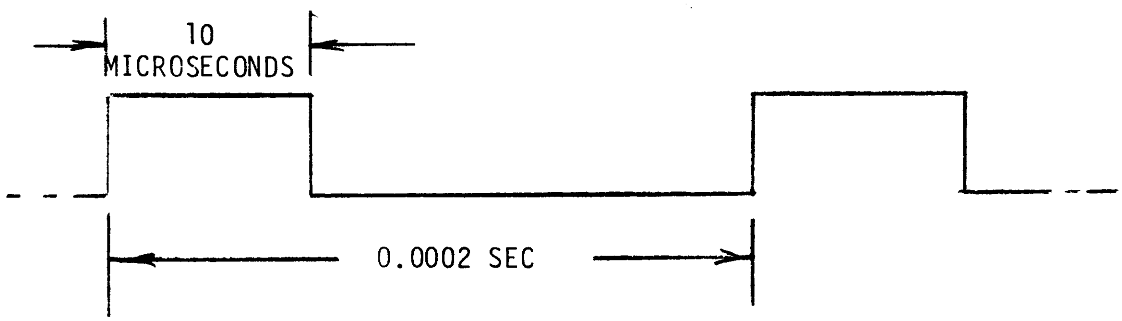
McDonnell Douglas Radio Services Corp.
Attn: J. C. McAllister
POB 516
St. Louis, MO 63166

EXHIBIT I TO FCC FORM 442

FIGURE 1

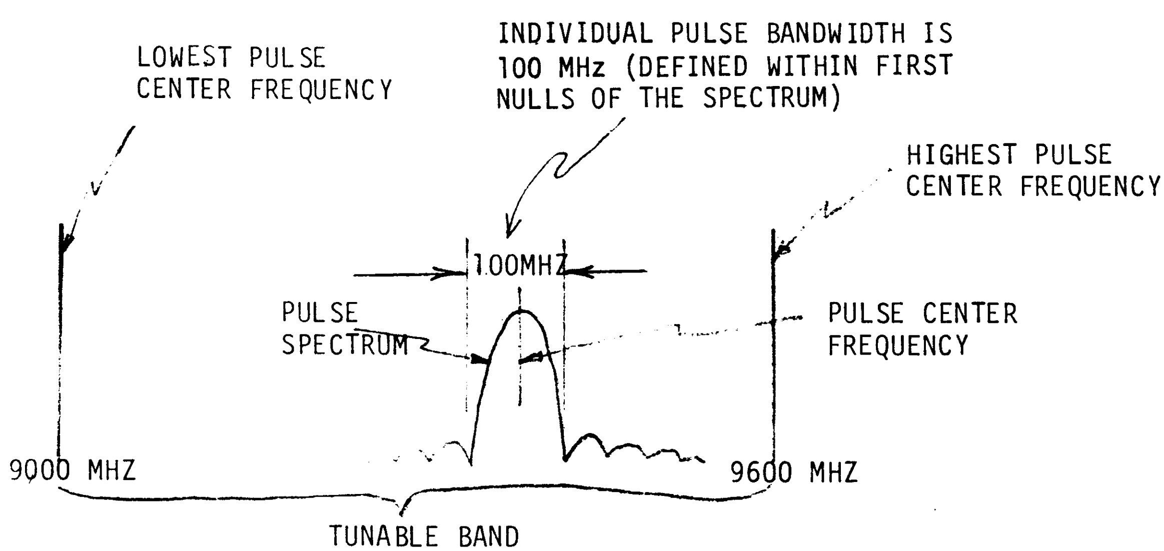
MODULATING SIGNAL



EACH 10 MICROSECOND PULSE IS BI-PHASE MODULATED WITH SUBPULSES OF 20 NANOSECONDS OR LONGER.

FIGURE 2

NECESSARY BANDWIDTH



NECESSARY BANDWIDTH = (9600 - 9000) + 100 MHZ = 700 MHZ
OR (700,000 KHZ)

(The necessary bandwidth is equal to the tunable bandwidth, i.e., 600 MHz, plus the 100 MHz modulation bandwidth).

McDonnell Douglas Radio Services Corp.
Attn: G. D. Foote, H362
POB 516
St. Louis, MO 63166

EXHIBIT II TO FCC FORM 442

11(a) Program

We are building an imaging radar; the type of which we believe will have future application to missile guidance. Our plans include installing the radar equipment in our company aircraft, gather and record radar data in flight, and then signal process the data in our laboratory.

Future plans include designing, packaging, and test-flying equipment with a form factor compatible with missile size and shape.

Description of Equipment

The radar equipment consists of a transmitter, receiver, antenna, and control box. It also contains radar data memory and digital magnetic recording equipment.

The transmitter is X-Band, and transmits coherent, pseudo random, bi-hase modulated pulses. The output transmitter stage is a travelling wave tube amplifier which is driven by a frequency synthesizer, the base frequency from which is derived from a stable crystal oscillator.

The receiver contains a low noise radio frequency amplifier and intermediate frequency stages to match the transmitted waveform. The receiver output is bi-polar video which is digitized and recorded for later processing.

The antenna has a one-foot dimension with a 6.9 degree beamwidth. It's highest sidelobe is 20 dB below the main beam. It has a 200 MHz bandwidth.

The control box contains the switches and controls to control and change the operating mode and parameters of the radar.

Theory of Operation

The antenna will be positioned to point to the sides of the aircraft velocity vector (sidelooking radar). The radar will be operated as a Synthetic Aperature Radar (SAR). Relatively long pulses are transmitted (through the antenna) and are reflected from the terrain below and to the side of the aircraft. The reflected radar data is received, digitized, and stored for later processing in the lab. In the lab the data will be processed to compress it in range and angle to achieve a high resolution ground map.

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Theory of Operation (Continued)

and stored for later processing in the lab. In the lab the data will be processed to compress it in range and angle to achieve a high resolution ground map.

11(b) Specific Objectives

Objectives sought during this experimental radar program are:

- to learn the interaction between equipment and processing complexity on SAR maps resolution and fidelity
- to learn what the radar parameters should be for a missile guidance application

11(c) The program will be used to develop, and extend methods, algorithms, techniques for missile guidance. The application of imaging radar for missile guidance is a new but growing field, and both U.S. Navy and U.S. Air Force development agencies are presently engaged in research and experimental development programs of a similar nature.

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EXHIBIT III TO FCC FORM 442

Item 20

The applicant is a wholly owned subsidiary of McDonnell Douglas Corporation (MDC) and proposes to render a non-profit radio communication service to its parent corporation. MDC is engaged in the design, development and manufacture of aircraft, spacecraft, missiles, other aerospace products, and associated supporting equipment for commercial customers and the U.S. Government.

The applicant and MDC have entered into an agreement whereby MDC will provide the necessary equipment to support its radio communication requirements. However, the applicant will have full control of the use, operation and maintenance of such equipment in the same manner as if the equipment were owned by the applicant.