GEOPHYSICAL REPORT

on an

AIRBORNE MAGNETOMETER SURVEY

covering

236 Contiguous Claims

Situated near

Missezula Lake, Princeton Area

Similkameen Mining Division

Province of British Columbia

centered at

Latitude 49°45'30"N; Longitude 120°39'W

on Behalf of

PAGEANT MINES LTD.

MAY 9, 1969

by

Instrument Operator:

J. Pasche

Geo-X Surveys Ltd. Vancouver, B.C.

JUNE 26, 1969

Report by:

D.R. Cochrane,

P. Eng.

G.E. White, B. Sc. James Cerne, M.S.



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GEO-X SURVEYS LTD. 627 HORNBY STREET, VANCOUVER 1, B. C.

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Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

2355 MAP

SUMMARY and CONCLUSIONS:

Early in May, 1969, Geo-X Surveys Ltd. completed

241 line miles of total field aeromagnetic surveying on the

Primer-Pageant claim group, situated near Princeton, B.C. and
on behalf of Pageant Mines Ltd.

The survey was completed in an Excalibur 800 fixed wing aircraft with a Varian V4937A proton precession magnetometer (†1 gamma); SDV 4991 digital recorder and analog chart recorders. Flight line positioning was facilitated by 35 mm. strip photography matched to mosaics prepared from Government airphotos (see accompanying Figure 3). Terrain clearance was recorded in analogue mode by a radar-type pulse altimeter.

Data processing was conducted by Geo-X Surveys Ltd. personnel using IBM equipment in Vancouver.

The total field isomagnetic plan (Figure 4, 1":1000') was plotted by a computer-plotter unit at a contour interval of 50 gammas.

The arithmetic mean magnetic value, 57,680 is normal for the magnetic latitude, however the range of values (up to 60,036 and down to 57,067) is quite considerable and this indicates a fairly wide range of bedrock magnetic susceptibilities. The magnetics in the survey area are complex, suggesting a parallel complex geological setting. Several magnetic high

(positive) features have been identified on accompanying maps, and these, in addition to other abnormal features (such as steep magnetic gradients and rapid directional changes) should be investigated on the ground. Several linear magnetic features are indicative of faults and an overall arcuate structure of unknown cause is the most regional feature. The "North" and "South" zones on the Primer Group are characterized by differing magnetic settings which is possibly indicative of their different geological settings. A magnetic low disturbance trough is spatially related to the two zones.

Respectfull & submitted,

D. R. COCHRANE

D.R. Cociente, P. Eng.

G.J. Wate, B. Sc.

James Cerne M S

INTRODUCTION:

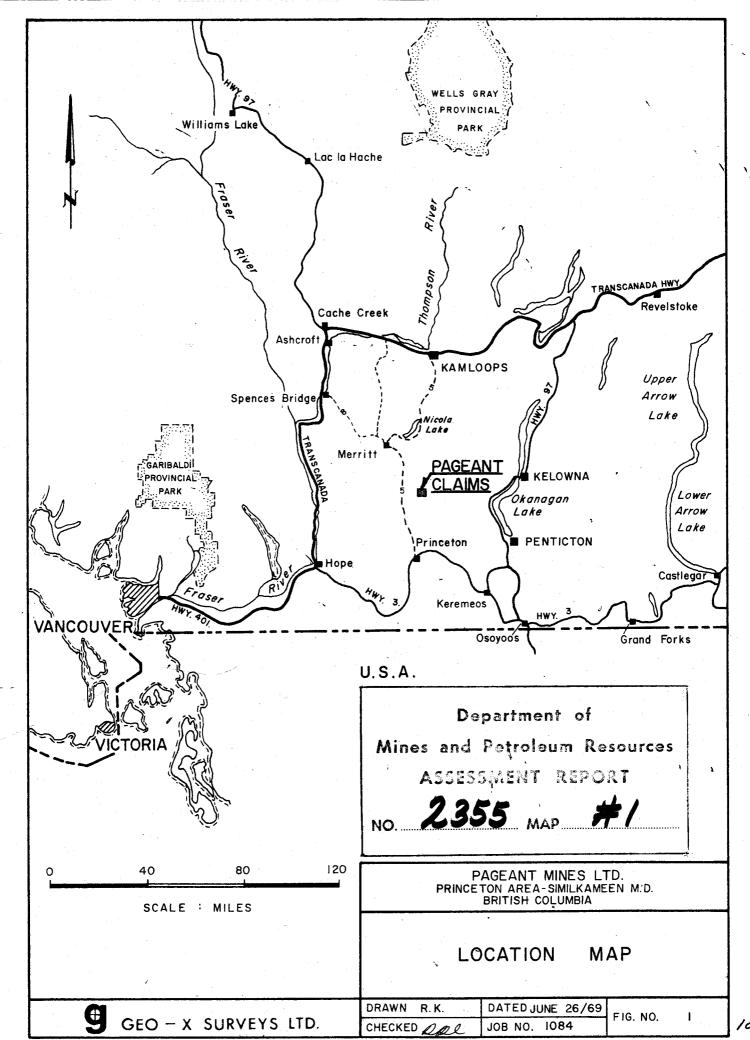
On May 9, 1969, Geo-X Surveys Ltd. of Vancouver,
British Columbia, on behalf of Pageant Mines Ltd. conducted an
airborne magnetometer survey over a group of claims in the
Princeton area, Similkameen Mining Division, Province of British
Columbia. The purpose of this survey was to (a) delineate,
if possible, any diagnostic magnetic patterns that may be
associated with areas of known mineralization within the
survey area; (b) to indicate the extent of these zones; and
(c) to possibly locate other areas that could be of interest
from an economic point of view.

A total of 241 line miles of total intensity airborne magnetometer surveying was completed. This report describes the instrumentation, field procedure and data processing and discusses the results obtained.

LOCATION and ACCESS:

The group of claims covered by this report is centered at latitude 49°45'30"N; and longitude 120°39'W near Missezula Lake.

Access to the property is by motor vehicle north from the town of Princeton, B.C. by gravel road up to Summers Creek to Missezula Lake.



1a

CLAIMS and OWNERSHIP:

The property on which the airborne magnetometer survey was conducted consists of some 240 mining claims known as the Primer-Pageant Group and listed as follows:

Name:	•	Number:
Edie's		1-80
Jack's		1-20
Jack X		1-18
John A		1-8
Pageant	1	1-4
ОВ		1-40
oc	•	1-40
OD		1-30

GENERAL SETTING:

The mineral property surveyed is situated in the Thompson plateau subdivision of the Interior Plateau physiographic division of British Columbia. The Thompson Plateau is a gently rolling upland of low relief which represents a late Tertiary erosion surface recently dissected by the Thompson River and its tributaries, and the Similkameen and Okanagan rivers, themselves tributaries to the Columbia. The plateau contains many rock types. Stocks of granite rock intrude Paleozoic volcanics and sediments and in some areas these are capped by gently

dipping or flat-lying eocene lavas. Thick glacial drift covers large areas, and southeast or south oriented drumlins are frequently ovserved [B.C. Department of Mines and Petroleum Resources Bulletin #48]. The local topography of the area surveyed is fairly gently rolling but a steep, north trending valley (Missezula) forms the west boundary of the area surveyed.

AIRBORNE FIELD RROCEDURE:

The total intensity of the geomagnetic field was measured and recorded along 62 flight lines, at an average terrain clearance of 400 feet. The cross flight lines have a general north-south bearing while the tie lines are northeast-southwest and northwest-southeast.

The survey was flown in a fixed wing aircraft, towing an airfoil sensor. A proton magnetometer, digital and chart recorders, camera and altimeter were mounted in the aircraft. The magnetometer and chart recorder continuously measured and recorded the magnetic field intensity. At one second intervals, the field amplitude and fiducial number were recorded on punch tape by the digital recording system. At thirty second intervals, the time and line number were punched on the tape. At two second intervals, a split image camera simultaneously photographed (1) the terrain, and (2) the clock and fiducial display panel. Thus each terrain photograph is bordered by a photograph of the clock and fiducial number.

The terrain clearance was measured with a Bonzar pulse type altimeter and recorded by a G-2000 chart recorder.

Solar flare warning and predictions, issued daily at the Space Disturbance Forecast Center in Boulder, Colorado, were used to schedule the flight during a magnetically quiet period.

The punch tape, chart and strip photograph processing is described in the following section. Instrument specifications are in Appendix IV.

DATA PROCESSING:

The data processing procedure consisted of four steps, discussed under the following headings:

- 1. Flight line X-Y positioning.
- 2. Editing of the paper tape.
- 3. Tabulation of critical fiducial numbers and their X-Y coordinates.
- 4. Contour plotting.

1. Flight Line X-Y Positioning:

From the aircraft, while the lines were being flown, the flight lines were roughly positioned on government aerial photographs. In the office, the beginning and end of each flight line was marked on the strip photographs, and the flight

lines were transferred onto a mosaic prepared from the government photos. An arbitrary X-Y coordinate system was superimposed on the mosaic with +Y north and +X east (see Figure 3). Thus, every position along a flight line was defined in terms of X (number of feet east of the origin) and Y (number of feet north of the origin), and has a corresponding magnetic value in gammas.

2. Editing of the Paper Tape:

A listing of the contents of the paper tape was made by IBM of Vancouver. The listing was examined and compared with the analog record as a guard against possible machine or operator error. The magnetic readings for areas of flight line intersection were compared as a check on the time variation of the geomagnetic field.

3. Tabulation of Critical Fiducial Numbers:

The first and last fiducial number on each line were tabulated along with their X-Y coordinates. In addition, points where the flight line changed direction were tabulated along with the appropriate fiducial number. The tabulated information was keypunched onto computer cards, and sent with the punch tape to IBM.

4. Contour Plotting:

IBM fed the punch tape to its computer, along with the X-Y coordinates of the start, end and any changes of direction that may have occurred in the flight line. The data plotting

interval along the flight lines was every third point or about 500 feet. The magnetometer readings were evenly spaced along the line segments and contoured by a computer-plotter unit at a contour interval of 50 gammas.

RESULTS/DISCUSSION/INTERPRETATION:

Introduction:

Since ferromagnetic susceptibility and natural rock magnetism change measurably from one rock type to another, accurate detailed mapping of the geomagnetic field often provides valuable information about the subsurface geology (even in heavily drift covered areas). Aeromagnetic surveys provide new knowledge of the type, general attitude, configuration and complexity of the geosuperstructure and often identify local elements which sometimes indicate ore. Aeromagnetic prospecting can be applied to the delineation of buried contacts and disruptions or the location of areas of pessible plutonic differentiation and its varied products. Considerable speed and accuracy is inherent in this survey method. When it comes to interpretation, however, there are two factors which can exert considerable influence. The first is geologic control, which reduces the number of variables that the interpreter must consider. The second is data analysis, which is essentially the use of filtering techniques.

Filtering can remove noise, regional variation, and the effects of various physical phenomena (such as the effect of topography, or changing depth of burial). In addition, interpretation techniques (explaining the data) must be flexible enough to be revised in the light of new geological, geochemical or geophysical information.

Data Presentation:

A total intensity isomagnetic field plan is presented as Figure 4. The horizontal scale is 1":1000' (approximately). The planimetry has been derived from uncontrolled airphoto mosaics. Some distortion is inevitable. The map depicts the intensity of the geomagnetic field present at the given nominal altitude on the particular flight day.

A general graphic interpretation accompanies this report and is designated Figure 5. It is basically a "manual" qualitative analysis of the magnetic features rather than a "computational" quantitative one. Considerable reference has been made to the aerial photography, available geology and geophysics in the preparation of the interpretation map. The "grid" data is stored on IBM punched cards and is available on request (within a reasonable period of time) for quantitative numerical analysis.

Basic Statistics:

The recorded total intensity range was between 60036

and 57067 gammas. The arithmetic mean of a small sample of the original data points used in contouring was 57680 gammas, and standard deviation 275 gammas. Thus, the area is characterized by values mainly between 57405 and 57955 gammas.

General Description/Interpretation:

In order to facilitate description of the isomagnetic map morphological terms are employed. Figure 4 may be regarded as a contoured "magnetic surface" (magnetic terrain) complete with magnetic gradients, hills, valleys and linears.

Occasionally textured and fabric analysis terms are employed as well.

The magnetic response within the survey area is complex, irregular and at first glance somewhat random. It consists of a number of large and high amplitude ridges and magnetic complexes often with steep flanks, and these are superimposed on a relatively gentle undulating planar magnetic background surface of just less than 57600 gammas. The complexity of the magnetic surface is, of course, an indication of the complexity of the geological setting.

The most diagnostic and persistent magnetic feature is a north trending arcuate shaped magnetic low (less than 57500 gammas) designated linear A-A'. It is flanked to the west by a parallel magnetic ridge collectively numbered "Magnetic Highs" 3(a) and 3(b). In the extreme south, there is Magnetic High #4

belonging to this same high trend. The ridge and trough are disturbed at their northern ends where the axis of the magnetic low forms a rather tight arc. This occurs just north of the geographical center of the area surveyed. The arc is designated linear A'-A". Along strike and some distance to the south of A" is a subparallel magnetic low (B-B') again trending almost north/south. The entire system A-A'-A" to B-B' may, in fact, be related and suggests a possible syncline or anticlinal structure and may be therefore an outline of the gross lithologic attitudes. This possibility should be investigated on the ground. This "horseshoe" pattern is disturbed on the east side by a northwest trending low, designated C-C', and by a similar series of lows, (E-E') situated to the north. These disruptive features may indicate magnetic response to faulting.

Another persistent series of magnetic lows has been named D-D' and is north trending and situated at the west side of the map area. It may be response from the Summers Creek fault.

The most obvious magnetic high (above 60,000 gammas) is located near the north boundary of the survey area and is an elliptical shaped area some 3000 feet long by 1500 feet wide. The extremely high intensity suggests a high bedrock magnetic susceptibility, (most probably a concentration of magnetite).

A steep magnetic gradient located about 1 1/2 miles southeast of the above described high is named Magnetic High #2. It culminates in intensities in excess of 58500 gammas.

The other areas characterized by response in excess of 58200 have been so designated on the accompanying interpretation plan. The known mineralized areas, the "North" and "South Zones" lie in two distinct magnetic environments. This suggests that they may be located in differing geological settings. Correlation of the general geology, as mapped by F. Lee of Western Geological Services 1969, with the magnetic data, indicates that each lithologic unit can show considerable variation in magnetic susceptibility. This suggests that slightly different phases of the same lithologic unit may be present.

A similar magnetic situation is manifest north of disruption E-E' and this area is, therefore, prime exploration country. The magnetic plan is a guide to the geological structure and lithology. Specific deviations from the normal pattern, overall trends and normal amplitude of the magnetic field should be investigated in order to determine their cause. This includes the steep magnetic gradients, and rapid changes in direction such as the "nose" area around A'-A". The most expedient method may be ground geological mapping and prospecting in these areas and the identification of the abnormal magnetic features on the ground.

Respect Files Submitted,

of

D.R. COCHRANE

BRITISH

OLUMB A

D. R. COCHRANE, P. Eng.

G. Mite, B. Sc.

James Cerne, M.S.

PERSONNEL

Name:

WHITE, Glen E.

Education:

B.Sc. Geophysics - Geology University of British Columbia.

Professional Associations:

Associate member of Society of Exploration Geophysicists.

Experience:

Pre-Graduate experience in Geology-Geochemistry-Geophysics with Anaconda American Brass.

Since Graduation in 1966 in Geophysics - Geology, has obtained experience in Mining Geophysics with Sulmac Explorations Ltd.

Airborne Geophysics with Spartan Air Services consulting on second derivative.

Micro-Gravity project with Velocity Surveys Ltd.

Recently acted as mining Geophysicist and technical Sales Manager in the Pacific north-west for W.P. McGill and Associates.

Presently employed as Airborne and Mining Geophysicist with Geo-X Surveys Ltd.

Active experience in all Geologic provinces of Canada has been obtained.

PERSONNEL

Name:

PASCHE, Juergen

Education:

Mittelschule - equivalent to Grade 12. Completed apprenticeship as precision mechanic with Carl Zeiss - Graduate Electrical Technology.

Experience:

3 years - Electro-Technician with SIEMENS of Braunschweig, Germany.

3 1/2 years - Seismic Party Chief with PRAKLA Association for practical deposit research in Germany - including field experience in Switzerland, Italy, and North Africa.

PERSONNEL

NAME:

CERNE, James

EDUCATION:

B.S. Geology (June 1967)

Case Institute of Technology - Cleveland,

Ohio.

M.S. Geophysics (August 1968)
California Institute of Technology Pasadena, California.

EXPERIENCE:

July 1965 - June 1967 - Metallurgy Dept., Case Institute of Technology - Student Asst.

June - September 1967 - N.A.S.A. Manned Spacecraft CNT. Lunar and Earth Sciences Div., Geophysics Group, Houston, Texas.

September 1967 - August 1968 - California Institute of Technology, Seismological Laboratory, Graduate Research Asst.

September 1968 - present. Employed by Geo-X Surveys Ltd. as Geophysicist.

PERSONNEL

NAME:

COCHRANE, Donald Robert

EDUCATION:

B.A.Sc. - University of Toronto M.Sc. (Eng.) - Queen's University

PROFESSIONAL

ASSOCIATIONS: Professional Engineer, (P. Eng.),

registered in British Columbia,

Ontario, Saskatchewan.

M.C.I.M.M., M.E.I.C., M.G.A.C.,

M.M.A.C.

EXPERIENCE:

Engaged in the Profession since 1962 while employed with Noranda Exploration Co. Ltd., Quebec Cartier Mines Ltd.,

Meridian Exploration Syndicate.

Experience in West Indies, Central and

South America, U.S.A. and Canada.

PERSONNEL

Name:

KEY, Robert A.

Education:

Grade XII Diploma.

1 year Petroleum Geology at the Institute

of Technology and Arts in Calgary.

Experience:

2 years in Steam Heating Design Drafting.

12 years with Mobil Oil Canada Limited,

Senior Draftsman.

2 years, mining exploration with Geo-X Surveys Limited as Chief Draftsman.

PERSONNEL

Name: YIP, David Edward

Education: Grade 12 - Majors: Science, Mathematics,

Social Studies and

Industrial Arts.

Lake Cowichan Secondary School

1 year - Vancouver Vocational Institute -

Drafting Training.

Experience: Presently employed by Geo-X Surveys Ltd.

since November 27, 1967 as Draftsman.

APPENDIX

CERTIFICATE

NAME:

MALESKU, Terrance D.

EDUCATION:

Grade XII - Balfour Technical School,

Regina, Saskatchewan.

EXPERIENCE:

September 1961 - September 1965 as Geologi-

cal Draftsman for Marathon Oil Co., Regina,

Saskatchewan.

September 1965 - December 1968 as Structural

Draftsman for Con-Force Products, Regina,

Saskatchewan.

April 1969 - presently employed as Geologi-

cal Draftsman for Geo-X Surveys Ltd.

PERSONNEL

NAME:

RODDY, Robert B.

EDUCATION:

Senior Matriculation - Alberta

Military Courses Attained:

1942 - Air Observer; 1948 - Photographic Technician; 1949 - Air Camera Operator; 1956 - Photographic Supervisor; 1956 - Camera Recorder Repair; 1957 - Junior Officer; 1957 - Public Relations Officer; 1959 - Flying Officer's Qualifying Exams; 1960 - Technical Photographic Officer; 1963 - Technical Officer's Radiological Defence; 1964 - Technical Officer's Logistics; 1966 - Royal Canadian Air Force Staff School; 1967 - Program Evaluation and Review Techniques.

EXPERIENCE:

- 1964 68: Manager-Photographic Logistics Cell at Material Command Headquarters -Canadian Armed Forces, Ottawa.
- 1959 64: Staff Officer-Photography at Training Command Headquarters, Royal Canadian Air Force, Winnipeg.
- 1957 59: Public Relations Staff Officerat Training Command Headquarters, Royal Canadian Air Force, Trenton.
- 1947 57: Supervisor-Photographic Services Unit at various R.C.A.F. stations throughout Canada and England.

PERSONNEL

NAME:

CARVAJAL, Juan Carlos

EDUCATION:

San Peter College, Santiago, Chile Grade twelve majors: Physics,

Mathematics, Chemistry.

University of Chile - 1 year.

2 seminars of Physics and Mathematics.

University of Valparaiso - 1 year of

Architecture.

Centers Studios of Santiago - 2 years Construction, Architectural Drafting.

EXPERIENCE:

March 1968 - Metropolitan Constructions

Ltd. (Santiago, Chile).

August 1968 - present - Employed by Geo-X Surveys Ltd. as Draftsman and

Survey helper.

PERSONNEL AND DATES WORKED

The following Geo-X Surveys Ltd. personnel were employed on the Pageant Mines Ltd. airborne magnetometer survey project.

A. FIELD WORK

G. E. White Navigator May 9, 1969

J. Pasche Flight Operator May 9, 1969

B. DATA PROCESSING AND REPORT PREPARATION

G. E. White Geophysicist June 20, 25

J. Cerne Geophysicist May 14, 29, 30 June 19, 20, 1969

D. R. Cochrane P. Eng. June 19, 20

C. DRAFTING AND REPRODUCTION

R. Key Draftsman May 15, 1969 June 2, 6, 13.

D. Yip Draftsman May 13, 14, 15, 30.
June 3, 5, 6, 9
13, 24, 25, 26, 30.

J. Carvajal Draftsman May 30

June 2, 3, 27, 30.

T. Malesku Draftsman June 4, 5.

B. Roddy Photo Coordinator May 20-23, 26-29.

COST BREAKDOWN

The following is a cost breakdown for an Airborne Magnetometer Survey conducted over the Primer-Pageant Claim Groups by Geo-X Surveys Ltd. through an Agreement with Pageant Mines Ltd. dated April 16, 1969.

Geo-X Surveys Ltd. provided the following for an all inclusive price.

- (a) Air Photo Mosaic
- Aeromagnetic Survey Coverage
- (c) Base Map Preparation
- (d) Preliminary Data Preparation
- (e) Computer Data Processing
- (f) Report Preparation

241 line miles at \$50.21 per line mile

TOTAL ALL INCLUSIVE PRICE \$12,100.00

Secretary-Treasurer.

Declared before me at the

City

U anconver, in the

Province of British Columbia, this 26

day of

Hebruary 1970, A.D.

Allen Late

A Commissioner for taking Affidavits within A Notary Public in and for the Province of British Columnia.

SUB - MINING RECORDER

SPECIFICATIONS OF THE V-4937A MAGNETOMETER SYSTEM

Performance

Range: 20,000 to 100,000 gamma (worldwide) Sensitivity: $\pm 1/2$ and ± 1 gamma in any field.

Sampling

Rate: manual and "clock" operation permits any

timing sequence.

Power Requirements

22-30 V, 6 amps for magnetometer, 60 watts for analog recorder and 100 watt maximum for digital recorder.

Physical Specifications

Console: size - 19 x 17 x 24 inches; Weight 68 lbs.

Analog

Recorder: dual channel - 15 x 10 x 10 inches, 30 lbs.

Scanner-

coupler: fucical counter, idént. control, 24 hr. clock,

40 lbs.

Recorder: size - 14 x 11 x 28 inches; Weight 41 lbs.

Data Output

Digital

Recording: BCD 1-2-4-8 (four line output)

"O" state - 18 to -30v through 100K ohms

1 state -1 to +3v through 100k ohms

Print

Command: Positive going 12 to 25v pulse; 15M second.

Auxiliary

Channels: A & B for radio altimeter and navigation equipment.

Analog

Recording: Galvanometric -1 mA full scale into 1500 ohms

Potentiometric: 100mV full scale. Minimum load

resistance 20K

Full scale resolution of the least most significant digits of the total geomagnetic field 0-99, 0-999 at 1 gamma sensitivity; 0-49, 0-499

at 1/2 gamma sensitivity.

INSTRUMENT SPECIFICATIONS

Aircraft

Type and Model: Excalibur 800

(Beechcraft Twin Bonanza modified by

Swearingen Aircraft, San Antonio,

Texas)

Power: Two 400 H.P. Lycoming 10-720-AIA

engines.

Gross Weight: 7900 pounds

Empty Weight: 5300 pounds

Useful Load: 2600 pounds

Fuel Capacity: 230 gallons (U.S.)

Performance at

7900 lbs. Gross: Climb - 1535 feet per minute (at sea level)

Cruise - 230 miles per hour.

Range - 1200 miles.

Instrument Specifications

Camera

Type: Neyhard Automax 35 m.m. pulse camera

Model: G-2 with auxiliary data box

Pulse Rate: Up to 10 frames per second

Film Format: 0.738" x 0.738" square picture with

0.200" x 0.738" data area.

Magazine: Mitchell 400 foot 35 m.m.

Lenses: (a) 17 m.m. F/14 Super-Takumar Fish-eye

(b) 35 m.m. F/2.0 Super Takumar

Data Box: (a) 24 hour Accutron Clock

(b) Frame counter

(c) Available for optional feature

Dimensions

(less magazine): 8 3/8" high, 4 1/2" deep, 6 1/4" wide.

Weight

(less lens and

magazine): 12 lbs.

