this process will be run. It will analyze the current weather data and produce a list of segments for IVAM to generate. The exact method of this determination is tbd.

VI-2.5. Element Generation

Given the list of segments to be produced, this process shall be capable of generating the elements required to produce them. For each segment, the Directory shall list the elements required. For each element the Director will list the modules, the data, and the parameters required to produce it. As elements are generated, they will be stored in packed format (see IV 3.3) on the disk in the Element Storage.

VI-2.6. Image Assembly

When all the elements required to produce a particular image are available, the Assembly Process shall be capable of proceeding independent of the other processes. This process shall feed the packed elements to the Assembly Hardware in order of ascending priority. The Assembler will fill-in each element as it is entered, overwriting elements of lower priority where it is required. Where the placement of alphanumeric labels depends on the orientation of generated elements, suitable algorithms shall be invoked to determine the best location for the label. The exact methods of alphanumeric placement are <u>tbd</u>.

When all of the elements required for a given image have been assembled, the Assembly Process will direct the Assembler to store the frame on a specific disk track.

VI-2.7. Display Control

When all the images required for a given presentation are present on the disk, the Display Control sequence will be passed from the Control Processor to the Display Controller. This Control Sequence will consist of a list of commands scheduled to be executed at particular frame times during the presentation. These commands will include SEEK TRACK(i), LOAD BIT MAP(J), select disk output, select BIT MAP(J) output, LOAD ENHANCEMENT TABLE(K), CHANGE ENHANCEMENT ENTRY(L), INITIATE DISSOVE, INITIATE WIPE.

VI-3. Control Processor Operating System

The Control Processor Operating System shall provide the IVAM Controller with the facilities it requires to command the physical resources of the IVAM system and to coordinate the functions performed on them.

This Operating System shall provide a multitasking environment in which separate tasks can run simultaneously. It shall also provide a means for these tasks to communicate between each other and to share data. It shall also provide a means for the IVAM Controller to initiate tasks at run-time.

The system shall provide a priority structure by which to arbitrate the functioning of IVAM tasks and the real-time demands of device and interprocessor communication. It shall also provide mechanisms whereby the execution of one task can be contingent upon events external to it. In addition, there shall be protection features which preclude the disruption of one task by an error in another.

It shall also provide a variety of file structures and directory services. It must provide block and record files and index files in which it is possible to access the "i"th block directly without reading those preceding it.

This system shall tolerate if not support the crosspoint memory blocks which will physically change the memory connected to the Control Processor.

Finally the system must have a real-time clock and provide a time-of-day function.

VI-4. IVAM Controller

The IVAM Controller will have overall control of the IVAM system. It alone will have knowledge of the subordinate processors and the Crosspoint Memory System. It shall be capable of directing RSX-11M to make its services available to IVAM. It shall also have knowledge of all IVAM information through the Directory.

Specifically, the Controller shall be capable of directing the concurrent operation of all the processes described in section VI-2. Within each process the Controller shall be capable of controlling the sequence of modules which effect its function. Therefore, the Controller must be capable of all functions required to sequence IVAM modules. Specifically the Controller must be able to:

1. Select the next module to be executed.
2. Determine what procesor has the module code.
3. Load the module code if it is not currently resident.
4. Stage the input data in a Crosspoint Memory Block.
5. Assign that memory block to the processor which will run the module code.
6. Place the parameters to be passed to the module in the crosspoint memory block.

7. Place a pointer to the parameter block in a specific location in the Crosspoint Memory Block.
8. Initiate a call to the module through the subordinate processor controller.
9. Register the results of the module execution in the System Directory.

The Controller must also be capable of dynamically allocating subordinate processors, crosspoint memory blocks, and blocks of space within crosspoint modules.

The Controller must have a complete knowledge of system status. All of this information will be stored in the IVAM Directory which will contain the current disposition of all system resources and the progress so far on each of the independent processes of section VI-2. The Directory will also contain pointers to segment definitions, module code, and all permanent and temporary system data sets. The Directory shall also be capable of representing the alphanumeric content of the segments such as city and state names.

VI-5. Subordinate Controller

The Subordinate Controller shall be capable of receiving a module identifying byte from the Controller. It will then generate a subroutine call to the appropriate module. Upon module completion it must be capable of notifying the controller. All other control functions are outside the purview of the Subordinate Controller.

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APPENDIX C

Input Specification

## REVISIONS

| LTR. | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|
| | | | |

THE UNIVERSITY OF WISCONSIN

SPACE SCIENCE & ENGINEERING CENTER

MADISON, WISCONSIN

TITLE

IVAM Input Interface Specification

| SCALE | DRAFTSMAN DATE | CHECKER DATE | ENGINEER DATE |
|---|---|---|---|
| NEXT HIGHER ASSEMBLY | PRODUCT ASSURANCE DATE | PROJECT APPROVAL DATE | |
| PROJECT NO. | SIZE | SHEET OF | DRAWING NO. 3100-0007 |

IVAM Input Interface Specification

Table of Contents

Dwg No. 3100-0007

IVAM Input Interface Specification

I. Scope

This document describes the input data required by IVAM, the format of input data, operational protocol, and physical interface. The specific data required for each IVAM installation is relative to that location and the area served.

There are two types of information in this document, (a) information which applies to all IVAM installations, and (b) information which must be determined for each IVAM installation because of its strictly local or regional area of interest. All data in this document dependent on location of the IVAM will be marked with an asterisk in the left column throughout the entire document.

II. Applicable Documents

AFOS Manual

PIL

CIL

tbd

___

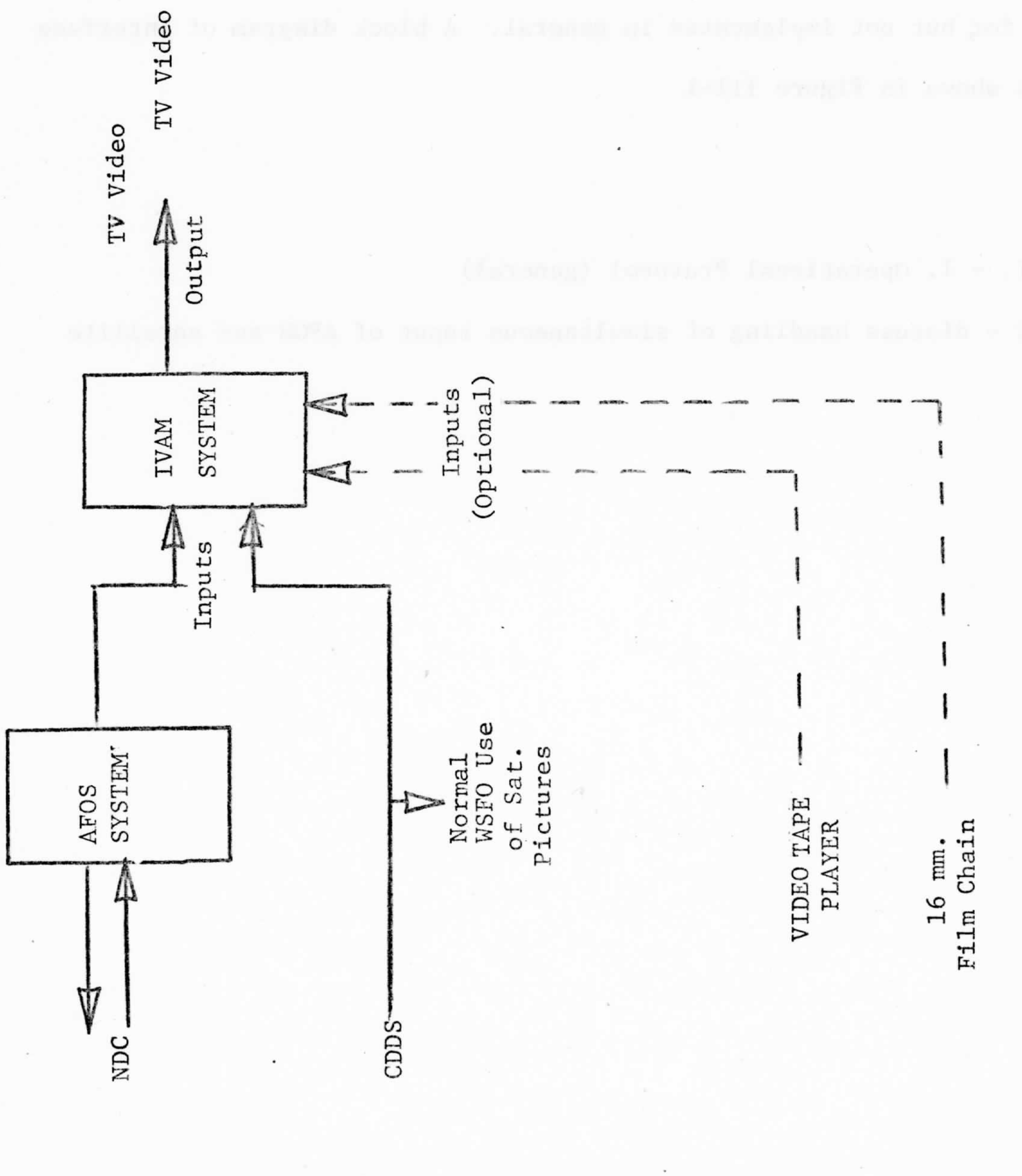
SSEC Dwg 3100-0006, IVAM System Specification

## III. General

The IVAM System is a stand-alone fully-automatic data display system for producing full color video weather information suitable for presentation to the public, including specific user needs. The input to the IVAM system is from two primary sources within the WSFO, AFOS and the CDDS line. Optional inputs, video tape and film, are being allowed for, but not implemented in general. A block diagram of interface units is shown in Figure III-1

### III. - 1. Operational Protocol (general)

MWK - discuss handling of simultaneous input of AFOS and satellite data.




Block Diagram of IVAM Input Units

Figure III-1.

IV. AFOS Input

All input data to the IVAM system from AFOS will feed via the Graphics Display Bus of AFOS. Detail description of the bus is found in AFOS Manual tbd.

Control between the IVAM system and AFOS will be via

tbd

as described in Section VIII. of this document.

IV.-1. AFOS Input Data Protocol

MWK - types of data (A/N, curve)

how requested

hand shaking reply, wait

errors

missing data

frequency of requests

formats required

V. CDDS Input

The IVAM system will accept data as fed over the CDDS line and store it for future use.

V-1. Data Required

mapping data
tbd
picture data

uniform grids

sectors

VI. Video Tape Input

Optional tbd

VII. Film Chain Input

Optional tbd

VIII. A/I Control Interface Bus

MWK - tbd

IX. Electrical/Physical Interface

JCS - tbd

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# APPENDIX D

## Transmission of Uniform Grids

## INTRODUCTION

The purpose of this paper is to consider an alternative method of transmitting graphic data around the NDC in the AFOS System. The method will be described and then compared with Variable Exception vector encoding along three dimensions: compaction, processing, and flexibility.

## METHOD

The curves transmitted over the FAX lines now and over the NDC in the future are generated at the NMC. All of these curves are derived from a construct called a Uniform Grid. In a Uniform Grid the parameter to be plotted is assigned a value at regularly spaced intervals throughout the area of interest. These values are derived from mathematical models or a weighted average of less regularly spaced point observations. The premise of this paper is that not only is the Uniform Grid a compact way of transmitting contour data, but it is much more flexible than graphics which are encoded as exception vectors.

## COMPACTION

The primary incentive for the use of variable exception vector encoding is the desire to minimize the number of bits which have to be transmitted in order to communicate a given graphic product. In the presentations at the World Weather Building in March 1976, the size of a typical graphic product was estimated to be 70-100 256 byte blocks

70 x 256 x 8 = 143,360 bits = 8,960 16-bit words to

100 x 256 x 8 = 204,800 bits = 12,800 16-bit words

A lower estimate was given over the phone by Art Bedient of NMC. He indicated the possibility of getting down to 24 or even 12 blocks using a long vector format. Thus the most optimistic estimate would be

12 x 256 x 8 = 24,576 bits or 1,536 16-bit words

The largest Uniform Grid listed by the Weather Service in the preparation of FAX output is 116 x 44 = 5104 points. However, this is seldom used. One of the largest of the widely used grids is the larger of the two LFM grids, which is

53 x 57 = 3021 points

At NMC the value at each of these points requires 12 bits of a 16-bit field. This would require

3021 x 12 = 36,252 bits or 2,266 16-bit words

which is better than all but the most optimistic estimates of the vector encoding. However, at SSEC our experience has shown that seven bits of input resolution is sufficient to produce pleasing contours. While many more bits are required during the processing so that round-off errors do not distort the results, the input data to the models has no more than seven bits resolution which should be sufficient for the uniform grid also. Therefore,

1322

3021 pts. x 7 bits = 21,147 bits     16 bits per word = 1,322 words

which is better than exception vectors and guaranteed rather than estimated.

Also, many of the AFOS installations may not be interested in the full area covered by the grid. They can choose to store only those points which are of interest to their installation. For instance, to cover North America one can select 625 out of the 1977 points of the PE grid and 1980 of the 3021 points in LFM grid. Then their local storage requirement would be

625 x 7 = 4375 = 271 words for the PE  or  1980 x 7 = 13,860 = 866 words

Further reduction may be possible due to the nature of the uniform grid data itself. It is very unlikely that any meteorological situation will result in tremendously different values between adjacent points on the uniform grid. It seems likely that only 5 bits would be required to represent the difference between adjacent points on a given day when only seven bits are required to cover the complete range of the parameter over the globe throughout the year. Thus the value at each point would be added or subtracted from the value to its left.

The first element in each row would be similarly computed from the point immediately above it. Even if there are occasions when there is a dramatic difference between adjacent points, they are definitely the exception. On such occasions extra resolution could be used.

Assuming such a method were used with the LFM grid:

3021 x 5 bits = 15,105 bits or 944 words

If only those points which are needed for North America are selected the reduction is even more dramatic:

1980 points x 5 bits per point = 9900 bits/16-bit words = approx. 620 words

Finally, another source of compaction comes from the fact that the alphanumeric labelling of curves is implicit in the uniform grid. It need not be transmitted because it has not yet been computed.

PROCESSING

The second dimension is the processing required at NMC to prepare the product for transmission and the processing required at the WSFO to prepare the product for display.

At NMC the preparation of Variable Exception Vectors does not represent a dramatic processing load. However, since the Uniform Grid already exists at NMC no preparation at all would be required for its transmission, unless it is further compacted as suggested. However, any compaction scheme that is appropriate to the Uniform Grid is likely to be less complex than the vector encoding.

The difference in processing at the WSFO would appear to favor the exception vectors since this method of encoding loads directly into the Aeroneutronics Display Processor. The Uniform Grid on the other hand requires contouring and smoothing which can be performed as separate functions or combined if Bessel Functions are used. This process requires about 15 seconds on McIDAS, which is a 24-bit machine. On the PDP-11 or the Keronix it will take considerably longer because these 16-bit machines will have to resort to double precision at critical points in the processing. Nevertheless, the time required should still be less than a minute per product. The software would present no problem since a number of contouring programs already exist including those of McIDAS, IVAM, Roger Davis, and Dr. Chia.

At first glance it would appear that a processor would have to be dedicated to the contouring function to handle the 1000 products produced by NMC each day. However, the number of products to be stored at any single WSFO will be a small fraction of this total load because there is no way that any small group of individuals could integrate 1000 graphic images in a single day. If it were necessary for them to do so, there would be reason to question the materials they had to work with. It is much more likely that 20-40 products per day would suffice at the smaller stations.

FLEXIBILITY

Because the bandwidth of the NDC is rightfully viewed as the critical resource of the AFOS System, the focus of AFOS design has been to optimize its use. However, while solving one problem it is often instructive to ask, "if we solve this problem, what is the next problem?" Assuming a working NDC and computers running at every WSFO, there will be an immediate desire to do more processing locally to integrate the nationally created information with local data sources and the local forecasters experience with local effects that are below the resolution of the models or which are updated frequently such as radar.

It is at this point that the uniform grid format is infinitely more useful than exception vectors. The exception vectors are essentially hardwired to the raster characteristics of the AFOS display and are more like microcode instructions than a data representation. Therefore, a great deal of unscrambling is required to get this encoding back into a format that is suitable for further processing. This processing is much more time-consuming than the one that created the vectors. This is because of the far greater number of input points. The output of this process, incidentally, is a uniform grid.

The uniform grids can also be scaled, windowed and combined in a variety of ways to produce new information which is nowhere near as well-represented by overlaying different images. For this reason the uniform grid data can be viewed as an extremely flexible input to a local processing system which provides a solid base for future expansion, new data sources, and new methods. Variable exception vectors, on the other hand, are an end-product which cannot serve as a processing input. They provide no clear advantage in terms of compaction even using best case versus worst case figures. The processing arguments which might be used to support their use in the present will be absolute by the time the system is implemented in the field.

There is one final issue. As mentioned earlier the vector encoding is specific to the raster characteristics of the AFOS display. This means that all future users of the AFOS data will be forced to standardize on an expensive nonstandard display which they may feel has more resolution than they need for their purposes. Also, since the resolution of the image is based on its greatest geographic extent, anyone interested in only a small portion of it is of necessity looking at an unaesthetic, highly digitized portion of it. With the Uniform Grid the apparent resolution is the same regardless of the scale and the data is in no way biased to a particular display device.

CONCLUSION

It would seem that there is no significant bandwidth advantage in the use of exception vectors. For the typical product derived from a PE or LFM grids the grid itself appears to be more compact. The processing load represented by the contouring is potentially a benefit as well as a burden. Also, the use of a flexible format would emphasize the end use rather than the transmission of the product, thus benefitting the entire meteorological community. The data would be equally useful with the AFOS display, a standard NTSC display, or a European SECAM or PAL display. The data and the display would be forever independent, and all users could judge the cost versus resolution trade-off for themselves when choosing this display.

# IVAM ANNUAL REPORT

JUNE 1977

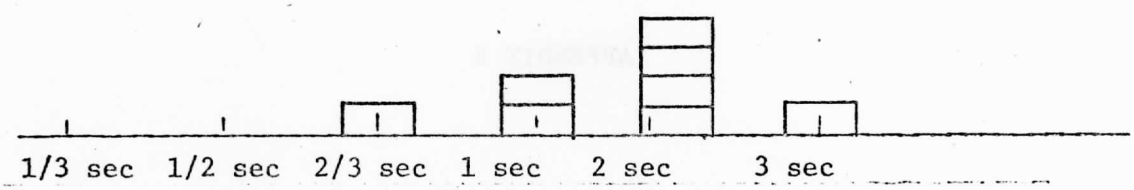
## APPENDIX E

## Guidelines for IVAM "Transitions"

Guidelines for Ivam "Transitions"

Results of the transition test film evaluation by members of IVAM weathercaster advisory panel indicated some general preferences by the members as a group. The lack of unanimity on any issue, however, must be a reminder to keep the avenue open for downstream changes as needed.

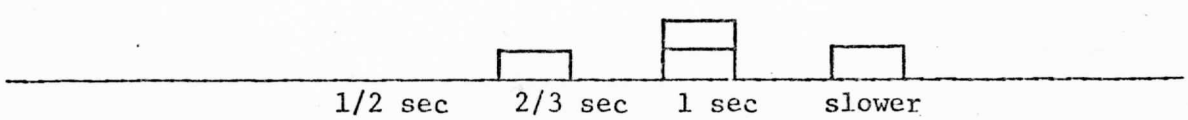
Of the four types of transitions tested (dissolve, fade out/fade in, pop/cut, and wipe), dissolve was the most preferred choice for both transitions between adjacent satellite pictures and satellite to graphics transitions. For the timing of dissolves, preferences were as shown in Figure 1.




Dissolve Timing Preference
Figure 1

For the purpose of establishing a baseline on IVAM, assumed transitions will be 2 second (30 TV frame) dissolves.

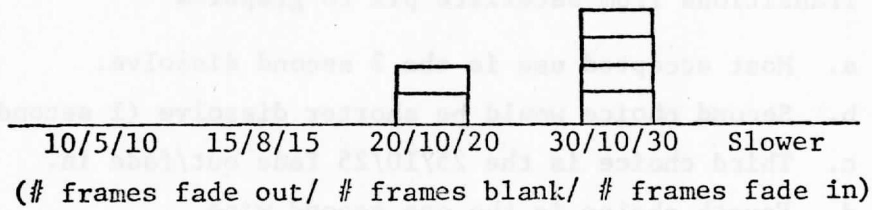
The second most acceptable transition is the "wipe." Timing preference for the wipe is shown in Figure 2.




Wipe Timing Preference
Figure 2

Wipes were preferred for graphics to graphics transitions, with limited mention of wipe for satellite to graphics transitions. In the interest of establishing a baseline, the one second (30 TV frame) wipe will be the assumed timing, unless other timing is specified.

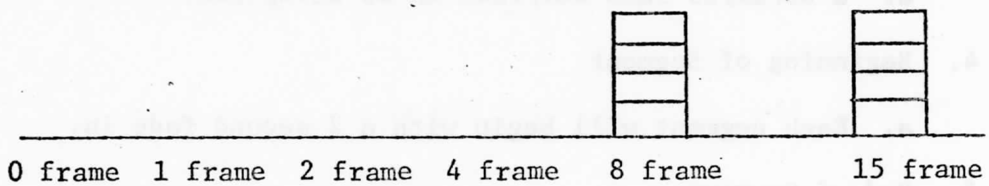
The fade out/fade in was considered acceptable by some for satellite pix to satellite pix transitions. Timing preference for fade out/fade in is shown in Figure 3.




Timing Preference for Fade out/fade in Transitions
Figure 3.

The baseline fade out/fade in transition will be the 25/10/25 frame unless other timing is specified.

Pops and cuts were found generally unacceptable for transitions between satellite picture and graphics. However, they were preferred by some for transitions within graphics. The timing preference is shown in Figure 4.




Timing Preference for "Pop" Transitions
Figure 4

A time of ten TV frames has been chosen for the standard "pop."

The duration of segments has been described in terms of integral segments, in fact in multiples of five seconds. In order to fit into the specific time allotment for a segment, the transition times must be carefully considered for two reasons: First, the amount of time required for transitions may become a significant portion of the time requirement of a segment; i.e., three dissolves in a 20 second segment require 6 seconds of the total 20 seconds. Second, our traditional thinking of integral number of seconds must account for the 1/3 second (10 frame) portions of the transitions as required for the "pop."

## Conclusion

The following "rules" can be used to choose transitions of IVAM output.

1. Transition of Satellite pix to satellite pix

   a. Most accepted use in the 2 second dissolve.

   b. Second choice would be shorter dissolve (1 second?).

   c. Third choice is the 25/10/25 fade out/fade in.

   d. Pops, cuts, and wipes are not considered generally acceptable for transitions between satellite pictures.

2. Transitions from satellite pix to graphics

   a. Most accepted use is the 2 second dissolve.

   b. Second choice would be shorter dissolve (1 second?).

   c. Third choice is the 25/10/25 fade out/fade in.

   d. Fourth choice is the one second wipe.

   e. Pops and cuts were found generally unacceptable for transitions between satellite pix and graphics.

3. Transitions between Graphics

   a. Two second dissolves are acceptable.

   b. One second wipes are acceptable.

   c. A ten frame "pop" is acceptable.

   d. a 25/10/25 fade out/fade in is acceptable.

4. Beginning of Segment

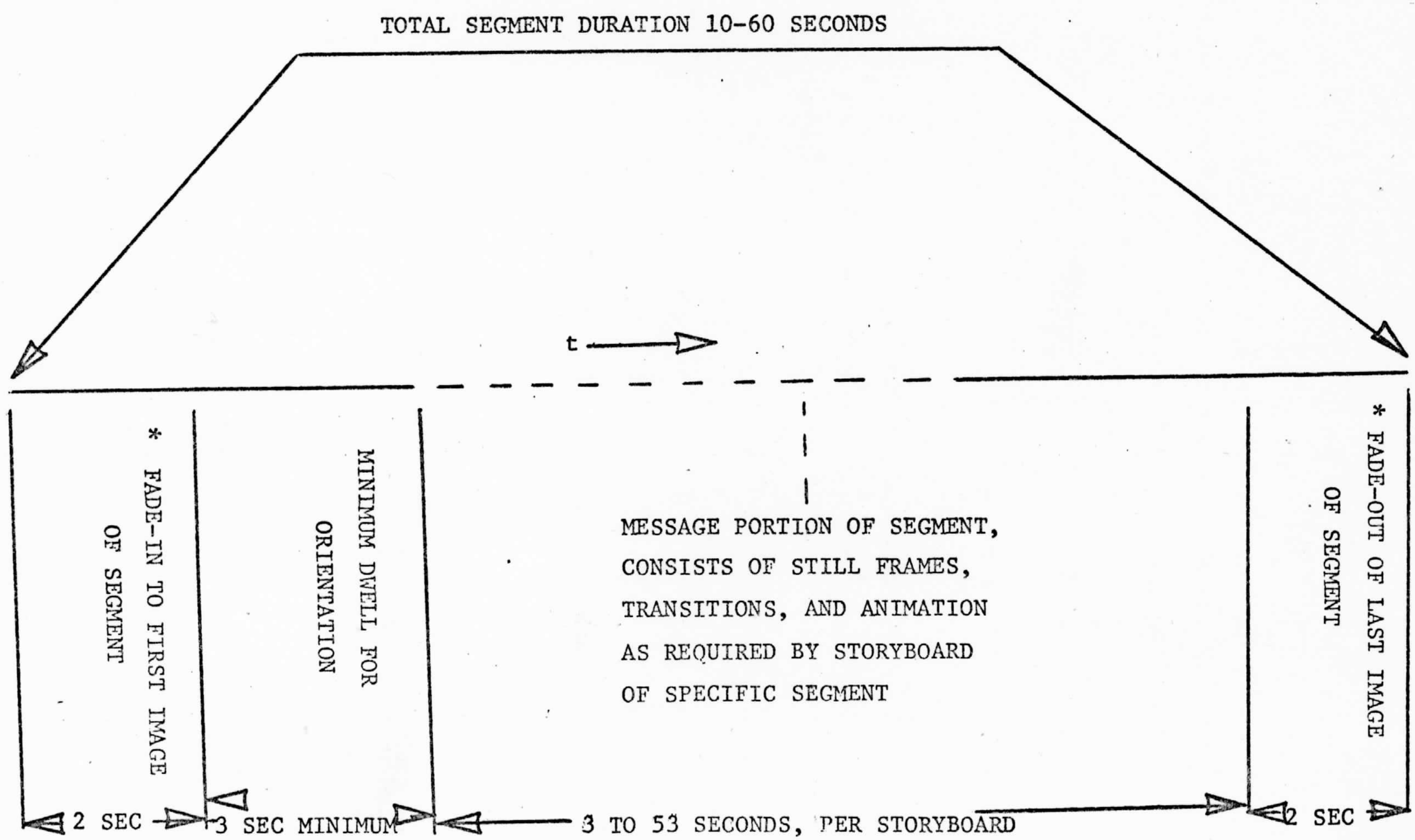
   a. Each segment will begin with a 2 second fade in.

5. End of Segment

   a. Each segment will end with a 2 second fade out.

Remarks

The test film used as a basis for these guidelines was designed to test the satellite pix to graphics transition. The satellite to satellite and graphics to graphics transitions were in the film for the sake of providing context. The observations made by the advisory committee on those transitions are valid, but a more complete set of evaluation criteria may be required in the future. However, until an image vocabulary of appropriateness and style are available, these guidelines should be used.




* The Fade-In/Fade-Out Requirements Are Waived for Emergency Segments